RESEARCH ARTICLE

Testing the Portfolio Risk in Philippine Microfinance Institutions

Nestor T. Necesito
Fairmont Raffles Hotel Makati, Philippines
nestor.t.necesito@gmail.com

Abstract: The study assesses the portfolio risk of microfinance institutions (MFIs) operating in the Philippines, evaluates and determines the challenges and issues affecting portfolio risk of MFIs, explains the microfinance programs and policy environment in the country, and examines the impact of institutional variables, borrowers' gender, and macroeconomic indicators from 1998 to 2014. Based on the Philippine MFI data of 119 institutions which are providing microfinance services at present, the study found that institutional variables, including number of active borrowers, gross loan portfolio, operating expense over loan portfolio, borrowers per staff member, return on equity, percent of women borrowers, regulation, and macroeconomic indicators including lending interest rate, GDP growth, and inflation were the factors that highly affected the portfolio risk in MFIs. Overall, outreach, cost efficiency, productivity, profitability, percent of women borrowers, and regulation alongside macroeconomic indicators appear to be more important features affecting portfolio risk of MFIs. The interest of the study is also to examine the impact of MFI lending to more women on portfolio quality. Further, we evaluate the relationship of MFI lending to more women on cost efficiency and financial sustainability. The study found that lending to women increases portfolio risk, is costly, and not financially sustainable. Although serving women has potential advantages in terms of reputation for better repayment, reliability, and greater ability to use the loan proceeds for economic development, the result is suggestive that the success of MFIs depends on the women borrowers' access to capital and interest rates matched to gender differences. Increasing women's access to basic financial services would better cope up with portfolio risk. The microfinance services are less efficient from its portfolio at risk point of view, thus, portfolio quality suffers. Certainly, it would be expected that microfinance industry in the Philippines not properly managed would incur losses in the long run. Overall, viability and long-term financial sustainability are important for the success of the MFIs. Unless microfinance operations become viable and sustainable, MFIs can never fully materialize their objective of reaching a greater number of active poor people and sustain the effort over the long term.

Keywords: MFIs, portfolio risk, portfolio at risk, gender, women, Philippines

Economic growth in the Philippines, among the developing markets, has been averaging at about 5% since 2002, higher than the rate achieved in the 1980s and 1990s. In the midst of financial crisis and uncertainties in various parts of the world, the Philippine economy posted a 7.2% Gross Domestic Product (GDP) growth in 2013. Growth momentum was maintained at 6.1% in 2014. The Philippines' strong economic growth, together with the government's durable fiscal administration, provided reason for the country to attain improving investment grade status from major credit rating agencies. Steady remittances from Overseas Filipino Workers (OFW) have delivered a robust ground for stability of Peso and a sound accumulation of international reserves. The country at the moment enjoys a savings rate that exceeds investment.

While the country achieves highly praised economic growth, one of the fastest in the region, major challenges remain. The government must intensify efforts to provide budget allocation to various programs that maximize returns—either through sustained growth or providing opportunities to the less privileged to achieve an inclusive growth. The government has pledged to pursue various measures under its updated Philippine Development Plan. These include programs that promote equal access to development opportunities through equal access to capital and establish effective and responsive social safety nets to assist those who are less capable of participating in economic activities. Microfinance has been gaining interest in the Philippines, providing the active poor with access to capital and other basic financial services as a sound tool in economic development and poverty alleviation. Simply put, microfinance institutions (MFIs) contribute to increasing active poor's access to other basic financial services. However, MFIs continue to face challenges and issues on controlling all the risks in the loan portfolio.

Financial institutions rarely lend to the poor, mostly because of information problems, high credit risk perception, lack of acceptable collateral, and the high transaction costs of processing small loans (Llanto, Garcia, & Callanta, 1996). Microfinance is thought to be riskier because borrowers generally have no collateral and little or no credit history on which to base a precise assessment of their credit risk (Brière & Szafarz, 2011). Thus, management of portfolio risk is essential to the viability and long-term financial sustainability of MFIs.

An interesting feature of microfinance is gender development and its ability to reach out to women. Data set for the years 1998 through 2014 suggests MFIs in the Philippines seem to be focused on serving more women which accounted for an average of 85% of active borrowers. However, gender differences in microfinance seem to be an understudied area in the Philippines.

The study evaluates and determines the challenges and issues affecting portfolio risk of Philippine MFIs and explains the microfinance programs and policy environment in the country. The main interest of the study is to examine the impact of institutional variables and borrowers' gender using the data obtained from Microfinance Information Exchange, Inc. (MIX) Market for the years 1998 through 2014, macroeconomic indicators obtained from World Development Indicators (WDI) for the years 1998 through 2013, and from BSP key statistics for the year 2014. The analysis makes use of the statistics and correlation matrix.

Overview of the Philippine Microfinance Programs and Policy

The Bangko Sentral ng Pilipinas (BSP) defined microfinance to include "financial services such as deposits, loans, payment services, money transfers, and insurance products to the poor and low-income households and their microenterprises" (n.d., par. 1) It should be noted that microfinance is not engaged in charity, subsidized credit, or dole outs nor is it the only remedy for poverty. The financial service most commonly provided is microfinance, which is typically issued in the form of a specific business loan for microenterprise purposes. A key defining characteristic of a microfinance loan is the ability to secure credit without collateral. In the Philippines, microfinance loans cannot exceed Ph150,000 (US$3,354.20).[1] Microfinance providers in the

Philippines often employ a group lending approach, whereby each person within a small group is liable for any default by another group member.[2]

The Philippines' microfinance sector is credited as one of the oldest and most active in the world. It has served as a natural experiment for microfinance (Daley & Sautet, 2005).

MFIs in the country are growing at a fast pace. Since 2002, microfinance in the Philippines have grown dramatically (Gatdula, 2014). In addition, in its 2014 financial inclusion initiatives report, the BSP (2015) said that there are 183 banks with microfinance operations serving more than 1 million clients.

In the Philippines, MIX Market has reported 119 MFIs providing services. In 2014, gross loan portfolio stood at US$1.20 billion with 4.37 million active borrowers. On the other hand, the deposits totaled US$0.82 billion with 5.60 million depositors.

From 1998 to 2014, there was a sustained increase in the gross loan portfolio and number of borrowers with a compounded annual growth rates of 19.41% and 14.60%, respectively. MFIs have been reaching out to the majority of the country's population—the active poor.

What do these numbers tell us? In general, the industry market profile reflects positively about the capacity of the active poor to save and pay debts when they are given access to capital and other basic financial services. The figures also suggest that microfinance service providers, such as rural and thrift banks, non-governmental organizations (NGOs), and cooperatives, can be profitable institutions.

The General Banking Law of 2000, which mandated the recognition of microfinance as a legitimate banking activity, empowered the BSP to create measures recognizing microfinance as a banking activity and to provide regulatory guidelines for its operations specific to the microfinance portfolios. If properly sustained, the BSP sees this as an effective intervention for poverty alleviation. Today, BSP is committed in the development of microfinance in the Philippines focusing on: i) creating an enabling policy and regulatory environment; ii) increasing the microfinance know-how, capacity, and skills of the BSP employees and the banking sector; and iii) promoting and advocating for viable and sustainable

microfinance operations within the banking sector.

Over the years, the BSP has released more than 40 regulations related to microfinance operations. The BSP has been proactive in the establishment and development of microfinance by enabling policy and regulatory environment, increase in the capacity on microfinance operations, and promote for the development of viable and sustainable microfinance operations. In fact, the Philippines has amended its policy and regulatory environment to increasingly support the microfinance industry (Carroll, 2010). In its 2013 financial inclusion initiatives report, the BSP (2014) noted that the Philippines was recognized as first in the world in terms of its regulatory environment and practices for microfinance.

However, microfinance clients are considered to be inherently risky, largely due to their extreme susceptibility to declining economic conditions and lack of information on their creditworthiness. The risk is somewhat mitigated by the use of the group lending methodology and more frequent repayment schedule options. During challenging economic times, institutions engaged in microfinance activity face not only the risk of rising delinquencies, but also the risk of default of other financial institutions with payment or funding obligations to these MFIs.

Previous Work on Risks in Microfinance

There are various empirical works on financial risks facing MFIs. There are significant literature evaluating MFI success and failure. The empirical works of Crabb and Keller (2006) and Gonzalez (2007), who pioneered the use of cross-country and cross-MFI data, highlight both the institutional and macroeconomic determinants of MFI success. The independent studies of Ahlin, Lin, and Maio (2011), Krauss and Walter (2009), and Hermes, Lensink, and Meesters (2011) examined correlations between financial performance and MFI institutional variables including percentage of women borrowers. Meanwhile, Ledgerwood (1999), de Aghion and Morduch (2005), Aggarwal, Goodell, and Selleck (2013), and D'Espallier, Guérin, and Mersland (2011) focus on the MFI lending to women and the existing empirical works are mixed.

The MicroFinance Network (2000, pp. 11-12) defined portfolio risk as "risk inherent in the composition of the overall loan portfolio. Policies on diversification (avoiding concentration in a particular sector or area), maximum loan size, types of loans, and loan structures lessen portfolio risk." MFIs must continuously review the entire portfolio to assess the nature of the portfolio's default and delinquency, looking for geographic trends and concentrations by sector, product, and even branch. By monitoring the overall default and delinquency in the portfolio, MFIs can assure that it has adequate reserves to cover potential loan losses (Carpenter, Pikholz, & Champion, 2000). Thus, MFIs have developed very effective lending methodologies that reduce the credit risk, including group and solidarity lending.

Testing and evaluating the portfolio at risk in a MFI is considered as a powerful tool in the investment decision-making and design of effective management control systems (Crabb & Keller, 2006).

As microfinance booms, local regulators get concerned about the impact of macroeconomic shocks on MFIs' performance. Investors worry about losing their investments as economic conditions worsen in many countries.

Conventional case studies have long pointed to the resilience of microfinance to systemic shocks. Gonzalez (2007) analyzed global MFI data set in search of quantitative evidence of impact of macroeconomic shocks and other variables on the quality of microfinance portfolios. The empirical work examined measures of portfolio at risk and default using similar data and determined that portfolio quality is significantly related to growth.

The success of MFIs depends on the country-level context, in particular macroeconomic and macro-institutional determinants. Understanding these linkages can make MFI evaluation more accurate and, further, can help to locate microfinance in the broader picture of economic development (Ahlin et al., 2011).

Krauss and Walter (2009) presented empirical work evidence that, over the period 1998–2006, including microfinance in global portfolios reduced overall portfolio volatility.

Using regression, the study controls for those observable variables that may have an impact on the quality of the portfolio, such as the regulatory requirement of an institution, years of experience as a microfinance provider, number of active borrowers, gross loan portfolio, key factors in its cost structure, staff productivity, rate of return, and percent of women borrowers. In the macroeconomic context, the study looks at lending interest rate, GDP growth, and inflation.

An additional objective of many MFIs is to empower women by increasing their economic position in society (Ledgerwood, 1999). For this reason, MFI lending is often targeted towards women. Many MFIs are with the hope that growth in microfinance will promote equality by giving women economic opportunities and freedom.

Formal-sector commercial banks tend to favor men mainly because men run the businesses and tend to control the assets that banks seek as collateral. Microfinance is a totally different business, though since it is about informal sector and small businesses, and women make up a large and growing segment of informal-sector businesses.

Serving women borrowers has potential advantages. Women are often more conservative in their investment strategies. This makes it easier to secure debt repayments and create a reputation for reliability. Also, aiming resources to women may deliver stronger development impacts and evidence suggests that lending to women yields greater social and economic impacts so are more likely to repay loans than lending to men (de Aghion & Morduch, 2005). There is preference of MFIs for women borrowers. Women borrowers are considered to be less movable, more trustworthy, and have greater social impact (Aggarwal et al., 2013). D'Espallier et al. (2011) presented empirical work evidence that more women clients are associated with lower portfolio-at-risk, lower write-offs, and lower credit loss provisions for MFIs. In fact, women borrowers are most likely to develop businesses and have higher repayment rates compared to men.

On the other hand, there is little understanding of the empirical works that have explained why it is costly to lend to women borrowers. Findings are limited and mixed in relation to trade-offs between serving women and efficiency. Although MFI lending

is often targeted towards women, it could be less efficient when too much focus is given to women (Hermes et al., 2011).

For the MFIs in the study, we identify the extent to which funds are lent to women with the idea that women have better repayment records than men. More loans to women reduces risk in the portfolio—a hypothesis we test.

Methods

Previous works have already investigated the properties of microfinance and suggest that the level of risk in an MFI's loan portfolio is influenced by the choice of lending methodologies, institutional variables, borrowers' gender, and macroeconomic indicators that affect the capacity of the borrower to service the debt and repay loans. From a portfolio perspective, observable returns of MFIs are to be evaluated not only on a case-to-case basis but also in regard to their relationships with other factors and related risks. In terms of risk exposure, estimates of the Capital Asset Pricing Model reveal that microfinance portfolios exhibit higher market beta than those of conventional financial institutions (Brière & Szafarz, 2011).

The study seeks to analyze the contribution of three key factors to portfolio risk in Philippine MFIs: the institutional variables, the extent of lending to women, and macroeconomic indicators. A general model to study these three issues takes the form

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \square_{it} \qquad (1)$$

where Y_{it} is a measure of the risk in the portfolio of the Philippine MFI data in period t. The variable, X_{1it}, is a set of institutional variables for the Philippine MFI data in period t; X_{2it} is a measure of the portion of the portfolio lent to women by the Philippine MFI data in period t, and X_{3it}, is a set of macroeconomic variables in period t.

The factors include both microeconomic and macroeconomic variables affecting portfolio risk. First, at the micro, or institutional level, the regulatory requirement and age of the institution, size, and

number of loans made are known to impact risk in loan portfolios. The number of outstanding clients may proxy for the financial institutions' ability and incentives to monitor borrowers, and institutions that lack sufficient scale economies will have higher risks. Also, the rate of return on the portfolio is a factor. MFIs that seek a high return should face a higher risk of loss.

The study controls for overall performance of the economy at the macroeconomic perspective. Measures of GDP growth and GDP deflator are included as independent variables. If the overall economy rises, the portfolio risk will decline. On the other hand, the direction of the effect of inflation is ambiguous from a theoretical point of view. If the inflation rate rises to hyperinflation levels, the portfolio risk rises. On the contrary, higher inflation may help borrowers if they obtained fixed-rate domestic loans. Using the empirical work evidence of microfinance institutions during inflationary times, and the fact that the country has experienced high inflation, the coefficient on the inflation rate should be positive—higher inflation increases the portfolio risk as it presents a higher probability of default.

The two measures for the dependent variable are portfolio in arrears (PIA) and portfolio at risk (PAR). PIA measures the percent of the total loan portfolio past due by more than 30 days, while PAR measures the percent of the total loan portfolio that has at least one payment past due by more than 30 days. PIA is a measure of late payments, whereas PAR is a measure of the risk to the entire portfolio that those late payments indicate. PIA measures only the amounts of payments at risk, not the loan value or total risk. PAR may be a better measure of risk in the loan portfolio of MFIs (Crabb & Keller, 2006).

The study focuses on PAR as measure of portfolio quality. Information about the quality of MFIs' loan portfolio, however, is carried in the proportion of value of all loans outstanding that have various installments of principal past due. In the absence of default rate statistics, PAR is a relatively accurate alternative for the probability of default of the MFIs' borrowers. Since the loan portfolio makes up most of an MFI's assets, PAR will be considered as the factor affecting portfolio quality. PAR-30 shall describe as

PAR more than 30 days over gross loan portfolio. Thus, the empirical model used in the study is

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9t} + \beta_{10} X_{10t} + \beta_{11} X_{11t} + \beta_{12} X_{12t} + \beta_{13} X_{13t} + \beta_{14} X_{14t} + \beta_{15} X_{15t} + \square_t \qquad (2)$$

where Y_t is PAR for the Philippine MFI data in period t. PAR must be analyzed together with write-off ratio (WOR) and loan loss rate (LLR). While PAR measure may be the same, a loan portfolio with a large concentration of delinquent loans and operational loss affected by arrears will be much riskier. WOR, the value of loans written-off as a percentage of gross loan portfolio, and LLR, the write-offs net of recoveries as a percentage of gross loan portfolio, from non-performing loans, represented by X_{1t} and X_{2t}, respectively, increases operational loss, thus the expected sign is positive. It is important to highlight that WOR and LLR are measures of default, while PAR measures the risk of default.

In order to control for difference in regulatory compliance and level of operation, the study includes a dummy variable identifying whether the institution is REGULATED or unregulated. The independent variable, X_{3t}, is an indicator that takes the value of 1 if the institution is regulated and 0 otherwise. A regulated MFI is more restricted and governed by a supervisory agency and banking authorities. If regulation controls risk, the coefficient on X_{3t} will be negative. The results from these tests are very important from a policy perspective.

Also, the study includes age of the MFIs to control for differences in experienced lending and collection practices. X_{4t} is the AGE of the institution for the Philippine MFI data in period t; the expected sign is negative as risks fall from maturity of operations. MIX benchmarks classify MFIs into three categories (new, young, and mature) based on the maturity of their microfinance operations. It is calculated as the difference between the year they started their microfinance operations and the year of data submitted by the institutions. As a criterion, matured MFI has more than 8 years of operations.

X_{5t}, $X_{6t,}$ and X_{7t} are the NUMBER OF ACTIVE BORROWERS, the number of individuals or entities who currently have an outstanding loan balance with the MFI, GROSS LOAN PORTFOLIO (GLP), the proxy of size and GLP/ASSETS, gross loan of portfolio as a percentage of total assets, respectively, for the Philippine MFI data in period t; the expected sign is positive—when the institution increases its coverage in providing access to capital and other basic financial services, high and uncontrolled growth deteriorates the portfolio quality, thus risks increases.

X_{8t} is an indicator of OPERATING EXPENSES/GLP, the cost structure including all payroll-related expense, depreciation and amortization, and administrative expense for the Philippine MFI data in period t; the expected sign is positive.

PRODUCTIVITY, FINANCIAL SUSTAINABILITY, and PROFITABILITY measured by number of borrowers per staff member, return on asset (ROA) greater than 100%, and return on equity (ROE), represented by X_{9t}, X_{10t} and X_{11t}, respectively, impact risk in loan portfolios. While actual MFI screening and portfolio monitoring cannot be measured, productivity measured by borrowers per staff member is included as a proxy. The expected sign on X_{9t} is positive. The rate of return measured by ROA and ROE are institutional. It is the return on the overall loan portfolio for the Philippine MFI data in period t; the expected sign is positive—a higher return suggests higher risk.

X_{12t} represented the PERCENT OF WOMEN BORROWERS, the number of active borrowers who are women as a percentage of total number of active borrowers on a per MFI basis. Initially, the expected sign on X_{12t} is ambiguous. Lack of access to capital and other basic financial services for women may suggest greater risk (positive sign); however, it is expected in many MFIs that lending to women will reduce risk (negative sign).

The macroeconomic variables are items 13, 14, and 15. X_{13t} is the indicator of the LENDING INTEREST RATE on the portfolio, the bank rate that usually meets the short and medium term financing needs of the private sector, which is likely to affect the ability of the borrower to make repayment; the expected sign is positive. X_{14t} is the GDP GROWTH, the percent change in GDP in year t; the expected

sign is negative. X_{15t} is the INFLATION or GDP DEFLATOR, the percent change in the index value of the GDP deflator in year t; the expected sign is ambiguous.

All values are reported in US dollars. The institutional variables available in the study were obtained from MIX Market. It is a data hub where MFIs share institutional data to broaden transparency and market insight. Supported by validated social indicators and financial performance data, MIX Market provides analysis and reports on risks and opportunities in the markets where MFIs operate. Incorporated in 2002, MIX is a non-profit organization headquartered in Washington, DC with regional offices in Africa, Asia, Europe, and South America. The macroeconomic variables available in the study were obtained from WDI for the years 1998 through 2013. The selected macroeconomic and financial indicators in 2014 were obtained from BSP key statistics. However, it is not expected to significantly bias the results since a great deal of cross-sectional variation exists.

Results

Summary Statistics and Correlations

From more than 119 Philippine MFIs in reporting data to MIX for the period 1998 through 2014, the gross loan portfolio covered by MFIs reporting to the MIX Market grew 11.20% along with growth in number of borrowers. The market for microfinance is still growing and there are still risks that we have to manage before it succeeds in providing access to capital and other basic financial services to active poor and low-income groups.

Table 1 reveals that the comparative data of PAR-30 are higher in the Philippines with 8.59% on average, and lower for East Asia and the Pacific with a mean of 4.07%. However, using the measure of statistical significance of differences, the variance and standard deviation for the Philippines were relatively low with 0.03% and 1.84%, respectively, as compared with East Asia and the Pacific with 0.11% and 3.28%, respectively. Since PAR-30 is an accepted measure

of portfolio quality, it shows the risk exposure of the loan portfolio that includes arrears and therefore at risk of not being repaid. The older the PAR, the less likely that the loan will be repaid. Although a higher PAR-30 does not necessarily translate into expected losses for the Philippine MFIs, the PAR-30 level of the Philippines should be cause for concern, because unlike commercial loans, most microfinance loans are not secured by high-quality collateral. The deterioration in portfolio quality since 1998 has been remarkable and it seems to suggest that the worst effects of the economic shocks of 2011-2014 are being experienced with PAR-30 level exceeding 10%. Descriptive statistics for all dependent and independent variables are presented in Table 2 and correlation coefficients in Table 3.

Table 1 *Portfolio at Risk > 30 Days (%) of the Philippines vs. East Asia and the Pacific*

Year	Philippines	East Asia and the Pacific
1998	6.70%	11.99%
1999	7.83%	11.36%
2000	6.72%	4.45%
2001	5.51%	5.41%
2002	9.48%	4.56%
2003	9.55%	5.72%
2004	7.10%	3.16%
2005	8.48%	4.69%
2006	10.29%	1.01%
2007	9.57%	0.72%
2008	5.93%	2.72%
2009	8.65%	3.32%
2010	7.91%	3.87%
2011	11.64%	2.00%
2012	11.74%	1.01%
2013	8.92%	1.00%
2014	10.04%	2.15%
Mean	8.59%	4.07%
Median	8.65%	3.32%
Variance	0.03%	0.11%
Std. Deviation	1.84%	3.28%

Data Source: The MIX Market

Table 2 reports summary statistics for the sample used in the study. Given the characteristics of Philippine MFIs, the quality of their loan portfolios is expected to be appropriate. As shown in Table 2, looking at the risk measure of MFI portfolios, PAR-30 is close to nine percent, however, the average value for of the other two indicators of portfolio quality is below five percent. The high quality of most portfolios in the sample proves that for many Philippine MFIs, collection of small loans from informal microenterprises is not an issue.

Table 3 presents correlation coefficients for all variables with significant values which are not underlined. The multicollinearity is not affecting the coefficients and consequently, they are tolerably estimated. The low level of correlation coefficients in Table 3 reflect possible elimination of multicollinearity problem in the data Using Klien's rule of thumb, the independent variables are not highly correlated because coefficients of correlation obtained from auxiliary regressions are not greater than the overall coefficient of correlation.

Table 2 *Summary Statistics*
N = 272. Country average data (1998–2014) from 119 Philippine MFIs in the MIX Market.

	Minimum	Maximum	Mean	Standard Deviation
Portfolio at risk > 30 days (%)	0%	72.72%	8.92%	9.89%
Write-off Ratio (%)	0%	58.93%	2.11%	4.52%
Loan Loss Rate (%)	-7.24%	1306.55%	4.69%	57.44%
Regulated	0	1	0.64	0.48
Age	0	1	0.85	0.36
Number of Active Borrowers	180	849,232	41,040	93,077
Gross Loan Portfolio (US$ million)	23,733	412,316,209	8,525,087	20,772,302
Gross Loan Portfolio to Total Assets (%)	20.20%	177.39%	68.89%	15.95%
Operating Expense/ Loan Portfolio (%)	0.12%	152.64%	32.94%	20.77%
Borrowers per Staff Member	11	1,040	121	73
Financial Sustainability	0	1	0.85	0.35
Profitability (%)	-5.53%	8.05%	0.12%	0.54%
Percent of Women Borrowers (%)	0%	127.19%	77.89%	26.38%
Lending Interest Rate (%)	5.53%	16.78%	8.77%	1.87%
GDP Growth (%)	-0.58%	7.63%	4.95%	1.88%
Inflation, GDP Deflator (%)	1.92%	22.38%	4.53%	2.23%

Estimation of the Model

Table 4 presents the statistics for the regression. The goodness of fit or adjusted R-square of the estimated model is 0.926085, meaning, more than 92.61% of the total variation in the portfolio risk can be explained by the model. The statistic along with the sign and level of significance of each independent variable can tell us many things about the portfolio risk in Philippine MFIs.

Table 5 estimates the model in equation (2) for 119 Philippine MFIs from 1998 through 2014 with 272 number of observations from 10,222 original unbalanced panel data points. The dependent variable in the regression is PAR-30. The results on Table 5 show that the Multiple R is high and correlation is strong with loan loss rate, percent of women borrowers and regulation.

Table 3 *Correlation Matrix*
N = 272. Country annual data (1998–2014) from 119 Philippine MFIs in the MIX Market.

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Portfolio at risk > 30 days (%)	1.00															
2	Write-off Ratio (%)	0.41	1.00														
3	Loan Loss Rate (%)	-0.27	-0.01	1.00													
4	Regulated	0.17	-0.21	-0.18	1.00												
5	Age	-0.11	0.18	-0.22	-0.56	1.00											
6	Number of Active Borrowers	0.48	0.39	-0.24	-0.10	0.25	1.00										
7	Gross Loan Portfolio (US$ million)	0.36	0.30	-0.22	-0.16	0.18	0.95	1.00									
8	Gross Loan Portfolio to Total Assets (%)	0.39	0.21	-0.06	0.40	-0.22	0.65	0.57	1.00								
9	Operating Expense/ Loan Portfolio	0.22	0.41	-0.14	-0.41	0.51	0.57	0.46	0.10	1.00							
10	Borrowers per Staff Member	0.17	0.08	-0.02	0.68	-0.30	0.15	0.19	0.41	-0.18	1.00						
11	Financial Sustainability	0.02	-0.14	-0.17	0.80	-0.47	0.01	0.09	0.41	-0.52	0.78	1.00					
12	Profitability (%)	0.43	0.10	-0.12	0.45	-0.26	0.62	0.52	0.64	0.18	0.34	0.44	1.00				
13	Percent of Women Borrowers (%)	0.55	0.28	-0.39	0.05	0.16	0.62	0.54	0.28	0.21	-0.11	-0.04	0.40	1.00			
14	Lending Interest Rate (%)	-0.64	-0.54	0.26	-0.39	0.13	-0.77	-0.70	-0.65	-0.27	-0.49	-0.40	-0.75	-0.65	1.00		
15	GDP Growth (%)	0.34	0.51	0.09	0.27	-0.26	0.48	0.49	0.56	0.16	0.51	0.40	0.40	0.27	-0.70	1.00	
16	Inflation, GDP Deflator (%)	-0.48	-0.47	0.24	-0.55	0.33	-0.40	-0.38	-0.35	-0.04	-0.72	-0.59	-0.55	-0.33	0.82	-0.66	1.00

Underlined correlations are insignificant at standard levels.

Table 4 *Regression Statistics*

Multiple R	0.997687
R Square	0.995380
Adjusted R Square	0.926085
Standard Error	0.004990

Table 5 *Determinants of Portfolio Risk in MFs—Dependent Variable: Portfolio at Risk*
Estimation of equation (2)

Independent Variables	Coefficient	Standard Error	p-value		95% Confidence Interval	
Intercept	-0.196602	0.150757	0.416		-2.112	1.719
Write-off Ratio	0.599959	0.993883	0.654		-12.029	13.228
Loan Loss Rate	0.053953	0.040775	0.412		-0.464	0.572
Regulated	0.214586	0.144679	0.378		-1.623	2.053
Age	0.086479	0.059536	0.384		-0.670	0.843
Number of Active Borrowers	-0.000001	0.000001	0.322	**	-8.549E-6	6.421E-6
Gross Loan Portfolio	0.000000	0.000000	0.371	**	-2.443E-8	3.106E-8
Gross Loan Portfolio to Total Assets	0.045617	0.196273	0.855		-2.448	2.540
Operating Expense/ Loan Portfolio	-0.006282	0.052157	0.924	*	-0.669	0.656
Borrowers per Staff Member	0.000456	0.000445	0.493	**	-0.005	0.006
Financial Sustainability	-0.074411	0.055232	0.407		-0.776	0.627
Profitability	0.003984	0.064387	0.961	*	-0.814	0.822
Percent of Women Borrowers	0.252183	0.033853	0.085		-0.178	0.682
Lending Interest Rate	-0.012064	0.005443	0.270	*	-0.081	0.057
GDP Growth	-0.010535	0.002228	0.133	*	-0.039	0.018
Inflation, GDP Deflator	0.002457	0.001892	0.418	*	-0.022	0.026
F-Statistic	14.364372					
p-value	0.204514					

No. of observations = 17
* and ** indicate significance at 5% and 1% levels, respectively.

The regression results showed that the independent variables are significant drivers of portfolio risk at a 5% level. Outreach represented by number of active borrowers and gross loan portfolio, cost efficiency measured by operating expense over loan portfolio, productivity represented by borrowers per staff member, profitability measured by return on equity, and macroeconomic variables have the strongest impact on portfolio risk. Assuming a confidence coefficient of 95%, 95 out of 100 cases intervals will individually contain the true coefficients of the independent variables, and the highest and lowest significance levels at which the null hypothesis can be rejected are 92.4% and 8.5%, respectively. However, for the F-test on whether all of the slope coefficients are, simultaneously, equal to zero, the independent variables are statistically significant at 5% level. The result of the regression and influence of the variables used is strong. The p-value of the F-statistic is 0.202514, hence, the overall regression as a whole is significant at 5% level.

Since the study focuses on whether the microfinance operations become viable and sustainable, we analyze the trend of the portfolio risk against minimum indicators. It is useful to analyze and correlate portfolio quality against outreach, financial sustainability, and profitability. It is interesting to note that the trends of PAR-30 vis-à-vis these minimum indicators suggest the priori hypothesis. Further, we evaluate the relationship of MFI lending to more women on cost efficiency and its ability to generate ROA or financial sustainability.

Figure 1 shows that as Philippine MFIs increase its outreach with greater number of active poor people, uncontrolled growth increases portfolio risk, thus, deteriorates the portfolio quality. Expanding the number of active borrowers which are actually active poor proves to be not viable and unsustainable. Here, the rapid expansion is counter-productive.
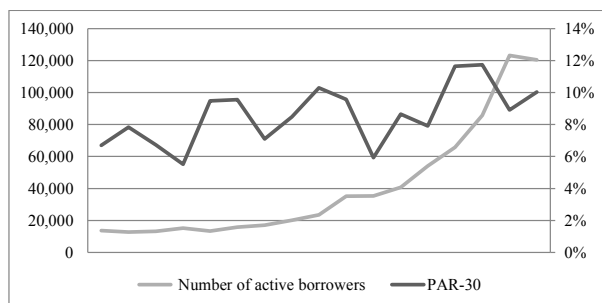

Fig. 1 *PAR-30 versus Number of Active Borrowers.*

Figure 2 shows financial sustainability improved as investments start to deploy its assets profitably, and that the Philippine MFIs expand the financial services, coordinate activities, and benefit from economies of scope and scale. As microfinance operations mature, it requires new investment in infrastructure and operating systems as shown in the latter year that can affect the portfolio and increase the portfolio risk.
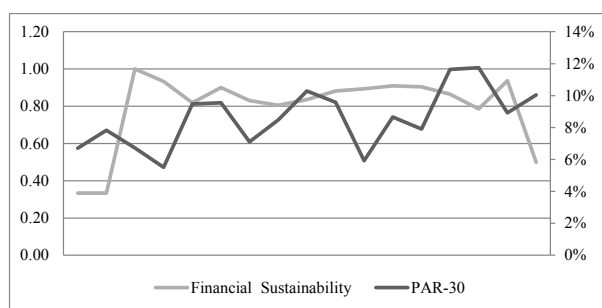
Fig. 2 *PAR-30 versus Financial Sustainability.*

Figure 3 shows that, in terms of profitability measured by ROE, Philippine MFIs succeed in maintaining financial services while covering all the expenses and generate profit, thus, producing return on investment.
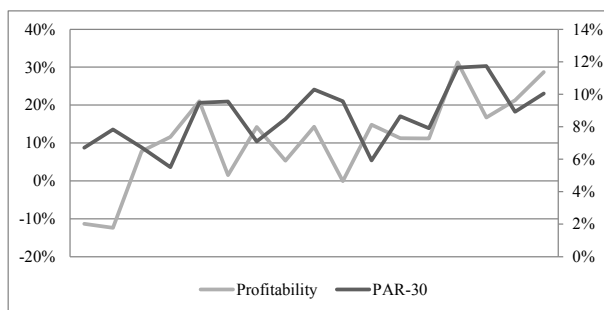

Fig. 3 *PAR-30 versus Profitability.*

Both trends in financial sustainability and profitability suggest that higher return results in higher portfolio risk.

Alongside outreach, financial sustainability, and profitability, efficiency is as important. Figure 4 shows that Philippine MFIs become cost effective by maintain the payroll-related and administrative expenses over loan portfolio at a low level. However, portfolio risk increases as cost efficiency does not translate to improved lending methodologies and collection practices. In the latter period, as expected, expanding in microfinance operations requires investments in personnel, facilities, and operating systems.
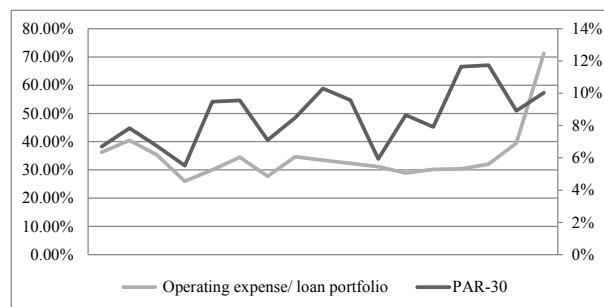

Fig. 4 *PAR-30 versus Operating Expense/ Loan Portfolio.*

Although empirical works and microfinance programs on women imply reducing portfolio risk, Figure 5 suggests that increasing exposure of women with lack of access to capital and high interest rates as a result of the restricted access to the formal labor market contribute to the increase of portfolio risk. This finding is subjective and may depend on the context.
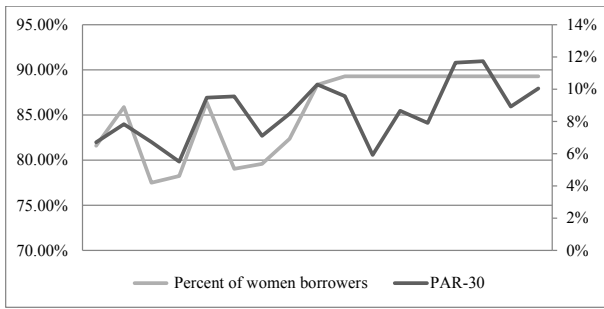
Fig. 5 *PAR-30 versus Percent of Women Borrowers.*

Finally, Figure 6 shows that the relationship between PAR-30 and GDP growth is strong. Philippine MFIs are taking more risks when economic conditions are favorable.
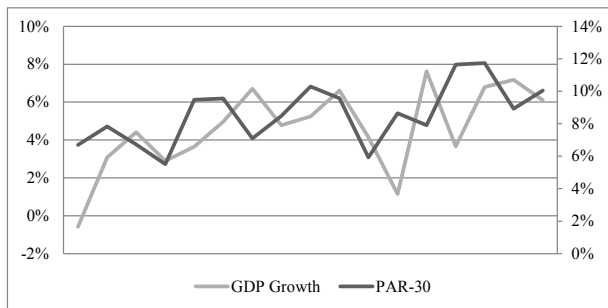

Fig. 6 *PAR-30 versus GDP Growth.*

As an additional objective of the study, Figure 7 shows that the Philippine MFI lending to more women has semi-strong trend with percentage of operating expense over loan portfolio, thus, interpreted as costly to lend to women, and there is a negative trend with financial sustainability. This interpretation is further supported by the result of the correlation matrix with positive association of percent of women borrowers with the operating expense over loan portfolio and negative with financial sustainability. Theoretically, the result is suggestive that serving more women requires intensive monitoring and administration, thus, high cost of operations. Financial sustainability as measured by ROA may vary in absolute and relative terms depending on the amount invested for capital and operational activities. Generating revenue to cover these costs can be achieved by charging high interest rates. Assuming all factors held constant, MFI lending to more women will increase cost and reduce ROA.
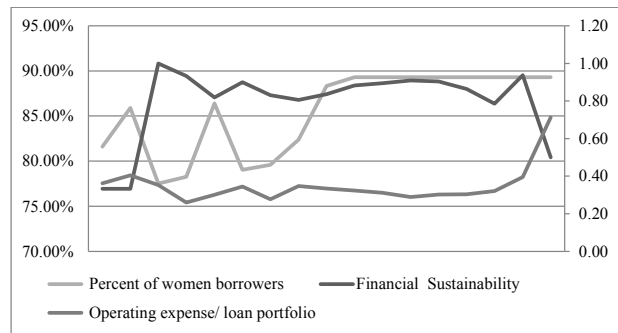

Fig. 7 *Percent of Women Borrowers versus Operating Expense/Loan Portfolio and Financial Sustainability.*

An examination at the model and figures indicate that the model is estimated well. The coefficients of most independent variables and trends reflected the predicted signs and the model is significant as shown by the F-test and figures. However, it is interesting to note the positive effect of regulatory requirement of the institution. Also, the unexpected signs of the loan loss rate and lending interest rate variables in all regressions may be due to errors introduced by our limited data. As estimated, the signs and trends of the coefficient on the percent of loans in the portfolio made to women and the macroeconomic factors including GDP growth and inflation are positive and significant. Overall, the signs and trends of the coefficients of all the variables are appropriate, a priori, if not based on alternative hypothesis.

For the estimated model, the key contributors to risk aside from institutional factors (as measured by the coefficient estimates) including percent of loans made to women are the macroeconomic factors GDP growth and inflation. In the study, the Philippine MFI data identified the extent to which funds are lent to women with the idea that more loans to women

reduces risk in the portfolio. MFI lending is targeted towards women due to its potential advantages in terms of reputation for better repayment, reliability, and greater ability to use the loan proceeds for economic development. However, correlation of portfolio quality and percent to women borrowers suggests that more loans to women increases risk in the portfolio. There have been many empirical works on the success of microfinance but results on the MFI lending to women seem inconsistent in terms of portfolio quality. However, focus of serving more women borrowers may have important implications for the role of gender in economic development and poverty alleviation. The significance of the macroeconomic variables suggests that a key part of the risk in the portfolio is uncontrollable at the institutional level. Therefore, MFIs would benefit by operating in such a way as to diversify their risks across many countries and regions.

Conclusion

Today, quality of the portfolio of microfinance becomes more complex. MFIs seem to succeed in fulfilling its objective of increasing active poor's access to basic financial services while achieving better monitoring, repayment and financial sustainability. The results identified that the institutional variables including number of active borrowers, gross loan portfolio, operating expense over loan portfolio, borrowers per staff member, return on equity, percent of women borrowers, regulation, and macroeconomic indicators including GDP growth and inflation were the factors that affected the portfolio quality and portfolio risk in Philippine MFIs. The main finding of the study revealed that outreach, cost efficiency, productivity, profitability, percent of women borrowers, regulation, and macroeconomic variables have the strongest impact on portfolio risk. The differences in time and across the 119 Philippine MFIs would affect the country's portfolio risk.

Microfinance institutions have grown providing access to capital and other basic financial services to millions of borrowers. The favorable policy and regulatory environment for MFIs facilitated the growth and development of the Philippine

microfinance. Over time, however, given the portfolio risks, MFIs started finding it difficult to remain sustainable while serving large number of active poor people. Although success of MFIs varies from country to country, the results supported the interest of the study that the impact of empowerment of women through microfinance programs is a key success factor in portfolio quality. When faced with lack of access to capital and higher interest rates, serving more women borrowers contributes to the increase of portfolio risk, and negatively impacts cost efficiency and financial sustainability. This study contributes by determining the challenges and issues affecting portfolio risk of MFIs, and understanding its nature and the importance of the role of gender in economic development and poverty alleviation. Moreover, in meeting the social and financial objectives towards the active poor including more women, MFIs should continue to expand their operations and diversify to mitigate the effects of significant macroeconomic factors affecting viability and long-term financial sustainability as a result of economies of scale.

Like all financial institutions, MFIs should identify, manage, and mitigate risks efficiently and effectively to be successful, otherwise it would incur losses in the long-run and not likely to meet its social and financial objectives. To continue providing financial service to the active poor on a sustaining basis, the MFIs themselves must be viable and sustainable. Besides the financial soundness of a business model, the more important aspect of microfinance operations is its notable impact to the active poor. Access to capital and other basic financial services and encouragement of entrepreneurship through microfinance could make a significant improvement in our economy. Overall, viability and long-term financial sustainability is not an end in itself; rather it is just a means to the end of alleviating poverty.

Viable and sustainable microfinance operations and interplay with government regulation and programs will enable active poor including more women to undertake and develop sustainable livelihood and entrepreneurial activities, encourage savings, create employment activities, and increase productivity. Microfinance industry in the Philippines if not properly managed would incur greater losses in the long-run.

Acknowledgments

Notes

[1] Exchange rate US$1 = Ph44.72 (as of December 29, 2014).
[2] Information about the Microfinance Programs and Policy can be accessed at Bangko Sentral ng Pilipinas Website (www.bsp.gov.ph).

References

Aggarwal, R., Goodell, J. W., & Selleck, L. J. (2013). *Lending to women in microfinance: Influence of social trust and national culture* (Working Paper No. 13/17). Cleveland, United Sates of America: Federal Reserve Bank of Cleveland.

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.

de Aghion, B. A., & Morduch, J. (2005). *The economics of microfinance*. Massachusetts, United States of America: Massachusetts Institute of Technology Press.

Bangko Sentral ng Pilipinas (BSP) (n. d.). *FAQs*. Retrieved from *http://www.bsp.gov.ph/about/advocacies_ micro_facts.asp*Bangko Sentral ng Pilipinas (BSP). (2015). *Financial inclusion initiatives 2014*. Manila, Philippines: BSP.

Bangko Sentral ng Pilipinas (BSP). (2014). *Financial inclusion initiatives 2013*. Manila, Philippines: BSP.

Brière, M., & Szafarz, A. (2011). *Investment in microfinance equity: Risk, return, and diversification benefits* (Working Paper No. 11/050). Brussels, Belgium: Centre Emile Bernheim.

Carpenter, J., Pikholz, L., & Champion, A. (2000). *A risk management framework for microfinance institutions*. Washington, D.C., United States of America: MicroFinance Network. Retrieved from h*ttp://www.microfinancegateway.org/sites/default/files/ publication_files/a_risk_management_framework_ for_microfinance_institutions.pdf*Crabb, P., & Keller, T. (2006). A test of portfolio risk in microfinance institutions. *Faith & Economics, (47-48)*, 25–39.

Carroll, N. (2010, January). Microfinance in the Philippines. *Asia Focus*. San Francisco, United States of America: Country Analysis Unit of the Federal Reserve Bank of San Francisco. Available at *http://www.frbsf.org/ banking/files/Asia-Focus-Microfinance_January-2010. pdf*.

Daley, S., & Sautet, F. (2005). *Microfinance in action: The Philippine experience* (Mercatus Policy Comment No. 1). Virginia, United States of America: Mercatus Center, George Mason University.

D'Espallier, B., Guérin, I., & Mersland, R. (2011). Women and repayment in microfinance: A global analysis. *World Development, 39*(5), 758–772.

Gatdula, D. 2014. *Microfinance services growing rapidly*. The Philippine Star. Retrieved from *http:// www.philstar.com/business/2014/04/03/1308082/ microfinance-services-growing-rapidly*.

General Banking Law of 2000, Republic Act No. 8791 (2000).

Gonzalez, A. (2007). *Resilience of microfinance institutions to national macroeconomic events: An econometric analysis of MFI asset quality* (Discussion Paper No. 1). Washington, D.C., United States of America: Microfinance Information Exchange, Inc. Retrieved from *http://www.themix.org/sites/default/files/ Discussion%20Paper%201.pdf*Hermes, N., Lensink, R., & Meesters, A. (2011). Outreach and efficiency of microfinance institutions. *World Development, 39*(6), 938-948.

Krauss, N., & Walter, I. (2009). Can microfinance reduce portfolio volatility? *Economic Development and Cultural Change*, *58*, 85–100.

Ledgerwood, J. (1999). *Microfinance handbook: An institutional and financial perspective*. Washington, D.C., United States of America: The World Bank.

Llanto, G., Garcia, E., & Callanta, R. (1996). *An assessment of the capacity of financial performance of microfinance institutions: The Philippine case* (Discussion Paper No. 96-12). Makati, Philippines: Philippine Institute for Development Studies.