

Microfinance Investment Funds – Analysis of Portfolio Impact

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Microfinance enables financial services (loans, savings models, capital transfers and insurance) to reach micro-entrepreneurs and low-income households in developing countries – indeed, without microfinance’s existence, local banks and credit institutions could not serve such clients. Experts believe only 3-5% of demand is covered for an estimated 500 million micro-entrepreneurs. Since each requires, on average, 500 US dollars per annum, the annual demand for unfunded credit amounts to 250 billion US dollars: a volume that would overstrain developing countries’ national credit markets. This suggests micro-entrepreneurs’ economic situation will not significantly improve, unless international capital markets are called upon to finance this volume of credit. This research therefore explores the economic impact of microfinance investment funds (MFIFs) and examines their return/risk profiles and consequences for portfolio management, giving recommendations to investors on how to consider microfinance in their asset allocations.

1. INTRODUCTION

Microfinance enables financial services (loans, saving models, capital transfers and insurance) to micro-entrepreneurs and households having a low income, who otherwise would not have access to the financial service sector (Felder-Kuzu, 2004). Of the 2.8 billion people worldwide currently suffering from poverty (World Bank, 2007), it is estimated that about 500 million count among the poor active in business, who try to improve their income in the form of micro-entrepreneurship and therefore need loans and other financial services (Felder-Kuzu, 2004). Experts state that only 3 to 5% of the demand for this credit is covered. Based on the fact that an estimated 500 million micro-entrepreneurs each require on average 500 US dollars per annum, the annual demand for unfunded credit amounts to 250 billion US dollars (Dieckmann, 2008). This volume would completely overstrain developing countries’ national credit markets (Menchetti, Oehri, Fausch, 2006). Despite the capital requirements discussed, microfinance investment opportunities for (commercial) investors are currently limited. At the end of 2007, over 80 Microfinance Investment Vehicles (MIVs) existed, within which Microfinance Investment Funds (MFIFs) represented just a small part (Goodman, 2007). Most of these MFIFs are invested directly in microfinance institutes (MFIs), with investments either in the form of equity or debt. Research regarding the capital structure of MFIFs shows that

over 70% of the microfinance investment volume is transacted in debt (MicroRate, 2006). MFI grant loans average between 25 – 1500 US dollars to micro-entrepreneurs in emerging and developing countries (Felder-Kuzu, 2008).

Due to MFIFs’ novelty, the annual return, risk characteristics and benefits in a diversified portfolio are not sufficiently known (Menchetti, Oehri, Fausch, 2007). This study analyzes the risk-return profiles of selected MFIFs and the impact of MFIFs on standard-structured portfolios. This research aims to evaluate the economic benefit of MFIFs for investors.

The research is set out as follows: in part 2, we give a short overview of the methodology applied. Our fund selection criteria are described in part 3. In part 4, we analyse the risk-return profile of selected MFIFs and their benefits and risks in standard-structured portfolios. Part 5 concludes the paper.

2. METHODOLOGY

In order to quantify the portfolio theoretical influence of the selected MFIFs, the following framework has been chosen:

1. First we build a sample portfolio consisting of stocks, bonds, hedge and money market funds.

The sample portfolio consists of a global stock index (MSCI World), a global bond index (JPM GBI), a hedge funds index (Hedge Funds Research Index HFRI) and a money market fund (UBS Money Market Fund). The risk-free investment opportunity is represented by the 6-month LIBOR.

2. We also define 3 investment strategies dependent on investors' risk appetites.

Investment Strategy \ Assets Classes	Growth	Balanced	Defensive
MFIF	0%	0%	0%
Stocks	60%	40%	20%
Bonds	10%	30%	50%
Hedge Funds	25%	20%	20%
Money Market	5%	10%	10%

Table 1: Sample portfolios – three investment strategies

3. Finally we modify the portfolios – “defensive”, “balanced” and “growth” with MFIFs.

In this context, we analyse the effects of 5% and 10% MFIF investment for these three investment strategies (defensive, balanced and growth). A total of 24 portfolios were created, wherein 5% and 10% MFIFs substitute the given asset classes.

The expected portfolio return (μ_p) and risk (σ_p) are determined on the basis of the following formula (Markowitz, 1952):

$$\mu_p = \sum_{i=1}^n x_i \mu_i \quad (1)$$

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n x_i x_j Cov_{ij} \quad (2)$$

$$\sigma_p = \sqrt{\sigma_p^2} \quad (3)$$

The Sharpe Ratio is given as the quotient of the realised excess return and the portfolio risk

$$SR_p = \frac{r_p - r_f}{\sigma_p} \quad (4)$$

3. RESEARCH SAMPLE

Five restrictions have been introduced to select MFIFs:

1. Microfinance investment quota: at least 70%
2. Capital structure: Debt >50% (microfinance debt funds)
3. Time series: at least 3 years
4. Money Market adequate return (LIBOR plus)
5. Price setting/Net Asset Value (NAV) evaluation: monthly

Based on the MFIF opportunity set, only three MFIFs fulfil all criteria:

	Dexia Micro Credit Fund (Dexia)	Triodos Fair Share Fund (Triodos)	Respons Ability Global Micro-finance Fund (respons Ability)
Fund currency	US dollar	US dollar	US dollar
When launched	September 1998	December 2002	November 2003
Observation period	9 years	5 years	4 years

Table 2: Overview of selected MFIFs

4. EMPIRICAL RESULTS

The following distribution parameters are given for the observation period:

	Period	Return	Risk	Min.	Max.	LIBOR	Sharpe Ratio
Dexia	01.99 – 12.07	4.88%	1.06%	-0.72%	1.22%	3.87%	0.9587
Triodos	01.03 – 12.07	1.30%	1.99%	-2.46%	1.53%	3.50%	N.A.
Respons-Ability	01.04 – 12.07	4.43%	1.20%	0.03%	2.54%	4.02%	0.3541

Table 3: Overview of distribution parameters, monthly end-date, risk-free interest: LIBOR 6 months USD, own calculations, sources: Datastream, BlueOrchard, Triodos, responsAbility

The observation period includes different market phases; the 1999-2002 bear market and the 2003- 2006 bull market. Overall this represents a complete market cycle.

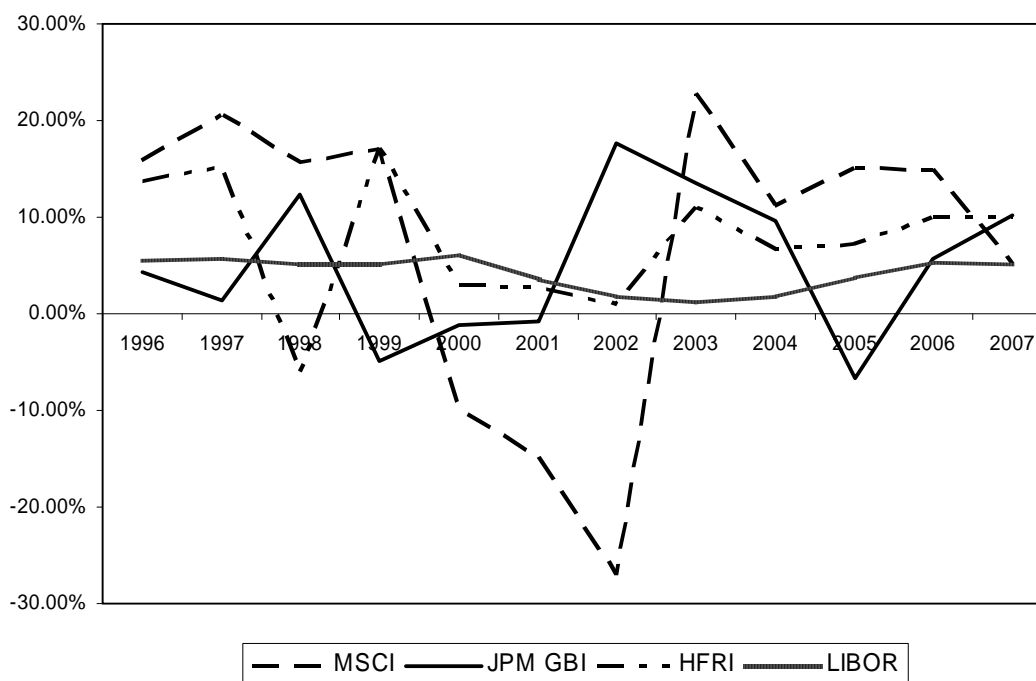


Diagram 1: Overview of the observation periods (market phases)

4.1 DEXIA

The Dexia MFIF shows low correlation to all considered asset classes. It correlates slightly positively to the bond index (+0.03), and negatively to the stock and hedge fund investments (-0.03 and -0.13 respectively).

	Dexia	MSCI	JPM GBI	HFRI	Money Market
Dexia	1.00				
MSCI	-0.03	1.00			
JPM GBI	0.03	-0.20	1.00		
HFRI	-0.13	0.58	0.02	1.00	
Currency market	0.27	0.02	-0.15	0.11	1.00

Table 4: Dexia Micro Credit Fund Correlation Matrix (January 1999 – December 2007)

If the Dexia MFIF is taken as a substitute for the given asset classes, in 3 of 4 substitutions the risk-adjusted excess return (Sharpe Ratio) improves. If it is chosen to substitute stock investments the best risk-adjusted return of the portfolios can be achieved. Compared to stock investments the Dexia MFIF generates constant positive returns during all market phases. Therefore the risk-adjusted excess return for portfolios can be smoothed, especially during unfavourable market developments. Compared with the sample portfolio, a decline in the Sharpe Ratio is proven, if Dexia MFIF is taken as a substitute for the Hedge Fund Index. We argue that Dexia MFIF and the Hedge Fund Index have low correlation to all asset classes as well as to each other. Therefore beneficial portfolio characteristics (low correlation, high Sharpe Ratio) of both asset classes are only replaced by each other. This results in a loss of diversification as well as performance within the portfolio and subsequently leads to a lower Sharpe Ratio.

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	0.20	0.22	0.24	0.20	0.20	0.18	0.16	0.21	0.24
Balanced	0.26	0.30	0.34	0.26	0.26	0.24	0.21	0.28	0.29
Defensive	0.39	0.42	0.46	0.40	0.42	0.36	0.32	0.41	0.42
% MFIF substitution	0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 5: Sharpe Ratios (01.1999 – 12.2007, own calculations)

The Dexia MFIF reduces portfolio risk, except for bonds alone, for both the 5% and 10% substitutions with Dexia MFIF for the growth portfolio, where it increases standard deviation. We argue that the Bond Index has a lower correlation to the Stock Index compared to the MFIF. Therefore the bond investment generates smoother returns in a portfolio compared to its substitute the Dexia MFIF, especially during unfavourable market

phases. In general, the standard deviation is reduced through a 5% substitution with Dexia MFIF on average about 0.53%, and through a 10% substitution even about 1.04%. The results show that the MFIF offers, due to reduced risk and lower correlation to traditional asset classes, an important contribution to risk reduction within the analyzed portfolios.

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	8.59	7.94	7.29	8.62	8.68	8.41	8.24	8.58	8.58
Balanced	5.89	5.29	4.70	5.84	5.82	5.71	5.54	5.89	5.89
Defensive	4.32	3.97	3.70	4.11	3.92	4.17	4.03	4.32	4.32
% MFIF substitution	0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 6: Standard deviations in % (01.1999 – 12.2007, own calculations)

The Dexia MFIF increases expected portfolio returns for all portfolio strategies, when it is used as a substitute for stock and money market investments. Regarding bond and hedge fund investments the opposite is demonstrated, since the expected returns are lower for all portfolio strategies. This result is not so surprising, since the expected returns of the stock index and money

market fund are lower than those of the Dexia MFIF. On the other hand, the expected returns of the bond and hedge fund index are higher than those of the Dexia MFIF. This means that Dexia MFIF substitution into bond or hedge fund investments has an adverse effect on portfolio returns.

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	5.59	5.61	5.62	5.58	5.56	5.41	5.22	5.68	5.68
Balanced	5.43	5.44	5.46	5.42	5.40	5.25	5.06	5.52	5.60
Defensive	5.54	5.55	5.56	5.52	5.51	5.35	5.17	5.62	5.71
% MFIF substitution	0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 7: Returns in % (01.1999 – 12.2007, own calculations)

4.2 responsAbility

The same procedure used to analyse Dexia is now carried out on the second MFIF (responsAbility). By contrast to Dexia the 4-year observation period of responsAbility covers a bull market.

The benefits of responsAbility MFIF in a portfolio depends on the asset class to be substituted as well as the chosen investment strategy. A money market substitution leads to improvements in the Sharpe Ratio for all investment strategies. However, in the case of a substitution for stock investments the opposite can be concluded in the defensive and balanced strategies

	Dexia	MSCI	JPM GBI	HFRI	Money Market
Respons-Ability	1.00				
MSCI	-0.14	1.00			
JPM GBI	0.20	-0.19	1.00		
HFRI	0.03	0.81	0.08	1.00	
Currency market	0.46	0.08	0.07	0.14	1.00

Table 8: responsAbility Correlation Matrix (January 2004 – December 2007)

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	1.06	1.07	1.08	1.06	1.05	1.06	1.06	1.08	1.08
Balanced	1.03	1.02	1.01	1.05	1.07	1.03	1.03	1.05	1.07
Defensive	0.76	0.68	0.60	0.80	0.85	0.73	0.68	0.78	0.79
% substitution	MFIF 0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 9: Sharpe Ratios (01.2004 – 12.2007, own calculations)

A responsAbility MFIF substitution demonstrates a risk reduction in almost all asset classes and regardless of the chosen investment strategy. Except in the case of a bond substitution with responsAbility MFIF, the investment strategy Growth, and in the case of a money market substitution with responsAbility MFIF, the investment strategy Defensive leads to increased.

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	5.35	4.98	4.61	5.36	5.39	5.15	4.96	5.34	5.34
Balanced	3.90	3.59	3.29	3.82	3.75	3.71	3.53	3.90	3.90
Defensive	3.52	3.37	3.26	3.31	3.11	3.39	3.27	3.53	3.53
% substitution	MFIF 0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 10: Standard deviations in % (01.2004 – 12.2007, own calculations)

In terms of portfolio return the substitution investments. A uniform picture is apparent with responsAbility MFIF has as a negative impact on respect to changes in returns. Returns are worsened by substitution in all investment categories except money market

Investment strategy	Sample portfolio	new portfolios (MFIF substitution with given asset class)							
		Stocks		Bonds		Hedge Funds		Money Market	
Growth	9.70	9.34	8.98	9.68	9.67	9.50	9.29	9.77	9.77
Balanced	8.06	7.70	7.34	8.04	8.03	7.85	7.65	8.13	8.20
Defensive	6.69	6.33	5.97	6.67	6.66	6.48	6.28	6.76	6.83
% substitution	MFIF 0%	5%	10%	5%	10%	5%	10%	5%	10%

Table 11: Returns in % (01.2004 – 12.2007, own calculations)

Based on the criteria Sharpe Ratio, risk, and return, the 2 case studies show that benefits of a MFIF in a portfolio depends mainly on the market situation. Considering portfolio performance, a substitution of money market investments with MFIF is the best alternative in the bull market.

5. CONCLUSIONS

All the MFIFs analyzed show low volatility as well as low correlation to the asset classes analyzed. The study results underline that MFIFs are a meaningful tool for portfolio diversification. MFIF substitution can be considered a favourable investment independent of the current market situation (Bull/Bear). Substitution with the money

market investments contributes to improvements in portfolio performance (Sharpe Ratio) regardless of the market situation. In general the results obtained are extremely dependent on the observation period, since the correlations between the individual investment categories vary with time and cannot be regarded as fixed. From the investor's point of view, the economic benefit of a MFIF is money market adequate returns, low volatility and a low correlation to traditional asset classes (stock, bond & hedge fund). In order to maximise benefits of these new asset class; potential investors should favour long-term investment horizons as well as substantial portfolio recourses to invest. Institutional investors therefore would appear to be the ideal investor.

CAVEAT: This paper is primary research on the portfolio impact of microfinance investment funds. The results of this study cannot be considered final, only a first insight into portfolio theoretical consequences of MFIFs. We need further research to verify our results and consider aspects like the valuation of equity within the MFIF or exchange rate risks.

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