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Examining the effect of participation in microcredit programs on assets owned by hardcore poor households in Malaysia

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This study employs a cross-sectional design with quasi-experimental approach to examine how participation in microcredit schemes affects hardcore poor household's assets. Assets tend to be more stable over time and it is a good indicator of economic well-being; therefore, this study measures the impact of Amanah Ikhtiar Malaysia's (AIM) microcredit schemes on assets owned by hardcore poor households in Peninsular Malaysia. Findings from this study confirm that the amount of loan received has a significant positive linear relationship with total productive assets and number of gainfully employed members, which subsequently leads to increase in household assets. It is recommended that AIM focus on review and re-organization of credit policies in order to increase client's ability to invest higher amount of loan to generate income and it should also initiate new strategies to reduce unemployment rate among the client's households.

Key words: Microcredit, hardcore poor, poverty, household asset, Amanah Ikhtiar Malaysia (AIM).

INTRODUCTION

Overview of microcredit program

The most famous and successful microcredit method-logy was started as an action research project, launched in 1976 by Professor Mohammad Yunus in Bangladesh. Microcredit as defined by The Asian Development Bank (2009), is the provision of a wide range of financial services which includes small amount of loans, small deposits and micro insurance to poor and hardcore poor micro entrepreneurs. As reported by Harris (2006), the Microcredit Summit adopted the definition of microcredit as a program that provides small amount of loans to poor people, particularly women for income generating pro-jects which allow them to care for themselves and their families. The objective of Microcredit Summit is to make sure that 175 million poorest households all over the world, especially women in those households, receive credit and other financial services before the end of 2015 (Harris, 2009). As mentioned in Microcredit Summit Campaign Report by Harris (2009), assuming five persons per household, providing financial services to 175 million households would affect a total of 875 million household members. When these households income rise above US$ 1 a day, nearly a billion people all over the world will rise above extreme poverty.

Poverty and microcredit in Malaysia

The poverty rate in Malaysia has declined dramatically from 49.3% in 1970 to only 3.6% in 2007 (Mid Term Review of the 9th Malaysia Plan, 2008). The government of Malaysia implements several strategies and works together with private sectors and non-government organizations to eradicate poverty (Economic Report, 2008/2009). For this purpose, Malaysian government provides assistance to development organizations; among them Amanah Ikhtiar Malaysia (AIM) is the most active one, to provide small scale financial services and training to poor and hardcore poor households in Malaysia.

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AIM started as an applied research in 1986 and was institutionalized as a registered private trust in 1987. AIM provides collateral free credit and training to poor and hardcore poor households. Clients of AIM are selected based on their gross average monthly household income. Households are considered as poor, when the gross monthly income falls below the poverty line income (PLI), which has been calculated by Malaysian government since 1976. When the income falls below half the PLI, the households are then considered as 'hardcore' poor. AIM provides financial services only to the poor and hardcore poor clients. AIM provides small amount of collateral free credit, based on small repayment system to be paid on weekly basis through center meeting. The cost to get the loan is almost zero because all transactions take place at the center meetings, which are commonly located near the client's house. AIM provides three economic loans namely I-Mesra loan, I-Srikandi loan and I-Wibawa loan. AIM also provides I-Penyayang loan or recovery loan, education loan or I-Bistari and housing/multipurpose loan known as I-Sejahtera. AIM in addition provides "Welfare and Well-Being Fund" to reduce members and next kin's burden when they face problem and to reduce members problem relating to destruction of projects. In 2008, AIM launched "Urban Micro Finance Program" to expand AIM's micro-financing approach to the poor and lower income group in urban areas. However, unlike the rural microcredit program, Urban Micro Finance Program do not select their clients based on PLI, rather they select clients with a household income below RM 2000, which indicates this program is designed to support non poor households also.

AIM extended their outreach by covering every state in Malaysia. As of March 2010, AIM has outreached 87 branches in eight states. There are 60497 groups in 6646 centers currently serving a total of 254116 clients. AIM provides financial services to 82 percent of the total poor and hardcore poor households in Malaysia (AIM, 2010).

Importance of impact assessment

Despite the positive impact of group based microcredit program practiced by AIM, many researchers question the effectiveness of microcredit program in improving the socioeconomic conditions of the hardcore poor borrowers (Hashemi, 1997; Rahman, 1998; Mosley, 2001; Coleman, 2002; Datta, 2004; Islam, 2007; Rahman et al., 2009). The impact of microcredit program depends on house-hold's ability to make use of the credit in income gene-rating activities and hardcore poor household's ability to use loan effectively is not the same as high income group borrowers (Rahman, 1998 and Datta, 2004). Study conducted by Hashemi (1997), Rahman (1998), Datta (2004), and Rahman et al. (2009) indicated that in Bangladesh, the conventional group based microcredit program have positive impact on high income group borrowers. Mosley (2001) in his study in Bolivia

provided empirical evidences that microcredit programs had positive impacts on poverty reduction, but such impact was greater for relatively richer borrowers than poorer borrowers. Therefore, he concluded that micro-credit program is inefficient in reducing poverty. A study conducted by Coleman (2000) in Thailand also indicates similar findings. The Consultative Group to Assist the Poor (CGAP, 2006), in their "Good Practice Guideline" published in October 2006 mentioned that microcredit can even harm the poor who do not have the capacity to absorb debts. Islam (2007) also indicated that hardcore poor borrowers experienced a further deterioration rather than improvement in their situation after participation in microcredit programs. Recent impact study conducted by Rahman et al. (2009) also addressed the importance of measuring the impact on hardcore poor households separately.

Since there was no known attempt so far by AIM or any external researcher to measure the impact of microcredit schemes on the hardcore poor, this study intends to measure how participation of AIM's microcredit schemes affect assets owned by hardcore poor households in Peninsular Malaysia.

MICROCREDIT PROGRAMS AND ECONOMIC WELLBEING

Microcredit is the provision of financial services to the low income poor in many developing countries around the world. The most successful microcredit model was launched in 1976 by Professor Mohammad Yunus. The result was the establishment of the Grameen Bank, which extended credit and banking facilities to the poor households in Bangladesh. Grameen Bank's microcredit model was replicated by many other NGO's around the world and AIM is one of them. The group based microcredit program has formed considerable trust and expectations among the academics, policy makers, NGO leaders, donors, investors and other development practitioners all over the world.

Studies conducted to measure the effectiveness of group based microcredit programs commonly focus on how participation affects borrower's income and assets. Assets represent the long-term results of income and expenditure flows therefore is considered as a better indicator of economic well-being than others. Patterns of asset accumulation, liquidation and liabilities indicate strategies employed by households to plan for, confront and take risks (Barnes, 1996). Moreover, because of the fungibility issue (uses of loan in non-income generating activities or multiple activities), in order to measure the accurate impact of microcredit programs, many researchers focused on households assets which also includes all microenterprise assets and asset owned by all individuals who eat from the same cooking pot.

The first comprehensive impact study conducted by Hossain (1988), found that Grameen members' average

household income was 43% higher than non-participants and the investment in fixed assets is about 2.5 times higher for borrowers with more than three years' membership than for those who joined during the year of the survey. Mustafa et al. (1996) mentioned that BRAC (Bangladesh Rural Advancement Committee) client's household assets increased from an average of BDT10959 to BDT23230 after participation. Kamal (1999) in his study on ASA's (Association for Social Advancement) clients noted that among the respondents, 90.42% of members reported that their business capital has increased; 88.41% of the respondents had better access to medical services 38.93% respondents reported that their household assets have increased; 59.66% reported an increase in value of livestock and 30.32% reported that their ownership of ornaments had increased after participating in microcredit programs. Uotila (2005) who carried out an impact study in Rwanda mentioned that participation of microcredit program increased respondents' enterprise income, household income, household assets, and level of household welfare over time. Dunn (2005) who conducted an impact study in Bosnia and Herzegovina reported that microcredit had a significant positive impact on household income, employment, business investment, business registration and post-war transition. Most recently, Hussain and Nargis (2008), in their study on several MFO's clients in Bangladesh, mentioned that household income has increased across all income percentiles for all regular, occasional and non-participant groups. The average annual household income grew at an annual compounded rate of 3.88%; from BDT48195 in 1998 to BDT60546 in 2004. Study conducted by Rahman et al. (2009) mentioned that age, education and number of gainfully employed members has a significant positive effect on household income and asset. This study suggested some adjustment to the existing microcredit programs to achieve the intended outcome, that is, to serve the purpose of those in the lower income society. Panda (2009) in his study conducted in India noted a significant increase in borrowers household income (11.41 percent), asset position was 9.75% higher than that of non-participants and the savings increased by 42.53%. This study also found an increase in annual employment days among the clients. Study conducted by Swain and Varghese (2009) among the self-help group members in India reported that total amount of savings increase with the length of participation in microcredit program. Their study also found a positive impact on livestock accumulation, but no impact on land value, business wealth or physical assets. Their study also indicated that credit and training together, have a positive impact on asset creation. Most recently, study conducted by Montgomery and Weiss (2011) to assess the impact of Khushhali Bank in Pakistan reported that although around two third of the total participants borrowed microcredit for livestock raising, agricultural activities or microenterprise, there is no significant

positive impact on sales or profit from those activities. Their study also noted an insignificant positive impact on aggregate consumer expenditure on food or educational expenditure per child. However, their study reported a positive significant impact on health expenditure and health care.

Besides providing positive socio-economic impacts, microcredit is also becoming a viable liquidity tool that helps smoothen consumption patterns and reduce the level of vulnerability (Otero, 1999). Poverty is not all about low income, it is also about irregular and uncertain income. Collins et al. (2009) who recently conducted a study in India, Bangladesh, and South Africa mentioned that "*whether or not financial services lift people out of poverty, they are vital tools in helping them to cope with poverty. The use of credit and savings is not only to smoothen consumption, but also to deal with emergencies like health problems and to accumulate the larger sums they need to seize income generating opportunities and pay for education, weddings, or funerals.*"

The impact of AIM's microcredit schemes followed a similar pattern. The first impact study conducted by Gibbons and Kasim (1990) showed a significant increase of client's monthly household income from an average of RM 142 per month to RM 220. This study also showed that the female participants experienced a higher increase in monthly household income compared to male participants. The overall repayment rate was 78%, which is much lower than cumulative repayment rate achieved by Grameen Bank (97 to 98%). The target repayment rate set by AIM (90%). However, among the women borrowers the repayment rate was 95%. The Second Internal Impact Study (1990) was done by AIM's research and development unit showed further overall improvement among participating households. The government of Malaysia initiated an impact assessment study on AIM's microcredit schemes by a team of Social Science and Economic Research Unit (SERU) of the Prime Ministers Department in 1990. SERU (1990) noted that the overall household income was more than double for those households who participated in AIM's microcredit schemes. The SERU study also found a significant impact on household's quality of life, which is based on the ownership and quality of housing, type and quality of household assets, agricultural land and savings. The increase in household income also facilitated an increase in expenditure on food, nutrition, education and reinvestment.

The Third Internal Impact Study (1994) reconfirmed the earlier findings in non-monetary impact of microcredit on poor households. This study showed an improvement in the percentage of owner occupied house to 85% compared to 80% prior to participation. The use of electric household products also showed some slight improvements. On the perception of nutritional quality, 58% felt there was an improvement, 34% felt no change and the remaining 8% responded as 'not sure'. This study also

also showed a 13% increase in household income. Study conducted by Salma (2004) noted that the household income, expenditure, savings and assets have increased and are higher for both AIM and PPRT (*Projek Perumahan Rakyat Termiskin*) participants compared to non-participants. It is noted that, these increases are higher for AIM clients than PPRT clients. Salma (2004) concludes that the microcredit program has direct and higher contribution to generate income than non microcredit programs.

Theoretical framework

Socio-economic development is a complex process of social and economic development, which in regard of assessment of the impact of microcredit, is demonstrated by using social capital theory, human capital theory, access to finance and a conceptual model named 'modified household economic portfolio model'. Social capital is the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit (Nahapiet and Ghoshal, 1998). AIM's group based microcredit model allows every client to assemble in a weekly center meeting, where clients exchange information and ideas with AIM officials and each other. This enforced weekly center meeting can improve client's social networking and bondage; therefore it can be important source of social capital. As per social capital theory this improved social bondage, can improve clients and their household member's ability to grasp income generating opportunities. Human capital is the knowledge and skills people accumulate through formal instruction, training and experience that facilitate the creation of personal, social and economic well-being (Becker, 1993). The importance and effect of training programs to improve household's abilities to take advantages of income generating opportunities were addressed by almost every studies measured the performances of microcredit program (Naved, 1994; Otero, 1999; Zaman, 1999; Pitt et al., 2003; Matin and Begum, 2003; Rahman et al., 2009). AIM provides a wide range of training in order to improve their client's ability to find new income generating activities, to select appropriate income generating activities, to use the loan suitably and to improve their money management skills.

The modern development theory studies the evolution of growth and income inequalities where access to finance plays a very critical role. As mentioned by Claessens and Tzioumis (2006), lack of access to finance can be the critical mechanism causing persistent income inequality or poverty traps, as well as lower growth. Access to finance increases clients and their household's ability to increase income generating opportunities and employment opportunities, which ultimately leads to increase household income and asset. Measuring the

impact of AIM's microcredit program on hardcore poor household's income therefore strengthens the underlying assumptions of access to finance where it is expected that access to working capital will lead to an increase in poor household's income, asset and quality of life in Peninsular Malaysia. The effect of microcredit on household income and poverty reduction will strengthen the assumption underlying the issue of 'inequality in the distribution of income', and therefore, also contribute to the modern development theory by addressing the usefulness of one of the most influential development program - microcredit program.

Research model

As mentioned by Hulme (1997), "behind all microfinance programs is the assumption that intervention will change human behaviors and practices in ways that will lead to the achievement (or raise the probability of achievement) of desired outcomes." The conceptual model of impact chain presents a complex set of links as each 'effect' becomes a 'cause' in its own right generating further effects. One of the most complex conceptual models for impact assessment was presented by Chen and Dunn (1996), called household economic portfolio model (HHEP). The researchers confirmed the usefulness of HHEP model in addressing the fungibility and attribution issues. The key advantages of HHEP model is that, it helps in the formation of research design and hypothesis. Both HHEP model developed by Chen and Dunn (1996) and modified HHEP model by Uotila (2005) has many implications for microfinance impact analysis and this research model is based on those implications.

Most of the earlier impact studies focused on the changes in income and asset at individual, household and enterprise level. Findings from most of the earlier studies presented income, expenses and assets as 'percentage changes'. Snodgrass and Sebstad (2002) measured the impact of SEWA Bank's microcredit programs in India. The key moderating variables they used for the ANCOVA test are number of economically active household members, household size, trade, age, marital status, education, religion and employment status. Dunn. (2005) assessed the impact of microcredit schemes in Bosnia and Herzegovina. Tilakaratna (2005) used two-stage least square method to determine the impact of microcredit on household asset, where she used amount of credit, household income and the sex of the household head as independent variables.

All the earlier impact studies reviewed in this research mostly used hypothesis testing and only a few used regression analysis and two-stage least square method. Since the primary objective of this study is to measure the impact of AIM's microcredit schemes on the hardcore poor participant's household asset, hypothesis testing was employed and a structural equation modeling was

also used to confirm the impact. The advantage SEM has over multiple regression is that it includes more flexible assumptions, correlated independent values, correlated error terms and testing overall model.

The circular flow microcredit as presented in HHEP model by Chen and Dunn (1996) indicates that participation in microcredit program is the cause and changes in household resources and household activities are the effects of microcredit. However, microcredit programs, by itself, do not change anything. The changes in household's resources and household activities depend on household's ability (mediating variables) to use the loan in a productive way. The mediating variables selected for the model are number of sources of income, number of gainfully employed members, total productive assets and household income. Since all the mediating and dependent variables are expected to be correlated, the error terms of moderating and dependent variables are therefore also expected to correlate.

The participation variables are the independent variables. Participation in AIM's microcredit schemes is defined by two variables, number of months as client and total amount of credit (economic loan) clients received from AIM's microcredit schemes. The number of gainfully employed members includes all self-employed members and the members who are engaged with waged/salaried job. Product and services offered by microcredit programs are expected to increase households' ability to employ their unemployed members. Participation in microcredit program is therefore expected to have a significant linear relationship with number of gainfully employed members. Since, the number of gainfully employed members represents the productive base of the household, it is expected to have a significant linear relationship with household assets.

It is expected that participation in AIM's microcredit program will enable hardcore poor households to start new income generating activities, and therefore, number of sources of income is expected to have a significant linear relationship with number of months as client and total amount of credit received. Moreover, number of sources of income is also expected to have a significant linear relationship with household assets.

The total productive assets in this study represent the market value of net productive assets owned by hardcore poor households. Since AIM provides credit for income generating activities, it is expected that the participation in microcredit program will increase households productive assets, and therefore expected to have a significant positive linear relationship with number of months as client and total amount of credit received. Participants used total productive assets to increase household income, therefore, it is expected that total amount of credit received by AIM's hardcore poor participants will have a significant linear relationship with household income. Household income used for household consumption, savings and reinvest in the economic

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Household assets tend to be more stable over time and a better indicator of economic well-being than income. Assets represent the long-term results of income flows and expenditures. Assets are the stock of wealth in a household, therefore considered as an important category to address when assigning the impact of microcredit. Household assets in this study are measured as the net worth of household asset. The net worth of the unit is gross wealth minus liabilities. Gross wealth includes both financial and physical assets. Liability includes all formal and informal debts. The financial assets for households include cash savings and deposit accounts. Productive assets include the total value of livestock (goats / sheep, cows / buffalos / poultry); agricultural and/or other production equipment; agricultural stock and/or other raw materials; enterprise assets; motor vehicles and orchard. The net worth of productive assets is the market value of all productive assets minus current liability. Physical asset includes the value of land minus the transaction cost. Other non-productive physical assets include the total market value of house, stove/cooker, chairs, benches, tables, wooden cots, other furniture, bed/mattress, bicycle, telephone, radio/television, tape recorder, sewing machine, clock/watch, jewelry, and other valuable household assets. Current liability includes all unpaid debt to AIM and other persons or organizations. This research measured the market value of physical assets by asking the question "If you were to sell this item today how much money do you think it would be worth?"
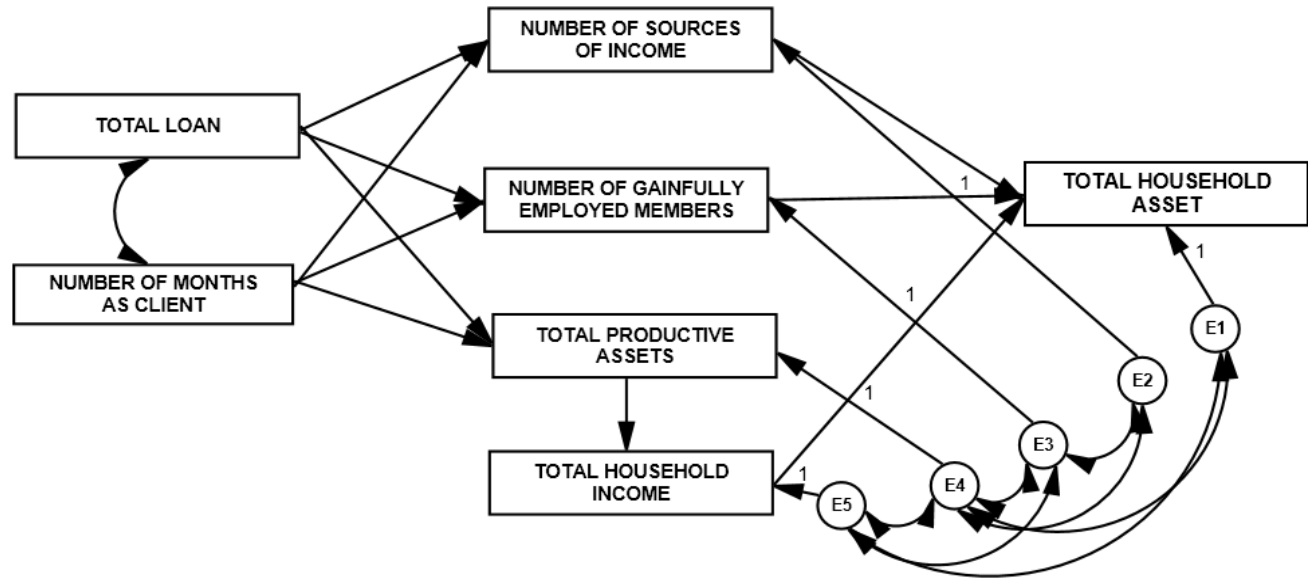
Figure 1. Asset model.

(Figure 1).

RESEARCH METHODOLOGY

The underlying assumption behind microcredit program is that poor and hardcore poor borrowers will invest the credit they received in income generating activities, which commonly includes small scale production or farming or microenterprise activities and these new investments are expected to improve their socio-economic well-being and gradually lift them out of poverty (Montgomery and Weiss, 2011). As mentioned by Montgomery and Weiss (2011), impact assessment methodology addressed how participation in microcredit program affects the selected variables with how those same selected variables would have in the absence of microcredit program. The most appropriate method to address the question should be by employing an experimental design. In full experimental approach, researchers need to construct an experiment in which all other variables are controlled, so that the effect can be attributed to the causes (Hulme, 2000). However, it is just not possible to control all the factors while measuring the impact of microcredit (Hulme, 2000). Moreover, other limitations of randomized study design are that it fails to address the effect of program placement and self-selection bias (Montgomery and Weiss, 2011).

Since the full experimental approach is not feasible for assessing the impact of microcredit programs (Khandker and Pitt, 1998; Swain and Varghese, 2009; Montgomery and Weiss, 2011), this study therefore used a quasi-experimental approach to measure the impact of microcredit. In quasi-experimental approach control and treatment groups are used to measure the impact of AIM's microcredit programs on the hardcore poor borrowers' household income and poverty in Peninsular Malaysia. In this approach, it is vital to select a control group that resembles the treatment group as much as possible. If the participants (treatment group) already share certain types of characteristics which are not necessarily shared by the non-participants (control group), this might generate selection bias, especially in quasi-experimental approach with cross-sectional data. When households themselves decide to participate in microcredit programs, they are indirectly practicing self-selection and as a group they hold some unobserved characteristics like

entrepreneurial abilities, skills or risk preference. This self-selection approach may influence the outcomes of participation. Moreover, researchers' ability to select appropriate control group may be influenced by the availability of the non-participants.

In Malaysia, AIM provides financial services to more than 82% of the poor and hardcore poor households. The rest of the poor and hardcore poor households are more likely to receive financial aid from other government and non-government development agencies or projects. It is also highly likely that these poor households live in remote locations therefore are unable to form a five member group and participate in weekly center meetings and/or they just do not want to participate in AIM's microcredit program. To minimize the difference between the control and the treatment group, this study therefore selects the control group from AIM's client base. Selecting the control group from the clients' base is expected to minimize the self-selection bias. Nevertheless, sampling only existing clients may bias the sample based on those who stayed, not dropped-out. Since the average dropout rate in AIM is very low, therefore this research did not collect any data from dropouts.

This research employed a cross-sectional design to measure the impact of AIM's microcredit schemes in Peninsular Malaysia. This study used a deductive reasoning approach to assess the impact of microcredit. It starts with the theories (modern development theory, social capital theory and human capital theory) which are used to explain how credit, social bonding and training can affect the socio-economic condition of the borrowers. This study adopted the group statistics that has been most often used known as 'average effect of treatment of treated', which measures the impact on the outcome of one group compared to others. The average program impact is estimated by comparing the average outcome of the members of treatment group (old respondents) with the same average outcome of the members of the control group (new respondents).

This research employed a stratified random sampling method, where samples were selected from three different geographic areas from three states namely Kedah, Kelantan and Terengganu in Peninsular Malaysia. These three states were randomly selected from the bottom six states (poverty rate were relatively higher in these six states) of Peninsular Malaysia. AIM offered financial services to the poor and hardcore poor households through a total of 28 branches in three selected states. Most of these branches are

Table 1. Household assets.

Variable	New respondents	Old respondents	Total respondents
N	172	161	333
Mean	27494.21	50358.78	38452.95
Standard deviation	17374.06	26158.56	24777.60

Shapiro-Wilk p-value=0.000; Leven's p-value=0.000; Mann-Whitney p-value=0.000

located in very small towns or rural areas, as the poverty rate in isolated rural areas are expected to be much higher than urban areas. Among these 28 branches, this study randomly selects three branches from each state. The selected three states were Baling from Kedah, Pasir Puteh from Kelantan and Setiu from Terengganu. All data was collected from these three branches.

The sampling methodology was designed to compare two groups of clients, where both groups were selected from AIM's client base. Therefore, instead of external control group, this study selects new clients (number of months as clients was less than 24 months) as control group and old clients (number of months as clients were between 48 to 72 months) as treatment group based on the number of months they participated with AIM. All the clients were first selected based on number of months as client and then selected again based on pre-AIM household income. Clients with pre-AIM household income below half of the joining years PLI were considered hardcore poor clients. 2779 clients participated in this program in all three branches for the selected period. Among them, a total of 505 clients (18%) of the 2779 clients were hardcore poor and among these 505 clients, 22 clients (4.36%) clients dropped out from the program. This study then collected data from AIM's client's record book. Data about 483 hardcore poor new and old clients' current unpaid debt, pre-AIM household income, joining date, total amount clients saved in AIM, total amount of credit received from each scheme and the total amount of credit received, had been collected. In the second stage of data collection, researcher explained the purpose of this study and asked these 483 selected clients for their permission to interview them. Among the 483 clients, 386 clients agreed to participate in the interview after their weekly center meeting, among them, 184 were old clients and 202 were new clients. Among these 386 clients, 45 clients mentioned that they received credit from other sources after joining AIM's microcredit program, and 8 clients did not answer all the questions because of personal reasons. This study then excluded clients who received credit from other sources, and those who did not answer all the questions, and collected complete data from total 333 hardcore poor clients, among them 161 were old clients and 172 were new clients.

RESEARCH FINDINGS

The research findings are summarized in four parts which are presented further. The first part tested the hypothesis – participation of AIM's microcredit program leads to an increase in the assets of hardcore poor households. The second part of the findings discusses the assumption. The third part presents the model fit summary. The last part presents the regression weights with p values.

Hypothesis testing

As presented in Table 1, the mean value of total household asset owned by all respondents is RM 38452.95 with a standard deviation of RM 24777.60. The mean and standard deviation for the old respondents are RM 50358.78 and RM 26158.55 respectively. In the case of new respondents, the mean and standard deviation are RM 27494.21 and RM 17374.061respectively. The p-value of Shapiro-Wilk test for both groups is less than 0.05, indicating that the normality assumption is violated. The p-value for Levene's test is less than 0.05, indicating that the variability of the distribution of household assets for new and old respondents is statistically significant. A non-parametric test, the Mann-Whitney test was therefore conducted.

The p-value for Shapiro-Wilk test is 0.00, which is less than 0.05, indicating that the mean net worth of household assets differs significantly among new and old respondents' households. As seen the Table 1, the old respondent's mean net worth of household asset is significantly higher compared to new respondents' households. Since old and new respondents were divided based on number of months as clients and total amount of credit received and both these variables differed significantly among new and old respondents, this research therefore concludes that participation in AIM's microcredit program leads to increase respondent's household assets.

Multivariate normality assumption

As mentioned earlier, the advantages of SEM over multiple regressions include flexible assumptions, like allowing interpretation in the face of multicollinearity. However, for the purpose of maximum likelihood estimation, each variable should be normally distributed (Garson, 2000.). The multivariate kurtosis value or Mardia's coefficient for asset model is 68.273, which is higher than 1.96 and therefore, multivariate normality cannot be assumed.

The p-value of Bollen-Stine bootstrap test is 0.010, which is less than 0.05, indicates a bad model fit. The Bollen-Stine p-value is less than 0.05, because of variability of the distribution of household asset is very high (coefficient of variation or CV is 0.64) and it is a positively skewed distribution. The square root transformation is most commonly used for positive skewed data. To fulfill the multivariate normality assumption, a square root transformation was done in the data for the Asset

Table 2. Bollen-Stine bootstrap: Asset model after transformation.

Bollen-Stine bootstrap (default model)
The model fits better in 181 bootstrap samples.
It fits about equally well in 0 bootstrap samples.
It fits worse or failed to fit in 19 bootstrap samples.
Testing the null hypothesis that the model is correct, Bollen-Stine bootstrap p = 0.100

Table 3. Model fit summary.

	CMIN	DF	P-value	CIMN/DF
Default model	6.306	3	0.098	2.102
	GFI	**AGFI**	**NFI**	**RFI**
Default model	0.995	0.950	0.995	0.967
	IFI	**TLI**	**CFI**	**RMSEA**
Default model	0.998	0.982	0.997	0.058

Model. The multivariate kurtosis value or Mardia's coefficient after square-root transformation reduced to 13.749, which is still higher than 1.96 and therefore multivariate normality cannot be assumed. The p-value of Bollen-Stine bootstrap test as presented in Table 2 is 0.100, which is more than 0.05, indicates that a satisfactory model fit in the presence of multivariate non-normality.

Model fit summary

As presented in Table 3, the model chi-square value is 6.306 with 3 degrees of freedom. The p-value of the model chi-square is 0.098, which is greater than 0.05, indicating a satisfactory model fit. The relative Chi-Square or CIMN/DF is 2 or less than 2 reflects a good model fit (Kline, 1998). The CIMN/DF of the research model is 2.102, which is higher than 2, indicates a moderate model fit. The goodness of fit index or GFI for the research model is 0.995, which is higher than 0.90, indicating a satisfactory model fit. Adjusted goodness of fit index or AGFI is a variant of GFI which adjusts GFI for degree of freedom. The model fit for AGFI is 0.950, which is greater than conventional value of 0.90, indicating a satisfactory model fit.

For the model to be accepted, the comparative fit index or CFI should be equal to or greater than 0.90. The CFI for the asset model is 0.997, which indicates a very good fit. By convention, the incremental fit index or IFI also should be greater than or equal to 0.90 for the model to be accepted. The IFI for this model is 0.998, which is higher than 0.90, also indicting a satisfactory model fit. The normed fit index or NFI values above .95 serves as a good model fit. NFI for the model is 0.995, which is higher than 0.95, indicating a satisfactory model fit. By

convention the relative fit index or RFI close to 1 shows a good model fit. RFI for this model is 0.967, which is close to 1, providing a satisfactory model fit. The TLI also called non-normed fit index should be greater than or equal to 0.95 for the model to be accepted. The TLI for this asset model is 0.982, which is greater than 0.95, indicting a satisfactory model fit. The root mean square error of approximation or RMSEA should be less than or equal to 0.05. The RMSEA for this model is 0.058, which is little more than 0.05, provides an acceptable model fit. Finally Hoelter's critical N were calculated to measure whether the sample size is adequate for this model or not. By principle, the sample size is adequate if Hoelter's N is greater than 200. The Hoelter's N for the research model at the 0.05 level of significance is 412, which indicates that the sample size used to test the model is adequate. The model fit summaries; CMIN, GFI, AGFI, NFI, RFI, IFI, TLI and CFI; indicating that the asset model serves as a good fit. In addition, Hoelter's critical N indicated that the sample size is adequate to test this model. However, the overall fit test does not establish that the particular paths within the model are significant. Since the research model is accepted by all the aforementioned tests, subsequent analysis were carried out on the structural coefficients and corresponding p-values.

Regression weights

Standardized structural coefficient estimates are based on standardized data and the standardized weights are used to compare the relative importance of the independent variables. The standardized regression weight of two independent variables on four moderating variables and the standardized regression weight of three moderating variables on household assets are presented in the Table 4.

The standardized regression weight for the 'total loan' on 'total productive assets', is 0.681. The data provide sufficient evidence (p-value = 0.000) to indicate a significant linear relationship between 'total amount of loan received by respondents' and the 'net market value of productive assets owned by respondents households'. However, the standardized regression weight between number of months as client has an insignificant positive linear relationship with total productive assets. The standardized regression weight of 'total productive assets' on 'household income' is 1.049. The p-value of this regression weight is 0.000, which indicates that total

Table 4. Regression coefficient.

Variable	Standardized regression weight	Unstandardized regression weight	p-value
Total loan ➔ No. of gainfully employed members	0.506	0.003	0.000*
Total loan ➔ No. of sources of income	0.066	0.000	0.444
Total loan ➔ Total productive assets	0.681	0.799	0.000*
No. of months ➔ No. of gainfully employed members as client	0.021	0.002	0.776
No. of months ➔ No. of sources as client of income	0.150	0.014	0.082
No. of months ➔ Total productive as client assets	0.008	0.159	0.875
Total productive ➔ Household assets income	1.049	0.199	0.000*
No. of gainfully ➔ Household employed assets members	-0.149	-40.027	0.049*
No. of sources ➔ Household of income assets	0.013	3.920	0.777
Household ➔ Household income assets	0.883	6.678	0.000*

*Significant at 5% level.

amount of productive asset has a significant positive linear relationship with household income.

The standardized regression weight of 'total loan' on 'number of gainfully employed members per household' is 0.506. The p-value of this regression weight is 0.000, indicates a significant positive linear relationship. It also indicates that households with higher number of gainfully employed members received higher amount of credit from AIM's microcredit schemes. 'Total number of month as client' has an insignificant positive linear relationship with 'number of gainfully employed members'. Moreover, 'total household assets' has a significant positive linear relationship with total number of gainfully employed members, which indicates that AIM's microcredit program does increase total number of gainfully employed members and gainfully employed members increases household assets clients.

The standardized regression weight of 'total loan' and 'number of months as client' on 'number of sources of income' is 0.066 and 0.150 respectively. The *p*-value for both regression coefficients is more than 0.05, which indicates that

both independent variables have an insignificant positive linear relationship with number of sources of income. However, sampled data indicates that participation of AIM's microcredit program increases hardcore poor respondent's households' sources of income.

The standardized regression weight of three moderating variables indicates that total amount of loan respondents received from AIM's microcredit schemes has significantly increased the 'number of gainfully employed members per household' and 'total market value of productive assets owned by respondents'. Moreover, number of gainfully employed members significantly increases household assets. Total amount of productive assets owned by AIM's hardcore poor clients also significantly increased their household income, and household income significantly increased household assets. The two significant paths between dependent and independent variables are:

Total Loan ➔ Gainfully Employed Members ➔ Household Assets

Total Loan ➔ Productive Assets ➔ Household Income ➔ Household Assets

As presented earlier, old respondent's households having a significantly higher household assets than that of new respondents, a significant model fit, significant linear relationships between AIM's microcredit schemes with productive asset on household income, then household assets and a significant linear relationship between total loan to gainfully employed members to household assets, clearly indicate that AIM's microcredit program does lead to increased hardcore poor household's assets in Peninsular Malaysia.

CONCLUSIONS AND RECOMMENDATIONS

The mean market value of enterprise assets, motor vehicle and orchards owned by old respondents are significantly higher than that of new respondents. This indicates that participation in AIM's microcredit schemes does lead to an increase in respondents enterprise asset, which

together with better transportation facilities can increase respondents household income and asset. It is also noted that old respondent's households have significantly higher amount of productive assets, non-productive assets and land compared to new respondent's households. Findings also showed the significant association between house and land ownership with respondents participation status- new and old respondents. Therefore, if can be concluded that, after participating in AIM's microcredit schemes, respondents are more likely to have their own house and more land. Findings also noted that the mean market value of old respondent's household assets is significantly higher than that of new respondents. Moreover, the findings of the SEM indicate two significant paths between the loan and household assets. The asset model indicates that total loan significantly increased number of gainfully employed members and number of gainfully employed members significantly increased household assets. The asset model also indicates that total loan significantly increase total productive assets, productive assets significantly increased household income and finally household income significantly increased household asset. All these findings indicate that participation of AIM's microcredit schemes lead to an increase in the hardcore poor household's assets in Peninsular Malaysia.

The findings of this study along with all other impact studies on AIM's microcredit schemes show that the microcredit offered by AIM leads to an increase in their client's household assets. AIM can therefore focus on increasing their outreach, since they already reached 82% of poor households in Malaysia, now, they have to focus on how they can reach the remaining 18% poor households. Moreover, the average dropout rate among both new and old clients is 4.36%. When any client drops out from microcredit program, despite the causes, it always represents a limitation of AIM's policy and programs. Therefore, AIM has to review their policy and microcredit methodology, and organize it in a way that can lead to a reduction in the dropout rate. Finally, since the findings showed that microcredit schemes have a positive linear relationship with client's household assets respectively, AIM can therefore adopt a more flexible model instead of fixed weekly repayment system that can allow their clients to accept higher amount of loan. Furthermore, the number of gainfully employed members per household has a significant positive linear relationship with household asset. AIM can therefore offer higher amount of credit to the households with higher number of gainfully employed members and provide adequate training to the unemployed members of clients household.

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