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## International Remittances and Household Expenditures: The Philippine Case

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# International Remittances and Household Expenditures: The Philippines Case

## Aubrey D. Tabuga

### Abstract

This paper examines the general relationship between remittances and household expenditures in the Philippines by doing a cross-sectional analysis of the 2003 Family Income and Expenditure Survey (FIES). Unlike past research works, it provides a comprehensive overview of the effect of remittance on spending behavior by looking not only at common categories like food, education, and housing but also vices like tobacco and alcohol. It addressed some methodological issues in examining remittance effects. These are the presence of zero expenditures, heterogeneity of the nationally representative sample, and inaccuracy of the FIES data on remittance. Zero expenditures were taken into account by using the censored Tobit model while heterogeneity was addressed by employing the Quantile Regression technique. Also, the FIES data on remittances was corrected by excluding the investment and pension components from the original remittance data used by past studies to arrive at more accurate estimate of remittances sent by family members working abroad and its effects. The study found that while there are evidences that households receiving remittances tend to consume more conspicuously on consumer items, they also invest more on education, housing, medical care and durable goods. There is no clear relationship though between remittances and tobacco and alcohol.

Key words: remittances, remittance income effect, household expenditures/spending, quantile regression analysis

### 1. Introduction

The inflow of international remittances to the Philippines has been recently increasing at phenomenal rates. Official data indicates that from 2001 to 2006, remittances have been growing at an average rate of over 16 percent annually. This suggests that within the said period it doubled and reached a crucial amount of US\$12.7 billion or 11 percent of the country's GDP. This indicates that remittances can play a huge role in the economic development of the country.

Examining the impacts of remittance receipts and migration has been the subject of numerous studies. The magnitude of these transfers has caught the attention of governments, international organizations, and the academe. A huge body of literature has been devoted to estimating its impact on aggregate economic measures. However, noting that these transfers directly benefit the households and that households' spending behavior strongly determines whether these will have short or long-terms impacts, numerous studies have been focusing on its influence on household expenditures. These studies determine if remittances and in a sense migration significantly affect household's tendency to invest thereby increasing the way in which remittances can help in local development of the labor-sending country or if it induce them to consume more and produce less thus preventing its potential to spur local development and encourage dependency. This paper will focus on such way of examining the impact of remittances.

The body of literatures on this topic is divided into two main views. The earlier view is pessimistic saying that households receiving remittances do not make productive investments. Rather, remittances or migration has induced dependency of the households on remittances, adversely affected local production and encouraged conspicuous consumption.<sup>1</sup> However, quite a number of recent studies have challenged this finding. Using bigger samples, they found that remittances induce households to invest in human capital such as education.<sup>2</sup> Remittance income via exchange rates shocks also influence households to engage in entrepreneurial activities as found by Yang (2005). In fact, even without investing these remittances, they can still contribute to the local economy by way of the multiplier effect of consumption done by the households receiving the remittances income (Taylor, Arango, Hugo, Kouaouci, Massey, & Pellegrino, 1996). These benefits have not been recognized in past research. Taylor & Mora (2006) attributed these pessimistic results to narrow definition of productive investment, inadequate samples and more importantly, to poorly-designed research approaches.

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<sup>1</sup> These include Lipton (1980), Ferran and Pessar (1991), and Gorges (1990) all cited in Taylor et al (1996).

<sup>2</sup> Adams (2005) and Sosa & Medina (2006) found such results.

As a result, the recent developments on this topic revolve around the methodological issues in estimating the effects of remittances. There is a need for the use of bigger and more representative samples of the population (Adams 2005). Also, one should address the endogeneity of remittance as an explanatory variable (Taylor & Mora, 2006; Yang, 2005). A variable has to be exogenous before it can be used as an explanatory variable, otherwise, estimating its effect on the dependent variable may yield unreliable results. Yang (2005) used exchange rate shocks to study the effect of remittance on investments because remittance itself is endogenous. Taylor & Mora (2006) on the other hand used migration itself instead of remittance income as explanatory variable to address this problem. Moreover, studies must also take into consideration the use of expenditure data that most of the time contain zero values. Using data that take zero values makes the OLS regression analysis yield biased results (Deaton, 1997).

In addition to the issues abovementioned, one has to exercise caution in generalizing the effect of remittances on expenditures especially when dealing with large, nationally representative data. This is due to the fact that large survey data are heterogeneous. If there is heterogeneity in the observations, making gross generalization of the effects of explanatory variables can be misleading. Moreover, heterogeneity often leads to the problem of heteroskedasticity, a problem where the error terms do not have a constant variance. This can make the researcher that uses OLS find the estimates significant although in reality it may be not. Often, past studies have assumed that errors in their models are homoskedastic (not heteroskedastic). Some have made efforts to correct for this problem by making standard transformations such as taking the ratios of the variables. However, even after transforming variables into logarithm or ratios, still it is rare to find normally distributed errors so that heteroskedasticity seem to be almost always present in survey data (Deaton, 1997). This paper does not make this kind of assumption by using the quantile regression (QR) technique because heteroskedasticity is very much present in large household surveys. In spite of this, it does not claim superiority in the methodology over past studies since heteroskedasticity is just one of the many obstacles into achieving more reliable result. Nevertheless, it aims to provide an alternative way of analyzing the relationship which others have not considered doing before.

Studies made on the Philippines case have focused more on remittance determinants and on the macro level effect of remittances. Rodriguez (1996) and Tan (2006) researched the determinants of remittances. Others dealt with the macro level impact of remittances such as on poverty (Pernia 2006) and economic growth (Burgess & Haksar, 2005). The study by Yang (2005) is the only one done so far at the household level for the Philippines in terms of household investments but did not address the heterogeneity of the observations. Yang tested for the effect of remittances on investments in education and entrepreneurial activities using exchange rate shocks generated by the Asian financial crisis during the period 1997 to 1998 as instrumental variable. He found that when given an exogenous shock to remittance income, households tend to invest the increase in child schooling and entrepreneurial activities. However, by focusing the analysis on the endogeneity issue, he used panel data taken from merged samples from various surveys cutting down the sample to only over 1,600. Although, heterogeneity seemed to be less of a problem compared to using the whole 42,000 samples from the national household survey, it could not be used to make an inference on the total population as the sample became too small.

While Yang (2005) provided useful insights on this topic, he focused more on human capital investment and entrepreneurship. It may be interesting to see as well whether households receiving remittances make unnecessary spending such as vices and festivities. None of the recent studies in this area has included these expenditure categories in their research. The essence of looking into these is that if households tend to allocate more on them, then remittances may produce dependency and efforts to make long-term improvements by the households may not be achieved. Moreover, it is also interesting to see how these households allocate resources to some rarely studied goods like family occasions and even gifts.

In studying the Philippines case, there are also some constraints in the datasets used that have not been overcome in past research. The data on remittances obtained from the Family Income and Expenditures Survey (FIES) which are useful in doing the kind of analysis mentioned do not reflect the true estimate of remittances going to the households. This data entry refers to the cash receipts from abroad which includes not only remittances from family members working abroad but also dividends from investments abroad. This problem, which will be discussed in more details in the empirical analysis section, was noted in both studies of Burgess & Haksar (2005, p.6) and Adams (2005). Therefore, there is a need to resolve this problem to arrive at more reliable estimate on the relationship between remittances and household expenditures. I have not heard of any Philippine study that has solved this problem in using the remittance variable from the FIES.

This paper therefore aims to contribute to the growing number of studies assessing the influence of remittances on families' spending behavior using a nationally-representative sample, correcting for the remittance data, addressing the problem arising from zero expenditures and heterogeneity of the observations. It needs to assume though that remittances are exogenously determined.

The main objective of this study is to examine the entire expenditure basket so that we are able to examine not only the investments made by remittance-receiving households but also a picture of their life style. The relevant research questions to ask therefore are: How does remittance income influence household expenditure behavior? Does it induce them to spend more on human capital investments like education and health? Does it encourage them to spend more on vices like alcoholic beverages and tobacco?

## 2. Theoretical Framework

The relationship between remittance and household expenditures can be explained theoretically by treating remittances as a source of income of the households receiving them. Traditional consumption models such as the lifecycle and permanent income theories of consumption state that the source of income doesn't matter in consumption behavior, as households tend to smooth consumption. Thus, we should expect that households receiving remittances behave like any other households with all other things the same. However, a number of recent studies have been showing that household receiving remittances have exhibited varying tendency to consume and invest compared to those that do not.<sup>3</sup> Several studies using a behavioral approach also show that sources and amount of income both play roles in placing them in certain accounts.<sup>4</sup> Since remittance is one source of income, then this study is quite similar to examining any difference on how households with various income sources spend them in certain commodities. However, since the survey does not ask how households spend income according to the sources, we could not put it this way. Moreover, since remittance income is fungible, it doesn't make sense to separate it and see how it is being spent because families spending remittances on consumption goods can devote other income to investments or vice versa.

In understanding the household expenditure behavior of remittance receiving households, it is important as well to look at the reason behind sending remittances. Remittances are one of the direct effects of labor migration. The New Economics of Labor Migration views migration as a risk-minimization strategy of the family by diversifying sources of income saying that remittances are motivated by altruism or concern of the remitter for their families receiving the remittances (Lucas & Stark, 1985). The social network theory on the other hand suggests that there is a social role that remittances play since the exchange happens between members of a social network (Portes, 1995). It may be that the senders are accumulating social obligations from the receivers or that those receiving them may reciprocate remittances through say, services to their family members. Remitters may be conforming to some social norms where they are made to believe sending remittance is what they are supposed to do. There is also the view that remittances are a repayment to non-migrant members for their support in the migrant's education (Lucas & Stark, 1985).

Understanding such motivations to remit is important in studying the way households receiving remittances actually spend their income. If the remitter does expect something in return like enjoying the investments made out of the remittance when he gets back to his place of origin, then the motivation is economic in nature. When the motivation is economic, then there is more reason to believe that this may be spent in more productive consumption like investing in entrepreneurial activities or education. On the other hand, if the reason for remitting is part of a social norm, then there is likely to be more conspicuous consumption than productive investment.

## 3. Empirical Analysis

This paper examines if there is any relationship between remittances and household expenditure behavior and thus, estimating the Engel function is at its core. The Engel function can be defined as a Marshallian demand curve that describes how a consumer's expenditures on some goods and services relate to its total resources holding prices of all goods constant (Lewbel, 2006). In other words, the quantity of a good consumed by the household is determined by its income, wealth or total expenditures. In this study, the variable remittance will be included in the Engel function whose effect will be statistically estimated.

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<sup>3</sup> Adams, 2006; Sosa and Medina (1996)

<sup>4</sup> See behavioral lifecycle hypothesis by Shefrin & Thaler (1988).

The choice of functional form of the Engel curve to be used is based on its theoretical plausibility. Among the existing choices, the Working-Leser model after that by Working (1943) which was used successfully by Leser (1963) is said to have more theoretical basis.<sup>5</sup> This model specification puts greater emphasis not on goodness of fit but on its ability to satisfy the adding-up restriction, which is a property of demand applicable to cross-sectional analysis. The Working-Leser model states that the budget share of a certain commodity is a function of the logarithm of the total expenditures. This means that if we increase total expenditure by a percentage, we should expect that budget share for a commodity changes in some proportions. The adding-up restriction simply states that when budget share of one commodity goes up, another's share has to be reduced because the household has a budget constraint to maintain.<sup>6</sup> The essence of using this type of model is that it tells us which commodity groups in the household's basket of expenditures are relatively more important. Remember that we want to determine whether remittances influence a household to pour more of its resources in certain categories such as education or food.

To make the model more realistic though, a set of other characteristics of the household is added to the basic Working-Leser model. These include characteristics of the household head in the absence of information on all members, household size and other household characteristics such as proportion of employed members. It is also important to include some geographical factors affecting their demand for certain goods. Leaving these factors out from the models may lead to biased estimates of the remittance effects.

For two households with the same expenditures and characteristics, does the presence of remittances lead to different spending patterns? To answer this question, the general model to be tested is represented by the following equation:

$$\frac{q_i}{Y} = \alpha_i + \beta_1 \text{LOG}(Y) + \beta_2 \text{REMIT} \times \text{LOG}(Y) + \sum(\lambda)Z + \varepsilon_i \quad (1)$$

where

$q_i$  = household's per capita expenditure on commodity group  $i$ ,

$Y$  = total expenditure per capita

$\text{LOG } Y$  = the logarithm of  $Y$

$\text{REMIT}$  = remittance dummy variable (1 if household received remittances in 2003, 0 otherwise)

$Z$  = a set of household characteristics such as the household head's age, educational attainment with no grade completed as the omitted variable, dummy for managerial/professional occupation, and non-agricultural business dummy, number of household members, ratio of employed members to total, and location dummy for urban area and 16 regional dummies where the region ARMM is omitted.

The main concern of this study is  $\beta_2$  which is the coefficient of the interaction term of remittance and expenditure, a measure of the influence of remittances to the slope of the Engel curve. The original slope of the Engel curve without remittances is  $\beta_1$ . This is interpreted as the amount of change in the commodity's budget share in percentage points given a percentage change in the total expenditure per capita. For the household receiving remittances, where  $\text{REMIT}$  is equal to 1 in Equation (1), the slope of its Engel curve is the sum of  $\beta_1$  and  $\beta_2$ . The regression analysis will revolve around testing the null hypothesis that  $\beta_2$  is equal to zero in each commodity group. If the statistical test indicates that this hypothesis is rejected, then  $\beta_2$  is statistically different from zero which means that remittance income influences expenditure in that particular commodity group. The  $\varepsilon$  is the usual error term in which we do not make any assumption of the distribution of its variance.

In the abovementioned equations, the set of household characteristics,  $Z$ , may be extended for certain expenditure categories. For instance, it may be necessary to include specific determinants such as the ratio of school-aged children in education expenditures, the ratio of adult members in tobacco and alcoholic beverage expenditures and the ratio of

<sup>5</sup> For detailed discussion on this model and other specifications, please refer to Deaton & Muellbauer, 1980. Other studies using or discussing the same model include Adams (2005), Castaldo & Reilly (2007), and Taylor & Mora (2006)

<sup>6</sup> The Working-Leser model specifies that the budget share for a commodity is a function of the logarithm of total expenditures such that:  $W_i = f(\log Y)$  where  $W_i$  is the expenditure share of the  $i^{\text{th}}$  commodity and  $Y$  is the total expenditure. The adding-up condition simply explains that households allocate expenditures according to a certain budget constraint such that the sum of the budget shares for all goods relative to the total expenditure, or  $\sum w_i$  is equal to 1. If estimated empirically in OLS for all commodity groups, this should be satisfied when  $\sum \alpha_i = 1$  and  $\sum \beta_i = 0$ .

young children for medical care. Descriptions of expenditure categories and explanatory variables used are shown in Tables 1 and 2 respectively.

Previous studies such as those by Adams (2005) and Castaldo & Reilly (2007) have calculated for the marginal budget shares and expenditure elasticities. However, this paper entails a far bigger sample and thus forcing to make estimates that generalize their marginal budget shares or elasticities may not give reliable results. Instead, this study will focus more on testing just the significance of the coefficient of interest,  $\beta_2$ .

It was earlier mentioned that this study does not assume that the error term's variance is constant and the heterogeneity of the sample is taken into consideration. This can be made possible using the quantile regression (QR) technique. The use of QR addresses some problems of large cross-sectional data that the OLS cannot such as heteroskedasticity and susceptibility to outliers. Moreover, even when heteroskedasticity is not a problem, given the heterogeneity of the sample, QR enables us to examine variations in the relationship between variables at various quantiles of the dependent variable.

QR was introduced by Koenker & Bassett in 1978 to complement analysis made by OLS. In contrast to OLS which is a conditional mean estimator, QR is a median estimator and by its name deals with various quantiles of the conditional distribution of the dependent variable. One advantage of using QR on top of OLS, as mentioned earlier, is its ability to analyze and illustrate the problem of heteroskedasticity (Koenker & Hallock, 2001). Cross-sectional analysis of a large dataset such as the nationally representative FIES has the inherent problem of heteroskedasticity because of the heterogeneity of the population under study. When a regression is heteroskedastic or when the error term observations do not have a constant variance, which is the usual case in large survey data, the OLS is no longer the best linear unbiased estimator (BLUE). In this case, the conditional mean estimated by OLS will no longer be at the 50<sup>th</sup> percentile or median. QR can illustrate this problem by fitting straight lines to the percentiles. Moreover, even when the error terms are homoskedastic (not heteroskedastic), it may be interesting to look at effects of remittances at various segments or quantiles of the observations.. QR makes this possible by giving a picture of the effects of the explanatory variable, LOG(Y), on the dependent variable,  $q_i/Y$  given a certain distribution say the 50<sup>th</sup> conditional quantile of  $q_i/Y$ . When we say conditional, it is in the sense that the distribution of  $q_i/Y$  is conditional on the explanatory variable LOG(Y). What QR does is exploring the shape of distribution and tells us the nature of the relationship at that portion. The relevant questions that can be answered by quantile regression are: What is the relationship of LOG(Y) to the budget share in say, food when that budget share is lowest (i.e. at lowest quantile)? What is its impact when the share of food is very high (i.e. highest quantile)? Unlike OLS, which gives a somewhat generalized picture, QR provides more differentiated, meaningful and policy-relevant results. Examining the differentiated effects is important when we are dealing with explanatory variables whose effects are rather ambiguous because it shows us its differing effects depending on which quantile we are looking at. If such ambiguous effect exists, generalization provided by OLS result can mislead us. Finally, the QR being a median estimator is less susceptible to outliers than the mean estimator OLS.<sup>7</sup>

Using quantile regression, Equation (1) becomes:

$$\frac{q_i}{Y}(\theta | LOG(Y), REMIT \times LOG(Y), Z) = \beta_1(\theta)LOG(Y) + \beta_2(\theta)REMIT \times LOG(Y) + \sum(\lambda)(\theta)Z \quad (2)$$

where the notation ( $\theta$ ) indicates that the parameters being estimated are that of a specified  $\theta$  quantile (e.g. 0.10, 0.20, 0.25, 0.75). For  $\theta=0.5$ , this means that the equation refers to the conditional median of  $q_i/Y$ . The notation ( $\theta | LOG Y, REMIT \times LOG Y, Z$ ) simply indicates that the equation estimates the median *conditional* on the explanatory variables LOG Y, REMIT  $\times$  LOG (Y), and Z. The quantile regression analysis is done by using the command “qreg” in Stata. Equation (2) will be estimated for each of the major commodity group and the significance of the  $\beta_2$  will be examined.

The econometric analyses OLS and QR are applicable for datasets that do not contain zero values. However, expenditure data almost always contain zero values. There can be a number of possible reasons as to why there are

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<sup>7</sup> A good introduction to quantile regression for demand analysis is provided by Deaton (1997). For a more detailed look at quantile regression, please refer to Koenker & Hallock (2001).

zero expenditures. One may be that the reference period of the survey is too brief, say only a week, that households may not report buying a particular commodity. Another explanation may be that households typically don't buy that commodity due to preferences or health concerns, such as in the case of alcoholic beverages or tobacco. In some studies, these zero observations are removed from the dataset. The dataset then becomes a truncated one. This leads the sample that is supposedly randomly obtained to become not random anymore as some parts were already removed. In the survey data used in this study, the number of observations taking zero values is non-negligible. Table 3 shows that zero expenditures take as much as 76 percent of the total observations. Thus, a separate analysis has to be done.

The econometric analysis capable of dealing with zero observations is the Tobit. The Tobit model was first proposed by Tobin in 1958 and was named as such because of its resemblance with the Probit model. The Tobit model describes the relationship between a non-negative dependent variable and a set of explanatory variables. It is a case of censored regression model. Censoring occurs because values below certain level, say zero, are not observed. The Tobit model assumes that there is an unobservable, usually referred to as latent, variable  $Y_i^*$  that is linearly related to a set of independent variables  $X_i$  through a vector of coefficients  $\beta$ . This relationship has a normally distributed random error term  $\varepsilon_i$ . Variable  $Y_i^*$  reflects the household's desire to spend on a certain commodity. It can be written as:

$$Y_i^* = X_i\beta + \varepsilon_i . \tag{3}$$

What is observable from the dataset is a variable  $Y_i$ , say the budget share in food, which is equal to  $Y_i^*$  whenever the latent variable is above zero and zero otherwise. This makes our dataset censored at zero. The observed variable  $Y_i$  is related to the unobservable variable  $Y_i^*$  by:

$$Y_i = \max(0, Y_i^*). \tag{4}$$

Equation (4) shows that the Tobit model uses maximum likelihood estimation (MLE) to estimate the relationship coefficient  $\beta$ . Maximum likelihood means that the  $\beta$  coefficient is estimated in such a way that it maximizes the likelihood or probability of seeing the observed data. Take note that  $\beta$  estimates the effect of  $X_i$  on  $Y_i^*$ , the unobserved variable and not the observed one,  $Y_i$ . The Tobit model will be used to study the effects of remittance on dependent variables containing zero values. The specification to be used is the same as the equation for every commodity group used in OLS and QR.

This study undertakes a cross-sectional analysis of a nationally representative sample obtained from 2003 Family Income and Expenditures Survey (FIES) conducted by the Philippine government's National Statistics Office (NSO). The FIES is a nationwide survey of households conducted every three years and contains detailed expenditure items and sources of income including remittances. In this survey, the respondents were interviewed in two separate operations using the same questionnaire. The half-year period preceding the interview was the reference period. The first round of the survey was conducted in July covering January to June and the second one was done within the first quarter of the following year covering July to December. For all food items, the "average week" consumption was employed to reduce memory bias. In categories like fuel, transportation, household operations and personal care, the reference period was the past month but in some cases, average month consumption was used. For all other categories, the past six months was used as the reference period.

The data on remittances, the subject of this study, is obtained from the income sources category cash receipts, assistance from abroad which include: (1) total cash received from family members who are contract workers, (2) total cash received from family members who are working abroad, (3) total pensions, retirement, workmen's compensation and other benefits, (4) total cash gifts, support, relief, etc., from abroad, and (5) total dividends from investment abroad. The basic Public Use Files of the FIES do not contain this kind of disaggregation, instead these items are summed and entered as one figure. Burgess & Haksar (2005) and Yang (2005) noted this problem in using it as an estimate for remittances.<sup>8</sup> It is no wonder that high income households receive large amount of remittances from

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<sup>8</sup> Burgess & Haksar(2005:p.6) noted that "data were not yet available to allow breakdown of income from abroad into remittances and investment income". Yang (2005) on the other hand mentioned in the Data Appendix that he used the household data on remittances from

abroad because the remittances estimate include dividends from abroad, pensions and workmen's compensation, income sources that are very high-income household-like. Thus, for the sake of more accurate estimate of remittance effects, the author requested for a computation of each item under the cash receipts, assistance from abroad variable.<sup>9</sup> The items (1), (2), and (4) were then summed up to account only for those receipts that can be assumed to be exogenous. Thus the term remittance used in this study refers only to a narrow definition of remittances composed of the three categories mentioned. Moreover, in kind remittances were not taken into account as well as those brought home by migrant workers.

It is important as well to define the term expenditures used in this paper. It adopts the official definition of expenditures used in the FIES which refer to the expenses or disbursements made by the family purely for personal consumption during the calendar year 2003. They exclude all expenses in relation to farm or business operations, investment ventures, purchase of real property and other disbursements which do not involve personal consumption. Gifts, support, assistance or relief in goods and services received by the family from friends, relatives, etc., are also included as part of family expenditures. Value consumed from net share of crops, fruits and vegetables produced or livestock raised by other households, family sustenance and entrepreneurial activities are also considered as family expenditures.

The survey data consists of 42,094 households. However, the regression could not make use of the whole sample due to the presence of missing data on the variable for employed members. Thus, only 40,408 observations were used. The remittance variable is used to categorize the households as remittance-receivers and non-receivers. The summary statistics of the two groups is shown in Table 4. The number of households receiving cash remittance in 2003 was 8,498 or slightly over 20 percent of the total household sample. On the average, household heads in this group tend to be older and more educated. Moreover, this group has higher per capita income than the non-remittance receiving household even after excluding the remittances they receive, has fewer young members and tend to be located more in urban areas.

For a picture of the mean budget shares for various commodity groups, these are tabulated in Table 5. On the average, remittance-receiving households spend less on food consumed at home but more on food eaten outside than those not receiving remittances. They also allocate relatively larger share of their budgets on education and housing, leisure and consumer goods but lower share on tobacco and alcohol. Whether these differences matter statistically or not is discussed in the proceeding empirical results.

#### 4. Empirical Results

The econometric results discuss three kinds of information at the most because the models were analyzed using three different techniques namely OLS, QR and censored Tobit analyses. Thus, the estimates generated are to be interpreted in different ways. The OLS estimate indicates the change in the *mean* value of the dependent variable given a change in the explanatory variable. The QR estimates on the other hand refers to the change in the *median* value of a specified quantile of the dependent variable given a change in the explanatory variable. The censored Tobit, which is done only for those expenditure categories with zero values, yields an estimate that affects the probability of the dependent variable taking a positive value.

The main concern of this study is on the significance, denoted by \*, of the interaction term REMITxLOGY. To emphasize the differences in this term across quantiles, they are graphically illustrated in Figure 1. Note that the interaction term or coefficient tells us the effect of remittance income on the slope of the Engel curve which is the coefficient of LOG(Y). In Equation (1), when there is no remittance (i.e. REMIT=0), the slope of the Engel curve refers to the coefficient of LOG(Y). However, when there is remittance (i.e. REMIT=1), the slope becomes the sum of the coefficients of LOG(Y) and REMITxLOGY because 1 multiplied by LOG(Y) is equal to LOG(Y). The slope tells us by how much the budget share changes with respect to a percentage change in total expenditures. For example,

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the Survey on Overseas Filipinos which is more accurate instead of the cash receipts from abroad contained in the APIS (Annual Poverty Indicators Survey), a substitute to the FIES during non-FIES year, which include both remittances and investment income from abroad.

<sup>9</sup> The author would like to thank Dr. Celia M. Reyes and Dr. Aniceto Orbeta, Senior Research Fellows of the Philippine Institute for Development Studies (PIDS) for the invaluable suggestions in using the FIES and Ronina Asis for gathering the necessary datasets for this study.



when given a LOG(Y) coefficient of -0.14 for food, this means that a percentage increase in total expenditures will cause a 14 percentage-point decrease in the budget share for food. The coefficient plotted in the graph measures the influence of remittance on this slope. Thus a negative (positive) coefficient simply tells us that remittance influences the Engel curve's slope to go downward (upward). Take note though that most of these interaction coefficients have very small magnitudes. By the term interaction, they need to get mixed with any large effect of total expenditures to form substantial effect. The discussion starts with food, followed by household investments such as education, medical care and housing. These will be followed by discussion on conspicuous consumption and others.

Panel A shows the interaction coefficient for food. As those of results in Adams (2005) and Castaldo & Reilly (2007), remittances induce the household to decrease the budget allocated for food. This influence is significant on the mean as shown by the OLS estimate. This is also true in all quantiles of the distribution which means that whether the budget share is low or high, remittance income affects it in a negative way. This effect however is relatively larger at the higher tails of the distribution such that the biggest magnitude of effect is approximately 2.5 times that of the smallest. We can say that those households receiving remittances who have relatively larger share on food tend to spend much less than the non-remittance receivers holding other factors constant. With the use of OLS regression analysis, this variation can not be seen since it generalizes the effect on the mean of food share.

The effect of remittance income on food in this study is consistent with the Engel's Law which states that as income rises, the share of budget going to food tends to decline. It is interesting to note however that this does not apply to the entire food basket. To examine the remittance effect on food more closely, I have divided food into those eaten at home and outside. Results are shown in Panel B and C. The effect of remittances is significant on food consumed outside but not always to food consumed at home. Panel B shows that the effect on latter is inconsistent. While OLS tells us that the effect is negative and somewhat significant, quantile regression provides differentiated results. At some lower quantiles (i.e. 0.2, 0.3 and 0.4), the effect of remittance income is in fact positive but insignificant while at higher quantiles (i.e. 0.7, 0.8, and 0.9), the effect is negative and significant. Thus we cannot generalize the effect of remittance on food eaten at home. We can only say that remittance affects food at home for those households which devote relatively higher of their resources to food consumed at home. Take note that food consumed at home includes the food prepared at home and eaten in place of work and school. For increase in income caused by remittances, such necessities may not respond significantly but may affect tendency to eat outside. Maybe remittance income influences households not to make unnecessary spending on food because they tend to eat less outside. In fact, we can say that most of the reduction in food share in Panel A can be attributed to the reduction in the share of food eaten outside. Food eaten outside covers those *regularly* bought and eaten by the family members outside of the home like snacks and lunch including daily allowance of school children for their sandwiches, softdrinks, etc. at school.

A large portion of households did not report any amount spent on food eaten outside. Thus the censored Tobit was used. The estimates are shown in Table 6. For food eaten outside, the  $\beta_2$  has a negative sign and is significant. This shows that households receiving remittance income are less likely to eat outside than those that do not. The Tobit estimate could not be interpreted straightforwardly as the OLS' because it refers to the effect of remittance on the latent variable  $Y_i^*$  or the desire to spend which is unobservable. To make it more useful, it is often used to calculate the probability that the budget share will be positive. However, this study will just dwell on its sign and significance because the objective is just to see the general effect of remittance in the expenditures of households.

We now go to the non-food expenditures particularly on human capital investment like education and health. To see the influence of remittance income on education expenditures, the models were extended to accommodate important variables such as the ratios of school-aged members<sup>10</sup> and a dummy for female-headed household. If the model does not control for these variables, the estimates of the effect of remittance may lose some reliability. At the same time, it is more realistic to compare education expenditures among only those with school-aged members so I limited the datasets on those with members 7 to 24 years of age. The interaction coefficients are plotted in Panel D of Figure 1. It shows that the effect is consistently positive and significant at all quantiles estimated.<sup>11</sup> The variation of this effect can be huge though. At higher (lower) tails of the distribution, meaning larger (smaller) share of education to total expenditures, the influence of remittances is much larger (smaller). In fact, the largest effect is 36 times the smallest.

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<sup>10</sup> This age range is assumed to be 7 to 24 years because the FIES do not provide data on exact school-age groups.

<sup>11</sup> Note that 0.1 quantile was not included as the regression rejected to produce outcome at this stage owed to the fact that this contains zero expenditure.

The OLS result is in fact 15 times the smallest coefficient. The dramatic upward trend means that remittance income becomes more important as education gets bigger share in the household budget *ceteris paribus*. Furthermore, the Tobit result supports the OLS and quantile regression findings. Table 6 shows that remittance positively influences the likelihood that the household will spend on education.

The interpretation of the results on medical care is quite difficult. Again as in education, the model has been extended to control for the probable effects of having infants and pre-school aged members in the household. Female-headed households are also assumed to have different expenditure behaviors on medical care. Despite adding these factors into the model, it is quite poor in explaining the movements in the budget share for medical care with Pseudo  $R^2$  that ranges from 0.01 to 0.077 and with OLS Adjusted  $R^2$  of 0.0535.<sup>12</sup> These numbers say that the model can only explain at most 7.7 percent of the movements in the share for medical care suggesting that medical care expenditures are randomly determined. Though the results indicate positive and significant effects in all three techniques, the model could not control for many other factors. These may suggest that remittance receivers allocate more on medical care but they may also have members that get sick more often.

The influence of remittance on housing is also positive and significant. As in the other categories mentioned, female-headed household dummy was included to control for gender effects. This is based on the assumption that female-headed households may spend more on minor repairs than male-headed households. In housing, we do not encounter the problem of zero expenditure as all observations contain some allocation on housing and minor repairs. Panel F illustrates the differentiated effects of remittances at various quantiles of the conditional distribution of budget share for housing. It indicates that except for the 0.9 quantile, remittance income significantly increases the budget share for housing. There is no pattern however as to the magnitude of this effect since the coefficient goes up and down across quantiles. It appears though that the OLS estimate seems to have captured most of those at the lower quantiles. This is probably because there are many small observations making the distribution skewed to the left.

We now turn to the effects of remittances on the tendency of households to spend on vices and consumer goods. The OLS estimate indicates that households receiving remittances tend to have lower budget shares for tobacco and alcoholic beverages than those not receiving them. Looking at the quantiles however does not lead us to confirm this since none of them shows significant effect. However, the censored Tobit result shows a negative and significant estimate suggesting that remittance income induces households to withhold giving in to their vices. Although the magnitude is very small, it is statistically different from zero. On the other hand, remittance significantly affects expenditure shares on consumer goods such as personal care items, clothing and footwear and non-durable furnishings. At the most, remittance income induces household to spend 0.12 percent more on consumer products. The more that household allocates its budget to this category, the greater the influence of remittance income becomes. This is further supported by a positive and significant estimate of the Tobit model.

In addition to its positive influence on consumer goods consumption, remittance affects as well the tendency to have more leisure expenditures. Leisure includes not only recreation but also family occasions. The coefficient of the interaction term is significant at lower conditional quantiles of the distribution. This indicates that remittance may be inducing those who are not putting much of their budget to leisure to spend more. It is not significant though at higher tails suggesting that remittance income does not induce those who are already allocating larger share of their budgets to leisure. The Tobit results provide us a hint on whether remittance affects the likelihood that household will spend any amount on leisure. In this case, it does contribute although very slightly. Further study on this may yield more interesting results especially when labor supply is taken into account. When remittance households tend to spend more on leisure activities such that they engage less in income generating activities, then remittance may be adversely affecting the local economy because production that should have otherwise been made were not made. Yang (2005) studied the effect of remittances on household labor supply (hours worked without pay in family-operated farms) via exchange rate shocks generated by the Asian financial crisis. He found negative but insignificant relationship between exchange rate shock and labor supply. He found however that it has positive effect on the likelihood to enter a new entrepreneurial activity.

It is also interesting to look at the impact of remittances on expenditures that are rarely studied like gifts. Gifts refer to those given by the household to other families as well as contributions to church and other institutions in cash and in

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<sup>12</sup> Detailed results containing the coefficients of all explanatory variables and adjusted  $R^2$ /Pseudo  $R^2$  can be requested from the author at aubreytbuga@gmail.com.

kind. Gifts comprise on the average approximately 1 percent of the household budget. At lower tails of the distribution, remittances induce gift-giving but discourage it at higher tails. This may be due to the presence of huge outliers in the data. The estimate for the 0.9 conditional quantile shows that the effect is negative and significant. This negative influence is also supported by the Tobit result. These results suggest random effects of remittance on gift-giving. It may be interesting to look deeper into how remittances can impact institutions by way of examining the magnitude of the gifts given by households. If such secondary transfers spur some economic activity, then we can say that gift-giving is one channel by which remittances can affect local development.

In terms of basic amenities, remittances tend to cause households to have bigger allocation to basic household utilities such as fuel, electricity and water. Also included in this category are transportation and communication and household operations. Since transportation is included, the model has been extended to control for the ownership of vehicle since households with cars normally would spend more on transportation. It is shown in Panel K that the importance of remittance is bigger as this category becomes more important in the household budget. Though the magnitudes are quite small, it is shown that they are statistically significantly different from zero. The largest effect can be more than twice as the lowest effect suggesting a relatively differentiated impact at various tails of the distribution.

The result of our analysis on durables can not be used to infer of the household population in 2003. This is so because the sample has been truncated to accommodate only those with non-zero expenditures which make up only about 24 percent of the entire sample. This sub sample has been estimated using the usual OLS and quantile regression as we did in other categories. It included an additional dummy for female-headed households. It is found that for those with durables expenditures, remittance income significantly influences the tendency to allocate more on durable goods except for those whose allocations are the largest (see Panel L of Figure 1). These goods include durable furnishings or equipment such as pieces of furniture, garden tools, appliances, and cars. The influence of remittance income also varies a lot because the largest effect is six times the smallest one. This positive effect of remittance is supported by the Tobit model (please see Table 6). Note that the Tobit analysis made use of the whole sample and not the truncated one. It indicated that remittance has a positive effect on the probability that a household will spend on durables.

Lastly, the effect of remittance income has been estimated in the budget shares going to other goods such as life insurance, interest in payments on loans for household expenditures and others like legal fees and losses due to fire. Taxes are also included in this category. The results shown in Panel M show negative effects that are statistically different from zero and this effect increases as one moves towards the higher quantiles. The Tobit result further asserts these findings.

The estimations done in the abovementioned discussion were all repeated but without the durables expenditure. This is because spending on durables is more randomly determined. We do not really expect a household to buy durable goods every year. Because of this, it may cause a noise on the data. Thus, as a check on the robustness of the model, expenditure on durables was taken out of the total amount of expenditures and in calculating all the budget shares. The results of this estimation did not lead to invalidation of the discussion made earlier.

## 5. Conclusion

In this study the influence of remittance income on household expenditure behavior was empirically examined. Through the use of OLS, QR and Tobit model techniques, the methodological issues of heterogeneity, heteroskedasticity and zero expenditures were taken into consideration while giving importance to the representativeness of the sample.

This study found that while there is some degree of conspicuous consumption, there are also evidences that households might be putting the extra income into better uses. Similar to findings of past research works, remittance induces households to spend more on education and housing. There is also some evidence that it influences the households to devote more on durable goods. However, claims that households receiving remittances may be spending more on conspicuous consumption may have some validity. This is shown by the strong and consistent evidence that remittance induces households to allocate more on consumer goods and leisure. But the good news is that remittances do not induce household spend more on vices like tobacco and alcohol. They also tend to allocate less on food but it should be emphasized that this does not apply to food as a whole but more to those that are regularly eaten outside. Although past studies have repeatedly examined the remittance effect on food, they have not really looked at it this way before.

This paper provided a very general view of the influence of remittances on household expenditures. A more detailed study is recommended especially on leisure and durable goods. Studying the relationship between remittance and labor supply may be more appropriate to deal with leisure. On the other hand, future studies must work on durables using an approach more relevant to its nature that requires a time element. Efforts to address this problem while taking into account the heterogeneity of the sample and the presence of zero expenditures may yield more useful results for policy analysis.

Learning from these results, we can say that remittances can potentially impact local development. Since households with remittances are more likely to devote their budget on education, the government has to complement this by improving the quality of education so that its returns will increase. Moreover, to expand the multiplier effect of consumption, the government must improve the overall investment climate so that remittances can have wider benefits. This effort also encourages households receiving remittances to invest their extra income into productive uses.

Table 1. Expenditure Categories

Category	Description
Food	food consumed at home and regularly eaten outside
Food consumed at home	actual food consumption (not expenditure) of the family during the past week; includes food prepared at home and eaten in place of work and school, home-cooked foods bought outside the home but eaten at home
Food consumed outside of home	food regularly consumed outside the home; includes food regularly bought and eaten outside the home like snacks and lunch; daily allowance of school children for their sandwiches at school
Education	tuition fees, study allowance, books, school supplies and other educational supplies
Medical Care	drugs and medicines, hospital room charges, medical charges, dental charges and other medical goods and supplies, other medical health services and contraceptives
Housing and Minor Repairs	actual house rent and imputed house rental value; house maintenance and repairs
Tobacco and Alcoholic Beverages	beer, wine, liquor, cigarettes and cigars in cash and in kind
Consumer Goods	expenditures on personal care goods such as beauty products, personal effects, and haircut services, and clothing and footwear; non-durable furnishings such as utensils and accessories
Leisure Goods	recreational goods, admission tickets to shows, admission fees to cockfights and races, and musical instruments; family occasions expenditures (food and refreshments, alcoholic beverages, services of priests, cooks, waiters, rental of space and facilities, package tours, and balloons, cakes)
Gifts	gifts outside the family, contributions to the church and other institutions
Fuel, Light and Water; Transportation and Communication; and Household Operations	fuel, light and water consumed during the reference period; expenditures on air, land, water fare, maintenance of family transport, driver's salary, gasoline/diesel; telephone bills, phone cards, postage stamps; payment for domestic services, and payment for repair and maintenance of appliances
Durable Furniture and Equipment	pieces of furniture, garden tools, appliances, cars, etc. acquired on a cash basis during the year and intended for family use; durable furniture and equipment purchased on installment basis
Others	life insurance and retirement premiums, interest in payment of loans on household expenditures and others including losses due to fire, theft, legal fees etc.

Variable	Description
$q_i$	Per capita expenditure in a commodity group in Philippine Pesos
Y	Total expenditure per capita
LOG(Y)	Logarithm of total expenditure per capita , Y
REMIT	Dummy variable with value of 1 when the household received remittances in 2003, 0 otherwise
Household Head Characteristics	
Age	Age of the household head
Education dummy 0	Dummy for no grade completed
Education dummy 1	Dummy for elementary undergraduate
Education dummy 2	Dummy for elementary graduate
Education dummy 3	Dummy for high school undergraduate
Education dummy 4	Dummy for high school graduate
Education dummy 5	Dummy for college undergraduate
Education dummy 6	Dummy for at least college graduate
Occupation dummy	Dummy variable with value of 1 when the household head's occupation is managerial, professional, technical or special, 0 otherwise
Non-agricultural business dummy	Dummy variable with value of 1 when the household head's business is non-agricultural, 0 otherwise
Female-headed household dummy	Dummy variable with value of 1 when the household head is female, 0 otherwise
Household Characteristics	
Total Members	Total family members (average for the two survey visits)
Ratio of employed members to total	Total number of employed members divided by total family members (2 <sup>nd</sup> visit only)
Ratio of infants to total	Number of members less than 1 year old divided by total members
Ratio of members 1 to 6 years old to total	Number of members 1 to 6 years old divided by total members
Ratio of members 7 to 14 years old to total	Number of members 7 to 14 years old divided by total members
Ratio of members 15 to 24 years old to total	Number of members 15 to 24 years old divided by total members
Ratio of members 25 years old and above to total	Number of members 25 years old and above divided by total members
Dummy for household with vehicle	Dummy value of 1 when household owns a vehicle, 0 otherwise
Location dummy: urban area	Dummy value of 1 when household is in the urban area, 0 otherwise

Table 3. Percentage of Zero Expenditure to Total Observations

Expenditure Category	Number of Zero Expenditure	Percentage to Total (N=42,094)
Food consumed at home	6	0.01
Food regularly eaten outside	15446	36.69
Education	12718	30.21
Medical Care	2272	5.40
Tobacco and Alcohol	7650	18.17
Consumer Goods	35	0.08
Leisure	9656	22.94
Gifts	10304	24.48
Durables	32099	76.26
Others	4092	9.72

Table 4. Summary Statistics on Explanatory Variables and Basic Information

Variable	All households (N=42,094)		Remittance-receiving households(n1=8,498)		Non-Remittance-receiving households (n2=33,596)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Logarithm of total expenditure per capita (LOG Y)	9.9527	0.7832	10.4290	0.7292	9.8220	0.7459
Interaction of remittance and log of expenditure per capita(REMIT*LOGY)	2.2453	4.2999	10.4290	0.7292	0	0
Household Head Characteristics						
Age	46.2037	14.2401	48.2470	14.6508	45.6431	14.0738
Education dummy 0: No grade completed	0.0319	0.1758	0.0148	0.1206	0.0366	0.1879
Education dummy 1: Elementary undergraduate	0.2167	0.4120	0.1157	0.3199	0.2445	0.4298
Education dummy 2: Elementary graduate	0.1963	0.3972	0.1569	0.3637	0.2071	0.4053
Education dummy 3: Highschool undergraduate	0.1251	0.3309	0.1097	0.3126	0.1294	0.3356
Education dummy 4: Highschool graduate	0.2140	0.4102	0.2567	0.4369	0.2023	0.4017
Education dummy 5: College undergraduate	0.1164	0.3207	0.1796	0.3839	0.0990	0.2987
Education dummy 6: Atleast college graduate	0.0995	0.2993	0.1666	0.3726	0.0810	0.2729
Occupation dummy	0.1542	0.3611	0.2077	0.4057	0.1395	0.3465
Non-agricultural business dummy	0.6425	0.4793	0.7942	0.4043	0.6009	0.4897
Female-headed household dummy	0.1671	0.3731	0.2778	0.4479	0.1368	0.3436
Household Characteristics						
Total Members	4.8162	2.1301	4.7882	2.0859	4.8239	2.1420
Ratio of employed members to total <sup>a/</sup>	0.4182	0.2337	0.3945	0.2163	0.4242	0.2375
Ratio of infants to total	0.0191	0.0611	0.0166	0.0571	0.0198	0.0621
Ratio of members 1 to 6 years old to total	0.1293	0.1678	0.1151	0.1611	0.1332	0.1694
Ratio of members 7 to 14 years old to total	0.1695	0.1910	0.1635	0.1917	0.1711	0.1908
Ratio of members 15 to 24 years old to total	0.1760	0.2129	0.1899	0.2196	0.1721	0.2108
Ratio of members 25 years old and above to total	0.5061	0.2526	0.5150	0.2455	0.5037	0.2545
Dummy for household with vehicle	0.0575	0.2328	0.1152	0.3193	0.0416	0.1998
Location dummy: urban area	0.4954	0.5000	0.6382	0.4806	0.4563	0.4981
Total expenditure per capita (Y)	29610	34738	45090	44981	25363	29983
Total income per capita	35597	63717	54574	62335	30391	63103
Non-remittance income per capita	31900	60173	37402	47603	30391	63103
Remittance income per capita	3697	16935	17172	33179	0	0
Remittance Dummy (REMIT)	0.2153	0.4110	1	0	0	0

a/ Contains 1686 missing data(N=40408, n<sub>1</sub>=7699, n<sub>2</sub>=32709)

Note: 16 regional dummies not shown here with ARMM as omitted were included in the model

Source: Family Income and Expenditure Survey, National Statistics Office, Philippines

Table 5. Mean Budget Share by Type of Household

Category	All households (N=42094)		Households receiving remittance (n1=8498)		Households not receiving remittance (n2=33596)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Food	0.5135	0.1403	0.4388	0.1356	0.5340	0.1345
Food consumed at home	0.4712	0.1533	0.3918	0.1388	0.4930	0.1498
Food eaten outside	0.0424	0.0553	0.0471	0.0501	0.0411	0.0565
Education <sup>1/</sup>	0.0317	0.0539	0.0501	0.0688	0.0266	0.0477
Medical care	0.0177	0.0433	0.0240	0.0539	0.0160	0.0397
Housing and Repair	0.1192	0.0858	0.1410	0.0939	0.1132	0.0824
House Rent	0.1130	0.0833	0.1332	0.0916	0.1074	0.0800
Minor Repair	0.0062	0.0262	0.0077	0.0308	0.0058	0.0247
Tobacco and Alcohol	0.0250	0.0293	0.0174	0.0229	0.0272	0.0304
Alcoholic Beverages	0.0096	0.0153	0.0066	0.0115	0.0104	0.0161
Tobacco	0.0154	0.0212	0.0107	0.0170	0.0167	0.0221
Consumer Goods	0.0695	0.0345	0.0762	0.0393	0.0676	0.0328
Personal Care	0.0396	0.0207	0.0425	0.0244	0.0389	0.0196
Clothing	0.0276	0.0220	0.0314	0.0244	0.0265	0.0212
Non-durables	0.0023	0.0050	0.0023	0.0056	0.0023	0.0049
Leisure	0.0252	0.0383	0.0310	0.0427	0.0236	0.0369
Recreation	0.0031	0.0077	0.0047	0.0102	0.0026	0.0068
Family Occasion	0.0221	0.0371	0.0263	0.0411	0.0210	0.0358
Gifts <sup>2/</sup>	0.0094	0.0247	0.0105	0.0228	0.0091	0.0251
Fuel, Transportation and Household Operations	0.1399	0.0592	0.1617	0.0664	0.1340	0.0556
Fuel, Electricity and Water	0.0679	0.0310	0.0700	0.0311	0.0673	0.0310
Transportation and Communication	0.0539	0.0463	0.0712	0.0531	0.0492	0.0430
Household Operations	0.0181	0.0178	0.0205	0.0225	0.0175	0.0162
Durables <sup>3/</sup>	0.0655	0.0923	0.0757	0.1053	0.0614	0.0862
Others	0.0386	0.0475	0.0335	0.0473	0.0400	0.0475
Taxes	0.0104	0.0263	0.0128	0.0282	0.0097	0.0257
Others	0.0282	0.0343	0.0206	0.0319	0.0303	0.0346

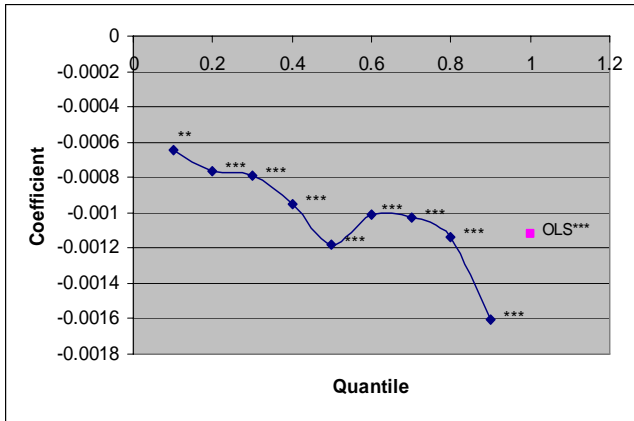
## Notes:

1/ Mean budget share in education for households with school-aged members (i.e. 7 to 24 years old): N=32054, n1=6536, n2=25518

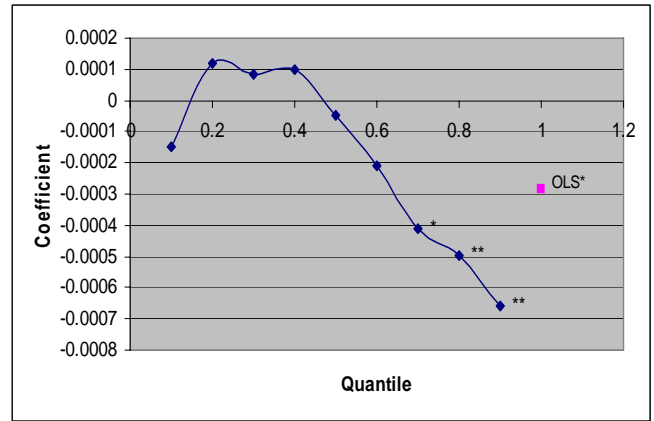
2/ Extreme value (1 observation) was excluded: N=42093, n1=8497, n2=33596

3/ Includes only those with durable goods expenditures: N=9993, n1=2801, n2=7192

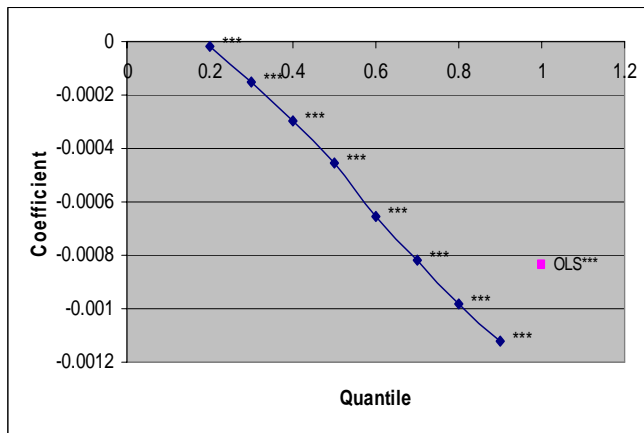
Figure 1. Coefficient of the Interaction Term: Remittance Dummy x Log of Expenditure per Capita <sup>1/</sup>



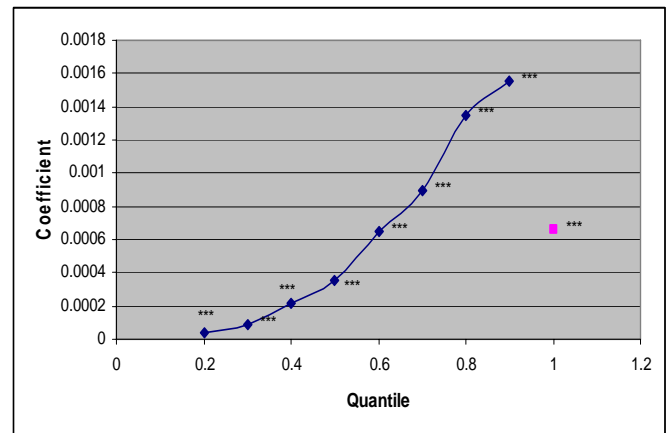
A. Food



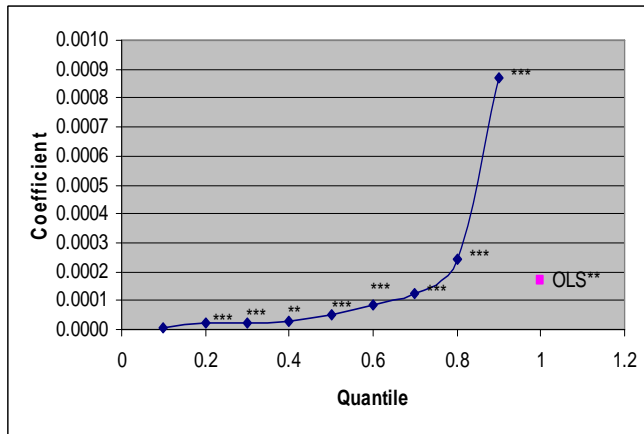
B. Food Consumed at Home



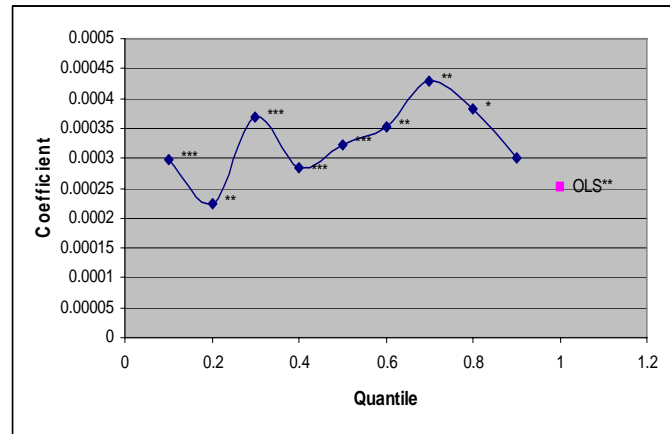
C. Food Regularly Eaten Outside



D. Education



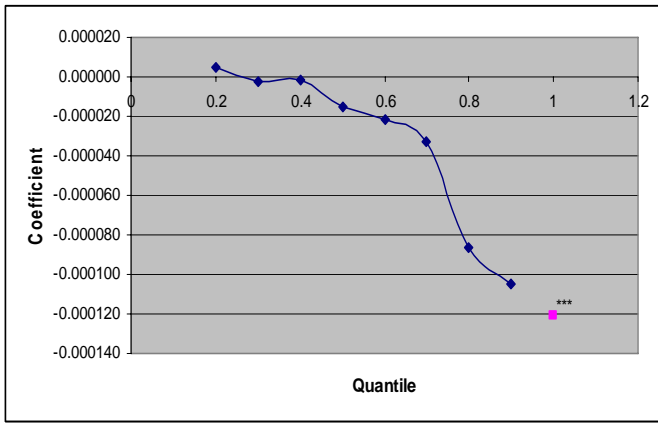
E. Medical Care



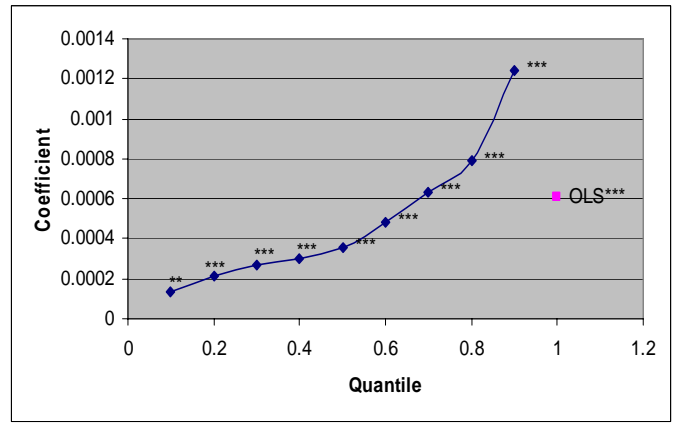
F. Housing and Minor Repair

<sup>1/</sup> Significance at 0.05=\*, 0.01=\*\*, and 0.001=\*\*\*

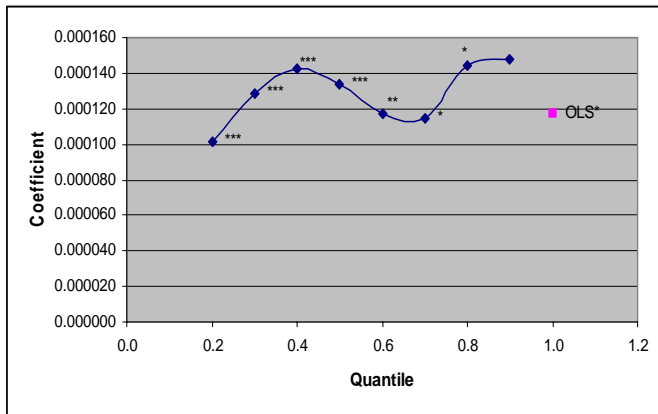




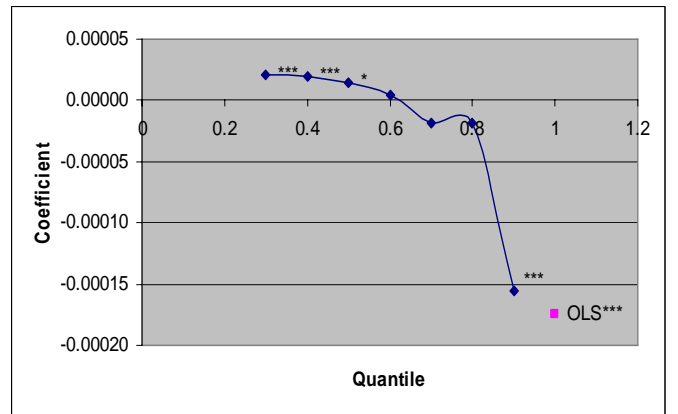
G. Tobacco and Alcoholic Beverages



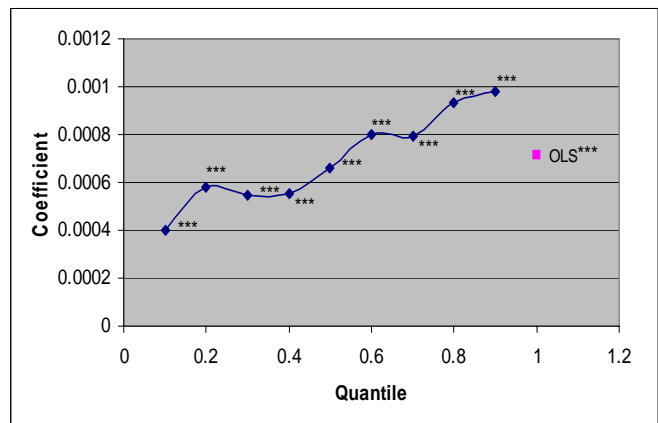
H. Consumer Goods



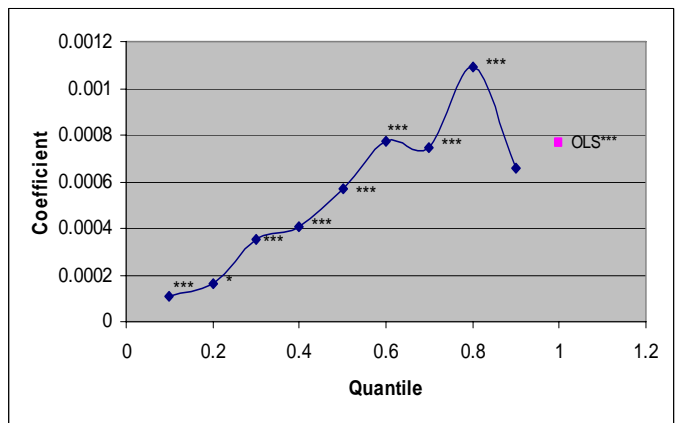
I. Leisure



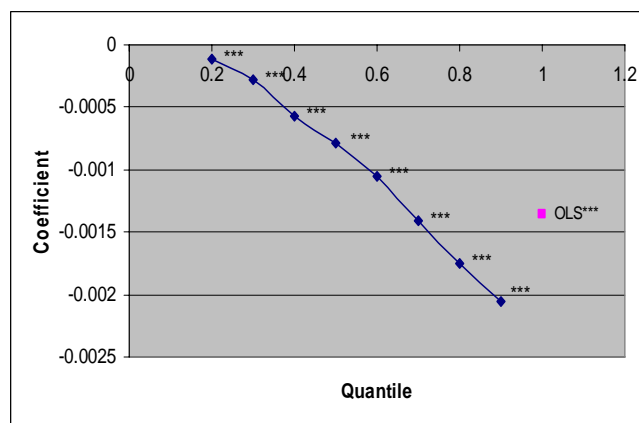
J. Gifts



K. Fuel, Transportation, Communication and Household Operations



L. Durables <sup>a/</sup>



M. Others

Note: <sup>a/</sup> Regression coefficient on sub-sample of 9,695 (non-zero expenditures only)

**Table 6. Tobit Model Results**

Variable	Food Eaten Outside	Education	Tobacco and Alcohol	Medical Care	Consumer Goods	Leisure	Gifts	Others	Durables
Logarithm of total expenditure per capita (LOG Y)	0.0254***	0.0280***	-0.0055***	0.0146***	0.0029***	.02437***	0.0126***	0.0195***	0.1098***
Interaction of remittance and log of expenditure per capita(REMIT*LOGY)	-0.0011***	0.0007***	-0.0002***	0.0002**	0.0006***	.0001*	-0.0002***	-0.0014***	0.0005*
Age	-0.0005***	0.0007***	-0.0003***	0.0004***	-0.0003***	.0001***	0	0	-0.0012***
Education dummy 1: Elementary undergraduate	0.0047*	0.0089***	0.0030**	0.0017	0.0057***	.0096***	0.0020*	-0.0076***	0.0166*
Education dummy 2: Elementary graduate	0.0087***	0.0140***	0	0.0015	0.0088***	.0128***	0.0025**	-0.0115***	0.0231***
Education dummy 3: Highschool undergraduate	0.0073**	0.0146***	-0.0007	0.0014	0.0103***	.0124***	0.0021*	-0.0139***	0.0205**
Education dummy 4: Highschool graduate	0.0092***	0.0201***	-0.0057***	0.0003	0.0112***	.0112***	0.0021*	-0.0066***	0.0119
Education dummy 5: College undergraduate	0.0063*	0.0277***	-0.0095***	-0.0024	0.0111***	.0088***	0.0009	-0.0001	-0.0009
Education dummy 6: Atleast college graduate	0.0025	0.0328***	-0.0144***	-0.0065***	0.0088***	.0051**	-0.001	0.0256***	-0.0367***
Occupation dummy	-0.0143***	0.0045***	-0.0045***	-0.0032***	-0.0027***	-.0023***	0.0002	0.0043***	-0.0124***
Total Members	0.0096***	0.0036***	0.0004***	0.0006***	0.0004***	.0028***	0.0006***	0.0029***	0.0139***
Location dummy: urban area	0.0069***	-0.0036***	-0.0028***	-0.0019***	-0.0021***	-.0094***	-0.0022***	-0.0112***	-0.0165***
Non-agricultural business dummy	0.0235***	-0.0065***	0.0001	0.0006	0.0041***	-0.0001	-0.0032***	-0.0079***	0.0213***
Ratio of employed members to total <sup>a/</sup>	0.0264***	-0.0510***	0.0160***	-0.0076***	0.0044***	-.0046***	0.0108***	0.0130***	-0.0175***
Female-headed household dummy	-----	-0.0031**	-0.0177***	-0.0003	0.0028***	-0.0005	-----	-----	-0.0158***
Ratio of infants to total	-----	-----	-----	0.0840***	-----	-----	-----	-----	-----
Ratio of members 1 to 6 years old to total	-----	-----	-----	0.0153***	0.0033**	.0183***	-----	-----	-----
Ratio of members 7 to 14 years old to total	-----	0.0698***	-----	-----	-----	-----	-----	-----	-----
Ratio of members 15 to 24 years old to total	-----	0.0630***	0.0047***	-----	0.0140***	-----	-----	-----	-----
Ratio of members 25 years old and above to total	-----	-----	0.0126***	-----	-----	-----	-----	-----	-----
_se	0.0643***	0.0531***	0.0313***	0.0412***	0.0329***	.0433***	0.0274***	0.0471***	0.1277***
Constant	-0.3024***	-0.3330***	0.0730***	-0.1542***	0.0542***	-.2617***	-0.1152***	-0.1611***	-1.2198***
Pseudo R2	-0.4222	-0.1192	-0.0555	-0.0193	-0.0203	-0.0542	-0.0371	-0.0624	0.4068
N	40408	31220	40408	40408	40408	40408	40407	40408	40408
Censored at 0	14542	5119	6814	2142	28	9039	9772	3535	30713
Uncensored	25866	26101	33594	38266	40380	31369	30635	36873	9695

a/ Contains 1686 missing data(N=40408, n<sub>1</sub>=7699, n<sub>2</sub>=32709)

Note: 16 regional dummies not shown here with ARMM as omitted were included in the model, Source: Family Income and Expenditure Survey, National Statistics Office, Philippines

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