

# **Should we Invest in Microcredit? A Financial Analysis of Microcredit from a USD-Investor's Perspective**

Hanna Koivulehto: Vienna University Of Economics And Business Administration, Vienna, Austria

**CONTACT:** Hanna Koivulehto, Vienna University of Economics and Business Administration, Nordbergstr. 15, B.6.11 (UZA4), 1090 Vienna, Austria.  
(T) +43 1 313 36 5995, Email: hanna.koivulehto@wu-wien.ac.at

## **Should we invest in Microcredit?**

### **A financial analysis of Microcredit from a USD-investor's perspective**

Version: September 2007

#### **Abstract:**

This study makes an innovative approach towards rating the profitability of micro-credit. While previous research on microfinance has been conducted through the analysis of individual case studies, this study takes a more widespread look at the financial performance of micro-lending organizations in less developed financial markets. A sample consisting of 24 micro-finance institutions (MFIs) operating in different regions worldwide is observed over a period of up to 9 consecutive years. The influence of both organization-specific and environmental factors on the profitability of their loan portfolios is examined. Furthermore, the capacity of those institutions to generate sufficient yields on their credit operations in order to attract rational foreign investors is rated. For this purpose, the realized credit spreads on MFI-portfolios are compared with spreads observable for exchange-traded USD-corporate bonds exhibiting equal levels of risk. The panel design and the investigation of multiple (partly qualitative) external variables influencing loan portfolio returns contribute to a comprehensive investigation of MFI-performance. Indeed, MFI-specific factors are found to be much more decisive for profitability than any environmental conditions.

**JEL.:** E4, F3, G2, O16

**Keywords:** Microcredit, Microfinance, Investment, Profitability

<b>1. Introduction</b> .....	<b>1</b>
<b>2. Literature Review</b> .....	<b>2</b>
<b>2.1. The Microfinance Industry</b> .....	<b>2</b>
<b>2.2. Profitability Drivers of MFIs</b> .....	<b>5</b>
<b>3. Empirical Research on Microcredit Profitability</b> .....	<b>7</b>
<b>3.1. Sample</b> .....	<b>7</b>
<b>3.2. Quantitative Analysis</b> .....	<b>9</b>
3.2.1. Data Preparation and Analysis.....	9
a) Microcredit Return Analysis.....	9
b) Microcredit Risk Analysis.....	9
c) Comparison of Returns.....	11
d) “Competitive” Yields.....	12
e) Microcredit Comparative Performance Measurement.....	13
3.2.2. Quantitative Data Analysis.....	13
a) Does the Average Profitability Meet Investors’ Demands?.....	13
b) Variables.....	14
c) Analysis of Influences on Microcredit Profitability.....	15
3.2.3. Results of the Quantitative Analysis.....	17
a) Does the Average Profitability Meet Investors’ Demands?.....	17
b) Influences on Microcredit Profitability.....	19
c) Microcredit Profitability Development.....	22
3.2.4. A note on Micro-Loan-Portfolio Write-Offs.....	24
a) Data and Data Analysis.....	24
b) Regression Results.....	26
3.2.5. Overview of Quantitative Characteristics of the Sample MFIs.....	27
<b>3.3. Qualitative Analysis</b> .....	<b>30</b>
3.3.1. Organization-Specific Performance Drivers.....	30
a) Top 5 Performers.....	31
b) Worst 5 Performers.....	34
3.3.2. Summary.....	36
<b>4. Implications</b> .....	<b>38</b>
<b>4.1. MFI-Specific Features</b> .....	<b>38</b>
<b>4.2. Environmental Conditions</b> .....	<b>41</b>
<b>5. Conclusion</b> .....	<b>43</b>
<b>Appendices</b> .....	<b>45</b>
<b>Appendix 1: UNCDF’s MFI performance indicators</b> .....	<b>45</b>
<b>Appendix 2: Factor analysis and rotation</b> .....	<b>46</b>
<b>Appendix 3: Write-off-Ratio regression (first regression with all variables)</b> .....	<b>47</b>
<b>References</b> .....	<b>48</b>

## **1. Introduction**

In recent years, microfinance and microcredit, in particular, have evolved as popular development aid tools in many less developed countries. Offering banking services to parts of the population that have no access to the traditional financial sector for reasons of poverty or discrimination has proved to be an extremely effective way of increase economic wealth for the whole society. The agents granting credit to small and poor customers with no or little collateral were soon to be called microfinance institutions (MFIs) thanks to the small size of their individual customer's accounts. Although the vast majority of MFIs were initially founded as non-profit organizations, some of them have undergone a transformation into regulated and commercial financial institutions. Nevertheless, information on the financial profitability of this industry is still extremely rare and mainly consists of isolated reports of individual organizations.

This is certainly a major reason for most traditional banks' reluctance to enter that specific market. There is hardly any private investment undertaken to build up and operate MFIs. In fact, individual investors also lack a suitable investment vehicle to participate in this industry. Even though past research in this field as well as the success of certain commercial MFIs indicates that offering banking services to poor clients can be a very attractive business, there are few studies on the purely financial aspects of microfinance. Given the manifest societal benefits of microcredit and the enormous excess of demand in funds, which cannot be served by the present funding methods, the inclusion of private, commercially oriented investors into the group of potential capital providers would be extremely desirable. Yet, rational investors naturally require a certain amount and type of information for their investment decision making. And the microfinance industry seems to currently offer too little reliable data to attract the attention of a noteworthy number of potential investors.

By focusing on the performance of MFIs' loan portfolios over time, this study aims at providing a basis for risk and return estimations of this industry. It shall contribute to a better understanding of the mechanics of microfinance. Eventually, potential investors, commercial financial institutions and MFIs themselves should be able to derive valuable insights about critical success factors in this type of business.

A review of past literature on this topic opens the discussion and leads into the description of this particular study's design. The reporting of the data analysis' results follows. Subsequently, a closer look is being taken at the organisational characteristics and environmental factors surrounding the sample's MFIs. Finally, the main implications of this investigation are discussed and conclusions drawn.

## **2. Literature Review**

### **2.1. The Microfinance Industry**

Microfinance refers to offering financial services poor clients (see e.g. Gulde et al. 2005). It can be distinguished from traditional banking through the special characteristics of the customers and the conditions of service (see e.g. Rutherford et al. 2004; CGAP 2005). A widespread feature of microcredit is the lack of collateral and the use of group liability schemes. Latter is often argued to contribute to higher repayment rates as a result of group pressure on the individual borrowers (see e.g. Ghatak 1999). Yet, not all empirical studies support this argument, as shown by Giné and Karlan (2006).

The provision of banking services to poor people has been argued to be beneficial both for the individual borrowers as well as for their societies (Bhatt et al. 1999). Access to banking services play a vital role for the development of every economy (King and Levine 1993). It is considered to help reduce poverty and thus foster individual freedom (see e.g. Daley-Harris 2005, p. 2) and promote small entrepreneurial engagement (see e.g. Rahman 1999; Tinker

2000; Chan 2005). This does not, however, mean that the establishment of credit institutes in poor societies automatically leads to prosperity. In fact, Matin, Hulme and Rutherford (2002) underline that the whole set of financial services (deposit, credit and insurance services) is demanded by poor bank clients. Engaging in those activities will improve the commercial flexibility of financial institutions targeting small (“micro-”) customers. There is, indeed, a tendency of microfinance organizations to increasingly add such services to their offering (see e.g. Dowla and Alamgir 2003; Dowla 2004; Hertz-Bunzl 2006; Porteous 2006). Sriram and Upadhyayula (2004) as well as Tucker and Tellis (2005) describe the transformation of former MFIs, which normally are not regulated by local banking laws, into commercial banks. Hartarska and Nadolnyak (2007) compare more than 100 MFIs originating in 62 countries and find no improvement in financial results or outreach attributable to a transformation into a regulated financial institution.

In summary, there is plenty of empirical evidence for the positive impacts of microfinance on the societies involved (see e.g. Raheim et al. 1996; Sebstad and Chen 1996). Other recent examples of similar results include the works of Kah, Olds and Kah (2005), Hietalahti and Linden (2006), Chowdhury, Ghosh, and Wright (2005), and Copestake, Bhalotra and Johnson (2001) as well as of Holvoet (2004) and Morris and Barnes (2005). Rahman (1999), however, criticizes the increasing pressure on both individual loan takers and on loan officers due to competition on the market for loans. Certain borrower groups may become victims of discrimination by MFI agents. Social tensions may, therefore, arise from the appearance of microfinance institutions in a community. Furthermore, the arrival of micro-financing institutions on a market also poses a potential threat to other financial institutions already operating in the region (Johnson 2004). If MFIs are subsidized by non-profit motivated donors they pose unfair competition to commercially oriented financial intermediaries who could potentially serve the market (Gulde et al. 2005).

Although the original goal of credit is the alleviation of poverty, the business potential of this “industry” cannot be neglected anymore. The number of MFIs globally has risen from a few initial establishments mainly in Bangladesh, Bolivia and Indonesia in the 1980s to approximately 10,000 (Castello 2004) serving somewhere between 30 and 100 million clients (Daley-Harris 2005; DESA/UNCDF 2006; UNCDF 2006). In total, MFIs were reported to manage 750 million small-sized savings or loan accounts in 2004 (World-Bank 2006). Microfinance operations have seen considerable growth in recent years (i.e. the number of customers seeking MFI services has grown by 25-30% annually during the last 5 years (UNCDF 2006)). Even more, the potential market is vast: The World Bank counts about 3 billion people who would profit from banking services but do not have access to them yet (World-Bank 2006). Some estimates about the market size for microfinance value the demand for credit at up to US Dollars 300 bn, while the current supply for such loans stands at US Dollars 4 bn (Beattie 2005). Currently, the lack of commercial service providers in this industry is assumed to be due to insufficient knowledge and unnecessarily fearful expectations of risks (CGAP 2005).

As the market for microfinance institutions is growing rapidly and new institutions enter, donors’ and other investors’ calls for improved transparency are getting louder. One possibility to bridge the information gap between an investor and a microfinance institution is to closely monitor the activities of latter. This could be done by large donor organizations through the establishment of close partnership agreements and regular performance reviews. The UNDP, for example, examines its microfinance portfolio in great detail every few years (Rosenberg 2005). The United Nations Development Programme (UNDP) and the United Nations Capital Development Fund (UNCDF), which offer a multitude of support and training services to microfinance institutions, propose five key indicators to measure the performance of MFIs (UNCDF 2005): *Outreach*, *Client poverty level*, *Collection performance*, *Financial*

*sustainability*, and *Efficiency*<sup>1</sup>. Additional indicators should be developed by the monitoring agents themselves based on their information needs.

Another possibility of improving transparency would be external ratings carried out by independent assessors. While producing credit ratings is common practice in almost all industries in well developed economies, such ratings remain comparatively rare in the microfinance industry. Farrington (2005) estimates that the first credit rating initiatives specializing on microfinance institutions took place in the second half of the 1990s. Since traditional credit rating methodologies are only partly applicable on this industry new rating tools and benchmarks that better reflected the performance of MFIs have been developed. This issue (i.e. accurately describing the performance and creditworthiness of MFIs), in fact, is still one of the most heavily discussed problems in the microfinance industry (Rating-Fund 2006). Eventually, only the availability of reliable performance indicators and credit ratings will allow MFIs to source funds from investors who are not driven by altruism but ROI. This is why the development of a solid rating system, sensible benchmarks and meaningful return figures is of utmost importance for the microfinance industry (World-Bank 2006).

## **2.2. Profitability Drivers of MFIs**

The impact of capital structure on the profitability of banks has been frequently examined for banks mainly operating in industrialized countries. Significant relations between leverage and various profitability figures have, for example, been revealed by Berger and Bonaccorsi di Patti (2006). A recent study by Kyereboah-Coleman (2007) looks at microfinance institutions in Ghana. The results imply a positive effect of debt on *MFI outreach* and thus its capacity to exploit economies of scale, which leads to higher income margins. In addition, *highly-leveraged MFIs* were found to experience less defaults by microcredit customers. Furthermore, the *age of an MFI* is positively correlated with defaults. Kyereboah-Coleman interprets this result with the tendency of a micro-bank to grow (following the market

---

<sup>1</sup> A detailed description of these indicators can be found in Appendix 1.

penetration strategy) by granting credit to new customers, who may not be as creditworthy as its present customer-base. The *capital structure* of a microfinance institution, hence, both directly and indirectly determines its financial success. *Long-term debt* is observed to be the most beneficial type of capital to MFIs (Kyereboah-Coleman 2007, p. 68).

Literature on commercial banks in industrialized countries points at a number of other factors influencing banking profitability: In their profound examination of almost 150 national financial markets, Demirgüç-Kunt and Levine (2001) highlight the importance the *local law-enforcement* capabilities on both financial and overall economic development. This view is only partly shared by Detragiache, Gupta and Tressel (2005) who find no significant relation between the regulatory/supervisory framework and the performance of the financial sector, but agree that *contract enforcement* and investor protection are critical (see also La Porta et al. 1997). Furthermore, *corruption and inflation* can help explain to which extent formal financial services are used by the private sector in low-income countries (Detragiache et al. 2005). Earlier empirical research by Huybens and Smith (1999) provides similar evidence on the relationship between inflation and financial market activity. While the number of banks active in a market has no impact on individual institutions' profitability, an increase in the *market penetration of the financial sector* (measured by the ratio of bank assets to GDP) tends to adversely affect profits. This effect, which is much stronger in less developed countries, may be the result of more intense competition among banks (Demirgüç-Kunt and Huizinga 1999). Similar to La Porta et al. (1998, p. 1124), Laeven and Majnoni (2005) depict the *rule of law* by the International Country Risk Guide of the Political Risk Services Group. In combination with a proxy for *property right protection* (i.e. the Index of Economic Freedom published by the Heritage Foundation), they find a significant influence of the performance of the judicial system on banks' credit spreads. They conclude that beside the *effectiveness of the judiciary*, there seems to be another influential determinant of credit spreads, namely the *inflation rate*. Detragiache, Gupta and Tressel (2005) measure financial sector efficiency in



terms of two ratios, i.e. net interest margin to interest-earning assets as well as overhead costs to total assets, and show that the *size of a bank's potential market* (measured in terms of total GDP) is positively correlated with bank performance. Furthermore, *corruption, political instability and political risk* tend to hamper the financial sector, while higher rates of *inflation* lead to more efficiency measured by the two previously mentioned ratios.

In his study, Sensarma (2006) develops a productivity measure for banks in less developed markets based on considerations of Kumbhakar and Lovell (2000) about the Total Factor Productivity and the cost frontier. The pure passage of *time* was found to be positively correlated with banks' cost efficiency.

Table 1 summarizes past research findings on financial service industry performance.

Literature primarily on	Variable Category	Specific Variable	Effect	Author
MFIs	Capital Structure	Leverage (esp. long-term debt)	Increases Profitability	(Kyereboah-Coleman 2007)
Commercial Banks	Financial Sector	Ratio of Bank Assets to GDP	Decreases Bank Profits	(Demirgüç-Kunt and Huizinga 1999)
Commercial Banks	Macroeconomic Environment	Inflation	Decreases margins	(Laeven and Majnoni 2005)
Commercial Banks	Macroeconomic Environment	Total GDP	Increases profitability	(Detragiache et al. 2005)
Commercial Banks	Regulatory / Legal Framework	Corruption	Decreases profitability	(Detragiache et al. 2005)
Commercial Banks	Regulatory / Legal Framework	Judicial Efficiency	Increases net interest income / margins	(Demirgüç-Kunt and Huizinga 1999; Laeven and Majnoni 2005)
Commercial Banks	Regulatory / Legal Framework	Political risk	Decreases profitability	(Detragiache et al. 2005)
MFIs	Other	Institution's Age	Increases Default Losses	(Kyereboah-Coleman 2007)
Commercial Banks	Other	Time	Increases Profitability	(Sensarma 2006)

Table 1: Summary of variables affecting banks' and MFIs' profitability

### 3. Empirical Research on Microcredit Profitability

#### 3.1. Sample

Even though the data for this study was drawn from various sources, the sampling methodology was strictly oriented towards obtaining *reliable* data on microfinance institutions. Information about MFIs was extracted from their balance sheets and income

statements. The organizations were selected into the sample based on their transparency quality and the availability of financial statements for a reasonable number of consecutive years. Therefore, there were two criteria that an MFI had to pass in order to be included in the sample: Reporting history and quality.

The quality of MFI reporting standards has been rated by “the MixMarket”, an organization promoting the collection, harmonization and publishing of MFI data. They propose a “diamond”-scheme that indicates the level of disclosure by an MFI. Since this particular study requires very detailed data only MFIs with the best reporting practices were selected into the sample, i.e. organizations having obtained 5 out of 5 potential diamonds by “the MixMarket”. Next, after shortlisting all 5-diamond MFIs in the full database of “the MixMarket”, their financial reporting histories were reviewed. MFIs that provided financial statements for as many consecutive years as possible prior to 2005 would be included in the final sample. In order to obtain a reasonably extensive sample, the minimum number of reporting years was set to seven. Some MFIs even offered neat data for up to nine consecutive years.

This procedure resulted in a sample consisting of 24 individual microfinance institutions publishing a total of 189 financial statements from 1997 to 2005. MFIs originating in 14 countries are represented in this sample. “The MixMarket” further groups them into 5 different geographic regions, as shown in table 2.

<b>Region</b>	<b><i>Africa</i></b>	<b><i>East Asia and Pacific</i></b>	<b><i>Eastern Europe and Central Asia</i></b>	<b><i>Latin America and the Caribbean</i></b>	<b><i>Middle East and North Africa</i></b>
<b>Countries</b>	South Africa	Philippines	Albania	Bolivia	Jordan
	Tanzania	Viet Nam	Bosnia and Herzegovina	Nicaragua	Morocco
	Uganda		Mongolia	Peru	Palestine

Table 2: Regional grouping of sample-MFI host countries

The panel design of this study allows observing the development of individual MFIs over time and helps prevent flaws caused by period-specific exceptional events, such as for example changes in reporting practices. Such issues can be identified during data preparation.

As for the selection of an appropriate profitability benchmark, the corporate bond market in a highly developed financial environment was chosen in order to provide a sensible reference figure for returns on investment in debt for this particular analysis. Accounting for the demands of a wide range of investors that have multiple alternative investment opportunities this study compares MFI-profitability with the yields realized on bonds traded in the United States. The next section will further describe the data and explain the analytical procedure.

## **3.2. Quantitative Analysis**

### **3.2.1. Data Preparation and Analysis**

#### **a) Microcredit Return Analysis**

With the aim of quantifying the profitability of their credit portfolios a total of 189 financial statements of MFIs were reviewed. Following traditional return measurement practices in the banking industry (see e.g. Schierenbeck 2001) all operational costs arising from crediting activities were deducted from credit related income (i.e. interest, commissions and fees). Additional adjustments specifically designed for microfinance institutions (see UNCDF 2005) were made to minimize the distorting effects of in-kind subsidies (e.g. donated tangible assets, consulting services received free of charge) and high rates of inflation devaluing net assets denominated in local currency amounts. Furthermore, revenue and expenses stemming from other operations, such as deposit taking, were deducted from further calculations, which led to an isolated observation of *microcredit* profitability.

#### **b) Microcredit Risk Analysis**

The lack of long time series data (financial statements of MFIs in the sample could be obtained for up to 9 continuous years only) and the specific characteristics of the MFIs in general (e.g. there is no market figure describing their firm value) make most quantitative risk measures used in modern financial risk management (e.g. volatility) not applicable for this study. Information about the risk of an MFI's loan portfolio, however, is carried in the

proportion of loans that have to be written off during each period. This figure should provide a relatively accurate proxy for the average probability of default of the respective institution's borrowers<sup>2</sup>. Since the loan portfolio makes up the lion's share of an MFI's assets and the focus of this study is on the credit operations of such organizations, the write-off ratio will be regarded as the main figure depicting microcredit risk. It shall describe the likelihood of default of a credit granting institution and will be used to derive a rating for each MFI in the sample.

Following current rating practices, rating ceilings are introduced to the system: No MFI can obtain a better rating than the best rated bonds issued by its home country's sovereign.

Standard&Poor's (2007) fixed-income research reports provide default rates for corporate bonds from all parts of the world and for all rating categories and different time horizons. These are derived through the observation of 12,293 bonds listed in the company's CreditPro® database for a time period reaching from 1981 to 2006. Since the sample data (i.e. the write-off ratios of MFIs) are calculated on an annual basis, the one-year default rates were chosen for comparison. While Standard&Poor's (2006) regards issues with a rating between AAA and BBB as investment grade securities, all ratings worse than BBB can be viewed as highly speculative. This is why a risk categorization in this study distinguishes between four categories only, namely "AAA", "AA", "A", and "BBB" or "Speculative". However, Standard&Poor's differentiate between 17 different rating categories reaching from "AAA" to "CCC/C". Therefore, the more detailed data structure of the Standard&Poor's report had to be transformed: The highest sub-category default rate of a group became the cut-off default rate to be applied on the MFI-sample's risk categorization (e.g. the highest probability of default

---

<sup>2</sup> The Expected Loss of a loan portfolio equals the Probability of Default multiplied by the Exposure at Default and the Loss Given Default ( $EL = PD * EAD * LGD$ ). We assume here that in case of default the total nominal amount of a loan is lost and the recovery rate is, hence, nil. Furthermore, the loan sizes in an MFI's portfolio are expected to be homogeneous. The write-off ratio depicts the total amount of loans that have to be written off during one period as a proportion of the average total loan portfolio. This figure should, therefore, represent the realized loss on the portfolio in relation to the total portfolio and will be treated as a proxy for the expected loss-ratio. With both EAD and LGD being 100%, the expected loss ratio (or, write-off ratio) equals the probability of default.

found in the group of “AA+”, “AA”, and “AA-”rated bonds yielded the applicable PD for the “AA” category). A summary of this procedure as well as the cut-off default rates can be found in table 3.

This probability of default criterion allows a clear allocation of MFIs into different groups of risk. For example, all MFIs exhibiting a probability of default lower than the cut-off PD of “AAA” would be classified into this risk group, unless their sovereign’s rating were worse. In that case, they would receive that country rating.

S&P's rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/ C
PD in %	0	0	0	0,02	0,05	0,07	0,06	0,16	0,25	0,33	0,57	0,86	1,54	2,7	7,1	10,1	26,3
Transformed rating	AAA	AA			A			BBB / Speculative									
cut-off PD in %	0	0,02			0,07			0,33									

Table 3: Default rates and cut-offs by rating category

*c) Comparison of Returns*

The return of MFIs on their credit granting activities would be compared with yields demanded by rational investors in developed financial markets.

Such investors would horserace any investment opportunity against securities of a similar nature. Assuming that capital owners could directly invest in micro-loans they would do so only after contrasting them with alternative forms of debt. One of the most striking features of developed financial markets is their capability of pricing financial contracts in short intervals; i.e. secondary markets allow investors to determine a price that reflects the current value of the contract for every traded security at any point in time. Exchange traded bonds can, hence, be regarded as rationally priced credit contracts. Eventually, the yield of a bond to an investor depends on its market price. This is why bond yields were chosen as benchmark returns for this study and shall serve as investors’ primary alternative to a microcredit engagement.

As discussed earlier, the aim of this study is to evaluate if micro-loans generate sufficient returns when confronted with a competitive environment, where capital owners can choose between different investment opportunities. Therefore, it is necessary to capture the

performance of microfinance in competition with market-priced debt contracts. Potential investors are, furthermore, assumed to originate in well developed financial markets and, consequently, look at yields achievable on their local bond markets as reference returns on their investments. These returns will be denoted “competitive” yields because they result from liquid securities trading by investors that strive to maximize their return given the lowest possible level of risk. By pursuing this goal they continuously adjust the prices of individual securities in competition with others.

#### d) “Competitive” Yields

The data for the “competitive” returns demanded by creditors was drawn from Reuters®. It shall be assumed that rational investors require a return on their investment in debt instruments that equals the yield achievable on their domestic secondary bond market. For this purpose the yields on a specific, highly liquid, bond market were observed: Yields of corporate bonds in the United States.

Depending on the risk associated with a specific investment (the rating of the bond’s issuer) the total yield to the investor consists of the domestic sovereign bond yield supplemented by an appropriate credit spread. In order to reflect one of microcredit’s main characters, namely the short life of the individual credits, corporate bonds with a relatively short maturity were chosen for comparison. As a result, the annual yields on corporate bonds with a maturity of 2 years and Reuters’ ratings of AAA, AA, A, and BBB as well as government bonds with the same maturity were selected as benchmark returns.

The bond yields were observed in monthly intervals and later transformed into an annual average rate of return for the investor. This nominal domestic yield, however, incorporated the local inflation and thus it could not directly be compared with MFI returns in foreign countries. Therefore, the yields obtained on a competitive bond market (i.e. USD-bonds in the United States) were translated into returns accounting for differences in inflation between the bond market country and the country of each MFI included in the sample using the

International Fisher Relationship. If latter relationship obtains, this adjustment should similarly take into account movements in exchange rates. This is not an unrealistic assumption since the International Fisher Effect has been shown to hold for both equity and debt markets (Hodder and Senbet 1990).

The calculations just described resulted in a data set consisting of yields that USD-investors would have required on investments in short-term debt in the 14 MFI-host-countries analyzed in this study for the years between 1997 and 2005. In the next paragraphs, these return rates shall be called “competitive yields”.

#### *e) Microcredit Comparative Performance Measurement*

While exchange traded bonds can be categorized into different groups of risk by their issuers’ ratings that are produced and published by external rating agencies, the risk inherent to micro-loans – or rather a bundle of such small loans that make up a microfinance institution – is far more cumbersome to determine. Nevertheless, “ratings” for the MFIs in the sample were synthesized following the procedures described earlier. This allowed for a classification of MFIs into different categories within the same risk rating scale as the commercial bonds data. As a consequence, individual MFIs’ credit business profitability could now be directly compared with the competitive yields required by foreign investors on debt capital reflecting a similar level of risk.

### **3.2.2. Quantitative Data Analysis**

#### *a) Does the Average Profitability Meet Investors’ Demands?*

With the aim of answering the main research question of whether the microcredit business offers competitive returns for investors, the average profitability of MFI loan portfolios are examined. Besides an analysis of the total sample, the Kruskal-Wallis-Test shall be used to show in which cases a distinction between individual sub-samples is sensible. The

introduction of appropriate categories opens up multiple opportunities to derive more detailed information on the economics of microcredit.

In the next paragraphs, a definition of the variables used in this analysis will be provided.

b) Variables

The *profitability* measure of microcredit was calculated by subtracting the return demanded by foreign investors from the credit-business-profitability figure observed with MFIs. This deductible “demanded return” depended on the rating of the respective MFI at that point in time. Consequently, a very risky MFI would have to compete with a US corporate bond having a speculative grade rating. The risk-adjusted microcredit return competitiveness would, hence, equal the MFI’s credit business yield minus the yield on speculative grade US corporate bonds converted into the MFI’s home currency. If the result were positive it could be assumed that the MFI could attract US investors. On the contrary, a negative result would indicate that it could not generate a competitive return on its lending activities. As, first of all, ratings of MFIs could vary from one year to another and, second, yields on corporate bonds in the US changed over time, also the applicable “demanded yields” were adjusted in yearly intervals. So, the resulting competitiveness-figure illustrated perfectly, how MFIs would have performed during the sample period if they had been competing for foreign investors those times.

$\begin{aligned} \text{Risk-adjusted microcredit return competitiveness} &= \text{MFI credit business margin before capital costs} \\ &\quad - \text{Foreign investors' demanded return (reflecting the MFI's} \\ &\quad \quad \text{risk level)} \end{aligned}$
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Given a dataset consisting of information about MFIs from all parts of the world, *categorization* by region or by other rather qualitative aspects might turn out to be sensible. Consequently, the sample was initially divided along regions. Later also results between MFIs having obtained a formal rating or not would be compared.



### c) Analysis of Influences on Microcredit Profitability

In addition to an analysis of the overall profitability competitiveness of MFIs, the influence of various factors on MFI's capacity to generate yields exceeding or at least equalling rational investor's expectations was analyzed through multiple regression.

The *dependent variable* of this regression was the microcredit-profitability-figure described above, which evaluates the competitiveness of microcredit returns from the point of view of rational foreign USD-investors.

The literature review revealed a number of potentially influential variables on the financial performance of micro-lending activities. Out of the vast selection of such factors, the *independent variables* shown in table 4 were initially chosen.

In order to compress the information of many related issues and thus prevent the problem of multi-collinearity, a factor analysis was conducted for most of the environmental variables, and the factor scores of the resulting items replaced the original variables. This procedure yielded four factors, each reflecting slightly different aspects of an MFI's operating environment.

The variables BANK-to-GDP, CORRUPT, GDP, INFL, LIBERAL, JUDICAL-1, JUDICAL-2, and POLIT were included in the factor analysis. Using the varimax-rotation-function of SPSS®, the number of individual variables could be halved. (A detailed report of this analysis can be found in Appendix 2). Having an eigenvalue of 2.38, factor 1, denominated "LawEnf", describes the legal and judicial environment of an MFI. Factor 2, "FormalizedFS" with an eigenvalue of 2.05, captures the main features of the formalized financial system in place. The third factor, "EcoPolicy", has an eigenvalue of 1.23 and serves as an indicator for the influence of the ruling government on the local economy. Finally, Factor 4, "EcoSize", is most closely related to the total size of the national economy and has an eigenvalue of 1.13.

In summary, the factors derived are described in table 5.

Name of Variable	Type of Var.	Definition of Var.	Scale	Data Source
AGE	Numerical	Age of the MFI in years	years	the Mix
BANK-TO-GDP	Numerical	Deposit Money Banks Assets to GDP / total GDP	%	IMF
CORRUPT	Numerical	Control of corruption (CC), the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	Points (worst: -2.5 – best: +2.5)	World Bank
COUNTRY	Dummy	Separate dummy variables for MFI host countries	0 / 1	the Mix
GDP	Numerical	Total GDP at PPP	\$ PPP	IMF
INFL	Numerical	Annual Inflation rate	%	IMF
JUDICAL-1	Numerical	Property Rights (Heritage foundation)	Points (worst: 5 – best: 1)	Heritage Foundation
JUDICAL-2	Numerical	Rule of Law (World Bank): The extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence	Points (worst: -2.5 – best: +2.5)	World Bank
LEV_ALL	Numerical	Total Debt to Total Assets Ratio	%	Financial Statement of the MFI
LEV_LONG	Numerical	Long-term Debt to Total Assets Ratio	%	Financial Statement of the MFI
LEV_SHORT	Numerical	Short-term Debt to Total Assets Ratio	%	Financial Statement of the MFI
LIBERAL	Numerical	"Regulation"-Index	Points (worst: 5 – best: 1)	Heritage Foundation
POLIT	Numerical	Political stability and absence of violence (PV), perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism	Points (worst: -2.5 – best: +2.5)	World Bank
RATING	Dummy	Does a rating exist? No/Yes	0 / 1	the Mix
REGION	Dummy	Separate dummy variables for MFI host regions	0 / 1	the Mix

Table 4: Original independent variables

Factor:	Strong loads with these variables	Factor interpretation
<b>F 1:</b> <b>LawEnf</b>	JUDICAL-1, JUDICAL-2, LIBERAL	Economic legislation and trust in law enforcement
<b>F 2:</b> <b>FormalizedFS</b>	BANK-to-GDP, JUDICAL-2, POLIT, CORRUPT	Sophistication of a formalized financial system, respect and trust in sustainable regulatory systems
<b>F 3:</b> <b>EcoPolicy</b>	INFL, POLIT	Political influence on national economy
<b>F 4:</b> <b>EcoSize</b>	GDP	Economy size

Table 5: Factor description

The initial regression model consisted of the following dependent variables: AGE, Factor1, Factor2, Factor3, Factor4, LEV\_LONG, LEV\_SHORT, LEV\_ALL, thirteen COUNTRY- and four REGION-dummies, and one for RATING. Thereof, the different time-horizon leverage variables (LEV\_LONG, LEV\_SHORT) as well as all regional and country-dummies were found to be statistically not significant on a 5% significance level; these variables were omitted and the regression was rerun, now including only AGE, LEV\_ALL, the four Factors, and RATING.

**3.2.3. Results of the Quantitative Analysis**

a) Does the Average Profitability Meet Investors' Demands?

When looking at the full sample of 24 MFIs observed between 1997 and 2005, the credit operations of these organizations generated a return that was 7.41 percentage points lower than a rational investor would have charged. Their yield was significantly lower than required by USD-investors at a 95% significance level. The variance of returns in the sample, however, was relatively high with a standard deviation of 30.34 percentage points (see table 6).

<b>Microcredit profitability from a USD-investor's perspective</b>			
sample size	189		
Mean	-0.0741	Minimum	-1.98
Std. Error Mean	0.02207	Maximum	0.38
Variance	0.092		
Std. Deviation	0.30335		
<b>One-Sample Test, Test Value = 0</b>			
t	-3.358		
df	188	95% Confidence Interval of the Difference	
Sig. (2-tailed)	0.001	Lower	Upper
Mean Difference	-0.07411	-0.1176	-0.0306

Table 6: Microcredit profitability from a USD-investor's perspective

Considerable differences were found in the profitability of MFIs' credit operations depending on the region they were operating in. As the Levene Statistic showed that variances between regions were significant, the Kruskal-Wallis-Test was applied to test for different means: The profitability of microcredit was found to be significantly different from one geographic region to another (see tables 7 and 8). During the observed time-period, the sample MFIs

located in the Middle East and North Africa as well as in Sub-Saharan Africa performed worst (yields were 34.66 and 19.27 percentage points lower than demanded, respectively), while those operating in East Asia and the Pacific region could almost reach investors demands (-2.78 percentage points). By contrast, microcredit operations of MFIs located in Eastern Europe and Central Asia as well as in Latin America outperformed bond markets by 0.47 and 5.20 percentage points respectively (see table 9).

<b>Test of Homogeneity of Variances</b>	
Levene Statistic	17.5418204
df1	4
df2	184
Sig.	0.000

Table 7: Test for homogeneity of variances with regional categorization from a USD-investor’s perspective

<b>Kruskal Wallis Test</b>	
<b>reference yield</b>	<b>USD-corporate bonds</b>
Chi-Square	39.646
Df	4
p-value	0.000
Grouping Variable: Region	

Table 8: Test for regional differences in microcredit profitability from a USD-investor’s perspective

<b>Region</b>	<b>Reference yield: USD corp. bonds</b>			
<b>Africa</b>	Mean	-0.1927	95% Confidence Interval for Mean	
	Std. Error for Mean	0.06373	Lower Bound	-0.3225
	5% Trimmed Mean	-0.1756	Upper Bound	-0.0629
	Median	-0.1262	Range	
	Variance	0.134	Minimum	-1.13
	Std. Deviation	0.36607	Maximum	0.38
<b>Middle East &amp; North Africa</b>	Mean	-0.3466	95% Confidence Interval for Mean	
	Std. Error for Mean	0.08831	Lower Bound	-0.5272
	5% Trimmed Mean	-0.2902	Upper Bound	-0.166
	Median	-0.1263	Range	
	Variance	0.234	Minimum	-1.98
	Std. Deviation	0.4837	Maximum	0.11
<b>Latin America &amp; the Caribbean</b>	Mean	0.052	95% Confidence Interval for Mean	
	Std. Error for Mean	0.01608	Lower Bound	0.0199
	5% Trimmed Mean	0.0562	Upper Bound	0.0841
	Median	0.0708	Range	
	Variance	0.017	Minimum	-0.33
	Std. Deviation	0.13158	Maximum	0.31

<b>East Asia &amp; Pacific</b>	Mean	-0.0278	95% Confidence Interval for Mean	
	Std. Error for Mean	0.03104	Lower Bound	-0.0912
	5% Trimmed Mean	-0.0133	Upper Bound	0.0356
	Median	-0.0049	Range	
	Variance	0.03	Minimum	-0.7
	Std. Deviation	0.17281	Maximum	-0.24
<b>Eastern Europe &amp; Central Asia</b>	Mean	0.0047	95% Confidence Interval for Mean	
	Std. Error for Mean	0.01589	Lower Bound	-0.0279
	5% Trimmed Mean	0.0067	Upper Bound	0.0373
	Median	0.0281	Range	
	Variance	0.007	Minimum	-0.23
	Std. Deviation	0.08409	Maximum	0.22

Table 9: Microcredit profitability by region from a USD-investor's perspective

Beside regional differences, the transparency features and its information sharing quality tend to play an extremely important role for the profitability of an MFI: Organizations having obtained an external rating (irrespective of how positive or negative) performed significantly better than those without a rating. On average, rated MFIs were very close to investors' demands (-1.71 percentage points), while unrated MFIs reported yield that were 16.68 percentage points behind USD-bond-investors' demands as shown in table 10. The impact of having a rating will be further discussed in the subsequent subsection.

<b>Levene's Test for Equality of Variances</b>				
F	Sig.			
11.506	0.001	Equal variances not assumed		
<b>t-test for Equality of Means</b>				
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-3.020	102.513	0.003	-0.14974	0.04958
<b>Differences in MC Profitability</b>				
	N	Mean	Std. Deviation	Std. Error Mean
No rating	72	-0.1668	0.38098	0.04490
Rating	117	-0.0171	0.22734	0.02102

Table 10: Differences in microcredit profitability by the existence of an external rating (from a USD-investor's perspective)

### *b) Influences on Microcredit Profitability*

As evidenced in the analysis above, there are various internal and external factors that tend to have an impact on the profitability of microcredit. In order to further explore the relationship between such influential parameters a regression analysis was conducted.

In the OLS-regressions with the reduced number of variables described earlier, all variables except of RATING were found to have a significant impact on microcredit profitability (see table 11).

Let us first look at the MFI-specific factors affecting their profitability: The age of an MFI seems to have the most striking effect on its credit-portfolio profitability. On average, one additional year of operations increases an MFI's loan-portfolio yield by 1.7 percentage points. Also, MFIs with high debt to equity ratios tend to be more profitable. Furthermore, the RATING-dummy shows that an MFI which has obtained some external rating can generate a higher yield (+7.0 percentage points) on its loan portfolio than a comparable institution without a rating (although this result was not statistically significant at a 5%-level).

Environmental parameters, on the other hand, also play an important role: The coefficient of the judicial and legislative factor (Factor1) is positive, which means that MFIs operating in an environment with more reliable law enforcement procedures and less economic regulation are more profitable. In addition, the coefficient of Factor2 shows that the more developed the formalized financial system is the lower the profitability of MFIs. In addition, political stability and high inflation rates (expressed through Factor3) tend to decrease microcredit profitability. Finally, MFI credit-portfolio yields tend to be lower in large economies, as indicated through the coefficient of Factor4. It seems to be more profitable to operate in small countries.

The majority of these results are intuitively sensible: The positive sign of the coefficient of AGE can be interpreted as a hint for MFIs' capability to learn and improve operations over time. Furthermore, the willingness of an MFI to go through a rating procedure in order to obtain an expert rating can, per se, be considered a sign of quality. It proves the organization's desire to become more transparent and responsible to its capital providers. The capital structure of an MFI, in fact, reveals how much external pressure there is to operate efficiently. A high degree of financial leverage leads to an MFI's necessity to price loans granted

appropriately in order to live up to its own financial obligations. An examination of the environmental factors' coefficients is equally conclusive: On the one hand, business ventures that involve credit risk require a proper law enforcement framework in order to secure sustainable operations. On the other hand, when the formalized financial sector is easily accessible to large parts of the population, microfinance institutions face competition by commercial banks and, hence, find their profit margins threatened. Competition is, naturally, likely to be more intense in markets that seem attractive to commercial financial institutions, i.e. countries with a stable political situation and a large national market. These issues can, thus, provide an explanation for the results of this regression analysis.

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	p-value
Constant	-0.4184	0.0517		-8.0908	0.0000
AGE	0.0169	0.0041	0.2956	4.1301	0.0001
LEVall	0.2911	0.0717	0.2758	4.0580	0.0001
F1LawEnf	0.0701	0.0191	0.2266	3.6662	0.0003
F2FormalizedFS	-0.0593	0.0180	-0.1971	-3.2925	0.0012
F3EcoPolicy	-0.0475	0.0188	-0.1553	-2.5250	0.0124
F4EcoSize	-0.0418	0.0210	-0.1389	-1.9918	0.0479
RATING	0.0695	0.0391	0.1116	1.7805	0.0767
Dependent Variable: Microcredit Profitability compared to USD-bonds					

Table 11: OLS-regression coefficients for microcredit profitability from a USD-investor's perspective

Regarding model fit, the OLS-regression analysis shows that there is a correlation of about 64% between the predicted and actual profitability of microcredit. Nevertheless, the dependent variables can only explain about 40% of microcredit profitability's total variance (see table 12). Estimated profitability spreads by a standard error of 24 percentage points around the observed values. Also, the residuals are not normally distributed, which puts into question the suitability of a linear model for the explanation of microcredit profitability by these factors (see table 13).

Model Summary				
R	R Square	Adjusted R Square	Std. Error of the Estimate	
0.6398	0.4094	0.3865	0.2376	
Change Statistics				
R Square Change	F Change	df1	df2	Sig. F Change
0.409	17.921	7	181	0.000
Predictors: (Constant), RATING, F1LawEnf, F2FormalizedFS, F4EcoSize, F3EcoPolicy, LEV_ALL, AGE				
Dependent Variable: MC Profitability from a USD-investor's perspective				

Table 12: OLS-regression model summary for microcredit profitability from a USD-investor's perspective

Jarque-Bera-Test			
Skewness	Curtosis	JB-Statistic	p-value
-2.114	13.452	958.610	0.000

Table 13: Test for normal distribution of residuals

### c) Microcredit Profitability Development

When looking at the development of the MFIs' profitability from one period to another, there are some remarkable findings: The profitability of the sample MFIs' microcredit business has, on average, been increasing during the observed period. When compared to investments in USD-denominated corporate bonds microcredit's performance enhanced by 1.79 % annually. Consequently, the mean annual change seems positive; yet this result is not significant. In certain years, the profitability figure of individual MFIs declined by almost as much as 60% (in 2004), which shows that the variance in profitability change is considerable (i.e. the standard deviation in the sample reached 106% annual change).

There tend to be differences in the growth between regions, too. The Kruskal Wallis statistic is significant at a 5%-level (refer to table 14). With an average annual growth in profitability of 27% African MFIs show fastest progress. They, nevertheless, are most in need to improve, as they tended to underperform corporate bonds significantly (see previous paragraphs). Except of Latin America and the Caribbean, where the annual MFI profitability change is strongly negative (-19%), microfinance institutions in other parts of the world seem to increase profitability (see table 15).



<b>Kruskal Wallis Test</b>	
<b>reference yield</b>	<b>USD-corporate bonds</b>
Chi-Square	9.75161333
df	4
p-value	0.04482616
Grouping Variable: Region	

Table 14: Kruskal Wallis Test

<b>Annual change in microcredit profitability</b>			
<b>Region</b>	<b>reference yield</b>	<b>USD-corporate bonds</b>	
<b>Africa</b>	Mean	27.71%	
	95% Confidence Interval for Mean	Lower Bound	-15.79%
		Upper Bound	71.21%
	5% Trimmed Mean	14.49%	
	Median	8.62%	
	Variance	130.77%	
	Std. Deviation	114.35%	
<b>Middle East &amp; North Africa</b>	Mean	23.81%	
	95% Confidence Interval for Mean	Lower Bound	-12.13%
		Upper Bound	59.76%
	5% Trimmed Mean	20.10%	
	Median	5.78%	
	Variance	58.98%	
	Std. Deviation	76.80%	
<b>Latin America &amp; Caribbean</b>	Mean	-19.78%	
	95% Confidence Interval for Mean	Lower Bound	-54.65%
		Upper Bound	15.10%
	5% Trimmed Mean	0.19%	
	Median	0.15%	
	Variance	198.09%	
	Std. Deviation	140.74%	
<b>East Asia &amp; Pacific</b>	Mean	8.63%	
	95% Confidence Interval for Mean	Lower Bound	-3.75%
		Upper Bound	21.02%
	5% Trimmed Mean	3.64%	
	Median	1.89%	
	Variance	9.81%	
	Std. Deviation	31.32%	
<b>Eastern Europe &amp; Central Asia</b>	Mean	2.84%	
	95% Confidence Interval for Mean	Lower Bound	-0.23%
		Upper Bound	5.91%
	5% Trimmed Mean	2.96%	
	Median	1.98%	
	Variance	0.53%	
	Std. Deviation	7.28%	

Table 15: Annual change of MFI-profitability by region

### 3.2.4. A note on Micro-Loan-Portfolio Write-Offs

#### a) Data and Data Analysis

The write-off-ratios of the sample MFI loan portfolios varied considerably. In order to identify possible influences on this ratio, an OLS-regression analysis was conducted using the same independent variables as above in combination with the profitability measure. There was no continuous data on loan write-offs available for all of the 24 cases, as some institutions did not report that figure in certain years (most frequently in 1997 or 1998). Those cases were excluded from the analysis.

Write-off ratios in the sample ranged from -0.41% (i.e. some of the loans already written-off could nevertheless be collected) to 26.22% with a mean of 1.72% and a standard deviation of 2.83%, as can be observed in table 16. When looking at the different regions, there seem to be differences: While write-off ratios are highest in Latin America and the Caribbean (2.1% on average), they are lowest in Africa (with a mean of 0.88%). Since write-off-ratio variances among the regional groups are not homogeneous (see table 17), the Kruskal-Wallis test is used to measure the statistical significance of differences between regions. Indeed, those are found to be striking (see tables 18 and 19).

MFI loan-portfolio write-off-ratios			
sample size	165		
Mean	0.01716788	Minimum	-0.0041
Std. Error Mean	0.00220648	Maximum	0.2581
Variance	0.00080331		
Std. Deviation	0.02834269		

Table 16: MFI loan-portfolio annual write-off-ratios

Test of Homogeneity of Variances	
Levene Statistic	5.374
df1	4
df2	160
Sig.	0.000

Table 17: Test for homogeneity of variances with regional categorization

<b>Kruskal Wallis Test</b>	
<b>reference yield</b>	<b>USD-corporate bonds</b>
Chi-Square	29.3
df	4
p-value	0.000
Grouping Variable: Region	

Table 18: Test for regional differences in MFI loan portfolio annual write-off-ratios

<b>MFI loan-portfolio write-off-ratios by region</b>		
<b>Region</b>		
Africa	Mean	0.00883
	Median	0.00525
	Variance	0.00014
	Std. Deviation	0.01182
Middle East & North Africa	Mean	0.02047
	Median	0.00200
	Variance	0.00312
	Std. Deviation	0.05582
Latin America & Caribbean	Mean	0.02163
	Median	0.01720
	Variance	0.00037
	Std. Deviation	0.01915
East Asia & Pacific	Mean	0.01767
	Median	0.00770
	Variance	0.00078
	Std. Deviation	0.02788
Eastern Europe & Central Asia	Mean	0.01181
	Median	0.01100
	Variance	0.00008
	Std. Deviation	0.00894

Table 19: MFI loan portfolio annual write-off-ratios by region

The importance of other factors than the geographic location of an MFI on the write-off-ratio of its loan portfolio is measured through an OLS-regression analysis. Here, the write-off-ratio represents the dependent variable, while the independent variables used earlier (i.e. AGE, Factor1, Factor2, Factor3, Factor4, LEV\_LONG, LEV\_SHORT, LEV\_ALL, RATING, and four Region-dummies) are used as potential explanatory variables. An initial regression showed that only Factor4, RATING, and half of the Region-dummies were significant at a 5%-level (see Appendix 3 for results and model fit of the initial regression). Factor1 and Factor3 were significant only at a 25%-significance level. Consequently, the regression was redefined to include a reduced number of explanatory variables, i.e. Factor1, Factor3, Factor4, RATING, and the four Region-dummies.

*b) Regression Results*

The explanatory power of the variables used is very weak: A model consisting of Factor1, Factor3, Factor4, RATING, and the four Region-dummies produces an adjusted R-Square of 0.067 with a standard error of the estimate of 2.7 percentage points (see table 20). Nevertheless, the direction of the coefficients seems sensible; except of two regional dummies none of them is significant at a 5%-level, though. In general, the coefficients of regional dummy-variables have the strongest impact on write-off ratios, which is consistent with earlier findings (see previous subsection and table 21). Also the impact of an external rating is important, decreasing the portion of the loan portfolio to be written off by 1 percentage point, on average. Although the coefficients for Factor1 and Factor3 are not significant, it seems that a better law-enforcement and a more sophisticated economic policy by the local government tend to reduce write-off-ratios (see table 21). The Jarque-Bera test shows that the residuals are not normally distributed (see table 22), which challenges the applicability of the t-statistics for significance, here. Finally, loans have to be written off slightly more often by MFIs operating in large economies than in small ones.

Model Summary				
R	R Square	Adjusted R Square	Std. Error of the Estimate	
0.1120	0.0670	0.0274	0.1120	
Change Statistics				
R Square Change	F Change	df1	df2	Sig. F Change
2.472	8.000	156	0.015	1.603
Predictors: REG_EastEuro_CentAsia, RATING, REG_Afr_MidEast, REG_EastAsia, F_4_EcoSize, F_1_LawEnf, F_3_EcoPolicy, REG_LatAm				
Dependent Variable: writeoffratios				

Table 20: OLS-Regression model summary

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	p-value
Constant	0.0090	0.0070		1.2570	0.2110
F1_LawEnf	-0.0060	0.0030	-0.1980	-1.6870	0.0940
F3_EcoPolicy	-0.0050	0.0030	-0.1600	-1.4420	0.1510
F4_EcoSize	0.0040	0.0020	0.1600	1.8020	0.0730
RATING	-0.0100	0.0050	-0.1700	-1.9140	0.0570
REGION_0-1_Africa-MidEast	0.0090	0.0090	0.1170	1.0060	0.3160
REGION_2_LatinAm	0.0210	0.0070	0.3560	2.9630	0.0040
REGION_3_EastAsia	0.0180	0.0090	0.2300	2.0530	0.0420
REGION_4_EastEuro_CentAsia	0.0150	0.0110	0.1930	1.3560	0.1770

Dependent Variable: write-off-ratios

Table 21: OLS-regression coefficients for MFI loan-portfolio write-off-ratios

Jarque-Bera-Test			
Skewness	Curtosis	JB-Statistic	p-value
4.462	33.506	6608.748	0.000

Table 22: Test for normal distribution of residuals

### **3.2.5. Overview of Quantitative Characteristics of the Sample MFIs**

In this section closing the quantitative analysis part, a closer look shall be taken at the commonalities and differences of various organizations at the level of individual MFIs. For this purpose, the sample's MFIs shall be mapped in terms (a) of the returns on their loan portfolios relative USD-bonds with a similar rating and (b) of the change<sup>3</sup> of this figure. As the organizations were observed for several consecutive years and there was some variance in these measures between different years, average annual values will be used here. Figure 1 shows the performance of the total sample's MFIs measured in terms of the previously mentioned properties.

<sup>3</sup>  $\Delta r = (1 + r_t) / (1 + r_{t-1}) - 1$

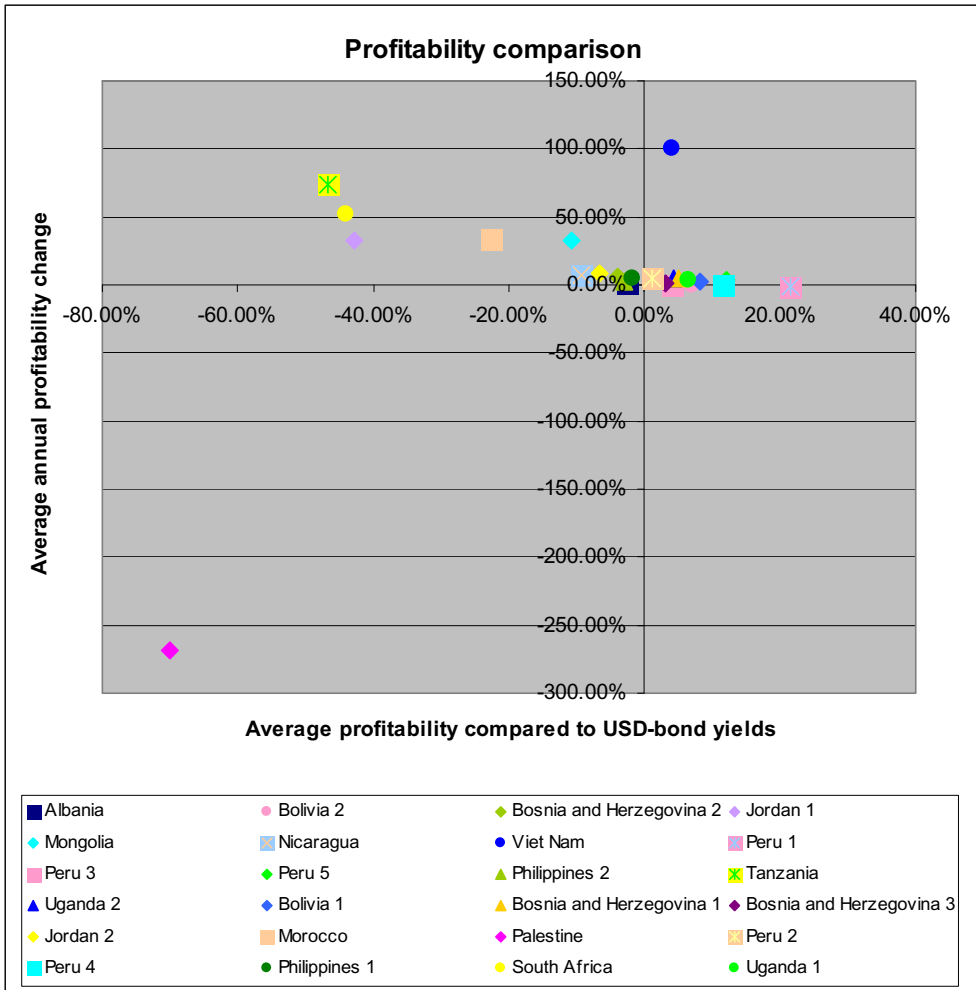


Figure 1: Average MFI performance (from a USD-investor's perspective)

With the exception of one MFI, the one operating under extraordinarily problematic conditions due to severe political unrest in the host region, all organizations with an average loan-portfolio yield below USD-bond yields were improving their profitability during the sample period. Negative average rates of profitability growth were, actually, only observed with MFIs that, on average, exceeded foreign investors' return demands by at least 4% annually. This also means that all but one MFI with an average decreasing profitability realized higher yields with their micro-lending business than investors holding USD-bonds. See table 23 for details. Figure 2 shows that profitable MFIs tend to be larger and have modest rates of profitability improvement. MFIs with a rather small loan portfolio, on the other hand, are improving their financial performance fastest, even though they may still operate with yields lower than those of USD-bonds.

MFI	Difference towards USD-bonds of comparable rating	Annual change (compared to USD-bonds)	Difference towards GBP-bonds of comparable rating	Annual change (compared to GBP-bonds)
Albania	-0.0252	0.0180	-0.0233	0.0144
Bolivia 1	0.0806	0.0221	0.0861	0.0144
Bolivia 2	0.0688	0.0020	0.0742	-0.0050
Bosnia and Herzegovina 1	0.0510	0.0436	0.0529	0.0404
Bosnia and Herzegovina 2	-0.0386	0.0557	-0.0367	0.0520
Bosnia and Herzegovina 3	0.0315	0.0101	0.0334	0.0068
Jordan 1	-0.4272	0.3297	-0.4266	0.3063
Jordan 2	-0.0662	0.0846	-0.0648	0.0807
Mongolia	-0.1085	0.3272	-0.1066	0.3190
Morocco	-0.2270	0.3402	-0.2228	0.3051
Nicaragua	-0.0920	0.0697	-0.0863	0.0669
Palestine	-0.7002	-2.6876	-0.7047	-2.2924
Peru 1	0.2150	-0.0084	0.2200	-0.0111
Peru 2	0.0105	0.0426	0.0132	0.0379
Peru 3	0.0409	0.0045	0.0463	-0.0010
Peru 4	0.1158	-0.0013	0.1212	-0.0074
Peru 5	0.1212	0.0310	0.1265	0.0236
Philippines 1	-0.0175	0.0479	-0.0124	0.0449
Philippines 2	-0.0292	0.0230	-0.0238	0.0147
South Africa	-0.4401	0.5214	-0.4346	0.4112
Tanzania	-0.4677	0.7354	-0.4681	0.6523
Uganda 1	0.0636	0.0331	0.0640	0.0289
Uganda 2	0.0437	0.0531	0.0439	0.0486
Viet Nam	0.0411	-0.0039	0.0428	-0.0076

Table 23: Average MFI loan-portfolio yields compared to USD-bonds

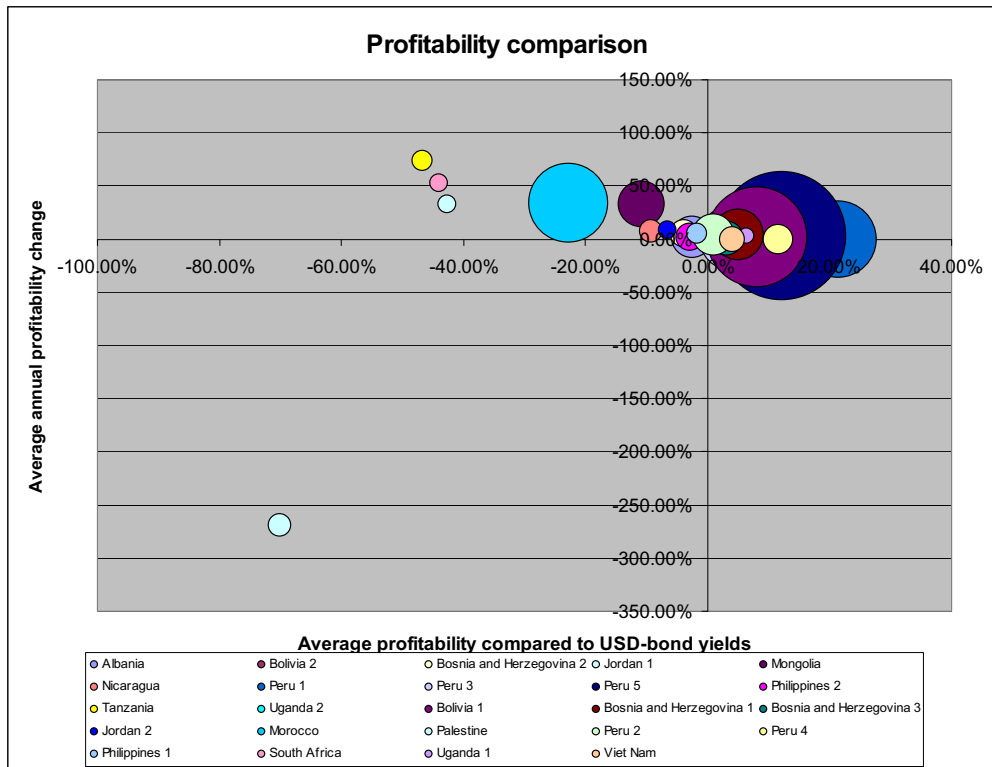


Figure 2: Relative MFI-profitability map (from a USD-investor’s perspective), bubble size represents the gross loan portfolio in 2005

These observations have already partly been explained earlier, where potential measurable profitability-influencing factors were discussed. Nevertheless, the quantitative analysis could not provide a complete description of the forces shaping MFIs’ financial performance. Therefore, a more qualitative analysis of the sample follows.

### **3.3. Qualitative Analysis**

#### **3.3.1. Organization-Specific Performance Drivers**

In order to reveal any potential organizational, structural or management related influences on performance (i.e. issues which could not be captured through quantitative research) the financially most successful MFIs shall be contrasted with the weakest organizations in the sample. First, the MFIs found in the quintile of highest average credit business profitability over the sample period were identified. Then, the organizations showing worst average profitability had to be detected. An analysis of their characteristics and operational procedures follows.



*a) Top 5 Performers*

<b>Rank</b>	<b>MFI</b>	<b>Average annual MC portfolio yield (compared to US-bonds)</b>	<b>Region</b>
1	Peru 1	0.21502	Latin America and the Caribbean
2	Peru 5	0.12115	Latin America and the Caribbean
3	Peru 4	0.11581	Latin America and the Caribbean
4	Bolivia 1	0.08062	Latin America and the Caribbean
5	Bolivia 2	0.06881	Latin America and the Caribbean

Table 24: MFIs with the best average profitability in the sample

All of the MFIs exhibiting the best average performance in this sample originate in Latin America and the Caribbean. Their average microcredit loan-portfolio returns exceeded yields on USD-bonds by approximately 7 to 22% (see table 24).

Common to all of these organizations was their tendency to use of modern technology in their service offerings. The provision of credit cards, either through a partner network (e.g. Mastercard) or on their own, was all but exceptional. ATMs were equally made available to micro-borrowers. Some organizations also include other associated services like money transfers and training (e.g. commercial, economic planning) in their offering.

In fact, all of the well performing MFIs had a very detailed understanding of the needs of their customers and offered to them relatively sophisticated products. The organizations seemed to segment the market by differences in credit usage (i.e. business or consumer credit) as well as borrower industry. Not all of the resulting segments were necessarily catered by each MFI. Instead, the target customers were clearly defined and the service offering rigorously tailored to their capabilities and demands. This proves of advanced marketing knowledge and good management practices in these institutions.

Although the market segmentation criteria were similar in many organizations, the targeted segments varied: Most organizations emphasized on customers asking for credit to invest in their agricultural business or small handicraft and textile manufactories. While micro-enterprises represented the most frequent target groups, some MFIs also provided consumer loans. Even though customers did not need to procure any collateral for most loans, the

majority of the best performing MFIs required their clients to have a certain level of experience in their profession. Most often, the borrower would have to show that s/he had already successfully run the business, in which the credit capital would be used, for at least one year.

With respect to the lending schemes, no universally optimal policy seems to exist. Some of the very profitable MFIs offered individual loans, some demanded group liability, and some had both – personal and group liability credit – in their product mix.

Given the fundamental need of their customers to better plan their financial management and to make their economic standing more predictable, many successful MFIs also accepted savings accounts. Furthermore, insurance services were provided by several MFIs, which help stabilize financial flows, too.

In summary, one major common feature to the most profitable MFIs can be described as follows: The organizations perfectly adapt their service offering to their target customers, who are clearly defined and well known in terms of their needs and characteristics.

Also in terms of legal status, some similarities can be observed. Usually, the MFIs started off as non-profit, non-governmental organizations with the aim to promote private enterprise at a small scale and within a specified region. Over the years, they have, however, transformed into either banks or non-bank financial institutions and operate under some form of regulatory supervision. This is also why their most important sources of funds are commercial loans, shareholder capital and customer savings – not capital donations. Thus, the most profitable MFIs of this study tend to be managed very much in line with any other commercial financial institution. Consequently, the distinction between a traditional commercial bank and such an MFI is becoming increasingly blurred.

Successful MFIs seem to be rather commercially oriented. Their average operating costs compared to their total loan portfolio were lower than those of their peers during the sample period, which can be regarded a hint for a more efficiency-driven organization (see figure 3).

Furthermore, enhanced risk management goes in line with better financial performance. Although the observation period's *average* values of write-off ratios and credit business profitability do not correlate, when looking at annual data, a negative correlation can be observed (see table 25 and figure 4). In periods of low loan write-offs, MFIs realize higher profits on their credit business and vice versa.

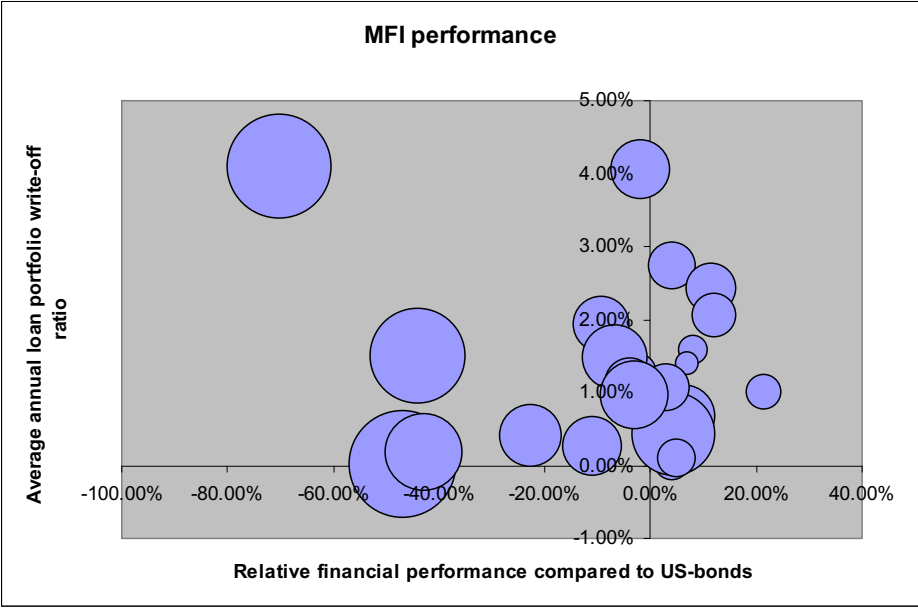


Figure 3: MFI average performance measures (bubble size = operating expense relative to loan portfolio)

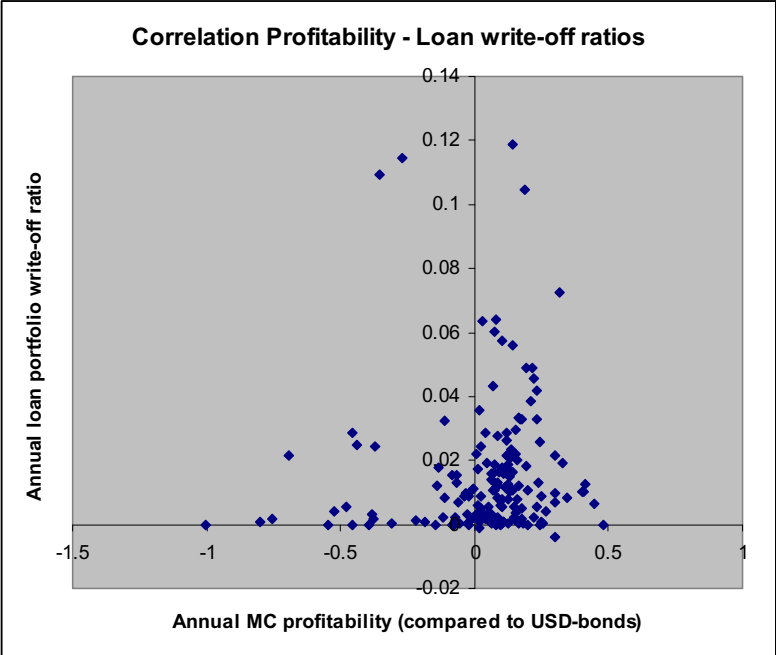


Figure 4: Relationship between annual microcredit profitability and write-off ratios<sup>4</sup>

<sup>4</sup> One extreme value omitted for illustrative purposes

<b>Pearson Correlation</b>	Write-off ratio
MC Profitability (from a USD-investor's perspective)	-0.32589
Sig. (2-tailed)	0.00002

Table 25: Correlation between annual microcredit profitability and write-off ratios

Therefore, the only issue distinguishing an MFI from a traditional bank may remain the selected target customer segments. Financial success will, hence, be determined by how well the organization's strategy fits the chosen market and how it is implemented.

*b) Worst 5 Performers*

<b>Rank</b>	<b>MFI</b>	<b>Average MC portfolio yield (compared to US-bonds)</b>	<b>Region</b>
20	Morocco	-0.22698	Middle East and North Africa
21	Jordan 1	-0.42717	Middle East and North Africa
22	South Africa	-0.44012	Africa
23	Tanzania	-0.46765	Africa
24	Palestine	-0.70020	Middle East and North Africa

Table 26: MFIs with the worst average profitability in the sample

With credit business profitability-rates as low as -23 to -70% on their loan portfolios, the average profitability of this sample's worst performing MFIs seems extremely bleak (see table 26). Yet, four out of five MFIs in the lowest-average-performance-quintile were simultaneously to be found in the fastest progressing quintile (see table 28).

The mission statements of these institutions scarcely differ from those of better performing MFIs. With the aim of fostering small business growth and entrepreneurship in the local communities, the most important products offered are business credit, consulting as well as training services. There seem to be no preferences towards certain industries – all types of micro-entrepreneurs are being catered. Even though the worst performing MFIs do not impress with their average profitability relative to USD-bonds their improvement has been remarkable. Most of them are in a process of transformation, placing increasing importance on marketing competencies and customer interaction. Also the definition of the target market is still mainly limited to those individuals that cannot access traditional financial institutions. A more detailed market analysis and segmentation might be desirable for the future.

Furthermore, the legal status obviously plays an important role for financial performance. Most of the least performing MFIs are considered NGOs, and are, hence, not primarily striving for financial success and independent economic sustainability. They are primarily financed by grants and subsidized loans. As a consequence, operational efficiency may not be as important as with commercially financed institutions for the organization's survival.

Interestingly, fast growing MFIs tend to have a worse financial performance than those with relatively modest loan portfolio growth. This relationship was revealed when the annual growth rates of the organizations' total loan portfolios were related to the respective annual loan portfolio yields (relative to USD-bonds). There is a significant negative correlation between those two variables (see table 27 and figure 5). The direction of the causality, though, is not perfectly clear: Does aggressive loan portfolio expansion lead to lower profitability; or, does low profitability make MFIs grow more abrasively?

Also, an analysis of the average figures of profitability and loan portfolio growth shows that the MFIs within the lowest profitability-quintile exhibit extraordinarily high growth rates (see table 28 at the end of this chapter). Three of them were more than doubling their loan portfolios every year; they, however, were also improving profitability fastest. On the contrary, MFIs with a relatively high average rate of profitability, exhibited rather low average growth rates (between 9 and 45% annually for the MFIs in the most profitable quintile).

In brief, MFIs most explicitly failing to earn a return on their loans disbursed that equals or exceeds rational foreign investors' expectations are most frequently rapidly growing, run as NGOs and funded by charitable donors. Nevertheless, they record impressive rates of profitability improvement – as long as there are no external factors (e.g. wars) constraining or paralyzing major parts of local economic activity. Although customer selection does not seem to cause any problems to these MFIs (low loan write-off ratios are even more often encountered with less profitable MFIs than with their more profitable peers), their target

markets could be defined more clearly. This could give guidance on how to best serve their clients' demands, and would allow for more focused strategic planning.

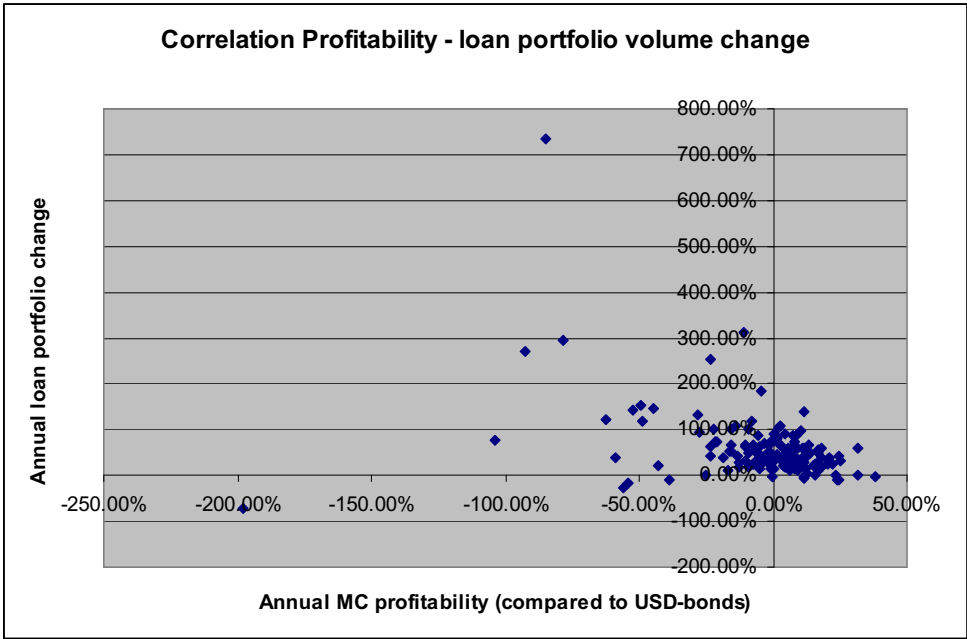


Figure 5: Relationship between annual microcredit profitability and loan portfolio volume growth

Pearson Correlation	Loan Portfolio volume change
MC Profitability (from a USD-investor's perspective)	-0.34707
Sig. (2-tailed)	0.00000

Table 27: Correlation between annual microcredit profitability and loan portfolio volume growth

**3.3.2. Summary**

The sample of this study comprises a variety of very heterogeneous MFIs. Their variability in terms of size, operations, and efficiency helped recognize sources of profitability differences between them.

It could be revealed that the best established MFIs with several years of experience and commercially oriented sources of capital tend to perform best with respect to profitability. Their yields are relatively stable and they exhibit modest growth rates, while most of the less profitable MFIs show impressive and almost constant economic improvement. Nevertheless, too rapid business expansion seems to lead to lower immediate profits. Efficiency also tends to be related to age. Younger organizations seem to have a less clear picture of their target market and are often run as NGOs. The profitability of latter increased best in cases where

there were strong partners as donors involved. Finally, the importance of MFIs to adapt their offering to the properties of their particular target markets must be underlined. Adding related services such as money transfers and insurances to their product mix obviously pays off for micro-banks. MFIs reporting of advanced market segmentation strategies and the use of modern technologies ranked best in terms of credit business profitability.

A summary of the average values of certain performance indicators used in this analysis can be found in table 28. Exactly half of the observed organizations reported higher average microcredit yields than USD-bond and only four out of the total sample of 24 MFIs showed decreasing average annual profitability rates.

MFI	Average MC Profitability relative to USD-bonds	Rank	Average annual relative profitability change	Rank	Gross loan portfolio in USD (2005)	Rank	Average annual loan portfolio growth	Rank	Average write-off ratio	Rank	Net credit-business operating expense / Loan portfolio	Rank
Peru 1	21.50%	1	-0.84%	23	76,541,768	4	33.81%	19	1.00%	11	11.38%	4
Peru 5	12.11%	2	3.10%	14	207,424,921	1	45.39%	11	2.06%	20	18.63%	7
Peru 4	11.58%	3	-0.13%	21	11,687,333	13	21.33%	23	2.42%	21	22.62%	10
Bolivia 1	8.06%	4	2.21%	16	130,106,000	2	9.07%	24	1.59%	18	8.15%	2
Bolivia 2	6.88%	5	0.20%	20	73,849,702	5	26.10%	21	1.38%	15	5.25%	1
Uganda 1	6.36%	6	3.31%	13	3,383,127	24	41.48%	14	0.68%	8	33.61%	16
Bosnia and Herzegovina 1	5.10%	7	4.36%	11	35,565,404	7	66.05%	7	0.10%	3	12.94%	5
Uganda 2	4.37%	8	5.31%	9	5,794,404	20	42.23%	13	0.43%	7	61.49%	21
Viet Nam	4.11%	9	-0.39%	22	9,123,297	16	34.97%	18	0.02%	2	11.28%	3
Peru 3	4.09%	10	0.45%	19	54,973,273	6	47.45%	10	2.73%	22	20.37%	8
Bosnia and Herzegovina 3	3.15%	11	1.01%	18	15,493,712	12	65.84%	8	1.06%	12	20.78%	9
Peru 2	1.05%	12	4.26%	12	22,137,315	10	74.51%	6	0.82%	9	23.65%	11
Philippines 1	-1.75%	13	4.79%	10	6,480,776	18	41.03%	16	4.06%	23	30.53%	14
Albania	-2.52%	14	1.80%	17	23,068,768	9	41.46%	15	1.27%	14	13.31%	6
Philippines 2	-2.92%	15	2.30%	15	10,654,855	15	21.58%	22	0.97%	10	40.16%	19
Bosnia and Herzegovina 2	-3.86%	16	5.57%	8	11,175,121	14	50.21%	9	1.12%	13	23.72%	12
Jordan 2	-6.62%	17	8.46%	6	5,080,596	23	42.47%	12	1.47%	16	38.61%	18
Nicaragua	-9.20%	18	6.97%	7	21,189,713	11	26.97%	20	1.94%	19	28.25%	13
Mongolia	-10.85%	19	32.72%	5	30,007,319	8	176.17%	2	0.25%	5	31.28%	15
Morocco	-22.70%	20	34.02%	3	82,612,174	3	109.53%	4	0.40%	6	34.81%	17
Jordan 1	-42.72%	21	32.97%	4	5,234,236	22	177.43%	1	0.18%	4	51.72%	20
South Africa	-44.01%	22	52.14%	2	5,355,669	21	40.36%	17	1.49%	17	79.57%	22
Tanzania	-46.77%	23	73.54%	1	6,258,307	19	113.41%	3	0.01%	1	98.84%	24
Palestine	-70.02%	24	-268.76%	24	7,897,061	17	75.07%	5	4.08%	24	97.78%	23

Table 28: Summary of information on sample MFIs

## **4. Implications**

In this section, the most important issues raised in the data analysis shall be contemplated. The aim is to highlight the effects of various external as well as MFI-internal features that determine financial success.

### **4.1. MFI-Specific Features**

Irrespective of the economic, political or regulatory environment of an MFI, there are certain intra-organisational features that seem to have an effect on its capability to charge reasonable fees and interest from its customers. The quantitative analyses showed significant relationships between the age of an MFI, its financial leverage, as well as the existence of an external rating and its financial performance.

It seems that older MFIs are more proficient in rating their clients' risk and can determine accurate interest levels, which leads to higher profitability of their credit business. MFI age and experience should, hence, be considered an important indicator for its likelihood to operate in a financially successful way. Whether a young MFI could profit from participating in a well established network and draw on partner-organizations' experience was not examined in this study. A well-functioning know-how-transfer within such a network could, however, potentially help newly created MFIs overcome profitability difficulties caused by a lack of experience. It could be observed, though, that non-profit MFIs with rapidly improving profitability rates were often backed by strong donor organizations. Latter were obviously able to transfer their knowledge to the supported MFIs and thus help them faster overcome initial organizational problems during the first years of existence. Such a development, however, could only be revealed with MFIs operating as donation-funded NGOs. The data did not allow for an examination of how deeply capital providers (e.g. traditional banks, shareholders) get involved in the management of commercially financed MFIs.



The capital structure of an MFI also tends to have a considerable effect on its profitability. In line with the findings of Kyereboah-Coleman (2007), microfinance organizations with higher financial leverage are more profitable. This may, at least partly, be a result of realizing economies of scale, as organizations which are willing to take on debt can react immediately to new business opportunities using e.g. commercial loans, whereas equity capital is very hard to obtain in many cases. Kyereboah-Coleman also points out that larger institutions often have more formalized operational structures and can, consequently, better handle moral hazard problems. Furthermore, external creditors of MFIs put pressure on latter to perform, which leads to tighter control systems and stricter loan portfolio management. As many MFIs do not yet operate as formal “banks” they are not necessarily bound to the local capital requirements applicable for commercial financial institutions. So, there is, most frequently, considerable potential for further leverage. Nevertheless, an overload of debt could cause problems for an MFI in the long run, even when it is successful and does not default on its liabilities, because it might hamper a possible future transformation into a regular (i.e. “regulated”) bank. In fact, it would, in many cases, be beneficial for both the MFI and the relevant economy to have MFIs fall under banking regulation (see e.g. Tucker and Tellis 2005). Therefore, a microcredit agency bearing a fair amount of debt in its funding is likely to operate in a more profitable way than a totally equity-financed peer organization. The financial leverage, however, should not be too high either, since that could constrain the future development of the organization. A reasonable level of debt would, hence, be located close to the maximal proportion accepted by locally applicable legislation at commercial banks.

Taking such a long-term view on the development of an MFI is certainly very sensible. Although MFIs are most frequently founded as non-profit organizations, a transformation into a regular bank is advantageous in many respects: The most profitable MFIs of this study’s sample were institutions that had initially been set up as NGOs but had, after a few years,

turned into regulated financial institutions. In addition to more efficient operations, these organizations can thus decrease their dependency on the generosity of their donors.

Transparency is another very important indicator for the profitability of an institution. In the case of the analyzed MFIs, those operating at higher margins were most frequently organizations that had undergone a credit rating procedure in the recent past. The commitment of letting external agents scan through the books and working practices of the organization seems to be very valuable for it. There may be two main sources of benefits here:

First, at a financial level, an independent credit rating allows a more precise determination of the cost of capital. The information gap between the rated organization and its capital providers is, at least to a certain degree, reduced. Both parties can use the rating statement to justify their demands in financing negotiations. This may lead to lower capital costs for MFIs which receive parts of their funding from commercial creditors.

Second, the rating process itself will most likely make the organization more aware of its own practices. It may reveal various sources of inefficiencies, bottlenecks, and potential external threats, but equally helps identify best practices, centres of knowledge and talent, and provenience of any competitive advantages. Major discrepancies between the organization's perceived and real capabilities may be detected and give reason for improvement. Through the rating report, the MFI will have the opportunity to look at its operations from an outsider's perspective. It may want to reflect on its structure, past mistakes and how to prevent them from happening in the future. This should lead to managerial steps being taken to promote smooth operations. It might become necessary to develop and spread valuable competencies among all parts of the organization. Eventually, this business review is likely to result in lower operating costs, which in turn improves the profitability of the MFI. A rating, thus, fulfils a controlling function for the rated MFI. Support for this argument also comes from the lower loan write-off ratios observed at MFIs with a rating relative to those without any external rating report (see chapter 3.2.3.a).

Additionally, it must be mentioned that the marketing approach of an MFI is equally critical to its financial success. Organizations that are aware of their total potential market, yet segment it into smaller groups of customers and target only those whose needs are well known, tend to outperform their peers and generate higher risk-adjusted yields on their credit business than do USD-bonds for investors. Therefore, investing in market research makes perfect sense for MFIs. It helps them develop products that are more relevant for their clients. This may involve the offering of auxiliary services (e.g. insurance, money transfers, or savings deposits). So, better quality service and an appropriate product mix result in higher profit margins realized on micro-loans.

Finally, attention shall be drawn to the explosive growth rates experienced in this industry. On average, the MFIs examined in this study expanded their loan portfolios by a rate of 59% annually (reaching from MFIs with average annual growth of 9% to organizations with 177% growth per year). Fast growth, however, tends to constrict MFI profitability. The data shows that extraordinarily expansionist institutions are less profitable than those with a more modest increase in loan capital disbursed. An explanation might be the incapacity of the organization to adapt its structure and working practices fast enough to the rapidly growing customer base and a surge in administrative activities associated with more micro-loans outstanding. MFIs with credit business returns above USD-bond yields typically saw their loan portfolios grow at a rate of 9 to 75%. By contrast, microcredit institutions with lower yields experienced average annual growth rates between 22 and 177% with a mean of 76% per annum (see section 3.3.1). Thus, all too rapid growth can have negative effects on MFI profitability.

#### **4.2. Environmental Conditions**

Beside organisation-specific characteristics, the environment of an MFI plays a vital role for its capacity to generate profits on its credit activities. The quantitative analysis showed that microcredit becomes more profitable the better the legal system and law-enforcement are. More liberal economic policies are desirable, too. High inflation rates, corruption as well as a

strong existing formalized financial sector tend to decrease MFI profitability. Also, smaller markets (in terms of total GDP in PPP) seem more attractive from an MFI's perspective.

It may seem surprising at the first glance that MFIs operating in countries with some degree of political unrest are more profitable than those active in politically very stable environments. Political instability, indeed, may be an obstacle for many traditional commercial banks to enter the market. So, the risks arising from social tensions seem to translate into higher profit margins for MFIs, because they face less competition from commercial banks. There are limits to this relationship, though. In regions experiencing an escalation of violence and permanent unrest no financial institution can sustain. This can be observed with the Palestinian MFI described in this study, which could only survive because of permanent donor support during the sample period. It can, hence, be concluded that perfect political stability is not a necessity for an MFI to operate profitably.

There is little proof on any singular macroeconomic or social country-wide indicator to have a sensible effect on the financial performance of a local MFI. For example, the sample's Ugandan MFIs saw profitability grow while the general poverty level was declining in their country. In Bolivia, on the contrary, the number of people living in poverty increased during the sample period, and still, Bolivian MFIs were among the most profitable ones in the sample. Also in Tanzania, poverty is threatening larger parts of the population nowadays than a decade ago but MFI profitability is comparably low, yet improving. In addition, the financial performance of an MFI does not seem to be dependent on the general poverty level of a country: Relatively profitable MFIs were located in countries with very different poverty levels reaching from 2% of the population living on less than USD 1 a day in Viet Nam, over 13% in Peru, to 32% in Uganda. On the opposite, the least profitable MFIs were found in Jordan, South Africa and Tanzania, with 2%, 12% and 60% of the people defined as extremely poor, respectively. Consequently, the degree of poverty observed in a country cannot be considered a good indicator for MFI success.

The educational level of a country's population, however, might play a role for MFIs. In most countries with improving educational indicators (e.g. literacy rates and school attendance, as reported by the United Nations (UNO 2007)), MFIs generated higher than average returns. Intuitively, this relationship could be explained through entrepreneurial engagement. When people are better educated they are more likely to turn their knowledge obtained through schooling into economic activity. They can more easily learn about ways to improve their business and will be more difficult to be exploited by fraudsters if they are literate. Better performing micro-entrepreneurs will be able to pay higher interest on their loans and default on their payments more rarely. Additionally, MFIs' customer communication and information transmission will be more efficient when clients understand written documents.

Beside the issues described above, this study could not reveal any further environmental factors influencing MFI-profitability. Hence, a strong national legal system and low corruption, as well as little competition from the traditional banking industry seem to foster MFIs. Overall poverty levels or the technological progress of a country have no clear implications on the financials of MFIs.

## **5. Conclusion**

The objective of this study was to reveal the main influential factors to microcredit profitability. First of all, it could be shown that current microfinance organizations can offer rational investors a sensible return on their investment under certain conditions. Second, critical success factors for MFIs' financial performance were identified. Hence, this study's findings can help pave the way for more vivid participation of private investors in the microcredit industry. The results of this analysis shall, at least to some extent, reduce the information gap perceived by most international capital markets with respect to MFIs.

In summary, there are striking differences in the financial performance of individual microcredit institutions. After all, the organization-specific characteristics appear to be far more important for the financial performance of a microcredit agency than the relevant environmental forces. Although national politics can provide a framework for MFIs that support their business, an organization's own management and operational practices are more decisive for its success. General statements about optimal operating conditions for micro-banks are hard to assert, while it seems very clear that MFI-specific business experience and the integrated execution of the chosen market strategy are key to financial profitability. Also the observation by an external party, e.g. a rating agent, has a very positive effect on economic performance. Consequently, each MFI must be treated as unique and needs to be examined separately in order to qualify its future prospects. There can be very profitable MFIs in almost any country, but there can be tremendously inefficient ones, too.

## Appendices

### Appendix 1: UNCDF's MFI performance indicators

UNCDF's core performance indicators for MFIs comprise:

- "Outreach: The number of clients or accounts that are active at a given point in time" (UNCDF 2005, p.2)
- "Client poverty level": This indicator can be approximated through the Average Outstanding Balance, which equals the "Gross amount of loans or savings outstanding / Number of active clients or accounts" (UNCDF 2005, p.2)
- "Collection Performance": Recommended ways of assessing loan collection include  
"Portfolio at Risk (x days) = Outstanding principal balance of all loans past due more than x days / Outstanding principal balance of all loans" (UNCDF 2005, p.3),  
"Loans at Risk (x days) = Number of loans more than x days late / Total number of outstanding loans" (UNCDF 2005, p.3)  
"Current Recovery Rate (CRR) = Cash collected during the period from borrowers / Cash falling due for the first time during the period under the terms of the original loan contract" (UNCDF 2005, p.4) and its annualized counterpart, the  
"Annual Loan-loss Rate =  $(1 - CRR) / T * 2$ , where T is the average loan term expressed in years" (UNCDF 2005, p.4)
- "Financial Sustainability (Profitability)" usually cannot be evaluated as easily as by using the ROE. Since many MFIs often operate in fragile economies and receive various services from donors free of charge, adjustments must be made to incorporate these issues into the profitability calculation. Three types of adjustments are suggested:  
"Inflation Adjustment (IA) = (assets [...] denominated in currency amounts – Liabilities [...] denominated in currency amounts) \* The inflation rate for the period" (UNCDF 2005, p. 5)  
"subsidized-Cost-of-Funds Adjustment (CFA) = Period-average borrowings by the MFI \* Market interest rate – Actual amount of interest paid by the MFI during the period" (UNCDF 2005, p. 5)  
"In-kind Subsidy Adjustment (ISA) = Market price an unsubsidized MFI would pay for a good or service – Actual price paid by the MFI" (UNCDF 2005, p. 6)  
Financial Sustainability measures accounting for the special characteristics of MFIs include:  
"Financial Self-Sufficiency = Business revenue (excl. grants) / (Total expenses + IA + CFA + ISA)" (UNCDF 2005, p. 6)  
"Adjusted Return on Assets = (Accounting profit/loss (excl. grants) – IA – CFA – ISA) / Period-average total assets" (UNCDF 2005, p. 6)  
and the "Subsidy Dependence Index"
- "Efficiency" should preferably be measured through the  
"Cost per Client = Personnel and administrative expense / Period-average number of active borrowers [\* GNI per capita to allow for a cross-country comparison]" (UNCDF 2005, p. 7)  
rather than the  
"Operating Expense Ratio = Personnel and administrative expense / Period-average gross loan portfolio" (UNCDF 2005, p. 7).

UNCDF also provides calculation schemes for performance indicators taking into consideration very specific loan characteristics, such as e.g. community-managed revolving loan funds.

## Appendix 2: Factor analysis and rotation

<b>Principal components analysis</b>				
<i>components</i>	1	2	3	4
BANKtoGDP	0.61689	0.45340	0.30505	0.20375
GDP	0.38529	0.00642	-0.20861	0.83017
INFL	-0.00376	0.40818	-0.84568	0.08240
POLIT	0.14592	0.83423	-0.02488	-0.32671
JUDICAL02	0.90130	0.08989	0.10049	-0.19621
CORRUPT	0.85327	0.05469	0.32945	0.14731
JUDICAL01	-0.77167	0.23370	0.37409	0.24990
LIBERAL	-0.76250	0.45864	0.24965	0.20142

<b>Rotated components</b>				
<i>components</i>	1	2	3	4
BANKtoGDP	-0.08643	0.82302	-0.00689	0.18925
GDP	-0.07981	0.20567	0.13230	0.90278
INFL	-0.07153	-0.10656	0.92084	0.15550
POLIT	0.15112	0.59665	0.51528	-0.42455
JUDICAL02	-0.66896	0.64723	-0.04771	-0.01795
CORRUPT	-0.45596	0.71871	-0.26454	0.25861
JUDICAL01	0.89756	-0.14476	-0.15312	-0.04955
LIBERAL	0.93430	-0.05192	0.08064	-0.11203

Rotation-methode: Varimax with Kaiser-normalization  
Convergence after 12 iterations

<b>Components' transformation-matrix</b>				
<i>components</i>	1	2	3	4
1	-0.75247	0.61890	-0.02865	0.22346
2	0.45408	0.64616	0.58466	-0.18563
3	0.33973	0.44161	-0.81000	-0.18295
4	0.33495	0.06648	-0.03541	0.93922

<b>Total variance explained</b>									
component	Initial eigenvalues			Sum of squared factor loadings			Rotated sum of squared loadings		
	total	% of variance	cumulated %	total	% of variance	cumulated %	total	% of variance	cumulated %
1	3.27	40.85	40.85	3.27	40.85	40.85	2.38	29.70	29.70
2	1.34	16.80	57.65	1.34	16.80	57.65	2.05	25.58	55.27
3	1.17	14.67	72.31	1.17	14.67	72.31	1.23	15.42	70.69
4	1.01	12.59	84.91	1.01	12.59	84.91	1.14	14.22	84.91
5	0.57	7.12	92.02						
6	0.35	4.35	96.38						
7	0.17	2.17	98.54						
8	0.12	1.46	100.00						



**Appendix 3: Write-off-Ratio regression (first regression with all variables)**

Dependent Variable: writeoffratios	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	,013	,010		1,314	,191	-,006	,032
LEV_ALL	-,001	,013	-,008	-,063	,950	-,026	,025
AGE	-,001	,001	-,117	-,968	,335	-,002	,001
LEV_LONG	-,001	,014	-,010	-,086	,932	-,029	,027
F_1_LawEnf	-,004	,004	-,149	-1,181	,239	-,012	,003
F_2_FormalizedFS	-,002	,003	-,087	-,782	,435	-,009	,004
F_3_EcoPolicy	-,005	,003	-,159	-1,388	,167	-,011	,002
F_4_EcoSize	,006	,003	,220	2,087	,039	,000	,012
RATING	-,010	,005	-,179	-1,981	,049	-,021	,000
REG_Afr_MidEast	,014	,012	,187	1,173	,243	-,010	,038
REG_LatAm	,024	,008	,398	2,947	,004	,008	,039
REG_EastAsia	,023	,010	,295	2,280	,024	,003	,042
REG_EastEuro_CentAsia	,013	,012	,173	1,117	,266	-,010	,037

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Dependent Variable: writeoffratios					Tolerance
<b>Excluded Variables:</b> LEV_SHORT	.(a)	.	.	.	,000

a) Predictors in the Model: (Constant), REG\_EastEuro\_CentAsia, LEV\_ALL, F\_4\_EcoSize, REG\_EastAsia, RATING, F\_2\_FormalizedFS, F\_3\_EcoPolicy, LEV\_LONG, F\_1\_LawEnf, AGE, REG\_LatAm, REG\_Afr\_MidEast

Model Summary									
R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
Dependent Variable: writeoffratios									
.346(a)	.120	.051	.0276174	.120	1.727	12	152	.066	1.595

a) Predictors: (Constant), REG\_EastEuro\_CentAsia, LEV\_ALL, F\_4\_EcoSize, REG\_EastAsia, RATING, F\_2\_FormalizedFS, F\_3\_EcoPolicy, LEV\_LONG, F\_1\_LawEnf, AGE, REG\_LatAm, REG\_Afr\_MidEast

## References

- Bakshi, G., Madan, D. and Zhang, F. X. (2006). "Investigating the Role of Systematic and Firm-Specific Factors in Default Risk: Lessons from Empirically Evaluating Credit Risk Models." Journal of Business 79(4): 1955-1987.
- Beattie, A. (2005). Commercial banks take a fresh look MICROFINANCE. Financial Times. London: 8.
- Bhatt, N., Painter, G. and Tang, S.-Y. (1999). "Can Microcredit Work in the United States?" Harvard Business Review: 26-27.
- Castello, S. A. (2004). Innovative Technologies in Microfinance for Latin America: Building Effective Delivery Channels. San Jose, Costa Rica, CGAP: 40.
- CGAP (2005). Annual Report 2005. Washington, D.C., Consultative Group to Assist the Poor: 37.
- Chan, S. H. (2005). "An Exploratory Study of Using Micro-Credit to Encourage the Setting up of Small Businesses in the Rural Sector of Malaysia." Asian Business & Management 4(4): 455-479.
- Chowdhury, M. J. A., Ghosh, D. and Wright, R. E. (2005). "The impact of micro-credit on poverty: evidence from Bangladesh." Progress in Development Studies 5(4): 298-309.
- Copstake, J., Bhalotra, S. and Johnson, S. (2001). "Assessing the impact of microcredit: A Zambian case study." The Journal of Development Studies 37(4): 81-100.
- Daley-Harris, S. (2005). State of the Microcredit Summit Campaign Report 2005. Washington, D.C., The Microcredit Summit Campaign: 68.
- Demirgüç-Kunt, A. and Huizinga, H. (1999). "Determinants of commercial bank interest margins and profitability: Some international evidence." World Bank Economic Review 13(2): 379-408.
- Demirgüç-Kunt, A. and Levine, R. (2001). Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development. Cambridge, Mass., MIT Press.
- DESA/UNCDF (2006). Building Inclusive Financial Sectors for Development. New York, United Nations Department of Public Information.
- Detragiache, E., Gupta, P. and Tressel, T. (2005). "Finance in Lower Income Countries: An Empirical Exploration." International Monetary Fund Working Paper WP/05/167.
- Dowla, A. and Alamgir, D. A. H. (2003). "From microcredit to microfinance: evolution of savings products by MFIs in Bangladesh." Journal of International Development 15(8): 969-988.

- Dowla, A. U. (2004). "Microleasing." Journal of Microfinance **6**(2): 137-160.
- Farrington, T. (2005). "The Evolution of Specialized Rating for MFIs." Micro Enterprise Development Review **8**(1).
- Ghatak, M. (1999). "Group lending, local information and peer selection." Journal of Development Economics **60**(1): 27-50.
- Giné, X. and Karlan, D. S. (2006). Group versus Individual Liability: A Field Experiment in the Philippines. World Bank Policy Research Working Paper 4008, World Bank: 38.
- Gulde, A.-M., Wajid, K., Vázquez, F., Detragiache, E., Hadjimichael, M., Basu, A., Blavy, R., Yulek, M. and El-Khoury, M. (2005). Microfinance: A View from the Fund, International Monetary Fund: 25.
- Hartarska, V. and Nadolnyak, D. (2007). "Do regulated microfinance institutions achieve better sustainability and outreach? Cross-country evidence." Applied Economics **39**(10): 1207-1222.
- Hertz-Bunzl, N. (2006). "Financing Hope: Improving Microfinance." Harvard International Review **27**(4): 32-34.
- Hietalahti, J. and Linden, M. (2006). "Socio-economic impacts of microfinance and repayment performance: a case study of the Small Enterprise Foundation, South Africa." Progress in Development Studies **6**(3): 201.
- Hodder, J. E. and Senbet, L. W. (1990). "International Capital Structure Equilibrium." The Journal of Finance **45**(5): 1495-1516.
- Holvoet, N. (2004). "Impact of Microfinance Programs on Children's Education." Journal of Microfinance **6**(2): 27-49.
- Huybens, E. and Smith, B. (1999). "Inflation, financial markets and long-run real activity." Journal of Monetary Economics **43**(2): 283-315.
- Johnson, S. (2004). "The impact of microfinance institutions in local financial markets: a case study from Kenya." Journal of International Development **16**(3): 501-517.
- Kah, J. M. L., Olds, D. L. and Kah, M. M. O. (2005). "Microcredit, Social Capital, and Politics: The Case of a Small Rural Town-Gossas, Senegal." Journal of Microfinance **7**(1): 119-149.
- King, R. G. and Levine, R. (1993). "Finance and Growth: Schumpeter Might Be Right." Quarterly Journal of Economics **108**: 717-737.
- Kumbhakar, S. C. and Lovell, C. A. (2000). Stochastic Frontier Analysis. Cambridge University Press. Cambridge.
- Kyereboah-Coleman, A. (2007). "The impact of capital structure on the performance of microfinance institutions." The Journal of Risk Finance **8**(1): 56-71.

- La Porta, R., López-de-Silanes, F., Shleifer, A. and Vishny, R. (1997). "Legal determinants of external finance." Journal of Finance **52**: 1131-1150.
- La Porta, R., López-de-Silanes, F., Shleifer, A. and Vishny, R. (1998). "Law and finance." Journal of Political Economy **106**(6): 1113-1155.
- Laeven, L. and Majnoni, G. (2005). "Does judicial efficiency lower the cost of credit?" Journal of Banking & Finance **29**(7): 1719-1812.
- Matin, I., Hulme, D. and Rutherford, S. (2002). "Finance for the poor: from microcredit to microfinancial services." Journal of International Development **14**(2): 273-294.
- Morris, G. and Barnes, C. (2005). "An Assessment of the Impact of Microfinance: A Case Study from Uganda." Journal of Microfinance **7**(1): 39-54.
- Porteous, D. (2006). Competition and microcredit interest rates. CGAP Focus Note: 16.
- Raheim, S., Alter, C. A. and Yarbrough, D. (1996). "Evaluating microenterprise programs: Issues and lessons learned." Journal of Developmental Entrepreneurship(1): 87-103.
- Rahman, A. (1999). "Micro-credit initiatives for equitable and sustainable development: Who pays?" World Development **27**(1): 67.
- Rating-Fund (2006). Microfinance Ratings: Raising Awareness Among MFIs, The Microfinance Rating and Assessment Fund: 13.
- Rosenberg, R. (2005). Review of UNDP Microfinance Portfolio, United Nations Development Programme: 73.
- Rutherford, S., Maniruzzaman, M. D. and Sinha, S. K., Eds. (2004). GRAMEEN II At the End of 2003: A 'Grounded View' of How Grameen's New Initiative Is Progressing in the Villages. Dhaka, Grameen.
- Schierenbeck, H. (2001). Ertragsorientiertes Bankmanagement. Wiesbaden, Betriebswirtschaftlicher Verlag Dr. Th. Gabler.
- Sebstad, J. and Chen, G. (1996). Overview of studies on the impact of microenterprise credit. Assessing the Impact of Microenterprise Services (AIMS). Washington, D.C., USAID Microenterprise Impact Project.
- Sensarma, R. (2006). "Are foreign banks always the best? Comparison of state-owned, private and foreign banks in India." Economic Modelling **23**(4): 717.
- Sriram, M. S. and Upadhyayula, R. S. (2004). "The Transformation of the Microfinance Sector in India." Journal of Microfinance **6**(2): 89-112.
- Standard&Poor's (2006). "Standard&Poor's Ratings Definitions." 2007 (9th March 2007), <http://www2.standardandpoors.com/portal/site/sp/en/eu/page.article/2,1,1,4,1145789987396.html>.

- Standard&Poor's (2007). Annual 2006 Global Corporate Default Study and Ratings Transitions. New York, NY, Standard&Poor's. **2007**: 14.
- Tinker, I. (2000). "Alleviating poverty: Investing in women's work." Journal of the American Planning Association **66**(3): 229-248.
- Tucker, M. and Tellis, W. (2005). "Microfinance Institutions in Transition: Fonkoze in Haiti Moves toward Regulated Banking Status." Journal of Microfinance **7**(2): 101-125.
- UNCDF (2005). Core Performance Indicators for Microfinance, United Nations Capital Development Fund.
- UNCDF (2006). "Basic Facts About Microfinance." 2006 (28th October), <http://www.uncdf.org/english/microfinance/facts.php>.
- UNO (2007). "Millennium Indicators." 2007 (16th April), <http://unstats.un.org/unsd/mdg/Data.aspx>.
- World-Bank (2006). "Microfinance At A Glance." 2006 (28th October), <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20433592~menuPK:34480~pagePK:64257043~piPK:437376~theSitePK:4607,00.html>.