

## Impact of microcredit on women borrower's quality of life in Bahawalpur, Pakistan

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### ABSTRACT

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Micro credit has been widely recognized in the recent development literature to have positive consequences of societal economic development. However, most studies examine the impact of micro credit on some narrow indicators of well-being such as income, poverty, education and health. While these indicators do measure and represent the standard of living of the society, and are important development objectives, they focus only on the material aspect of well-being. Therefore, it does not really shed light on whether micro credit is associated with quality of life which is the subjective aspect of economic development. This gives rise to the question on whether micro credit also leads to better quality of life. This paper attempts to answer this question by encompassing the investigation not only on the impact of micro credit and its domains loan duration, training and loan size on income, but also on quality of life. The Multinomial logit model analysis technique was used to make empirical evidence to show the association between microcredit and quality of life. The cross sectional primary data that were obtained from a survey questionnaire of 400 women borrowers of the three microcredit provided banks, namely Khushhali bank, Tameer microfinance bank and NRSP-bank in Bahawalpur, Southern Punjab, Pakistan was used for the analysis. The results show that micro credit and its three domains loan duration, training and loan size have an important impact on household income as well as on quality of life. These findings indicate that micro credit is an essential investment to achieve good quality of life in particularly economically non-developed states.

#### Keywords:

Micro credit, Loan duration, Training,  
Loan size, Quality of life, Pakistan

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## 1. Introduction

Microcredit, which generally recognized as a method to improve poor people condition. It supports poor to come out of poverty by taking small loans for small scale income generating activities [1]. The Asian Development Bank [2] states microcredit as financial services such as loans,

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deposits, payment services, money transfer, and insurance to poor and hardcore poor households and their micro-enterprises. Indeed, microcredit has been proposed as one of the potential causes that might elucidate why progress accelerate across states or communities through it. All over the world, the underprivileged are excluded from the clientele of financial institutions. They either have partial, restricted access or completely restricted access in developing countries. In the absence of financial excess, the poor people resort to informal financial arrangements, which at times render them in a vicious cycle of poverty. Last two decades have seen the rise of financial institutions, both government and private, in the formal as well as the informal sector. Microcredit encompasses both these formal and informal arrangements [3].

The stream in financial services indicates momentous growth in the sector. It changes all the previous concept of the usage of financial services by the poor people. It broke all the perceptions about the poor not being trustworthy of repayment. It has generated a variety of giving the microcredit that exhibits the trustworthiness and capability of the poor to generate and return the loans and mobilize the money through the economy [4].

There are 723 microfinance providers reported in 2009 that have 190 million clients among which 74% were women users [5]. Microfinance services predominantly target women borrowers. The reason is that not just because women are the poorer of the two genders, but as the evidence suggests they are more credit-worthy in loan repayment as compared to men. However, another reason is that as mothers, women mostly use their improved income toward household and child welfare [6]. Microfinance services help women to rise from poverty more than their male counterparts [7].

Furthermore, it is an approach to facilitate women and ensuring a stable population level who are the poorest citizens in a country. Similarly, women comprise 2/3 of the poorest citizens in each country of the world, according to the 1997 United Nations Development Report [8]. Population growth will be lower down by supporting women's efforts to achieve economic self-sufficiency. Unfortunately, it's a very crucial reality that Pakistan ranks third on the list of the most dangerous countries for the women in their survival in the whole world, while Afghanistan has first and Congo has second ranked respectively [9]. Especially in Pakistan women are struggling daily for their basic rights, self-recognition & respect; even nearly 1,000 women are killed in 2011 at the name of "Honor" if they raised their voice [10]. Women participation in economic activities is a status, reducing rather than a status enhancing activity in Pakistan. As it has never been considered as a valued activity [11].

There are social constraints on economic activity and mobility of women in a patriarchal society like Pakistan [12]. Thus, these researchers demonstrate that microcredit contributes in the highest standard of living, which is definitely a significant development objective especially for women. However, it would be realized that development is not solely referred to the material or physical aspects of life<sup>2</sup>, but it is also emphasizes on quality of life. On the other hand the query is what establishes a good quality of life? However the main challenge of the underdeveloped countries has to face poorer quality of life regarding women that's why the economic development of such countries are still question marks as compare with the developed countries. As a result the need to address the concerns of women in international development has been well publicized since the United Nation's Women's Year (1975) and the following Decade for Women (1976-85). It was shown that women and children are the most vulnerable to the adverse consequence of the diversion of

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<sup>2</sup> Here the term Quality of life is used interchangeable with subjective well-being [45]. Subjective Well-Being is a scientific concept rather than a specific measure of well-being, and that it contains affective components i.e. mood and emotions like joy, satisfaction of life, happiness or depression as well as cognitive evaluations of quality of life (see e.g. [77]).

resources from health and education and withdrawal of subsidies for food, medical care and education [13].

Another study by Goulet, [14] might be a helpful perspective in the development of the inner meaning of quality life which comprises the three fundamental standards, which are sustenance, self-esteem and freedom. Although the first basic value is related to having the basic human needs such as food, shelter, education and health, the other two are subjective in nature with a sense of worth and self-respect, and having full control over oneself.

Each nation is focusing for its economic development by using the indicating ladder of quality of life. Human experiences have been commonly expressed in terms of quality of life. Quality of life is meant to the extent to which individuals of group's perceived satisfaction or dissatisfaction in various life domains to represent either how well human needs are met. In this concern several programs have been developed to deal with this situation such as the United Nations Development Program (UNDP) and International Financial Institutions (IFIs) particularly the World Bank and United Nations focused on the millennium development goal that have elevated poverty alleviation to the policy forefront [15]. In this regard that micro credit and its three domains loan duration, training and loan size play a significant role in the development of poor women's quality of life.

### *1.1. The conceptual framework*

The concept of quality of life was conceived as a distinct option for the more problematic idea of material welfare in the wealthiest society and was viewed the new, multidimensional and a great deal more mind stunning goal of societal development. Consequently, the quality of life is influenced by the degree of independence, the social relationship with the environment an individual's physical and mental health and other factors [16]. Traditionally, females are financially dependent on males. Often women are more vulnerable members of society and therefore have been marginalized. Most of the underdeveloped and developing countries have male dominant societies that impose various boundaries on females. They neither travel, outdoors nor are allowed to have social contact with male individuals of the community. When females have their own income, psychologically, they feel powerful because of Independence and this leads them towards good quality of life [17,18].

Pakistan has got the majority of its residents living in rural areas. Southern Punjab is especially known by its conservative culture where women are not given their due human rights, low quality of life and are only known as the carriers of male honor [19]. The rights of a woman are subjugated to male rights [20]. The people of Pakistan are ardent followers of the patriarchal system. The foremost social training of parents is to serve and obey men in every matter, whether it's about domestic responsibilities or serious issues of life like the selection of a spouse and even number of off springs to be born are the decisions taken by the heads of the family [21].

The condition of women is different in context to different areas of the world. Among developed countries the status of women is changed as compared to underdeveloped countries. In numerous underdeveloped countries such as Pakistan, India, Bangladesh and Sri Lanka largely women don't have the way to contribute and they require cheap advance to gain a respectable employment. To meet these necessities various approaches have been made at distinctive means, e.g. individual projects were set up and credit surety plans were presented, but they contributed nothing to the persevering monetary improvement of women and increasing their quality of life [22].

International Labor Organization [23], widely focused that microcredit have an impact on women's livelihood. it leads to higher income that help women to better perform their reproductive role as brokers of the health, nutritional, and educational status of other household members. It increases women's employment in micro enterprises and in improving the productivity of women's

income-generating activities and enhancing their quality of life. It also enhances status within the family as independent producers and providers of valuable cash resources to the household economy. These evidences come from empirical findings of Asia [24-37] have shown the significant, positive effect and dynamic role of microcredit on quality of life has not being denied especially in the developing countries regarding women.

## 2. Data and Method

### 2.1. The Data

The data used in this study are primary data gathered through a survey questionnaire carried out 1<sup>st</sup> May-July 31<sup>st</sup> 2016 in Bahawalpur, Southern Punjab, Pakistan. The three quarters of the total area of the district Bahawalpur was taken an area of study. The research area was divided in two parts, namely Bahawalpur City (Urban) and Bahawalpur Sadar (Rural). The total population of Bahawalpur is about 4,074,960. The sample of the study consists of 400 women borrowers of three microcredit provided institutes, namely Khushahli Microfinance Bank, Tameer Microfinance Bank and National Rural Support Bank (NRSP-Bank) respectively, a simple random sampling method was used for the selection of the sample of the study.

### 2.2. Measures of Microcredit

There is a lack of correspondence, in the literature on what establishes microcredit. Actually, there is also a discrepancy on how microcredit ought to be measured. On the other hand, in the current study microcredit is viewed to constitute three dimensions or components which further contains three items (Table 1) to measure the microcredit of women borrowers. These three dimensions of microcredit are: i) loan size ([38-40]) loan duration ([41,42] and iii) loan training ([43] used from the previous researches respectively.

**Table 1**  
Microcredit Dimensions and Related Indicators

Dimensions of Microcredit	Items
Microcredit	i. Loan size
	ii. Loan Duration
	iii. Training

The general microcredit profile of the women borrowers is obtained through a single item measure. Every women respondents are asked to assess her overall state to use of microcredit by using, Likert scale, ranging from 1 to 5. In the measurement scale of the Loan size (LS) or amount is 1 = (5000-10,000), 2 = (10,000-15,000), 3 = (15,000-20,000), 4 = (20,000-25,000), 5 = (25,000-more). While to the measurement scale of the Loan duration (LD) is 1 = 1-12 months, 2= 12-24 months, 3= 24-36 months, 4= 36-48 months, 5= 48- more. Lastly, to measure the scale of Training (T) 1= 1 day, 2= 2 days, 3= 3 days, 4 = 4 days and 5= not at all respectively.

### 2.3. Measures of Quality of Life

Whereas the quality of life investigated by [44-50]; ILO [51] they have discovered that quality of life is influenced by many factors and conditions like accommodation, employment, income, material welfare, moral attitudes, personal and the familial life, social support, stress and crisis, health-related quality of life, health services, working conditions, nourishment, education opportunities, ecological

factors and others. In this study After reviewing the earlier studies, this study is able to select the four domains of quality of life which contains 20 items (Table 2) to measure the women borrower's quality of life. These four dimensions are i) Health Life Improvement. It covers further four aspects of human health such as; by purchase of food items (grocery, fruits and clothing), intake of food items (milk, meat and fruits), purchase medicine by recommended doctor, and ability to cope with work-related stress. ii) Economic life Improvement. Under this heading it covers following components such as; ability to pay utility bills of house rent and transport cost, dealing with business related matters, participation income generating actives and personal savings. iii) Familial Life Improvement. It consists of following elements these are; ability to manage spousal relations, command respect in the family, ability to give quality time to your family and ability to visit friends and relatives. iv) Household Life Improvement. It contains the following items; number of rooms, toilet facility, availability of drinking water, electricity connection, own consumer durables and HH assets, home appliances, media resources, communication resources and vehicle.

**Table2**  
 Dimensions of Quality of Life and the Related Indicators

Dimensions of Quality of Life	Items
Health Life Improvement	i. food items (grocery, fruits and clothing)
	ii. intake of food items (milk, meat and fruits)
	iii. purchase medicine by recommended doctor
	iv. ability to cope with work-related stress
Economic life Improvement	i. ability to pay utility bills (house rent and transport cost)
	ii. dealing with business related matters
	iii. participation income generating actives
	iv. personal savings
Familial Life Improvement	i. ability to manage spousal relations
	ii. command respect in family
	iii. ability to give quality time to your family
	iv. ability to visit friends and relatives
Household Life Improvement	i. number of rooms
	ii. toilet facility
	iii. availability of drinking water
	iv. home Appliances
	v. electricity connection
	vi. Vehicle
	vii. own consumer durables and HH assets
viii. Media & Communication resources	

In addition to deriving quality of life of women borrowers through the calculation of QOL as above, information with regards to the overall state of quality of life of the women borrowers is obtained through a single item measure. Each of the women respondents is asked to assess her overall state of quality of life using a Likert scale, ranging "1" for worse, "2" for same, "3" for improved.

Hence the Table 3 below, shows the mean score for each dimension of quality of life. Of the four dimensions the last domain, Household Life Improvement has been accounted as a subjective measure of the quality of life to evaluate the state of household quality of life of women borrowers in subjective manners such as number of rooms is 1=1 room, 2=2-3 rooms and 3= 4-5 rooms. Toilet facility is 1= No Toilet, 2= Toilet without Flush and 3= Toilet with Flush. Availability of drinking water is 1= Tap water, 2 = Hand Pump and 3= Machine Pump. Electrical connection is measured as 1 = No connection, 2= Temporarily connection and 3 = Full connection. Own consumer durables and HH

assets are measured by 1 = Fan, 2 = Air cooler and 3 = Air conditioner. Whereas home Appliances is measured 1 = Refrigerator, 2 = Sewing Machine and 3 = Washing Machine. Use of media resources is measured as 1 = Radio, 2 = TV and 3 = Personal Computer. While communication resources is measured as 1 = Land Line, 2 = Mobile and 3 = Use Public call office. Use of vehicle is measured as 1 = Bicycle, 2 = Motorcycle, and 3= Car respectively. The mean score of quality of life is under below Table 3.

**Table3**  
 Mean Score of Quality of Life

Dimensions of Quality of Life	Mean Score
Health Life Improvement	2.2275
Economic life Improvement	2.465
Familial Life Improvement	2.2125
Household Life Improvement	1.9225
Individual assessment of their overall quality of life	1.97

Source: "Survey, 2016 computed using STATA Version 13"

#### 2.4. Multinomial logit model analysis

In this paper, after studying the previous researches and theoretical framework, this study has selected the dependent and independent variables to design the empirical model of this research. Besides the variables microcredit and its three domains as one of the independent variables, we include other factors as control variables. Details are given below:

Model  $QOL_i$  include microcredit and its three domains or dimensions Loan Duration, Training and Loan size respectively in Eq. 1.

$$QOL_i = \beta_0 + \beta_1 LD_i + \beta_2 T_i + \beta_3 LS_i + \beta_4 Age_i + \beta_5 Edu_i + \beta_6 FSize_i + \beta_7 MS_i + \beta_8 PAI_i + e_i \dots \quad (1)$$

As the women's borrower quality of life is a qualitative variable, the study used the Multinomial Logit and Probit Model to measure the impact of microcredit on women's borrower's quality of life. The STATA has used for analysis. In the light of the model, to analyze the impact of impact of microcredit on women's borrower's quality of life, women borrower's Health Life Improvement, Economic life Improvement, Familial Life Improvement and Household Life Improvement as dependent variable while age, education, family size, personal annual income, marital status and use of microcredit, its loan duration, training and loan size are taken as as independent variables.  $QOL_i$  is measured into three categories "1", "2" and "3". Whereas age, education, family size, personal annual income and marital status are measured in numeric values (numbers) and these values has transformed into scale 1 to 5.

As shown above, the women's borrower quality of life, which is the dependent variable in the Eq. 1, is tabulated from overall discrete evaluation on several domains of quality of life. Whereas the household characteristics includes demographic variables of the head of the household, such as age, education, family size, personal annual income and marital status in Table 4. So as to validate the findings in Eq. 1, a single item measure of quality of life as the dependent variable is used to re-estimate the equation. The assessment in this research is the Multinomial Logit Model (MNL). The results of the estimation are discussed in the following section.

**Table 4**  
 Summary Statistics of the Variables

Variables	Min	Max	Mean	Std. Dev
Overall quality of life	1	3	1.97	.6082969
Loan Duration	1	4	2.385	.6226912
Training	1	5	2.755	.9038902
Loan size	3	5	4.335	.7169799
Age	1	5	2.76	1.138261
Education	1	5	2.46	1.049358
Family Size	2	4	3.11	.6394703
Marital Status	1	5	2.7575	1.066084
Personal Annual Income	1	5	3.405	1.097262

Source: "Survey, 2016 computed using STATA Version 13"

### 3. The Results

#### 3.1. Empirical Results of Multinomial Logit Model Estimation

**Table 5**  
 Results of Multinomial Logit Estimation (Full Sample)

Model 1 Independent Variables	Dependent Variables					
	Worsen Relative to Improved QOL 1			Same Relative to Improved QOL 2		
	Coefficient	Std. Error	Z	Coefficient	Std. Error	z
Loan Duration	-1.575***	0.363	-4.33	-0.0986	0.235	-0.42
Training	-0.296	0.218	-1.36	-0.043	0.179	-0.25
Loan size	-2.005***	0.324	-6.18	-1.233***	0.278	-4.43
Age	-0.0447	0.2580	-0.17	0.9149	0.2194	0.42
Education	0.5236***	0.2577	2.03	0.27944	0.1790	1.56
Family Size	-0.1258	0.3455	-0.36	-0.2306	0.2755	-0.84
Marital Status	-0.3398	0.2551	-1.33	-0.3224	0.1980	-1.63
Personal Annual Income	-1.2745***	0.2572	-4.96	-0.7058***	0.1815	-3.89
LR $\chi^2$ (6)	67.45		Log likelihood	-331.95804	Number of obs	400
Prob > $\chi^2$	0.0000		Pseudo R <sup>2</sup>	0.0922		

Source: "Survey, 2016 computed using STATA Version 13"

Note: Coefficient \*\*\* is significant at the 1% ( $p < 0.01$ ), \*\* is significant at the 5% ( $p < 0.05$ ) and \* is significant at the 10% ( $p < 0.10$ ) level, respectively. Improved is the base outcome (3).

The microcredit loan profile haven listed in Table 5. The p-value for Pearson's Chi-square tests indicates an association between women borrower's respondents with the loan duration, training and loan size ( $p$ -value = 0.000 < 0.005). The interpretation of results in both cases, worsen relative to improve and same relative to improve quality of life, the predictor variables, the logit of outcome relative to the referent group are as follows.

The empirical results of the multinomial logistic regression are presented in Table 5 of the Eq. 1. It is found that the variation in loan duration, training and loan size are significant at 1% ( $p < 0.01$ ) in explaining the variation in quality of life of women borrower's. These variables have the accurate, predictable signs. While other variables in which education and personal annual income are significant, whereas age, family size, and marital status are insignificant. The results therefore confirm in loan duration (LD) the outcomes of earlier researches, i.e. microcredit guides to improve the quality of life of the poor women borrower's. This finding is consistent with prior studies that also

reported a positive influence of the loan duration (LD) on borrowers such as [52-54]. On the other hand, it is in contrast to study of ([55] which reported that loan duration has negative, but significant influence on borrower's worsen quality of life, while positive but not significant effect on the borrower's same quality of life.

Similarly, in the case of Training (T), the findings support other researcher such as ([56-68] that training and monthly meetings with loan officers and skill and development provision by the microcredit provider yield improved and significantly positive effect on quality of life in women users. Whereas ([69]) have found negative and significant relationship (in relation to their business/project activity) has a higher probability to default to those borrowers who had some training. Which means that provision of training and advice together with the loan by the same organization positively affects loan repayment also to improvements in borrower's skill which leads to better quality of life.

Likewise, with respect to loan size (LS), the more the loan size (LS), the less likely to same quality of life than to improve, based on negative parameter establish, found to be significant at 1% ( $p < 0.01$ ). Hence the higher the loan size the better the quality of life of women borrowers. Hence when a woman is a manipulator of microcredit, she is supposed to be experienced and wiser than the women who are not avail the microcredit. Therefore microcredit is a kind of financial service that can be a source of financing since microcredit targets women. The results of the present research are alike [70-73]. As a result, this research established enough evidence to reject the null hypothesis which hypothesize that there is no relationship between loan duration (LD), training (T), loan size (LS) and women's quality of life.

### 3.2. Impact of Marginal Effect

Table 6 shows the estimation results in impact of change in the explanatory variable on women's borrowers quality of life. Marginal effect also complementary to the multinomial logit regression estimates as it relates the impact of each explanatory variable on the predicted outcome probabilities of choice and rate of increase and decrease. For categorical variables with more than two discrete choices, the marginal effect reveals the difference in predicted probabilities for each comparison category relative to the base category as [74].

**Loan Duration (LD)**- In the Table 6, the results indicate that the higher the marginal effect of the loan duration, that if it increases by one unit, then the probability of worsen quality of life relative to improve quality of life will decrease by 21.2 % percent, *ceteris paribus*. However, if a loan duration is increased by one unit, the probability of the same quality of life relative to improve quality of life will rise by 16.4% percent though holding all other variables in the model constant. Whereas, the marginal effect of the loan duration of the probability of improving quality of will rises 47.8% percent *ceteris paribus*.

**Training (T)** - Training (T) which was only significant that if it increases by one unit, then the probability of worsen quality of life relative to improve quality of life will decrease by 37 % percent, however holding all other variables in the model constant. On the other hand, if training (T) increases by one unit, then the probability same quality of life relative to improve quality of life will increase by 25.5 2 % percent, *ceteris paribus*. Similarly, the marginal effect of the training of the probability of improving quality of will rises 11.4 % percent *ceteris paribus*.

**Table 6**  
 Marginal Effect of the MNLM (Full Sample)

Model 1 Independent Variables	Dependent Variables					
	Worsen QOL		Same QOL		Improved QOL	
	1		2		3	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
<b>Loan Duration</b>	-0.212***	0.383	0.164***	0.0418	0.478*	0.0284
<b>Training</b>	-0.037*	0.021	0.025	0.027	0.0114	0.0213
<b>Loan size</b>	-0.139***	0.026	-0.292	0.0336	0.168***	0.027
<b>Age</b>	-0.01693	0.2425	0.0251	0.0321	-0.0081	0.0276
<b>Education</b>	0.0417	0.0289	0.0001	0.0319	-0.0418*	0.0226
<b>Family Size</b>	0.0089	0.0359	-0.0356	0.0440	0.0267	0.0340
<b>Marital Status</b>	-0.0107	0.0267	-0.0308	0.0322	0.0415	0.0253
<b>Personal Annual Income</b>	-0.0985***	0.0260	-0.0059	0.02855	0.1045***	0.0217

Source: "Survey, 2016 computed using STATA Version 13".

Note: Coefficient \*\*\* is significant at the 1% ( $p < 0.01$ ), \*\* is significant at the 5% ( $p < 0.05$ ) and \* is significant at the 10% ( $p < 0.10$ ) level, respectively. Improved QOL is the base outcome (3).

**Loan Size (LS)**- The results show that the higher the marginal effect of the loan size, that if it increases by one unit, then the probability of worsen quality of life relative to improve quality of life will decrease by 13.9 % percent, still holding all other variables in the model constant. Likewise, if loan size is increased by one unit, the probability of the same quality of life relative to improve quality of life will fall by 29 % percent ceteris paribus. Conversely, the marginal effect of the loan size of the probability of improving quality of will rises 16.8% percent, even though holding all other variables in the model constant.

**Age (AGE)** - In the Table 6, the results indicate that the higher the marginal effect of the Age (AGE) that if it increases by one unit, then the probability of quality of life of the worsen group of relative to improve quality of life will decrease by 0.01 % percent, ceteris paribus. However Age (AGE) is increased by one unit, the probability of the same quality of life relative to improve quality of life will rise by 0.02% percent though holding all other variables in the model constant. Whereas, the marginal effect of the Age (AGE) of the probability of quality of life of the group to improve will decrease 0.008% even though holding all other variables in the model constant.

**Education (EDU)** - The results indicate that the higher the marginal effect of the Education (EDU) that if it increases by one unit, then the probability of quality of life of the worsen group of relative to improve quality of life will increase by 0.04 % percent, ceteris paribus. However Education (EDU) is increased by one unit, the probability of the same quality of life relative to improve quality of life will rise by 0.0001% percent though holding all other variables in the model constant. Whereas, the marginal effect of the Education (EDU) of the probability of quality of life of the group to improve will decrease 0.04% percent and significant at 10% ceteris paribus.

**Family Size (FS)** - The results indicate that the higher the marginal effect of the Family Size (FS) that if it increases by one unit, then the probability of quality of life of the worsen group of relative to improve quality of life will increase by 0.008 % percent, ceteris paribus. However Family Size (FS) is increased by one unit, the probability of the same quality of life relative to improve quality of life will fall by 0.03% percent though holding all other variables in the model constant. Whereas, the marginal effect of the Family Size (FS) of the probability of quality of life of the group to improve will increase by 0.02% percent ceteris paribus.

**Marital Status (MS)** - The results indicate that the higher the marginal effect of the Marital Status (MS) that if it increases by one unit, then the probability of quality of life of the worsen group of relative to improve quality of life will decrease by 0.01 % percent, ceteris paribus. However Family Size (FS) is increased by one unit, the probability of the same quality of life relative to improve quality of life will fall by 0.03% percent though holding all other variables in the model constant. Whereas, the marginal effect of the Family Size (FS) of the probability of quality of life of the group to improve will increase by 0.04% percent even though holding all other variables in the model constant.

**Personal Annual Income (PAI)** - The results indicate that the higher the marginal effect of the Personal Annual Income (PAI) that if it increases by one unit, then the probability of quality of life of the worsen group of relative to improve quality of life will decrease by 0.09 % percent, ceteris paribus. However Personal Annual Income (PAI) is increased by one unit, the probability of the same quality of life relative to improve quality of life will fall by 0.005% percent though holding all other variables in the model constant. Whereas, the marginal effect of the Family Size (FS) of the probability of quality of life of the group to improve will increase by 0.1% percent and found to be significant at the 1% level ( $p < 0.01$ ) ceteris paribus.

### 3.3. Multinomial Probit Model

It is necessary to assess the model for the robustness of its key findings. Thus, it is expected that the main conclusions as derived from the signs and significance level of key variable(s) should hold even when the variables are subjected to different model specification. Therefore, an alternative measure of quality of life is employed for robustness check. In the results estimation of the multinomial logit model that women borrower's who got microcredit have improved their quality of life. To verify the results are robust, it also estimated by using the multinomial probit model. Table 7 shows that overall the model is statistically significant as the  $\text{Prob} > \chi^2 = 0.0000$ .

**Table 7**  
 Results of Multinomial Probit Estimation or Robustness check

Model 2 Independent Variables	Dependent Variables					
	Worsen Relative QOL to Improved QOL 1			Same QOL Relative to Improved QOL 2		
	Coefficient	Std. Error	z	Coefficient	Std. Error	z
Loan Duration	-0.965***	0.248	-3.87	0.0645	0.184	0.35
Training	-0.212	0.157	-1.35	-0.039	0.139	-0.28
Loan Size	-1.388	0.219	-6.32	-0.844***	0.195	-4.38
Age	-0.0228	0.1857	0.12	0.1115	0.1639	0.68
Education	0.4348**	0.1832	2.37	0.2583**	0.1342	1.92
Family Size	-0.0498	0.2419	-0.21	-0.1404	0.2032	-0.69
Marital Status	-0.2268	0.1890	-1.20	-0.2517*	0.1527	-1.65
Personal Annual Income	-0.9666***	0.1958	-4.94	-0.5484***	0.1396	-3.93

Source: "Survey, 2016 computed using STATA Version 13".

Note: Coefficient \*\*\* is significant at the 1% ( $p < 0.01$ ), \*\* is significant at the 5% ( $p < 0.05$ ) and \* is significant at the 10% ( $p < 0.10$ ) level, respectively. Improved QOL is the base outcome (3).

**Loan Duration (LD)**- The results shown in Table 7, in the case of worsen quality of life relative to improve quality of life, the coefficient Loan Duration (LD) is negative and significant at 1% percent indicating that longer the loan duration affects to decrease the worsen quality of life of the women borrower's. However, there is a slight difference in the same quality of life relative to improve quality of life, the coefficient of the Loan Duration (LD) variable is positive but not significant.

**Training (T)**- In the estimated results of both cases worsen quality of life relative to improve quality of life and the same quality of life relative to improve quality of life the coefficient of Training (T) is negative but not significant indicating that as longer the Training days the lesser the worsen or same quality of life.

**Loan Size (LS)**- An assessment of the variable loan size (LS) the coefficient is found to be negative and significant, indicating as increase the loan size the decrease in the worsen quality of life relative to improve quality of life and the same quality of life relative to improve quality of life. Hence the results indicate that all the results are consistent with the results of the multinomial logit model.

**Age (AGE)** – The estimated result of the variable Age (AGE) the coefficient is found to be negative and insignificant in the case of worsen quality of life relative to improve quality of life. Whereas the coefficient of Age (AGE) is found to be positive, but insignificant in the case of same quality of life relative to improve quality of life, indicating that as more the Age (AGE) the more same quality of life relative to improve. Hence the results indicate that all the results are consistent with the results of the multinomial logit model.

**Education (EDU)** - In the estimated results of the variable Education (EDU), for quality of life of women borrowers in Education (EDU), is lesser for worsen quality of life and for the same quality of life as compare to base category improve quality of life. It means that the more the Education (EDU), the more likely to quality of life to improve, based on positive parameter establish. Hence the more the Education (EDU), the better the quality of life of women borrowers. This is simply because, the comparative analysis exists on categories to improve quality of life as a base, is found to be positive and significant. Henceforth the results point out that all the results are reliable with the results of the multinomial logit model.

**Family Size (FS)** - In the estimated results of both cases worsen quality of life relative to improve quality of life and the same quality of life relative to improve quality of life the coefficient of Family Size (FS) is negative and insignificant, indicating that as more the Family Size (FS) the lesser the worsen or same quality of life relative to improve. Henceforth the results point out that all the results are reliable with the results of the multinomial logit model.

**Marital Status (MS)** - In the estimated results of both cases worsen quality of life relative to improve quality of life and the same quality of life relative to improve quality of life the coefficient of Marital Status (MS) is negative and significant, indicating that as more the Marital Status (MS) the lesser the worsen or same quality of life relative to improve. Accordingly, the results point out that all the results are consistent with the results of the multinomial logit model.

**Personal Annual Income (PAI)** - In the estimated results of both cases worsen quality of life relative to improve quality of life and the same quality of life relative to improve quality of life the coefficient of Personal Annual Income (PAI) is negative and significant, indicating that as more the Personal Annual Income (PAI) the lesser the worsen or same quality of life relative to improve. In view of that, the results highlighted that all the results are consistent with the results of the multinomial logit model.

#### 4. Conclusion

Previously, economist and strategy makers have been highlighted on the accretion of physical and human resources as a tool for accomplishing development goals for instance to raise income and improve health and education level of the poor women. Though these two forms of resources are essential, ignoring microcredit could lead to letdown of attaining the full prospects of development and quality of life. This study endorses the results in the past studies microcredit does matter to increase material well-being (income) i.e. the quality of life of poor women. Based on the results, this

research concluded that micro credit and its three domains loan duration, training and loan size have played a significant role in the borrower's quality of life. In future government and non-government agencies can increase women's borrowers quality of life through promoting the microfinance institutions.

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