3

Poverty Alleviation in the Philippines: Comparing the Effects of Food and Nonfood Grants in Eastern Samar and Agusan del Sur

Mitzie Irene P. Conchada and John Paolo R. Rivera

As the Philippines moves towards a more sustainable economic growth, the battle against poverty also intensifies. Various poverty alleviation programs have been implemented, and some of them could be classified as food and nonfood grants. For instance, the Department of Social Development and Welfare (DSWD) and the Department of Education (DepEd) work hand in hand to provide feeding programs in public schools where most of the poor can be targeted. These feeding programs aim to target the poor and help them cope up with higher prices of food and other basic commodities. Moreover, feeding programs help poor children to focus on their studies and become more productive individuals. It helps address the demand-side concern of food security for the poor.

There is a huge part of the literature on food programs that point out to the fact that these programs can have a positive effect on education outcomes (Manasan & Cuenca, 2007). For instance, the Food for School Program (FSP) in 2005, though short-lived, led to increased investment in

human capital through higher school attendance and increased patronage of other social services such as health (Manasan & Cuenca, 2007). On the contrary, Standing (2008) stressed several reasons why food programs may not be effective. Targeting the poor and monitoring the effectiveness of the program are seen as two of the major issues. Once this happens, the purpose is defeated and resources are wasted. This is the reason why advocates of nonfood programs are adamant in supporting such. Nonfood programs can come in the form of conditional cash grants, scholarships, or credit programs.

In an earlier study on food and nonfood programs conducted by Conchada and Rivera (2013), nonfood programs turned out to be more effective than food programs at least in Pasay City. It has contributed to an improved school participation rate as well as reduced incidence of hunger. The nonfood grant allows more flexibility on the part of the household head to invest in the education and health of family members, given that it is an investment good while the food grant is more of a consumption good.

Given such background, the study would like to extend the research of Conchada and Rivera (2013) to two other provinces in the Visayas and Mindanao regions, where the incidence of poverty is very high. Similarly, this study will focus on the following key question: Which between the food-grant and nonfood-grant programs of the government has a greater influence in raising the welfare of the poor in Eastern Samar and Agusan del Sur as per the Community-Based Monitoring System (CBMS) survey is concerned? Given this key question, the objectives of this study are as follows:

- To show that one grant is superior than the other in enhancing the welfare of the poor, theoretically and empirically; and
- To identify the facets that will contribute to increasing school participation and reducing the state of hunger of households by implementing an empirical framework incorporating the various government-sponsored programs to alleviate poverty. Hence, this study will be able to determine the significant government programs that can increase school participation and reduce state of hunger.

The results of this study will be used to complement the findings of the previous study of Conchada and Rivera (2013). Moreover, it aims to suggest policy recommendations to address hunger and absenteeism among the poor in the provinces of Eastern Samar and Agusan del Sur. In the 2012 official poverty statistics of the Philippine Statistics Authority, Eastern Samar had the highest poverty incidence (59.4%) in Region 8, while Agusan del Sur had the highest poverty incidence (38.6%) in the Caraga Region. The type of

program, whether it is a food or nonfood grant or a cash grant, will matter to people who cannot afford to send their children to school or provide a well-balanced meal. Moreover, this will also help government maximize its very limited resources.

Food and Nonfood Grants in the Phippines: Food-for-School Program (FSP) and the Conditional Cash Transfer (CCT) Program

Incidence of Hunger and Malnutrition and the FSP

For most poor families, hunger is one of the problems they have to deal with on a daily basis. As defined in Conchada and Rivera (2012), hunger is the painful sensation due to inadequate and irregular food intake. If hunger is prolonged, it may lead to diseases such as malnutrition (particularly undernutrition). The latest Social Weather Station (SWS) survey (http://www.rappler.com/move-ph/issues/hunger/82144-sws-hunger-survey-2015) reported that there was a slight improvement in the fight against hunger. Self-reported hunger among households fell from 19.9% in 2012 to 18.3% in 2014, with the National Capital Region experiencing the biggest drop from 23.5% to 16%. On the other hand, severe hunger increased slightly in the past decade from 3% to 3.5% as seen in Table 1. The recent developments in the fight against hunger could be attributed to the government's efforts on improving feeding programs in public schools and the private sector's initiative, particularly nongovernmental organizations, in sponsoring similar programs.

Table 1. Incidence of Hunger in the Philippines

Severity of Hunger/ Area	2006		2006			2007	2014	
	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	
Severe hunger	2.6	3.9	4.2	3.4	4.6	3.9	4.0	3.5
Number of families	400,000	600,000	700,000	580,000	800,000	670,000	696,000	
Moderate hunger	—	—	12.7	10.1	12.3	15.1	15.0	
Number of families	—	—	2,209,000	1,757,000	2,140,000	2,597,000	2,580,000	
Total hunger incidence	15.5	16.7	16.9	13.9	16.9	19.0	19.0	18.3
National Capital Region	16.7	21.0	18.3	15.0	12.8	17.7	20.7	16.0
Luzon	18.0	13.7	14.7	10.0	14.7	17.7	18.3	19.3
Visayas	13.3	14.3	16.0	17.7	19.7	19.0	15.3	16.6
Mindanao	12.0	21.7	21.0	17.3	21.3	22.3	22.7	19.2

Source: Social Weather Stations (SWS); Department of Education (DepEd) (2007).

In the latest Philippine Nutrition Survey, as reported by Rappler.com (2014), there has not been much progress in the nutritional status of Filipino children in the past five years since 2008. It was reported that the prevalence of underweight among children ages 0 to 5 years old in 2013 was 19.8% compared to 20.7% in 2008. Moreover, the prevalence of stunting was recorded at 30.3% in 2013 compared to 32.3% five years ago (http://www.rappler.com/move-ph/issues/hunger/61824-2013-national-nutrition-survey). One of the items in the Millennium Development Goals (MDG) is to cut in half the number of children under age 5 who are malnourished. The goal is to temper it to 13.6% by the year 2015.

Moreover, estimates from the 2012 Family Income and Expenditure Survey (FIES) conducted by the National Statistics Office (NSO) revealed a 10% subsistence incidence among Filipino households in 2012. This information has not changed much since 2003, when subsistence incidence was 10.1%. In 2003, the subsistence incidence increases for households with six or more family members as seen in Table 2, which implies that a bigger family size for a poor family has a higher chance of falling below the food threshold.

Table 2. Subsistence Incidence by Household Size (2003).

Household Size	Total Number of Households (Thousands)	Subsistence Poor (Food–Poor)	
		Number of Households (Thousands)	Incidence
All households	16,480	1,671	10.1
1	689	9	1.3
2	1,636	38	2.3
3	2,651	95	3.6
4	3,320	186	5.6
5	3,018	287	9.5
6	2,163	320	14.8
7	1,397	285	20.4
8	779	197	25.3
9	428	131	30.6
>10	399	121	30.3

Source: National Statistical Coordination Board (2011); Family Income and Expenditure Survey (2003); Department of Education (2007).

As discussed by Conchada and Rivera (2012), food insecurity brought about by poverty can lead to myriad of health problems and this includes malnutrition. A child below 5 years old experiencing malnutrition is more prone to poor performance in school and high dropout rates. Long-term measures to address the problem on food insecurity or hunger include improving the supply side such as logistics and infrastructure and increasing purchasing power, but it may take time for the desired outcome to take place. Instead, the government implemented short-term programs such as the FSP (Conchada & Rivera, 2012).

Perceived Benefits of the FSP

There are a number of benefits from the Food-for-School Program. The first benefit is improved education quality and efficiency. Conchada and Rivera (2012) mentioned that investments in the nutrition and health of the child can result in improved performance and a lower dropout rate. Second, it addresses short-term hunger and improves cognition, which results in better performance in school as manifested in higher test scores. Third, it leads to higher enrollment rates, which again translates to higher probability of improved test scores. Lastly, it promotes community participation, which creates many positive externalities. The program allows communication between the teachers, parents, and school officials as they coordinate regarding the feeding program.

Conditional Cash Transfer (CCT) Program

An example of a nonfood grant is the conditional cash transfer. The program is aimed at providing assistance to extremely poor households to improve their health, nutrition, and education particularly children aged 0 to 14. For the chosen households to continue to avail the transfer, they have to comply with certain conditions: pregnant women must avail of pre- and postnatal care and be attended by a trained health professional during childbirth, parents must attend family development sessions; 0- to 5-year-old children must receive regular preventive health checkups and vaccines, 3- to 5-year-old children must attend daycare or preschool classes at least 85% of the time, 6- to 14-year-old children must enroll in elementary or high school and must attend at least 85% of the time, and 6- to 14-year-old children must receive deworming pills twice a year (Conchada & Rivera, 2012). As of September 2014, the CCT in the Philippines is implemented in 144 cities and 1,438 municipalities in 80 provinces, and a total of 4.3 million households are enrolled.

Framework of the Study and Methodology

To show which between food grants and nonfood grants are more effective in targeting beneficiaries, we appeal to the theoretical framework employed by Conchada and Rivera (2013). There is a need to show the superiority of the nonfood grant over the food grant in uplifting the welfare of the poor to rationalize the phasing out of the FSP by the government due to its ineffectiveness. Instead, the government preferred nonfood grants.

The theoretical underpinnings of Conchada and Rivera (2013) employed a baseline model that showed the welfare (i.e., measured by utility) of a representative household without any subsidy from the government. They appealed to the solution from a utility maximization problem (UMP). A Cobb–Douglas utility function and a linear budget constraint for a typical household were used to solve for the optimal basket of consumption (i.e., Marshallian demand functions).

Afterwards, the UMP would incorporate the role of an exogenous amount of food grants provided by the government. Here, Conchada and Rivera (2013) assumed that the introduction of food grants will allow the poor household to spend all household income on all other goods (i.e., good *Y*) but still allow for the consumption of the other good (i.e., good *X*) through the exogenous food grant (i.e., ω). Thus, it can be construed that since the poor household will not spend on *X* due to the exogenous ω, an increase in the consumption of *Y* will happen since the representative household can now exhaust income on *Y*. Therefore, the food grant was able to increase the utility level, from the baseline model, of the representative household since it was able to increase its consumption of *X* and *Y*, provided that $X < \omega$.

Then, Conchada and Rivera (2013) did another iteration of the UMP. This time, instead of incorporating an exogenous food grant, a nonfood grant in the form of a cash grant was included. The cash grant is equal to the price of *X* times the number of food grants that the government was supposed to provide. This technically altered the linear budget constraint.

The utility levels from the baseline model, the food grant iteration, and the cash grant iteration revealed that the utility of a representative household is higher if a nonfood grant is provided as shown below:

No Government Transfer		**Exogenous Noncash Grant (Food)**		**Nonfood Grant (Cash)**
	<		<	
$U^* = \left(\frac{\alpha Z}{\alpha P_1 + \beta P_1}\right)^{\alpha} \left(\frac{\beta Z}{\alpha P_2 + \beta P_2}\right)^{\beta}$		$U^*_{FG} = \omega^{\alpha}(Z/P_2)^{\beta}$		$U^*_{CG} = \left(\frac{\alpha Z + \alpha P_1 \omega}{\alpha P_1 + \beta P_1}\right)^{\alpha} \left(\frac{\beta Z + \beta P_1 \omega}{\alpha P_2 + \beta P_2}\right)^{\beta}$

Note: For the complete details of the UMP, refer to Conchada and Rivera (2013).

Meanwhile, to empirically show which between a food grant or a cash grant is more effective in enhancing the welfare of households, a functional relationship between the government-sponsored programs against poverty and target variables, namely, school participation and state of hunger, was established. The results of the regression will provide policy recommendations for improving the delivery of the transfers. The functional relationships are shown in Equation 1 and Equation 2:

$$SPR_i = f(FEEDPROG_i, HEALTH_i, SCHOLAR_i, TRAINING_i, HOUSING_i, CREDIT_i, FSIZE_i, TOTIN_i) + \varepsilon_i \quad (1)$$

$$SHG_i = f(FEEDPROG_i, HEALTH_i, SCHOLAR_i, TRAINING_i, HOUSING_i, CREDIT_i, FSIZE_i, TOTIN_i) + \varepsilon_i \quad (2)$$

To underscore the effect of educational attainment and employment status to school participation and the state of hunger, an equation capturing the contribution of educational attainment and employment status to income and then income to school participation and state of hunger was established. As a matter of technicality, Equation 3 is also necessary because income is deemed to be endogenous with educational attainment and employment status (one may argue that educational attainment is also endogenous with employment status, warranting another behavioral equation).

The reason behind Equation 3 is those who are able to acquire higher educational level are those who can have access to higher levels of income and therefore are those who can send children to school and can reduce the chances of experiencing hunger. Equation 3 will be estimated using linear generalized method of moments (GMM). Afterward, the predicted values of total income will be used as the representation of income influencing school participation and the probability of household hunger in estimating Equation 1 and Equation 2.

$$\begin{aligned} TOTIN_i = {} & \alpha_0 + \alpha_1 ELEMUNDR_i + \alpha_2 ELEMGRAD_i + \alpha_3 HSUNDR_i \\ & + \alpha_4 HSGRAD_i + \alpha_5 PSUNDR_i + \alpha_6 PSGRAD_i + \alpha_7 COLUNDR_i + \alpha_8 COLGRAD_i \\ & + \alpha_9 WMSPHD_i + \alpha_{\mathbf{0}}\ PERMANENT_i + \alpha_{\mathbf{1}}\ SEASONAL_i + \alpha_{\mathbf{2}}\ TEMPORARY_i + \nu_i \end{aligned} \quad (3)$$

where

SPR_i is the school participation rate of household *i* measured by the

number of children in the household with age 6 to 12 who are in grade school divided by the total number of children in the household with age 6 to 12;

SHG_i is the variable for the construct hunger. It is measured by the number of times a household consumes food. Prevalence of hunger is an outcome of poverty being addressed by the government through transfers;

$FEEDPROG_i$ is an indicator whether a household is a recipient of a feeding program sponsored by the government. It represents the food grant projects of the government such as the FSP program. It is a dummy variable assuming a value of 1 if the household availed of feeding programs and 0 otherwise. The studies of Del Rosso (1999), Moock and Leslie (1986), and Glewwe and Jacoby (1994) suggested the use of this variable for the feeding program construct; and

$HEALTH_i$, $SCHOLAR_i$, $TRAINING_i$, $HOUSING_i$, and $CREDIT_i$ are indicators whether a household is a recipient of government-sponsored programs specifically health, scholarship, training, housing, and credit programs, respectively. These represent the various nonfood grants by the government. It assumes a value of 1 if the household availed of such programs and 0 otherwise. The studies of Del Rosso (1999), Moock and Leslie (1986), and Glewwe and Jacoby (1994) suggested the use of this variable for the nonfood grant construct.

On a mathematical and statistical perspective, if the coefficient of the feeding program is less than the coefficients of the nonfood grants, then it can be deemed that the nonfood grant is superior to a food grant in enhancing welfare. Meanwhile, if the coefficients of the government-sponsored programs are positive and statistically significant in influencing school participation, then it can be interpreted that these programs are relevant in enhancing school participation. On the other hand, if the coefficients of the government-sponsored programs are negative and statistically significant in influencing state of hunger, then it can be understood that these programs are also relevant in reducing hunger.

$FSIZE_i$ is family size, which is expected to have a negative relationship with school participation rate. *Ceteris paribus*, we expect that larger households will have a lower school participation rate because they will

be inclined to spend more on immediate needs like food, clothing, and shelter, and education may be ancillary. Hauser and Daymont (1977), Biblarz and Raftery (1999), Borromeo, Castillo, and Lopez (2007), and Tullao and Rivera (2009) suggested the inclusion of this variable.

$TOTIN_i$ is total household income comprised of earned family income, internal and external remittances, and other sources of income. This is suggestive of the financial competence of households in acquiring basic necessities as suggested by Borromeo, Castillo, and Lopez (2007) and Tullao and Rivera (2009). This variable is also necessary to identify households who are poor and warranting the need for transfers.

The employment status of the household head includes $PERMANENT_i$, $SEASONAL_i$, and $TEMPORARY_i$, which are indicators whether the household head is employed permanently, seasonally, or temporarily, respectively. Note that temporary employment is the base category. By a priori, being permanently employment can increase school participation and decrease the likelihood of hunger because of the stable flow of income necessary to finance educational spending and food consumption. Lillard and Willis (1994) and Binder and Woodruff (1999) suggested the relevance of these variables.

$ELEMUNDR_i$, $ELEMGRAD_i$, $HSUNDR_i$, $HSGRAD_i$, $PSUNDR_i$, $PSGRAD_i$, $COLUNDR_i$, $COLGRAD_i$, and $WMSPHD_i$ are indicators of the highest educational attainment of the household head. It can be elementary undergraduate, elementary graduate, high school undergraduate, high school graduate, postsecondary undergraduate, postsecondary graduate, college undergraduate, college graduate, and with graduate studies, respectively. The category of no educational attainment is the base category. By a priori, a higher educational attainment of the household head implies higher chances of seizing lucrative job opportunities and acquiring meaning employment that will provide for sufficient food consumption. Likewise, as per the empirical results of Borromeo, Castillo, and Lopez (2007) and Tullao and Rivera (2009), educated parents beget educated children so the vicious cycle of poverty can be stopped.

ε_i and ν_i are the stochastic disturbance terms that capture all other variables that were not included in the equations.

Methodology

The CBMS Survey for Eastern Samar (2006) and Agusan del Sur (2006) will be utilized to estimate Equation 1 and Equation 2. The CBMS is a poverty and policy-impact monitoring system using a database of household information at the local level for local planning, program implementation, and facilitation. Descriptive statistics are presented to provide an immediate picture of the extent to which government programs reach their intended households. The data set will be subjected to the linear GMM estimation to analyze the statistical significance of the government-sponsored programs in improving school participation as in Equation 1. Meanwhile, the maximum likelihood estimation (MLE) will be used to estimate the statistical significance of the exogenous variables stated in Equation 2 to the probability that a household will experience the state of hunger.

Since the data set to be used in Equation 1 is cross-sectional, heteroscedasticity is prevalent (Gujarati & Porter, 2009). According to Baum, Schaffer, and Stillman (2003), a useful approach in addressing heteroscedasticity of unknown form is to employ the GMM introduced by Hansen (1982). It makes use of the orthogonality conditions to allow for efficient estimation in the presence of heteroscedasticity of unknown form. Thus, with heteroscedasticity, the GMM estimator is more efficient than any other estimator (Baum et al., 2003). GMM estimation is also advantageous because of its robustness to differences in the specification of the data generating process (DGP) and its capacity to automatically address endogeneity. According to Greene (2003), under the GMM, a sample mean or variance estimates its population counterpart regardless of the underlying process. It provides this freedom from unnecessary distributional assumptions. However, it must be used with caution. That is, if more is known about the DGP's specific distribution and other statistical properties, the GMM may not be able to maximize the available information contained in the data. Hence, according to Greene (2003), the natural estimators of the parameters of the distribution become inefficient. Thus, the method of maximum likelihood estimation (MLE) is more appropriate because it makes use of the out-of-sample information and generates more efficient estimates.

Since the endogenous variable in Equation 2 is a binary dummy variable, it will be modeled as a standard logistic probability model. For a binary outcome data, the dependent variable takes one of two values as shown by Equation 4:

$$y = \begin{cases} 1 & \text{with probability } p \\ 0 & \text{with probability } 1 - p \end{cases} \quad (4)$$

From Equation 31, the dependent variable assumes a value of 1 if the household experiences hunger, and assumes a value of 0 if otherwise. There is no loss of generality in setting the values to 1 and 0 if all that is being modelled is p, which determines the probability of the outcome (Cameron & Trivedi, 2005). For a comprehensive discussion on the standard logistic probability model, refer to Rivera and See (2012).

The logistic specification of the variables influencing the probability that the household will experience hunger is given by Equation 5.

$$\mathrm{h}\left(\frac{p_i}{1-p_i}\right) = f(FEEDPROG_i, HEALTH_i, SCHOLAR_i, TRAINING_i, HOUSING_i, CREDIT_i, FSIZE_i, TOTIN_i) + \varepsilon \quad (5)$$

where p_i is the probability that a household experiences hunger.

Results and Discussion

Eastern Samar

Eastern Samar is one of the six provinces in the Eastern Visayas Region. The province was listed as second class based on its average income mainly coming from palay, coconut, abaca fiber, and fish production. It is considered as one of the poorest provinces in Eastern Visayas. According to NSCB (2011), it has the highest poverty incidence of population and families in the region with 54.0% and 45.8%, respectively. The statistics on subsistence incidence of population and subsistence incidence of families scored the highest in the province with 32.2% and 25.7%, respectively (NSCB, 2011). Figures on education and health depict a rather unpromising picture. Though it had the highest elementary net enrollment ratio in school year 2010–2011 in the region, its elementary cohort survival rate was the lowest with only 64.7% compared to 86.0% in Southern Leyte (NSCB, 2011). There are only 84 barangay health stations, 11 government hospitals, and 5 private hospitals despite the fact that Eastern Samar is the third largest province in terms of population in the region. As such, the prevalence of underweight children was 13.4% in 2010 (NSCB, 2011). Table 3 shows the descriptive statistics

of Eastern Samar based on the CBMS data set. A total of 1,004 households were included in the survey, mostly permanently employed (499 household heads).

Few households (46%) qualified and availed of the food and nonfood programs of the government in 2006. Only 2% availed of the feeding program while health programs had the highest participation from households.

Equation 1 for Eastern Samar utilized the GMM to determine the effect of the food program, nonfood programs, income, and other demographic variables on school participation of children with age 6 to 12. The regression results are summarized in Table 4. The significant variables were nonfood programs such as scholarship, housing, and household size.

Table 3. Descriptive Statistics for Eastern Samar (2006)

Variable	Number of Households	Mean	Standard Deviation	Minimum	Maximum	Skewness
School participation rate (if the number of children between 6 to 12 years old is positive)	1,004	0.359	0.461	0	1	0.576
Total household income (for total household income ≤ 10,000,000 only)	1,000	72,398.46	108,848.5	0	1,418,000	5.496
Household size (for household size ≤ 20 only)	1,004	4.513	2.261	1	17	0.662
Number of children aged 6 to 12 who are attending elementary school	1,004	0.359	0.461	0	6	0.576
State of Hunger	1,004	—	—	—	—	—
Experienced hunger	142	—	—	—	—	—
Did not experience hunger	862	—	—	—	—	—
Received government programs (out of 1,003)						
Feeding	22	—	—	—	—	—
Health	346	—	—	—	—	—
Scholarship	22	—	—	—	—	—
Training	13	—	—	—	—	—
Housing	2	—	—	—	—	—
Credit	61	—	—	—	—	—

Table 4. GMM Linear Regression Estimates for Eastern Samar

Variable (Dependent Variable: SPR_i)	Coefficient	*p*-Value
$FEEDPROG_i$	0.0387	0.713
$HEALTH_i$	–0.0028	0.928
$SCHOLAR_i$	0.1840	0.045
$TRAINING_i$	–0.2039	0.104
$HOUSING_i$	0.3798	0.000
$CREDIT_i$	–0.0631	0.306
$TOTIN_i$	0.0000	0.612
$HSIZE_i$	0.0483	0.000
Constant	–0.5460	0.063
Number of households		1,003
F*(11, 8977)*		20.55
Prob > *F*		0.0000
R^2		0.0634

The food program in the Eastern Samar data set was represented by the variable *FEEDPROG*. This variable is a government or private-sector program aimed at providing supplemental feeding program to children aged 0 to 5. Results showed that this variable was not significant in contributing to a higher school participation rate.

The nonfood program variables scholar and housing were the most significant variables that affected school participation rate in Eastern Samar. Households who availed of a scholarship program will most likely enjoy an increase of 18.4% in school participation rate. In addition, if the household availed of the housing program, their school participation rate increases by 38%. These nonfood programs directly affect children between the ages of 6 to 12 avoid dropping out of school. The variable household size was also significant. As the household size increases, school participation rate increases also but only by 0.4%. This is contrary to a priori expectations since more family members would mean fewer resources divided among the family members, especially for a poor family.

Equation 2 for Eastern Samar utilized MLE to determine the effect of the food programs, nonfood programs, income, and other demographic variables on the state of hunger. Table 5 summarizes the marginal effects with the assumption that the people did not benefit from the food and

nonfood programs of the government. The overall value of the dependent variable in the marginal effects after logit model implies that there is a 12.4% probability of a family experiencing hunger if there are changes in any of the independent variables. However, there are no significant variables that affect the incidence of hunger. The same is true for the marginal effects with the assumption that the people benefited from the food and nonfood programs of the government. The low turnout rate of those who availed of the food and nonfood programs in Eastern Samar could have been one of the reasons why no variable turned out to be significant. Government programs such as health programs are not availed by the majority of the population of the province because there are only 84 barangay health stations and 11 public hospitals. Moreover, lack of income from its low local government revenue collection (NSCB, 2011) and few businesses and investments contribute to higher poverty incidence. This makes it more difficult for the local government to reach out to the targeted beneficiaries due to lack of funds coupled with the large number of families experiencing poverty.

Table 5. Marginal Effects for Eastern Samar

Variable (Dependent Variable: $SHGR_i$)	*dy/dx*	*p*-Value
$FEEDPROG_i$	–0.01146	0.673
$HEALTH_i$	–0.0063	0.804
$SCHOLAR_i$	0.0650	0.573
$TRAINING_i$	0.0709	0.523
$CREDIT_i$	–0.0133	0.817
$TOTIN_i$	–0.0000	0.649
$HSIZE_i$	0.0052	0.653
Number of households		1,001
Predicted probability		0.1244

Agusan del Sur

Agusan del Sur is a province located in the Caraga Region of Mindanao. Most of the population (approximately 73%) is located in the rural area while the rest is in the urban area. The indigenous people comprise 33% of the total population. The major source of economic activity is farming. Agricultural land, which comprises 46% of total land area, is used for crops, livestock,

and agro-forestry. Most of the crops produced include rice and corn and other common crops such as coconut, oil palm, and banana (CBMS, 2010). The province is considered a first-class province with a total income of PHP 729.00 million and had a total internal revenue allotment of PHP 652.00 million in 2007. However, poverty incidence in 2006 is 48.7% ("Status Report on the Millennium Development Goals Using CBMS Data," 2010). Other social indicators show that school participation rate is 74.95% in elementary and 44.14% in the secondary level for school year 2006 to 2007, higher than the previous two school years. The same is true for achievement rate in both the elementary and the secondary levels due to a lower dropout rate (CBMS, 2010). The province has 5 public hospitals, 2 private hospitals, 14 rural health units, 132 barangay health stations, and 203 day care centers (CBMS, 2010). Table 6 shows the descriptive statistics of Agusan del Sur based on the CBMS data set. A total of 301,807 households were included in the survey, mostly permanently employed (100,116 household heads).

Table 6. Descriptive Statistics for Agusan del Sur (2006)

Variable	Number of Households	Mean	Standard Deviation	Minimum	Maximum	Skewness
School participation rate (if the number of children between 6 to 12 years old is positive but less than 1)	301,807	0.569	0.210	0.143	1	-1.199
Total household income (for total household income ≤ 10,000,000 only)	549,564	77,382.97	126,818.6	0	9,054,781	13.911
Household size (for household size ≤ 20 only)	549,854	6.072	2.345	1	20	0.546
Number of children aged 6 to 12 who are attending elementary school	550,162	0.923	1.014	0	7	0.835
State of hunger	550,219	—	—	—	—	—
Experienced hunger	77,411	—	—	—	—	—
Did not experience hunger	472,808	—	—	—	—	—
Received government programs						
Feeding program	35,233	—	—	—	—	—
Health	232,002	—	—	—	—	—

Table 6 continued...

Scholarship	9,032	—	—	—	—	—
Training	13,962	—	—	—	—	—
Housing	4,048	—	—	—	—	—
Credit	52,931	—	—	—	—	—

Equation 1 for Agusan del Sur utilized the GMM to determine the effect of the food program, nonfood programs, income, and other demographic variables on school participation of children with age 6 to 12. The regression results are summarized in the Table 7. All food and nonfood programs turned out to be highly significant based on the regression result.

The high turnout rate from the number of households who availed of the food and nonfood programs to address school participation and incidence of hunger contributed to the highly significant variables. For the food program, a household that availed of the program will most likely experience a 4.3% increase in school participation rate. However, most of the nonfood programs had a counter-intuitive effect on school participation. For instance, households who availed of the scholarship program result in a decrease of 4.1% in school participation rate. The same is true for health, housing, and credit—they negatively affect school participation rate.

Table 7. GMM Linear Regression Estimates for Agusan del Sur

Variable (Dependent Variable: SPR_i)	Coefficient	*p*-Value
$FEEDPROG_i$	0.0431	0.000
$HEALTH_i$	-0.0441	0.000
$SCHOLAR_i$	-0.0412	0.000
$TRAINING_i$	0.0102	0.009
$HOUSING_i$	-0.0378	0.000
$CREDIT_i$	-0.0589	0.000
$TOTIN_i$	0.0000	0.000
$HSIZE_i$	-0.0019	0.000
Constant	0.9269	0.000
Number of households		364,280
$F(11, 8977)$		513.25
Prob > *F*		0.000
R^2		0.0106

One implication is that the results could reflect wrong targeting. Most of nonfood programs do not increase school participation. Agusan del Sur experienced one of the highest poverty incidence reported at 48.7% in 2006, which implies that their immediate need was to have access to the most basic necessity, which is food. In fact, 14% of the total number of households that were surveyed regarding the state of hunger answered that they experienced hunger. This is higher compared to those in Eastern Samar. Given this, the availment of a nonfood program such as credit does not necessarily lead to higher school participation because the household would have to prioritize the food requirements of the family. The only nonfood program that led to an increase in school participation was training programs. Training programs enhance the entrepreneurial skills and/or increase the employability of the individual. Having a business or being employed means that the household has more income, which implies more resources to address the basic needs such as education. This is supported by the positive relationship of the variable income to school participation rate. On the other hand, as household size increases, school participation rate decreases by 0.01%.

Equation 2 for Agusan del Sur utilized MLE to determine the effect of the food program, nonfood programs, income, and other demographic variables on the state of hunger. Results are summarized in Table 8. Only the nonfood programs appeared to be significant in affecting the incidence of hunger. The nonfood programs health, scholar, and training decrease the incidence of hunger unlike housing and credit programs. A scholarship program for instance helps decrease the incidence of hunger by 2.6%. Households with children who receive scholarship are less likely to experience hunger since the family's income could now be allotted to food and other basic necessities instead of education. The same is true for households who avail of health programs and training programs. However, housing and credit programs lead to a higher incidence of hunger. A family under a housing program would have to prioritize paying for utilities, especially electricity and water, and this usually competes with spending on food. A credit program may not lead to a lower incidence of hunger since the household could use the money for other things aside from food. Credit is usually for paying off debt (interest payment); thus, allotment for food may not be addressed.

Table 8. Marginal Effects for Agusan del Sur

Variable (Dependent Variable: $SHGR_i$)	*dy/dx*	*p*-Value
$FEEDPROG_i$	–0.0015	0.159
$HEALTH_i$	–0.0048	0.000
$SCHOLAR_i$	–0.0257	0.000

Table 8 continued...

$TRAINING_i$	–0.0114	0.000
$HOUSING_i$	0.0405	0.000
$CREDIT_i$	0.0235	0.000
$TOTIN_i$	–0.0000	0.000
$HSIZE_i$	0.0055	0.000
Number of households		364,280
Predicted Probability		0.0754

Other significant variables are income and household size. An increase in income increases the incidence of hunger but only by an infinitesimally small amount. One reason behind this could be the fact that most of the households' employment status is temporary. Household size, on the other hand, positively affects incidence of hunger.

A summary of regression results for Eastern Samar and Agusan del Sur is provided in Table 9. For Eastern Samar, the nonfood program scholarship positively affects the school participation rate among elementary-aged children. However, the scholarship program in Eastern Samar has a higher effect on school participation compared to Agusan del Sur. The very low elementary cohort survival rate in Eastern Samar explains why scholarship programs have a higher impact in increasing school participation rate. Agusan del Sur experienced a different effect on school participation.

Household size is also significant in affecting school participation rate. In Agusan del Sur, as household size increases, school participation rate decreases. On the other hand, as the number of family members increases in Eastern Samar, school participation rate also increases but only by 0.4%.

As for the incidence of hunger, only the nonfood credit program was found to affect the incidence of hunger in Agusan del Sur. No variables were found to be significant in explaining the incidence of hunger in Eastern Samar because of the very small number of people who availed of the food and nonfood programs, as explained earlier. The variables income and household intuitively affect the incidence of hunger in Agusan del Sur. A household with higher income is less likely to experience hunger. In the same way, a larger household leads to a higher incidence of hunger.

Table 9. Summary of Significant Variables for Eastern Samar and Agusan del Sur

Province	Significant Variable	*p*-Value
Eastern Samar		
GMM model (for school participation rate)	$SCHOLAR_i$	0.045
	$HOUSING_i$	0.000
	$HSIZE_i$	0.000
Probability logit (for incidence of hunger)	No significant variables	
Agusan del Sur		
GMM model (for school participation rate)	$FEEDPROG_i$	0.000
	$HEALTH_i$	0.000
	$SCHOLAR_i$	0.000
	$TRAINING_i$	0.009
	$HOUSING_i$	0.000
	$CREDIT_i$	0.000
	$HSIZE_i$	0.000
	$TOTIN_i$	0.000
Probability logit (for incidence of hunger)	$HEALTH_i$	0.000
	$SCHOLAR_i$	0.000
	$TRAINING_i$	0.000
	$HOUSING_i$	0.000
	$CREDIT_i$	0.000
	$HSIZE_i$	0.000
	$TOTIN_i$	0.000

Conclusions

Most often, developing economies support poor households with nonfood grants instead of food grants due to convenience, nature of transfers, and the obvious difference in utility derived by households. Explicitly, a food grant provides a household with consumable goods that can provisionally relieve them from hunger. That is, when the food grant is consumed, recipient households are still bounded to low levels of living. The setback with food grants is they cannot provide multiplicative returns because they are purely consumption goods, unless households sell them at a premium. On the other hand, cash transfer can incorporate all the benefits of a food grant and

generate higher returns for the household in the future because it is not only a consumption tool but also an investment tool.

A recipient household can make use of the cash grant in two ways: (1) A poor household can use it to purchase consumables (i.e., food), which has exactly the same effect of a food grant. Moreover, a cash grant can also be used for utilities, education, and medical expenses, whichever is deemed of higher priority by households. (2) If the cash grant is significant in amount that the household can save and accumulate it, the money can be used to finance a small business or be spent on further education—a cash grant can be used to establish a sustainable source of income and/or find meaningful employment. However, households will not be able to experience immediate improvements in their well-being unlike those who received food grants.

To maximize the benefits of a cash grant, it must be a CCT, wherein recipient households are encouraged to make productive use of the transfer. However, a mechanism to monitor where the CCTs are spent must be in place. Oftentimes, poor households are unable to put the CCT into productive use because of the inherent need to satisfy more urgent and contemporaneous needs.

Most government programs aimed at alleviating poverty in the Philippines are prone to being unproductive due to errors of inclusion and exclusion. As for the case of food and nonfood programs in Eastern Samar and Agusan del Sur, not all addressed school participation rate and incidence of hunger as per the estimated coefficients due to its insignificant results. As per the first research objective, endeavoring to determine whether a food grant is better than a nonfood grant in addressing poverty issues and identifying the factors that may affect school participation and the incidence of hunger, based on the GMM regression result in Eastern Samar, nonfood grants proved to be better than food grants as evidenced by significant variables representing nonfood grants. Nonfood grant programs such as scholarship programs may possibly lead to an increase in school participation rate among children of ages 6 to 12 in Eastern Samar.

On the other hand, both food and nonfood programs may influence school participation in Agusan del Sur. The feeding program may possibly increase school participation unlike the other nonfood programs such as health, scholarship, housing, and credit. This implies that the food program has a significant effect in increasing school participation compared to nonfood programs, at least in those areas. Agusan del Sur experienced one of the highest poverty incidences (48.7%) in 2006, which implies that their immediate need was to have access to the most basic necessity, which is food. A feeding program is more likely to increase school participation. Results were consistent with the literature, which stipulates that health plays a vital

role in a student's participation in school. One of the primary reasons why students drop out of school is because of health reasons such as malnutrition.

To provide empirical evidence in addressing the research objectives, the logistic probability regression revealed intriguing and varying results for Eastern Samar and Agusan del Sur. Specifically, no variable was significant in affecting the incidence of hunger in Eastern Samar. Only the nonfood credit program significantly affected the incidence of hunger, but the result is counter-intuitive. This could be attributed to the fact that the credit program is a monetary grant that may not necessarily address the food insecurity concerns of the household because it is usually used to pay off another debt.

Other demographic variables that turned out to significantly affect school participation and incidence of hunger were income and household size. The small but positive effect of income on school participation could be due to the fact that income is transitory for most families living below the poverty line since they do not have permanent work. Meanwhile, in Agusan del Sur, as the family size increases, school participation decreases—consistent with a priori.

The counter intuitive results of some variables may imply that there could be a mismatch in targeting. As such, program(s) should be revisited; otherwise, government resources are wasted. It is in this light that the programs should be aligned with the goals of full employment and equitable distribution of resources, as well as the MDG.

Both theoretical and empirical results have shown that nonfood programs turned out to have a greater effect in addressing school participation and incidence of hunger. It would be beneficial for the local government's allocation of resources to the poor if they implement programs aimed at providing health benefits and scholarship programs in increasing school participation rates among elementary students especially in public schools. Careful planning has to be practiced in identifying the beneficiaries of these programs in order to minimize inefficiencies and waste of resources.

In the case of incidence of hunger, credit programs do not really address the problem. The program has to be restructured to make sure that beneficiaries would experience lower incidence of hunger through improvements in income generation provided by the credit program. Long-term benefits from the credit program will only be realized if the financial support is used for income-augmenting purposes such as sustainable livelihood programs and entrepreneurial activities. The local government of Agusan del Sur may focus on increasing school participation given the very low elementary cohort survival rate by providing more scholarship programs.

Another policy implication that can be construed from the results is that programs should be made more sustainable in order for poor households to experience the benefits in the long run. One example is the generation of income. Most of the poor households in Eastern Samar and Agusan del Sur are temporarily employed, and it would be beneficial for them if the programs would assist them in maintaining a permanent source of income. Monetary compensation is one direct way of alleviating poverty. Priority should be given in generating employment opportunities, especially in the urban and rural poor areas. The current programs could be temporary measures but are not sustainable in the long run—because they breed dependency among poor households. The rapid population growth is also a hurdle as to why low school participation and incidence of hunger are prevalent in rural areas. There is a need to create more sustainable programs addressed towards the issue of rapid population growth.

The public sector must be able to allocate resources to sustainable programs in cooperation with the private sector and NGOs. An example is the *Go Negosyo* program that aims to educate and provide network for potential entrepreneurs in the country. In line with this, the promotion of micro, small, and medium enterprises will be very helpful in addressing the poverty issues. Another possibility is to tap the *Flexi Fund Program*, an SSS program for overseas Filipino workers and their family. This could provide seed capital for those who are planning to venture in a new business.

The unavailability of time series data that could provide a more in-depth analysis of how relevant the programs are needs to be addressed. Since this study only uses one time period, it focused on whether or not the food or nonfood program was significant in increasing school participation rate and decreasing the incidence of hunger. The problem of poverty is a multifaceted issue that needs to be addressed starting from the root cause. Poor school participation rate and high incidence of hunger are just some of the manifestations of poverty. Further studies could be done to verify if a similar case is present in other provinces in the Philippines where poverty is prevalent.

References

Agence France-Presse. (2008, April 14). DepEd expands school rice program as costs soar. *Inquirer.Net*. Retrieved from http://newsinfo.inquirer.net/breakingnews/nation/view/20080414-130335/DepEd-expands-school-rice-program-as-costs-soars

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). *Instrumental variables and GMM: Estimation and testing* (Working Paper 545). Massachusetts: Boston College.

Becker, G.S. (1965). A theory on the allocation of time. *The Economic Journal*, *75*(299), 493–517.

Becker, G.S., & Lewis, H.G. (1973). On the interaction between the quantity and quality of children. *The Journal of Political Economy*, *81*(2), S279–S288.

Becker, G. S., & Tomes, N. (1993). Human capital and the rise and fall of families. In G.S. Becker (Ed.), *Human capital: A theoretical and empirical analysis with special reference to education* (3rd ed.) (pp. 257–298). Chicago, IL: University of Chicago Press.

Biblarz, T., & Raftery, A.E. (1999). Family structure, educational attainment and socioeconomic success: Rethinking the "pathology of matriarchy." *American Journal of Sociology*, *105*(2), 321–365.

Binder, M., & Woodruff, M. (1999*). Intergenerational mobility in educational attainment in Mexico* (SSRN Working Paper Series 166388). Rochester, NY: Social Science Research Network.

Björklund, A., Ginther, D. K., & Sundström, M. (2004). *Family structure and child outcomes in the United States and Sweden* (IZA Discussion Paper No. 1259). Bonn, Germany: Institute for the Study of Labor.

Borromeo, M. R. V., Castillo, J. C. E. D., & Lopez, E. N. (2007). *Selected demographic variables affecting the educational attainment of children in the Philippines.* (Undergraduate thesis). De La Salle University, Manila, Philippines.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: Methods and application*. Cambridge: Cambridge University Press.

Chevalier, A., & Lanot, G. (2001). *The relative effect of family characteristics and financial stuation on educational achievement.* London, UK: Centre for the Economics of Education.

Comprehensive land use plan of Pasay city. (2011). Retrieved from http://www.pasay.gov.ph/Pdf/socio-eco/popLandUse3.pdf

Conchada, M.I.P., & Rivera, J.P.R. (2013). Assessing the impacts of the food and non-food grant on poverty alleviation in the Philippines: The case of Pasay city. *Malaysian Journal of Economic Studies*, *50*(1), 53–78.

De Janvry, A., & Sadoulet, E. (2006). *Making conditional cash transfer programs more efficient: Designing for maximum effect of the conditionality*. Berkeley: University of California.

Del Rosso, J.M. (1999). *School feeding programs: Improving effectiveness and*

increasing the benefit to education. A guide for program managers. Retrieved from http://www.schoolsandhealth.org/Documents/Improving%20effectiveness%20and%20increasing%20the%20benefit%20to%20education%20-DelRosso-June99.pdf

Department of Education (DepEd). (2006). *Operational guidelines on the Food-for-School program: Bigas para sa mag-aaral at pamilya* (Enclosure to DepEd Memorandum 270). Pasig City: DepEd.

Department of Education (DepEd). (2007). *Operational guidelines on the Food-for-School program for SY 2008–2009* (Enclosure to DepEd Memorandum 419). Pasig City: DepEd.

Esguerra, C.V. (2011). 1.6M pamilyang nabigyan na ng P4B pantawid. *Inquirer Libre*, *10*(147), 2.

Family Income and Expenditure Survey. (2003). Retrieved from http://www.census.gov.ph/content/family-income-and-expenditure-survey-fies

Greene, W.H. (2003). *Econometric analysis* (5th ed.). New Jersey: Prentice Hall.

Gujarati, D.N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). Singapore: McGraw-Hill Companies, Inc.

Haller, A. O., & Portes, A. (1973). Status attainment processes. *Sociology of Education*, *46*(1), 51–91.

Hansen, L. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, *50*(4), 1029–1054.

Hauser, R. M., & Daymont, T. N. (1977). Schooling, ability, and earnings: Cross-sectional findings 8 to 14 years after high school graduation. *Sociology of Education*, *50*(3), 182–206.

Haveman, B., & Wolfe, B. (1984). Schooling and economic well-being: The role of non-market effects. *The Journal of Human Resources*, *19*(3), 377–407.

Lillard, L., & Willis, R. (1994). Intergenerational educational mobility: Effects of family and state of Malaysia. *The Journal of Human Resources Special Issue 29*(4), 1126–1166.

Manasan, R.G., & Cuenca, J.S. (2007). *Who benefits from the Food-for-School program and Tindahan Natin Program: Lessons in Targeting* (Discussion Paper Series No. 2007–10). Makati: Philippine Institute for Development Studies.

Meyers, A.F., Sampson, A.E., Weitzman, M., Rogers, B.L., & Kayne, H. (1989). School breakfast program and school performance. *American Journal of Disabled Children, 143*(10), 1234–1239.

National Statistical Coordinating Board. (2011). Retrieved from http://www.nscb.gov.ph/poverty/2009/table_3.asp

Philippine Statistics Authority. (2014). *Official poverty statistics*. Retrieved from http://www.nscb.gov.ph/poverty/dataCharts.asp

Rappler. (2014, July 10). Latest Philippine Nutrition Survey reveals little progress in beating hunger. *Rappler News*. Retrieved from http://www.rappler.com/move-ph/issues/hunger/61824-2013-national-nutrition-survey

Rappler. (2015, January 28). How hungry was the Philippines in 2014?

Rappler News. Retrieved from http://www.rappler.com/move-ph/issues/hunger/82144-sws-hunger-survey-2015

Rivera, J.P.R., & See, K.G.T. (2012). The role of education and government sponsored programs in limiting family size in Pasay, Eastern Samar, and Agusan Del Sur. *DLSU Business & Economics Review*, *21*(2), 17–36.

Schultz, T.W. (1960). Capital formation by education. *The Journal of Political Economy*, *68*(6), 571–583.

Simeon, D.T., & Grantham-McGregor, S. (1989). Effects of missing breakfast on the cognitive functions of school children of differing nutritional status. *American Journal of Clinical Nutrition, 49*(4), 646–653.

Social Weather Station (SWS). 2014. Retrieved from http://www.sws.org.ph

Standing, G. (2008). How cash transfers promote the case for basic income. *International Journal of Basic Income Research, 3*(1). Retrieved from http://www.bepress.com/cgi/viewcontent.cgi?context=bis&article=1106&date=&mt=MTMwODEwNTE0OA==&access_ok_form=Continue

Status report on the Millennium Development Goals using CBMS data. (2010). Retrieved from http://www.neda.gov.ph/econreports_dbs/MDGs/4thProgress2010/PROVINCIAL_Reports/AGUSAN%20DEL%20SUR.pdf

The province of Eastern Samar. (2011). Retrieved from http://www.nscb.gov.ph/ru8/profiles/provincial_profiles/esamar.htm

Todaro, M. P. & Smith, S. C. (2006). *Economic development* (8th ed.). Manila, Philippines: Pearson South Asia Pte. Ltd.

Tullao, T.S., & Rivera, J.P.R. (2009). *Impact of temporary labour migration on the demand for education: Implications for human resource development in the Philippines* (Occasional Paper 16 Research Summaries on Sharing Research Agendas on Knowledge Systems). Paris, France: United Nations Educational, Scientific and Cultural Organization (UNESCO).