

## EMPOWERING MUSLIM WOMEN IN GENERATING HOUSEHOLD INCOME THROUGH MICRO OR SMALL SCALE ENTERPRISES IN MALAYSIA

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### ABSTRACT

*Reducing poverty in Malaysia has come a long way since 1990 when the United Nations introduced the Millennium Development Goals in which one of the goals is to halve the number of people living on less than \$1.25 a day by 2015. Microfinance program was adopted by the government as one of the poverty eradication strategies in the country, in particular, to assist women to uplift their family socio-economic conditions and to be out from poverty. Since microfinance program is quite new in the country, empirical studies on empowering women through this program are very scanty. The present study attempts to investigate whether the additional income obtained from micro-enterprises carried out by female members of Amanah Ikhtiar Malaysia (AIM, one of the microfinance programs, is able to increase the quality of life and socio-economic status of the member's family. For this purpose, the study conducted a survey on respondents who are the participants of AIM program using convenience sampling in Perak and Kelantan. The analyses are done using descriptive statistics, tests of mean differences of dependent and independent samples, one way ANOVA and multiple regression of OLS method. The findings of the study show the success of AIM microfinance scheme to uplift standard of living of poor households in Perak and Kelantan through the participation of female members who are majority Muslim women. The obvious differences between income level before and after they joined the scheme are tested and it is found that the differences are highly significant. This is highly supported by the ownership of vehicle(s) which is believed to assist them in conducting economic activities from the project and the experiences that they have through higher age. Majority of the respondents agree that the scheme enables them to provide more education for the children as well as the healthcare of family members. Besides, the scheme has enabled them to fulfill their duty as Muslim through zakah payments and even signifies their important role in increasing the standard of living of the family through small scale businesses/projects.*

Keywords: Microfinance; Muslim women; Standard of living; Amanah Ikhtiar Malaysia.

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### 1. INTRODUCTION

Poverty eradication has been one of the major concerns of the governments of the developing countries. According to Rural Poverty Report 2001 in Peck (2005), there are 1.2 billion people who are extremely poor surviving on less than US\$1 a day in the world. Extremely poor people spend more than half of their income to obtain (or produce) staple foods. Most of these people suffer from nutritional deficiencies, and many suffer from hunger at certain times of the year. Even, within this community, one child in five will not live to see his or her fifth birthday (Barr, 2005). Considering the importance of resolving poverty problem, the United Nation's 2030 Agenda for Sustainable Development resolves to free the human race from the tyranny of poverty and to heal and secure the planet.

The first Sustainable Development Goal aims to "End poverty in all its forms everywhere". Its seven associated targets aims, among others, to eradicate extreme poverty for all people everywhere, reduce at least by half the proportion of men, women and children of all ages living in poverty, and implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

There is a growing acknowledgement that microfinance programs have the potential to help the poor, especially women, to develop income generating activities. The value of microfinance lies in its ability to give credit to normally poor women, whose lack of collateral forces them to rely on expensive informal credit. The cheaper credit is expected to become capital for starting up micro or small businesses that generate income for women, and subsequently increase the welfare of their household members (Pitt and Khandker, 1998)

Among the developing countries, Malaysia has a success story and a commendable record in reducing the poverty level in the country. In 1999, it was reported that 8.5% of the population was under the poverty line. However, after only five years, i.e., in 2004, Malaysia managed to reduce the population living below the poverty level to only 5.7%. Microfinance is one of the objectives of New Economic Policy (NEP) which was launched by the Malaysian government to reduce poverty and income disparities in Malaysia.

One of the unique features of microfinance program is that majority of the clients of microfinance institutions are women. These women patronize microfinance institutions to get microcredit used to start various income generating activities. In Malaysia, women participation in the labor force has been increasing steadily from 2,374,300 in 1990 to 3,941,600 in 2009 (<http://www.kpwkm.gov.my>). Women involvement in the labor force whether it is in the large corporations, medium or small scale companies has greatly helped in reducing the number of households in poverty in Malaysia from 409,300 in 1990 to 228,400 in 2009 (<http://www.kpwkm.gov.my>). Another positive outcome as a result of women participation in the labor force is

that the additional income obtained can be used toward increasing the quality of life and also socio-economic status of the family members.

Studies on the impact of microfinance on women have been frequently presented from the feminists point of view (Hashemi, Schuler, and Riley, 1996; Mayoux, 2001; Rao, 2008). Most of these studies look at the contribution of microfinance in empowering poor women in making household decision, reproduction, controlling income and assets, as well as increasing their self-esteem. To the best of our knowledge, studies which present the role of women, especially Muslim women in microfinance activities to complement their spouses in generating household income have been non-existent. In fact most impact studies of microfinance program on empowering women in Malaysia are descriptive in nature, in which hardly statistic tools are used to analyze rigorously on data collection from primary or secondary data. Thus, the present study will attempt to fill these gaps.

The present study, therefore, aims to investigate whether the additional income obtained from micro-enterprises carried out by female members of AIM, especially Muslim women, is able to increase the quality of life and socio-economic status of the member's family. The study uses survey method to obtain primary data from the participants of AIM program and the data are analyzed using several statistical tools to obtain rigorous results which could be used for policy recommendations.

The structure of this paper is as follows. Section 2 presents an overview of microfinance in Malaysia, followed by a literature review on microfinance in Section 3. Section 4 explains data and methodology used in the study. Section 5 presents the findings of the study, and finally, Section 6 concludes the study with policy recommendations.

## 2. DEVELOPMENT OF MICROFINANCE IN MALAYSIA

Micro-credit program in Malaysia started in 1987 with the establishment of Amanah Ikhtiar Malaysia (AIM). The program is one of the poverty eradication strategies in the country. There are three large microfinance institutions in Malaysia namely Amanah Ikhtiar Malaysia (AIM), Yayasan Usaha Maju (YUM) and The Economic Fund for National Entrepreneurs Group (TEKUN). AIM and YUM are poverty-oriented institutions that only give microcredit loans only to people who live at, or below, the country's poverty line. TEKUN provides microcredit loans to both poor and below average income people. AIM and TEKUN provide microcredit services throughout Malaysia (Peninsular, Sabah and Sarawak). Meanwhile, Yayasan Usaha Maju (YUM) focus on providing microcredit loans to the poor people of Sabah. Each of these microfinance institutions has its own lending systems and has been subsidised by the government since their existence (Suraya Hanim Mokhtar & Zariyawati Mohd Ashhari, 2015)

AIM was established to replicate the Grameen Bank model for rural micro-financing (Conroy, 2002). The objective of AIM is to help alleviate rural poverty through provision of micro-financing to the rural poor as a way to generate income. Currently, almost 99 per cent of the members are women and the loans available are generally on short-term basis (between 25 to 150 weeks payback time).

Beside AIM, public institutions such as agricultural bank (formerly Bank Pertanian, recently has changed its name to Agribank), as well as the Credit Guarantee Corporation (CGC) also provide lending to small and medium enterprises (SMEs). However, the loan sizes of these institutions are somewhat above the conventional microfinance.

Initially the banking sector in Malaysia does not put much interest on microfinance. According to McGuire, Conroy and Thapa (1998) the central bank of Malaysia, Bank Negara Malaysia (BNM), restricted the spread between base and maximum lending rates in the commercial banking system to 4%, less than would be required to cover the extra costs associated with microfinance lending. In the case of some loans guaranteed by CGC the permissible spread was only 2%, reinforcing this effect. Therefore, getting involved in microfinance activity is difficult for commercial bank as well as other institutions.

However, AIM, as a government link institution has been successful to help government in alleviating poverty in Malaysia. Grant from the Malaysian government is one of the success factors that make AIM successful in assisting poor people in Malaysia. As of February 2011, AIM had 264,333 members and had disbursed a total of RM5.01 billion loans AIM's activities have been directed almost entirely, but not exclusively to the alleviation of poverty among poor Malays. At present, AIM has 63,887 Grameen like groups in operation mainly consists of female members and boasting a repayment rate of 99.49% (<http://www.aim.gov.my>). By September 2014, AIM had cumulatively disbursed more than RM11.3 billion in financing to its participants (*Sahabats*), a far increase from RM891,488 in 1990. AIM's market share of the microfinance industry stands at 40% in 2013. As the premier and most successful microcredit institution in the country, AIM had definitely been a key player in alleviating poverty especially among women – its target market. The overall incidence of poverty in the country, measured as a percentage of households, declined significantly from 37.4% in the 1980s to 1.7% in 2012 due to successful programs by Aim and others.

All impact studies conducted on AIM in 1989 (Amanah Ikhtiar Malaysia, AIM,2008), 1990-1991 (Social and Economic Research Unit, SERU), 1991-1993 and 1994-1995 (AIM, 2008) show that borrowers were able to increase their income after receiving loans from AIM. The impact study conducted by AIM in 2005 shows that borrowers would be out of poverty after four loan cycles with average loan of RM3,500 per loan. The study also reports that 31% of borrowers hire family members as workers and another 31% of borrowers hire non-family members as workers. Therefore, we can conclude that micro-credit is a powerful tool to alleviate poverty and generate employment.

## 3. LITERATURE REVIEW

Available empirical studies on the impact of microfinance programs on the poor, especially women, have given mixed results. While some research report positive results (Hashemi, Schuler, and Riley, 1996; Pitt and Khandker, 1998), other studies found shortcomings of microfinance programs (Mayoux, 2001; Park and Ren, 2001; Rahman, 1999). Della-Giusta and Phillips (2006) conducted a study highlighting the differences between rural and urban women entrepreneurs in Gambia. Of the two sample groups, given their similar pre-entrepreneurial experiences, the urban women were found to be more entrepreneurial than rural women. This was probably due to their greater exposure (through tourism), their different educational backgrounds, and the larger market place giving more opportunities for trading and learning.

A study undertaken by Mayoux (2001) on microfinance in Cameroon found large disparities in the success and sustainability of women enterprises financed by microcredit. According to Mayoux (2001), rather than class background, the differences seem to come from the women's ability to mobilize and activate social networks. Another study carried out by Mummidi (2009) found controversial results both supporting and denying the assumption that microfinance can promote income generating activities. Mumidi (2009) suggests that a better understanding of the diversity of women's livelihood and a better understanding of the range of constraints, motivations, skills and capabilities of women through the livelihood background might be useful to comprehend the impact of microfinance.

As the microcredit program is aimed to fight the problem of poverty in underdeveloped and developing countries, some literatures are looking at the end results of the program by analyzing the impact of it in reducing poverty level. Chowdhury, Gosh and Wright (2005) pointed out two main findings from their study on Bangladesh. First, micro-credit is associated with both lower objective and subjective poverty and, second, the impact of micro-credit on poverty is particularly strong for about six years with some leveling off after that point. Another study on Bangladesh conducted by Amin and Topa (2003) found that while micro-credit is successful in reaching out the poor, it is less successful in reaching out the vulnerable. These results also suggest that micro-credit is unsuccessful in reaching out the group most prone to destitution, the vulnerable poor.

Coleman (2006) conducted a study to investigate the impact of group lending program in Northeast Thailand, addressing the issue of self-selection and endogenous program placement, thus leading to biased estimation of impact in previous microfinance impact assessment studies. To overcome this problem, this study conducted quasi experimental impact study and collected detail data on household and village characteristics. The data was analyzed by using Tobit regression and the results show that the impact of group lending is insignificant on physical assets, savings, production, sales, productive expenses, labor time, and on most measures of expenditure on health care and education.

Kabeer and Noponen (2005) studied the social and economic impact of PRADAN, a Self Help Group (SHG) microfinance in Jarkhand, one of the poorest states in India. This study used interview as the tool for qualitative research and use descriptive statistics as the tool for quantitative research. The result of the study appeared that PRADAN's SHG-bank linkage model has had significant and positive impact in improving livelihood base, savings and debt position, and living and consumption standards of participants. PRADAN participants have been able to secure their primary livelihood source through own agriculture supplemented by labor, livestock and non-farm enterprise activities in comparison to more marginally positioned non-members who must still rely on unskilled labor activities as their primary source of income. The access to financial services and the strengthening of participant's agricultural activities is associated with less vulnerability in terms of higher savings, less onerous debt and less crises related borrowing and more investment in productive activities and fewer months of seasonal migration. It is also associated with significant household welfare gains especially shelter, food security and education. Despite the positive results, this study also showed that empowerment is not an automatic outcome of targeting women for financial services. While gains in terms of women's knowledge, awareness and skills were clearly discernible, impact in terms of participation in decision-making within the home and in the public domain were far more modest.

With regards to the economic impact of micro-credit programs in Malaysia, a few studies had been undertaken to determine the effectiveness of AIM's micro-credit program on poverty reduction in Malaysia. The first was an impact assessment study conducted in 1988. The objective of the study is to evaluate the effectiveness of AIM in replicating the Grameen Bank micro-credit program in increasing household income of the poor who are involved in the pilot phase of the program. The study is based on a sample size of 283 members. The major finding of the study is that 70% of AIM members involved in the study experienced significant increase in their monthly household income from an average of RM142 per month to RM220 per month (Kasim, 2000). The second internal impact assessment study done by AIM resulted in similar major finding and concluded that access to micro-credit facilitates results in an increase in the household income of AIM members (Kasim, 2000).

In the middle of 1990, the Social and Economic Unit (SERU) of the Malaysia's Prime Minister's Department initiated an impact assessment study on AIM microcredit scheme. The objectives of the study among other things are to evaluate AIM's credit delivery mechanism to their members, AIM's achievement in poverty reduction, and the cost-effectiveness of AIM's micro-credit scheme in alleviating poverty. SERU had opted to take samples from the state of Kedah, which at the time was an underdeveloped and agricultural-based state whose population consists of the poor within the rubber and rice sectors. The study found that AIM, using their rigorous means testing, has ensured that only the poor are eligible to get access to their micro-credit scheme. In addition, the study also concluded that members household income has more than doubled from an average of RM198 before becoming AIM member to RM457 with access to micro-credit scheme. With regards to the cost-effectiveness, the study concluded that with the total operating cost of RM1,757,019, AIM was able to uplift 249 poor households from the clutches of poverty (SERU, 1991).

The latest impact assessment study conducted internally by AIM was in 2005. The study found that AIM micro credit scheme was able to increase client household income from RM326 before joining the program to RM932 per month after getting loan from AIM, an increase of 186% (Amanah Ikhtiar Malaysia, 2008).

In summary, most of the previous studies reviewed in this section concentrate on poverty alleviation and the role of women in microfinance in general. Our study focuses on the involvement of Muslim women in microenterprises activities and their role in contributing to the household income. The study mainly investigates whether the additional income obtained from microenterprises carried out by Muslim female members of AIM is able to increase the quality of life and socio-economic status of the member's family. In addition, as oppose to the simple descriptive method used in impact assessment studies conducted by AIM, this study employs rigorous statistical tools to examine the relationship between microcredit loan and household income.

#### 4. DATA AND METHODOLOGY

This study aims to analyze the household economic performance or standard of living of Muslim women who are involved in microcredit program or scheme provided by AIM. The participants consist of Malaysian women (regardless of ethnicity, religion and others) who obtain credit from AIM to improve their family standard of living. Using convenience sampling, we restrict the selection of sample to participants of AIM program in Perak and Kelantan.

In this regard, we apply several stages of stratification. First, two districts in the states of Perak and Kelantan are chosen to represent the members of AIM program. The specific districts chosen are given below:

- i. Perak – the districts selected are Kuala Kangsar and Teluk Intan.
- ii. Kelantan – the two districts selected are Kota Bharu and Tumpat.

Second, participants are selected randomly from different centres ('pusat'), named by AIM branch offices, in each district. We pre-determined the sample size of participants from each district to be 500, in which the total participants in the survey conducted is 2000 from these four districts in Perak and Kelantan.

The study targets the number of respondents to be 2,000. However, we foresaw less number of completed questionnaires will be received since it was anticipated that some of the respondents identified to be included in the sample may refuse to participate in the survey, or may not complete the questionnaire satisfactorily. At the end of the survey, which was conducted in 2008, we are able to collect 1,961 usable responses to be used for the analysis. From total of 1,961 respondents, the number of respondent who are Muslim women is 1,730.

#### 4.1 Variables and their measurements

In this section, we explain the variables that are used in the analysis, which are basically formed from the survey questions given to the respondents. These variables will later be used in all analyses and the model developed to test the economic impact of AIM participation, particularly by Muslim women.

##### 4.1.1 Demographic variables

###### a. Religion

These groups are categorized as follows: (i) Muslim; (ii) Christian; (iii) Buddhist; (iv) Hindus and (v) others. It is noticed that majority of AIM participant are Malays as the program is aimed to reduce the poverty rate among the Bumiputras. However, we also believed that a Bumiputra might not necessarily a Muslim.

###### b. Ethnicity

The analysis is restricted to the four main ethnic groups in Malaysia, which are Malay, Chinese and Indian and others

###### c. Marital status

This variable is crucial to be included in the analysis as there is obviously different marital status of participants in AIM program. A dummy variable is formed for marital status with 1 for *married* respondents and 0 for those who are *not married or divorced*.

###### d. Age

As for this variable, open ended question is asked on the age of respondents and the raw number is used in the regression of the model.

###### e. Educational level

The levels of education are range from 'no education at all' to the highest level of education, namely 'post-graduate level'. The lowest code of number is given to those who have no education (one) and the highest code for those who have the highest level of education (five)

###### f. State

In the model, the base category is *Perak*. Thus, one dummy variable is constructed to represent another state – *Kelantan*.

###### g. Household size

Total household size is defined as the total number of persons living in the same home.

#### 4.1.2 Economic performance or standard of living

- a. Amount of income gained *before* and *after* being an AIM participant  
Apart from monthly income obtained from main and secondary occupations, annual and per capita annual incomes are also computed. The per capita annual income is defined as annual income of the respondent per household size.
- b. Assets gained *before* being an AIM participant  
This variable captures the assets owned by the respondent (or the spouse) before her participation in AIM. It is either she (or her spouse) owns the land (inclusive of house) or vehicle or not own them. Thus, a dummy variable is formed for each assets, land and vehicle with value of 1 = own asset and value of 0 = not own asset.
- c. Assets gained *after* being an AIM participant  
For this category of asset, the *value of assets* and *types of assets* are used. The value of assets is the total value of all assets gained after joining AIM in Ringgit Malaysia (RM). Types of assets are categorized into five : 0 = not own any asset, 1= own a house(s), 2 = own land(s), 3 = own vehicle(s), 4 = own more than 1 asset and 5 = other assets. The measurement of types of assets is based on the scale value of 1 until 5, in which the lower scale represents very basic assets and higher scale represents additional assets above the basic ones.

#### 4.1.3 Involvement in AIM scheme

- a. Duration of involvement  
This is the period of time the respondents are involved in the AIM scheme which is measured in months.
- b. Reason(s) of involvement  
There are four categories of reasons for being involved in AIM micro-credit scheme: (1) Easy accessibility of finance, (2) Supports from earlier participants, (3) Support from members of group and (4) Other reasons.
- c. Problem of repayment and its reasons.  
There are two variables developed for the problem of repayment. One, *the existence of the problem* which is classified as 1 if there is a problem(s) and 0 if there is no problem. This variable could be measured using one dummy variable. Second, *reasons of repayment problem* which is classified into four : (1) No profit gained from the project, (2) Family problem (Death, Illness and others), (3) The finance was not used for AIM project and (4) Natural disasters.

#### 4.1.4 The usage and repayment of loan from AIM

- a. Impact of the AIM scheme on business progress.  
This variable measures the degree of business progress from the scheme. It is range from the (1) failure of business until (5) great progress of the business.
- b. Improvement of family welfare and standard of living  
Using scale from (1) strongly agree until (5) strongly disagree, the variable of improvement of family welfare is captured. Thus, the lowest value represents the existence of improvement and the highest value represents no improvement in family welfare from the scheme. The questions consist of several key questions such as: the AIM scheme enables to uplift the household income; the scheme is able to increase the family spending; the respondent feels more responsible to pay the debt; the scheme able to improve health condition of family members; the scheme will allow the respondent to send their children to higher level of education or tuition classes; and the scheme enables respondent to make main financial decision in the family.
- c. Improvement in financial management  
Using similar scale as above the improvement in financial management is captured in this variable with the lowest value (1) represents the existence of improvement and the highest value (5) represents no improvement in financial management from the scheme.
- d. Degree of Islamic awareness  
The questions on the ability of participant to pay zakah and his/her awareness of Islamic responsibility are used to measure degree of Islamic awareness. Again, using the above-mentioned scale, the lowest value (1) represents the existence of Islamic awareness and the highest value (5) represents none existence of Islamic awareness from the scheme.

#### 4.2 Data Analysis Techniques

This study utilizes several methods to analyze the results. Descriptive measures such as frequencies, proportions and mean are used to provide a general summary of the findings. To determine differences between groups, *t*-test for dependent sample and *t*-test for independent sample are applied for variables having two groups/categories, and *F*-test is employed for those with more than two groups/catogaries (One-way Analysis of Variance, ANOVA).

For more in-depth analyses on the role of Muslim women to uplift the standard of living of their families, ordinary least squares (OLS) regressions (Multiple Regression) are estimated to determine factors that may have impact on a particular variable. A proxy is used for the standard of living variable (dependent variables), that is, level of earnings/income (after joining the AIM scheme). The regressors (independent variables) are selected from the list mentioned in the earlier section, such as, education level, marital status, own of assets and others.

Examples of the OLS model could be developed are as following:

$$\begin{aligned} (\text{income\_level})_t = & \beta_0 + \beta_1(\text{dummy\_state})_t + \beta_2(\text{education})_t + \beta_3(\text{age})_t \\ & + \beta_4(\text{household\_size})_t + \beta_5(\text{marital\_status})_t + \beta_6(\text{asset\_vehicle})_t \\ & + \beta_7(\text{asset\_land})_t + \xi \end{aligned} \quad (\text{equation 1})$$

where  $\beta$ s are coefficients of variables,  $t$  is number of respondents (Muslim women) and  $\xi$ s are errors.

## 5. RESULTS AND ANALYSIS

### 5.1 T-test for dependent samples

In this test, we identify yearly income per capita before joining AIM scheme and after joining AIM scheme as the targeted variables. The test is conducted for all respondents and therefore, the sample size is 1,961. Since we deal with continuous data, the Kolmogorov-Smirnov and Shapiro-Wilk normality tests are initially conducted as further statistical tests would depend on whether or not the data are normally distributed. Both tests basically compare the scores of the sample data to a set of normally distributed scores that have the same mean and standard deviation. If the test is non-significant ( $p > 0.05$ ), it indicates that the scores in the sample data do not significantly differ from a normal distribution. Otherwise, if the test is significant, the sample data is not normally distributed. Besides, we also check normality of data using Normal Q-Q plots of the variables, Skewness and Kurtosis values and graphic representation of histogram.

Using original data of yearly income per capita in Ringgit Malaysia (RM), the data (both before and after joining AIM scheme) are not normally distributed. The Kolmogorov-Smirnov and Shapiro-Wilk statistics are significant at 5% level as shown in Table 1, which infers that the distribution of both data have deviated from normal. Looking at Normal Q-Q plots of both data too, the red dots observed are strayed away from the green line, which also infers that the distribution of data have deviated from normal. As the values of Skewness (S) and Kurtosis (K),  $S = 4.166$  and  $K = 33.85$  for income before joining AIM scheme; and  $S = 4.285$  and  $K = 28.73$  for income after joining AIM scheme, both statistics implies that the distributions are not normal.

Table 1. Tests of normality- yearly income per capita (original and transform data)

Variable Name	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Yearly income per capita (before AIM)	0.126	1944	0.000	0.727	1944	0.000
Yearly income per capita (after AIM)	0.209	1944	0.000	0.621	1944	0.000
Natural log yearly income per capita (before AIM)	0.059	1931	0.000	0.980	1931	0.000
Natural log yearly income per capita (after AIM)	0.045	1931	0.000	0.992	1931	0.000

Note: <sup>a</sup> Lilliefors Significance Correction.

Since the original data of yearly income per capita are not normally distributed, we transform the data into natural log. Again, the tests of normality are conducted. Results of Kolmogorov-Smirnov and Shapiro-Wilk still indicate that the transform data are not normally distributed. However, values of Skewness and Kurtosis and plots of Normal Q-Q indicate quite differently.  $S = -0.375$  and  $K = 1.5$  for income before joining AIM scheme; and  $S = 0.292$  and  $K = 0.488$  for income after joining AIM scheme. The Normal Q-Q plots illustrate that the red dots mostly cluster closely to the green line. These results indicate that the transformed data are normally distributed. Base on the Normal Q-Q plots and values of Skewness and Kurtosis which imply that the data are normally distributed, we proceed with the t-tests (paired samples).

Table 2. T-test for dependent samples: natural log yearly income per capita (before and after joining AIM scheme)

Variable Name	Paired Differences					
	Mean	Std Dvn	Std Error Mean	t	df	Sig. (2-tailed)
Pair 1 Nat. log yearly income per capita						

(before AIM) - Nat. log yearly income per capita (after AIM)	-1.35	0.888	0.202	-66.67	1930	0.000
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Based on the paired samples statistics, the natural log yearly income per capita after the respondents join AIM scheme is higher (mean = 8.13, SD = 0.77) compared to the natural log yearly income per capita before join AIM scheme (mean = 6.78, SD = 0.59). As shown in Table 2, the difference between the means was observed to be statistically significant at 5% level. We also calculate the effect size for dependent samples t-test using percentage of variance accounted for ( $r^2$ ) and Eta squared ( $\eta^2$ ). The effect size statistics provide an indication of the magnitude of differences between the groups (before and after joined AIM scheme):

$r^2 = t^2 / (t^2 + df) = (-66.668)^2 / ((-66.668)^2 + 1930) = 0.697$  means that 69.7% of the variance in the respondents' income per capita is influenced by the involvement of respondents in AIM program;

Eta squared,  $\eta^2 = t^2 / (t^2 + N - 1) = 0.697$ . Base on Cohen (1988, pp. 284-7), since eta squared is greater than 0.14, there is a large effect size of the AIM program on the difference of income per capita of respondents.

### 5.2 T-test for independent samples

Further t-tests are conducted to analyze the existence of significant differences in the *mean yearly income per capita of respondents (after joining AIM)* when the respondents *either own or not own assets*, such as *land* and *vehicle*, before they joined the AIM scheme; whether or not they are *involved in any economic activities/businesses* before they joined AIM scheme; and their *marital status*, married or non-married (inclusive divorcee). The null hypotheses for the tests are:

H1<sub>0</sub>: There is no significant difference between those who own and do not own land (before joining AIM) on yearly income per capita (after respondents joined AIM)

H2<sub>0</sub>: There is no significant difference between those who own and do not own vehicle (before joining AIM) on yearly income per capita (after respondents joined AIM)

H3<sub>0</sub>: There is no significant difference between those married and not married on yearly income per capita (after respondents joined AIM).

H4<sub>0</sub>: There is no significant difference between those who are involved or are not involved in any economic activity (before joining AIM) on yearly income per capita (after respondents joined AIM).

**Table 3. Independent sample t-test for mean yearly income per capita by assets ownership (land and vehicle), involvement in any economic activities and marital status.**

Variable Name : nat. log yearly income per capita (after AIM)		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
By land ownership	Equal variances assumed	3.195	0.074	-2.77	1946	0.006	-0.18	0.065
	Equal variances not assumed			-2.41	172.28	0.017	-0.18	0.075
By vehicle ownership	Equal variances assumed	10.24	0.001	-2.62	1946	0.009	-0.11	0.044
	Equal variances not assumed			-2.83	694.83	0.005	-0.11	0.040
By marital status	Equal variances assumed	4.774	0.029	-0.43	1693	0.665	-0.03	0.079
	Equal variances not assumed			-0.39	111.62	0.695	-0.03	0.087
By economic activity involvement	Equal variances assumed	0.251	0.617	-0.12	1777	0.908	-0.004	0.038
	Equal variances not assumed			-0.12	1534.66	0.908	-0.004	0.038

Results of the t-test for equality means of yearly income per capita by all four independent variables are displayed in Table 3. As for the land ownership, those who not own the land were observed to have higher mean natural log yearly income per capita after joining AIM (mean = 8.148, SD = 0.765) compared to those who own land (mean = 7.96, SD = 0.904). Output of Levene's test for equality of variance indicates non-significant p-value of 0.074, which is larger than 0.05. Based on this, estimates from equal variances assumed are consulted. The results indicate that there is significant difference between means of per capita income between those who own land and those who not own land. The effect size statistics provide an indication of the magnitude of differences between the groups within the independent variables. In other words, it is an indication of how much the difference in

the dependent variable is influenced by the independent variable. Percentage of variance accounted for ( $r^2$ ) is computed as  $r^2 = t^2 / (t^2 + df) = -2.77^2 / (-2.77^2 + 1946) = 0.00393$  (0.39%) which implies that variance of land ownership does not largely explained variances in yearly income per capita of respondents after joining AIM. Eta squared computed as  $\eta^2 = t^2 / (t^2 + (N_1 + N_2 - 2)) = (-2.77)^2 / ((-2.77)^2 + 1946) = 0.00393$ , which also support the small effect of land ownership on the mean difference of yearly per capita income after joining AIM scheme.

Using independent variable of vehicle ownership, those who do not own vehicle(s) were observed to have higher mean natural log yearly income per capita after joining AIM (mean = 8.16, SD = 0.796) compared to those who own vehicle(s) (mean = 8.04, SD = 0.695). Output of Levene's test for equality of variance indicates significant p-value of 0.01, that is smaller than 0.05. Based on this, estimates from equal variances not assumed are consulted. The t-test results indicate that there is significant difference between means of per capita income between those who own vehicle and those who do not own vehicle. The effect size statistics are computed and following are the statistics:  $r^2 = 0.0114$  (1.14%) and  $\eta^2 = 0.0041$ . The  $r^2$  value implies that variance of vehicle ownership does not largely explained variances in yearly income per capita of respondents after joining AIM. Value of  $\eta^2$  similarly implies the small effect of vehicle ownership on the mean difference of yearly per capita income after joining AIM scheme.

By marital status, it is observed that those who are not married have higher mean natural log yearly income per capita after joining AIM (mean = 8.18, SD = 0.862) as compared to those who are married (mean = 8.14, SD = 0.772). Output of Levene's test for equality of variance indicates significant p-value of 0.029, that is smaller than 0.05. Thus, estimates from equal variances not assumed are then consulted. The t-test results indicate that there is no significant difference between means of per capita income between those who are married and not married.

Using involvement of economic activity before joining Aim as an independent variable, it is found that those who are not involved in any economic activity before joining AIM scheme have higher mean natural log yearly income per capita after joining AIM (mean = 8.15, SD = 0.776) as compared to those who are involved in economic activity (mean = 8.15, SD = 0.777). Output of Levene's test for equality of variance indicates insignificant p-value of 0.617, that is greater than 0.05. Thus, estimates from equal variances assumed are then consulted. The t-test results indicate that there is no significant difference between means of per capita income between those who are involved and those who are not involved in economic activity before joining AIM.

In sum, findings from the tests indicate that there exist significant differences in means of yearly income per capita between those who own assets, such as land and vehicle. However, there is no significant difference in means of yearly income per capita when marital status and involvement of economic activity before joining AIM are taken into consideration.

### 5.3 One-way between groups Analysis of Variance (ANOVA)

In this section, further analysis is done to signify differences of means yearly income per capita of respondents after joining AIM scheme by independent variables which have more than two categories/groups, such as religion, education level, ethnicity and progress of business/project (using AIM funds). ANOVA compares the variance (variability of yearly per capita income) between different groups with the variability within each of the groups. An F ratio is calculated, which represents the variance between the groups, divided by the variance within the groups. A large F ratio implies more variability between the groups (caused by the independent variable) than there is within each group (referred to as error term). A significant F test indicates that we can reject the null hypothesis, which states that the population means are equal. The null hypothesis could be written as:

$H_0$ : There is no significant difference between the means of yearly income per capita of respondents after joining AIM scheme, against the alternative hypothesis:

$H_1$ : There is at least one significant difference between the means of yearly income per capita of respondents after joining AIM scheme.

Based on religion as an independent variable, the descriptive analysis displays that there were differences observed between the means of yearly per capita income. Table 4 shows that Buddhists have the highest mean yearly income per capita (in natural log). This is followed by Hindus, Christians and Muslims. As for ethnicity, Chinese score the highest, and then followed by Indians, Malays and others. By education level, those who have the highest mean of yearly per capita income are those with high school/diploma qualification. This is followed by those have secondary education, no education, primary education and tertiary qualification. Using progress of project as an independent variable, those who stated that their business is progressing well are those who have the highest yearly income per capita. This is followed by those who stated that their project/business progress is moderate, slow, stagnant and fail.

Table 4. Mean and standard deviation of yearly income per capita (after joining AIM) across groups by independent variables

Independent variable	Group	N	Mean	Std Dev.
Religion	Islam	1718	8.14	0.78
	Christian	4	8.20	0.22
	Buddhism	10	8.44	0.93
	Hinduism	53	8.33	0.61
	Total	1785	8.15	0.78



Ethnicity	Malay	1716	8.14	0.78
	Chinese	7	8.74	1.26
	Indian	59	8.32	0.60
	Others	3	8.06	0.29
	Total	1785	8.15	0.78
Education level	No education	211	8.14	0.76
	Primary	1005	8.12	0.77
	Secondary	512	8.21	0.79
	High school/diploma	40	8.32	0.81
	Degree (first and higher)	2	7.62	0.34
	Total	1770	8.15	0.78
Progress of business/project	Fail	10	7.69	1.13
	No progress	31	7.95	0.68
	Slow progress	463	<b>8.08</b>	<b>0.78</b>
	Moderate progress	1193	8.17	0.76
	Great progress	82	<b>8.34</b>	<b>0.87</b>
	Total	1779	8.15	0.78

Table 5. ANOVA and Levene's test for homogeneity of variances

Independent variable	ANOVA		Levene's test	
	F statistic	Sig.	Levene statistic	Sig
Religion	1.44	0.229	2.199	0.086
Ethnicity	2.402	0.06	5.037	0.002
Education level	1.988	0.094	0.752	0.557
Progress of business/project	4.082	0.03	2.609	0.034

Looking at ANOVA results in Table 5, it is found that the F-statistics are not significant for independent variables of religion, ethnicity and education level as the p-value of F statistics are higher than 0.05. These results indicate that there is no significant difference for the mean of yearly income per capita for different groups of religion, ethnicity and education level. However, when progress of business/project is taken into consideration, there exists significant difference in mean of yearly income capita for five distinct groups: great progress, moderate progress, slow progress, stagnant and failure. Thus, we further conduct the post-hoc test to identify which group is significantly different.

Base on Tukey HSD and Bonferroni post-hoc tests, it is found that there is significant difference of mean yearly income per capita between those who stated that their business/project is progressing slowly and progressing well ( $p=0.034$ ). Referring to Table 4 (numbers in bold), the mean yearly per capita income for highly progress business/project ( $M= 8.34$ ,  $SD = 0.87$ ) is higher than for slowly progress business/project ( $M=8.08$ ,  $SD=0.78$ ). The effect size is also calculated to analyze how much the difference in the dependent variable is influenced by the independent variable. Eta squared,  $\eta^2$ , is used in this case. It is formulated as  $\eta^2 = \text{sum of squares between groups} / \text{total sum of squares} = 9.771/1071.307 = 0.00912$  (0.91%) which indicates that only 0.91% of the variance in mean yearly per capita income after joining AIM is explained by the difference among levels within progress of business/project. Based on guidelines proposed by Cohen (1988), this value represents small effect. Even the Levene statistic for progress of business/project implies that we have violated the assumption of homogeneity variance. This is similar to groups in ethnicity. Only Levene statistics for religion and education level indicate that we have not violated the homogeneity of variance assumption.

#### 5.4 Descriptive analysis on impact of AIM scheme on level of income and family well-being.

Being aware that majority of respondents or AIM participants are Muslim, the present study focuses further analyses only on *Muslim women* participants/respondents. By excluding non-Muslim respondents, we conduct descriptive analysis on the responses on survey questions which relate to the impact of AIM scheme on welfare of respondents' families and their standard of living, particularly in generating income for household members. The questions are responded using Likert scale (1 until 5)

from 1 = strongly agree to 5 = strongly disagree. Table 6 displays the frequencies and percentages for those responses in each question provided.

Table 6. Descriptive analysis: Responses on the impact of AIM scheme

<b>Key question</b>	<b>Scale</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>
AIM increases household income	Strongly agree	554	32.0	32.1
	Agree	1137	65.7	66.0
	Indifferent	27	1.6	1.6
	Disagree	4	0.2	0.2
	Strongly disagree	2	0.1	0.1
	Total	1724	99.7	100.0
AIM increases household spending	Strongly agree	371	21.4	21.5
	Agree	1316	76.1	76.1
	Indifferent	32	1.8	1.9
	Disagree	9	0.5	0.5
	Strongly disagree	1	0.1	0.1
	Total	1729	99.9	100.0
Able to pay zakah	Strongly agree	124	7.2	7.2
	Agree	876	50.6	50.8
	Indifferent	411	23.8	23.8
	Disagree	309	17.9	17.9
	Strongly disagree	6	0.3	0.3
	Total	1726	99.8	100.0
Able to strengthen the family bond	Strongly agree	367	21.2	21.2
	Agree	1322	76.4	76.4
	Indifferent	36	2.1	2.1
	Disagree	4	0.2	0.2
	Strongly disagree	1	0.1	0.1
	Total	1730	100.0	100.0
More responsible to pay the debt	Strongly agree	494	28.6	28.6
	Agree	1213	70.1	70.1
	Indifferent	18	1.0	1.0
	Disagree	4	0.2	0.2
	Strongly disagree	1	0.1	0.1
	Total	1730	100.0	100.0
Able to improve family health condition	Strongly agree	174	10.1	10.1
	Agree	1203	74.7	74.8
	Indifferent	230	13.3	13.3
	Disagree	27	1.6	1.6
	Strongly disagree	5	0.3	0.3
	Total	1729	99.9	100.0
Able to make expenditure decision in the family	Strongly agree	229	13.2	13.2
	Agree	1322	76.4	76.4
	Indifferent	154	8.9	8.9
	Disagree	24	1.4	1.4
	Strongly disagree	1	0.1	0.1
	Total	1730	100.0	100.0
Able to send children to tertiary education	Strongly agree	260	15.0	15.1

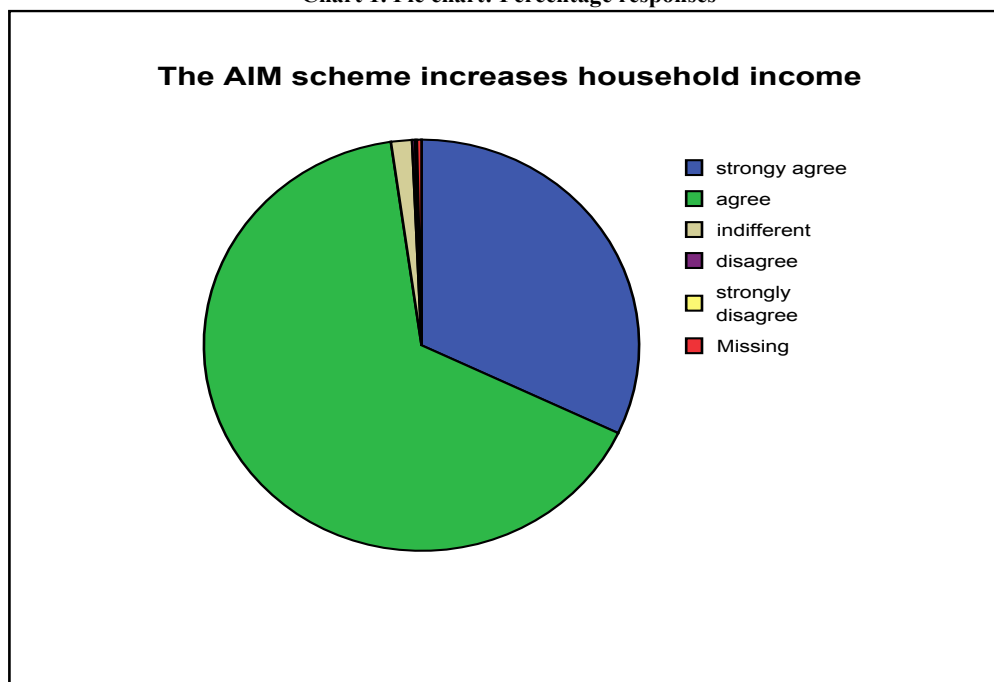
	Agree	1263	73.0	73.1
	Indifferent	177	10.2	10.2
	Disagree	25	1.4	1.4
	Strongly disagree	2	0.1	0.1
	<b>Total</b>	<b>1727</b>	<b>99.8</b>	<b>100.0</b>
Able to send children to tuition classes	Strongly agree	204	11.8	11.8
	Agree	1304	75.4	75.4
	Indifferent	184	10.6	10.6
	Disagree	38	2.2	2.2
	Strongly disagree	0	0.0	0.0
	<b>Total</b>	<b>1730</b>	<b>100.0</b>	<b>100.0</b>

Note: Total frequency excludes missing value/data

The results in Table 6 and Chart 1 show that, in total, 98.1% of respondents answered strongly agree and agree that participation in AIM scheme does increase their household income. Furthermore, 97.6% of respondents strongly agree and agree that participation in AIM scheme does increase their household spending. They are also able to improve welfare or well-being of the family members in term of healthcare and education. Looking at the findings, 84.8% of respondents strongly agree and agree that by participating in the scheme, they are able to improve family healthcare and 88.2% of respondents highly agree and agree that they are able to send their children to higher level education, while 87.2% of them strongly agree and agree that they could even send their children to tuition classes to complement normal hours of school education.

Since women are the focus target of this scheme of micro scale enterprise, the results signify the role of Muslim women in uplifting the standard of living of the family members. 13.7% of the members strongly agree and 76.4% agree (total of 89.7%) that, even though they are not the head of family, they are able to make main decision as regard to expenses of household members. More importantly, 98.7% of them strongly agree and agree that they feel more responsible to pay debt after participating in the scheme and 57.9% strongly agree and agree that they are able to pay zakah (in particular, income and asset zakah) from the additional income obtained from the scheme. On top of this, the scheme also provides opportunities for household members to work together for the successfulness of the projects/businesses. Apparently, when they are asked on the relationship among family members, the respondents answered that they strongly agree (21.2%) and agree (76.4%) that the project that they are working on from the scheme does improve the family relationship.

Chart 1. Pie chart: Percentage responses



### 5.5 Regression analysis

In this section, detailed analysis is conducted to further support our previous findings using multiple regression by the Ordinary Least Squared (OLS) method. In this case, the dependent variable used is natural log yearly income per capita after joining the AIM scheme and the regressors (or independent variables) are household size, dummy for land asset (1= own asset, 0= does not

own asset), dummy for vehicle asset (1= own asset, 0= does not own asset), dummy for state (1 = Kelantan, 0= Perak), level of education, age and marital status. Basically, we would like to observe significant individual contributors to the successfulness of the scheme in increasing the household income as well as overall significant of regressors' variance on the variance of dependent variable.

The result of multiple regression are displayed in Table 7. In general, all independent variables, except education level, are significant predictors which are useful estimates of yearly income per capita of respondents after they joined AIM scheme. Household size contributes significantly to variance on yearly per capita income at 1% level with the expected sign. The negative sign indicates that the level of per capita income (measured as income divided by family members) is lower as the household size is larger. Though statistically significant at 10%, dummy for vehicle asset also contributes to variance in yearly per capita income with positive sign. This indicates that respondents who own vehicle before they joined the scheme have more advantage in term of higher income than who did not own the asset. On the contrary, coefficient of dummy for land asset shows negative sign and it is more significant (5% level). It indicates that those who do not own land before joining the scheme are better off than who do own land asset. These results imply that the uplifting of income of respondents is positively complemented by the ownership of vehicle which assist them in the project/ business rather than the ownership of land which is very much use for shelter or home settlement.

Using dummy for state as one of the predictors, the positive and significant coefficient implies that those respondents who are in Kelantan have higher level of yearly per capita income compared to those in Perak. Positive and significant coefficient of age variable signifies the importance of experience at older age which contributes to the success in handling the project/business from the scheme. In fact, significant and positive coefficient of marital status indicates that those who are married (and having dependents helping out in the business project) obtain higher income from the project. However, the variable of marital status is only significant at 10% level.

Table 7. Determinants of income level after joining AIM scheme

Independent variables	<i>OLS estimates</i>	
	<i>Dependent variable: Natural log yearly per capita income</i>	
	<i>B</i>	
Constant	8.629***	(86.196)
Household size	-0.148***	(-21.135)
Dummy vehicle asset	0.092*	(1.949)
Dummy land asset	-0.143**	(-2.135)
Dummy state	0.341***	(8.757)
Education level	0.031	(1.225)
Age	0.007***	(2.988)
Marital status	0.141*	(1.901)
R <sup>2</sup>	0.255	
F	78.216	
Prob (F-stat)	0.000	
Durbin-Watson	1.886	

Note: OLS estimates corrected for heteroscedasticity (White and Huber/White, respectively); t-ratios are in parentheses; \*\*\*statistically significant at the 1% level; \*\*5% level; \*10% level.

The results are strengthened with goodness of fit (R<sup>2</sup>), F statistic and diagnostic tests of multicollinearity, serial correlation, heterokedasticity and normal distribution of residuals. Although R<sup>2</sup> is only 0.255 or 25% (indicates that 25% variance in the criterion variable accounted by our model), the F- statistic is highly significant at 1% level which signifies the importance of variance of each independent variable to the variance of dependent variable. By examining the variance inflation factors (VIF) and tolerance of predictors, we find there is no problem of multicollinearity in residuals as each predictor's VIF does not exceed 10 and tolerance figures are very high (mostly more than 0.8). As of serial correlation, since Durbin-Watson statistic is not less than 1 or greater than 3, it could be concluded that the model suffers no problem of serial correlation. Furthermore, we corrected

the model for heteroskedasticity problem while doing the estimation using White test. Normality distribution of residuals are ensured by plotting the normal P-P plot and it is found that they are normally distributed as the data mostly fit into the diagonal line.

## 6. CONCLUSION AND POLICY IMPLICATION

The present study aims to investigate whether the additional income obtained from micro-enterprises carried out by female members of AIM is able to increase the quality of life and socio-economic status of the member's family. For this purpose, the study conducted a survey on respondents who are the participants of AIM program using convenience sampling in Perak and Kelantan. The analysis are done using descriptive statistics, tests of mean differences of dependent and independent samples, one way ANOVA and multiple regression of OLS method.

The findings of the study show the success of AIM microfinance scheme to uplift the standard of living of the poor households in Perak and Kelantan through the participation of female members whom majority of them are Muslim women. The obvious differences between income level before and after they joined the scheme are tested and it is found that the differences are highly significant. This is highly supported by the ownership of vehicle(s) which is believed to assist them in conducting economic activities from the project and the experiences that they have through higher age. Though education level is not a significant factor which contributes to higher income from the scheme, majority of the respondents agree that the scheme enables them to provide more education for the children as well as better healthcare for family members. Last but not least, the scheme has enabled them to fulfill their duty as Muslim through zakah payments and even signifies their important role in increasing the standard of living of the family through small scale businesses/projects. The findings are somehow consistent to previous studies on the successfulness of microfinance in empowering women such as Hashemi, Schuler, and Riley (1996), Pitt and Khandker (1998), Amin and Topa (2003), Kabeer and Noponen (2005), Kasim (2000), SERU (1991) and Amanah Ikhtiar Malaysia (2008).

As policy recommendation, the findings on the success of the micro-credit program in improving the socio-economic status of the poor through involvement of women imply that Amanah Ikhtiar Malaysia needs to intensify its effort in outreaching the poor, both in rural and urban areas to make sure micro-credit is available to these people as well as to encourage involvement of female members of the family to assist in increasing household's well-being. In addition, AIM also needs to not only provide general trainings to its members to acquire skills needed to operate a business, but it should also offer specific and specialized trainings on skills required to run specific businesses especially if these businesses are proven to generate high income to its members. Furthermore, what other countries could learn from the findings is that the microfinance program objective to eradicate poverty level could be successful if it has full support from the government and more opportunities given to women to involve in small business similar to men.

The present study, however, encounters several limitations which probably could be addressed by future research. One, the data used are only collected from two states while AIM branches are also existed in other states of the country. Two, comparing the successful of several microfinance program is rather interesting rather than only focus on one program eventhough AIM is the earliest and the biggest program at present. Finally, more empirical techniques of analysis can be conducted on data collected beyond the one existed in this study to obtain better results such as logit regression, structural equation modeling and others.

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