

## Migration, Credit and Household Consumption Expenses: An Analysis with HIES 2010 Data

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**Abstract:** Using the data on 12,240 households as sample collected from Household Income and Expenditure Survey (HIES) 2010 and adopting **Two-stage Least Square (2SLS) regression approach** using Propensity Score Model tool as one of the regressors to estimate average treatment effects of treated, this article attempts to examine the effects of migration and credits on consumption expenditures by households in Bangladesh separately as well as jointly while all kind of consumption expenditures are divided into major eight categories. While trying to compare the life standards in respect to per capita consumption expenditures on different items in between different groups on the basis of whether these groups have migrating members or not and have undertaken any form of credit or not, the regression results found that controlling propensity score, households taking credits expend more on all eight categories of consumption items by significant amount than households without credits and households having at least one migrant also expend more on all categories of consumption items than their contemporary other households having no migrant. But the simultaneous impact of migration and credits on consumption is negative, an interesting result revealing the fact that the households who used credit to bear the migration cost cut their consumption since most of the migrant didn't start to send remittances during the study period or remittances sent by those migrants are either very poor at initial stage or maximum amount of it is used to repay the credits. As a result the joint impact of migration and credits on consumption expenditure is found to be negative or at minimal level. Finally, it can be concluded that the findings of the study strengthen the case for remittances and credits as a poverty alleviating policy tool by improving human capital development through increasing expenditure on food & nutrition, health & education, housing & other consumption items and suggest that utmost importance should be given in the proper management of remittances and credits in order to accrue their beneficiary impacts.

**Keywords:** Household Consumption Expenses, Credits, Migration, Remittances, Propensity Score Matching (PSM) Analysis, Regression Model Analysis.

### Introduction

The debate over the topic on “Whether micro-credit/credit is welfare increasing or not?” is still going on its way, even today. Since welfare is non-quantifiable, level of

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consumption or the consumption expenditure can be treated as a probable proxy for welfare. This is same whether we consider in the individual level or the national level. Although in national level the use of real GDP per capita is a popular approach to represent economic wellbeing of a country, welfare is more related to consumption per capita rather than GDP per capita. In micro level consumption expenditure of a household reveal the standard of living of that household. Holding all other things same, a household with higher consumption expenditures maintains higher standard of living as compare to another household with lower consumption expenditures. For a given household, consumption expenditures of that household depends largely on the endowment position of that household, the net change in the available resource position and on some other determinants (no of household members, some demographic factors etc.). In order to maximize welfare from consumption most literatures focus on the life cycle & permanent income hypothesis with explanation of consumption smoothing.

Two relevant things for Bangladesh that can largely affect the consumption expenditures at household level are credits (including microcredit) and remittances. In case of judging the effects of monetary policy the demand for money is heavily influenced by the cost and availability of credit. Moreover, the credit sector has recently emerged as one of the largely expanding sector in Bangladesh. Therefore credits may act as a determinant in case of consumption pattern for the households. Credits may leave different effects through different chains. Besides, in Bangladesh remittances can be used for consumption and investment which further stimulates demand for goods and services, as well as contribute to financial development. Remittances have already developed the purchasing power of the households with migrants and therefore ensured higher consumption level as compare to other homogeneous households with non-migrants. Many literatures have already been developed to explain the effects of changes in these determinants on welfare position of the household.

The present paper deals with effect of migration and credit on consumption for households. Here we have attempted to establish a link among the terms consumption, credit and migration and to see whether credits and remittances play some sort of role in raising consumption expenditure at some point of time and if yes how much.

### **Relevant Literature Review**

The main focus of this article is on the effects of household credits and remittances/migration on consumption patterns of households. So this research relates closely to the literature on household credits, remittances and consumption. There has been much researches already conducted on those issues. For example, Keynes (1936) postulated the Keynes psychological law, also known as the "Absolute Income

Hypothesis (AIH)", which implies that current consumption expenditure is a function of current disposable income and as income increases, consumption expenditure increases but at a decreasing rate. Duesenberry (1949) developed the "Relative Income Hypothesis (RIH)" focusing that the average propensity to consume (APC) of a family depends on the family's level of income relative to the income of the neighborhood. Friedman (1957) propounded the "Permanent Income Hypothesis (PIH)" with the message that consumption is a function of permanent income rather than current disposable income and transitory income or temporary unexpected income does not affect consumption. On the other hand, Ando and Modigliani (1963) in the "Life Cycle Hypothesis (LCH)" postulated that individuals plan their consumptions and savings over their entire life time. In this case, all resources available to the consumers are relevant to consumption decision. Many recent authors, studying a variety of research questions, have focused on household consumption - usually measured by expenditures devoted to a given bundle of consumption items (for example Cutler and Katz 1991, Krueger and Perri 2002).

However, there are some existing empirical evidences that suggest a link among migration, household accumulated credits known as debt and household consumptions. Angelucci (2011) shows that poor households' entitlement to an exogenous, temporary but guaranteed income stream increases US migration (from Mexico) of semi-skilled people even if this income is mainly consumed. Carroll, Dunn and McCarthy (1997) have studied the relationship between household debt growth and durable consumption and also found a significant positive relationship between these variables. Ludvigson (1999) finds that changes in total installment credit and revolving credit are significantly related to non-durable and service consumption growth. Maki (2000) finds that changes in consumer credit and delinquencies are positively related to consumption growth. There are some evidences that credit constraints might prevent poor agrarian households from smoothing consumption across years (Morduch (1995) and Rosenzweig and Wolpin (1993)). Ekici & Dunn (2010) shows that a one-thousand dollar increase in credit card debt results in a decrease in quarterly consumption growth of almost two percent.

Using macro-economic variables Jappelli and Pagano (1989) and Wilcox (1989) have provided empirical evidence which suggests that the excess sensitivity of consumption to current disposable income can be explained, to some extent, by credit constraints. Due to the fact that credit constraints are unobservable, a number of variables have been used as proxies: the rate of unemployment (Wilcox 1989), the ratio of current disposable income to previous consumption (Muellbauer 1983) and the total consumer credit to consumption ratio (Jappelli and Pagano 1989). Bacchetta and Gerlach (1997) generated a wedge between interest rates applied to lenders and borrowers and found that empirically the borrowing/lending wedge is a significant determinant of consumption in the United

States, Canada and Japan. Pitt and Khandker (2002) estimate the impact of participation, by gender, in the micro credit programs in Bangladesh on labor supply, schooling, household expenditure and assets using a quassi-experimental survey design to correct for the bias from unobserved individual and village-level heterogeneity. The study found that credit has a larger effect on the behavior of poor households in Bangladesh when women are the program participants. Using longitudinal data, Khandker (2005) found that access to microfinance contributes to poverty reduction, especially for female participants, and to overall poverty reduction at the village level.

Taylor and Mora (2006) find that Mexican households with international migrants have relatively large marginal budget shares for investments, health, and consumer durables and relatively small marginal budget shares for food and housing. Raihan et. al. (2009) examines the impacts of international remittances on household consumption expenditure and poverty in Bangladesh using computable general equilibrium modeling of the Bangladesh economy and micro econometric analysis at the household level. The study estimates that 1.7 out of the 9 percentage point reduction in the headcount ratio during 2000–2005 was due to the growth in remittances. Raihan (2010) explores that remittance plays a very important role in regard to household well being measured by consumption level and their poverty incidence. A similar study on the impacts of migration and remittances has been conducted by Mamun et al. (2010). A study by Hassan et. al. (2010) shows that the impact of inward remittances flows on per capita GDP growth in Bangladesh during 1974-2006 is negative at first but becomes positive at a later stage- a strong evidence of a non-linear relationship.

As mentioned above, there has been much empirical works within and outside Bangladesh to look into the impacts of those remittance and credit on the welfare position of households. This current study will add value to the existing literature in several ways. Some of the previous researches were confined only in estimating the effects of credits and/or remittances on consumption patterns and ignore many other aspects such as how credits and remittances affect the endowment position of the certain entity. In most cases the findings of previous researches are very much limited to estimate the effects of remittances or the effects of credits on consumption expenses separately or studied the sources of fluctuations of consumption due to changes in its determinants. But in many cases we observe a joint impact of these two determinants on our outcome variable. They never have attempted to put these things together. Lastly, Bangladesh has recently emerged as a newly developing country with an expanding credit market and increasing international migrants. The previously administered researches on that issue have never attempted to explore the story with HIES data. Here comes the rationale of the current study which is expected to minimize this gap to some extent.

## Objectives of the Study

The main objective of this study is to analyze the impact of credits and migration or remittances on the level of consumption expenditure of household by disaggregating all kinds of consumption expenditure into eight broad categories. Along with providing an overview of existing credits, migration and remittances scenario, we want to analyze the separate as well as simultaneous impact of credits and migration on each of the broad category of consumption expenditures. Therefore the study has been conducted to provide the answers of the following questions:

1. How does undertaking of Credits/Micro-credits affect the expenditure pattern of households?
2. How do migration/remittances affect the consumption pattern of households?
3. What types of consumption expenditures are affected due to undertaking credits and/or migrating abroad?
4. What happens for the above cases if we consider the almost homogeneous households into consideration?

## The Conceptual Framework

For analytical purposes, we need to explain some key terms such as - consumption and determinants of consumption, variations in consumption expenses and its determinants, credits and micro-credits, and migration and remittances.

Consumption of a good denotes full utilization of that good while consumption expenditure denotes the value of goods and services bought by people. Consumption can be classified as durable goods (such as cars and television sets), non-durable goods (such as food) and services (like restaurant expenditure). Consumption can also be divided according to the needs it satisfies. A commonly used classification identifies ten varieties of expenditure that are Food, Clothing and foot wear, Housing, Heating and energy, Health, Transport, House furniture and appliances, Communication, Culture and schooling, and Entertainment.

In addition to current income level, the level of price and demographic factors, other determinants that can raise the purchasing power of household are undertaking credits and grants, acquisition of assets etc. Accumulated savings in the past can be squeezed in case of necessity and give rise to a jump in consumption, similarly with what happens with **wealth increase**, due, for instance, to stock exchange boom or house prices boom.

The family debt amount depends on necessity and opportunities of consumer credit, depending in turn on interest rates and marketing strategies by banks and other consumer credit institutions can be boosted to fund consumption, while repayment functions in opposite direction. Expectations on future income, especially if concerning short-term credible events such as new employment perspectives, may also play an important role.

Variations in consumption expenses come from total current inflow of assets and total current outflow of assets. If credits and/or remittances are used for investment purpose which is defined as net change in capital, a change in undertaking of credits or receiving remittances can result in a change in asset holding. Since multiple items can result in inflow of assets we can have the total asset inflow for a given period of time as-

$$\text{Total inflow of Assets} = \sum_j \text{Asset Inflow from item } j; j= 1, 2, \dots, n.$$

And variation in inflow of assets = f (variations in different items of asset inflow)

If different items of asset inflow are independent from each other, all variance terms in the parenthesis will be added to generate the overall variation in asset inflow items, but if some items become inter-dependent then there might come some covariance/interaction terms along with the variance terms to generate the overall variation in asset inflow items.

A reduction in the level of available resources is called outflow of assets which is influenced by multiple items including consumption expenditure itself. Since our goal is to capture the effect of change in determinants of consumption on consumption expenses, we must separate out the consumption items from the asset outflow items. Then for a given period of time we have-

$$\text{Total outflow of Asset} = \sum_j \text{Asset Outflow for item } j; j= 1, 2, \dots, m \text{ except consumption items.}$$

And similarly, Variation in outflow of assets = f (variations in different determinants of asset outflow excepting the consumption items).

In order to generate the overall variation in asset outflow items, all variance terms in the parenthesis will be added up if the determinants are independent from each other, but if some determinants become inter-dependent then there might come some covariance/interaction terms along with the variance terms.

Credits encompass any form of deferred payments which allow one party to provide resources to another party where the second party does not reimburse the first party

immediately but instead arranges either to repay or return those resources (or other materials of equal value) at a later date. Credit may consist of money, goods or services (e.g. consumer credit) etc. Credit is extended by a creditor, also known as a lender, to a debtor, also known as a borrower. Loans taken by households from different sources are called household credits. These credits can be micro-credits or bank credits. Micro-credit is a special type of credit that requires no collateral and no legal instrument. In lending agreements, collateral is a borrower's pledge of specific property to a lender, to secure repayment of a loan. The collateral serves as protection for a lender against a borrower's default (borrower's failure to pay the principal and interest under the terms of a loan obligation). If a borrower does default on a loan (due to insolvency or any other event), the lender can seize the collateral to recoup its losses and thus the lender then becomes the owner of the collateral. Because collateral offers some security to the lender in case of borrower's failure to pay back the loan, loans that are secured by collateral typically have lower interest rates compare to unsecured loans. Micro-credits are small loans made to impoverished people, and due for repayment after a short period of time, normally a year or less. Such credits are granted to groups (particularly of women) where each group provides guarantees based on the solidarity of its members. Micro-credits in general are extended for the financing of micro productive activities such as farming, commerce, handicrafts, food, and so on.

Human migration is movement by humans from one place to another, sometimes over long distances and/or in large groups. Migration has continued under the form of both voluntary migration and involuntary migration within one's region, country, or beyond. People who migrate into a territory are called immigrants, while at the departure point they are called emigrants. The other place can be within the country or outside the country. Income earned from host country by migrant people and sent back to home country is called remittance.

### **The Recent Scenarios of Migration & Credits in Bangladesh**

Bangladesh is becoming a growing economy day by day and credit systems have already expanded in a large scale. The financial (credits and deposits) system of Bangladesh is comprised of three broad fragmented sectors- i) formal sector, ii) semi-formal sector and iii) informal sector. The sectors have been categorized in accordance with their degree of regulation. The formal sources of credits are State-owned Banks, Private Commercial Banks, Non-Bank Financial Institutions (FIs), Insurance Companies, Capital Market Intermediaries like Brokerage Houses, Merchant Banks etc. and Micro-Finance Institutions mostly of which are NGOs. The semi-formal sector includes those institutions which are regulated otherwise but do not fall under the jurisdiction of Central Bank,

Insurance Authority, Securities and Exchange Commission or any other enacted financial regulator. This sector is mainly represented by Specialized Financial Institutions like House Building Finance Corporation (HBFC), Palli Karma Sahayak Foundation (PKSF), Samabay Bank, Grameen Bank etc., Non-Governmental Organizations (NGOs) and discrete government programs. The informal sector includes private intermediaries which are unregulated. The informal sources behind the development of such credit systems are relatives, friends, neighbors and village capitalists. Banks are most important sources of short term working capital for businesses and have become increasingly active in recent years in making long-term business loans (Rose &Hudgins, 2005). In Bangladesh, in terms of both industry assets and deposits, private commercial banks command the greatest market share. While private commercial banks have been growing very rapidly, the sluggish growth of nationalized commercial banks and specialized (development) banks has adversely affected financial sector competitiveness. The recent permission to launch 8-10 new commercial banks is an indication of credit market expansion.

Microcredit, a special type of credit program in Bangladesh, is implemented by NGOs, Grameen Bank, state-owned commercial banks, private commercial banks, and specialized programs of some ministries of Bangladesh government. Loan amounts up to BDT 50,000 are generally considered as microcredit; loans above this amount are considered as microenterprise loans.

**Table-1: Basic Statistics of NGO-MFIs in Bangladesh (As of 30 June 2011)**

Particulars	June, 2008	June, 2009	June, 2010	June, 2011
No. of Licensed NGO-MFIs	293	419	516	576
No of Branches	15,077	16,851	17,252	18,066
No. of Employees	98,896	107,175	109,597	111,828
No. of Clients (Million)	23.45	24.85	25.28	26.08
Total borrowers (Million)	17.79	18.89	19.21	20.65
Loan Outstanding (Tk. million)	134,680.96	143,134.03	145,022.66	1,73,797.60
Amount of Savings (Tk. million)	47,386.19	50,610.04	51,362.93	63,304.44

Source: MRA-MIS Database-2011 ([www.mra.gov.bd](http://www.mra.gov.bd))



The table-1 contains overall microcredit scenario in Bangladesh and indicates a gradual expansion in that sector in terms of number of MFIs, number of branches and amount of outstanding loans and that expansion is sharp after mid of 2010.

Now let's turn our eyesight to another determinant of consumption which is labor migration. In recent years, labor migration is one of the major sources of income for over 9 million labor migrants and their families in Bangladesh. Recent statistics show that the number of Bangladeshi migrants to foreign countries have doubled in the past 20 years and a total 0.9 per cent of its total population (over 14, 00,000 people) have left the country in 2013 alone where 13.4 per cent of them were women. Net migration rate for Bangladesh is -0.52 migrant(s)/1,000 populations (2013 est.) (Source: CIA World Fact book). As results of these, Bangladesh got an amount of about USD 59,630 million as remittances in last 5 years (Source: Foreign Exchange Policy Department, Bangladesh Bank). These remittances are greatly contributing to raise the consumption expenditures of the households. Remittances—around USD 12 billion in Sep, 2013—contribute over 11% of GDP in Bangladesh and are one of the major single sources of foreign exchange. As a result we observe an upward shift in the level of consumption of the households having migrants.

**Table-2: International Migration of Workers and Remittances Flow**

Year	No. of Workers*	Percentage Changes	Remittances** (Million US \$)	Percentage changes
2004	272,958	-	3,563.31	-
2005	252,702	-7.42	4,249.87	19.27
2006	381,516	50.97	5,484.08	29.04
2007	832,609	118.24	6,562.71	19.67
2008	875,055	5.10	8,979.00	36.82
2009	475,278	-45.69	10,717.73	19.36
2010	390,702	-17.80	11,004.73	2.68
2011	568,062	45.40	12,168.09	10.57
2012	607,798	7.00	14,163.99	16.40
2013	409,253	-32.67	13,832.13	-2.34
2014	132,689 (up to April, 2014)	-	3733.46 (up to March, 2014)	-

Source: \* BMET, \*\* Bangladesh Bank and Author's calculation

So, credits and remittances have been playing much stronger roles in determining the standard of living for the general mass in Bangladesh and are being used in either consumption purpose or investment purpose. But majority of the literature studying households' economic well-being have focused on income, wages or earnings as the outcomes of interest. Thus studying the impacts of credits and remittances on consumption expenses is very necessary.

### **The Methodology & Data**

BBS has successfully completed 15 rounds of HIES with the latest survey in 2010. For the survey, a two stage stratified random sampling technique was followed in drawing sample of HIES 2010 under the framework of Integrated Multipurpose Sample (IMPS) design developed on the basis of the sampling frame based on the Population and Housing Census 2001. The IMPS design consisted of 1000 Primary Sampling Units (PSUs) throughout the country. There were 640 rural and 360 urban PSUs in the sample. Each PSU comprised of around 200 households. In the first stage about half, 612 to be exact, of total 1000 IMPS PSUs were drawn. These PSUs were selected from 16 different strata – of which 6 are urban, 6 are rural, and 4 are Statistical Metropolitan Areas (SMAs). As many as 612 PSUs, of which 392 rural and 220 urban, were selected systematically from these 16 strata as a subset of Integrated Multipurpose Sample (IMPS) design of BBS. In the second stage, the selected PSUs were further sub-sampled, and 20 households were selected from each PSU, for a total sample size is 12240 households. Of these, 7840 are rural households while 4400 are in urban areas. The survey was duly completed without interruption in one year (February 1, 2010, to January 31, 2011). Data was collected over a year to capture the seasonal variations in income, expenditure, and consumption patterns. The one-year period was divided into 18 terms. A total of 34 PSUs were covered in each term, to collect data from 680 sample households. There were 36 (including two reserve) enumeration teams for the survey. Each team of five members was assigned to 1 PSU to collect data for a continuous period of 20 days. Strong supervision and quality control measures were adopted in HIES 2010. (Source: HIES 2010 preliminary report).

The variables are divided into two broad categories- (i) the dependent variables and (ii) the independent variables/regressors. Total expenditure on consumption items can be treated as the dependent variable for the regression model designed to serve the principal objective. The covariates can be total value of available assets/endowments, items that cause cash/assets inflow and outflow (in cash or in kind), type of credits taken, amount of credits, repayment of credit (interest & installment payment), existence of natural shocks, amount of remittances received (in cash or in kind) etc. Besides, there might be some other regressors to capture the background information of the respondents as well. Some

exogeneous variables has been chosen based on common understanding, some from previous literatures and some from some economic models. One will easily be able to justify the grounds of the covariates undertaken in this study.

For simplicity we have divided all kinds of consumption expenditures into the following eight categories: i) Foods, ii) Housing, iii) Clothing, iv) Health and Education, v) Transport and Communication, vi) Recreation, vii) Household appliances and viii) Others. The detailed breakdown of all consumption expenditures are mentioned in the Appendix. For each of the category this study needs to use the **Two-stage Least Square (2SLS) regression approach** using PSM tool as one of the regressors. That is we will first find out the propensity score using a probit regression and then will use that score as a covariate.

The Propensity Score (PS) is used to estimate Average Treatment Effect on Treated (ATT). Holding all other characteristics of the households same, the study has been designed to compare consumption expenses of households without credit and households with credit taking credit as a “Dummy variable”. Since credit can leave indirect impacts through another variable (e.g. some people may migrate by collecting some funds from having some credit), there might be some interaction terms in explanatory variables. A similar set of analysis can be made for migration.

We can treat consumption expenditure for each separate item (of the above eight types) as the dependent variable with other relevant explanatory variables for each of the broad categories. Then we can run the following “**Systems of Simultaneous Regression Equations**” to capture our major objectives.

$$Conexp_{ij} = \alpha + \beta X_{ij} + \gamma W_i + U_{ij} \dots\dots\dots (i)$$

Where-  $Conexp_{ij}$  denotes consumption expenditure of  $i^{th}$  household on  $j^{th}$  item,  $X_{ij}$  denotes the vector of regressors that vary over households and over commodity items,  $W_i$  denotes the vector of regressors that vary across households but remains same for each commodity type within the household. Before we run the above regression we should find out the “Propensity Score (Pscore)” for the households because simultaneous study of consumption expenditures as dependent variable and credits along with migration as independent variables may lead to econometric problems (for endogeneity and sample selection bias) which could arise because the households with more consumption expenditure (indicating more solvencies) might have more access to bank credits and low-income households may have more or less access to such programs. The same argument is true for remittances. Since international migration tends to be costly, it is possible that only the relatively well-off households are able to send workers abroad. If

that is indeed the case, a simple ordinary least squares regression might overestimate the impact of remittances or credits.

To assess the effect of remittances/credits on the consumption of a household, we should make use of a propensity score based *matching* approach (propensity score matching or *PSM*). Under this approach we will match credit holder households with other households that share similar characteristics but do not take credits. Our justification for adopting the *PSM* approach is based on a paucity of data, which prevents us from examining household situations before and after credits have been taken. In fact, any application of such a difference-in-differences approach requires longitudinal or panel data on credit taking households which purpose cannot be served through the usage of HIES data. For such type of data, an instrumental variables (IV) regression may be carried out as a remedy for the regression in equation (i), but it is difficult to obtain appropriate instruments in natural settings. Khandker et. al. (2011) deals with that issue and suggests that village and community infrastructure variables can be used as IV for credits undertaking. One possible remedy is to generate the propensity score first through a probit regression and then use this propensity score as a covariate in the regression model. Since the HIES data set has considered 12,240 households as sample with 4071 credit takers and 8164 non-takers (quite a large sample size - in terms of both credit takers and non-takers) there should be no serious problem of using PSM technique due to small sample size.

In case of PSM we consider modeling the likelihood of being treated by means of a binary choice model (e.g. logit or probit):

$$\Pr (w_i = 1|x) = G(x) \equiv P(x)$$

Where  $w_i$  takes the value of 1 if credit is taken and 0 otherwise and  $x$  denotes the regressors. In the treatment literature, the function  $p(x)$  is known as the propensity score. Once we get the propensity score then we can surely use “**Two-stage Least Squares Method (2SLS)**” that will serve our purpose.

After we get the propensity score as described above, we can now use the most popular causal relationship establishing tool-the regression model. But here we should keep in mind that the base category varies for different comparisons in this study. While comparing the effect of credit we compare the regarding consumption expenses of credit undertaking and not-undertaking households and the same is applicable when we go for estimating the effects of migration. Moreover, when we go for the joint effect of migration and credit the base category changes to the households who are neither credit undertakers nor any household member migrant. Therefore in each comparison we have

to take a different base outcome. Therefore, on the basis of base categories we should use different models and this study will try to focus on objectives with the following three models:

$$Y_{ij} = \alpha + \beta \text{Credit}_i + \theta \text{Pscore}_i + U_{ij} \dots\dots\dots \text{(ii)}$$

$$Y_{ij} = \alpha + \gamma \text{Migrate}_i + \theta \text{Pscore}_i + U_{ij} \dots\dots\dots \text{(iii)}$$

And,

$$Y_{ij} = \alpha + \beta \text{Credit}_i + \gamma \text{Migrate}_i + \delta \text{Credit}_i * \text{Migrate}_i + \theta \text{Pscore}_i + U_{ij} \dots\dots \text{(iv)}$$

For all the above models  $Y_{ij}$  denotes consumption expenditure of  $i^{\text{th}}$  household in  $j^{\text{th}}$  item,  $\text{Credit}_i$  denotes the dummy equal to 1 if the household  $i$  undertake any credit and 0 otherwise,  $\text{Migrate}$  is another dummy equal to 1 if the associated household have any migrant and 0 otherwise, and we have used another dummy to represent the interaction term equal to 1 if the associated household have both credit and migrant and 0 if the household have at least neither. In between the above models the 3<sup>rd</sup> one breaks down the households into more categories and this facilitates a deeper, finer and more understandable analysis. Besides using this model we will be able to compare the outcomes across those groups with the outcome of a unique base group.

### Empirical Results and Analysis

In order to establish a link among consumption, credit and migration or remittance and to see whether credits and migration play some sort of role in raising consumption expenditure at some point of time and if yes how much, we have followed two ways – linking through summery statistics and linking through regression findings.

It is logical that we will first observe the standard of living of households through some summery statistics of the variables related to the objectives. Once we get some notion regarding the states of households then analyzing the effect of remittance and credit on the consumption patterns of households will be much easier. The average size of household is 4.5, the average age of the household heads is 46 years and 88% of them are Muslim 36% of the households are in urban areas, 64% are in rural areas, 86% household heads are male and the rest 14% household heads are female. Each household has more than one income earners on average and the dependency ratio is 0.57. The total years of education per household on average are 17 years. These findings have been summarized in the table-3.

**Table-3: Households and household members**

Variable	Obs.	Mean*	Min.	Max.
No of Male members	12,240	3	0	11
No of Female members	12,240	3	0	10
No of Income Earners	12,240	2	0	6
No of Dependent Members	12,240	0.57	0	1
No of People who can read a letter	12,240	3	0	14
No of People who can write a letter	12,240	3	0	14
Average Total years of education for HH	12,240	17	0	144

(\*For mean value, the fractional numbers of people are converted into immediate whole number)

Since the study focuses on the consumption expenses of household expenses which also depend on the accumulated assets of related households as well as other determinants, it is customary to get some notion of the state of assets of the households being studied. The table- 4 below presents the distribution of households by size of land owned and operated in rural area of Bangladesh.

**Table-4: Lands occupied by Households: proxy for Households assets**

Land Size (in acre)	Owned land (% of Households)	Operated land (% of Households)
Landless	4.6	3.6
0.01-0.49	60.5	55.4
0.50-0.99	11.6	14.2
1.00-2.49	14.6	18.3
2.50-7.49	7.6	7.8
7.50+	1.1	0.7
<b>Total</b>	<b>100</b>	<b>100</b>

It is revealed from the table that, in rural area, percentage of household having no land reduced to some extent in 2010. Household having land up to 0.49 acre is 60.5% in 2010, the percentage of households with land ownership 7.50 acre and over is 1.1%. In case of operated land, it may be seen from the same table that, the percentage of households having smaller size of operated land i.e. up to 0.49 acre is 55.4% and the percentage of households with land ownership 7.50 acre and over is 0.7%. (Source: HIES 2010 report).

For the same reason we should have some idea about the quality of lives of the households surveyed in HIES 2010. In regard to the overall housing condition we see that 13% households report that they have a separate dining space and 75% households have a separate kitchen facility. More than 26% households report to have used brick/cement/pucca in the walls of main dwelling structure and 10% household report to have used brick/cement/pucca in the roofs of main dwelling structure. Access to electricity and mobile phones has increased remarkably. Households with access to electricity increased to 58 percent in 2010. A phenomenal increase is observed in case of mobile phone use. It has increased to 63.74 percent. These sorts of information have been put on the table-5.

**Table-5: Status of Households: proxy for Living standards**

Variable	Obs.	Mean	Min.	Max.
Separate Dining	12,240	0.13	0	1
Separate Kitchen	12,238	0.75	0	1
Pucca Walls	12,182	0.26	0	1
Pucca Roofs	12,169	0.10	0	1
Electricity Connection	12,240	0.58	0	1

In the 2010 HIES, 7.35% of the households reported to have opened a bank account over the last 12 months, 14% reported to deposit money in micro/financial institutions, 33% of the households reported receiving loans from financial or non-financial institutions, friends, money lenders, etc. during the last twelve months preceding the day of enumeration. Average amount of loan taken per HH is TK 37627. Since one of our objectives is to find a link between credit and consumption, it becomes necessary to observe how the money received from credit is expended. The results are shown in table-6.

**Table-6: Information on credit scenario**

Variable	% of Households
Opening new Bank Account	7.35
Deposited money in Micro/Financial Institutions	14.4
Received Loan from Financial Institutions/Friends etc.	33
Average amount of loan taken per HH	TK 37, 627

One-fourth of the loans are utilized in business purpose, 18% in agricultural purpose, another 13% housing purpose and 10% in purchasing foods. Health and education captures 6% of the loans undertaken.

Remittances significantly boost income, consumption and saving at the household level. Remittances significantly boost income, consumption and saving at the household level. In all areas, income, consumption and saving per household of remittance receivers far exceed that of households who do not receive remittances.

**Table-7: Information on migration and remittances**

Variable	Obs.	Mean	Min.	Max.
Any HH member migrated	12,240	0.13	0	1
Total no of migrants	12,116	0.01	0	4
HH receiving remittances	12,240	0.14	0	1
Remittances received from within the country	1,610	23,915.67	100	530,000
Remittances received from abroad	1,238	142,893.90	500	5000,000

For the remittance receiving households in 2010, income per month is on average 82 percent higher, consumption per month is 37.7 percent higher and saving per month is 107 percent higher relative to households who do not receive remittance. On an average almost 13% households reported that any member of those households have migrated either within the country or abroad and the data from BBS report show that about 12.28% of the 2010 HIES households reported any kind of migration either within the country



(8.60%) or abroad (3.97%). Most migrants are in the 25–44 age-group, and are overwhelmingly male. Almost 14% of the households reported that they have received remittances from either within the country or abroad. The average amount of remittance received from within the country is 24 thousand taka per recipient household over the last year and that amount from abroad is almost 142 thousand taka per recipient household. Combining remittances received from within the country and from abroad we see that average amount of remittance received 152 thousand taka per recipient household over the last year.

The empirical estimated results of regression equation (ii), (iii) and (iv) have been reported in column 1, 2 and the following columns respectively in table 8 which reveal the impact of credit and migration on all of the eight categories of consumption items.

**Table-8: Empirical Results of Regression Equations**

<b>Models/ Variables</b>	<b>(ii) Credit</b>	<b>(iii) Migration</b>	<b>(iv) Credit</b>	<b>(iv) Migration</b>	<b>(iv) Credit* Migration</b>
In (food expenses per capita)	0.25*	-0.03	0.73***	0.38*	-1.52***
In (house expenses per capita)	0.13*	0.19	0.31***	0.48***	-0.98***
In (per capita expenses on cloths)	0.12*	0.21	0.34***	0.43***	-0.90***
In (per capita expenses on health & education)	0.23***	0.27*	0.12*	0.31***	-0.55***
In (per capita expenses on transport & communication)	0.08	0.14	0.13	0.41**	-0.60*
In (per capita expenses on recreation & pastime)	0.13	0.21	0.47***	0.74***	-1.07***
In (per capita expenses on household durables)	0.24***	.34**	0.34***	0.52***	-0.77***
In (other expenses per capita)	0.06	0.73***	0.15	1.01***	-0.91***
<b>legend: * p &lt; 0.05; ** p &lt; 0.01; *** p &lt; 0.001</b>					

For regression (ii) (second column) our base category is constrained in those households who have undertaken any forms of credit from any sources. The findings show that credit undertaking households enjoy 25% higher per capita food expenses, 13% higher per capita housing expenses, 12% higher per capita clothing expenses, 24% and 23% higher per capita expenses on household appliances and that on human capital respectively in compare to the non-credit holding households. The credit effects on per capita expenses on transport and communication, recreational items and miscellaneous items are not strong enough.

For regression (iii) (third column) our base category is those households who have migrating members (at least one migrant from the household). Here the migration has no significant effect on household food, housing, clothing, communication and recreation expenses per capita. Migration raises household per capita expenses on durables by 34%, that on health and education by 27% and that on other miscellaneous items by 73%. Now let's move on to our third model regression (iv) (fourth, fourth and sixth column) where we will be able to compare the life standards in respect to per capita consumption expenditures on different items in between different groups on the basis of whether these groups have migrating members or not and have undertaken any form of credit or not. In case of food expenditure per capita, households taking credits expense 72% more than households without credits and 38% more than households having no migrant but per capita expenditure on food items decline by 152% for households having both credits and migrants. In case of per capita expenses on housing, clothing and HH durables expenditures, households taking credits expense 30%, 33% and 34% more than households without credits respectively and 47%, 42% and 52% more than households having no migrant respectively but expenditure on these items decline by 98%, 89% and 76% respectively for households having both credits and migration. Similar results are found for all other consumption expenditures that is the regression results show that controlling propensity score, households taking credits expend more on all types of consumption items mentioned above by significant amount than households without credits, holding other things constant and households having at least one migrant also expend more on all categories of consumption items than their contemporary other households having no migrant.

But the simultaneous impact of migration and credits is negative which implies that households taking credits and having migrant reduces expenditure on consumption items, an interesting result revealing the fact that migrations for those households have been supported by credits and remittances sent by those migrants are either very poor at initial stage or maximum amount of it is used to repay the credits. As a result the joint impact of migration and credits on consumption expenditure is negative or at minimal level. The logical justification for the result can be proved from HIES data.

Here we should first concentrate on the comparison groups which are i) treatment group- those households who have both migration and credit and ii) control group- those households who have neither credit nor migration. The results in the associated columns give the differences in per capita expenses on different consumption items between these two groups.

The following table presents the distribution of households across four different groups

**Table-9: Distribution of households across groups**

<b>HH Status</b>	<b>No credit no Migration</b>	<b>Only Credit</b>	<b>Only Migration</b>	<b>Both Migration &amp; Credit</b>
1	6,999	3,701	1,170	370
0	5,241	8,539	11,070	11,870
<b>Total</b>	<b>12,240</b>	<b>12,240</b>	<b>12,240</b>	<b>12,240</b>

We can see that among the total of 12,240 households, the treatment group consists of only 370 households who have both migration and credit and there are 6,999 households in the control group who have neither credit nor migration. The HIES data also gives us one more useful information: of the 370 households most (359) of them (97.3%) have less than a year in abroad. Under the present socio-economic circumstances in Bangladesh it can be assumed that they must have used credits for bearing migration costs and these HHs have not started sending remittances back at home or started to send a very poor amount which had to use to repay the credits with interest. The available data also supports that fact: the average amount of remittances received in last year by those 359 households is only 59 thousand taka while the average amount of remittances received in last year by those 370 households is only 61 thousand taka but the average amount of remittances received in last year by 1540 (1170+370) households is above 1 lakh taka. All these results justify that per capita expenses on those households must be lower in comparison to those households who have neither credit nor migration.

### **Conclusion and Policy Implications**

By establishing a quantitative analysis to obtain the effects of foreign remittances and credits on the consumption expenditure by households in Bangladesh to capture whether credits and remittances are welfare increasing or not, we strengthen the case for remittances and credits as a poverty alleviating policy tool. The beneficial consequences

of foreign remittances may lead us towards the path of adopting a “foreign employment” policy. And beneficial consequences of credits or micro-credits may help us to accelerate poverty reduction. Remittances from Bangladeshi migrants have constituted a larger share of the country’s development budget than foreign aid. Thus migration is now considered as important livelihood strategy for the people of Bangladesh. But the welfare deteriorating effect of migration cost which is mainly supported by taking credits from various sources is a major impediment for the human capital development since households taking credit to bear migration cost have to sacrifice consumption of foods, cloths, housing, health and education and other things necessary for developing human capital and hence reduces the long run benefits of migration. In this regard, utmost importance should be given to some policy considerations such as expanding the growth of MFIs and other financial institutions in order to provide initiate easy credit system for migration with longer repayment period and lower interest rate. Government and the manpower associations should take immediate steps for the improvement in the wages and conditions of employment of nationals working abroad, expansion and diversification of the countries of employment, and improving the skill component of the emigrant workforce etc. All these efforts will help us in obtaining greater foreign exchange income, reduction of domestic unemployment and overall achieving better standard of living.

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## APPENDIX

**Table: Consumption Items**

Sl.	Items	Components
1	Food	Food grains, Pulses, Fish, Eggs, Meat, Vegetables, Milk & Dairy, Sweetmeat, Oils & Fats, Fruits, Drinks, Sugar & Molasses, Outside Foods, Tobacco products, Spices, Betel leaf & Chew goods and Misc.
2	Regular Housing Expenses	Fuel & Lighting, Washing & Cleaning, and Cosmetics, Household-use textiles, Housing related expenses, HH worker's salaries.
3	Clothing & Footwear	Ready-made Garments, Clothing material & Tailoring and Footwear.
4	Health & Education	Medical Treatment Expenses, Educational Expenses (schooling, tuition etc.).
5	Transport and Communication	Transport, Travelling and Communication.
6	Recreation	Pastimes and Entertainment.
7	Household Durables/ Appliances	Cooking equipment, Furniture, Personal Articles, Consumer Durables and Misc. Durables.
8	Others	Taxes, Interests, Fines, Insurance expenses, Transfers and Expenses on Religious activities.