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Efficacy of the Amanah Ikhtiar Malaysia Microcredit Scheme in Elevating the Income of the B40 Group

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Abstract

This study aims to investigate income group changes within the B40 and factors contributing to a higher income group, after utilizing microcredit from Amanah Ikhtiar Malaysia (AIM). The study was conducted in the North of Peninsular Malaysia involving the states of Perlis, Kedah and Pulau Pinang. The data was collected from 380 women micro-entrepreneurs who received AIM microcredit. The Wilcoxon signed-rank test was used to analyse the significant differences in the income changes. Meanwhile, ordinal logistic regression was applied to estimate the factors that contribute to the higher income group among the AIM women micro-entrepreneurs. The findings indicate that AIM women micro-entrepreneurs within the B40 subgroups had significantly increased their income, hence, moving them up to the higher income group. The results also indicate that education, amount of loan borrowed, business experience and business management are significant factors that influence the women micro-entrepreneurs likelihood to be in the higher income group. This study made a profound contribution as it demonstrated clearly the success of microcredit in elevating the income of the B40 group across different income group levels prior to receiving the loan. Therefore, this study suggests that outreach of microcredit programmes should be further extended to the B40 group.

Keywords: B40, Microcredit, Women Micro-Entrepreneur, Poverty, Amanah Ikhtiar Malaysia.

Introduction

Microcredit refers to the provision of small loans to the poor and low-income group, which allows them to engage in economic activities, particularly micro-enterprise. The microcredit concept took root several centuries ago, but only in the 1970s did the term microcredit emerge and has been used extensively by Professor Muhammad Yunus, an economics lecturer from University of Chittagong in Bangladesh, who initiated microfinancing programmes for the poor called the Grameen Bank Project. The microcredit programme under the Grameen Bank Project was designed to provide small loans to groups of poor women to create income-generating self-employment through micro-entrepreneurship. This group is based on solidarity group lending, whereby every member of the group is responsible for the repayment of the other members (Santos et al., 2022). This project has achieved

remarkable success in helping poor women to move out from poverty. Based on the tremendous success in Bangladesh, the microcredit programme has diffused to other countries and has been widely acclaimed as a successful development tool for combating poverty in many countries, especially in developing countries, including Malaysia (Bhuiyan et al., 2012).

A replication of Grameen Bank, microcredit disbursement in Malaysia started as an action research called the Ikhtiar Project by the Centre of Policy Research in Universiti Sains Malaysia. The Ikhtiar Project believed that the poor can improve their economic status if they receive assistance in the form of financial capital for carrying out business activities. In line with this belief, the Ikhtiar Project was implemented for two and a half years, commencing in January 1986 to June 1988. The project was carried out in a poverty-stricken area in Northwest Selangor and at the end of the period, the beneficiaries were able to increase their income remarkably, especially female participants, as shown in Table 1. Data presented in Table 1 indicates that 70% of respondents successfully increased their income with a total average monthly income increment of RM119. Female participants had tremendous success where 84% of them were able to increase their average monthly income by RM136, while 65% of male participants saw an increase of RM65 in their monthly income. Meanwhile, only 30% of total participants experienced no change or a negative change of RM20 decrease in income.

Table 1

Average monthly household income increment of Project Ikhtiar beneficiaries according to gender from December 1986 to August 1988

	Female		Male		Total		Total respondent s
	RM	Respondent s (%)	RM	Respondent s (%)	RM	Respondent s (%)	
Positive	136	84	65	65	119	70	125
Negative/no changes	1	16	21	35	20	30	53
Total	113	100	63	100	78	100	178

Source: Gibbons and Kasim (1990)

The total loan repayment from all participants was 78%, with 90% of female participants managing to settle their loan. Based on this result, the Ikhtiar Project was declared a success in alleviating poverty, especially when considering the female participants' performances (Gibbons & Kasim, 1990). The project's remarkable success in alleviating poverty saw it grow from a pilot research project into a significant programme recognized by the government for combating poverty. Amanah Ikhtiar Malaysia (AIM) was institutionalized as a private trust body in 1987 in continuation of the Ikhtiar Project and became the pioneer microfinance institution in Malaysia responsible for facilitating the poor by providing microcredit.

With the assistance of microcredit, along with other development and poverty alleviation programmes, the incidence of poverty in Malaysia declined tremendously in 1990, after the first long-term national policy or NEP (New Economic Policy) was discontinued. The

poverty rate fell from 49.3% in 1970 to 15% in 1990. This rate further continued to decline from 49.3% to 6% between 1970 to 2002 and further declined to 8.4% in 2020 (Department of Statistics Malaysia, 2021). Given the low rate of absolute poverty, the 10th Malaysia Plan launched in 2011 had shifted its focus from combating absolute poverty, which involves households below the poverty line income (PLI), to relative poverty by concentrating on the poorest 40% of households (B40). This new orientation towards elevating the livelihood of the bottom 40% of households was undertaken due to concerns about income inequality. Furthermore, the new dimension of poverty ensures inclusive development so that the lower income and vulnerable groups benefit from the economic growth (Khazanah Research Institute, 2019). Strategies for elevating the status of the B40 varies from poverty eradication to increasing their potential earnings, as the programme is not based on dispensing assistance but facilitating the low-income group with opportunities for raising their capacities and capabilities. Entrepreneurial development and skills training are the core elements in programmes targeting the B40, while microcredit has been highlighted by the government as a significant tool for improving the livelihood of the B40 (The Economic Planning Unit, 2010).

However, the aspiration to reduce poverty among women through microcredit paints a worrisome picture whereby the failure rate among new small, medium dan micro enterprises (SMEs) in Malaysia is still relatively high (Yusoff et al., 2018). Many new SMEs are prone to fail within the first 5 years, with a 60% failure rate (National Economic Advisory Council, 2010). Moreover, 42% of SMEs that existed in 2000 failed to survive in 2005. This critically affects the sustainability growth of micro-enterprise, given that 76.5% of SMEs in 2018 is micro (SME Corp Malaysia, 2019).

Given the current state of affairs regarding the sustainability issues of micro-enterprise, which could hamper the impact of microcredit on the poor women, this study found the need to assess the impact of microcredit on poverty reduction among microcredit recipients, and to examine factors contributing to the higher income level among them.

Literature Review

The Economic Impact of Microcredit

Given that the primary goal of microcredit is to eradicate poverty, a spotlight has focused on the effectiveness of microcredit in increasing the income of the borrowers. The assessment of income and expenditure are two important indicators used to assess the effectiveness of microcredit in poverty alleviation (Hulme, 2000). However, according to Muda and Lonik (2020), measuring changes in income has dominated impact assessment studies related to microcredit in the context of Malaysia country. Evaluating the income assessment of microcredit borrowers is essential to determine whether the funds are well spent and benefit the recipients.

Shamim (2019) examined the effectiveness of microcredit in raising income among borrowers in Bangladesh and found that microcredit had significantly delivered a positive impact on participants' monthly income, which led to a better standard of living. Ghulam Hussain et al (2019) also found that the microcredit programme provides employment opportunities, raised microcredit participants' income and consequently, contribute to poverty reduction. Similarly, Ding and Abdulai (2020) also found that microcredit impacted poverty reduction in China. The study revealed that all types of microcredit sources significantly contributed to household income per capita and consumption. Miled and Rejeb (2018) extended the study on the impact of microcredit on poverty reduction by measuring the impact at the macro level among 40 developing countries involving 596 microfinance

institutions. The analysis showed that microfinance had significantly reduced poverty and increased consumption among borrowers in those developing countries. Felix and Belo (2019) examined the impact of microcredit on poverty reduction involving 11 developing countries in South-East Asia and found that microcredit plays a significant role in poverty alleviation across countries. The analysis at the macro level shows that microfinance has a big potential to become an effective tool for the alleviation of poverty on a global scale.

The positive impact of microcredit on borrowers' income is consistent with cases in Malaysia, which shows that the microcredit scheme has remarkably contributed to greater household income, subsequently reducing the number of poor households in the country. In a similar vein, Al-Shami et al (2017) concurred in their study on the impact of microcredit on income increment between new and old borrowers. The finding indicated that old borrowers received greater positive impact after utilizing the loan compared to new borrowers, which also indicates that prolonged involvement in microcredit is likely to offer greater benefits to microcredit recipients. This finding is corroborated by Tammili et al (2018), who reported that all microcredit participants experienced an increase in income after receiving the loan. Another case study in Malaysia by Wahab et al (2018) also found that the majority of respondents reported a stable income after receiving microcredit compared to before receiving the loan. Shah and Arif (2021) also found that participation in microcredit had increased the standard of living and income level among the microcredit recipients.

A large number of existing studies on the impact of microcredit on poverty reduction have concluded that microcredit successfully raises borrowers' income, which in turn leads to a reduction in poverty. However, some studies have revealed that microcredit could have different impacts across borrowers with different income levels prior to joining the scheme. Better off recipients are likely to gain more benefits from the scheme compared to the poorer recipients. Tambe et al (2017) aimed to determine the impact of microcredit in India and found that microcredit benefited the poor but was less beneficial to the very poor. The poor were able to invest the loan in income generating activities and accumulate assets, while the very poor tended to use the loan for consumption purposes due to the lack of basic necessities. Consequently, the very poor struggled to repay the loan, which worsened their socio-economic conditions. Similarly, Rahman et al (2009) noted that microcredit is more effective in raising income for high income borrowers compared to medium and low-income groups. Meanwhile, Selvaraj et al (2018) argued that microcredit had successfully reduced poverty in the poorest as well as the lower income group, which consisted of 40% of bottom households in the country. This result is in line with Omar et al (2012), who stated that most participants from the hardcore poor and low-income groups had managed to cross their group income levels into a much higher income group.

Having said that, the impact of microcredit could differ across borrowers since they had different income levels prior to joining the scheme. Therefore, this study found the need to address the microcredit impact across borrowers with different income levels within the B40 group. Moreover, most previous studies used poverty line income (PLI) as a proxy for measuring poverty reduction among microcredit borrowers, which concentrated only on the absolute poor. Having largely addressed poverty, Malaysia has shifted the concept of poverty from absolute poverty to relative poverty by focusing not just on the poor below PLI but also the poorest 40% of households (B40). Therefore, the assessment of microcredit programmes that aim to elevate the income of the B40 is worthy of further examination.

Factors Contributing to the Sustainability of Micro-Enterprise

Factors that contribute to the sustainability of micro-enterprise vary according to the different aspect approached by scholars. Saad and Duasa (2011) studied factors influencing the success of micro-entrepreneurs among the microcredit recipients. Their study categorized the amount of loan borrowed, age, gender, educational level, assets owned before joining the microcredit programme, person in charge who handled the programme and area of residence as the important factors contributing to the level of income by the microcredit recipients. Hussin et al (2015) evaluated five factors that contribute the sustainability of micro-enterprise which are personality factor, cultural factor, environment factor, microfinance factor and entrepreneurial factor. The result of the study argued that self-confidence, presence of role model, marketing opportunity, saving method, and communication skills are critical factors that increase the economic performance of the micro-enterprise. Meanwhile, Adeoti and Asabi (2018) emphasised on the efficiency in business management by having proper accounting record as vital for the development of micro-enterprise such as having a cash daybook, sales daybook and purchase daybook to record business transaction.

Apart from that, some scholars concentrate on the personal qualities of the entrepreneur as critical factor for business success. Lee and Wang (2017) found that resilient entrepreneur who has the ability to overcome adversities, adapt to uncertainties and learn from previous failures as the core elements of successful entrepreneur behaviour. The characteristics or trait of the entrepreneurs explained the capacity of a person to function well in the face of adversity, stress and uncertainty, and the lens of individual resilience explain why some entrepreneurs are more success than others (Fisher et al., 2016). Persistence behaviour among entrepreneurs despite the challenging time is irrefutable evidence as the primary factor for business success (Hedner et al., 2011).

The problem of sustainable growth of micro-enterprise could be affected by many reasons, such as the personal level issues related to the entrepreneurs' attitude, entrepreneur and business characteristics, motivation, and competencies. Additionally, firm-level problem such as strategies, innovations and macro-level problem such as external business climate conditions also affect sustainable growth. The success factors that influence successful micro-entrepreneurs differ from one study to the next due to the wide range of micro-enterprise settings measured at the individual, micro, meso and macro environment levels (Cabrera & Mauricio, 2017). A study on the success factors of micro-entrepreneurs, therefore, will contribute to a deeper and wider understanding of critical factors for the sustainability of women micro-enterprise.

Methodology

Sample

The main purpose of this study is to examine the income changes among the AIM borrowers who fall under the category of B40 and factors contributing to the higher income among them. The stratified random sampling method was adopted and the study was carried out in the Northern Region of Peninsular Malaysia, namely in the states of Perlis, Kedah and Pulau Pinang with the participation of 11 AIM branches. A total of 380 AIM microcredit recipients was included based on the guidelines by (Krejcie and Morgan, 1970). This resulted in 35 participants from each AIM branch, which was selected randomly. Data were collected through questionnaires that were returned during AIM's weekly meetings. All respondents in this study were women since AIM offers the microcredit scheme only to women.

Statistical Model

Descriptive Statistics

The descriptive analysis was adopted to describe the frequency distribution and percentage of the respondents' and business profiles, and the difference of income changes among the respondents before and after receiving microcredit scheme. Measuring changes in the income levels of AIM microcredit participants was based on the conceptual framework proposed by by (Kartar, 1986). As shown in Table 2, the conceptual framework of this present study measured differences between 'before' and 'after' situations with income as the central variable. This method is appropriate for measuring changes in income levels among AIM borrowers to determine if the scheme has a significant impact on the elevation of the borrower's income level.

Table 2

Conceptual framework of the "Before" and "After" design

	"Before" the Programme	"After" the Programme
Programme Participants	Ea1	Eb1

Notes: Ea1: level of income before participating in the AIM microcredit scheme

Eb1: level of income after participating in the AIM microcredit scheme

This study used the relative poverty line income (PLI) as a proxy for measuring respondents' income levels. The relative PLI was adopted from Khazanah Research Institute (2019), which used to measure different dimension of poverty within the B40 group. As presented in Table 3, the division of households' income for the B40 group is categorized into 5 groups, namely hardcore poor (households with monthly income below RM465), absolute poor (households with monthly income of between RM466 to RM930), relative poor (households with monthly income of between RM931 to RM2291), B40 income threshold (households with monthly income of between RM2292 to RM3852) and median monthly income (households with monthly income of between RM3853 to RM4852). Referring to Table 3, the present study intended to measure changes in the income levels of AIM participants at the individual level by focusing on income earned only from micro-enterprise activities.

Table 3

Income subgroups within the B40

Peninsular Malaysia	Hardcore Poor (below half PLI)	Absolute Poor (below PLI)	Relative Poor (below half of median income)	B40 income threshold	Median monthly income
Relative poverty line income	RM465	RM930	RM2291	RM3852	RM4852

Source: Khazanah Research Institute (2019)

Model Specification

The ordinal logistic regression was used to estimate the parameters that influenced the position of income group level. This analysis was chosen because the dependent variable of

the study is a rank-based ordinal data. The category of dependent variables of the study is categorized into income subgroup as stated in Table 3. Therefore, the statistical model for this study must explain how independent variables relate to being in higher or lower income group. The study adopted a proportional odds model that assumes that the odds of response below a given response level are constant regardless of which level we picked. Accordingly, the logistic regression models for the factors that contribute to the probability being in a higher income group are as follows:

$$\text{logit}(\gamma_j) = \ln \left[\frac{\Pr(Y \geq y_j | x)}{1 - \Pr(Y \geq y_j | x)} \right] = \theta_j - \beta_i X_i$$

Where,

$\Pr(Y \geq y_j)$ is the cumulative probability of the event ($Y \geq y_j$); Y is classified into 4 categories of income group (Dummy variables where 0 = Hardcore poor; 1 = Absolute poor; 2 = Relative poor; 3 = B40 threshold; 4 = Median monthly income); θ_j are the respective intercept parameters; X = the list of explanatory variables where X_1 = Age; X_2 = Number of dependents; X_3 = Educational level (Dummy variables where 0 = no formal education; 1 = primary school; 2 = secondary school; 3 = certificate/diploma; 4 = bachelor's degree); X_4 = Amount of loan borrowed; X_5 = Business experience; X_6 = Duration of AIM membership; X_7 = Business type (Dummy variables where 1 = food industry and 0 = otherwise); X_8 = Resilience; X_9 = Business management; X_{10} = Microcredit scheme; X_{11} = Challenges and barriers.

Results and Findings

The Respondent's and Business' Profile

Table 4 provides the frequency and percentage values for items in the respondent's profile due to the income group. The table indicates that majority respondents (29.5%) were aged between 41 and 50 which shows that the majority of respondents are in an economically active group. Majority of respondents within this age are fall under relative poor (51 respondents). With regard to marital status, 85.0% of respondents were married and majority of them are relative poor with 153 of them. In terms of the educational level, 72.6% of total respondents had completed secondary school. Majority respondents who completed secondary school fall under the category of relative poor, accounted 128 of them. In term of the number of dependents, the majority of respondents had 5 dependents (31.3%). Majority of respondents who have 5 dependents are also fall under relative poor (54 respondents). This indicates that the majority of respondents have a high number of dependents, which means more responsibilities, especially to maintain the family's economic security.

Table 4

Frequencies of respondent's profile

	Hardcore poor	Absolute poor	Relative poor	B40 income threshold	Median monthly income	Total (N=380)	Total (%)
Age							
18-30	1	11	20	13	3	48	12.6
31-40	3	22	49	21	5	100	26.3
41-50	4	22	51	24	11	112	29.5
51-60	1	17	39	25	9	91	23.9
61-70	0	2	16	10	1	29	7.6
Marital Status							
Married	8	55	153	81	26	323	85.0
Divorced	0	11	15	8	3	37	9.7
Single	1	8	7	4	0	20	5.3
Educational level							
No formal education	0	0	5	2	0	7	1.8
Primary school	1	8	18	10	3	40	10.5
Secondary school	6	58	128	65	19	276	72.6
Diploma/Higher certificate	2	6	20	11	5	44	11.6
Bachelor's degree	0	2	4	5	2	13	3.4
Number of Dependents							
No dependent	1	11	18	12	0	42	11.1
1	0	8	17	9	3	37	9.7
2	5	9	32	9	6	61	16.1
3	1	10	24	18	6	59	15.5
4	2	11	30	16	3	62	16.3
5	0	25	54	29	11	119	31.3

Table 5 indicates the frequency and percentage of business' profiles due to income group with their frequencies in each income categories. The result reveals that large number of respondents that is 50% of them borrowed the lowest range of loan provided by AIM which is between RM1,000 to RM5,000 and majority of them are under the category of relative poor (90 respondents). The study also shows that more than a half of the respondents which is 43.9% have become an AIM membership for less than 5 years and majority of them are relative poor (75 respondents). Result on business experience indicates that the highest percentage of respondents which is 29.7% have less than 3 years of business experience prior to joining AIM and majority of them are categorized as relative poor (52 respondents). In terms of business type, majority respondents which 60.3% of them involved in food related business and most of them are also under relative poor (108 respondents).

Table 5

Frequencies of business' profile

	Hardcore poor	Absolute poor	Relative poor	B40 income threshold	Median monthly income	Total (N=380)	Total (%)
Amount of loan borrowed (RM)	7	51	90	33	9	190	50
1,000-5,000	2	18	64	42	9	135	35.5
5,001-10,000	0	2	13	9	4	28	7.4
10,001-	0	2	7	7	3	19	5.1
15,000	0	1	1	0	2	4	1.1
15,001-	0	0	0	2	2	4	1.1
20,000							
20,000-							
25,000							
25,001-							
50,000							
Duration of AIM membership							
>5 years	7	41	75	35	9	167	43.
5 – 10 years	1	17	56	33	12	119	31.3
11 – 15 years	0	7	25	11	1	44	11.6
15 – 20 years	1	9	19	14	7	50	13.2
Business experience prior to joining AIM							
microcredit	3	18	49	22	5	97	25.5
No	2	34	52	21	4	113	29.7
experience	3	11	31	21	9	75	19.7
> than 3	0	3	25	18	3	49	12.9
years	1	8	18	11	8	46	12.9
3-5 years							
6-10 years							
10-20 years							
Business type							
Food	6	44	108	58	13	229	60.3
industry	3	30	67	35	16	151	39.7
Otherwise							

Range of Income Before and After Joining the Aim

Table 6 presents the whole range of income pattern earned by participants based on the relative PLI to assess poverty reduction among AIM women micro-entrepreneurs in relation to objective one. Based on Table 6, the percentage of hardcore poor before receiving microcredit was 25.8%, which refers to respondents who received an income of below

RM465. After joining AIM, the percentage of respondents under the hardcore poor income category dropped to 2.4%, a reduction of 23.4%. Moreover, respondents with income ranging from RM465-RM930, which falls under the absolute poor income category or under PLI, recorded a 4.4% drop from 23.9% before receiving the AIM microcredit, to 19.5% after receiving the AIM microcredit. The relative poor group, who earned an income of between RM931-RM2290, made up 37.9% prior to joining the microcredit scheme, which then increased to 46.1% (an increment of 8.2%). The result also shows that 10.5% of respondents were below the B40 income threshold with a monthly income of between RM2291 to RM3852 prior to receiving the microcredit. The percentage of respondents below the B40 income threshold reported a 14% increase, which constitutes 24.5% of recipients in the category after joining the scheme. Lastly, there were 1.8% of respondents in the median monthly income group who earned a monthly income of between RM3853 to RM4000 prior to participating in the AIM microcredit scheme but after joining the AIM microcredit scheme, these respondents increased to 7.6%, which was an increment of 5.8%. Table 6 also illustrates that the relative poor group recorded the highest proportion of respondents in both, before and after receiving AIM microcredit. In addition, it was found that the B40 income threshold saw the highest increase in percentage (an increment of 14%), compared to other income groups and the hardcore poor recorded the highest decrease in percentage, which was by 23.4%.

Table 6

Distribution of microenterprise income per month: "Before" – "After" according to relative poverty line income

Relative Poverty Line Income (RM)	Income Category	Before		After		Before and after changes	
		N	%	N	%	N	%
>465	Hardcore poor	98	25.8	9	2.4	-89	-23.4
465 – 930	Absolute poor (PLI)	91	23.9	74	19.5	-17	-4.4
931 - 2290	Relative poor	144	37.9	175	46.1	+31	+8.2
2291 – 3852	B40 income threshold	40	10.5	93	24.5	+53	+14
3853 - 4852	Median monthly income	7	1.8	29	7.6	+22	+5.8
Total		380	100.0	380	100.0		

It is important to highlight that there is a total of 27.8% decrease in percentage of respondents below PLI, where the hardcore poor group registered a 23.4% decrease, while the absolute poor group registered a 4.4% decrease. This illustrates that the poor not only surpassed the PLI but also climb the ladder to a higher income group, which shows that AIM has made a substantial contribution in uplifting the income of its borrowers. The hardcore poor's income is usually spent on necessities since they usually lack the basic needs in life. Nevertheless, the ability of the hardcore poor to fulfil their basic necessities, raise their income and pay back the loan is considered a remarkable result.

The findings also show that all income groups above PLI, which consist of the relative poor, B40 income threshold and median monthly income, recorded a positive change in income. It is important to note that among these three groups situated above the PLI, the percentage of participants within the B40 income threshold (RM2291-RM3852) saw the

highest increase in percentage (an increment of 14%) after receiving and utilizing the microcredit compared to other income groups.

Wilcoxon Signed-Rank Test

Next, the study adopted the Wilcoxon signed-rank test to investigate changes in income scores before and after receiving the microcredit. Table 7 shows that the value for the negative rank is 1, meaning that 1 respondent was downgraded to a much lower income group compared to before receiving microcredit. Meanwhile, the value of positive ranks is 210, which indicates that 210 respondents had successfully elevated their income and shifted to a higher income group after participating in the microcredit scheme. Besides that, the unchanged value is 169, which represents 169 respondents who remained in the same income group after receiving the loan.

The findings indicate that only one respondent was downgraded to a lower income group; meanwhile, majority of the respondents had successfully moved up into a higher income group. Even though some respondents remained in the same income group after joining the AIM microcredit scheme, their income increased within the same income group range. This occurred due to the wide range of income value in a certain income group level.

Table 7
Ranks

		N	Mean Rank	Sum of Ranks
Income (after)	Negative Ranks	1 ^a	73.00	73.00
	Positive Ranks	210 ^b	106.16	22293.00
Income (before)	Ties	169 ^c		
Total		380		

Notes: a. Income (after) < Income (before)

b. Income (after) > Income (before)

c. Income (after) = Income (before)

Table 8 reveals results of the wilcoxon signed-rank test that measures whether changes in income score are statistically significant. Results show that the p-value (0.000) is less than the alpha value ($\alpha=0.05$), indicating that there is a significant difference in the income scores before and after the programme. Therefore, it can be concluded that the AIM microcredit scheme has a significantly positive impact on elevating income among its beneficiaries, which then shifts the respondents to a higher income group.

Table 8

Test statistics for wilcoxon signed-rank test

	Income (after) – Income (before)
Z	-13.073
Asymp. Sig. (2-tailed)	.000

Ordinal Logistic Regression

The ordinal logistic regression was used to estimate the factors that contribute to the level of income among AIM borrowers after receiving microcredit in particular to be into a higher income group, which in line with the second objective of the study. The statistically

significant chi-square statistic ($p < 0.05$) in the model fitting information table presented in Table 9, indicates that the model gives better prediction than if it just based on the marginal probabilities for the outcome categories. Therefore, the full model (with factors that affect income group as a predictor) is significantly better than the intercept only model.

Table 9

Model fitting information

Model	-2 Log Likelihood	Chi-Square	df	Sig
Intercept only	841.175			
Final	762.503	79.212	14	0.000

Table 10 measured the goodness-of-fit using the Pearson's chi-square and Deviance chi-square statistic for the model. These statistics are intended to test whether the fitted data are consistent with the observed data. The result in Table 10 shows that both p-values are larger than 0.05 ($p > 0.05$) which indicates a well-fitting model.

Table 10

Goodness-of-fit

	Chi-Square	df	Sig
Pearson	1114.810	1270	0.999
Deviance	762.503	1270	1.000

Pseudo R^2 values of Nagelkerke in Table 11 indicates that the factors contribute to the level of income explain 23.5% of the variation between income group. It shows that other factors also play important role that affect the income group. However, this does not negate that there is statistically significant and relatively large difference in the average income group affected by the success factors.

Table 11

Pseudo R-square

Cox and Snell	0.218
Nagelkerke	0.235
McFadden	0.094

Table 12 shows the result of ordinal logistic regression on factors contributing to the level of income. The median monthly income does not have an odd associated with it since this category serves as the base of the reference category. From the observed significance level in Table 12, it is stated that the educational level shows negative coefficient values (with bachelor's degree as reference level) which suggests that lower educational level has a negative effect on the income group level. This mean that the odds of being in the higher income group for primary school (education =1) is 0.205 ($e^{-1.587}$, $p < 0.05$) which indicates that respondents who received only primary school level education has only 0.205 times chances to be in the higher income group compared to those that has bachelor's degree. This finding correlates with Bhuiyan et al (2017) who revealed that education level has positive relationship to the income generated from micro-enterprise activities where higher education level will contribute to higher likelihood of high income. The finding also shows that an increase in one unit of amount of loan borrowed was associated with a higher odds of being

in the higher income group with an odds ratio of 2.044 ($e^{0.715}$, $p < 0.05$). This finding is supported by Tundui and Tundui (2020) who also found that total amount of loans received from micro finance institution has significantly influenced the performance of the borrowers to generate more income.

The result also demonstrated that for every one unit increase in the business experience, there is a predicted increase by a factor of 1.189 ($e^{0.173}$, $p < 0.05$) in the odds of being in the higher income group. This finding is consistent with Thaher et al (2021) who showed that business experience affected the business success among women micro and small sized entrepreneurs. Uddin (2021) also provided evidence that insufficient business experience is one of the main challenges that hinders business growth among women micro-entrepreneurs. Lastly, business management is also found to be a significant factor that influences higher income among AIM women micro-entrepreneurs. The result shows that for one unit increase in the business management, it resulted in an increase by a factor of 2.201 ($e^{0.789}$, $p < 0.05$) in the odds of being in the higher income group. This finding is in agreement with Pandey (2019) which showed that business management practices among micro-entrepreneurs have significantly contributed to the business's income.

Table 12

Parameter estimates of ordinal logistic regression

						95% Confidence Interval	
						Lower Bound	Upper Bound
	Estimate	Std. Error	Wald	df	Sig.		
Threshold [Hardcore poor = 0]	2.885	1.483	3.782	1	0.052	-0.022	5.792
[Absolute poor = 1]	5.320	1.470	13.091	1	0.000	2.438	8.202
[Relative poor = 2]	7.707	1.507	26.160	1	0.000	4.754	10.660
[B40 threshold = 3]	9.819	1.542	40.522	1	0.000	6.796	12.842
Location							
Age	0.149	0.116	1.642	1	0.200	-0.079	0.376
No. of dependents	0.108	0.064	2.832	1	0.092	-0.018	0.234
[Education = 0]	-1.173	1.040	1.274	1	0.259	-3.211	0.864
[Education = 1]	-1.587	0.726	4.777	1	0.029	-3.010	-0.164
[Education = 2]	-1.104	0.600	3.390	1	0.066	-2.280	0.071
[Education = 3]	-0.875	0.649	1.814	1	0.178	-2.147	0.398
[Education = 4]	0 ^a	.	.	0	.	.	.
Amount of loan borrowed	0.715	0.123	33.736	1	0.000	0.473	0.956
Business experience	0.173	0.086	3.983	1	0.046	0.003	0.342
Duration of AIM membership	0.018	0.130	0.019	1	0.891	-0.237	0.272
[Business type = 1]	0.104	0.239	0.188	1	0.664	-0.365	0.573
[Business type = 0]	0 ^a	.	.	0	.	.	.
Resilience	0.200	0.374	0.286	1	0.593	-0.5330	0.933
Business management	0.789	0.345	5.234	1	0.022	0.113	1.464
Microcredit	0.119	0.307	0.149	1	0.699	-0.483	0.720
Challenges and barriers	0.148	0.130	1.299	1	0.254	-0.107	0.404

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Table 13 shows parallel line test to evaluate the proportional odds assumption, which stated that the slope coefficients in the model is the same across response categories. This test compares the ordinal model which had a set of coefficients for all thresholds (labelled Null Hypothesis), to a model with a separate set coefficient for each threshold (labelled as General). From table 13, chi-square value is 23.612 and p-value is greater than 5% level of significance which indicates that we failed to reject the null hypothesis ($p > 0.05$). There is not enough evidence to reject the null hypothesis for general model. Hence, we conclude that proportional odds assumption appears to have held for general model.

Table 13

Test of parallel lines

	-2 Log Likelihood	Chi-Square	df	Sig
Null hypothesis	762.503			
General	738.891	23.612	42	.990

Conclusion

The impact of AIM microcredit on poverty reduction among its recipients indicates that participants have managed to cross the PLI benchmark and moved up to a higher income group. The present study found a decrease in respondents under the PLI, which is indicative of a decrease in the percentage of hard-core poor and absolute poor after receiving the microcredit. The findings also clearly indicate that the AIM microcredit scheme has a significant positive impact on income earned across all income level prior to becoming an AIM member. This view is supported by Al-Mamun and Mazumder (2015), who found that microcredit recipients across different income levels had successfully upgraded their economic status by generating greater income after receiving and utilizing the loan. However, this result contradicts studies by Hamdan et al. (2012), who found that microcredit yields better outcome for the wealthier recipients compared to the middle and lower income recipients prior to receiving the loan. In regard to the factors influencing higher income among AIM women micro-entrepreneurs, the study suggests that higher educational level, amount of loan borrowed, business experience and business management are significant factors in generating higher income among AIM women micro-entrepreneur.

This study provides a valuable insight for government and microfinance institutions regarding the impact of microcredit on efforts to elevate the B40 group. Results show that microcredit can be a promising tool in raising the income of the poor and low-income groups, regardless of the income levels of participants before receiving the loan. Hence, data suggests that AIM and other microfinance institutions should focus on increasing the degree of outreach coverage so that more people can benefit from the scheme, especially those from the poor and lower-income group. In addition, the study also strongly suggest that microcredit has the potential to empower women since all AIM clients in the present study are women. Thus, offering opportunities to women in the form of access to economic resources through microcredit will likely increase their income through micro-enterprise, which subsequently leads to poverty reduction.

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