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ON THE PERFORMANCE OF MICROFINANCE INVESTMENT FUNDS

- *A quantitative study of the financial performance of 83 funds from 1998 to 2015*

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Abstract. This thesis investigates the financial performance of microfinance investment funds (MFIFs), which are social impact investments investing in microfinance institutions (MFIs). Given that microfinance customers live in developing regions and pursue entrepreneurial businesses, the returns of MFIFs are supposedly uncorrelated with developed markets, and therefore marketed as providing investors with a diversification benefit. Constructing an unbalanced panel data set consisting of 83, both fixed income and equity, mutual funds ranging from 1998 until 2015 we test whether these funds are correlated with developed markets or not by using the Jensen's alpha CAPM. In addition to the stand-alone performance analysis of these funds, we use the matched pairs technique to compare the performance of MFIFs to other, more conventional, socially responsible mutual funds. Our findings are in line with previous, smaller, studies and support the claim that adding MFIFs to a portfolio of developed market assets do provide a diversification benefit. Moreover, these funds do not indicate worse performance than other socially responsible investments (SRIs).

Keywords: Microfinance investment vehicles, microfinance investment funds, CAPM, mutual fund performance, socially responsible investments

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Abbreviations/Glossary

MFI	Microfinance institution
MIV	Microfinance investment vehicle
MFIF	Microfinance investment fund/Microfinance fund
SRI	Socially responsible investment
ESG	Environmental, social, and governance factors
CSR	Corporate social responsibility
SICAV	Société d'investissement á capital variable
FCP	Fonds commun de placement
FI	Fixed income
LuxFLAG	The Luxembourg fund labelling agency
NAV	Net asset value
CAPM	Capital asset pricing model
ISIN	International securities identification number
SIF	Sustainable investment forum

Table of contents

1 Introduction 5
1.1 Purpose 6
1.2 Research questions 6
1.3 Limitations of scope 7
2 Current state of knowledge 7
2.1 Microfinance 7
2.2 Investing in microfinance 9
2.2.1 Investment types 11
2.3 Socially responsible investments 12
2.4 Previous research of the performance of MFIFs 14
2.5 Previous research of the performance of SRI funds 16
3 Method 16
3.1 Portfolio evaluation 16
3.1.1 The capital asset pricing model 17
3.1.2 Jensen's alpha 17
3.1.3 Sharpe ratio 18
3.1.4 Treynor ratio 18
3.2 Matched pairs estimation 19
3.3 Econometric specification 19
3.1 Hypotheses 21
4 Data 22
4.1 Microfinance investment funds 22
4.2 Benchmark indices and risk-free interest rates 22
4.3 Socially responsible investment funds 23
4.4 Data management and considerations 24
4.1 Summary statistics microfinance investment funds 26
4.2 Summary statistics matched pairs sample 27
5 Results 28
5.1 Stand-alone evaluation of microfinance investment funds 28
5.2 Matched pairs evaluation of microfinance investment funds 30
5.3 Discussion 33
5.3.1 Stand-alone evaluation 34
5.3.2 Matched pairs evaluation 35
5.3.3 Robustness 36
6 Conclusions 36
7 Summary 39
8 References 40
9 Appendix 45
9.1 Summary statistics 45
9.2 Results 48
9.3 Descriptive 52

1 Introduction

In the mid-1990s a new type of microfinance investment vehicle emerged as a response to the growth within the sector, and its increased need of funding. The increasing global focus on social responsibility, together with marketed characteristics of microfinance presented attractive potential benefits for investors stemming from double bottom line returns (financial and social returns). This interest in microfinance is still increasing; by the end of 2013 the microfinance investment fund market represented US$ 9.9 billion in total assets and had 106 active funds.

Microfinance funds invest in the equity and debt of microfinance institutions, and receive financial returns from interest and fees. At the same time, these funds provide a social impact, since the microfinance institution target group of financially excluded individuals receive an opportunity to get access to financial markets, and in the long run become self-sufficient, rather than aid-dependent. From an investor perspective, the funds are said to provide diversification benefits if included in a portfolio with developed market holdings. The benefits stems from the supposedly low correlation of the returns of entrepreneurial enterprises in developing countries to the returns of global financial markets.

Several studies have been conducted on the poverty impact of microfinance services, as well as on the financial performance of microfinance institutions. Due to the novelty of microfinance funds, these investments, and in extension the future development of microfinance institutions, have not been analysed as thoroughly. Janda and Svárovská (2010), and Janda, Rausser, and Svárovská (2014) investigated the portfolio diversification potential of microfinance funds for institutional investors. They found that microfinance funds had low correlation with developed and emerging markets, and thus provide diversification benefits to investors with a balanced portfolio. However, in both of these studies the samples were restricted to include five and twelve funds, respectively, over a study period of three to four years (2006-2010). Another study, conducted in 2013 by Brière and Szafarz, tried to overcome this novelty by investigating investments directly in the equity of listed MFIs, which is quoted daily. They concluded that microfinance had converged towards the traditional financial sector, and their spanning tests indicated that there is a minimal diversification potential with investing in microfinance stocks.

The entire market for sustainable investments, not only microfinance, has also undergone rapid growth during the last decade, where companies pursue sustainable and socially responsible strategies to improve shareholder value. Several studies on both the importance of corporate sustainability and the performance of socially responsible investments have been made. The results indicate that sustainable strategies create shareholder value in the long run, and that socially responsible investments' performance is equal to that of conventional investments. However, impact investments (a type of socially responsible investment) have not been widely covered, and considering that microfinance constitutes the majority of this market we identify a need to evaluate the performance of microfinance funds to other, more conventional, sustainable investments.

1.1 Purpose

The purpose of this thesis is to investigate if microfinance investment funds, as an impact investment, possess attractive traits for investors. From the microfinance institutions point of view, there is a need of funding, where microfinance funds are of growing importance in providing capital. However, the viability of the funds is dependent on their performance towards investors. Social responsibility and 'doing good' is becoming more and more important in the business world today and accounts both to firms and their behaviour, and to investors. Thus, both social and financial returns are likely to be of importance in the investment decisions of investors. For microfinance funds, with stable but low returns, other attractive traits than the financial return from investing are probably wished for.

One aspect of this is to analyse whether the funds are favourable to include in an investment portfolio in terms of the financial performance. If the funds are to be sustainably attractive to investors, they should arguably possess good risk and return characteristics as well as provide diversification benefits for investors. In addition, a new perspective is given by comparing microfinance funds with other socially responsible investments where the purpose is to evaluate if the microfinance sector is equal other investments also providing investors with financial as well as social returns.

The interest in analysing the microfinance funds is confirmed by studies conducted by both researchers and microfinance stakeholders. A limitation of previous studies is that they have only included a handful of funds and only covered a short period of time. This thesis aims to contribute to the existing knowledge within the field of microfinance funds by performing a stand-alone analysis with a more extensive dataset of MFIFs, and also by conducting a pairwise comparison of these funds to other socially responsible funds. Given the somewhat contradicting findings regarding the diversification benefits of microfinance funds, we believe that a more extensive dataset will give us superior indication of the actual characteristics. Since the sample will include more funds, and cover a longer study period, we will have more variation and be able to follow the development of the funds from being newly issued to more mature.

The matching is an attempt to evaluate if it is equally good to invest in microfinance as an impact investment as compared to conventional SRIs. The choice of comparing MFIFs to SRIs is based on their supposed diversification benefits and social objectives. This comparison will be based on the same measures as the stand-alone evaluation of the microfinance funds.

1.2 Research questions

Considering the potential importance of microfinance funds as a source of funding for microfinance institutions and the development of the sector, we identify a need to evaluate the financial performance of these funds. In extension, the similar characteristics of microfinance funds and socially responsible investments raise the question of how MFIFs perform relative SRIs. Such an comparison can also contribute further to the evaluation of the performance of microfinance investment funds. Subsequently, we establish the following research questions:

1. Are microfinance investment funds attractive in terms of portfolio diversification?
2. Are microfinance investment funds equal other socially responsible investments in terms of financial performance measures?

1.3 Limitations of scope

Microfinance funds are often said to provide double bottom line returns, however the scope of this thesis is limited to only include an analysis of the financial performance of the funds, leaving a discussion of the social impact aside. One reason for this limitation is the fact that the social impact often is more difficult to quantify and it is rather an effect of the choices made by the next actor in the microfinance investment chain, the microfinance institutions. For these funds to be seen as a feasible and sustainable alternative, the financial performance is likely needed to provide the suggested diversification benefits for investors. Furthermore, this thesis does not cover an analysis of the investment targets and decisions of the microfinance funds in terms of which institutions the funds choose to provide capital to. This also implies that we do not analyse geographical differences in investments. The only criterion for a fund to be included is that it invests at least 50 percent of its assets in microfinance.

2 Current state of knowledge

In this section, we will first present the background of and the market for microfinance. Special attention will be given to investments into microfinance and different aspects of that. Thereafter we will briefly discuss socially responsible investments. Finally, the section covers previous research on the financial performance of microfinance funds.

2.1 Microfinance

Muhammad Yunus and his Grameen Bank were awarded the Nobel Peace Prize in 2006 for the pioneering concepts of microfinance and microcredit. It all began in the 1970s when Yunus started to offer small loans to local villagers. Prior to his efforts, several banks had offered loans to poor households but they were inefficient, corrupt, and wasted millions of dollars in subsidies (de Aghion & Morduch 2005). Thus, microfinance improves access to financial services for low-income individuals who, to a large extent, are excluded from mainstream banking. As of today, the number of financially excluded adults is estimated to 2.5 billion, out of which 80 percent live under US$ 2 per day and do not have accounts with formal financial institutions (World Bank 2014). The number of microfinance borrowers has increased from 13 million in 1997 to 204 million in 2012, out of which 116 million are amongst the poorest in their home countries (Microfinance Summit Campaign 2014). The global average interest rate on microcredit is roughly 35 percent, but it varies substantially around the world. For example, in Uzbekistan the average rate is 80 percent, and in Sri Lanka it is 17 percent (CGAP 2008).

MFIs commonly have more volatile delinquency than commercial banks. Tangible assets and collateral are rare, instead MFIs rely on their customers to be motivated to repay their loans given that they will continue to be provided with financial services. Therefore, microfinance make use of unconventional loan structures such as group lending and in extension peer pressure to reinforce this motivation to repay the loans. A drawback of this is that as soon as some individuals in the group default, others can lose confidence and trust in the institutions. Then the peer pressure works in opposite direction so instead of enhancing the motivation to repay the loans it drives more individuals to delinquency. This behaviour is sometimes referred to as 'repayment cancer', from which several MFIs have died even though it could have been cured (Rosenberg 1999). Hence, reasonable and good delinquency/repayment monitoring is important. As of today the repayment rates on microcredit are at 97 percent globally (Microfinance Information Exchange 2015) [1].

Since its first appearance in the mid 1970s, microfinance has been widely debated. Some claim that it is a great tool for poverty reduction and contributes to the empowerment of women, while others claim that these suggested effects lack evidence (e.g. Banerjee et al. 2013; Roodman & Morduch 2009; Karlan & Zinman 2011). Other studies show benefits that, even though not necessarily in line with the commonly argued effects, are likely to be of importance in the effort to improve the lives of the poor in the long run (e.g. Banerjee et al. 2013; Dupas & Robinson 2013). J-PAL and IPA (2015) summarised five key findings from seven randomized evaluations that looked into the effects of microcredit and its impact on poverty with starting point in the following three questions:

1. What is the impact of access to microcredit on financial behaviour, business activity, and household welfare?
2. Do borrowers' investments translate into increased income?
3. Does access to microcredit help empower women or increase household investments in education or health?

They argued that their findings could be seen as representative for the microcredit industry, since the studies were conducted between 2003 and 2012 and together covered four continents and different types of borrower settings. Assessing the above questions, they concluded that:

1. Demand for many of the microcredit products was modest
2. Expanded credit access did lead some entrepreneurs to invest more in their businesses
3. Microcredit access did not lead to substantial increases in income
4. Expanded access to credit did afford households more freedom in optimising how they earned and spent money

[1] There are several different measures of repayment/delinquency that are being used by MFIs. The choice of which measure to use is primarily based on the availability of information and MFIs are often forced to use a less-than-ideal measure because the information needed for a better one cannot be produced by the systems at hand. Some examples of ratios include, collection rates (also referred to as recovery rates, repayment rates, and loan recuperation), arrears rates, and portfolio at risk rates. Repayment rates are calculated as amounts paid against defaulted amounts (Rosenberg 1999).

5. There is little evidence that microcredit access had substantial effects on women's empowerment or investment in children's schooling, but it did not have widespread harmful effects either

In a survey from 2014, the Center for the Study of Financial Innovation (CSFI), reported that investors are less concerned with the MFIs attaining their social goals. Rather, investors in microfinance expressed concerns regarding the indebtedness of MFIs and the insufficient framework for institutional governance (CSFI 2014). The risk of over-indebtedness, in combination with slowing economies, puts pressure on MFIs and lowers the quality of their portfolios. Also, investors' lack of a long-term strategy cause them to underestimate the potential risks with the over-indebtedness. On an individual level, over-indebtedness leads to difficulties in repaying loans, and as a consequence borrowers take new loans to repay old loans (Ledgerwood 2013). Another potential issue is that when the MFI market matures, the returns and margins will become lower. This implies that the credit risk increases when individual loan amounts increase.

To summarise, evidence from microfinance studies is ambiguous and the lack of evidence for the suggested effects of microfinance is an explanation to the on-going debate on whether microfinance is efficient or not. Even so, the interest in microfinance and the growth of the microfinance industry still remains.

2.2 Investing in microfinance

'The landscape of microfinance investment is changing. Once exclusively under the purview of multilateral financial institutions, governments, and non-profit organisations, microfinance investment opportunities have grown significantly for private investors and institutions. This trend not only reflects the growth of the microfinance industry, but also investors' growing attraction to microfinance and "impact investments", which emphasize both financial and social returns.' (Luminis 2012)

It is not only the microfinance institutions and their services that have developed over the past years; the funding of them has also undergone major changes. As of today, one could in a rough manner explain the microfinance investment chain as having microfinance funds providing capital to MFIs, which, in turn, provide micro-entrepreneurs with small loans that are being granted for productive purposes (see fig. 2.1).

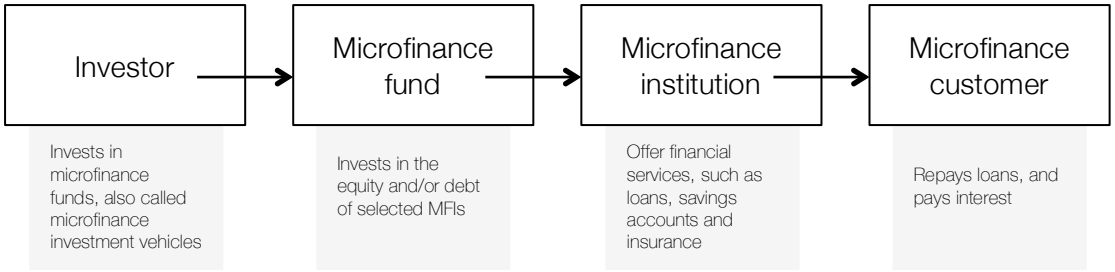


Figure 2.1. The microfinance investment chain. Source: Own figure based on descriptions from MicroRate (2015).

Hence, microfinance institutions provide banking services, including savings, insurance, and credit to micro-entrepreneurs (e.g. Galema, Lensink & Spierdijk 2011; Brière & Szafarz 2013; Conning & Morduch 2011). The small loans (or microcredits) are granted based on an assessment of the viability of the client's business to utilise the capital, generate revenue, and repay the loan, rather than on conventional criteria such as available collateral. The idea of enhancing the productivity of these micro-entrepreneurs, and in extension reduce poverty, is a type of self-help instead of income redistribution (Cull, Demirgüç-Kunt & Morduch 2009). Investments into microfinance generate social returns from the enabling of individuals to earn a living for themselves, and in the same time, microfinance provides financial returns to its investors through interest. The social and financial returns of microfinance are often referred to as double bottom line returns (Luminis 2012). Reconnecting this to the issues with over-indebtedness, where microfinance borrowers take new loans to repay old loans, the returns stemming from microfinance could come from an unhealthy lending situation, and not social improvement.

Initially, many MFIs were founded as non-profit organisations focusing on the social aspects of microfinance, and the institutions received their funding from donors, both public and private, and aid organizations (e.g. Galema, Lensink & Spierdijk 2011). Since then, several factors have contributed to the development and commercialisation of the microfinance industry. For instance, a number of MFIs have developed and moved from being donor provided to go public and become commercial banks, like the Compartamos Banco, or for-profit organisations[2]. Apart from providing funding through microfinance institutions, some countries have initiated stimulation programs to make traditional banks more involved in microfinance (Galema, Lensink & Spierdijk 2011). This growth has caused the financing requirements to increase rapidly, which in turn has lead to major transformations where funding has changed from being donor-dependent, to become more dependent on commercial sources (Rhyne & Otero 2007; Goodman 2008). Another aspect of the transformation in funding can be referred to the increased attention paid to SRIs and impact investing. Pension funds belong to a group where the interest in microfinance investments is especially strong (Galema, Lensink & Spierdijk 2011). The double bottom line returns of microfinance, mentioned above, as well as high growth, low delinquency rates, strong margins, and scalability of MFIs, have led to an increased attractiveness of microfinance investments among international commercial banks and investors (MicroRate 2015). The factors mentioned above have lead to diversification of the market and the sources of funding.

The first funds to invest in MFIs emerged in the mid-1990s, and are referred to as microfinance investment vehicles (MIVs). An early fund is the investment fund, Profund, which raised US$ 23 million to finance MFIs in Latin America. By 2006, MIVs possessed portfolios of MFI shares with a total value of US$ 2.3 billion (Galema, Lensink & Spierdijk 2011). Today microfinance investments are commonly channelled through these MIVs, about 50 percent of the foreign funding of MFIs is related to the vehicles (MicroRate 2015; Galema, Lensink & Spierdijk 2011). The vehicles can be divided into investment funds and structured products, and the investment

[2] Banco Compartamos is a microfinance bank, and one of Mexico's most financially successful banks. It became a for-profit organisation in 2000, and a bank in 2006 (Bloomberg 2015).

funds, in turn, can be divided into three types (see fig. 2.2); microfinance development funds, quasi-commercial, and commercial microfinance funds (Goodman 2008). Thereby, microfinance investment vehicles, and in extension microfinance investment funds, work as gateways for microfinance investments[3]. The funds provide MFIs with sought after access to international financial markets, and allow private and public funding to reach the institutions (Goodman 2008). Apart from providing capital, the MFIFs are also active in the governance of the MFIs to ensure economic development and social impact (Goodman 2008). By the end of year 2013, the microfinance fund market was estimated to manage US$ 9.9 billion in total assets distributed over 106 active funds. Furthermore, equity funds financed about 291,000 borrowers and the MFIs funded by these equity funds provided average loans of US$ 1,588, corresponding figures for fixed income and mixed funds together were 187,000 borrowers and average loans of US$ 1,831 (Symbiotics 2014).

Microfinance development funds	**Quasi-commercial microfinance funds**	**Commercial microfinance funds**
These funds emphasise development more than financial returns. They often aim to provide capital through sustainable mechanisms to support growth and development. Well-diversified portfolios consisting of both loans and equity. Low number of shareholders.	These funds have higher return requirements than the first category, but have had a large focus, and impact, on the development of microfinance. High focus on equity. Often not open to new investors.	These funds are the most heterogeneous of the three categories. These funds, mainly, target retail investors, and invest in the most mature, and thus stable, MFIs. They invest primarily in loans.

Figure 2.2 Three types of microfinance investment funds. Source: Descriptions based on Goodman (2008).

2.2.1 Investment types

Investments into MFIs can be made either directly in the equity of listed MFIs, or through a microfinance investment fund (Brière & Szafarz 2013). The MFIF market consists of both open-end and closed-end mutual funds, where the former has grown rapidly. In 2011, open-end funds comprised two thirds of the entire market, and as these funds have a broader investor base (retail and institutional investors) there is an increased need for reliable third party information. As an example, the LuxFLAG label has emerged, which ensures investors of a pronounced microfinance focus of the funds (MicroRate 2013) [4].

[3] Noteworthy is that structures like donor institutions, foundations, NGOs, and development agencies are not classified as investment funds as their structure and mission is beyond that of the others (Goodman 2008).

[4] The LuxFLAG microfinance label ensures that the microfinance fund invests directly or indirectly in the microfinance sector. Indirect investment refers to funds that are investing in other funds, which in turn invests in MFIs. Direct investments imply that the microfinance fund invests directly in MFIs. Microfinance funds must apply to be considered by the LuxFLAG Board, if the application is approved (i.e. if the fund meets the eligibility criteria), a fee of 3,000 Euro must be paid and then the label is valid for one year. Thus, in order to keep the LuxFLAG label, the MIVs must renew their label annually. To obtain the LuxFLAG label the fund must invest a minimum of 50 percent of its holding into the microfinance sector (LuxFLAG 2015).

The Financial Industry Regulatory Authority (FINRA) defines a mutual fund as 'an investment company that pools money from many investors and invests it based on specific investment goals.' An open-end mutual fund sells shares, where each share corresponds to ownership of the fund and entitles investors to income and capital gains from the investments of the fund. The price of a share corresponds to the fund's (approximate) net asset value (NAV) per share, and adding potential sales charges. The shares of mutual funds are redeemable, meaning that they can be bought and sold back to the fund at current NAV per share (FINRA 2015).

Furthermore, the mutual funds can offer different share classes of the same portfolio. The classes invest with the same objectives, but offer different services, charges and fees, which result in different financial performance. By offering different share classes, the mutual fund allows investors to choose the class most suitable for their objectives (FINRA 2008). Funds can issue both capitalisation ('cap') and distribution ('dis') share classes, which are different in terms of the distribution of dividends of the fund, where the latter then distributes dividends. Some funds offer share classes directed at different types of investors, for example retail and institutional shares. Institutional investors buy in large quantities, and could be banks, pension funds, large companies, and insurance companies. Retail investors refer to smaller, often individual, investors (Ledgerwood 2013).

2.3 Socially responsible investments

Microfinance investment funds are covered within the field of socially responsible investments, and especially within what is being referred to as impact investing. Given our interest in comparing microfinance funds to other conventional SRIs, we will in this section present an overview of the SRI market.

Socially responsible investments are investments where environmental, social, and governance (ESG) factors are included in the decision process as a complement to the traditional financial analysis. This investment strategy has grown rapidly over the past decade, but it is not a modern idea. During ancient times, several religions had different ways of incorporating ethics in their preaching. For example, Judaism taught ethical spending of money, the Christians had ethical loan restrictions based on the Old Testament, and the Catholic Church imposed prohibition of usury (Renneboog, Horst & Zhang 2008). The modern type of SRIs might have appeared in the 1940s, when unions and government agencies chose not to invest in companies, which were perceived to have unfair labour practices. This socially responsible focus increased in the 1970s due to turmoil such as the Vietnam War, environmental degradation, and Apartheid. During the 1990s, the focus shifted towards human rights violations and global labour standards. In more recent years, the focus has mainly been on corporate governance (Hill et al. 2007).

The investment decision for socially responsible mutual funds can be based on negative, positive, and norm-based screening. Negative screening implies that the fund excludes assets, which are not in line with ESG criteria, for instance exclusion of companies that produce tobacco products. Conversely, positive screening implies that a fund invests in companies based on ESG performance relative to peers. Positive screening could, for instance, be investments in

companies that promote good working conditions or develop environmentally friendly technologies. Norm-based screening implies that the investment decision is made with consideration to minimum standards of business practice based on international norms (GSIA 2012).
A positive aspect of SRI portfolios is that they often, due to the screening and good governance, are subject to lower risk than other investments. The popularity of SRI portfolios might stem from their ability to perform better than others during bear markets, despite the fact that they underperform during bull markets (Nofsinger & Varma 2014).

Corporate social responsibility (CSR) is a concept that has gained huge attention and has changed operations worldwide. There are several definitions of CSR; but in its simplest form one could use the definition by Mackey, Mackey, and Barney (2007) where CSR refers to firm actions that are aiming to improve social or environmental conditions[5]. Institutional investors can invest in SRI funds as a part of their CSR strategy. Conversely, SRI funds can invest in firms with a pronounced CSR strategy, as it can be seen as eligible in terms of ESG criteria. Investors may derive both financial and non-financial benefits from investing in SRIs. A vast number of studies try to find an answer to whether a CSR strategy creates shareholder value or not. Some of these studies have found that CSR creates shareholder value in the long run, but not necessarily in the short run (Renneboog, Horst & Zhang 2008).

Similar to the MFIF market, the entire SRI market has experienced rapid growth. In the beginning of 2014, the global market for sustainable investments was estimated to US$ 21.4 trillion in terms of total assets, which corresponded to a growth of 61 percent since 2012. SRIs then constituted 30.2 percent of professionally managed assets, out of which 63.7 percent were attributed to the European market, and 30.8 percent were related to the US market (GSIA 2014). The growth and increased interest in socially responsible investments lead the UN Secretary General to initiate the Principles for Responsible Investments (PRI) in 2005. It includes six principles, which act as guidelines for institutional investors in their investment process. By signing the principles the investors make a public commitment to adopt and to implement them. At present, the framework has 1,380 signatories and a total of US$ 59 trillion assets under management (PRI 2015). There is also an extended framework of seven principles for investors in inclusive finance (PRI PIIF). These principles were established in 2011 and in 2014 the framework had 49 signatories, and a total of US$ 9 billion invested in inclusive finance (PRI 2015).

Impact investing is an investment strategy within the SRI framework. In short, the difference between the two is that SRIs have a social aspect while impact investing more distinctly provides social impact at an individual basis. Impact investing is referred to as targeted investments aiming to solve social and environmental problems (GSIA 2012). The term includes community investing, which serves to provide underserved individuals or communities with capital. Hence, impact investing includes microfinance. The definition of impact investing differs somewhat between regions, therefore a comparison between different markets may suffer from

[5] E.g. Hill et al. (2007) defined CSR as 'the economic, legal, moral, and philanthropic actions of firms that influence the quality of life of relevant stakeholders.'

discrepancies[6]. However, to get an approximate overview of the impact investing market, the US has a market share of 63 percent and Europe has the second largest market share of 26 percent. In 2014, the US SIF reported US$ 36.8 billion in combined impact investing assets under management. Of these, US$ 12.2 billion is managed by investors that are exclusively engaging in impact investing whereas investors of the remaining US$ 24.6 billion engage in impact investing as well as other SRI strategies. In Europe, the corresponding figure was reported to be US$ 28 billion in 2014 according to Eurosif. Approximately 55 percent of these US$ 28 billion were invested in microfinance (GSIA 2014).

To summarise, SRIs have a wider objective in choosing their investments, while impact investments choose investments, which more distinctively provide a social impact in specific areas or communities. There is no universal standard for the screening process of SRIs as long as the selection criteria and process does not violate hypernorms (Dunfee 2003), and fund management companies can independently choose what to invest in[7]. Impact investing also lack a universal standard, but are more distinctly required to increase autonomy and growth of individuals and social undertakings by providing support. Given the somewhat stricter distinction of impact investing, the actual social impact of these investments is easier to measure than a wider social impact such as reducing carbon dioxide emissions.

2.4 Previous research of the performance of MFIFs

On the topic of MFIFs and their performance, few academic studies are to be found. To our knowledge, there are only a handful of researchers who have studied the performance and volatility-reducing characteristics of such funds. The novelty of MFIFs is the reason for the insufficient knowledge about the returns, risk characteristics, and benefits of the funds in a diversified portfolio (Oehri and Fausch 2008).

There are some studies investigating the diversification potential of adding MFIs to an investment portfolio. Galema, Lensink, and Spierdijk (2011) investigated if diversification gains were reached by adding MFIs to a portfolio consisting of risky international assets. Their findings indicated that such an investment might be useful for investors who aim to find a better risk-return portfolio. As previously mentioned, public investments in microfinance can be made via MFIFs or equity in listed MFIs. Brière & Szafarz (2013) conducted a study on the latter, and found evidence indicating that the microfinance sector was becoming more similar to the conventional financial market. They concluded that investments in equity resulted in minimal diversification benefit.

Oehri and Fausch (2008) analysed three MFIF shares; the Dexia Micro Credit Fund, the Triodos Fair Share Fund, and the responsAbility Global Microfinance Fund. They found evidence of low

[6] Community banking deposits and development finance are included in some regions; however, in Europe the impact investing market is defined as the investments made by professional or private investors in social enterprises (GSIA 2014).

[7] 'Hypemorms are principles so fundamental that, by definition, they serve to evaluate lower-order norms, reaching to the root of what is ethical for humanity. They represent norms by which all others are to be judged.' (Donaldson and Dunfee 1999)

volatility and low, negative, correlation to the chosen indices, and concluded that MFIFs are a good portfolio diversification tool. Furthermore, Oehri and Fausch (2008) argued that MFIFs are favourable investments regardless of whether used in bull or bear market situations and that portfolios investing in MFIFs experience higher Sharpe ratios. According to them, to reach the full potential of MFIFs, investors should allocate substantial resources and commit on a long-term basis. Therefore, they concluded that this type of investment is ideal for institutional investors.

In 2010, Janda and Svárovská examined the risk and return characteristics of 11 MFIF shares aimed at institutional investors. Their study investigated if MFIFs were correlated with developed and emerging markets, and they found evidence indicating that the returns of MFIFs were uncorrelated, with negative beta coefficients, to the benchmark indices. Janda and Svárovská (2010) concluded that the systematic risk of MFIFs was close to zero, implying that adding microfinance assets to a broader portfolio can help reducing the overall risk. Additionally, they could not identify abnormal returns of the funds.

In a later study, Janda, Rausser, and Svárovská (2014) again tested two hypotheses regarding risk and return characteristics of microfinance funds. In contrast to their previous study, they included all existing funds at the time, regardless of the length of the time series data. They therefore used unbalanced panel data methods to overcome the problem with short data periods. Furthermore, they distinguished between Euro and US dollar denominated funds by using risk-free rates in each currency. To evaluate the risk and return characteristics, they estimated the beta, and R-squared coefficients, as well as Jensen's alpha, which are common measures used in portfolio evaluation and which we will present in the method section. They also conducted a mean-variance spanning test to investigate whether adding microfinance funds to a benchmark portfolio could result in higher mean and lower standard deviation, i.e. a mean-variance efficient portfolio. Janda, Rausser, and Svárovská (2014) found that the returns of MFIFs were uncorrelated, with negative betas, to that of the market portfolio, and that the returns of MFIFs exceeded the expected returns of a market portfolio predicted by CAPM.

Of the few studies that have been conducted, the novelty of microfinance funds have consistently been mentioned as an issue (e.g. Oehri and Fausch 2008; Brière and Szafarz 2013; Janda, Rausser & Svárovska 2014). Our study improves upon these by adding more funds and a longer time span, both prior to and after the years covered in previous studies. In contrast to the aforementioned studies, we also add liquidated and currently inactive funds to, at least partially, prevent distortion of our results due to survivorship bias.

Given the somewhat contradicting findings regarding the diversification potential of microfinance investments, as well as the previously limited samples, we believe that by conducting a study of a larger sample we can contribute with new evidence on the diversification properties and risk-return characteristics of MFIFs.

2.5 Previous research of the performance of SRI funds

Previous research of socially responsible investments is more extensive, however for the purpose of this thesis, we will only cover studies on the diversification benefits and the matched pairs estimation method.

On the topic of ethical investment funds, Mallin, Saadouni, and Briston (1995) identified a lack of studies on the financial performance of UK ethical investment funds, despite the increased interest in and number of ethical funds. Previous studies had focused on the investment policies of the funds, and more precisely, on whether the companies the funds invested in were operating ethically or not. Mallin, Saadouni, and Briston (1995) compared the performance of UK ethical investments to that of conventional funds. Their findings were ambiguous, in twelve instances (out of 29) ethical funds outperformed non-ethical funds on the test metrics; Jensen's alpha, Sharpe ratio, and Treynor ratio.

Nofsinger and Varma (2014) used a matched pairs estimation method to investigate if SRI funds outperform the market during a crisis, and found that compared to the matched conventional funds they did. However, they reasoned that the dampening effect came at the cost of worse performance during non-crisis periods. Nofsinger and Varma (2014) concluded that these funds could be argued to offer diversification benefits. They used a sample of 240 matched funds, where SRI funds were matched with conventional funds with the same reported objective, inception date, allowing for discrepancies up to one year, and total net assets.

3 Method

To answer our research questions, we turn to theories on portfolio evaluation, which include both risk and performance measures. Thereafter, we clarify how we will apply these theories when conducting our stand-alone and matched pairs evaluations.

3.1 Portfolio evaluation

The concept of portfolio performance has according to Jensen (1968) two dimensions:

'(1) The ability of the portfolio manager or security analyst to increase returns on the portfolio through successful prediction of future security prices. (2) The ability of the portfolio manager to minimize (through "efficient" diversification) the amount of "insurable risk" born by the holders of the portfolio.' Jensen 1968, p. 389.

In accordance with this, evaluation of portfolio performance is essentially about measuring the expected return and risk in order to enable the investor to select the 'best' portfolio based on preferences in terms of reward versus risk. The most commonly used risk measures include the beta coefficient, the standard deviation of returns and the R-squared, while Jensen's alpha, the Sharpe ratio, and the Treynor ratio are commonly used performance measures (e.g. Aamir Shah, Hijazi & Hamdani 2005). This thesis will include all of the measures mentioned above.

3.1.1 The capital asset pricing model

The capital asset pricing model (CAPM) is widely used in literature when evaluating the performance of portfolios. The basic model is referred to as the Sharpe and Lintner CAPM and is calculated as,

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f] \qquad i = 1, 2, \dots, N$$

where $E(R_i)$ and $E(R_m)$ are expected return of fund *i* and the market respectively, R_f is the risk free rate, and $[E(R_m) - R_f]$ is the market premium. The model provides a way of measuring the risk and explaining the relationship between risk and reward (expected return). The idea is that the total risk of a portfolio can be divided into two types of risk; systematic and unsystematic risk. Systematic risk concerns market risk and cannot be diversified away while unsystematic risk or 'specific risk' is uncorrelated with movements in the market and can therefore be diversified away. The systematic risk component is measured by the beta coefficient, which is the relative volatility of the portfolio compared to the market (see fig. 3.1) and consequently beta shows to what extent the investor should be compensated for taking on additional risk. This compensation, or risk premium, corresponds to beta multiplied by the market premium. Thus, the Sharpe and Lintner regression model implies that the expected return of a fund equals the risk free asset and the risk premium. Finally, the unsystematic risk component is measured by the residual standard deviation, which estimates the accuracy of the expected return of the fund (Berk and DeMarzo 2011). A 1996 paper by Ferson and Schadt suggested the use of conditional performance evaluation, meaning that lagged variables are incorporated in the regressions. Fund managers use public data, which is reported in hindsight, meaning that their investment decisions are based on past, and not current, events. Their findings indicate a change in risk measures when incorporated in the model.

Beta	**Interpretation**
$\beta > 1$	Fund more volatile than the benchmark index/market
$\beta = 1$	Fund moves with the benchmark index/market
$0 < \beta < 1$	Fund less volatile than the benchmark index/market
$\beta = 0$	Fund not moving with benchmark index/market
$\beta < 0$	Fund moves counter to the benchmark index/market
$\beta < -1$	Fund more volatile than the benchmark index/market

Figure 3.1. Description of the interpretation of the beta coefficient.

3.1.2 Jensen's alpha

Jensen (1968) argued that a thorough understanding of the nature and measurement of risk had been a difficulty when attempting to evaluate the performance of portfolios. He further claimed that when estimating the systematic risk of managed portfolios one needs to allow for the possibility of the manager to have superior forecasting skills. This implies that the manager's portfolio likely earns more than the normal risk premium given its level of risk, and therefore,

Jensen (1968) suggested that one should include a non-zero constant in the CAPM regression, namely alpha. Jensen's alpha is a measure of the difference between the actual average return of a portfolio and the expected return given the market conditions and the risk of a portfolio. In essence, the alpha coefficient, the intercept of the CAPM excess return regression, is a measure of abnormal performance (Kothari & Warner 2001). Considering that mutual funds hold different asset classes, the alpha coefficients might be explained by the alphas of the fund's holdings (Ferson & Schadt 1996).

The use of CAPM when evaluating portfolios has been widely criticised. The model is not very successful in explaining observed returns, and for instance Fama and French (2004), discuss some of the model's empirical problems. They argue that even though the CAPM is taught as an introduction to portfolio theory the empirical problems are reason enough to question the validity of the model in studies. Also the extension of the CAPM using Jensen's alpha may result in problems when studying funds concentrating on low beta stocks, small stocks or value stocks since these funds will lend to produce positive abnormal returns relative to the prediction of the Sharpe Lintner CAPM, even when the fund managers do not have superior skills (Fama & French 2004). This implies that the CAPM fails to explain the returns of small companies and value companies. Subsequently, Fama and French developed a three-factor model to capture these differences. Despite this, the CAPM is still frequently used in literature and it is also the chosen model in this thesis. Even though the MFIFs are, supposedly, low beta assets we believe that the CAPM is sufficient to answer our research questions and given that we perform a stand-alone evaluation of funds with similar investments the Fama French factors will not be able to capture any additional variation.

3.1.3 Sharpe ratio

Sharpe (1966) formulated a measurement of the performance of a portfolio, which takes into account the trade-off between the reward, in terms of risk premium, and the risk. This reward-to-variability measurement is known as the Sharpe ratio and is given by:

$$Sharpe\ ratio = \frac{(R_i - R_f)}{\sigma_i}$$

where R_i is the average return of fund *i*, R_f is the average risk free rate and σ_i is the standard deviation of fund *i*'s returns. Basically, it is a measure of the risk-adjusted return and thus a portfolio with a zero or negative Sharpe ratio implies that there is no point investing in it. On the contrary, the higher the Sharpe ratio the more preferable the portfolio is in terms of better performance and greater profits relative additional risk.

3.1.4 Treynor ratio

Treynor (1965) introduced a variant of the reward-to-variability ratio in which he used the volatility of a fund, measured by the beta coefficient, instead of the variability. The ratio then

measures a portfolio's return taking into account the systematic risk. The Treynor ratio is given by:

$$Treynor\ ratio = \frac{(R_i - R_f)}{\beta_i}$$

Investors will choose to invest in the portfolio with the highest Treynor ratio as the unsystematic risk has been diversified away and it is only the systematic risk (market risk) left to consider. A downside of the Treynor ratio is that, when there are funds with negative beta coefficients, the Treynor ratio is not applicable.

3.2 Matched pairs estimation

The matched pairs estimation technique is a method that can be used to compare the performance of different types of funds. The technique has been used in some studies analysing the performance of ethical investments. For instance, Mallin, Saadouni, and Briston (1995) used it to analyse the performance of ethical and non-ethical mutual funds. Two common characteristics of SRIs can be overcome when using the matched pairs estimation technique:

1. The comparatively short time that most of these funds have been in existence
2. The fact that their portfolios tend to consist of investments in smaller companies and so may be subject to a small company effect

When using the matched pairs technique, funds are matched based on certain criteria. Commonly used criteria are inception date, fund size, and fund objective (e.g. Mallin, Saadouni & Briston 1995; Nofsinger & Varma 2014). Given limitation in the sample of SRIs, smaller discrepancies are allowed for regarding these criteria. For instance, Nofsinger & Varma (2014) gradually drop the inception date criterion in order to enable matching of their funds. The performance of the funds are then evaluated pairwise against each other using, for instance, the risk-adjusted measures mentioned above; Jensen's alpha, the Sharpe ratio and the Treynor ratio.

3.3 Econometric specification

When conducting the stand-alone evaluation of the performance of MFIFs, we first run the following simple CAPM regression:

$$R_{i,t} - R_{f,t} = \beta_i(R_{m,t} - R_{f,t})$$

where the dependent variable is excess return, calculated by subtracting the risk-free rate, $R_{f,t}$ from the return of fund *i*, $R_{i,t}$. The independent variable is market premium, calculated by subtracting the risk-free rate, $R_{f,}$ from the return of the benchmark index, $R_{m,t}$. The results from this regression is only used to compare the beta coefficients in terms of magnitude, sign, and significance with the beta coefficients received in our main regression.

Our main regression, on which we base our analysis, includes the Jensen's alpha and is specified as follows:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t})$$

In order to capture the variation in currencies we use the trading currency for each unit when including the benchmark index and the risk-free rate in the regressions. Also, fixed income funds are compared to a fixed income index, while equity funds are compared to an equity index.

To answer our first research question, we run the above regressions and calculate the Sharpe and Treynor ratio. The CAPM regressions are run at four aggregate levels, the entire sample, asset class, asset currency, and trading currency, as well as at an individual level. The Sharpe and Treynor ratios are calculated for the same aggregate groups, and individually for all funds. We acknowledge the difference in time span for the shares by using averages of the risk-free rates over each of the shares' existence.

When comparing microfinance funds with conventional SRIs, to answer our second research question, we first create matched pairs based on the following two criteria:

1. Inception date, and
2. Initial fund size

We take the two criteria into consideration to ensure that the funds being compared are in the same phase of the business cycle and of the same size, in terms of total assets when issued. Due to the limited number of funds, we allowed for smaller deviations in inception month, and in initial assets. These deviations range from 0 to 12 months and 0 to 220 million, however one needs to take into account that the larger the difference in million, the larger the fund implying that the percentage deviation is smaller. We did not allow for larger discrepancies in inception date since we have relatively newly issued funds, and we wished to avoid having to compare funds that are in their initial phase with funds that are more stable given the supposedly worse performance of funds during the initial months. Furthermore, we did not want to allow for too large deviations in fund size based on the argument that it is supposedly not feasible to compare small funds with large funds given that the size arguably requires different skills of the fund managers. The matched funds are all traded in the same currency within each pair, and we control for the currencies in the same manner as in the stand-alone evaluation of the MFIFs.

The evaluation is based on the same regressions and measures as the stand-alone evaluation. We run the two regressions, on aggregate and on individual levels divided between MFIFs and SRIs. Then, we calculate the Sharpe and Treynor ratios for the MFIFs and SRIs on aggregate and individual levels. The averages of the risk-free rates are again calculated based on the time period of the individual funds.

The analysis will be based on the estimated coefficients of the second regressions, while the beta coefficients from the first regressions will be compared in terms of magnitude and sign (as a robustness check) against the ones from the Jensen's alpha regressions. Furthermore, we run the

regressions using the S&P 500 index instead of the MSCI World Index as an equity benchmark as a robustness check to see if the correlation is stable for different indices. Even though out of scope for our research focus, we run the regressions using emerging markets indices, the MSCI Emerging Markets Index and the JPM Emerging Market Bond Index. We do this to capture the relation between the two asset classes, in terms of correlation with the benchmark indices. Finally, we control for potential differences in performance of institutional and retail shares, by including a dummy for retail shares.

3.1 Hypotheses

Given the suggested diversification benefits of microfinance funds, we expect the beta coefficients to be positive, and close to zero. If the beta coefficient is close to one, then these funds do not fully provide diversification benefits. Thus, when running the regressions our first hypothesis is:

$$Hypothesis\ 1\text{: } 0 \leq \beta_i < 1$$

An indication of good performance is the fund's ability to generate excess return. The MFIFs are hypothesised to generate stable returns due to high repayment ratios. Consequently, we expect a positive Jensen's alpha and hence the second hypothesis is:

$$Hypothesis\ 2\text{: } \alpha_i > 0$$

When evaluating the respective Sharpe and Treynor ratios for the microfinance funds, there is no such distinguished level as for the beta and alpha coefficients. Rather, we will simply compare the magnitude of the ratios to the benchmark indices, the higher the ratios the better.

We pairwise compare the betas of the MFIFs and the SRIs, to find out whether it is possible to see if one of the two types of investments is more correlated with the benchmark index. Given that the SRIs include investments in developed markets, we expect the beta coefficients of the SRIs to be larger than the ones of the MFIFs. Hence, our third hypothesis is defined as:

$$Hypothesis\ 3\text{: } \beta_{MFIF} < \beta_{SRI}$$

The ability to generate abnormal return is expected to be larger for MFIFs than SRIs since we expect the MFIFs to have lower betas and thus lower correlation with the market than conventional SRIs. Since the alpha measure is the difference in performance from that expected by the market and given a certain level of risk, it will in this case capture baseline performance rather than superior skills of microfinance fund managers. Thus, it will be related to the expectation of the beta coefficient. The fourth hypothesis is therefore:

$$Hypothesis\ 4\text{: } \alpha_{MFIF} > \alpha_{SRI}$$

Furthermore, we calculate the Sharpe and Treynor ratios for each of the fund types, both at aggregate and individual levels, over the entire time period in order to see if they differ in terms of being compensated for additional risk.

4 Data

We use two datasets in our analysis, one for the stand-alone evaluation of the MFIFs and one for the matched pairs evaluation. In this section we will first present the data and then we will discuss data management as well as considerations and possible limitations with the data at hand.

4.1 Microfinance investment funds

The data on MFIFs was retrieved from Bloomberg Financial Services on November 19th 2015 and consists of monthly NAVs, dividends (if distributed), and total assets. All funds included in the sample have a pronounced microfinance investment objective, and we have data ranging from their respective inception dates up until October 2015[8]. The funds assets are denominated in either Euro or US dollar, but there are four possible currencies, Euro, US dollar, Swiss franc, and British pound, in which the different share classes are traded. Furthermore, we only include MFIFs that are classified as open-end, SICAV, or FCP implying that we actively choose not to include closed-end funds[9]. Several of the funds included in the sample issue more than one share class, and shares in different trading currencies. In total, our sample includes 83 shares out of which 51 are fixed income, 27 are equity, and 5 are mixed allocation. Most of the funds are incorporated in Luxembourg, with the exceptions of the EMF Microfinance Fund AGmvK, which is Liechtenstein-based, the Erste Responsible Microfinance Fund, which is Austria-based, and the IIV Mikrofinanzfonds, which is incorporated in Germany. For a complete list of the 83 shares, see Appendix 9.8.

4.2 Benchmark indices and risk-free interest rates

The data on market indices and risk-free rates was obtained from Bloomberg on November 19th and November 30th 2015, respectively. As we are investigating whether the returns of MFIFs are correlated with developed markets or not, we choose the MSCI World index as a proxy for the returns of developed markets. The MSCI World Index is a free-float weighted equity index, which represents the equity performance of 23 developed countries. We choose to use the index as it offers a broad global equity benchmark; the index has also been used in other studies as a proxy for global market risk (e.g. Krauss and Walter 2009; Janda, Rausser & Svárovská 2014).

[8] The oldest fund in the sample was issued in October 1998, and the newest fund was issued in May 2015.
[9] SICAV funds are open-end funds that are registered as a limited liability company with variable share capital, these funds can choose to act as self-managed investment companies or appoint a Luxembourg based management company. FCP funds are also open-end funds, however they do not have a legal personality and must be managed by a fund management company.

The MSCI is denominated in US dollar, but we have retrieved currency-converted series for all trading currencies of our sample to capture currency volatility.

Our sample consists of both equity and fixed income funds, and to properly capture the differences between them, we use a fixed income index to proxy for market returns for the fixed income funds. The chosen index is the JPM Global Aggregate Bond index (JPM GABI), which is a comprehensive benchmark including investment grade bond issues of different fixed income assets in both developed and emerging markets. Unfortunately, the index was not available in Swiss franc and we will therefore use the Euro version of the index for these funds, since the Swiss franc up until recently was pegged against the Euro (The Economist 2015).

We retrieved data on government treasury bills, as risk-free rate proxies. For the currencies where Treasury bill rates are not applicable we have followed Thomson Reuters recommendations (Thomson Reuters 2010). Thus, the risk-free rate proxy for Swiss franc is the 1-month Lombard rate, and for the Euro we use the 1-month Euribor (Euro interbank offered rate) [10]. We use the Bloomberg generic 1-month bill as a proxy for the US risk-free rate; the index is based on the US 1-month T-Bill and the cash management bill closest to maturing 30 days from today[11]. The UK 1-month Bond Yield is used as a proxy for the British pound risk-free rate.

4.3 Socially responsible investment funds

The data on SRIs was retrieved from Bloomberg on November 30th 2015 and includes monthly NAVs, dividends (if distributed), and total assets. Our sample for the matched pairs estimation consists of in total 32 mutual, open-end, funds, hence 16 pairs, out of which six are equity funds and ten are fixed income funds. Four of the fixed income funds are denominated in US dollar, and the remaining twelve funds are all denominated in Euro. The SRI funds are labelled with the Novethic SRI Label, the Novethic Green Label, or are offered by members of US SIF and we have data ranging from their respective inception dates up until October 2015[12]

The relatively low number of pairs, compared to the total number of microfinance funds in our sample, mainly depends on two things; the majority of microfinance funds are only a couple of years old, and are fixed income funds, while the majority of SRI funds are equity funds. Due to the low number of SRI funds available for matching, we were not been able to match the funds on objectives, and thus we have a broad variety of investment strategies in our sample. The most worthwhile comparison would perhaps have been between microfinance funds and SRI impact funds, however as microfinance funds constitute the majority of impact funds, it was difficult to find data on other types of impact funds.

[10] The Lombard Rate is the rate at which the Swiss National Bank grants the banks interest-bearing loans against the pledge of specified securities and debt register claims (Bloomberg Snapshot 2015).
[11] The 1-month T-Bill has only been auctioned since July 31st 2001, prior to that the values of the GB1M Index were interpolated based on cash management bills (Bloomberg Snapshot 2015).
[12] The oldest SRI fund was issued in September 2007 and the newest SRI fund was issued in May 2013.

4.4 Data management and considerations

As stated in the microfinance investment funds-section, our analysis will be based on open-end funds. The advantage of studying open-end funds over closed-end funds is that since they are traded on a public exchange, monthly data on NAV's is available and thus facilitates a comparison.

The first MFIFs were established as late as by the mid-1990s, since then the number of funds has increased. Consequently, it is not possible to conduct a balanced panel analysis over a longer time span. To increase the number of observations in our sample, we construct an unbalanced dataset where we include all funds (that we could retrieve data on from Bloomberg), regardless of inception date, asset class and share class. The dataset consists of both fixed income and equity funds, and the classification of the asset class focus is based on what is reported by Bloomberg.

Furthermore, we distinguish between randomly and non-randomly missing values. The majority of funds report their NAV monthly. However, there are a few exceptions where NAV is reported quarterly[13]. In those instances, we use linear interpolation to estimate the missing values[14]. Among the monthly reported NAVs there are a few cases of randomly missing values for which we also use interpolation[15]. Since it only concerns a small number of observations, and since there is no reason to believe that there is a specific reason for not reporting the values, the use of interpolation should not have any major impacts on the results of our analysis. Another potential problem is that of outliers. One of the fixed income funds in our sample displays a 22.45 percent return in one month, which via visual inspection is to be considered an extreme value. Hence, we exclude this observation from the sample.

A common problem in mutual fund evaluations is (mutual fund) attrition, which cause the studies to suffer from survivorship bias. Funds that become liquidated often do so due to poor performance. Consequently, studies not including liquidated funds might overstate the performance, and the inference about the impact of fund characteristics could be wrong (Elton, Gruber & Blake 1996). In an attempt to overcome potential survivorship bias we have chosen to include funds that have become liquidated or inactive during the study period[16]. Even though the number of liquidated and inactive funds is low, we believe that by including them in the analysis this is an improvement upon prior studies, which have not included any liquidated funds.
Since the data covers monthly NAV prices, and we are interested in the development of the funds, i.e. the monthly return, we have created new variables for the monthly percentage change for each fund in Stata. Consequently, we have observations on monthly returns from November 1998 up until October 2015. Since our dataset includes funds that pay dividends, these monthly NAVs are dividend-adjusted before we calculate the return. The formula used to calculate the return is:

[13] This is the case for all three shares of the Luxembourg Microfinance and Development Fund, and all four shares of the Symbiotics Sicav (Lux.) SICAV SIF - SEB Microfinance Fund.
[14] Interpolation implies that we have constructed new data points within the range of the known data points.
[15] Six of the funds in the sample have, in total, 19 missing values.
[16] Six funds have become liquidated during the sample period: Triodos KI Cap, rGML Q, Azure A, B, and C Cap, and Saint Honoré. Four funds are currently inactive: DRFV P Cap (USD), Etimos P Cap, Finethic C6, Dutch MF.

$$R_{i,t} = \left[\frac{\left(NAV_{i,t} - NAV_{i,t-1}\right)}{NAV_{i,t-1}}\right] * 100$$

where $i = 1, 2, \ldots, 83$ is MFIF and t is month. There could be a potential problem with outlying observations, when using the percentage change, if the base value is very different between the funds. However, we do not find this to be a problem, as we calculate the change from the month before and not from inception. Therefore we do not use the natural logarithm formula, which would smoothen the observations. The percentage change in benchmark indices is calculated in the same manner:

$$R_{m,t} = \left[\frac{\left(Index_{m,t} - Index_{m,t-1}\right)}{Index_{m,t-1}}\right] * 100$$

where m is index and t is month. The risk-free rates are reported as the actual rate in Bloomberg, and to be consistent with the use of change in the variables, we calculate the change in the risk-free rates as:

$$R_{f,t} - R_{f,t-1}$$

The Breusch-Pagan test indicates presence of heteroskedasticity for some of the funds in the sample, since standard errors are biased in the presence of heteroskedasticity, which in extension cause biased test statistics and confidence intervals; we use robust standard errors in our regressions.

In the regressions at aggregate levels, we exclude funds of funds as they, at least, partially invest in funds included in our sample. If included, our results could be biased as the returns of these funds likely are correlated with the returns of other funds in our sample. An implication of this is that our sample of funds with a "mixed allocation" focus only will include one fund, and we will therefore not look at this asset class at an aggregate level. At the individual level, results for all 83 funds in the sample are reported.

The majority of funds in our sample are LuxFLAG labelled, and since the funds have to pay a fee to receive the label this could imply that poor-performing MFIFs are not present. However, since this fee is low in comparison to the size of the funds, this should not be a problem. Also, when retrieving data on funds we have not based our choice of which funds to include on whether or not they have the label.

The novelty, and relative scarcity, of microfinance investment funds made matching on exact dates and asset sizes difficult. Therefore, we have allowed for deviations up to a couple of months (i.e. observations) and the deviation in assets in relation to the total assets of the microfinance funds. Moreover, we have not matched the funds on share class level.

4.1 Summary statistics microfinance investment funds

The sample consists of 83 shares, belonging to a total of 23 different portfolios. The average current asset size is $323.04M for US dollar denominated funds and €155.69M for Euro denominated funds. The average age of the included share classes is 58 months. In tab. 4.1 aggregate level summary statistics for the dependent variable, monthly return is presented. Equivalent statistics based on trading currency and at an individual level are presented in tab. 9.1 and 9.2, respectively, in Appendix.

	Mean	**Std dev**	**Min**	**Max**	**Obs**
Entire sample	0.17%	1.02%	-17.96%	13.65%	4,538
MSCI World	0.71%	3.87%	-19.04%	11.07%	4,616
JPM GABI	0.41%	2.10%	-5.19%	7.40%	4,616
Asset class	*Mean*	*Std dev*	*Min*	*Max*	*Obs*
Fixed income	0.16%	0.85%	-11.47%	7.71%	2,988
Equity	0.19%	1.30%	-17.96%	13.65%	1,479
Asset currency	*Mean*	*Std dev*	*Min*	*Max*	*Obs*
USD	0.19%	0.84%	-11.47%	7.71%	2,267
EUR	0.15%	1.17%	-17.96%	13.65%	2,271

Table 4.1. Summary statistics of mean monthly return, excluding funds of funds. (The entire sample, and asset currency includes the one mixed allocation fund that is left when funds of funds are dropped from the sample.) Source: Own calculations based on Bloomberg data.

As illustrated in fig. 4.1, the mean monthly returns of the funds have been stable and slightly positive during the entire study period.

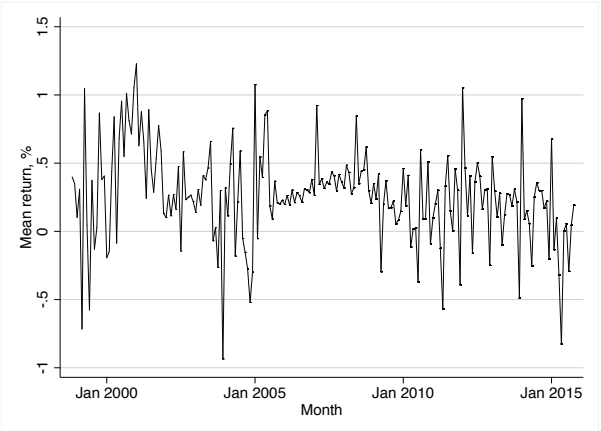
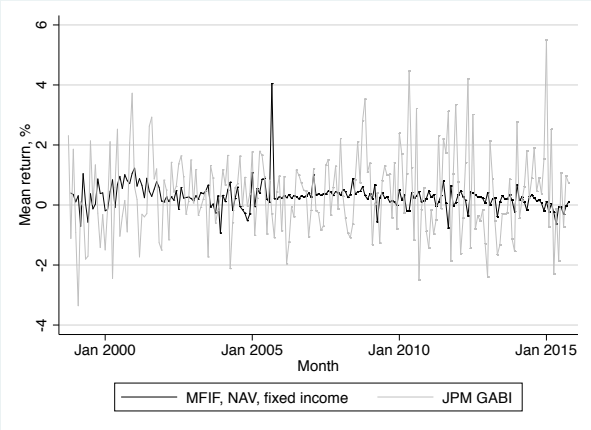


Figure 4.1 Mean monthly NAV return of all funds.
Source: Own calculations based on Bloomberg data.

From fig. 4.2 and 4.3, we see that the mean monthly returns of the funds are considerably less volatile than the benchmark indices. Both fixed income and equity funds have mean monthly returns that are stable over the study period and that are slightly positive.



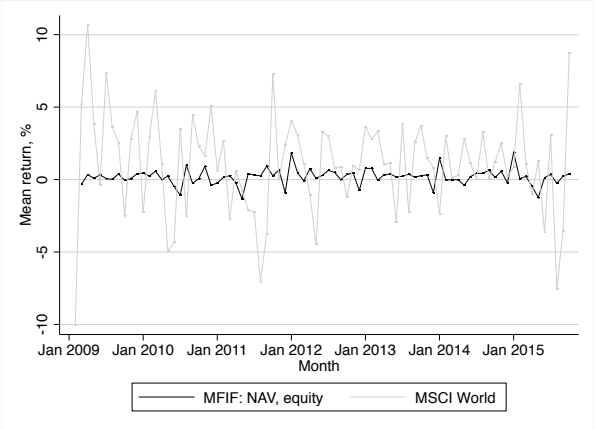


Figure 4.2. Mean return of fixed income funds. Source: Own calculations based on Bloomberg data.
Figure 4.3. Mean return of equity funds. Source: Own calculations based on Bloomberg data.

4.2 Summary statistics matched pairs sample

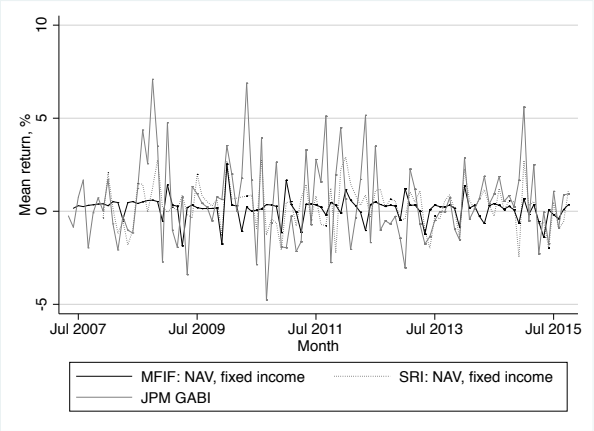
The matched pairs sample consists of 16 pairs. The average age of the microfinance funds is 63 months, and the average age of the SRI funds is 62 months. The average initial asset size for the US dollar denominated microfinance funds is $80.96 million, while the average asset size for the SRI funds is $129.93 million. The average initial asset size of Euro denominated funds is €85.96 million for the microfinance funds, and €80.98 million for the SRI funds.[17] Below, in tab. 4.2 summary statistics of the returns per category are presented. Equivalent statistics for the asset currency group is presented in tab. 9.3 in Appendix.

Entire sample	**Mean**	**Std dev**	**Min**	**Max**	**Obs**
MFIFs	0.18%	1.08%	-5.34%	5.33%	1,011
SRIs	0.49%	3.24%	-21.28%	16.94%	996
MSCI World	0.87%	3.50%	-10.51%	11.07%	1,051
JPM GABI	0.46%	2.24%	-4.77%	7.40%	1,051
Asset class	*Mean*	*Std dev*	*Min*	*Max*	*Obs*
MFIF: Fixed income	0.10%	1.06%	-5.34%	5.13%	546
SRI: Fixed income	0.22%	1.47%	-8.31%	7.52%	523
MFIF: Equity	0.28%	1.09%	-4.75%	5.33%	465
SRI: Equity	0.78%	4.42%	-21.28%	16.94%	473
Trading currency	*Mean*	*Std dev*	*Min*	*Max*	*Obs*
MFIF: USD	0.14%	0.69%	-3.80%	1.03%	151
SRI: USD	-0.04%	1.73%	-8.31%	7.52%	140
MFIF: EUR	0.19%	1.13%	-5.34%	5.33%	860
SRI: EUR	0.57%	3.42%	-21.28%	16.94%	856

Table 4.2. Matched pairs: Summary statistics of mean monthly return. Source: Own calculations based on Bloomberg data.

[17] One of the SRIs are denominated in USD and matched with a Euro denominated MFIF, hence we have used the EURUSD spot exchange rate as of 06:51:18 ET on January 20th 2016 to convert the assets of the SRI fund. The average current asset size (as of October 31st 2015) for the US dollar denominated microfinance funds is $95.2 million, while the average asset size for the SRI funds is $563.5 million. The average current asset size of Euro denominated funds is €260.9 million for the microfinance funds, and €103.5 million for the SRI funds.

Fig. 4.4 and 4.5 show mean monthly return for the fixed income and equity samples, respectively. Fixed income microfinance funds and SRIs are quite similar in terms of volatility, while equity microfinance funds are considerably less volatile than the SRIs and the equity benchmark index.



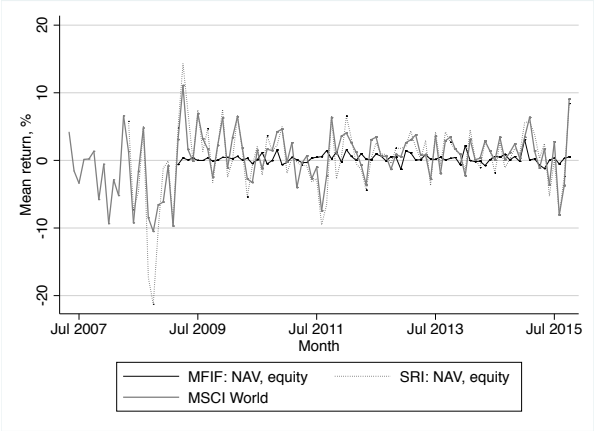


Figure 4.4. Matched pairs: mean return of fixed income funds. Source: Own calculations based on Bloomberg data.
Figure 4.5. Matched pairs: mean return of equity funds. Source: Own calculations based on Bloomberg data.

5 Results

In this section, we will first present the regression results from the stand-alone evaluation of the microfinance funds. This evaluation will be divided into four parts; CAPM results at aggregate levels, risk-adjusted return measures at aggregate levels, CAPM at individual level, and risk-adjusted return measures at individual level. Thereafter we will present the results from the matched pairs evaluation. These results will be presented in the same structure as the stand-alone evaluation.

5.1 Stand-alone evaluation of microfinance investment funds

	Beta	**Alpha**	**R^2**	**Sharpe**	**Treynor**	**Obs**
Entire sample	0.020***	0.17%***	0.20%	0.19	0.10	4,538
	(0.006)	(0.015)				
MSCI World	n.a.	n.a.	n.a.	0.19	0.01	4,616
JPM GABI	n.a.	n.a.	n.a.	0.20	0.00	4,616
Asset class	*Beta*	*Alpha*	*R^2*	*Sharpe*	*Treynor*	*Obs*
Fixed income	0.018*	0.17%***	0.20%	0.22	0.10	2,988
	(0.010)	(0.016)				
Equity	0.023***	0.18%***	0.30%	0.16	0.09	1,479
	(0.007)	(0.034)				
Asset currency	*Beta*	*Alpha*	*R^2*	*Sharpe*	*Treynor*	*Obs*
USD	0.011	0.20%***	0.00%	0.24	0.21	2,267
	(0.010)	(0.012)				

EUR	0.026*** (0.007)	0.15%*** (0.024)	0.40%	0.14	0.06	2,271

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 5.1. Microfinance funds: aggregate regressions.

First we run the regression for the entire sample, with risk-free rates dependent on trading currency, and benchmark index based on asset class and currency. The beta coefficient for the entire sample is close to zero, and the alpha coefficient, the constant of the regression, indicates a baseline return for these funds of 0.17 percent. The R-squared value is also low, meaning that market movements only explain a small fraction of the performance of these funds.

In the second aggregate regression we divide the sample into two groups based on asset class, fixed income and equity. The subsample of fixed income funds is approximately twice as big as the equity subsample. The equity beta is low and significant at the one percent level but slightly higher than the fixed income beta, which is significant at the ten percent level. The alphas from the two regressions are 0.17 percent and 0.18 percent respectively. The equity benchmark index explains somewhat more of the movement of the corresponding funds, than does the fixed income benchmark. However, both R-squared values are low.

The third aggregate level is asset currency, which divides the sample into US dollar and Euro denominated funds. These two groups are more or less of the same size in terms of number of observations. The Euro funds display a higher, significant, beta than the US dollar funds. However, the Euro funds have a lower alpha coefficient. Both R-squared values are close to, or even, zero.

The Sharpe ratio for the entire sample is 0.19, which is equal to or marginally lower than the Sharpe ratios of the equity benchmark, MSCI World Index, and of the fixed income benchmark, JPM GABI, respectively. The Treynor ratio of the entire sample is 0.10, which is higher than the ratios of the benchmark indices.

When we calculate ratios for fixed income and equity funds, we find that the fixed income sample has a slightly higher Sharpe, and a slightly lower Treynor ratio than the equity sample.

At the third aggregate level, asset currency, we find that US dollar denominated funds have a slightly higher Sharpe ratio than Euro denominated funds. The US dollar funds have almost a three times higher Treynor ratio than the Euro funds.

To summarise, regardless of aggregate level, we find similar results with highly significant alphas, and beta coefficients. Furthermore, we find overall low R-squared values indicating that the movement of the funds only to a small extent can be explained by the movement of the benchmark indices. The Sharpe ratios are similar in magnitude and close to the ratio of the benchmark indices, while the Treynor ratio varies in magnitude and sign (see tab. 5.1). We also run the regression on the sample based on trading currency, these results are presented in tab. 9.5 in Appendix.

The individual CAPM regressions of the funds are presented in tab. 9.6 in Appendix. The estimated beta coefficients range from -0.283 to 0.401, but few of them are significant. When comparing the alpha coefficients, we receive significant coefficients for more than half of the funds at one percent significance level, and the alphas range from -1.92 percent to 0.53 percent. The R-squared values show high variation in magnitude, ranging from 0.00 percent to 48.40 percent, where 69 out of the 83 funds have R-squared values that are lower than 10 percent.

The Sharpe and Treynor ratios for the individual funds are also presented in tab. 9.6 in Appendix. The calculated Sharpe ratios range from -1.98 (one fund have -77.31) to 5.93, however the majority of the funds have Sharpe ratios that are positive and slightly larger than zero. The Treynor ratios of the funds range from -1.18 to 2.82, but most of the ratios are close to zero.

To summarise, at an individual level, the funds show relatively similar results even though some of them show exaggerated coefficients. Even so, there is no clear pattern in terms of maturity of the funds regarding the performance.

5.2 Matched pairs evaluation of microfinance investment funds

The results from our matched pairs regressions at aggregate levels are presented in tab. 5.2 and the results from the asset currency level are presented in tab. 9.7 in Appendix.

Entire sample	**Beta**	**Alpha**	**R^2**	**Sharpe**	**Treynor**	**Obs**
MFIFs	0.048*** (0.013)	0.18%*** (0.034)	1.00%	0.20	0.04	1,011
SRIs	0.794*** (0.040)	-0.06% (0.079)	48.60%	0.16	0.01	996
MSCI World	n.a.	n.a.	n.a.	0.25	0.01	1,051
JPM GABI	n.a.	n.a.	n.a.	0.22	0.00	1,051
Asset class	*Beta*	*Alpha*	*R^2*	*Sharpe*	*Treynor*	*Obs*
MFIF: Fixed income	0.060** (0.030)	0.10%** (0.046)	1.40%	0.12	0.02	546
SRI: Fixed income	0.225*** (0.031)	0.15%** (0.063)	10.50%	0.16	0.01	523
MFIF: Equity	0.036*** (0.013)	0.26%*** (0.051)	1.10%	0.29	0.09	465
SRI: Equity	1.038*** (0.043)	-0.26%* (0.135)	65.00%	0.18	0.01	473
Trading currency	*Beta*	*Alpha*	*R^2*	*Sharpe*	*Treynor*	*Obs*
MFIF: USD	0.122* (0.064)	0.14%** (0.055)	3.30%	0.20	0.01	151
SRI: USD	0.459*** (0.109)	-0.02% (0.140)	7.70%	-0.02	0.00	140

MFIF: EUR	0.045***	0.17%***	1.30%	0.20	0.05	860
	(0.013)	(0.040)				
SRI: EUR	0.802***	-0.07%	50.20%	0.18	0.01	856
	(0.041)	(0.090)				

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 5.2. Matched pairs: aggregate CAPM regression results.

When we compare the entire sample of MFIFs with the entire sample of SRIs we find that the MFIF beta coefficient is substantially lower than the SRI coefficient, while the estimated alpha for the MFIFs is higher than the alpha of the SRIs. The R-squared value for MFIFs is low, while almost 50 percent for SRIs. This indicates that the movement of the benchmark index, to a larger extent, explains the movement in the performance of SRIs.

Comparing the next aggregate level, asset class, we find that the fixed income beta and alpha coefficients are similar in magnitude. The equity funds, on the other hand, are showing opposite levels. Both asset classes of MFIFs, and fixed income SRIs have low R-squared values. SRI equity funds follow the market to a larger extent.

Next we compare the funds based on trading currency, and see that US dollar funds have the same magnitude in beta and alphas, but the SRI Euro beta is substantially higher than the MFIF Euro beta. However, Euro MFIFs have higher alphas than the Euro SRIs. Also at this aggregate level we find low R-squared values for both MFIF groups and for the SRI US dollar denominated funds, while the SRI Euro denominated funds have a high R-squared value.

The Sharpe ratios for the aggregate regressions are quite similar to the Sharpe ratios of the benchmark indices. SRIs display a Sharpe ratio slightly lower than the MFIFs. The Treynor ratio is slightly higher for MFIFs, while the SRIs and benchmark Treynor ratios all are close to zero.

Based on the asset class regressions, we find quite similar Sharpe ratios for all, except for equity microfinance funds, which is about twice as large. The same pattern is visible for the Treynor ratios.

The trading currency regressions yield identical Sharpe ratios for both Euro and US dollar denominated microfinance funds, while US dollar denominated SRI funds have a negative ratio and Euro denominated funds have a positive ratio of the same magnitude as MFIFs. Once again, the Treynor ratios are almost equally large in all groups, but Euro denominated microfinance funds have a slightly higher ratio.

To summarise, the beta coefficients show quite large variation in terms of magnitude, while the alphas are more similar to each other. The R-squared values are low, except for most of the SRI groups. The risk-return ratios are low, but quite similar across groups even though microfinance funds display slightly higher ratios.

Pair	Fund name	Ccy	Beta	Alpha	R^2	Sharpe	Treynor	Obs
1	KCD FIS - Global	EUR	0.051	0.04%	1.50%	0.10	0.03	80
			(0.036)	(0.161)				
	Parvest Green Tigers C Cap		0.959***	-0.07%	50.20%	0.20	0.01	83
			(0.109)	(0.386)				
2	Triodos I Dis	EUR	0.043	0.14%	0.90%	0.15	0.05	80
			(0.041)	(0.166)				
	DNB Oekofonds TNL		1.241***	-0.85%**	72.40%	-0.01	0.00	90
			(0.106)	(0.354)				
3	Triodos I Cap	EUR	0.025	0.45%***	1.50%	0.78	0.19	78
			(0.021)	(0.080)				
	Alliance Citizen Care SRI - I		0.918***	-0.162	61.70%	0.37	0.02	79
			(0.068)	(0.259)				
4	Triodos B Cap	EUR	0.026	0.39%***	1.70%	0.70	0.17	76
			(0.021)	(0.0813)				
	Cadmos B		1.072***	-0.18%	77.20%	0.29	0.01	79
			(0.063)	(0.237)				
5	Triodos R Dis	EUR	0.029	0.39%***	2.00%	0.69	0.15	75
			(0.022)	(0.0813)				
	Parvest Environmental C Cap		0.936***	-0.25%	66.30%	0.18	0.01	66
			(0.066)	(0.248)				
6	Triodos R Dis	EUR	0.044	0.14%	1.20%	0.15	0.04	76
			(0.039)	(0.141)				
	Parvest Environmental C Cap		0.936***	-0.25%	67.00%	0.22	0.01	76
			(0.066)	(0.248)				
7	rAMF A Dis	EUR	0.133**	0.02%	5.00%	0.07	0.01	101
			(0.066)	(0.148)				
	Swisscanto Green Invest I		0.448***	-0.05%	44.30%	0.14	0.01	94
			(0.051)	(0.133)				
8	DRFV I	EUR	0.042**	0.33%***	10.80%	2.02	0.08	97
			(0.017)	(0.031)				
	Allianz Euro Credit SRI I		0.061	0.48%***	1.30%	0.39	0.08	95
			(0.060)	(0.136)				
9	DRFV Microfinance B Dis	EUR	-0.017	0.08%	0.20%	0.09	-0.04	57
			(0.057)	(0.103)				
	Erste Responsible Bond T		0.118*	0.30%**	6.60%	0.34	0.03	53
			(0.066)	(0.148)				
10	DRV A Dis	EUR	0.073	0.01%	1.90%	0.04	0.01	54
			(0.106)	(0.169)				
	Erste Responsible VA		0.108	0.36%**	5.50%	0.40	0.04	53
			(0.069)	(0.149)				
11	DRFV LC A Cap	EUR	-0.031	-0.19%	0.20%	-0.11	0.07	51
			(0.138)	(0.276)				
	Erste Responsible A		0.154	0.13%	5.20%	0.14	0.01	53

			(0.111)	(0.218)				
12	DRFV LC P Cap	USD	0.227**	0.00%	6.90%	0.00	0.00	40
			(0.086)	(0.142)				
	TIAA-CREF		0.635***	0.02%	32.70%	-0.03	0.00	37
			(0.115)	(0.159)				
13	EMF IT	USD	-0.021	0.27%***	1.60%	1.61	-0.13	44
			(0.015)	(0.026)				
	TIAA-CREF Institutional		0.636***	0.01%	32.10%	-0.03	0.00	37
			(0.116)	(0.161)				
14	EMF IA	USD	0.229	0.04%	7.00%	0.05	0.00	43
			(0.178)	(0.137)				
	TIAA-CREF Retirement		0.637***	0.02%	33.60%	-0.03	0.00	37
			(0.111)	(0.157)				
15	rAMF I Dis	EUR	0.103	0.10%	7.50%	0.18	0.01	35
			(0.083)	(0.158)				
	Erste Responsible VT		0.220***	0.16%	23.80%	0.26	0.01	35
			(0.063)	(0.157)				
16	BOMF - Debt I Cap	USD	-0.004	0.31%***	0.50%	5.92	-0.76	24
			(0.012)	(0.011)				
	Pax World		-0.301	-0.06%	1.00%	-0.02	0.00	29
			(0.402)	(0.580)				

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 5.3. Matched pairs: individual CAPM regression results. Abbreviations of fund names have been made where applicable, for full information on fund names see tab. 9.8 (MFIFs) and 9.9 (SRIs) in Appendix.

The pairwise regression on individual level is presented in tab. 5.3. The beta coefficients are close to zero for the MFIFs, the majority of the SRI betas are larger than the MFIFs and have larger variation in magnitude. The estimated alphas are roughly of the same magnitude for both MFIFs and SRIs, and vary in terms of being higher or lower than the matched.

The results from the Sharpe and Treynor ratios for the pairs are somewhat ambiguous. However, the ratios are, similar to the aggregate regressions, of the same magnitude. In some of the pairs, microfinance funds have higher quotas on both measures, whereas some pairs differ more substantially.

5.3 Discussion

In this section we discuss the results with regards to our hypotheses. First, we focus on the stand-alone evaluation and then we continue by discussing the matched pairs evaluation.

5.3.1 Stand-alone evaluation

The first hypothesis regards the beta coefficient, and more specifically the correlation of the funds to developed markets. All coefficients are around zero in magnitude, which is in line with our expectations of low correlation. The performance of microfinance funds should supposedly not follow developed markets since MFIFs invest in MFIs, which in turn provide microcredit to individuals who use the capital as funding for small businesses. Our findings are in line with Oehri and Fausch (2008), Janda and Svárovská (2010), and Janda, Rausser, and Svárovská (2014), in the sense that we find low correlation with developed markets too. However, we do not find evidence of that the funds, at aggregate levels, move in the opposite direction of the market as the aforementioned studies did. We receive a number of negative betas at the individual level, but for the purpose of this study we are interested in analysing the performance of microfinance funds as a portfolio. The appearance of negative betas could be explained by Nofsinger and Varma's (2014) finding of better performance of SRI funds than conventional funds during bear markets, while worse during bull markets. The interpretation of a negative beta in the CAPM context is that the fund moves counter to the market, implying that it could be the case that these funds have better performance than conventional funds when the market is declining. However, we have not specifically tested for different time periods to fully reinforce this reasoning.

Related to the low betas are the R-squared values. As expected, the R-squared values are low, which indicates that the movement of the benchmark indices do not explain the movement of the funds. Hence, if an investor chooses to invest in microfinance funds with the distinctive wish to diversify the portfolio this comes with the expectation of these funds being uncorrelated and not fully move with the market or even opposite the market. Thus, the low R-squared of the funds further strengthens the claim that microfinance funds display low correlation with developed markets.

The second hypothesis regards the alpha coefficient, which explains abnormal returns or compensation for systematic risk (i.e. beta). We find statistically significant alpha coefficients of the same magnitude for all aggregate regressions. The alphas are positive, which is in line with our hypothesis of larger-than-zero alphas, implying that microfinance funds compensate investors for the systematic risk. Our findings are in line with previous studies and given that we include more share classes over a longer time period, we can further strengthen the argument that the returns of microfinance funds exceed those expected by the CAPM. However, since we find close-to-zero betas the returns of microfinance funds must be captured by either the alphas or the error terms. This implies that the positive alphas could be explained by the low correlation of the funds with developed markets. This relation is visible when comparing Euro denominated funds with US dollar denominated funds, where we find that the lower the beta coefficient the higher the alpha coefficient. Another potential problem is related to the loan structure offered to microfinance receivers, which might cause the previously mentioned phenomenon of new loans financing old loans. If this is the case, the estimated alphas could capture these potentially fictive returns, and hence this would imply that investments in microfinance funds do not yield returns stemming from social improvement.

The Sharpe, or reward-to-variability, ratios show that investors are being compensated for taking on additional risk. At all aggregate levels, the Sharpe ratios are very similar to those of the chosen benchmark indices, which imply that investing in microfinance funds does not yield better performance and greater profits relative the level of risk than the market portfolio. On the other hand, adding microfinance to a portfolio does not worsen the risk-adjusted return.

The Treynor, or reward-to-volatility, ratios show that investors are compensated for the systematic risk on all aggregate levels. The ratios of the aggregate levels differ from the Treynor ratios of the chosen benchmark indices. This is expected since the ratios of the benchmarks should supposedly be zero, as these portfolios should not have any systematic risk to be compensated for as they index their own market.

5.3.2 Matched pairs evaluation

The first hypothesis of the matched pairs evaluation is regarding the beta coefficient, where the betas for the microfinance funds is hypothesised to be smaller than those of the conventional SRIs due to the nature of the investments. When we compare the betas at all aggregate levels, we find that MFIFs have lower betas than the SRIs, which indicates that microfinance funds provide better diversification benefits than conventional SRIs. Furthermore, at some of the aggregate levels the results show evidence of no diversification benefit from investing in SRIs since the beta coefficient is approximately one, implying that the funds more or less move with the market. The lower betas of MFIFs are in line with our hypothesis as the conventional SRIs supposedly have larger market exposure given their investment strategy. Nofsinger and Varma (2014) found evidence of diversification benefits from SRIs, which contradicts our findings on equity SRIs. On the other hand, we do find varying beta coefficients for the SRIs indicating that in some instances they can possibly provide diversification benefits when included in a portfolio. When we compare the matched pairs at individual level, we find that all MFIFs and fixed income SRIs can provide diversification benefits given the low correlation with developed markets. Hence, the aggregate results of the SRIs should be interpreted with caution since the included funds have varying investment strategies as opposed to the MFIFs where all of the funds have practically the same strategy.

The second hypothesis of the matched pairs evaluation is regarding the alpha coefficient, where we expect the alpha to be larger for MFIFs than for SRIs since we hypothesise lower correlation of microfinance funds to the market. At aggregate levels, we find evidence of our hypothesis. However, looking at the fixed income funds, which have similar betas, we can see that the SRI funds generate higher abnormal returns. This can be interpreted as better performance of SRI fixed income funds, since they are slightly more volatile than the MFIFs, but still generate higher abnormal return. Reconnecting to the discussion of the alpha coefficients in the stand-alone evaluation, we see that the SRIs in most instances have a higher beta and a lower alpha than the MFIFs. This does not necessarily imply that microfinance funds generate higher abnormal returns than SRIs but simply that the returns must be captured by alpha given low correlation with developed markets.

When analysing the Sharpe ratios between MFIFs and SRIs for the entire samples, we find that the risk-adjusted return are of similar magnitude, and they are lower than the benchmark indices. Overall, the Sharpe ratios of MFIFs are higher than the ratios of SRIs, indicating that microfinance investors are being compensated for taking on additional risk to a higher extent than investors into conventional responsible investments. However, since microfinance funds generate stable but low returns it is not strange that the Sharpe ratio is lower than the benchmark index. For SRIs the lower Sharpe ratio is explained by higher returns, but greater fluctuations implying that these investments are riskier than MFIFs.

The Treynor ratio of the entire sample of MFIFs is larger than that of SRIs and both benchmark indices, which indicates that MFIFs are providing better performance and greater returns relative systematic risk. Hence, microfinance funds do generate attractive risk and return traits as they provide good returns relative the level of risk.

5.3.3 Robustness

When running the simple CAPM regression without Jensen's alpha, the estimated beta coefficients do not differ substantially in magnitude or sign. The inclusion of several aggregate levels, asset class, asset currency, and trading currency show that the results found are not driven by a specific type of microfinance fund. Hence, our results on the entire sample are representative for all funds included.

In order to control for the stability of our results we run regressions using other indices. We first controlled for the relation between equity and fixed income funds by using the MSCI Emerging Markets Index and the JPM Emerging Market Bond Index, since a potential problem is our inclusion of the JPM Global Aggregate Bond Index, which includes both developed and emerging markets assets. We find the same relation between asset classes in our main regression and the robustness check, which implies that the microfinance funds have low correlation to emerging markets as well. This further justifies our decision to use a fixed income proxy based on both developed and emerging markets, as emerging markets assets do not distort our results. Furthermore, we controlled for the stability of the equity results by using the S&P 500 Index, which is similar to the MSCI World Index. The results do not show any significant differences, which strengthen the use of the MSCI World Index to capture the behaviour of the developed market.

Since we include both retail and institutional share classes, we control for significant differences between the two investor types by including a retail dummy. The results do not indicate any differences in performance. Previous studies have also included retail share classes, but they have not tested for potential differences. We wanted to take this distinction into consideration to ensure that the added variation from including retail shares does not distort the results.

6 Conclusions

For the microfinance funds to be attractive in terms of portfolio diversification they should first of all have low systematic risk in order to reduce the total risk of the portfolio and second they should possess attractive risk and return characteristics.

When evaluating the performance of microfinance funds we find evidence of low correlation to developed markets and hence low systematic risk. Therefore, we can conclude that they do reduce the total risk if included in a portfolio of developed market assets. Adding a microfinance fund to a portfolio will provide investors with stable returns, regardless of market situation. From the risk-adjusted measures, the Sharpe and Treynor ratios, we can conclude that these funds do possess attractive characteristics given that they provide reasonable returns relative the level of risk. Consequently, as a complement in an existing portfolio, microfinance funds provide diversification benefits.

The results from the matched pairs regressions indicate that MFIFs, despite being specialised investments, generate positive returns, are less correlated with developed markets than SRIs, and have risk-return levels in the same range as the other SRIs. Thus, we conclude, that if choosing between investing in conventional SRIs, MFIFs constitutes a good alternative with more advantageous diversification benefits. However, the results are ambiguous in the sense that the SRIs must be analysed with caution at aggregate levels given the different investment objectives among the SRIs.

As an overall conclusion, microfinance funds are worthwhile investment options and have positive characteristics, but there are indications of differences between the funds when dividing them into different aggregate levels and especially when looking at them individually. Even so, evaluating individual performance is not the purpose of this study. Thus, by creating a single microfinance fund portfolio and evaluating the performance against benchmark indices we can conclude that microfinance funds, in general, provide diversification benefits.

Relating our findings to those of other previous studies, we can confirm the presence of diversification benefits, given that we find similar results by including more funds (not only in number, but also from a variation perspective; institutional and retail) and studying a longer time period. Hence, the performance of microfinance funds is seemingly stable over time and there is so far no indication of that the market for microfinance funds is becoming more correlated with developed markets, as opposed to what Brière and Szafarz (2013) suggested. Furthermore, as our study runs separate regressions for asset class, asset currency, and trading currency we can in addition to confirming the diversification benefits conclude that the results are robust for all types of open-end microfinance investment funds. That microfinance funds primarily is an attractive option for institutional investors, as concluded by Oehri and Fausch (2008), is not within the scope of our study. Hence, we cannot draw any conclusions on whether or not there are differences for institutional and private investors, but we can conclude that the performance of institutional and retail-focusing funds do not show evidence of any statistically significant differences.

A possible drawback of our study is that we use an unbalanced panel dataset, due to different inception dates of the funds, and hence have missing values. The missing values in our dataset are randomly missing, thus they should not cause biased results. Another potential fallacy of our study is the inclusion of a fixed income index based on both emerging and developed markets assets. Since, by including emerging markets, the results for the fixed income funds could potentially be distorted and not properly answer the research question. We have tried to overcome this fallacy by conducting robustness checks to evaluate whether the results are sensitive to the use of different indices. There were no indication of such sensitivity, but of course, it would have been preferable to have a pure developed market index for fixed income funds. Furthermore, we have not controlled for different share classes, other than retail and institutional, which of course could behave differently. In an attempt to overcome this, we have adjusted the returns of the funds that distribute dividends. Finally, a potential drawback of our study is the matching of microfinance funds and conventional SRIs, as we were limited in the choice due to similar age and size of microfinance funds. However, the comparison provided in this study gives reasonable indications of the relative performance.

Given the results on abnormal returns of microfinance funds, and the discussion made regarding the meaning in combination with low correlation, an interesting question for a future study would be do disentangle from where these abnormal returns come. Furthermore, the indications found regarding the relative performance of microfinance funds and conventional SRIs raises the question of how microfinance funds perform relative other impact investments. Especially since microfinance funds are still relatively young, and the interest for the funds is increasing. Given the increased interest in microfinance investments and our findings of diversification benefits, an extension of this field would be to investigate the impact of MFIFs on the microfinance market. By doing so it would potentially be possible to answer whether they improve the microfinance market through increased governance and outreach of microfinance institutions or whether their concern for financial performance leads to fictive social investment where only the best performing MFIs receive funding. Furthermore, ones the number of funds will increase and hence lead to more data it will be possible to analyse potential differences between geographical regions and investment objectives, which likely would be an extension of our study in future research.

7 Summary

During the past decade the market for microfinance has developed, which has resulted in a new type of investment vehicle, namely microfinance investment funds. These investment funds are marketed as being uncorrelated with the return of developed markets and thus to provide a good portfolio diversification alternative. By constructing an unbalanced panel dataset of 83 open-end mutual fund shares, of 23 different portfolios, ranging from October 1998 to October 2015, this study tries to find an answer to whether these funds do provide a good diversification alternative or not. Using common portfolio evaluation measures, such as the Jensen's alpha CAPM and the Sharpe and Treynor ratios, we find evidence confirming the claim of portfolio diversification benefits for all investment types of microfinance funds. The funds display close-to-zero betas and larger-than-zero alphas, and have risk-adjusted measures at least of the same magnitude as the chosen benchmark indices. Moreover, the performance of these funds is compared to that of conventional socially responsible investment funds. This is conducted by using the matched pairs estimation technology, through which microfinance funds and SRIs are analysed pairwise. The findings further strengthen the evidence of diversification benefits of microfinance funds and indicate that compared to conventional SRIs they are equally beneficial in terms of risk-adjusted return measures.

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9 Appendix

9.1 Summary statistics

Tab. 9.1 shows the monthly returns in NAV per trading currency for microfinance funds, excluding funds of funds.

Trading currency	Mean	Std dev	Min	Max	Obs
USD	0.22%	0.76%	-8.26%	5.26%	1,237
EUR	0.14%	0.95%	-6.42%	5.37%	2,277
CHF	0.17%	0.91%	-11.47%	7.71%	653
GBP	0.22%	1.94%	-17.96%	13.65%	371

Table 9.1. Source: Own calculations based on Bloomberg data.

Tab. 9.2 shows the monthly returns in NAV for all microfinance funds in the sample. Trading currency in parentheses. Microfinance fund names have been abbreviated, for information on full name, asset class focus, fund age, and fund currencies see tab. 9.8.

MFIF	Mean	Std dev	Min	Max	Obs
Capital Gestion - B Cap (EUR)	0.22%	0.17%	-0.28%	0.57%	38
BOMF - Debt P Cap (CHF)	0.15%	0.32%	-2.83%	0.94%	166
DRFV P Cap (EUR)	0.24%	0.17%	-0.51%	0.74%	114
DRFV LC I Cap (EUR)	0.11%	1.27%	-3.83%	3.67%	61
DRFV I Cap (EUR)	0.31%	0.18%	-0.45%	0.80%	97
Dutch Microfund A (EUR)	0.13%	1.61%	-4.75%	4.98%	34
Erste Responsible T (EUR)	0.18%	0.47%	-1.07%	2.47%	69
Erste Responsible A (EUR)	0.05%	0.76%	-3.16%	2.52%	69
IIV Mikrofinanzfonds I (EUR)	-0.08%	1.22%	-6.42%	0.61%	48
IIV Mikrofinanzfonds R (EUR)	-0.06%	1.14%	-5.37%	1.23%	48
KCD FIS – Global (EUR)	0.08%	1.38%	-3.42%	4.30%	80
KCD III – Universal (EUR)	0.23%	0.07%	0.14%	0.34%	9
LMDF- SVCSF A (EUR)	0.05%	0.29%	-1.41%	0.52%	67
LMDF – SVCSF C (EUR)	0.09%	0.11%	-0.09%	0.32%	64
LMDF - SVCSF B (EUR)	0.13%	0.25%	-0.93%	0.58%	67
rAGMF H Cap (EUR)	0.26%	0.29%	-0.36%	2.38%	129
rAGMF H Cap (CHF)	0.17%	0.27%	-0.41%	2.24%	142
BOMF - Debt I Cap (EUR)	0.29%	0.06%	0.14%	0.39%	24
rAGMF N Cap (EUR)	0.16%	0.29%	-0.18%	0.64%	6
rAMF A Dis (EUR)	0.06%	1.44%	-4.10%	4.70%	101
rAMF I Dis (EUR)	0.14%	0.82%	-3.38%	1.19%	35
rAML S Cap (EUR)	0.27%	0.36%	-0.77%	1.44%	59
rAML S Cap (CHF)	0.22%	0.35%	-0.86%	1.39%	62
rAMF II (CHF)	0.21%	0.57%	-1.63%	1.20%	16
rAGMF II H Cap (CHF)	0.13%	0.28%	-0.23%	0.88%	18
rAGMF II H Cap (EUR)	0.17%	0.27%	-0.17%	0.91%	18

Triodos R Cap (EUR)	0.42%	0.62%	-0.92%	2.34%	75
Triodos I Cap (EUR)	0.46%	0.61%	-0.87%	2.42%	78
Triodos B Cap (EUR)	0.41%	0.62%	-0.92%	2.33%	76
Triodos B Dis (EUR)	0.17%	1.29%	-4.15%	4.51%	76
Triodos KR Dis (GBP)	0.14%	2.20%	-9.35%	11.39%	80
Triodos R Dis (EUR)	0.17%	1.27%	-4.14%	4.54%	76
Triodos I Dis (EUR)	0.18%	1.52%	-4.75%	5.33%	80
Triodos Z Cap (EUR)	0.44%	0.60%	-0.69%	1.66%	23
Triodos Z Dis (EUR)	0.19%	1.42%	-4.41%	3.49%	23
Triodos KR Cap (GBP)	0.42%	0.81%	-3.00%	2.52%	67
Triodos KB Dis (GBP)	-0.03%	2.54%	-17.96%	4.39%	64
Wallberg I Dis (EUR)	0.08%	1.22%	-4.55%	5.37%	84
Wallberg P Cap (EUR)	0.21%	0.26%	-0.83%	0.89%	84
BOMF - Debt DB-N (EUR)	0.26%	0.06%	0.12%	0.37%	13
BOMF - Debt DB-N (CHF)	0.21%	0.08%	0.11%	0.36%	13
Azure C Cap (EUR)	0.07%	0.16%	-0.21%	0.49%	33
Azure B Cap (CHF)	0.04%	0.17%	-0.23%	0.46%	33
BOMF - Debt P Cap (USD)	0.30%	0.36%	-2.74%	1.23%	204
DRFV LC I Cap (USD)	0.18%	1.04%	-3.20%	1.99%	57
EMF A (USD)	0.02%	0.84%	-3.94%	0.44%	84
EMF T (USD)	0.23%	0.21%	-1.06%	0.44%	84
KCD FIS – Lateinamerika (USD)	0.01%	1.66%	-7.17%	4.51%	80
BOMF - Debt I Cap (USD)	0.31%	0.05%	0.15%	0.39%	24
rAGMF B Cap (USD)	0.28%	0.96%	-4.60%	4.13%	142
rAML Q (USD)	0.35%	0.42%	-0.80%	2.14%	79
rAML I Cap (USD)	0.29%	0.35%	-0.82%	1.47%	62
rAGMF II Cap (USD)	0.20%	0.26%	-0.13%	0.91%	18
EMF IT (USD)	0.27%	0.17%	-0.70%	0.41%	44
EMF IA (USD)	0.04%	0.90%	-3.80%	0.41%	43
BOMF- Debt DB-N (USD)	0.29%	0.06%	0.14%	0.37%	13
Azure A Cap (USD)	0.08%	0.16%	-0.18%	0.49%	33
Triodos KI Dis (GBP)	0.15%	2.59%	-11.02%	13.65%	80
SEB III B/D NH Dis (EUR)	-0.99%	0.01%	-1.00%	-0.98%	4
SEB II B/D NH Dis (EUR)	-1.56%	1.12%	-3.21%	-0.02%	16
Seb II B/C NH Cap (EUR)	-1.80%	0.91%	-3.21%	-1.22%	10
Seb II A/D NH Dis (EUR)	-1.50%	1.25%	-3.15%	0.59%	16
DRFV B Dis (USD)	0.15%	0.04%	0.08%	0.19%	7
DRFV B Dis (EUR)	0.05%	0.82%	-3.18%	0.79%	57
DRFV LC A Cap (EUR)	-0.24%	1.88%	-5.34%	5.13%	51
DR - Vision I Cap (USD)	0.24%	0.09%	0.08%	0.45%	41
DRV I Cap (CHF)	0.18%	0.10%	-0.13%	0.35%	39
DRV A Dis (EUR)	0.03%	1.25%	-3.19%	3.37%	54
DRFV LC P Cap (CHF)	-0.16%	0.92%	-3.22%	0.84%	35
DRFV LC B Dis (EUR)	-0.20%	1.77%	-5.25%	5.10%	44
DRFV B Dis (CHF)	0.01%	0.91%	-2.67%	2.56%	30
DRFV P Cap (CHF)	0.14%	0.11%	-0.21%	0.36%	43

BOMF - Debt P Cap (EUR)	0.23%	0.38%	-2.91%	2.05%	150
Triodos KI Cap (GBP)	0.47%	0.60%	-0.61%	2.42%	44
BOMF - Debt I Cap (CHF)	0.25%	0.08%	0.11%	0.37%	24
DRFV LC P Cap (USD)	0.00%	0.92%	-3.25%	1.03%	40
Finethic C1 (USD)	0.38%	0.17%	0.05%	0.99%	108
Finethic C3 (CHF)	0.41%	2.62%	-11.47%	7.71%	65
Finethic S1 (USD)	0.00%	0.19%	-0.31%	0.72%	69
Finethic C6 (GBP)	0.32%	0.16%	0.06%	1.00%	36
Saint Honoré A (EUR)	0.18%	0.22%	-0.46%	0.80%	71
DRFV P Cap (USD)	0.23%	1.64%	-8.26%	5.26%	38
Etimos Fund - P Cap (EUR)	0.11%	0.16%	-0.31%	0.54%	51

Table 9.2. Source: Own calculations based on Bloomberg data.

Tab. 9.3 shows the mean returns in NAV per asset currency for microfinance funds and socially responsible investment funds.

Asset currency	Mean	Std dev	Min	Max	Obs
MFIF: USD	0.04%	1.12%	-5.34%	5.13%	202
SRI: USD	0.02%	1.69%	-8.31%	7.52%	193
MFIF: EUR	0.22%	1.06%	-4.75%	5.33%	809
SRI: EUR	0.60%	3.50%	-21.28%	16.94%	803

Table 9.3. Source: Own calculations based on Bloomberg data.

Tab. 9.4 shows the mean returns in NAV for all microfinance funds and socially responsible investment funds, respectively. Trading currency in parentheses. Fund names have been abbreviated, for information on full name, asset class focus, fund age, and fund currencies see tab. 9.8 (microfinance funds) and 9.9 (socially responsible investment funds).

MFIF	Mean	Std dev	Min	Max	Obs
KCD FIS – Global (EUR)	0.08%	1.38%	-3.42%	4.30%	80
Triodos I Dis (EUR)	0.18%	1.52%	-4.75%	5.33%	80
Triodos I Cap (EUR)	0.46%	0.61%	-0.87%	2.42%	78
Triodos B Cap (EUR)	0.41%	0.62%	-0.92%	2.33%	76
Triodos R Cap (EUR)	0.42%	0.62%	-0.92%	2.34%	75
Triodos R Dis (EUR)	0.17%	1.27%	-4.14%	4.54%	76
rAMF A Dis (EUR)	0.06%	1.44%	-4.10%	4.70%	101
DRFV I (EUR)	0.31%	0.18%	-0.45%	0.80%	97
DRFV Microfinance B Dis (EUR)	0.05%	0.82%	-3.18%	0.79%	57
DRV A Dis (EUR)	0.03%	1.25%	-3.19%	3.37%	54
DRFV LC A Cap (EUR)	-0.24%	1.88%	-5.34%	5.13%	51
DRFV LC P Cap (USD)	-0.01%	0.92%	-3.25%	1.03%	40
EMF IT (USD)	0.27%	0.17%	-0.67%	0.41%	44
EMF IA (USD)	0.04%	0.90%	-3.80%	0.41%	43
rAMF I Dis (USD)	0.14%	0.82%	-3.38%	1.19%	35
BOMF - Debt I Cap (USD)	0.31%	0.05%	0.15%	0.39%	24

SRI	Mean	Std dev	Min	Max	Obs
Parvest Green Tigers C Cap (EUR)	0.90%	4.77%	-10.48%	16.46%	83
DNB Oekofonds TNL (EUR)	-0.09%	5.81%	-21.28%	16.94%	90
Alliance Citizen Care SRI – I (EUR)	1.40%	3.88%	-8.75%	11.19%	79
Cadmos B (EUR)	1.16%	4.06%	-10.98%	12.73%	79
Parvest Environmental I Cap (EUR)	0.63%	3.51%	-7.36%	8.82%	66
Parvest Environmental C Cap (EUR)	0.80%	3.63%	-7.45%	8.77%	76
Swisscanto Green Invest I (EUR)	0.19%	1.66%	-3.93%	4.83%	94
Allianz Euro Credit SRI I (EUR)	0.46%	1.31%	-3.81%	3.81%	95
Erste Responsible Bond T (EUR)	0.35%	1.07%	-2.21%	2.65%	53
Erste Responsible VA (EUR)	0.40%	1.06%	-2.21%	2.65%	53
Erste Responsible A (EUR)	0.19%	1.58%	-3.72%	4.68%	53
TIAA-CREF (USD)	-0.03%	1.19%	-4.29%	2.49%	37
TIAA-CREF Institutional (USD)	-0.04%	1.20%	-4.44%	2.49%	37
TIAA_CREF Retirement (USD)	-0.03%	1.18%	-4.20%	2.49%	37
Erste Responsible VT (EUR)	0.25%	0.97%	-2.08%	1.52%	35
Pax World (USD)	-0.07%	3.07%	-8.31%	7.52%	29

Table 9.4. Source: Own calculations based on Bloomberg data.

9.2 Results

Tab. 9.5 shows the Jensen's alpha CAPM regressions results per trading currency for microfinance funds, excluding funds of funds.

Trading currency	Beta	Alpha	R^2	Sharpe	Treynor	Obs
USD	0.037***	0.22%***	0.90%	0.31	0.07	1,237
	(0.011)	(0.023)				
EUR	0.025***	0.14%***	0.50%	0.17	0.16	2,277
	(0.007)	(0.020)				
CHF	-0.015	0.19***	0.10%	0.19	-0.08	653
	(0.020)	(0.033)				
GBP	0.009	0.21%**	0.00%	0.11	0.27	371
	(0.021)	(0.096)				

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 9.5.

Tab. 9.6 shows the Jensen's alpha CAPM regressions results for all microfinance funds. Microfinance fund names have been abbreviated, for information on full name, asset class focus, fund age, and fund currencies see tab. 9.8.

MFIF	Beta	Alpha	R^2	Sharpe	Treynor	Obs
Capital Gestion - B Cap	-0.015	0.23%***	3.20%	1.31	-0.15	38

	(0.019)	(0.032)				
BOMF - Debt P Cap	0.009 (0.022)	0.16%*** (0.024)	0.30%	0.53	0.19	166
DRFV P Cap	0.045*** (0.016)	0.24%*** (0.028)	11.20%	1.55	0.06	114
DRFV LC I Cap	-0.004 (0.088)	0.12% (0.156)	0.00%	0.10	-0.30	61
DRFV I Cap	0.042** (0.017)	0.33%*** (0.031)	10.80%	2.02	0.08	97
Dutch Microfund A	-0.078 (0.049)	0.27% (0.310)	3.90%	0.13	-0.03	34
Erste Responsible T	0.102*** (0.031)	0.13%*** (0.047)	27.10%	0.40	0.02	69
Erste Responsible A	0.102*** (0.037)	0.00% (0.085)	11.20%	0.08	0.01	69
IIV Mikrofinanzfonds I	0.020 (0.026)	-0.08% (0.197)	0.20%	-0.04	-0.03	48
IIV Mikrofinanzfonds R	0.031 (0.024)	-0.07% (0.182)	0.60%	-0.03	-0.01	48
KCD FIS - Global	0.051 (0.036)	0.04% (0.161)	1.50%	0.08	0.02	80
KCD III - Universal	0.021** (0.008)	0.24%*** (0.016)	48.40%	3.73	0.12	9
LMDF- SVCSF A	0.001 (0.011)	0.06% (0.040)	0.00%	0.20	0.57	67
LMDF – SVCSF C	0.010 (0.007)	0.09%*** (0.021)	3.80%	0.89	0.10	64
LMDF - SVCSF B	0.001 (0.010)	0.13%*** (0.035)	0.00%	0.54	1.35	67
rAGMF H Cap	0.019 (0.017)	0.27%*** (0.030)	1.50%	0.95	0.15	129
rAGMF H Cap	0.032 (0.020)	0.16%*** (0.027)	3.90%	0.65	0.06	142
BOMF - Debt I Cap	0.005 (0.004)	0.30%*** (0.015)	1.80%	4.94	0.60	24
rAGMF N Cap	-0.035 (0.086)	0.18% (0.122)	3.10%	0.61	-0.05	6
rAMF A Dis	0.133** (0.066)	0.02% (0.148)	5.00%	0.07	0.01	101
rAMF I Dis	0.103 (0.083)	0.10% (0.158)	7.50%	0.18	0.01	35
rAML S Cap	0.001 (0.014)	0.28%*** (0.050)	0.00%	0.79	2.82	59
rAML S Cap	0.003 (0.012)	0.23%*** (0.047)	0.10%	0.64	0.74	62
rAMF II	0.120	0.08%	26.30%	0.37	0.02	16

	(0.092)	(0.181)				
rAGMF II H Cap	0.014 (0.021)	0.12%* (0.062)	1.40%	0.48	0.09	18
rAGMF II H Cap	-0.01 (0.026)	0.20%*** (0.061)	0.60%	0.70	-0.19	18
Triodos R Cap	0.029 (0.022)	0.39%*** (0.081)	2.00%	0.69	0.15	75
Triodos I Cap	0.025 (0.021)	0.45%*** (0.080)	1.50%	0.78	0.19	78
Triodos B Cap	0.026 (0.021)	0.39%*** (0.081)	1.70%	0.69	0.16	76
Triodos B Dis	0.044 (0.039)	0.13% (0.143)	1.10%	0.14	0.04	76
Triodos KR Dis	0.038 (0.040)	0.10% (0.245)	0.40%	0.07	0.04	80
Triodos R Dis	0.044 (0.039)	0.14% (0.141)	1.20%	0.15	0.04	76
Triodos I Dis	0.043 (0.041)	0.14% (0.166)	0.90%	0.13	0.05	80
Triodos Z Cap	0.070** (0.030)	0.37%*** (0.114)	19.10%	0.74	0.06	23
Triodos Z Dis	0.033 (0.051)	0.17% (0.311)	0.80%	0.14	0.06	23
Triodos KR Cap	0.008 (0.042)	0.41%*** (0.113)	0.10%	0.51	0.52	67
Triodos Dis	-0.055 (0.077)	0.01% (0.276)	0.50%	-0.01	0.01	64
Wallberg I Dis	-0.025 (0.056)	0.15% (0.148)	0.30%	0.11	-0.06	84
Wallberg P Cap	-0.018 (0.016)	0.28%*** (0.036)	2.00%	1.05	-0.15	84
BOMF - Debt N	0.004 (0.004)	0.27%*** (0.019)	2.10%	4.61	0.71	13
BOMF - Debt N	0.003 (0.008)	0.21%*** (0.023)	1.30%	2.61	0.70	13
Azure C Cap	0.046*** (0.008)	0.05%* (0.027)	29.50%	0.71	0.02	33
Azure B Cap	0.030** (0.011)	0.01% (0.026)	14.10%	0.24	0.01	33
BOMF - Debt P Cap	0.068*** (0.021)	0.29%*** (0.036)	5.30%	0.88	0.05	204
DRFV LC I Cap	0.401*** (0.105)	0.13% (0.129)	19.30%	0.17	0.00	57
EMF A	0.095 (0.061)	-0.01% (0.105)	3.50%	0.03	0.00	84
EMF T	-0.016 (0.018)	0.24%*** (0.021)	1.60%	1.15	-0.15	84
KCD FIS - Lateinamerika	0.041*	-0.03%	1.10%	0.01	0.00	80

	(0.024)	(0.192)				
BOMF - Debt I Cap	-0.004 (0.012)	0.31%*** (0.011)	0.50%	5.93	-0.79	24
rAGMF B Cap	-0.114* (0.067)	0.33%*** (0.081)	3.50%	0.30	-0.03	142
rAML Q	0.061 (0.040)	0.39%*** (0.065)	0.90%	0.99	0.07	79
rAML I Cap	0.0064 (0.010)	0.28%*** (0.046)	3.90%	0.82	0.45	62
rAGMF II Cap	-0.024 (0.045)	0.20%*** (0.066)	0.70%	0.78	-0.08	18
EMF IT	-0.021 (0.015)	0.27%*** (0.026)	1.60%	1.61	-0.13	44
EMF IA	0.229 (0.178)	0.04% (0.137)	7.00%	0.05	0.00	43
BOMF- Debt N	-0.005 (0.017)	0.29%*** (0.015)	0.80%	5.07	-0.58	13
Azure A Cap	0.002 (0.008)	0.08%** (0.031)	0.20%	0.52	0.40	33
Triodos KI Dis	0.047 (0.047)	0.10% (0.287)	0.40%	0.06	0.03	80
SEB III B/D NH Dis	-0.008 (0.006)	-0.97%*** (0.006)	29.10%	-77.31	1.22	4
SEB II B/D NH Dis	0.013 (0.052)	-1.57%*** (0.305)	0.20%	-1.37	-1.18	16
SEB II B/C NH Cap	0.164* (0.071)	-1.92%*** (0.280)	30.30%	-1.98	-0.11	10
SEB II A/D NH Dis	0.083 (0.149)	-1.57%*** (0.344)	2.60%	-1.18	-0.18	16
DRFV B Dis	0.035* (0.0147)	0.16%*** (0.016)	37.80%	3.75	0.04	7
DRFV B Dis	-0.017 (0.057)	0.08% (0.103)	0.20%	0.09	-0.04	57
DRFV LC A Cap	-0.031 (0.138)	-0.19% (0.276)	0.20%	-0.11	0.07	51
DR - Vision I Cap	-0.012 (0.014)	0.24%*** (0.015)	1.70%	2.58	-0.20	41
DRV I Cap	0.007 (0.010)	0.18%*** (0.017)	1.70%	1.75	0.26	39
DRV A Dis	0.073 (0.106)	0.01% (0.169)	1.90%	0.04	0.01	54
DRFV LC P Cap	-0.036 (0.060)	-0.14% (0.161)	0.70%	-0.17	0.04	35
DRFV LC B Dis	0.135 (0.124)	-0.25% (0.274)	3.00%	-0.10	-0.01	44
DRFV B Dis	0.074 (0.125)	-0.03% (0.136)	2.90%	0.01	0.00	30
DRFV P Cap	0.007 (0.009)	0.14%*** (0.017)	2.00%	1.26	0.20	43
BOMF - Debt P Cap	-0.005 (0.020)	0.26%*** (0.033)	0.10%	0.66	-0.51	150
Triodos KI Cap	-0.041 (0.028)	0.50%*** (0.090)	4.50%	0.78	-0.11	44

BOMF - Debt I Cap	0.003 (0.009)	0.24%*** (0.016)	0.70%	3.24	0.82	24
DRFV LC P Cap	0.227** (0.086)	0.00% (0.142)	6.90%	0.00	0.00	40
Finethic C1	0.071** (0.030)	0.40%*** (0.031)	10.50%	2.39	0.06	108
Finethic C3	-0.283 (0.173)	0.53%* (0.285)	6.80%	0.16	-0.01	65
Finethic S1	0.003 (0.018)	0.00% (0.023)	0.00%	0.00	0.00	69
Finethic C6	0.020** (0.008)	0.32%*** (0.026)	6.40%	2.05	0.16	36
Saint Honoré A	-0.010 (0.015)	0.19%*** (0.043)	1.40%	0.83	-0.18	71
DRFV P Cap	0.119 (0.072)	0.26% (0.270)	2.20%	0.21	0.03	38
Etimos Fund - P Cap	0.009 (0.010)	0.13%*** (0.027)	1.20%	0.86	0.15	51

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 9.6.

Tab. 9.7 shows the Jensen's alpha CAPM regressions results per asset currency for microfinance funds and socially responsible investment funds, respectively.

Asset currency	Beta	Alpha	R^2	Sharpe	Treynor	Obs
MFIF: USD	0.005 (0.094)	0.05% (0.079)	0.00%	0.05	0.10	202
SRI: USD	0.263*** (0.080)	0.00% (0.119)	5.80%	0.02	0.00	193
MFIF: EUR	0.048*** (0.012)	0.20%*** (0.038)	1.60%	0.24	0.05	809
SRI: EUR	0.826*** (0.041)	-0.08% (0.094)	52.10%	0.18	0.01	803

Robust standard errors in parentheses
*** p<0.01 ** p<0.05 * p<0.1

Table 9.7.

9.3 Descriptive

Tab. 9.8 shows information on full name, asset class focus, fund age, fund currencies, total assets and ISIN codes for microfinance funds. Ccy refers to trading currency, and Assets refers to total assets as of October 31st 2015, if not stated otherwise.

Equity funds	Ccy	Assets	Inc date	ISIN
IIV Mikrofinanzfonds I	EUR	€190.7M	11-10-10	DE000A1H44S3

IIV Mikrofinanzfonds R	EUR	€190.7M	11-10-10	DE000A1H44T1
KCD Mikrofinanzfonds FIS – Global[LuxFLAG]	EUR	€112.6M	09-02-27	LU0412316290
KCD Mikrofinanzfonds FIS – Lat. AmL[LuxFLAG]	USD	€31.85M	09-02-27	LU0412316373
Luxembourg Microfinance and Development Fund - Social Venture Capital Sub-Fund A[LuxFLAG]	EUR	€4.3M (15-09-30)	10-03-31	LU0456965887
Luxembourg Microfinance and Development Fund - Social Venture Capital Sub-Fund B[LuxFLAG]	EUR	€14.7M (15-09-30)	10-06-30	LU0456967404
Luxembourg Microfinance and Development Fund - Social Venture Capital Sub-Fund C[LuxFLAG]	EUR	€2.4M (15-09-30)	10-06-30	LU0456967404
responsAbility Sicav Lux Microfinance Leaders I Cap[LuxFLAG]	USD	$254.1M	10-08-31	LU0520962514
responsAbility Sicav Lux Microfinance Leaders S Cap[LuxFLAG]	EUR	$254.1M	10-09-27	LU0520963082
responsAbility Sicav Lux Microfinance Leaders S Cap[LuxFLAG]	CHF	$254.1M	10-08-31	LU0520962605
Triodos Sicav II - Microfinance Fund I Dis[LuxFLAG]	EUR	€224.6M (15-01-30)	09-03-01	LU0402513674
Triodos Sicav II - Microfinance Fund KI Cap[LuxFLAG] (*Liquidated*)	GBP	€166.4M (14-02-28)	10-10-29	LU0402513914
Triodos Sicav II - Microfinance Fund B Cap[LuxFLAG]	EUR	€224.6M (15-01-30)	09-06-02	LU0406596501
Triodos Sicav II - Microfinance Fund B Dis[LuxFLAG]	EUR	€224.6M (15-01-30)	09-07-01	LU0407946978
Triodos Sicav II - Microfinance Fund I Cap[LuxFLAG]	EUR	€224.6M (15-01-30)	09-04-01	LU0402513328
Triodos Sicav II - Microfinance Fund KB Dis[LuxFLAG]	GBP	€224.6M (15-01-30)	10-06-01	LU0464591139
Triodos Sicav II - Microfinance Fund KI Dis[LuxFLAG]	GBP	€224.6M (15-01-30)	09-03-01	LU0402514052
Triodos Sicav II - Microfinance Fund KR Cap[LuxFLAG]	GBP	€224.6M (15-01-30)	10-04-01	LU0403566226
Triodos Sicav II - Microfinance Fund KR Dis[LuxFLAG]	GBP	€224.6M (15-01-30)	09-03-01	LU0403566739
Triodos Sicav II - Microfinance Fund R Cap[LuxFLAG]	EUR	€224.6M (15-01-30)	09-07-01	LU0402511389
Triodos Sicav II - Microfinance Fund R Dis[LuxFLAG]	EUR	€224.6M (15-01-30)	09-07-31	LU0402512866
Triodos Sicav II - Microfinance Fund Z Cap[LuxFLAG]	EUR	€224.6M (15-01-30)	13-10-31	LU0842298738
Triodos Sicav II - Microfinance Fund Z Dis[LuxFLAG]	EUR	€224.6M (15-01-30)	13-10-31	LU0842303249

Fixed income funds	**Ccy**	**Assets**	**Inc date**	**ISIN**
BOMF - BlueOrchard Debt N Cap[LuxFLAG]	EUR	$276.0M	14-06-30	LU1079060882
BOMF - BlueOrchard Debt N Cap[LuxFLAG]	USD	$276.0M	14-06-30	LU1079060700
BOMF - BlueOrchard Debt N Cap[LuxFLAG]	CHF	$276.0M	14-06-30	LU1079060619
BOMF - BlueOrchard Debt I Cap[LuxFLAG]	EUR	$276.0M	13-10-31	LU0973080392

BOMF - BlueOrchard Debt I Cap[LuxFLAG]	USD	$276.0M	13-10-31	LU0973079543
BOMF - BlueOrchard Debt I Cap[LuxFLAG]	CHF	$276.0M	13-10-31	LU0973079972
BOMF - BlueOrchard Debt P Cap[LuxFLAG]	USD	$276.0M	98-10-07	LU0091117944
BOMF - BlueOrchard Debt P Cap[LuxFLAG]	EUR	$276.0M	03-04-02	LU0164081316
BOMF - BlueOrchard Debt P Cap[LuxFLAG]	CHF	$276.0M	01-12-05	LU0136928586
Capital Gestion - Microfinance B Cap[LuxFLAG]	EUR	€55.5M	12-08-16	LU0790037278
Dual Return - Vision Microfinance A Dis[LuxFLAG]	EUR	€213.4M	11-03-25	LU0563441798
Dual Return - Vision Microfinance I Cap[LuxFLAG]	USD	€235.0M	12-05-10	LU0306116160
Dual Return - Vision Microfinance I Cap[LuxFLAG]	CHF	€231.0M	12-07-25	LU0306116830
Dual Return Fund - Vision Microfinance B Dis[LuxFLAG]	EUR	€213.4M	11-01-25	LU0563441954
Dual Return Fund - Vision Microfinance B Dis[LuxFLAG]	CHF	€213.4M	13-04-25	LU0846183142
Dual Return Fund - Vision Microfinance B Dis[LuxFLAG]	USD	€213.4M	15-03-25	LU0846183068
Dual Return Fund - Vision Microfinance I Cap[LuxFLAG]	EUR	€213.4M	07-09-25	LU0306115196
Dual Return Fund - Vision Microfinance Local Currency A Cap[LuxFLAG]	EUR	$38.3M	11-07-25	LU0591909972
Dual Return Fund - Vision Microfinance Local Currency B Dis[LuxFLAG]	EUR	$39.9M (15-11-10)	12-02-27	LU0591910129
Dual Return Fund - Vision Microfinance Local Currency I Cap[LuxFLAG]	EUR	$39.9M (15-11-10)	10-09-27	LU0533938022
Dual Return Fund - Vision Microfinance Local Currency I Cap[LuxFLAG]	USD	$42.2M	11-01-25	LU0548652287
Dual Return Fund - Vision Microfinance Local Currency P Cap[LuxFLAG]	USD	$42.2M	11-09-26	LU0646936384
Dual Return Fund - Vision Microfinance Local Currency P Cap[LuxFLAG]	CHF	$39.9M (15-11-10)	12-10-25	LU0846183811
Dual Return Fund - Vision Microfinance P Cap[LuxFLAG] (*Inactive*)	USD	€87.4M (09-07-31)	06-05-26	LU0236782842
Dual Return Fund - Vision Microfinance P Cap[LuxFLAG]	EUR	€213.4M	06-04-25	LU0236782842
Dual Return Fund - Vision Microfinance P Cap[LuxFLAG]	CHF	€231.0M	12-03-26	LU0236783907
EMF Microfinance Fund AGmvK A	USD	$59.8M	08-10-24	LI0045795726
EMF Microfinance Fund AGmvK IA	USD	$59.8M	12-03-30	LI0146840744
EMF Microfinance Fund AGmvK IT	USD	$59.8M	12-02-01	LI0146840751
EMF Microfinance Fund AGmvK T	USD	$59.8M	08-10-24	LI0045796468
Erste Sparinvest - Erste Responsible Microfinance A	EUR	€27.5M (15-10-15)	09-12-10	AT0000A0G249
Erste Sparinvest - Erste Responsible Microfinance T	EUR	€27.5M (15-10-15)	09-12-10	AT0000A0G256

Etimos Fund - Global Microfinance Debt P Cap[LuxFLAG] (*Inactive*)	EUR	€3.49M (15-08-31)	11-05-31	LU0605440857
Finethic S.C.A SICAV-SIF - Finethic Microfinance C1[LuxFLAG]	USD	$209.2M	06-10-15	LU0262965956
Finethic S.C.A SICAV-SIF - Finethic Microfinance C3 - Hedged in CHF[LuxFLAG]	CHF	$209.2M	11-06-30	LU0504540880
Finethic S.C.A SICAV-SIF - Finethic Microfinance C6 - Hedged in GBP (Inactive) [LuxFLAG]	GBP	$209.2M	12-01-30	LU0740790083
Finethic S.C.A SICAV-SIF - Finethic Microfinance S1[LuxFLAG]	USD	$209.2M	08-10-15	LU0338488116
KCD Mikrofinanzfonds III - Universal[LuxFLAG]	EUR	€30.8M	15-01-30	LU1106543249
responsAbility Global Microfinance Fund B Cap[LuxFLAG]	USD	$1,031.4M	03-11-25	LU0180189770
responsAbility Global Microfinance Fund II H Cap[LuxFLAG]	CHF	$1,031.4M	14-04-30	LU1050624433
responsAbility Global Microfinance Fund II H Cap[LuxFLAG]	EUR	$1,031.4M	14-04-30	LU1050624516
responsAbility Global Microfinance Fund II Cap[LuxFLAG]	USD	$1,031.4M	14-04-30	LU1050624359
responsAbility Global Microfinance Fund H Cap[LuxFLAG]	EUR	$1,031.4M	05-01-26	LU0180190273
responsAbility Global Microfinance Fund H Cap[LuxFLAG]	CHF	$1,031.4M	03-12-23	LU0180190604
responsAbility Global Microfinance Fund N Cap[LuxFLAG]	EUR	$1,031.4M	15-04-30	LU1050624607
responsAbility Sicav Microfinance Leaders Q[LuxFLAG] (*Liquidated*)	USD	$136.4M (13-06-28)	06-11-15	LU0274396679
responsAbility Sicav Lux - Mikrofinanz-Fonds A Dis[LuxFLAG]	EUR	€497.0M	07-05-29	LU0302153209
responsAbility Sicav Lux - Mikrofinanz-Fonds I Dis[LuxFLAG]	EUR	€497.0M	12-11-27	LU0826191198
responsAbility Sicav Lux - Mikrofinanz-Fonds I II[LuxFLAG]	CHF	€497.0M	14-06-30	LU1050624276
Symbiotics Sicav Lux - SEB Microfinance Fund III B/D NH Dis[LuxFLAG]	EUR	€4.0M (15-09-30)	15-05-29	LU1235211452
Symbiotics Sicav Lux- Seb Microfinance Fund II A/D NH Dis[LuxFLAG]	EUR	€5.4M (15-09-30)	15-03-31	LU1068869970
Symbiotics Sicav Lux- Seb Microfinance Fund II B/C NH Cap[LuxFLAG]	EUR	€1.2M (15-09-30)	14-06-02	LU1068870044
Symbiotics Sicav Lux- SEB Microfinance Fund II B/D NH Dis[LuxFLAG]	EUR	€5.6M (15-09-30)	14-06-02	LU1068870127
Wallberg Global Microfinance Fund I Dis[LuxFLAG]	EUR	€15.2M	08-10-21	LU0375612404
Wallberg Global Microfinance Fund P Cap[LuxFLAG]	EUR	€15.2M	08-10-21	LU0375612230

Mixed allocation funds	**Ccy**	**Assets**	**Inc date**	**ISIN**
Azure Global Microfinance Fund A Cap[LuxFLAG] (*Liquidated*)	USD	$10.6M (14-08-29)	11-11-30	LU0668571820
Azure Global Microfinance Fund B Cap[LuxFLAG] (*Liquidated*)	CHF	$10.6M (14-08-29)	11-11-30	LU0668573875
Azure Global Microfinance Fund C Cap[LuxFLAG] (*Liquidated*)	EUR	$10.6M (14-08-29)	11-11-30	LU0668575144

Dutch Microfund A (*Inactive*)	EUR	€1.6M (10-02-26)	08-09-12	NL0006369092
Saint Honoré Microfinance A (*Liquidated*)	EUR	€4.1M (11-10-21)	05-11-28	LU0236800768

Table 9.8. Source: Bloomberg (2015).

Tab. 9.9 shows information on full name, asset class focus, fund age, fund currencies, total assets and ISIN codes for socially responsible investment funds. Ccy refers to trading currency, and Assets refers to total assets as of October 31st 2015, if not stated otherwise.

SRIs	**Ccy**	**Assets**	**Inc date**	**ISIN**
Parvest Green Tigers Classic-Capitalisation Novethic Green Label/LuxFLAG Environment	EUR	€60.5M	08-11-30	LU0823437925
DKB Oekofonds TNL	EUR	€13.6M	08-04-01	LU0355139220
Alliance Citizen Care SRI – I Novethic SRI Label	EUR	€15.1M	09-03-13	FR0010727792
Cadmos Fund Management-Guile Europ Engagement B Novethic SRI Label	EUR	€83.5M	09-03-06	LU0412997206
PARVEST Environmental Opportunities I Cap Novethic Green Label	EUR	€135,1M	09-11-12	LU0406802768
PARVEST Environmental Opportunities C C Novethic Green Label	EUR	€135,1M	09-11-12	LU0406802339
Swisscanto (LU) PF Green Invest Income (EUR) I Your SRI Diamond Standard	EUR	€20.0M	07-12-07	LU0288149338
Allianz Euro Credit SRI I Novethic SRI Label	EUR	€167.3M	07-09-17	FR0010510461
Erste Responsible Bond Euro Corporate T Novethic SRI Label	EUR	€157.8M	11-05-02	AT0000A0PHJ4
Erste Responsible Bond Euro Corporate VA Novethic SRI Label	EUR	€157.8M	11-05-02	AT0000A0PHK2
Erste Responsible Bond Euro Corporate A Novethic SRI Label	EUR	€157.8M	11-05-02	AT0000A0PHH8
TIAA-CREF Social Choice Bond Premier US SIF	USD	$609.5M	12-09-21	CUSIP87245R680
TIAA-CREF Social Choice Bond Institutional US SIF	USD	$609.5M	12-09-21	CUSIP87245R672
TIAA-CREF Social Choice Bond Retirement US SIF	USD	$609.5M	12-09-21	CUSIP87245R698
Erste Responsible Bond VT Novethic SRI Label	EUR	€138.0M	12-11-30	AT0000A0WLW5
Pax World High Yield Bond Fund US SIF	USD	$425.7M	13-05-01	CUSIP704223577

Table 9.9. Source: Bloomberg (2015).

Below follows a list of descriptions for the 23 microfinance portfolios included in the sample, these descriptions are the ones that are presented under the fund description menu in Bloomberg.

Azure Global Microfinance fund (AGMF) is an open-end fund incorporated in Luxembourg. The Fund's objective is to provide an attractive risk-adjusted return. The Fund invests in a

diversified portfolio of targeted microfinance Funds investing in MFIs and other microfinance investments.

BlueOrchard Microfinance Fund – BlueOrchard Debt (BOMF) is a SICAV incorporated under the laws of Luxembourg. The Fund aims at offering investors a stable return, higher than money market rates, by providing debt financing to a well-diversified portfolio of carefully selected, financially sustainable MFIs in emerging economies.

Capital Gestion Microfinance is an open-end fund incorporated in Luxembourg. The Fund's objective is to achieve capital appreciation. The Fund invests primarily in listed and unlisted debt securities issued by microfinance institutions but also in government or corporate bonds in emerging markets.

Dual Return – Vision Microfinance is a SICAV incorporated in Luxembourg. The Fund's objective is total return. The Fund invests its assets directly in notes issued by carefully selected microfinance institutions or indirectly in collateral debt obligations. To a limited extent, the Fund may also hold non-listed shares issued by microfinance institutions.

Dual Return Fund – Vision Microfinance Local Currency is a SICAV incorporated in Luxembourg. The Fund's objective is total return. The Fund invests its assets directly in notes issued by carefully selected microfinance institutions or indirectly in collateral debt obligations. To a limited extent, the Fund may also hold non-listed shares issued by microfinance institutions.

Dutch Microfund is an open-end fund incorporated in the Netherlands. It invests in a wide range of microfinance products including direct and indirect investments in microfinance institutions, small-and-medium enterprises and other investments in emerging markets. The investments are spread across various countries and regions through equity and loan products.

EMF Microfinance Fund AGmvK is an open-end investment fund incorporated in Liechtenstein. The objective is to generate long-term rise of its assets and to contribute the creation of prosperity to underprivileged population group and emerging countries by indirectly financing entrepreneurial activities. The Fund invests in Microfinance Institutions (MFIs) to provide financial services.

Erste Sparinvest - Erste Responsible Microfinance is an open-end mutual investment fund incorporated in Austria. The Funds objective is long term capital appreciation and incomegeneration. The fund mainly invests in global microfinance investment products with a focus on microfinance lending. On a fund of funds basis also smallerproporting can be invested in microfinance equity.

Etimos Fund – Global Microfinance Debt is an open-end fund incorporated in Luxembourg. The objective of the Fund is to offer to socially responsible investors financially and socially sound investments to contribute to the sustainable development of emerging market economies. The Fund invests up to 90 % of its assets in short to medium-term senior debt instruments.

Finethic S.C.A SICAV-SIF - Finethic Microfinance is a SICAR incorporated in Luxembourg. The Fund's objective is to provide capital appreciation while investing in microfinance. The Fund invest its assets by lending money to entrepreneur with litte access to capital market.

IIV Mikrofinanzfonds is an open-end fund incorporated in Germany. The Fund's objective is to achieve adequate returns as well as to offer access to the financial market to developing nations. The Fund invests in a diversified portfolio from the microfinance sector. The Fund invests globally but with a focus on Latin America, Caribbean, Africa, Asia, Europe, etc.

KCD Mikrofinanzfonds – Global and **KCD Mikrofinanzfonds – Lateinamerika** is an open-end Fund incorporated in Luxembourg. The Fund's objective is capital appreciation and income generation. The Fund invests mainly in the micro financing sector, re-financing small companies promoting sustainable development in less developed markets. The Fund can also invest in REITs, other investment funds and money market instruments.

KCD Mikrofinanzfonds III – Universal is an open-end fund incorporated in Luxembourg. The Fund's objective is to achieve an appropriate capital appreciation. The Fund invests in a diversified portfolio with uncertified loan receivables mainly in developing countries.

Luxembourg Microfinance and Development Fund – Social Venture Capital Sub-Fund is an open-end fund incorporated in Luxembourg. The Fund aims at contributing to the alleviation of poverty in developing countries. The objective is to help promising microfinance institutions (MFIs) have a positive social impact towards achieving financial autonomy.The Sub-Fund invests in promising middle-layer MFI.

responsAbility Global Microfinance Fund is an open-end Fund incorporated in Luxembourg. The Fund's objective is to achieve a real increase in value over the long term. The Fund thus enables and promotes the generation of income for economically active but poor sectors of the population by providing them with access to financial services through its investment activities.

responsAbility SICAV (Lux) - Mikrofinanz-Fonds is an open-end investment fund incorporated in Luxembourg. The Fund enables and promotes the generation of income for economically active but poor sectors of the population by providing them with access to financial services through its investment activities.

responsAbility SICAV (Lux) Microfinance Leaders is an open-end investment fund incorporated in Luxembourg. The Fund's objective is growth over the long term. The Fund will invest in local, successful and promising financial service providers - so-called microfinance institutions (MFIs) - to promote entrepreneurial activity aimed at reducing poverty in developing countries.

Saint-Honoré Microfinance is a SICAV incorporated in Luxembourg. The objective of the Fund is to make a strong positive impact on micro-entrepreneurs in developing countries, while ensuring capital preservation and some return to the investor. The Fund primarily invests in UCIs and various debt securities.

Symbiotics SICAV (Lux) – SEB Microfinance Fund is an open-end fund Luxembourg. The Funds objective pursues a double bottom line return, being both a socially transformative positive impact fund and offering an attractive financial return. The Fund invests in fixed income instruments issued by emerging, sustainable and inclusive finance institutions.

Triodos SICAV II Microfinance Fund is an open-end fund incorporated in Luxembourg. The Fund's objective is to invest the funds available to it in risk-bearing assets (equity and quasi-equity, and/or other assets permitted by law) and senior debt, in line with the general objective of the Triodos Group.

Wallberg Global Microfinance Fund is an open-end investment fund incorporated in Luxembourg. The Fund's objective is long term capital appreciation. The Fund focuses on the microfinance sector which offers a high yield component. The sectors include: financing, insurance, real estate, infrastructure, and trade. The Fund focuses on credit transactions with an average maturity of five years.

Below follows a list of descriptions for the 16 socially responsible investment funds included in the sample, these descriptions are the ones that are presented under the fund description menu in Bloomberg.

Parvest Green Tigers Classic-Capitalisation is a SICAV incorporated in Luxembourg. The Fund invests at least two-thirds of its assets in equities of companies whose technologies, products and services provide solutions to environmental problems in Asia. The Fund may also invest one-third of its assets in other securities, money-market instruments, derivatives, liquidities and other funds.

DNB Oekofonds TNL is an open-end investment fund incorporated in Luxembourg. The Fund's objective is long-term capital appreciation. The Fund invests mainly in equities of issuers that are directly involved with processing, exploring, and researching alternative energy sources in order to protect our ecolocical system. The Fund will pursue issuers with sustainable growth.

Allianz Citizen Care SRI is an open-end fund incorporated in France. The Fund's objective is to outperform the euro stock market. The Fund invests its assets in international equity securities.

Cadmos Fund Management-Guile European Engagement is a Sicav incorporated in Luxembourg. The objective of the Fund is to achieve capital appreciation. The Fund invests in shares of European signatories of the UN global compact and aims to engage with portfolio companies to foster increased corporate responsibility.

Parvest Environmental Opportunities is an open-end fund incorporated in Luxembourg. The objective is to increase the value of its assets over the medium-term. The Fund invests in equities

issued by small and mid-cap innovative companies from any country involved in environmental markets or alternative energy, energy savings, water treatment & sewage, pollution control, etc.

Swisscanto LU Portfolio Fund Green Invest Income EUR is an open-end fund incorporated in Luxembourg. The investment objective is to generate an adequate return by investing in bonds worldwide and respecting the criteria of sustainability. The fund invests at least two thirds of its assets in fixed- and variable-interest securities of states and companies.

Erste-Spartinvest - Erste Responsible Bond Euro Corporate is an open-end investment fund incorporated in Austria. The Fund invests primarily in euro-denominated corporate bonds of European issuers which primarily are rated as investment grade. The Fund's investment universe is based on ethical-sustainable factors.

TIAA-CREF Social Choice Bond Fund is an open-end fund incorporated in the USA. The Fund seeks a favorable long-term total return. The Fund invests in a broad range of investment-grade bonds and fixed-income securities giving special consideration to certain social criteria.

Erste Responsible Bond is an open-end mutual fund incorporated in Austria. The investment universe is screened for sustainability and ethical criteria on a qualitative basis. The Fund's objective is growth and income. The Fund invests into diversified bond categories denominated in Euro with a focus on investment grade ratings.

Pax World High Yield Bond Fund is an open-end fund incorporated in the USA. The Fund aims to produce high current income. The Fund invests in high-yield fixed income securities and combining financial analysis with environmental, social, and governance (ESG) analysis in order to identify investments.