

**Microfinance commercialization:
Financially *and* socially optimal investments**

Rients Galema#, Robert Lensink#¶

#Centre for International Banking, Insurance and Finance (CIBIF),
Faculty of Economics and Business, University of Groningen, the Netherlands
¶ Development Economics Group, Wageningen University and CREDIT, University of
Nottingham, UK

Abstract

In this paper we try to identify those microfinance institutions (MFIs) that are attractive investments in terms of financial and social returns. These are investments that improve the portfolio in terms of diversification while also performing well on reaching out to the poor. Our main results indicate that MFIs that provide individual loans mainly provide financial benefits, while those focusing on group loans provide more social benefits to investors. If we exclude Africa and South Asia, we find that MFIs that offer group loans also offer financial benefits.

Keywords: Microfinance; Microfinance Institutions; Commercialization; Mean-Variance

Spanning; Outreach

¶ Corresponding author: Faculty of Economics and Business, University of Groningen, PO BOX 800, 9700 AV Groningen, the Netherlands; telephone: +31-50-363-3712; fax: +31-50-363-8252; email: b.w.lensink@rug.nl.
The authors thank SNS Asset Management for financial support.

1. Introduction

The United Nation (UN) reports that in 2005 still over 1 billion people, about one sixth of the world population, were living in extreme poverty. These people earn less than one dollar a day. To fight this poverty, the UN has set the United Nations Millennium Development Goals in September 2000, which aim at halving extreme poverty by 2015. According to the UN, microfinance can be a significant contribution to the achievement of the Millennium Development Goals (MDGs). Therefore, the UN declared 2005 to be the International year of Microcredit, to bring further attention to global poverty and the impact of microfinance.

The practice of modern microfinance became active during the 1980s. In 1983, a research project to examine the possibility of designing a credit delivery system to provide banking services targeted to the rural poor was transformed into an independent bank by government legislation. This bank, the Grameen Bank, was founded by Muhammad Yunus in 1976, which is remembered as a groundbreaking step in microfinance. New microfinance programs and institutions have been founded rapidly worldwide ever since. The Grameen bank and its founder were jointly awarded the Nobel Peace Prize in 2006.

In a very broad sense, microfinance is the provision of financial services to the poor. At first, the aim of microfinance was to provide very small loans (microcredit) to the poorest on earth, to help them engage in productive activities or grow their tiny businesses (microenterprises), which could not have been financed otherwise. However, over time microfinance moved toward a broader range of services including loans, savings, insurance, transfer services and other financial products. Microfinance institutions (MFIs) and academics have come to realize that the poor require a variety of financial products, enabling “a world in which as many poor and near-poor households as possible have permanent access to an appropriate range of high quality financial services, including not just credit but also savings, insurance, and fund transfers” (Christen, Rosenberg and Jayadeva, 2004).

About ten years ago, microfinance started to become more commercial, and this commercialization is increasing very strongly. Commercial banks and international private and institutional investors play an increasing role in funding microfinance institutions. Especially pension funds are willing to invest in microfinance. To some extent the trend of increasing interest of private and institutional investors for microfinance can be explained by the growing pressure for socially responsible investment. However, microfinance may also provide attractive opportunities for portfolio diversification since the risk-adjusted returns exhibit low correlations with other assets (Krauss and Walter, 2008). In addition, Ahlin and Lin (2006) and Gonzalez (2007) show that microfinance portfolios have high resilience to economic shocks. This high resilience may be due to the fact that many clients of MFIs are part of the informal economy, which is less sensitive to macro-economic business cycles. Therefore, investing in microfinance could provide diversification benefits.

This paper investigates whether adding microfinance funds to a benchmark portfolio of international assets is beneficial for international investors. We are especially interested in the question whether it is possible to select a subset of microfinance institutions that offer portfolio diversification opportunities for international investors that also score high on the outreach goal. Some of the most commercialized microfinance institutions are comparable in terms of profitability to commercial banks. However, their focus on financial sustainability and efficiency could be at the expense of reaching the poor.

Opponents of commercial microfinance argue that it conflicts with the traditional aim of poverty reduction, because commercial MFIs tend to focus on financial efficiency rather than on reaching out to the poor. Several studies have indicated there may be a trade-off between depth of outreach and achieving financial sustainability, since unit transaction costs for smaller loans are higher than those of larger loans (Hulme and Mosley, 1996; Conning, 1999; Paxton and Cuevas, 2002; Lapenu and Zeller, 2002). Traditional microfinance

supporters claim that efficiency driven MFIs are only focused on those individuals who have strong financial potential. This could induce a shift from group lending to the more profitable individual-based lending. Christen (2000) shows that in three of the most competitive microfinance markets in Latin America, a shift from group to individual lending has occurred. In addition, Cull et al. (2007) show in an extensive study that individual-based MFIs seem to perform better in terms of profitability. However, the share of poor borrowers and female borrowers in the loan portfolio is lower for individual lending than for group lending. Finally, Hermes, Lensink and Meesters (2008) show that there is a trade-off between outreach, in terms of average loan size and percentage of female borrowers, and MFI efficiency.

For microfinance commercialization critics, the results of the above studies are disturbing, since it means that the traditional aim of microfinance is fading away. Therefore, supporters of the traditional aim of microfinance argue that there is additional need for investors that are interested in both the financial and social performance of their investments, i.e. socially responsible investors. The market for socially responsible investment (SRI) has shown tremendous growth and microfinance is an attractive niche within this market, which is expected to grow even further as the microfinance industry matures. This paper is intended to help investors identify microfinance investment opportunities that are both financially and socially interesting. These investment opportunities are attractive in terms of risk and return and poverty reduction.

We use the methodology of mean-variance spanning tests to examine whether adding microfinance to a benchmark set of risky assets improves the risk-return profile for investors. This methodology has been used in several seminal papers studying benefits of international diversification, especially in the context of emerging markets, see e.g. Bekaert and Urias (1996). Since it is not possible to go short in microfinance, we apply a spanning test with short-sale constraints, based on De Roon, Nijman and Werker (2001). We will apply the

spanning test to different groups of MFIs, with the aim of selecting a subset of MFIs for which spanning is rejected. In particular, we use the spanning test to find a subset of MFI investments that score high on the outreach goal and improve the risk-return profile of a set of benchmark investments as well. This analysis helps socially responsible investors to determine in which MFIs they should invest.

The paper is organized as follows. Section 2 provides an overview of commercialization in microfinance. Section 3 explains the methodology that we use. Section 4 presents the data. Section 5 presents a descriptive analysis to select MFIs that score high on outreach indicators. Section 6 provides results of spanning tests for those groups of MFIs that score high on outreach in order to select subgroups of MFIs that score high both in terms of social and financial returns. Section 7 concludes.

2. Commercialization of Microfinance

The number of MFIs and the number of clients served worldwide is increasing rapidly. Now, more than 10,000 MFIs in more than 85 countries, serve over 100 million micro entrepreneurs. The increase in the number of MFIs and MFI clients calls for additional funding. Driven by increasing access to commercial funding sources, the volume of microfinance loans has risen sharply in recent years, from an estimated USD 4 billion in 2001 to approximately USD 25 billion in 2006. Still, only a fraction of today's potential borrowers' demand is met, while the microfinance sector still faces a USD 250 billion funding gap (Dieckmann, 2007). This means a significant investment opportunity for capital markets. The current trends in microfinance will lead to a more financially and efficiency-driven microfinance environment, where many MFIs tend to transform themselves from mission-driven, often inefficient NGOs, into regulated financial institutions funded by private capital.

According to Dieckmann (2007), MFIs can be distinguished into four classes according to the degree of commercialization. Tier 1 MFIs are the top 150 largest MFIs who are mature and well-known, mostly regulated and financially sustainable. Tier 2 MFIs are smaller and less well-known MFIs, which are nearly profitable. The majority are candidates for institutional conversion to microfinance banks (about 8 percent of MFIs). Tier 3 MFIs are mostly NGO's, which are approaching profitability (about 20 percent of MFIs). Tier 4 MFIs are start-up MFIs, which are mostly unprofitable (about 70 percent of MFIs). Although the most MFIs are still in tier 4 and show little perspective for private investors, the top tier is most important regarding the size of loan portfolios and the degree of outreach. The 100 largest MFIs experience a growth rate of their client base of 26 percent per year (Reddy, 2007), and in 2006 there were already about 30 MFIs with a loan portfolio in excess of USD 100 million.

The commercialization of microfinance is reflected in strong financial performance. Christen (2000) shows that in a competitive environment in Latin America, MFIs are more profitable than their peers from other non-commercial regions, and in addition, are even more profitable than commercial banks in their own region. Littlefield and Holtman (2005) find that worldwide, the top MFIs are nearly twice as profitable as the leading commercial banks in their local environment. In addition, studies have indicated that MFIs show low default rates, which tend to fall between 1% and 3% (Easton, 2005; Kraus and Walter 2008). In combination with impressive growth rates and strong returns, MFIs are potentially interesting for foreign investors.

While domestic savings are still the main funding source for MFIs, representing 41 percent of all assets in 2005 (Sengupta and Aubuchon, 2008), many MFIs turn to international capital markets as financing alternative. As Swanson (2007) points out, most of the MFIs are not deposit-taking institutions, and are unlikely to become so, given the cost and complexity

of regulations typically applied to deposit-taking institutions. Consequently, future MFI funding is unlikely to be obtained by means of deposit-taking. It is also not assumed that other domestic sources in emerging countries will generate more than a fraction of the enormous potential capital demand. This is because capital markets in developing countries are thin and the key institutional investors are averse to or legally constrained from significant investment in microfinance.

The longer maturity of international capital financing will strengthen the financial structure of MFIs, and will make them less exposed to external factors such as bank runs, currency risks, and macroeconomic crises. Especially the top tier MFIs are increasingly attracting the interest of foreign investors, as these MFIs are usually profitable, have a more experienced management, and are considered to most effectively absorb the commercial funding.

The landscape of foreign capital in microfinance consists of two main types of investors, namely the public investors known as International, or Development Finance Institutions (IFIs or DFIs), and private investors, which includes individual and institutional investors. Foreign investment in microfinance more than doubled from USD 1.7 billion in 2004 to around USD 4.4 billion in 2006. In this period, public investments from IFIs increased from USD 1.1 billion to USD 2.4 billion and private investments increased from USD 0.6 billion to USD 2.0 billion (Dieckmann, 2007). In 2005, foreign capital provided 22 percent of funding for the top 100 MFIs (Swanson, 2007).

Approximately 50 percent of MFI foreign capital funding is channelled through specialised Microfinance Investment Vehicles (MIVs). The main investors in MIVs are individual investors. The share of IFIs in MIV funding has declined from 36 percent in 2005 to 30 percent in 2006, while institutional investors are catching up. The number of MIVs has

increased rapidly and there are now over 80 MIVs (CGAP, 2008). Total investment of these MIVs has doubled between 2005 and 2006, reaching USD 2 billion in 2006.

MIVs have different funding sources, due to a diverse investment approach regarding social returns and financial returns. While the more socially focused are particularly funded by development agencies and private donors, the more financially focused are mainly funded by commercial investors and socially responsible investors.

One of the first MIV start-ups, which was mainly backed by capital from development agencies and private donors, was the equity fund ProFund. In 1995, it raised USD 23 million to finance Latin American MFIs (Dieckmann, 2007). The first typical commercially driven MIV was Dexia-Micro-Credit fund, which was launched in 1998 in Luxembourg, and was mainly funded by private investors. The fund offered investors a return above their cost of funds and an ability to cash in their investments. In 2007, the Dexia-Micro-Credit fund had USD 205 million in assets under management (Dieckmann, 2007). The top 10 MIVs now account for 67 percent of total MIV investment and about 80 percent of MIVs are located in Latin America and Eastern Europe (CGAP, 2008). The largest MIV is Procredit Holding with a loan portfolio of EUR 757 million, followed by the European fund for Southeast Europe with a EUR 245 million loan portfolio.

Foreign funding primarily took place via debt-structured finance, of which collateralized debt obligations (CDOs) and securitizations were most important. While CDOs and securitizations have a lot in common, the impact on MFIs' financial structure is different. Whereas the CDOs rely on MFIs ability to repay their loans, securitizations rely on the abilities of the borrowers of MFIs to repay their loans. In July 2004, the first CDO based on microfinance funds, BlueOrchard Microfinance Securities I (BOMSI), was created by BlueOrchard in a partnership with Developing World Markets (DWM). The first closing raised USD 40 million via international capital markets and a subsequent closing raised an

additional USD 47 million. In both offerings, investors bought seven year notes, with a single repayment of principal at maturity. The proceeds of the investment of 90 investors were used to fund loans to 14 MFIs in nine countries. This securitization was much less diversified than typical CDOs in developed markets where the asset pool may comprise many hundreds or thousands of loans (Swanson, 2007). Since there was no asset substitution or active management, the returns were simply the repayments of these 14 loans.

An innovating aspect of BOMSI's funding was that it enclosed five levels of risk: senior debt, three subordinated debts, and equity. This made it possible to reach investors with different risk strategies. Investors are paid according to the 'cash waterfall', meaning that senior debt is paid first, next the other debt levels and equity investors receive the residual cash left. The US government development agency OPIC purchased the most senior tranche of securities, which encouraged investors who otherwise might have been unwilling to consider the transaction. Also, BOMSI's investors have not made loans to the fund, they have purchased securities in the form of bonds and equity interests. On the first closing date of BOMSI, 4% of the invested capital was financed by private investors, while on the second closing date this already amounted to around 41% (Swanson, 2007). This is a clear indication of growing participation of commercial investors. In 2006, DWM closed a third CDO transaction for which it was sole sponsor; Microfinance Securities XXEB (MFS). This USD 60 million securitization of loans to 26 MFIs was for 56% financed by private investors. According to Byström (2008), CDOs are a very promising means of extending financing to (commercial) microfinance institutions on a much larger scale. However, due to the current credit crisis, chopping up debts into different credit tranches has become less popular among investors.

Other than CDOs, microfinance is also commercially funded by securitization of microfinance loans, in which private investors have a substantial share. The first securitization

transaction was conducted by ICICI in India. In May 2006, ProCredit Bank Bulgaria sold USD 48 million of its loan portfolio to institutional investors. The transaction was arranged by the Deutsche Bank and partially guaranteed by the European investment Bank and KfW. In addition, it was rated BBB by Fitch Ratings. In addition, ProCredit Serbia was structured in 2007 and issued a senior loan participation note worth EUR 125 million.

While funding microfinance is typically debt based, MFIs have also started to raise capital from the international equity markets. However, the factor slowing the growing attraction of private equity, is the small number of exits to date. Private equity investors tend to be more focused on capital gains upon sale of their stake than dividends payments as the principal component of its return. Nevertheless, in 2006 the first IPO in Africa was executed when Equity Bank in Kenya listed its shares on the Nairobi Stock Exchange. In addition, the Mexican Compartamos conducted a successful IPO in April 2007 and transferred into a commercial bank. Also, Accion Investments has invested USD 12.4 million in equity in five MFIs (Reddy and Rhyne, 2006).

3. Methodology

Microfinance offers social returns in terms of reducing poverty, although investments in microfinance could also be beneficial to investors who aim at a diversified portfolio strategy. Concerning the latter, we test whether investing in microfinance can help reduce the risk of an existing portfolio. Where previous studies, such as Krauss and Walter (2008), were primarily focused on whether or not financial indicators of MFI's show low correlation with domestic or global benchmarks, this study is in line with standard mean-variance investment theory. Instead of relying on simple correlations, a spanning test is used to assess whether adding

microfinance to a benchmark portfolio allows investors to reach a mean-variance efficient portfolio with a higher mean and a lower variance¹.

Huberman and Kandell (1987) were the first to suggest a multivariate test of the hypothesis that the minimum-variance frontier of a set of K benchmark assets is the same as the minimum-variance frontier of the K assets plus a set of N test assets. This test assumes that short sale constraints are absent. Since it is impossible to go short in microfinance, we use the spanning test with short-sale constraints proposed by De Roon, Nijman, and Werker (2001). We assume that short-sale constraints are only imposed on the test asset (microfinance) but not on the benchmark portfolios. We use the same testing procedures as in De Roon, Nijman, and Werker (2001). For details, we refer to their article and the appendix.

4. Data

The dataset used in this paper contains annual data on MFI's for the period 1997 to 2007, and is publicly available from MixMarket (www.mixmarket.org). The MixMarket is a global, web-based, microfinance information platform, which seeks to develop a transparent information market to link MFIs worldwide with investors and Donors and promote greater investment and information flows. All numbers are converted to US dollars at contemporaneous exchange rates. Participation of MFIs in the MIX database is voluntarily, but data submission is closely monitored. MFIs have to enclose substantiating documentation, such as audited financial statements and annual reports, which help external analysts and researchers to understand their operations. As reported in Gonzalez (2007), MFIs should have the availability of adequate information systems, which is driven by the potential exposure to investors and donors looking for MFI investment opportunities. Therefore, the Mix database can be viewed as a random sample of the best MFIs in the world. Consequently, the dataset

¹ See De Roon and Nijman (2001) for a survey of mean-variance spanning

should present the potential investment environment for microfinance investors looking for diversification benefits.

As pointed out in Krauss and Walter (2008), the standard approach to analyze the risk of an assets class is to use historical market returns. However, since MFIs are not actively traded there is no market-to-market valuation, and the standard approach is not feasible. Also the fundamental approach of calculating alpha and beta is not possible since microfinance is an emerging asset class with no peer group of listed organizations. Krauss and Walter (2008) point out that using emerging market commercial banks as a listed peer group is not a valid approach, because microfinance behaves very differently in terms of risk and thus cannot be regarded as the same asset class. Two important risks of microfinance bonds are default risk and currency risk. Although the latter is not taken into account in the present study, we believe the former can be proxied by book returns. If an MFI has low book returns, the chance that it will default is high, resulting in a low investor return. The implicit assumption we make is that investors cannot distinguish risky MFIs from less risky ones, so that they cannot charge a premium on riskier MFI investments. We believe that for the period we investigate, in which commercial MFI investment has just started to take off, this is a reasonable assumption.

We use return measures based on accounting earnings to estimate an accounting alpha and beta. The return on assets (ROA) and the return on equity (ROE) proxy for MFI market returns. ROA is probably the most sensible proxy, since equity investment only plays a minor role in the microfinance sector. Still, our approach is definitely biased because it compares backward-looking accounting returns with forward-looking market returns. However, earlier research, in the US banking industry, has determined that the relation between accounting betas and market betas are significantly correlated (Karels and Sackley, 1993). In addition, the short run returns for microfinance investors are based on past performance with respect to

interest and dividend payments. Any possible gains for investors from ultimately selling their stake in MFIs can, however, not be incorporated in the test.

The data reported by MixMarket is not adjusted for subsidies and this dilutes the real market risk of MFIs. Subsidies constitutes an investment risk, since the frequency and size are neither predictable nor enforceable, which in this study could not be accounted for. Krauss and Walter (2008) point out that, from an investor perspective, MFI subsidies can be compared to a too big to fail (TBTF) support for commercial banks. Large financial institutions that are too big to-fail are likely to be bailed out by national supervisory institutions in times of severe financial distress, given that their collapse could endanger the stability of the financial system.

For the benchmark, in line with Krauss and Walter (2008), the returns from the MSCI world and MSCI emerging markets are used. In addition, two bonds indices are used as benchmarks; the JP Morgan Global Broad index and the JP Morgan Global Composite . Most investments in microfinance are typical debt-based and not equity-based. Therefore, a comparison based on the addition of microfinance assets to an existing portfolio of debt may be better than to a portfolio of equity. All benchmark returns are obtained from Thomson Datastream. Finally, the GDP figures used to scale average loan sizes were obtained from United Nations accounts.

5. Descriptive analysis

The main aim of this paper is to find potential investment opportunities in microfinance with both a social return and a financial return. Social returns are returns that capture the social and environmental benefits of investments. This could mean for instance that these investments help to reduce the poverty or increase people's chances of education and access to healthcare. In microfinance research, social performance is evaluated as the extent to which MFIs reach

out to the poor. In line with the literature (see e.g. Cull et al., 2007) we use average loan size and percentage of female borrowers as proxies for outreach. Average loan size is considered as a proxy for outreach in the sense that is inversely related to it. We also deflate average loan size by GDP to correct for national income differences.

In the descriptive analysis presented in this section, we make selections of MFIs that score high on the outreach indicators. These are good investment opportunities from a social point of view. In the next section, we use spanning tests to examine whether these MFIs also provide interesting investment opportunities in terms of risk-return. In this way, we are able to identify institutions that are interesting investment opportunities in terms of both social and financial returns. In Table 1, a description of the distribution of MFI's over the years, for the entire dataset, is provided. In 1997 the dataset contains only a small number of observations while the amount of observations increases rapidly over the following years. For 2007 the amount of observations is also small since most MFI did not yet complete their financial statements when we extracted the data from MixMarket.

[INSERT TABLE 1 ABOUT HERE]

Using information from the MIX Microbanking Bulletin, we categorize MFIs based on loantype, legal status, regulation and regions..First, the loan types distinguished in the dataset are individual (individual lending), mixed (individual lending and solidarity or village bank lending), solidarity (solidarity group lending) or village (the MFI uses village group lending). Typically, individual loans are larger and more profitable, while group loans are smaller and less profitable. To make a clear distinction between the two, we ignore mixed and combine solidarity and village into one group. So we end up with two groups, namely individual lending and group lending.

Second, the regions distinguished in the dataset are Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Middle East and North Africa, Latin America and South

Asia. Cull et al. (2007) point out that MFIs with different strategies, regarding outreach or financial efficiency, may target different regions to obtain the desired returns. Some regions may have a more developed microfinance industry than other regions, and may therefore be more commercially driven. Also, cultural differences could influence the success of microfinance programs.

Third, we distinguish MFIs according to their legal status. We distinguish banks, cooperatives / credit unions, non-bank financial institutions, non-profit (NGOs) and rural banks. Depending on their legal status, MFIs have different goals with respect to reaching out to the poor and striving for financial efficiency. For instance, MFIs with a non-profit status have a dedicated policy to reach the poor, whereas MFIs with a bank status are expected to be more commercial.

[INSERT TABLE 2 ABOUT HERE]

In Table 2 we present descriptive statistics for individual lending and group lending. Individual lenders perform better in terms of financial indicators than the group lending MFIs, whereas MFIs using group lending score much better on outreach indicators. In particular, individual lending offer higher mean return with a lower variance than group lending, while group loans are smaller and more targeted at female borrowers. Therefore, when basing an investment decision only on financial returns, we expect that MFIs that practice individual lending are a more valuable addition to investors' portfolios than those that practice group lending. The opposite could hold when basing the investment decision only on outreach.

[INSERT TABLE 3 ABOUT HERE]

Next, we make subgroups of the individual and group lending, according to region and legal status. The results are given in tables 3 and 4. Table 3 shows that the majority of groups within the group of MFIs using individual lending score high on GDP deflated average loan size and thus low on outreach. In Table 4 we see that group lenders have a lower than total

mean GDP deflated average loans size for every subgroup. Regarding the percentage of female borrowers, every group's percentage of female borrowers is higher than the total mean percentage. So, whatever further classification is made, MFIs that use group lending score high on outreach. In Table 4 we also see that for group lending, East Asia has the lowest GDP deflated average loan size and the highest percentage of female borrowers. .

[INSERT TABLE 4 ABOUT HERE]

6. Results of spanning tests

In the previous section, we identified several groups of MFIs with high outreach. These are the potential socially responsible investments. To find out whether these MFIs are also interesting for investors in terms of risk-return profile, we perform spanning tests. The mean variance spanning test is first conducted for groups of MFIs with different loan types. The results are displayed in Table 5 and confirm our descriptive analysis. The results for the spanning test indicate a difference between individual lenders and group lenders, with regard to risk-return. The spanning tests show that for international equity and bond investors, adding group lending MFIs to a benchmark portfolio is not interesting in terms of risk-return profile, whereas it is interesting to invest in individual lending MFIs.

[INSERT TABLE 5 ABOUT HERE]

Since the spanning tests indicate that group lending MFIs do not provide interesting investment opportunities in terms of financial returns, it is interesting to examine whether within this group of MFIs there are subgroups that may be interesting in terms of their risk-return profile. Table 6 shows that a further classification in terms of regions is relevant. The table suggests that MFIs in East Asia and the Pacific, Eastern Europe and Central Asia, Latin America and Middle East and North Africa may give investors beneficial investment opportunities. It should be noted, however, that the spanning tests for Middle East and North

Africa and Eastern Europe are based on only 16 and 29 observations, from 4 and 6 different MFIs, respectively.

[INSERT TABLE 6 ABOUT HERE]

We also performed spanning tests on group lenders with a difference in regulation status (regulated versus non-regulated) and for group lenders with differences in legal status. These tests indicated that for none of these subgroups, spanning was rejected. For reasons of space we have not presented these results here

7. Conclusion

Two important motives for investing in microfinance are (1) it provides attractive opportunities to increase portfolio diversification and (2) it is an attractive socially responsible investments. In this paper we tried to identify those MFIs that satisfy both motives for investing in microfinance. These are MFIs that offer investors diversification opportunities, while also performing well on outreach. Our most important results are:

- 1) Investing in MFIs that provide individual loans is attractive from a diversification point of view: for this group spanning is always rejected. However, this group performs relatively badly in terms of outreach when compared with MFIs that provide group loans.
- 2) Investing in MFIs that provide group loans is less attractive from a diversification point of view: for this group spanning is usually not rejected. However, this group performs relatively well in terms of outreach when compared with MFIs that provide individual loans.

These results point at a dilemma: either one invests in MFIs using group lending to reap social returns or one invests in individual lending to reap financial returns. However, making additional subdivisions seems to partially solve this dilemma. MFIs that offer group loans can be interesting in terms of diversification if they are not from Africa or South Asia. This seems to suggest that investor that want both social and financial benefits, should not invest in these regions. MFIs that offer group loans are especially interesting for these investors if they are from East Asia and the Pacific, since they score the best in terms of outreach while they are also a valuable addition to their diversified portfolio.

Appendix. Mean-variance spanning test

Usually the spanning methodology is applied to a portfolio of assets. However, since data on MFIs are only available on a yearly basis for the period 1997 to 2007, we use the return on individual MFIs to perform spanning tests based on a panel. It can be shown that a properly defined average model (model based on portfolios) follows directly from the panel data model, implying that the coefficients should *in theory* be the same.

In short, we run the following pooled panel regression;

$$R_{2t} = \alpha + \beta R_{1t} + u_t \quad t = 1 \dots T \quad (1)$$

where at time t the net returns of the test and the benchmark assets are given by the K - and N -dimensional vectors R_{2t} and R_{1t} , respectively. In our case, the test asset is the return on a set of MFIs. So we restrict ourselves to the case of $N = 1$. The test amounts to testing

$$\begin{aligned} \alpha + (\mathbf{1}_K - 1)\eta_{\min} &\leq 0 \\ \alpha + (\mathbf{1}_K - 1)\eta_{\max} &\leq 0 \end{aligned} \quad (2)$$

where η is the risk-free rate and $\mathbf{1}_K$ is a K -vector of ones. So we test intersection under short sales constraint for a minimum and a maximum value of the risk free rate. The chosen minimum and maximum values of the risk free rate are zero and the expected return on the global minimum variance portfolio of the benchmark assets, respectively. If intersection is rejected, it will also be rejected for all intermediate values of the risk free rate, which implies a rejection of spanning. We can test (2) by calculating the test statistic suggested by Kodde and Palm (1986)

$$\xi(\eta) = \min (\hat{\boldsymbol{\alpha}}_J - \boldsymbol{\alpha}_J)' \text{Var}[\hat{\boldsymbol{\alpha}}_J(\eta)]^{-1} (\hat{\boldsymbol{\alpha}}_J - \boldsymbol{\alpha}_J), \quad \text{s.t. } \hat{\boldsymbol{\alpha}}_J \leq 0 \quad (3)$$

where $\hat{\boldsymbol{\alpha}}_J$ and $\boldsymbol{\alpha}_J$ are the restricted and unrestricted estimates of Jensen's alpha, respectively.

The test statistic is asymptotically chi-square distributed with 2 degrees of freedom. Its

distribution is given in Kodde and Palm (1986). We determine probabilities using numerical simulation, as proposed by Gouriéroux, Holly, and Montfort (1982).

References

- Ahlin, Christian and Jocelyn Lin, "Luck or Skill? MFI Performance in Macroeconomic Context", October 2006, BREAD Working Paper, No. 132.
- Byström, H.N.E., "The Microfinance Collateralised Debt Obligation: A Modern Robin Hood?", 2007, *World Development*, 36, 2109-2126
- Bekaert, G. & Urias, M.S., "Diversification, integration and emerging market closed-end funds", 1996, *Journal of Finance*, 51, 835-870.
- CGAP, "Foreign Capital Investment in Microfinance; Balancing Social and Financial Returns", 2008, Focus note, No. 44
- Christen R. P., "Commercialization and Mission Drift: The Transformation of Microfinance in Latin America", 2000, CGAP, Occasional Paper, No. 05.
- Christen, R. P., Richard Rosenberg, and Veena Jayadeva, "Financial Institutions with a Double Bottom Line: Implications for Microfinance", 2004 Washington D.C.; CGAP Occasional Paper 8.
- Conning, J., "Outreach, sustainability and leverage in monitored and peer-monitored lending", 1999, *Journal of Development Economics*, 60, pp. 51-77.
- Cull, R., A. Demirguc-Kunt and J. Morduch, "Financial performance and outreach: A global analysis of lending microbanks", 2007, *Economic Journal*, 117, F107-F133.
- De Roon, Frans A. and Nijman, Theo E., "Testing for mean-variance spanning: a survey," *Journal of Empirical Finance* 8 (2001), 111-155
- De Roon, Frans A. and Nijman, Theo E. and Werker, Bas J.M., "Testing for mean-variance spanning with short sales constraints and transaction costs: the case of emerging markets," *Journal of Finance* 56 (2001), 721-742.
- Dieckmann, Raimar, "Microfinance: An Emerging Investment Opportunity", *Deutsche Bank*

Research, December 2007,

Easton, Tom, "The Hidden Wealth of the Poor", November 2005, *The Economist*.

Gonzalez, Adrian, "Resilience of Microfinance Institutions to National Macroeconomic Events: An Econometric Analysis of MFI Asset Quality", 2007, Working paper, Available at SSRN: <http://ssrn.com/abstract=1004568>

Gouriéroux, Christian, Alberto Holly, and Alain Montfort, "Likelihood ratio test, Wald test and Kuhn-Tucker test in linear models with inequality constraints on the regression parameters", 1982, *Econometrica* 50, 63-80.

Hermes, Niels, Lensink, Robert and Meesters, Aljar, "Outreach and Efficiency of Microfinance Institutions", Working paper, Available at SSRN: <http://ssrn.com/abstract=1143925>, 2008.

Huberman, G. & Kandel, S, "Mean-variance spanning", 1987, *The Journal of Finance*, 42, 873-888.

Hulme, D. and P. Mosley, "Finance against poverty", 1996, Volumes 1 and 2, London: Routledge.

Karels, G.V. & Sackley, W.H., "The relationship between market and accounting betas for commercial banks", 1993, *Review of Financial Economics*, 2, 59-72.

Kodde, David A., and Franz C. Palm, "Wald criteria for jointly testing equality and inequality restrictions", 1986, *Econometrica*, 54, 1243-1248.

Krauss, Nicolas, and Ingo Walter, "Can Microfinance Reduce Portfolio Volatility?", 2008, SSRN working paper, No. 943786.

Lapenu, C. and M. Zeller, "Distribution, growth, and performance of the microfinance institutions in Africa, Asia and Latin America: A recent inventory", 2002, *Savings and Development*, 26, pp. 87 -111.

- Littlefield, Elizabeth and Holtman, Martin, “Microfinanciers Overtake their Commercial Peers”, July 2005, *The Banker*.
- Paxton, J. and C. Cuevas, “Outreach and sustainability of member-based rural financial intermediaries”, 2002, In: M. Zeller and R.L. Meyer (eds), *The triangle of microfinance: Financial sustainability, outreach, and impact*, Baltimore and London: Johns Hopkins University Press.
- Reddy, Rekha M. and Rhyne, Elisabeth. “Who Will Buy Our Paper: Microfinance Cracking the Capital Markets?”, April 2006, *Insight*, 18, pp. 1-19.
- Reddy, Rekha M. “Microfinance Cracking the Capital Markets II”, May 2007, *InSight*, 22, pp. 1-17.
- Sengupta, Rajdeep, and Craig P. Aubuchon, “The Microfinance Revolution: An Overview”, 2008, *Federal Reserve Bank of St. Louis Review*, 90, 1, 9-30.
- Swanson, Brad, “The Role of International Capital Markets in Microfinance”, 2007, Paper presented at a symposium on Credit Markets for the Poor, Columbia, University Business School.

Table 1
Description of the panel

Year	Average loan size	Obs.	Average loan/GDP per capita	Obs.	% Female borrowers	Obs.	Return on Equity	Obs.	Return on Assets	Obs.
1997	1228.58 (2981.12)	24	0.99 (1.90)	23	0.75 (0.23)	13	0.63 (1.94)	25	0.03 (0.09)	25
1998	792.83 (1003.28)	58	1.34 (2.41)	54	0.67 (0.25)	38	0.00 (0.57)	63	-0.01 (0.11)	63
1999	653.05 (897.38)	91	1.06 (1.82)	85	0.69 (0.27)	72	-0.30 (4.04)	96	0.00 (0.16)	96
2000	629.44 (906.71)	126	1.00 (1.47)	118	0.69 (0.28)	103	0.00 (0.36)	131	-0.01 (0.15)	131
2001	657.02 (947.45)	163	1.00 (1.88)	154	0.63 (0.28)	146	0.02 (0.40)	171	-0.02 (0.21)	171
2002	678.70 (1044.44)	280	1.12 (2.10)	269	0.63 (0.27)	242	-0.01 (0.87)	282	0.00 (0.16)	282
2003	819.70 (1639.54)	411	1.39 (3.88)	392	0.64 (0.27)	377	-0.06 (0.85)	415	-0.01 (0.20)	415
2004	925.67 (2002.35)	618	1.28 (3.37)	587	0.65 (0.29)	544	0.02 (1.37)	623	0.00 (0.18)	623
2005	919.25 (2272.28)	705	1.07 (2.29)	667	0.64 (0.28)	630	0.13 (1.78)	705	0.01 (0.12)	705
2006	1033.57 (1989.73)	790	0.88 (2.32)	766	0.67 (0.27)	723	0.29 (4.89)	798	0.02 (0.11)	798
2007	212.40 (393.68)	80	0.28 (0.41)	63	0.86 (0.25)	80	0.45 (3.94)	81	-0.03 (0.16)	81
Total	867.27	3346	1.09	3178	0.66	2968	0.10	3390	0.00	3390

In this table we report averages per year for average loan balance (gross loan portfolio / number of active borrowers) in US dollars, average loan size / GDP per capita in US dollars, the percentage of borrowers that is female (number of female borrowers / number of active borrowers), return on equity (net operating income less taxes / period average equity) and return on assets (net operating income less taxes / period average assets). Obs. indicates the number of panel observations and standard deviations are reported between brackets. Total averages and total number of observations are reported in the last row.

Table 2

Outreach and financial indicators for individual versus group lenders

Lending Type	Average loan size	Obs.	Average loan/GDP per capita	Obs.	% Female borrowers	Obs.	Return on Equity	Obs.	Return on Assets	Obs.
Individual	1294.37 (1238.27)	344	1.23 (1.91)	333	0.48 (0.23)	284	0.19 (0.48)	345	0.04 (0.05)	345
Group	152.14 (138.04)	294	0.27 (0.42)	284	0.85 (0.21)	284	0.03 (2.59)	298	0.01 (0.13)	298

In this table we report averages per lending type. The group lending type includes solidarity lending and village banking. We have excluded the mixed lending types. For the two lending types we report the average of average loan size (gross loan portfolio / number of active borrowers) in US dollars, average loan size / GDP per capita in US dollars, the percentage of borrowers that is female (number of female borrowers / number of active borrowers), return on equity (net operating income less taxes / period average equity) and return on assets (net operating income less taxes / period average assets). Obs. indicates the number of observations and standard deviations are reported between brackets.

Table 3

Outreach and financial indicators for individual lenders by region and legal status

Subgroups	Average loan size	Obs.	Average loan/GDP per capita	Obs.	% Female borrowers	Obs.	Return on Equity	Obs.	Return on Assets	Obs.
<u>Panel A: Regions</u>										
Africa	741.25 (691.13)	32	1.53 (2.17)	32	0.34 (0.17)	24	0.17 (0.14)	32	0.02 (0.02)	32
East Asia and Pacific	1015.18 (969.49)	49	1.03 (0.82)	49	0.35 (0.36)	34	0.31 (0.68)	49	0.06 (0.03)	49
Eastern Europe and Central Asia	2135.75 (1386.30)	52	2.09 (2.63)	49	0.44 (0.21)	52	0.15 (0.11)	52	0.05 (0.04)	52
Latin America and the Caribbean	1255.69 (1244.23)	204	1.03 (1.84)	196	0.55 (0.17)	168	0.19 (0.48)	204	0.04 (0.05)	204
Middle East and North Africa	766.25 (50.45)	4	1.23 (0.19)	4	0.23 (0.02)	3	-0.05 (0.07)	5	-0.01 (0.02)	5
South Asia	504.67 (20.98)	3	0.47 (0.15)	3	0.09 (0.01)	3	-0.99 (1.38)	3	-0.07 (0.09)	3
<u>Panel B: Legal Status</u>										
Bank	987.73 (828.49)	56	2.65 (3.01)	56	0.40 (0.18)	46	0.39 (1.00)	56	0.03 (0.04)	56
Cooperative/Credit Union	1126.53 (776.80)	40	0.57 (0.42)	40	0.37 (0.29)	26	0.07 (0.14)	40	0.01 (0.03)	40
Non-Bank Financial Institution	1444.91 (1128.21)	99	0.93 (0.98)	99	0.49 (0.10)	84	0.17 (0.17)	100	0.04 (0.04)	100
Non-Profit (NGO)	1410.69 (1661.53)	106	1.13 (2.19)	95	0.59 (0.23)	99	0.11 (0.40)	106	0.06 (0.06)	106
Rural Bank	1223.14 (1023.98)	37	0.94 (0.75)	37	0.27 (0.32)	23	0.25 (0.09)	37	0.05 (0.03)	37

In this table we report averages per region and legal status for individual loan types. We report the average of average loan size (gross loan portfolio / number of active borrowers) in US dollars, average loan size / GDP per capita in US dollars, the percentage of borrowers that is female (number of female borrowers / number of active borrowers), return on equity (net operating income less taxes / period average equity) and return on assets (net operating income less taxes / period average assets). Obs. indicates the number of observations and standard deviations are reported between brackets.

Table 4

Outreach and financial indicators for group lenders by region and legal status

Subgroups	Average loan size	Obs.	Average loan/GDP per capita	Obs.	% Female borrowers	Obs.	Return on Equity	Obs.	Return on Assets	Obs.
<u>Panel A: Regions</u>										
Africa	112.76 (52.88)	96	0.33 (0.28)	89	0.70 (0.25)	91	-0.08 (0.41)	97	-0.03 (0.09)	97
East Asia and Pacific	87.29 (37.94)	38	0.14 (0.12)	38	0.94 (0.08)	35	0.10 (0.22)	41	0.04 (0.06)	41
Eastern Europe and Central Asia	415.41 (267.20)	29	0.77 (1.05)	29	0.86 (0.18)	27	0.14 (0.20)	29	0.10 (0.17)	29
Latin America and the Caribbean	168.14 (73.88)	63	0.15 (0.08)	61	0.94 (0.09)	63	0.14 (0.19)	63	0.08 (0.12)	63
Middle East and North Africa	216.19 (127.15)	16	0.20 (0.09)	16	0.79 (0.20)	16	0.16 (0.06)	16	0.10 (0.06)	16
South Asia	86.31 (33.73)	52	0.16 (0.13)	51	0.92 (0.22)	52	-0.03 (6.22)	52	-0.06 (0.15)	52
<u>Panel B: Legal Status</u>										
Bank	244.30 (131.93)	10	0.10 (0.05)	10	0.98 (0.02)	10	0.47 (0.12)	10	0.26 (0.12)	10
Cooperative/Credit Union	-	-	-	-	-	-	-	-	-	-
Non-Bank Financial Institution	183.47 (194.90)	115	0.42 (0.62)	108	0.75 (0.24)	108	0.01 (0.72)	115	0.00 (0.12)	115
Non-Profit (NGO)	123.42 (68.65)	159	0.19 (0.17)	156	0.89 (0.18)	156	0.02 (3.46)	163	0.00 (0.13)	163
Rural Bank	-	-	-	-	-	-	-	-	-	-

In this table we report averages per region and legal status for group loan types. We report the average of average loan size (gross loan portfolio / number of active borrowers), average loan size / GDP per capita in US dollars, the percentage of borrowers that is female (number of female borrowers / number of active borrowers), return on equity (net operating income less taxes / period average equity) and return on assets (net operating income less taxes / period average assets). Obs. indicates the number of observations and standard deviations are reported between brackets.

Table 5
Mean-variance spanning tests by loan type

	Individual loans	Obs.	Group loans	Obs.
<u>Return on Equity</u>				
MSCI world	30.66*** (0.00)	345	1.81 (0.18)	298
MSCI emerging markets	40.80*** (0.00)	345	2.06 (0.17)	298
JPM global	16.33*** (0.00)	345	0.00 (0.95)	298
JPM emerging markets	30.88*** (0.00)	345	2.10 (0.16)	298
<u>Return on Assets</u>				
MSCI world	66.73*** (0.00)	345	0.37 (0.53)	298
MSCI emerging markets	55.93*** (0.00)	345	0.19 (0.64)	298
JPM global	68.11*** (0.00)	345	0.64 (0.42)	298
JPM emerging markets	50.96*** (0.00)	345	0.80 (0.36)	298

In this table we report mean-variance spanning test for individual and group loans. The benchmark stock indexes are (1) MSCI world: the Morgan Stanley Capital International developed markets stocks index and (2) MSCI emerging markets: the Morgan Stanley Capital International developing markets stocks index. The benchmark bond indexes are (1) JPM global; the JP Morgan Global Broad and (2) JPM emerging markets; JP Morgan Emerging Markets Bond Index Global Composite. Obs. indicates the number of panel observations. We report Wald statistics and p-values are reported between brackets. *,** and *** indicate that H_0 is rejected at a significance level of 10%, 5% or 1%, respectively.

Table 6

Mean-variance spanning tests for group lenders in different regions

	Africa	East Asia and Pacific	Eastern Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia
<u>Panel A: Return on Equity</u>						
MSCI world	0.00 (0.96)	47.00*** (0.00)	9.00*** (0.00)	4.84** (0.03)	288.22*** (0.00)	1.09 (0.30)
MSCI emerging markets	0.00 (0.95)	15.46*** (0.00)	10.77*** (0.00)	4.72** (0.03)	145.61*** (0.00)	3.44* (0.08)
JPM global	0.00 (0.97)	11.51*** (0.00)	4.90** (0.03)	5.62** (0.02)	74.83*** (0.00)	0.00 (0.96)
JPM emerging markets	0.00 (0.97)	4.58** (0.03)	16.32*** (0.00)	5.39** (0.02)	25.63*** (0.00)	5.27** (0.03)
<u>Panel B: Return on Assets</u>						
MSCI world	0.00 (0.94)	14.84*** (0.00)	6.42** (0.01)	5.26** (0.02)	508.89*** (0.00)	0.00 (0.93)
MSCI emerging markets	0.00 (0.92)	5.90** (0.02)	8.44*** (0.00)	4.76** (0.03)	675.43*** (0.00)	0.00 (0.92)
JPM global	0.00 (0.95)	6.28** (0.01)	2.34 (0.13)	5.47** (0.02)	92.44*** (0.00)	0.00 (0.93)
JPM emerging markets	0.00 (0.90)	2.55 (0.11)	7.08** (0.01)	5.44** (0.02)	11.53*** (0.00)	0.00 (0.88)

In this table we report mean-variance spanning test for group lenders by region. The benchmark stock indexes are (1) MSCI world: the Morgan Stanley Capital International developed markets stocks index and (2) MSCI emerging markets: the Morgan Stanley Capital International developing markets stocks index. The benchmark bond indexes are (1) JPM global; the JP Morgan Global Broad and (2) JPM emerging markets; JP Morgan Emerging Markets Bond Index Global Composite. Obs. indicates the number of panel observations. We report Wald statistics and P-values are reported between brackets. *,** and *** indicate that H_0 is rejected at a significance level of 10%, 5% or 1%, respectively.