MJBE Malaysian Journal of Business and Economics

Microfinance and Portfolio Diversification

Habib Ahmad[1*] and Syed Zulfiqar Ali Shah[2]
[1]Hamdard Institute of Management Sciences, Hamdard University, Islamabad Campus, Islamabad, Pakistan
[2]International Islamic University, Islamabad, Pakistan

*** Corresponding author's email:**
habib.ahmad@hamdard.edu.pk

Received: 12 February 2019

Accepted: 25 March 2019

Keywords: *microfinance, portfolio diversification, microfinance stock*

ABSTRACT

The purpose of this paper is to investigate the impact on diversification benefits if microfinance stocks are included in a portfolio. Prices of different micro-finance stocks and data regarding stocks indices of respective countries are taken from Thomson One Banker database. To investigate whether diversification benefits may be enhanced or not by including microfinance stocks in one's portfolio, the mean-variance spanning test is applied. Although the lesser or sometimes negative correlation between microfinance stocks and international portfolio is spotted no diversification benefits are identified by the inclusion of microfinance stocks in the portfolio. It may be because of the reason that most of the microfinance stocks are offering negative returns and therefore not attractive for the investors. The poor performance of micro-finance institutions maybe because of the two-fold objective of sustainability and social welfare or may be attributed to high operating cost bear by microfinance institutions. It means that microfinance may not offer good diversification opportunities. This is the first study of its kind that investigates to investigate the role of microfinance stocks in international diversification.

INTRODUCTION

With globalization, stock markets of different countries became more interrelated (Beine & Candelon, 2011; Garcia & Tsafack, 2011). A stun in one economy is easily transmitted to others, which has completely changed the paradigm of investment opportunities for international investors. To diversify their risk, international investors invest globally but a strong association between different stock markets has trimmed down the potential gains from diversification. To unearth the combination of assets that are not interrelated is an important task in an existing increasing trend of co-movement. Diversification became hard to achieve, however, turn to be more valuable as well. Even more, the need for diversification may be demanded if it is risky to invest in the home country.

According to portfolio theory there exist a set of assets which can provide maximum return and lower risk if the assets in the portfolio are not correlated with each other or if they are negatively correlated. Identification of that appropriate set of assets may be possible if such a combination of assets is discovered that move in opposite directions. Microfinance can be used as a ploy for international diversification by international investors to diversify their risk. As the nature of microfinance institutions is different than the nature of conventional financial institutions so the inclusion of stocks from microfinance institutions in one's portfolio may lead to better diversification opportunities for international investors. Most of the previous studies focus on only one country (Kebede & Berhanub, 2013; Tomaselli, Timko, & Kozaka, 2013) but in this research, the sample of the study is large enough, so the findings will be more generalizable. The study will be helpful to international investors because it advises them regarding diversification opportunities to diversify their risk.

LITERATURE REVIEW

Microfinance is becoming more and more commercialized. Most of the commercial banks are supporting microfinance institutions financially. In most developing countries like Pakistan, Nepal, India, Thailand etc microfinance programs are also initiated by commercial banks. For instance, in India NABARD has instigated a program to engage private banks in microfinance. With the commercialization of microfinance traditional services offered by microfinance institutions also altered. Now microfinance institutions are not only offering loans but also provide other financial services like insurance etc.

The funding methodology of microfinance institutions also starts to transform. Conventionally, microfinance institutions are financed by aid organizations and public donors but recently some of the microfinance institutions in developing countries started to finance themselves through capital markets. Limited literature (Ahlin, Lin, & Maio, 2011; Gonzalez, 2011) is available which investigated the appeal of microfinance institutions for investors. However, literature regarding the "risk diversification role" of microfinance for international investors is even scarcer. Krauss and Walter (2009) suggest that microfinance institutions may play an important role in international portfolio diversification if their stocks are negatively correlated with other stocks. Some studies (Galema, Lensink, & Spierdijk, 2011) also found that microfinance institutions are offering high return for a small risk. So, the inclusion of microfinance institutions in their portfolio may be encouraging for international investors but the performance of microfinance institutions is not the same across different regions. For instance, Stephensi and Tazi (2006) showed that financial performance of microfinance institutions in Central Asia, Eastern Europe and Latin America is better but the performance of microfinance institutions in South Asia and Southern Africa

is not as good as the preceding regions. On the other hand, some researchers (Annim, 2012) argued that microfinance institutions have to fulfil dual objectives of social welfare as well as sustainability. Consequently, they may not provide better returns for conventional investors. From the discussion, it is projected that a microfinance institution may or may not provide diversification opportunities. They may be uncorrelated with the market but because of their dual objectives, they may not provide good returns for the conventional investors who are interested in their wealth maximization.

DATA AND METHODOLOGY

Data for stocks of different microfinance institutions and data for indices of different countries is taken from Thomson One Banker database. To investigate the role of microfinance institutions on international diversification using prices of those companies whose shares are traded in any stock exchange of the world are used. As we are interested in investigating whether the inclusion of microfinance stocks in a portfolio will diversify the risk, mean-variance spanning test is applied. According to mean-variance spanning test (Kan & Zhou, 2012), a set of a risky asset (benchmark portfolio) spans a larger set of risky assets (benchmark portfolio + MFI stock) if the mean-variance frontier of the benchmark assets is identical to the minimum-variance frontier of benchmark assets plus additional assets i.e. (benchmark portfolio + MFI stock). This implies that if an investor does not get benefit from holding additional assets then it is practical to invest in only a benchmark portfolio. The case is very much true if the benchmark portfolio is from domestic assets whereas additional assets are from foreign markets which attach foreign exchange risk with them.

Although some studies (Galema, Lensink, & Spierdijk, 2011) have investigated the diversification gains from adding microfinance stocks to a portfolio of risky assets they have used accounting returns like return on equity and return on assets rather than stock returns. In this study, market-based returns of the stocks are used which are more relevant. Daily stock returns for benchmark asset and stocks of each microfinance institution are calculated by using the following formula.

$$R_t = Ln\left(\frac{p_t}{P_{(t-1)}}\right)$$

Whereas R_t is a return of a microfinance stock at day *t*. p_t is the price of microfinance stock at day *t* and p_{t-1} is the price of microfinance stock at time $t - 1$. Return is obtained by dividing today's price on yesterday's price and then taking the natural log. Morgan Stanley Capital International's (MSCI) all country world index is taken as a benchmark asset. As few microfinance institutions trade in the stock market so most of these stocks are taken in the analysis. Microfinance institutions along with the country of origin they belong are given in Table 1.

The risk for benchmark asset and risk for stocks of each microfinance institution is also calculated. The correlation between the benchmark asset and each microfinance stock is also calculated. As suggested by Kan and Zhou (2012) for mean-variance spanning test sharp ratio is calculated for each series to find lambda. Before calculating lambda, R_p and σ_p are also found by using the following formulas.

Table 1 Microfinance institutions along with the country of origin

Equity Bank	Kenya
African Bank Capitec Bank Blue Financial Services (BFS)	South Africa
Danamon Bank Rakyat Indonesia	Indonesia
Financiera Independencia	Mexico
SKS	India

$$R_p = R_b w_b + R_M w_M \quad (1)$$

$$\sigma_p^2 = w_b^2 \sigma_b^2 + w_m^2 \sigma_m^2 + 2 w_b \sigma_b w_M \sigma_M r_{bm} \quad (2)$$

σ_p is minimized by taking its first derivative and then putting it to zero to find the value of w_M and w_b. The second derivate of for equation (2) is found to check whether the risk is minimized at the given value of w_M and w_b. This process is done for each MFI stock. Here it is assumed that the investor will invest all his wealth in either of the two assets. The values of σ_p, R_p and risk and return of the individual MFI are used in the calculation of Sharpe ratio and hence lambda. Lambda can be found by using the following formula.

$$\lambda_1 = \max \frac{1+S_p^2}{1+S_b^2} - 1$$

$$\lambda_2 = \min \frac{1+S_p^2}{1+S_b^2} - 1$$

Whereas S_p is Sharpe ratio of ex-post tangency portfolio of MFI plus benchmark asset. And S_b is Sharpe ratio of ex-post tangency portfolio of benchmark asset only. As investors can maximize their wealth by investing in tangency portfolio so squared Sharpe ratios of their tangency portfolios are compared and analyzed that how close the two frontiers are. The maximum difference between the two ex-post frontiers is denoted by λ_1 and the minimum difference between the two ex-post frontiers is denoted by λ_2. Both of the effects are captured in terms of squared sample Sharpe ratios. Three tests as proposed by (Kan & Zhou, 2012) are applied in the analysis and are given below

$$LR = T\sum_{i=1}^{2} \ln(1+\lambda_i)$$

$$W = T(\lambda_1 + \lambda_2)$$

$$LM = T\sum_{i=1}^{2} \left(\frac{\lambda_i}{1+\lambda_i} \right)$$

Whereas *LR* is likelihood test ratio, *W* is a Wald test and *LM* is Lagrange multiplier test. All the tests have an asymptotic χ^2_{2N} distribution. The value of each test is calculated for three value of *T* to usually 1*T*, 2*T* and 3*T*.

Daily average risks and returns of different microfinance institutions, benchmark portfolios and MFI's plus benchmark portfolios are given in Table 2 at different periods. Correlation between returns of microfinance institutions and benchmark portfolio and volatility of the stock index on which an MFI is traded are given in the last two columns of Table 2. From Table it is observed that 50% of the time MFI's and 29% of the time a benchmark portfolio are giving a negative return. It means that microfinance stocks are 21% more prone to lose as compared to stocks included in benchmark portfolios. It is also observed that 75% of MFI's are giving negative returns at least twice out of three

different periods whereas 25% of MFI's are giving no negative return. Similarly, the risk of microfinance institutions is found to be greater than the benchmark portfolio. As microfinance institution represents an individual stock whereas the benchmark portfolio represents a combination of different stocks, so the risk of an individual stock is found to be greater than the risk of a combination of different stocks. From the risk and return of MFI plus benchmark portfolio, it is observed that the risk of the portfolio is decreased for all combinations of portfolio whereas mixed results are found regarding the return of the portfolio. In some combinations, an increase in return is spotted, whereas in other combinations a decrease in return is detected. To investigate whether this decrease in risk and fluctuations in returns are significant or not, the mean-variance spanning test is applied. Mean-variance spanning test will help to further investigate the relationship. It is also observed that the frequency of negative returns in the MFI plus portfolio is lesser as compared to the frequency of negative returns in stocks of individual microfinance institutions as well as benchmark portfolios.

Table 2 Descriptive statistics of MFI stocks and benchmark portfolio

	T	Return	Risk	Return	Risk	Return	Risk	Correlation	Index Risk
		Benchmark		MFI		Portfolio			
SKS	180	0.00091	0.00687	−0.00656	0.04155	0.00077	0.00682	0.03428	0.00013
	362	−0.00007	0.01089	−0.00301	0.04404	−0.00017	0.01071	0.05959	0.00094
	474	0.00063	0.00589	0.00186	0.03375	0.00061	0.00588	0.23956	0.00010
DANAMON	997	0.00016	0.00710	−0.00038	0.03515	0.00014	0.00701	0.03916	0.00011
	1942	0.00031	0.00848	−0.00187	0.06654	0.00029	0.00844	0.02499	0.00032
	3039	0.00012	0.01032	0.00032	0.03009	0.00013	0.01018	0.17714	0.00037
Rakyat	438	0.00046	0.00546	0.00223	0.02680	0.00047	0.00545	0.15028	0.00016
	827	−0.00044	0.01238	0.00060	0.03236	−0.00039	0.01230	0.27795	0.00033
	1366	0.00049	0.00936	0.00119	0.02451	0.00053	0.00927	0.24902	0.00051
Blue	278	0.00015	0.00742	0.00441	0.04011	0.00031	0.00725	−0.02859	0.00012
	557	−0.00058	0.01651	−0.00459	0.05228	−0.00097	0.01560	−0.03093	0.00035
	835	0.00029	0.00939	−0.00128	0.06415	0.00027	0.00934	0.04610	0.00359
Equity	111	−0.00349	0.02103	−0.00414	0.04734	−0.00359	0.01974	0.07789	0.00019
	223	0.00045	0.01735	−0.00089	0.03594	0.00023	0.01619	0.09867	0.00017
	335	0.00045	0.00899	0.00217	0.01598	0.00090	0.00739	−0.12529	0.00004
CAPITAC	525	−0.00007	0.01117	0.00223	0.05044	0.00000	0.01105	0.07288	0.00013
	1050	0.00026	0.00697	0.00146	0.02335	0.00032	0.00685	0.11233	0.00014
	1574	0.00011	0.01177	0.00144	0.01662	0.00052	0.01024	0.14774	0.00202
African	748	0.00084	0.00655	0.00619	0.02426	0.00093	0.00654	0.20423	0.00012
	1497	−0.00005	0.01054	−0.00050	0.03151	−0.00007	0.01044	0.20093	0.00016
	2522	0.00016	0.01027	−0.00133	0.04625	0.00012	0.01024	0.15087	0.00132
Independencia	288	−0.00195	0.01907	−0.00445	0.02022	−0.00307	0.01667	0.44568	0.00050
	576	0.00053	0.01108	0.00100	0.02397	0.00055	0.01105	0.39901	0.16527
	864	0.00034	0.00844	−0.00060	0.02278	0.00030	0.00839	0.27015	0.11051

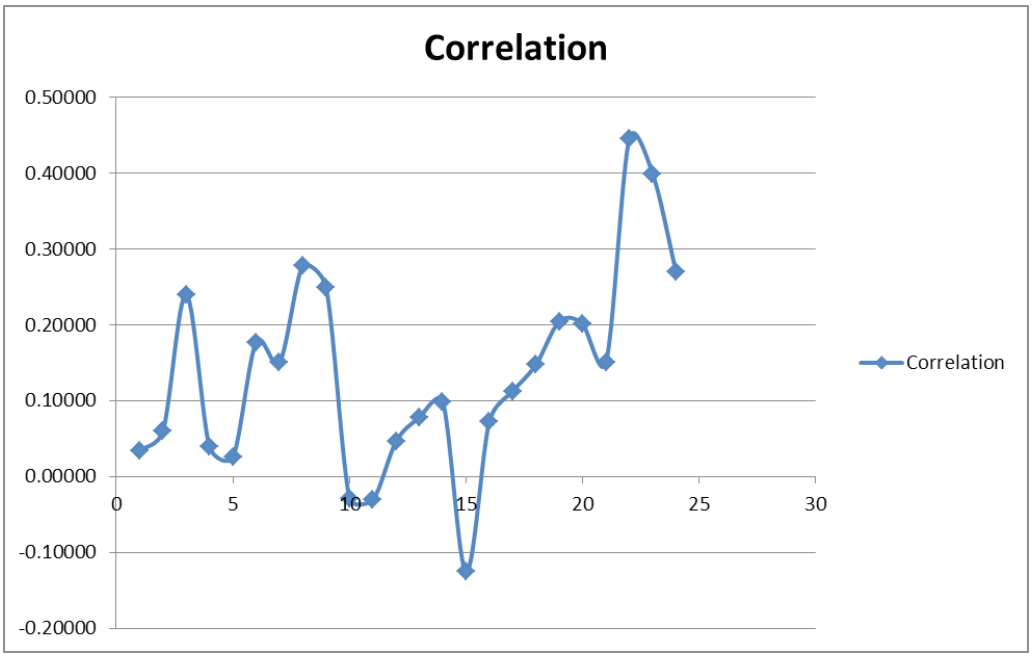

Figure 1 Correlation between microfinance stocks and the benchmark portfolio

Graphical representation of the correlation between microfinance stocks and the benchmark portfolio is given in Figure 2. From Figure 2 it is observed that a significant portion of correlations lies below 0.2. Similarly, risk of the stock exchanges on which microfinance institutions are traded is found to be low. It is spotted that most of the markets have risk below 0.1% with an exception to Mexico.

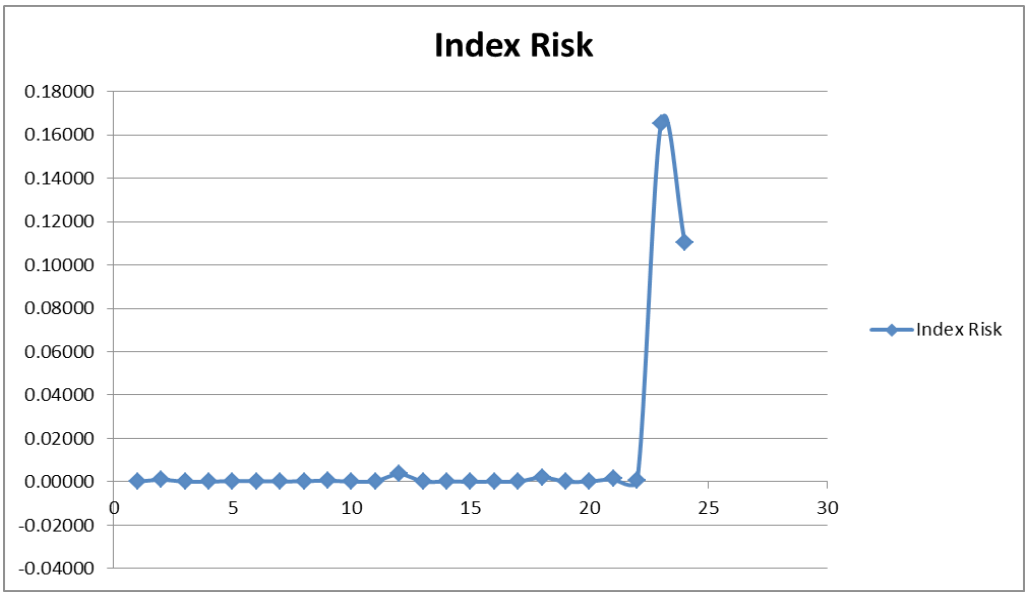

Figure 2 Risk of stock indices on which microfinance stocks are trading

RESULTS OF MEAN VARIANCE SPANNING TEST

To investigate that whether the inclusion of microfinance stocks in a portfolio will increase the diversification benefits or not results of mean-variance spanning test are reported in Table 3. From Table 3 it is witnessed that the calculated value of Chi-Square is lesser than the value retrieved from Table 2 for the given level of alpha and degrees of freedom which leads to the acceptance of null hypothesis and we can say there is no statistically significant relationship between the variables. It is observed that investing in microfinance institutions do not improve the mean-variance frontier. In general inclusion of microfinance stocks in the portfolio may not give diversification benefits. Same results were obtained from Table 2 in which most of the microfinance institutions were offering negative returns and addition of a stock having a negative return may not be an attractive investment for international investors. Hence it is determined that if only the monetary aspect of microfinance institutions is kept in mind then the investment may not be attractive but if social aspect of microfinance institutions is taken into account then investing in microfinance stocks may be an attractive investment opportunity. The poor performance of microfinance stocks may be attributed to a variety of reasons, but the high operating cost and high financial expenses need ample attention. The high operating cost may due to most of the microfinance institutions are operating in lesser developed areas of developing countries with weak infrastructure and lesser modes of communication. Access to potential borrowers is also a difficult task. Similarly, higher financial expenses may be for the reason that most of the developing countries experience higher inflation rates during the sample period. Higher inflation rate may either force microfinance institutions to charge a higher interest rate or to fulfil their objective of social well-being.

CONCLUSION

Besides this, it is also learnt that the inclusion of microfinance stocks in a portfolio may not give diversification benefits. It is because of the negative returns provided by stocks of most microfinance institutions. So, investing in microfinance stocks may be better for social investors as they are interested in maximizing their social returns but may not fulfil the objectives of conventional investor who invests in firms that maximize their monetary profits.

Table 3 Mean-variance spanning test

MFIs	T	Wald Test	Likelihood Ratio	LM Test
SKS	180	−0.85651	−0.85856	−0.86061
	362	−1.72254	−1.72665	−1.73078
	474	−2.25548	−2.26087	−2.26627
Danamon	997	0.06110	0.06110	0.06110
	1942	0.11902	0.11902	0.11901
	3039	0.18625	0.18625	0.18624
Rakyat	438	0.55227	0.55193	0.55158
	827	1.04276	1.04211	1.04145
	1366	1.72239	1.72130	1.72022
Blue	278	0.70145	0.70056	0.69968
	557	1.40542	1.40365	1.40188
	835	2.10686	2.10421	2.10156
Equity	111	1.32664	1.31878	1.31098
	223	2.66524	2.64944	2.63376
	335	4.00384	3.98010	3.95655
Capitac	525	1.28442	1.28286	1.28129
	1050	2.56885	2.56571	2.56258
	1574	3.85083	3.84612	3.84143
African	748	2.82892	2.82358	2.81826
	1497	5.66162	5.65094	5.64029
	2522	9.53814	9.52015	9.50221
Independencia	288	6.59233	6.51801	6.44481
	576	13.18466	13.03603	12.88962
	864	19.77699	19.55404	19.33443

REFERENCES

Ahlin, C., Lin, J., & Maio, M. (2011). Where does microfinance flourish? Microfinance institution performance in macroeconomic context. *Journal of Development Economics, 95*(2), 105–120.

Ali, I., & Hatta, Z. A. (2012). Women's Empowerment or Disempowerment through Microfinance: Evidence from Bangladesh. *Asian Social Work and Policy Review, 6*(2), 111–121.

Annim, S. K. (2012). Microfinance efficiency: Trade-offs and complementarities between the objectives of microfinance institutions and their performance perspectives. *European Journal of Development Research, 24*(5), 788–807.

Bateman, M. (2012). The Role of Microfinance in Contemporary Rural Development Finance Policy and Practice: Imposing Neoliberalism as 'Best Practice'. *Journal of Agrarian Change, 12*(4), 587–600.

Beine, M., & Candelon, B. (2011). Liberalisation and stock market co-movement between emerging economies. *Quantitative Finance, 11*(2), 299–312.

Boehe, D. M., & Cruz, B. L. (2013). Gender and Microfinance Performance: Why Does the Institutional Context Matter? *World Development*, In Press.

Chaudhary, M. A., & Ishfaq, M. (2003). Credit worthiness of rural borrowers of Pakistan. *Journal of Socio-Economics, 32*(6), 675–684.

Galema, R., Lensink, R., & Spierdijk, L. (2011). International diversification and Microfinance. *Journal of International Money and Finance, 30*(3), 507–515.

Garcia, R., & Tsafack, G. (2011). Dependence structure and extreme comovements in international equity and bond markets. *Journal of Banking & Finance, 35*(8), 1954–1970.

Gonzalez, A. (2011). Lessons for Strengthening Microfinance Institutions through Financial Crises, Fluctuations in Food and Fuel Prices, and Other Major Risks. *MicroBanking Bulletin*.

Haile, H. B., Bock, B., & Folmer, H. (2012). Microfinance and female empowerment: Do institutions matter? *Women's Studies International Forum, 35*(4), 256–265.

Imai, K. S., & Azam, M. S. (2012). Does Microfinance Reduce Poverty in Bangladesh? New Evidence from Household Panel Data. *The Journal of Development Studies, 48*(5), 633-653.

Kan, R., & Zhou, G. (2012). Tests of Mean-Variance Spanning. *Annals of Economics and Finance, 13*(1), 139–187.

Kar, A. K. (2013a). Mission drift in microfinance: Are the concerns really worrying? Recent cross-country results. *International Review of Applied Economics, 27*(1), 44-60.

Kar, A. K. (2013b). Double bottom lines in microfinance: Are they mutually exclusive? *Journal of small Business & Entrepreneurship, 26*(1).

Kebedea, H. A., & Berhanub, W. (2013). How Efficient Are the Ethiopian Microfinance Institutions in Extending Financial Services to the Poor? A Comparison with the Commercial Banks. *Journal of African Economies, 22*(1), 112–135.

Krauss, N., & Walter, I. (2009). Can Microfinance Reduce Portfolio Volatility? *Economic Development and Cultural Change, 58*(1), 85–110.

Kurosaki, T., & Khan, H. (2012). Vulnerability of microfinance to strategic Default and covariate shocks: Evidence from Pakistan. *The Developing Economies, 50*(2), 81–115.

Lensink, R., & Pham, T. T. (2012). The impact of microcredit on self-employment profits in Vietnam. *Economics of Transition, 20*(1), 73–111.

Marr, A. (2012). Effectiveness of Rural Microfinance: What We Know and What We Need to Know. *Journal of Agrarian Change, 12*(4), 555–563.

Montgomery, H., & Weiss, J. (2011). Can Commercially-oriented Microfinance Help Meet the Millennium Development Goals? Evidence from Pakistan. *World Development, 39*(1), 87–109.

Nghiem, S., Coelli, T., & Rao, P. (2012). Assessing the Welfare Effects of Microfinance in Vietnam: Empirical Results from a Quasi-Experimental Survey. *The Journal of Development Studies, 48*(5), 619-632.

Ngo, T. M.-P., & Wahhaj, Z. (2012). Microfinance and gender empowerment. *Journal of Development Economics, 99*(1), 1–12.

Quayes, S. (2012). Depth of outreach and financial sustainability of microfinance institutions. *Applied Economics, 44*(26), 3421–3433.

Stephensi, B., & Tazi, H. (2006). Performance and transparency: A survey of microfinance in South Asia. Microfinance Informatin exchange, Incorporated. *Microfinance Informatin exchange, Incorporated.*

Tomaselli, M. F., Timko, J., & Kozaka, R. (2013). Assessing Small and Medium Forest Enterprises' Access to Microfinance: Case Studies from The Gambia. *The Journal of Development Studies, 49*(3), 334–347.