



Drawing Insights on Poverty Movement with Multi-Year PPI Data

A Case Study of Two Filipino MFIs

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Executive Summary

Beyond merely reaching the poor, the development sector needs to demonstrate, in clear and quantifiable terms, that they are helping the poor to escape poverty. Grameen Foundation developed the Progress out of Poverty Index® (PPI®) with the goal of providing MFI decision-makers a cost-effective and practical tool that can be used to both measure outreach to the poor and monitor poverty levels of MFI clients over time.

This report uses PPI data from two MFIs in the Philippines (MFI 1 and MFI 2) to explore what types of poverty movement analyses can be carried out with multiple years of PPI data and what implications can be drawn from such analyses. MFI 1 is one of Asia's first PPI users; it has been working with Grameen Foundation and collecting PPI data regularly since 2009. MFI 2 began collecting PPI data from all clients more recently in 2010, though it collected data on a sample of clients in 2009. In total, MFI 1 and MFI 2 each had over 50 branches and MFI 1 had over 150,000 active clients (predominantly borrowers), while MFI 2 had over 750,000 clients, including both savers and borrowers.

Findings

The MFIs' data were analyzed in a variety of ways. First, basic poverty movement analysis was used to see how poverty levels for one cohort of clients changed between PPI score collection dates. **Overall, it appeared that poverty rates—the percentage of clients who are poor—decreased over time for most clients at both MFIs.**

Second, Grameen Foundation examined poverty movement trends for sub-samples of clients. While there is no comparison group for the clients overall, segmentation of clients into different groups allows for comparisons to be drawn between them. For this report, the three main segmentations examined included the following:

- ▶ length of client membership (new vs. returning and long-term clients);
- ▶ frequency of taking out loans (those with more PPI scores within a given timeframe vs. those with fewer PPI scores during the same timeframe); and
- ▶ activity level of clients (active borrowers vs. clients that eventually became inactive or resigned).

Examining poverty movement by different groupings of clients has revealed interesting trends, particularly for client groups segmented by activity level and frequency of taking out loans.

Length of client membership did not appear to affect client poverty. No clear trend was found that significantly differentiated poverty movement patterns between new, returning or long-term clients. A variety of slight differences in trends seemed to contradict one another making it difficult to draw out further implications. However, what was apparent was that all groups consistently saw improvements in poverty status over time.

Both frequent and infrequent loan users saw declines in poverty rates over time with similar magnitudes. However, those who took fewer loans, as a group, were initially less poor than those who took loans more frequently. This may imply that poorer clients need to take out loans more frequently or that they can only afford to take out smaller sized loans and those loans tend to have shorter terms.

For MFI 1, there were no significant correlations between change and poverty and whether the client remained active. **For MFI 2, those that were active saw a clear decrease in poverty rates over time, while poverty**

rates for those that became inactive leveled out right before they became inactive, and those that resigned, as a group, actually saw a slight increase in poverty rates before resigning. This implies that clients who generally continue to see their poverty levels drop will continue to take loans, while clients who generally see their poverty levels remain the same or increase stop taking loans.

Further research on more comprehensive data, both quantitative and qualitative, could provide a better understanding of what is driving these trends and how the MFIs can implement changes to better meet the need of their different client segments.

Conducting a Poverty Movement Analysis

This exercise, in addition to providing some insights for MFI 1 and MFI 2, has also revealed a number of challenges and opportunities that must be considered when trying to understand how the PPI can be used to measure poverty movement. Two challenges in particular have been highlighted: 1) a need to put more thought into designing the data requirements for future analysis and 2) limitations on attribution possible without an external comparison group.

But with these challenges come opportunities. Trends found through poverty movement analysis can be combined with other existing knowledge about clients to develop hypotheses about why the trends may be occurring. Both qualitative data (such as interviews or focus group discussions) and quantitative data (such as financial performance indicators or other data collected from branches or clients) can be used in combination with the PPI to better understand what trends are occurring and why.

Background

Beyond merely reaching the poor, the development sector needs to demonstrate, in clear and quantifiable terms, that they are helping the poor to escape poverty. In recent years, behavioral economists, including Esther Duflo and Dean Karlan, both of MIT and the Abdul Latif Jameel Poverty Action Lab, have made significant gains in estimating the impact of microfinance programs on borrowers by conducting evaluations using randomized control trials (RCTs). Although such methods are better able to isolate the impacts of activities of microfinance institutions (MFIs) on client outcomes, they often require observations from large numbers of non-clients and randomized placement of services during the study period, which is typically not realistic for an MFI to do on its own. Periodic impact assessments and RCTs play a role in the evaluation of microfinance and other development programs; however, MFIs need to be able to measure and manage their own performance on a day-to-day basis. Grameen Foundation developed the Progress out of Poverty Index (PPI) with the goal of providing MFI decision-makers a cost-effective and practical tool that they could use themselves to both measure outreach to the poor and monitor poverty levels of MFI clients over time. This data allows program leaders to analyze how their clients' lives are changing and, when combined with other data points, determine whether the program is helping.

Data Sample

This report uses PPI data from two MFIs in the Philippines, referred to as MFI 1 and MFI 2, to explore what types of poverty movement analyses can be extracted with multiple years' worth of PPI data and what implications can be drawn from such analyses. MFI 1 is one of Asia's first PPI users; it has been working with Grameen Foundation and collecting PPI data regularly since 2009. MFI 2 began collecting PPI data from all clients more recently in 2010, though it collected data on a sample of clients in 2009. In total, MFI 1 and MFI 2 each have over 50 branches and MFI 1 has over 150,000 active clients (predominantly borrowers) while MFI 2 has over 750,000 clients (including both savers and borrowers).

For both institutions, Grameen Foundation selected branches for this report based on which branches were found to have the most complete sets of PPI data. For MFI 1, seven branches were selected because they had data on at least 70% of clients between July 2010 and December 2012. For this sample, the majority of analysis was conducted for clients with three recorded PPI scores between 2010 and 2012.

For MFI 2, 24 branches had sufficiently complete data for clients whose first score was collected in 2011 and ten branches had sufficiently complete data for clients whose first score was collected in 2010. As MFI 2 had more complete data and collected data more often than MFI 1, a sufficiently large sample of clients with four PPI scores between 2010 and 2013 existed for data analysis.

For both MFI 1 and MFI 2, the policy for PPI data collection is that a PPI score should be collected at the start of each new loan cycle. For MFI 1, first loans are always 6 months in length, while subsequent loans can range from 6 to 12 months in length. For MFI 2, the first loan is also always 6 months, and the length of subsequent loan terms can vary from anywhere between 1 to 12 months.

Client Segments

In conducting the analysis of poverty movement, Grameen Foundation analyzed trends in poverty levels for the following sub-groups of clients:

- ▶ Clients who started taking loans out in different years;
- ▶ Clients with different total numbers of collected PPI scores;
- ▶ Clients with different membership lengths;
- ▶ Clients with more or fewer PPI scores between 2010 and 2013, which were used as a proxy for the frequency of taking out loans; and
- ▶ Active and inactive clients measured using different proxies for inactivity.

For MFI 1, “new” clients are those that had their first PPI score collected during their first loan cycle. “Recent” clients are those that have five or fewer loans total and include the new clients just described. “Long term” clients are those that had their first PPI score collected during or after their sixth loan.

TABLE 1. MFI 1 SAMPLE DATA

Type of Client	Year of First PPI Collection	Number of Scores Collected in Total			# of Branches Surveyed
		1 score	2 scores	3 scores	
New	2010	7,512	3,592	1,322	7
Recent	2010	12,108	5,796	1,643	7
Long Term	2010	616	525	223	7

For MFI 2, “new” clients are those that had their first PPI score collected during their first loan cycle. “Returning” clients are those that had their first PPI score collected within three years of their first loan and includes new clients. “Long term” clients are those whose first PPI score was collected between their fourth and tenth year of membership.

TABLE 2. MFI 2 SAMPLE DATA

Type of Client	Year of First PPI Collection	Number of Scores Collected in Total				# of Branches Surveyed
		1 score	2 scores	3 scores	4 scores	
New	2010	2,918	1,537	1,179	2,021	10
New	2011	16,428	5,078	5,949	0	24
Returning	2010	3,487	5,047	4,817	12,684	10
Returning	2011	34,782	21,974	49,152	0	24
Long Term	2010	346	670	838	2,497	10
Long Term	2011	11,376	5,653	13,403	0	24

Data Limitations

Taking into consideration additional data, such as number of loans, loan amounts, length of loan term and purpose of loan associated with each PPI collection would have allowed for more in-depth analysis. Other data that may have been useful to consider include demographic data such as age, gender and occupation of clients. Ensuring that the design of management information systems (MIS) includes this extra data will enhance the type of analysis that can be carried out on a frequent basis.

Other limitations include incomplete data—for MFI 1, for example, the majority of PPI data appears to be missing from the first six months of 2011. Small data samples when analyzing data by branch, as well as small data samples among long term clients, also made it difficult to gather statistically significant findings for these sub-samples of the client population.

Lastly, lack of data for a comparison group makes it difficult to assess how trends in poverty movement would differ for MFI 2 and MFI 1 clients if they had not become members of these MFIs. In other words, while trends in poverty movement can be defined and correlations between various factors (such as length of membership) and poverty movement can be measured, attribution of these results to the MFIs' programs cannot be determined with this data alone. See the section "Opportunities for More Robust Poverty Movement Analysis" for ways the data could have been improved.

Key Findings

A wide variety of statistical analysis tests allowed Grameen Foundation to identify how multiple years of PPI data can best be used to infer useful insights. First, basic poverty movement analysis was used to see how poverty levels for one cohort of clients changed between PPI score collection dates. **Overall, it appeared that poverty rates—the percentage of clients who are poor—decreased over time for most clients at both MFIs.** However, data limitations and the lack of a comparison group meant that it would be difficult to attribute changes from such basic analysis.

More useful insights were found instead by examining poverty movement trends for sub-samples of clients. Thus while there is no comparison group for the clients overall, segmentation of clients into different types allows for comparisons to be drawn between groups. For this report, the three main segmentations examined included the following:

- ▶ length of client membership (new vs. returning and long-term clients);
- ▶ frequency of taking out loans (those with more PPI scores within a given timeframe vs. those with fewer PPI scores during the same timeframe); and
- ▶ activity level of clients (active borrowers vs. clients that eventually became inactive or resigned).

The rationale for examining poverty movement trends by looking at these sub-categories of clients are as follows. For length of membership, one might expect that clients who had been members longer would see diminishing returns from taking out new loans with regards to increases in income. Alternatively, any impact on poverty rates from loans could take a while to materialize and thus poverty movement may be more pronounced for returning or long-term clients. While analysis of the data cannot show causality, it could reveal whether trends support or refute these theoretical relationships between length of membership and poverty movement. However, **length of client membership did not appear to affect client poverty.** No clear trend was found that significantly differentiated poverty movement patterns between new, returning or long-term clients. A variety of slight differences in trends seemed to contradict one another making it difficult to draw out further implications. Furthermore, PPI data did not exist for returning and long-term clients when they took out their first loan. Thus, the changes in poverty from their entry into the institution to their first recorded PPI collection are not captured. However, what was apparent was that all groups consistently saw improvements in poverty status over time.

Second, the relationship between loan uptake and poverty movement was investigated. Poverty movement trends were compared for clients who took out three loans over four years with those that took out four loans over four years. Data did not exist for the specific number of loans clients had taken out. However, since PPI scores are, according to policy, taken out at the start of each new loan cycle, each PPI score collection was used as a proxy for a loan renewal. Thus clients with more PPI scores within the same period of time were likely taking out loans more often and for shorter durations. Analyzing trends for those that take out more or fewer loans could show whether a relationship exists between taking loans out more or less frequently and poverty movement. **The**

findings showed that both frequent and infrequent loan users saw declines in poverty rates over time with similar magnitudes. However, those who took fewer loans, as a group, were initially less poor than those who took loans more frequently. This may imply that poorer clients need to take out loans more frequently or that they can only afford to take out smaller sized loans and those loans tend to have shorter terms.

Finally, analysis was conducted not only on those who continued to stay in the program but also on comparisons of them with those who dropped out. Distinguishing between active clients, inactive clients (clients that appeared to stop withdrawing loans but had not formally resigned from the program), and resigned clients allows us to examine whether clients who become less poor over time are more likely to continue to take out loans from these MFIs and whether changes in poverty levels could potentially be linked to clients who stop taking out loans. Ideally, we would like to find that continuing to take out loans leads to decreasing poverty rates. At the same time, it is possible that clients may become inactive or resign because they have become poorer and cannot afford to take out more loans as a result—or worse, that clients become poorer as a result of the loans and therefore do not want to take out more loans. Alternatively, clients may become inactive or resign because they have benefited from the program to such a degree that they no longer need loans. While the analysis cannot identify causality, it sets the direction of further research.

For MFI 1, there were no significant differences among the different groups of clients. For MFI 2, those that were active saw a clear decrease in poverty rates over time, while poverty rates for those that became inactive leveled out right before they became inactive, and those that resigned, as a group, actually saw a slight increase in poverty rates before resigning. This implies that clients who generally continue to see their poverty levels drop will continue to take loans, while clients who generally see their poverty levels remain the same or increase stop taking out new loans. The MFIs, in turn, could potentially use this information to assess which clients may drop out, when they may drop out, and what interventions could improve the situation for these clients and keep them active.

Examining poverty movement by these different groupings of clients has revealed interesting trends, particularly for client groups segmented by activity level and frequency of loan use. Further research on more comprehensive data, both quantitative and qualitative, could provide a better understanding of what is driving these trends and how the MFIs can implement changes to better meet the needs of their different client segments.

Poverty Movement by Length of Membership

For new clients from MFI 1 and new and returning clients from MFI 2, poverty rates were found to decrease over time.¹ Poverty movement trends for returning clients at MFI 1 were not statistically significant and thus inconclusive. However, both statistical significance and magnitude of trends differed across a variety of different client segments for both MFIs. Since the majority of changes in poverty movement were found not to be statistically significant for MFI 1, analysis and interpretation of results focuses largely on MFI 2 data for this section.

¹ Notably, however, for both institutions, as we did not have a control group we cannot be sure of how much of this trend can be attributed to the products and services provided by the MFIs. In fact, it is hypothetically possible that the poverty levels of MFI members, while decreasing over time, could be decreasing over time by less than others in their community with similar socio-economic profiles, which then moderates the positive effect of the MFI. Ideally, we would want to be able to compare this trend to change in poverty level over time for other similar members of the local community. See section “Opportunities for More Robust Poverty Movement Analysis.”

TABLE 3. POVERTY MOVEMENT FOR MFI 1 AND MFI 2

Client Category	MFI 1	MFI 2
New	Improving	Improving
Returning	No significant movement	Improving
Long Term	No significant movement	Improving

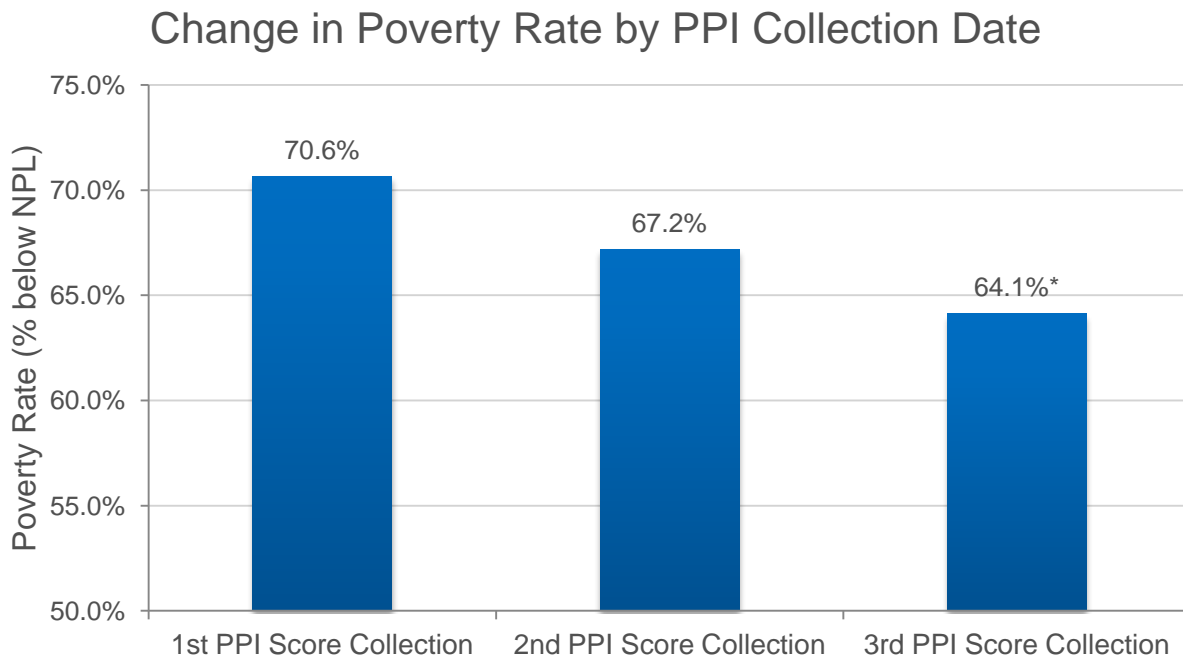
Overall, poverty movement trends appeared to be similar for new, returning and long-term clients. However, magnitude of poverty movement differed among clients with different membership lengths—and in different ways depending on in which year the first PPI score was collected. As such, it appears that both internal and external factors likely play a role in the magnitude of poverty movement found for different segments of these clients.

MFI 1

For MFI 1, regressions were run to measure poverty movement for both new clients (first PPI score collected on their first loan) and long-term clients (first PPI score collected on their sixth loan cycle or above) between 2010 and 2012. However, statistically significant trends were only found for new clients between their first and third PPI score collection dates. Trends for long-term clients were not found to be statistically significant and are therefore inconclusive. This is in part because the sample for long-term clients was too small: limited to 669 observations from 223 clients. As a result, further analysis of poverty movement of MFI 1 clients focused on new clients. This also meant that a comparison could not be made between poverty movement trends for new MFI 1 clients and long-term MFI 1 clients.

Among the 1,322 new clients at MFI 1 who had three PPI scores collected since taking out their first loan, poverty levels decreased by 6.5 percentage points between 2010 and 2012, which means that 9.2% of clients who lived below the poverty line had moved above it. This trend was found to be statistically significant within a 90% confidence interval when controlling for differences among branches and year in which the first PPI score was collected.

FIGURE 1. CHANGE IN POVERTY RATES AMONG NEW MFI 1 CLIENTS FROM FIRST TO THIRD PPI SCORE COLLECTION FROM 2010 TO 2012



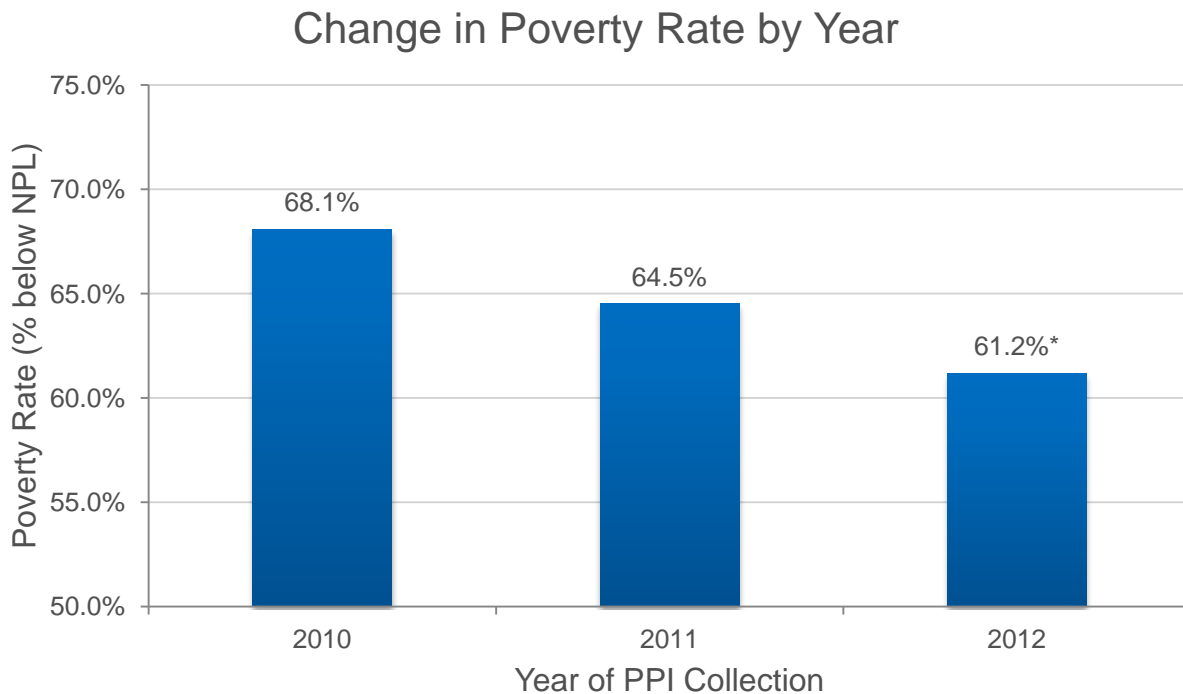
Sample Size: 3,966 observations (1,322 clients with three PPI scores each)

* Change in poverty levels between the first PPI score collection and third PPI score collection was found to be statistically significant at the 10% level.

Given the variety of loan term lengths within the sample, another question that this analysis brings up is whether or not this trend would look similar if we did a comparison from year to year rather than from one PPI collection to the next for the same cohort of clients. This may be important to consider since it is possible for three PPI scores to be collected over as little as 8 months (6 month loan followed by two 1-month loans) or as much as 2.5 years (6 month loan, followed by two 12-month loans). If a large portion of the sample covered three PPI scores in less than a year, the poverty movement measured in that time could conceivably be much different than for poverty movement measured over three years. A table providing data on the number of months between PPI score collections for MFI 1 can be found in Appendix A.

The following graph shows the regression results for MFI 1 new clients divided by year instead of the PPI score collection. A similar trend is found, with a drop in poverty level by 6.9 percentage points between 2010 and 2012. This trend was also significant within a 90% confidence interval when controlling for year of first PPI score collection and branch level effects. This seems to indicate that either most of the original sample (Figure 1) had three loans spread out over three years or that the difference in poverty movement over three loans does not differ greatly if spread out over three years or over less time.

FIGURE 2. CHANGE IN POVERTY RATES AMONG NEW MFI 1 CLIENTS WITH THREE PPI SCORES FROM 2010 TO 2012



Sample size: 3,537 observations (PPI scores over three years for 1,322 clients).

* Change in poverty levels between 2010 and 2012 was found to be statistically significant at the 10% level.

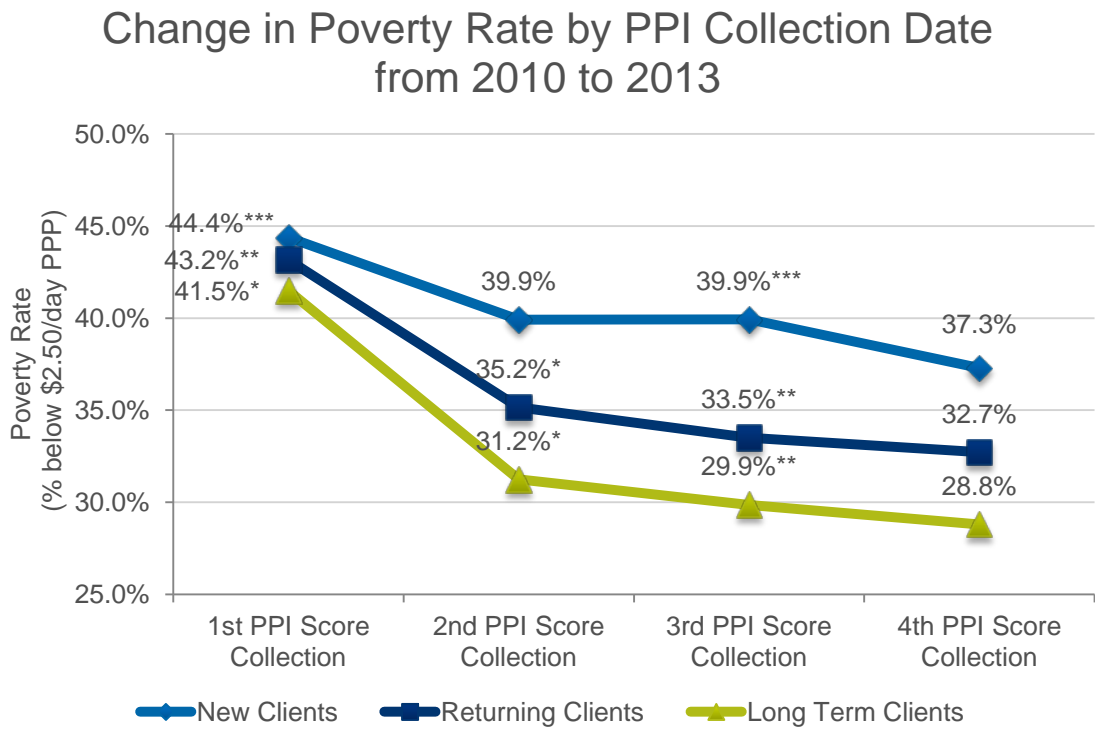
MFI 2

For MFI 2, which had a larger data sample overall, a statistically significant decrease in poverty rates over time was found among all three client segments analyzed from 2010-2013: new clients (first PPI score collected on their first loan), returning clients (first PPI score within three years of first loan), and long-term clients (first PPI score collected between fourth and tenth year of membership). A slightly higher percentage of new clients in 2010 started off poorer than returning clients in 2010, who in turn were found to be more likely to be poor than long-term clients in 2010. This is consistent with the trend found that poverty rates of clients on the whole decrease for those who remain active clients of MFI 2 longer.²

However, from 2010 to 2013, clients with longer memberships overall saw larger scale drops in poverty rates than did newer clients during the same years. This may indicate that the effects of membership on poverty movement become larger over time and are less likely to materialize in the short term. However, within the same client segment (e.g., long-term clients), the changes in poverty rates also varied significantly between those whose first PPI scores were collected in 2010 and those whose first PPI scores were collected in 2011. This may be indicative of data quality issues or external factors driving poverty movement, such as the economic situation at the regional and national levels.

² Further analysis on the difference in poverty movement for active, inactive and resigned clients is explored further in separate sections of this report.

FIGURE 3. CHANGE IN POVERTY RATES AMONG MFI 2 CLIENTS FROM FIRST TO FOURTH PPI SCORE COLLECTION FROM 2010 TO 2013



Sample Sizes:

New Clients (8,084 observations), Returning (50,688 observations), Long Term (9,800 observations).

All analysis controls for differences across branches and year of first PPI measurement.

*Change statistically significant at the 10% level.

** Change statistically significant at the 5% level.

***Change statistically significant at the 1% level.

For new clients, poverty rates declined by 4.5 percentage points between the first and second PPI score collection dates and by 2.7 percentage points between the third and fourth PPI scores collection dates. Both of these findings were statistically significant within a 99% confidence interval when controlling for branch level effects and year of first PPI score collection. The total drop in poverty levels among new clients between their first and fourth PPI score collection for MFI 2 was 7.1 percentage points, meaning that 16.0% of clients living below the poverty line during the first collection and had moved above it by the fourth collection.

Interestingly, for both new clients who started and had their first PPI score collected in 2010 and those who started and had their first PPI score collected in 2011, the drop in poverty rates was found to be larger between the first and second PPI score collection than any other subsequent PPI score collections. (See Figure 4 below).

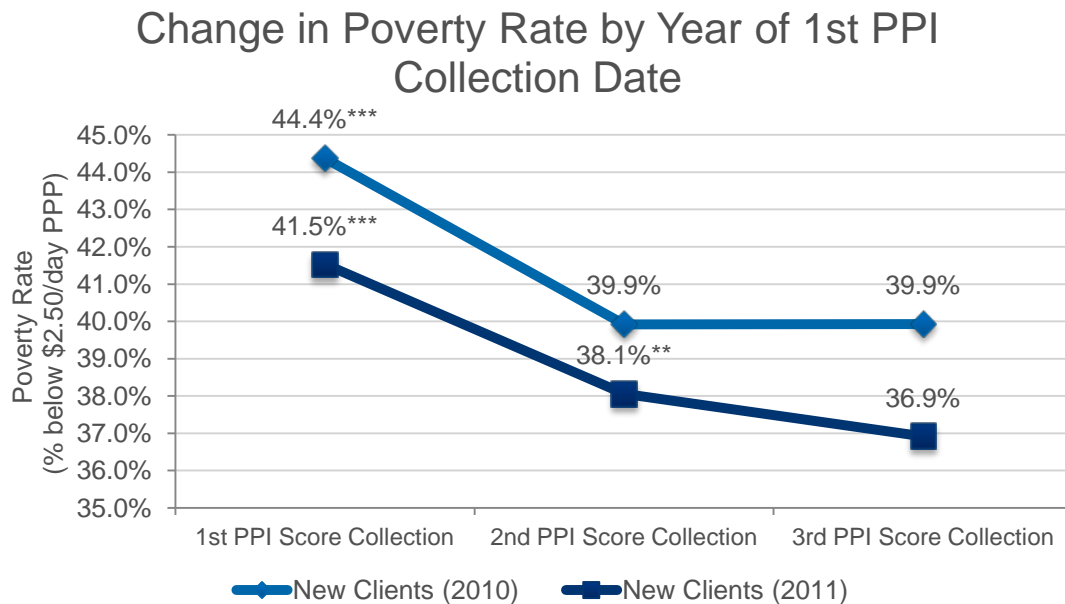
This seems to indicate that factors other than general changes in the economy from one specific year to the next are driving a change in poverty movement between the first and second PPI score collection.

One possible explanation is that subsequent loans can be much shorter than the first loan, resulting in less time for changes in poverty levels to occur. (Notably, all analysis conducted on these client segments already controlled for first year of PPI measurement).

It would be worth examining further why poverty rates may decrease by a larger amount between the first and second PPI score collections for new clients than for subsequent loan cycles. One hypothesis worth testing, for

example, is that clients are more likely to buy more assets after their first loan disbursement than for subsequent loan disbursements and thus their poverty likelihoods, which are linked to asset possession, decrease. However, it is also possible for other internal factors (caused by membership) or external factors (not caused by membership but not related to year of PPI score collection) to be affecting the change in poverty rates between the first and second PPI score collection. Further research would still need to be done to determine which factors can be attributed to causing these shifts in poverty rates and if the trend remains consistent in subsequent years.

FIGURE 4. INITIAL CHANGE IN POVERTY RATES AMONG NEW MFI 2 CLIENTS WITH FOUR PPI SCORES (JOINED IN 2010) AND THOSE WITH THREE PPI SCORES (JOINED IN 2011)



Sample Sizes: New Clients in 2010 (8,084 observations), New clients in 2011 (17,919 observations).

All analysis controls for differences across branches and year of first PPI measurement.

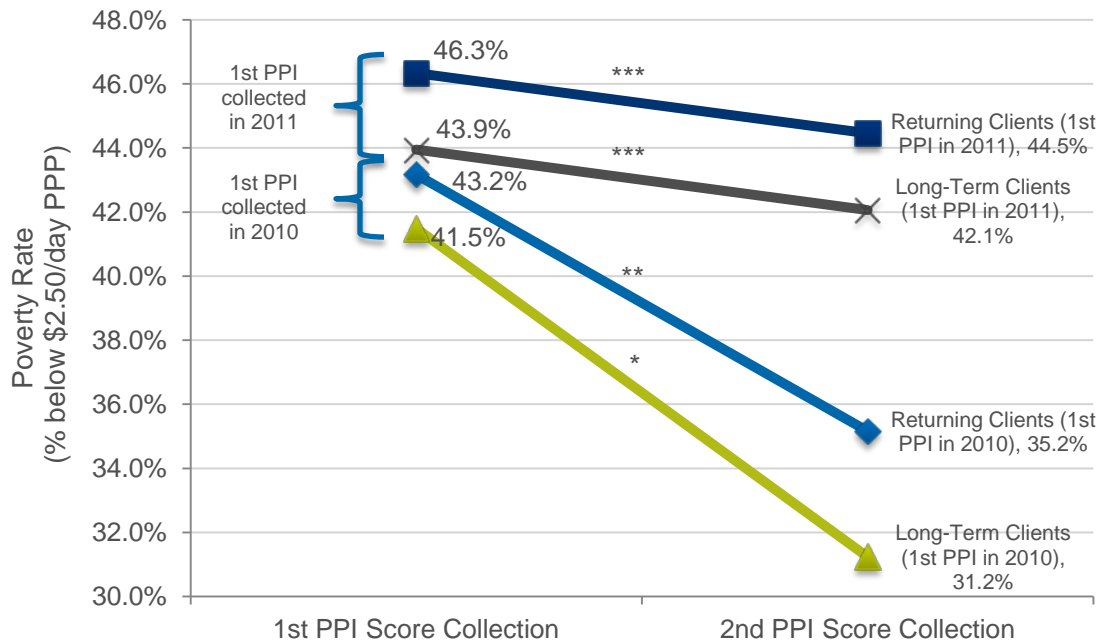
** Change statistically significant at the 5% level.

***Change Statistically significant at the 1% level.

Interestingly, it appears that the opposite trend is found when comparing poverty movement trends for different cohorts (first PPI score in 2010 vs. in 2011) of returning and long-term clients. Specifically, it appears that the large magnitude of the decrease in poverty rates (8 percentage points for returning clients and 10 percentage points for long-term clients) for clients that had their first PPI score collected in 2010 is not found for those who had their first PPI score recorded the following year, in 2011. For those whose first PPI score was recorded in 2011, the drop in poverty rates is actually larger in magnitude for new clients than for returning or long-term clients. This is the opposite of the trend found in Figure 3, where new clients were found to have a smaller drop in poverty rates than returning and long-term clients. This makes it difficult to hypothesize how poverty movement differs in magnitude between new, returning and long-term clients and seems to imply that other factors (such as external factors or data collection issues) are having a larger impact on the trends found than the length of membership.

FIGURE 5. INITIAL CHANGE IN POVERTY RATES AMONG RETURNING AND LONG-TERM MFI 2 CLIENTS WITH FOUR PPI SCORES (JOINED IN 2010) AND THOSE WITH THREE PPI SCORES (JOINED IN 2011)

Change in Poverty Rates by Year of 1st PPI Collection Date



Sample Sizes:

- Returning Clients with first PPI in 2011 (34,920 observations)
 - Long-Term Clients, with first PPI in 2011 (30,813 observations)
 - Returning Clients with first PPI in 2010 (50,688 observations)
 - Long-Term Clients, with first PPI in 2010 (9,800 observations)
- All analysis controls for differences across branches and year of first PPI measurement.

* Change statistically significant at the 10% level.
 ** Change statistically significant at the 5% level.
 ***Change Statistically significant at the 1% level.

Despite the limitations arising from the conflicting data analysis results for the sample with four PPI scores starting in 2010 and the sample with three PPI scores starting in 2011, we can still take away one general implication about the relationship between length of membership and poverty movement. In other words, regardless of the length of membership, all client groups experience a decline in poverty rates over time. However, the variation in trends for different segments at different times implies that further research should be done to clarify what factors may be leading to differences in magnitude for poverty movement between client groups with different membership lengths.

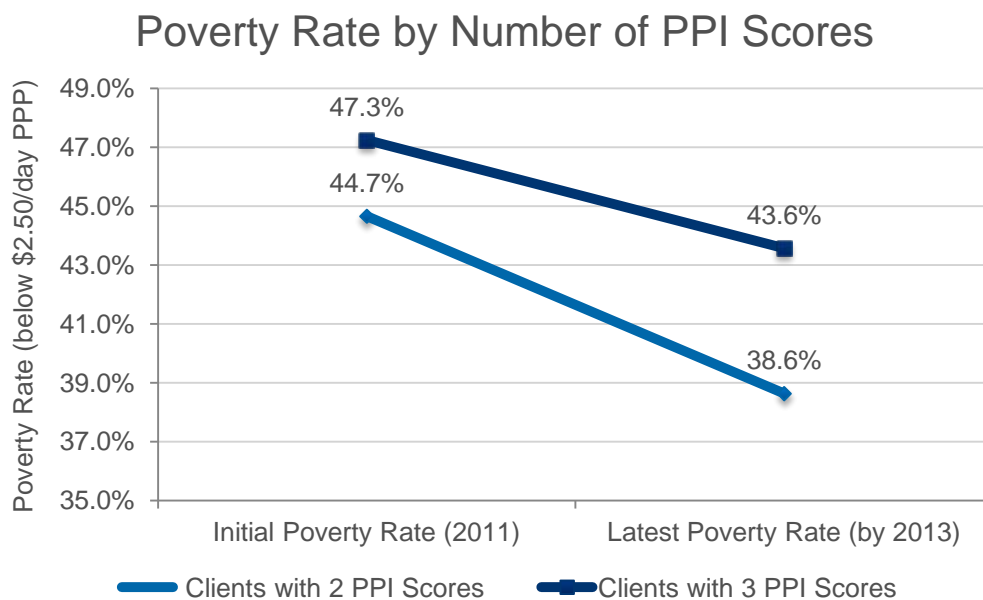
Poverty Movement and Loan Use

Aside from length of membership, also of interest is the relationship of loan use and poverty movement. For MFI 1, the loan data were not reliable and could not be used for analysis. For MFI 2, sufficient data existed to observe differences in poverty movement trends between clients with different frequencies of loan use during the same time period. Despite loan terms, sizes, and cycles not being consistently available in the dataset, we can use PPI

score collection records as proxies for taking out loans. Specifically, the data shows that clients with three PPI scores between 2011 and 2013 had higher initial poverty rates and saw slightly slower rates of improvement over time than clients with just 2 PPI scores between 2011 and 2013. It seems likely that clients with fewer PPI scores are taking out loans with longer terms (and thus possibly larger sized loans) or are taking breaks between loans while those with more PPI scores are likely taking out loans with shorter terms (and thus perhaps smaller sized loans) or take out multiple types of loans (business, health, multi-purpose, etc.). This could indicate that poorer clients are more likely to take out more short term, smaller sized loans than less poor clients. One possible cause for this trend could be that clients who are more financially distressed may be more likely to take out loans more often. At the same time, clients that are less financially distressed may be able to handle larger loans with longer loan terms or may simply take out fewer loans due to less urgent needs for financing.

The decrease in poverty rates was found to be 2.4 percentage points larger for clients that took out just two loans from 2011 to 2013. This seems to indicate that these overall poorer clients who are taking out more loans may not be as likely to see their poverty levels decrease as much as clients who start off less poor and take out fewer loans.

FIGURE 6. POVERTY MOVEMENT AMONG CLIENTS BY FREQUENCY OF LOAN USE (MORE PPI SCORES INDICATE MORE FREQUENT LOAN USE)



Sample size: 7,345

Differences between poverty rates for clients with 2 PPI scores and those with three PPI scores were found significant at the 1% level (both for initial and latest poverty rates).

However, we do not know whether those with just two PPI scores are taking out larger loans with longer terms or taking out short-term loans with periods of inactivity in between. It is also possible that not all new loans are linked to a new PPI score, though it seems that PPI data has been collected more consistently overall for MFI 2 than for MFI 1. Further qualitative data collection would be useful in order to assess why some clients take out more loans or different-sized loans than other clients and whether this may be related to initial poverty levels.

Poverty Movement of Active and Inactive Clients

The analyses above explored trends among clients who have multiple scores over time. These clients are predominantly those who stay in the program, but what about those who drop out? To answer this question, PPI data were also segmented into different groups based on activity level to assess whether unique trends exist for clients who remain active (take out loans repeatedly), those who stop taking out loans but may remain as members, and those who resign. At both MFI 1 and MFI 2, PPI data are not collected for clients at the point in time that they stop taking out loans or resign. However, we can compare initial poverty levels of those who drop out and those who are retained and in cases where more data exists (MFI 2), we can go further by comparing the trends in poverty movement for those who are active, those who are inactive (but potentially still maintaining savings accounts), and those that have officially resigned.³

MFI 1

For MFI 1, regressions were used to measure the differences between the initial poverty levels, as well as poverty movement, of those who were presumed to have had dropped out and those who continued to have PPI scores collected up until at least 2012. However, the only statistically significant finding was that among clients that took out their first loan in 2010, those that took out another loan in 2011 were initially 2.2% less poor than those that stopped taking out loans after 2010. This was found to be statistically significant within a 90% confidence level. Yet, the difference in poverty rate between clients that joined in 2010 and did not take out another loan and those that joined in 2010 and continued taking out loans until 2012 was quite small and not found to be statistically significant at any conventional levels. As such, it is difficult to interpret the data analyzed for MFI 1. There may not be a significant difference overall between poverty rates of clients that remain active and those that drop out. If the lack of a difference between initial poverty rates across clients retained for shorter or longer periods of time persists in future analysis, then this would imply that those who stay are not qualitatively different than those who leave the program at least in terms of initial poverty levels. This then could help to disprove the criticism that only clients that are less poor at the onset are served well by the MFI and thus the poorer ones drop out of the program, at least in the case of MFI 1.

Additionally, the question still remains as to whether the PPI score provides an accurate proxy for inactivity since a lack of a PPI score in one year could signify that a client has stopped taking out loans, did not have a PPI score recorded due to a data collection error, or had a PPI score recorded late (after 12 months) due to a PPI score collection error. (See Appendix A for lengths of time between PPI score collections).

MFI 2

For MFI 2, more types of data over longer periods of time allowed for more in depth data analysis to be done on the differences in poverty movement between clients that continue to take out loans and those that stop utilizing

³ How inactivity is measured and defined is also important to consider before analyzing and interpreting differences in active and inactive client poverty levels over time. For MFI 1, clients who only had 1 or 2 PPI scores recorded since having their first loan taken out in 2010 were considered inactive. However, in some cases, it is also possible that loan officers simply did not record PPI information at later loan cycles. So lack of later PPI scores is used as a proxy for inactivity or dropping out, but the accuracy of such a proxy is unclear. For MFI 2, records are kept for which clients resign and when. As such, PPI data was compared for active clients (taking out loans, continuous PPI data collection), inactive members (not taking out loans, but no longer have PPI data and thus likely only utilizing savings), and resigned members (no longer participating in any MFI 2 programs). Notably, if MFI 1 clients stop taking out loans, they cannot continue to avail of MFI 1 programs after a grace period of two months and are then considered inactive. However, if MFI 2 clients stop taking out new loans they can continue to be considered active MFI 2 clients as savers.

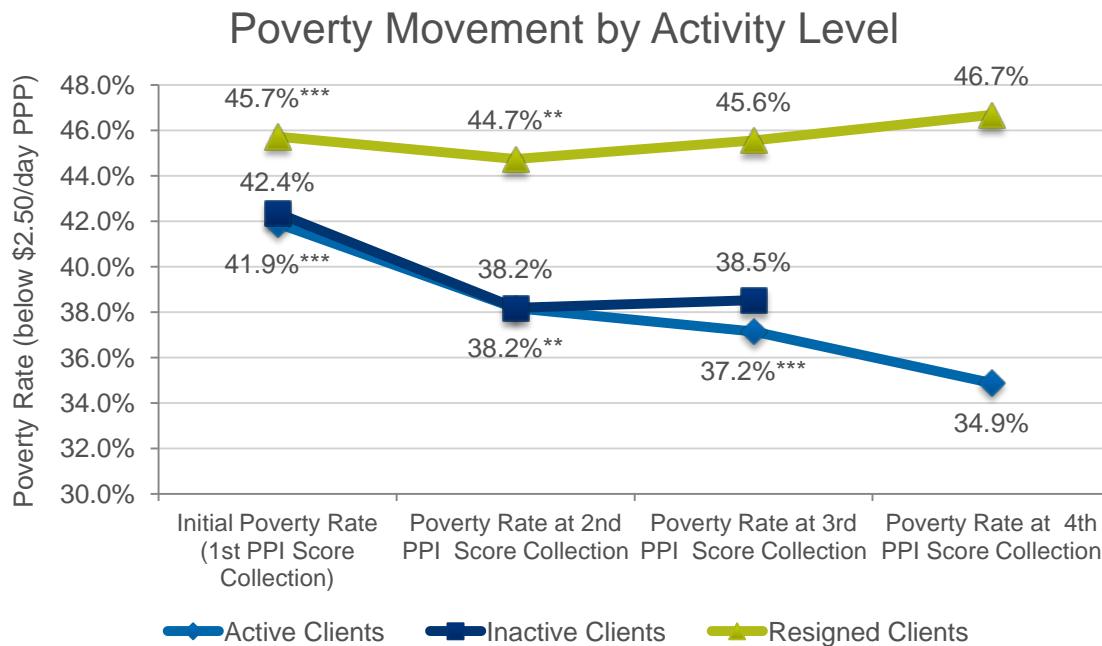
the MFI's services. Specifically, in addition to measuring activity level by the continuation or discontinuation of PPI score collections over multiple years, activity level could also be measured by noting whether or not the client was marked as "resigned" in MFI 2's management information system (MIS). Notably, at MFI 2, clients can stop taking out loans (and thus stop having PPI scores collected) but can remain active by continuing to deposit into their savings accounts. For MFI 1 clients, only those that take out loans can make use of savings accounts and thus the clients are more likely to leave the MFI completely if they stop taking out loans. However, there is no record made in MFI 1's dataset of whether a client has officially resigned.

When comparing active members (ongoing PPI collection and thus ongoing loans) and inactive members (PPI collection stops after a certain period but members have not resigned) at MFI 2, we found that initial poverty likelihood levels were similar and differences were not statistically significant. This finding suggests that, at the baseline, those clients that remain active are not significantly poorer or less poor than those that become inactive.

However, for MFI 2 clients who resigned after their fourth PPI collection, initial poverty levels were higher than clients that remained active by 3.8 percentage points and this relationship was found to be significant within a 99% confidence interval when controlling for branch level effects and clients' first year of PPI collection. This seems to imply that there is a marked difference between inactive clients (as measured by a lack of a PPI score in 2014) and resigned clients (who have officially left MFI 2), in terms of baseline poverty levels. This in turn suggests that using the lack of a PPI score as a proxy for whether a client has left a MFI may be misleading since initial poverty levels and poverty movement trends differ for inactive and resigned clients. It is also possible that inactive clients at MFI 2 differ significantly from inactive clients at MFI 1 as those that are inactive at MFI 2 but choose not to resign are likely continuing to use savings services or temporarily do not need a loan, while inactive clients at MFI 1 could include both those that are temporarily inactive and those that have left the MFI completely.

For the graph below, note that no data exists for the fourth PPI score of inactive clients since their inactivity is measured by a lack of a final PPI score.

FIGURE 7. POVERTY MOVEMENT AMONG ACTIVE, INACTIVE AND RESIGNED CLIENTS AT MFI 2 THAT JOINED IN 2010



Sample Size: 38,686 observations (all new clients with two, three or four PPI scores)
 All analysis controls for differences across branches and year of first PPI measurement.
 ** Change statistically significant at the 5% level.
 ***Change Statistically significant at the 1% level.
 Note: no changes for inactive clients were found to be statistically significant at conventional levels.

A few implications can be taken from the differences in these trends at MFI 2. The first is that only active clients have a clear trend in decreasing poverty levels. Though both active and inactive members initially begin with similar poverty rates, clients that do not take out a fourth loan appear to see a leveling out of their poverty rates (or a slight increase) while those that continue to take out loans continue to see poverty rates decline at a relatively consistent rate. Note, however, that poverty movement trends for inactive clients were not found to be statistically significant at any conventional levels. On the other hand, clients that resign completely—both stop taking out loans and withdraw any savings—are the most likely as a group to start off poorer and to remain in poverty during their tenure as clients. This may indicate that clients who are initially poorer gain less benefit from taking out loans or have more difficulty paying back loans. Also, as with the inactive clients, the last PPI score seems to indicate higher poverty rates for clients that resign. This may mean that for some clients resignation is linked to a more sudden increase in poverty rates after their last loan. However, further inquiry would be needed for MFI 2 to better understand what factors are fueling these trends as the data analyzed thus far can only show what the trends are and not why they are occurring.

The second implication to consider, as noted earlier, is that the lack of PPI score records may simply not be a good indicator for inactivity in this case. This may be because PPI scores are not being consistently recorded for all loans, or because lengths of loans vary widely or some clients decided to not renew a loan initially but then take out another loan at a later time. The variety of factors that may lead to a PPI score not being collected should thus also be considered before using PPI score collection as a proxy for retention rates. Moreover, if the MFI were

able to collect data on clients at the time of their resignation (exit surveys) this would allow for more insightful analysis with regards to correlations between poverty rates and dropout rates.

Summary of Findings

In summary, Grameen Foundation's analysis of multiple years of PPI data from MFI 1 and MFI 2 has shed some light on the types of insights that can be derived from looking at poverty movement trends of different types of MFI clients. For this report, specifically, analysis focused on clients segmented by length of membership, activity level (active, inactive or dropped out), and frequency of loan use. Below are our main findings:

1. Regardless of the length of membership (new, returning, or long-term), all client groups experience a decline in poverty rates over time. However, trends for different segments at different times vary significantly, making it difficult to draw more insightful results, as does the absence of complete, high quality data.
2. Using PPI score records as a proxy for frequency of loan application, MFI 2 data shows that those that take out more loans are initially poorer and have slower rates of improvement than those who take out fewer loans.
3. Examining the poverty movement trends of clients who stay in the program and those who drop out yields interesting insights. In the case of MFI 1, there is no evidence that active clients have different poverty status and movement from inactive ones. In the case of MFI 2, however, clients who eventually resign are both initially poorer as a group and tend to remain poor compared to those who remain active.

While these trends cannot alone be used to determine impact, they can be used as a starting point for MFI 1 and MFI 2 to a) better understand the profiles of different client segments; b) begin to hypothesize why certain client groups may start off poorer or be more or less likely to become less poor over time; and c) set the direction of further research to understand factors and drivers of poverty movement.

Opportunities for More Robust Poverty Movement Analysis

This exercise, in addition to providing some insights for MFI 1 and MFI 2, has also revealed a number of challenges and opportunities that must be considered when trying to understand how the PPI can be used to measure poverty movement. Two challenges in particular have been highlighted: 1) a need to put more thought into designing the data requirements for future analysis and 2) limitations on attribution possible without an external comparison group. However, with these challenges also come opportunities. In addition to addressing these challenges by working with MFIs to compile more complete data and collect data from both clients and comparison groups, analysis can be enhanced by uncovering trends with the use of additional qualitative and quantitative data.

Data Quantity and Quality

Both the quantity and quality of data that an organization has collected from its clients and can access through its MIS will significantly affect the ability of the organization to gain useful insights from poverty movement analysis. Both MFI 1 and MFI 2 had data quality issues that limited how many branches could be included in the analysis. In particular, while MFI 1 has been collecting PPI data for longer, the range of years that had sufficiently complete data was only between 2010 and 2012 and included a 6-month gap in 2011. The relative limitations of MFI 1's data meant that very little analysis could be done with regard to segmenting poverty movement trends for different client groups. Moreover, the accuracy of the analysis that was done becomes more difficult to gauge because of

the missing data in 2011. For MFI 2, some data issues existed as well, particularly in 2010, when some branches were transitioning to the 2009 PPI scorecard while some were still using the older scorecard. However, overall data was more complete at MFI 2 and allowed for more varied analysis.

To address these concerns, MFIs need to consistently follow best practices regarding PPI data collection—such as collecting data for all clients. Otherwise, data may be skewed to better represent areas or clients for whom PPI data is collected consistently. Additionally, data encoding systems could be improved to reduce human error, such as the inputting of incorrect loan cycles or incorrect dates—common mistakes that can significantly alter analysis findings. At the very least, the MFIs should investigate discrepancies in data.

Another problem came in the form of the type of data received for this analysis. This led to limitations that in turn shaped how clients were segmented when measuring differences in poverty movement trends. While PPI score collections can sometimes be used as proxies for other factors—such as dropout rates (implied by a lack of PPI scores after a certain date) or frequency of loan renewal (implied by number of PPI scores collected within a certain timeframe)—these uses are limited and may not be adequately accurate. For MFI 2, for example, not all clients that lacked PPI scores had resigned as may have otherwise been assumed had data not been specifically collected to verify which clients were active and which had formally resigned.

MFIs and other pro-poor organizations collecting PPI data, therefore, could greatly benefit from considering early on in the PPI integration process what kind of information they hope to eventually gain from poverty movement analysis. Specifically, these organizations should collect other types of client-specific data alongside PPI data that allows for a clearer image of the client profile that they serve. For example, if a MFI wants to know which types of client business are correlated with larger decreases in poverty movement, data could be collected on the client businesses alongside PPI data. Other examples of potentially useful forms of data to be correlated with poverty movement include product types, loan amounts, distribution channels used, repayment rates, and financial performance data.

Comparison Groups

In addition to data collection and quality challenges that can affect the accuracy and variety of data analysis conducted, challenges also exist in interpreting the data without external comparison groups. As such, data from clients segmented into different groups can provide insights on the relative difference in poverty movement between two groups but cannot tell us how or if those poverty movement trends would differ had those clients not become members of the MFI. Without evaluating data from a similar comparison group, organizations run the risk of attributing poverty movement trends to the MFI or organization when in fact outside factors may be having a larger impact on the poverty movement of clients. Even the trends themselves may be misleading, for example, if poverty rates of clients are shown to be decreasing but in reality are decreasing by less than they would be for similar non-MFI clients. Were that to be the case, an MFI or organization could have a negative impact on clients or beneficiaries poverty rates but still see a downward poverty movement trend when analyzing data.

The most ideal comparison group would be a control group—or a group of individuals surveyed at the same points in time and similar to the MFI clients in all ways observable except for MFI membership. A MFI (or other pro-poor organization using the PPI) could collect PPI data from a pre-selected control group and then analyze and compare the poverty movement trends found for the control group (non-MFI clients) and the treatment group (the MFI clients). However, this would require additional planning early on in the PPI collection process, as well as additional costs since loan officers would not otherwise collect information from non-clients. Furthermore, the control group would need to be composed of individuals who both wanted to be clients and were accepted as

such. In practice, this means the control group would need to be randomly selected from among those who are accepted into the program and then not giving them services they applied for. This presents a large disadvantage of using a control groups for the MFI. Any organization seeking to measure poverty movement should consider the costs and benefits of collecting data from a control group and also assess whether using a control group would be needed for the insights that they hope to gain from measuring poverty movement. If an organization wants to confidently attribute impact on client poverty movement to the organization's work, a control group is necessary. This type of research can be designed so that a control group is set up and maintained when testing, for instance, the effectiveness of a new product.

One alternative to selecting and surveying a control group would be to use other comparison groups as a proxy for a control group—such as country, province or municipality level poverty data. If, for example, data exists for changes in poverty rates for the municipalities in which a MFI works, this could be compared to the changes in poverty rates for the MFI clients living in that municipality. While this is not a substitute for rigorous impact evaluation, at the very least, some factors at the specific geographical level can be accounted for, such as natural disasters and government programs affecting the whole area. The benefit of using such a comparison group would be the time, planning and cost savings resulting from using data that has already been collected. However, such a comparison would likely be limited in terms of accuracy since the type of people that become MFI clients are likely not completely representative of a municipality, province or country. To the extent possible, PPI data collecting organizations seeking to use comparison groups should narrow down poverty data from such groups such that the same demographic group is being used as a comparison as would be clients or beneficiaries of the organization. If the organization is unable to find or use a near exact comparable group, any differences between the two groups should be noted and included in the interpretation of data analysis results.

Validation and Interpretation of Poverty Movement Trends

When it is not feasible to use a comparison group, PPI collecting organizations should still attempt to validate trends found by collecting other forms of data that may support or negate the findings from the PPI. For example, loan officers at MFI 2 could be interviewed to assess whether clients that resign start off initially poorer than other clients. Even if a control group does exist and trends can be verified, collecting additional types of qualitative and quantitative data can help organizations understand why trends are occurring. For example, at MFI 2, interviews could also be conducted with resigned clients (perhaps as part of an exit survey) to assess whether clients resign because they feel their income levels have decreased as a result of the loans or due to other factors.

In general trends found through poverty movement analysis, should be combined with other existing knowledge about clients to develop hypotheses about why the trends may be occurring. Once produced, further data will need to be collected to test such hypotheses. Both qualitative data (such as interviews or focus group discussions) and quantitative data (such as financial performance indicators, or other data collected from branches or clients) can be used in combination with the PPI to better understand what trends are occurring and why.

Appendix A: Months between PPI score collections for MFI 1 sample

Months since last PPI measurement	1 st PPI Collection Date	2 nd PPI Collection Date	3 rd PPI Collection Date	TOTAL
0	1,322	0	0	1,322
1	0	2	1	3
2	0	1	0	1
3	0	1	1	2
4	0	0	1	1
5	0	0	11	11
6	0	93	298	391
7	0	141	421	562
8	0	23	80	103
9	0	11	69	80
10	0	12	77	89
11	0	13	27	40
12	0	284	70	354
13	0	518	199	717
14	0	159	41	200
15	0	15	12	27
16	0	25	6	31
17	0	16	1	17
18	0	2	2	4
19	0	4	4	8
20	0	2	0	2
24	0	0	1	1
TOTAL	1,322	1,322	1,322	3,966

Scores collected within 3 months of last PPI score indicate an error

Majority of PPI scores collected between 6 and 14 months from last PPI score

Long lapse between scores may indicate that a PPI score was not collected for previous loan