# Discrete Utilization and Nutrition: Evidence From Bangladesh

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## Contents




## Abstract

This paper aims to investigate the relationship between household nutrition and social safety net utilization using data from the Bangladesh Integrated Household Survey to contribute to a growing body of literature that investigates household nutrition as a driving force in (social safety net utilization) decisions. The results of this paper indicate that a unit increase in the number of underweight children correlates with an increase in the likelihood of only utilizing social safety nets that provide cash transfers by six percentage points while decreasing the likelihood of utilizing both types of social safety nets (those that provide cash and those that provide in-kind food transfers) by five percentage points. However, a unit increase in the number of underweight non-children (household members above six years of age) correlates with a decrease in the likelihood of only utilizing monetary social safety nets by one percentage point while increasing the likelihood of utilizing both types of social safety nets by one percentage point as well. These results are also robust to a variety of sensitivity checks. The results of this paper may also have various policy implications for growing and developing countries such as Bangladesh.



**Key Words:** Discrete Choice, Nutrition, Social Safety Nets, Bangladesh, Health

# 1 Introduction

In the first quarter of 2019, Bangladesh was the seventh fastest-growing economy in the world [10] and, with a population of approximately 170 million (in a country roughly the size of the state of Iowa), it is one of the most densely populated countries in the world [5]. While dropping over time, as of 2019, roughly 20% of Bangladesh's population lives under the national poverty line of $1.9 per day [2].

There is extensive literature in welfare economics regarding cash and in-kind transfers as well as consumption and nutrition in the developing world, but there is not as much literature at the intersection of these topics. This paper aims to contribute to this intersection through a nutritional lens by investigating the relationship between nutrition and social safety net utilization in Bangladesh to see how household nutrition impacts social safety net utilization decisions. To help answer this question, data from the third round of the Bangladesh Integrated Household Survey, a nationally representative survey, will be used.

There are many policy motivations underlying this research as well. From the aspect of the government, there are incentives to reduce costs of welfare by decreasing the reliance on in-kind food transfers, as cash transfers are generally cheaper to supply [9]. Moreover, reducing the dependence on in-kind food transfers can also help the local economy by preventing local price reductions and, thus, keeping local producers competitive. There can also be efforts to improve the level of human capital in the future by focusing on improving the lives of children (especially those who are malnourished) at an early stage. Lastly, there are general incentives to reduce the overall reliance on social safety nets. Focusing on infrastructure that helps specific groups can lead to long-term government savings, but less focus should be placed here for developing countries such as Bangladesh.

Ultimately, using a multinomial logit model, the results of this paper support the existence of differential effects on the number of household members that are underweight based on whether they are children or non-children[1]. We see that a unit increase in the number of underweight children correlates with a roughly six percentage point increase in the likelihood of only utilizing social safety nets that provides cash transfers, whereas a similar unit increase in the number of underweight non-children correlates with a one percentage point decrease in the same utilization likelihood. Furthermore, we see that equivalent unit changes in the number of underweight children and non-children correlate with a five percentage point decrease and a one percentage point increase in utilizing both types of social safety nets, respectively. These results are robust to a variety of sensitivity checks.

It is important to note that the social safety nets that provide food in Bangladesh are primarily in the form of rice and wheat [1]. The food offered by social safety nets in Bangladesh may not help households with malnourished children as they may require

[1] Non-children are categorized as household members over the age of six.

special nutrients[2] that are not available through social safety nets and thus these households require money to buy them, whereas malnourished non-children may need not only specialized nutrients but general calories, as well.

In order to reduce reliance on in-kind food transfers, the Bangladeshi government may have an incentive to invest in infrastructure that targets the nutritional needs of households. In the context of reducing the overall costs of supplying social safety nets, investment in infrastructure aimed at reducing the number of underweight non-children could lead to long-term savings as the demand for monetary social safety nets would increase while the demand for both monetary and food social safety nets would decrease. This investment could also help bolster the local economy. However, from a perspective of investment in future human capital, creating more social safety nets that provide more nutritional in-kind food transfers may be more beneficial, especially for households with malnourished children. Small investments at an early stage can vastly improve the level and quality of future human capital.

The rest of this paper is organized as follows. Section 2 provides a brief literature review on cash and in-kind transfers along with consumption and risk behavior in the developing world. Section 3 discusses the data used and the general methodology and discusses the initial results. Section 4 discusses the empirical strategy used in the paper. Section 5 discusses the results of the paper. Section 6 conducts various sensitivity checks to test the robustness of the model. Section 7 discusses the limitations of the model and methodology. Section 8 concludes and discusses possible next steps. Sections 9 through 12 include various appendices (labeled A through D).

## 2 Literature Review

Literature on development and nutrition is broad, and so is their intersection. However, there is much less literature available on social safety net utilization in developing countries, especially regarding household nutrition as the driving force of decisions. Previous literature from the World Bank has identified that the costs for cash transfers and vouchers tend to be significantly lower relative to those of in-kind transfers [9]. This can be due to the additional costs associated with aggregating these in-kind transfers at a large scale. In the context of food transfers, these can include purchasing and harvesting crops and paying the associated labor costs. Furthermore, unlike cash or vouchers, food can rot over time so there is also a natural reduction in the available food stock over time. There is also evidence from the National Bureau of Economic Research that in-kind transfers, when compared to cash transfers, ultimately help consumers more at the expense of local producers [7]. Simply stated, as "free" goods enter the local market, the supply for these goods rise, forcing prices to fall. As many farmers cultivate and sell locally, the introduction of food transfers can ultimately hurt the local economy.

[2]Some common examples may include dairy and meat products.

Interestingly, Banerjee and Duflo see that, when looking at how the poor spend their money, roughly 50% to 80% of consumption is spent on food[3]. However, these poor households have the *choice* of spending more on food (and less on other non-essentials), implying that there is no extra compulsion to spend on *more* calories [4]. In the context of this study, this may help explain why the demand for cash transfers seems to dwarf those for in-kind food transfers.

Lastly, an important aspect of these poor households is their level of relative risk. Households with higher levels of relative risk aversion may fundamentally behave differently than households with lower relative levels of risk aversion. Previous research has been conducted by the Federal Reserve Bank of St. Louis to estimate the coefficient of relative risk aversion using data on self-reports of personal well-being from the Gallup World Poll. Among the developing countries researched, Bangladesh had one of the highest levels of relative risk aversion of 1.30 [8]. In comparison, its neighbor, India, had an estimated level of relative risk aversion of 0.92, making it much less risk-averse than Bangladesh. In comparison to the developed countries, Bangladesh also ranked quite high in terms of relative risk aversion. For example, the United States had only a slightly higher level of relative risk aversion of 1.39 compared to Bangladesh's 1.30.

## 3 Data

Three primary data sources are used in this paper. The main data source comes from the third round of the Bangladesh Integrated Household Survey (BIHS) which was conducted in 2019 and published in 2020 by the International Food Policy Research Institute. The BIHS is a nationally representative household-level survey in Bangladesh that collects detailed data on many household characteristics. For each unit of observation (the household), the primary variables of interest in this paper are utilization of any social safety nets and nutrition (as proxied for by the Body Mass Index). The BIHS survey collects information on all the social safety nets utilized by each household in the past year. There are five primary categories of utilized social safety nets to consider: "None", "Money", "Rice", "Wheat", and "Other Food". For the purposes of this study, these categories are collapsed into three distinct types: "None", "Money", and "Food". It is also important to note that many households can utilize multiple social safety nets so a fourth category, "Both", is also considered for households that utilize multiple *types* of social safety nets[4]. These categories are mutually exclusive, so households in the category "Money" *only* only utilized social safety nets that provided cash transfers.

To supplement this rich data, two separate datasets are used to categorize "underweight" individuals by age based on their Body Mass Index (BMI). The primary

[3]These values have regional variation.

[4]It is important to note that each available social safety net provides *either* food or money. However, households are available to utilize multiple social safety nets and some may provide food while others provide money.

dataset comes from the Centers for Disease Control and Prevention (CDC), which provides the fifth percentile BMI by age which is commonly considered "underweight" in health literature [6]. One drawback, discussed later, is that the CDC data focuses on Americans, which may not be the best indicator of nutrition in other parts of the world. In a robustness check (discussed in detail in Section 6), World Health Organization (WHO) data[5] is also used and, ultimately, there is no significant difference in results in the marginal effects. In the model, the variable $ncUW$ represents the number of underweight children and the variable $nncUW$ represents the number of underweight non-children.

Along with these primary variables, various other (annual) household characteristics are also used as controls in this paper as they may also help explain household utilization decisions. Some of the most relevant controls are the annual household income (measured by both employment and non-employment income), the travel time to the nearest town, and the household region. Furthermore, many households participate in some form of agriculture, but many do not have the *opportunity* to consume from their harvests. This can be because these households must pay their workers or sell their harvests and do not have any harvest leftover to consume. An indicator for crop consumption is included to net out the ability to consume their own harvest as it can also influence decisions. For instance, a household that can easily produce and consume their own crops may have little need for food transfers and prefer cash transfers instead. Also, an indicator of if the head of the household (the primary respondent) has at least a high school education is also collected[6]. Annual expenditure (on both food and non-food items) is also calculated and used in a standard CRRA utility function. Lastly, the size of the household, broken down into the number of children ($nc$) and non-children ($nnc$), is also included.

Table 1 shows the summary statistics of the relevant variables used in the study in both aggregate terms and by household social safety net utilization type. A seemingly staggering statistic may be that the largest household includes 17 members. However, especially in more impoverished areas of Bangladesh, multigenerational households are not uncommon [3]. For the most part, the averages of many of the controls are similar across utilization categories. The one variable that does stands out is the variable "atleastHS" which is an indicator of whether or not the head of the household (the primary respondent) has at least a high school education. When compared to those in other categories, households who who only utilize social safety nets that provide in-kind food transfers are much less likely to have a head who has at least a high school education which may indicate that those without high school educations may only have access to lower paying jobs and thus require food more readily as opposed to cash transfers. However, it is important to note that none of the averages are very high – the

[5]The WHO separates its data by age, one dataset contains BMI information for individuals under five years of age [12] and a second dataset contains BMI information for adolescents and children above five years of age [11].

[6]Those who had vocational training were not considered as having at least a high school education.

highest proportion, as expected, is for households who did not utilize any social safety net but this proportion is not significantly higher than the average of those who only utilize monetary social safety nets. What is most interesting, in regards to the nutrition-related variables, is that the average number of underweight children stays relatively consistent across all utilization types but the average number of underweight non-children has much more variation across all utilization types. This may indicate differential effects based on the number of underweight children and non-children.

Table 1: Summary Statistics (Aggregate and By Utilization Type)

| Statistic | N | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|---|
| householdIncome | 5,442 | 170,270.600 | 166,882.700 | 0 | 3,802,016 |
| householdSize | 5,442 | 4.131 | 1.734 | 1 | 17 |
| numChildren | 5,442 | 0.527 | 0.722 | 0 | 5 |
| numNonChildren | 5,442 | 3.604 | 1.490 | 1 | 14 |
| timeToTown | 5,442 | 43.403 | 51.041 | 0 | 2,402 |
| atleastHS | 5,442 | 0.046 | 0.209 | 0 | 1 |
| cropConsumed | 5,442 | 0.574 | 0.495 | 0 | 1 |
| numChildUnderweight | 5,442 | 0.190 | 0.439 | 0 | 3 |
| numNonChildUnderweight | 5,442 | 0.690 | 0.922 | 0 | 7 |

| | None | Money | Food | Both |
|---|---|---|---|---|
| householdIncome | 182369.1210 | 169661.8309 | 131235.1374 | 134110.0971 |
| householdSize | 3.8375 | 4.6081 | 3.7885 | 4.5162 |
| numChildren | 0.5149 | 0.5508 | 0.5000 | 0.5414 |
| numNonChildren | 3.3226 | 4.0573 | 3.2885 | 3.9748 |
| timeToTown | 43.3757 | 41.3259 | 45.8571 | 47.9335 |
| atleastHS | 0.0555 | 0.0442 | 0.0110 | 0.0216 |
| cropConsumed | 0.5948 | 0.5713 | 0.5027 | 0.5198 |
| numChildUnderweight | 0.1718 | 0.2199 | 0.1703 | 0.2104 |
| numNonChildUnderweight | 0.5550 | 0.8405 | 0.7060 | 0.9514 |

Table 2 shows the proportion of utilization by region. The trend across utilization types is relatively consistent – most households do not utilize any social safety nets but, for the households that do utilize social safety nets, most utilize only money, then both, and then only food. Interestingly, there is much variation in the proportions between regions (see Section 11 – Appendix C) which may indicate some level of regional influence or accessibility that should be accounted for.

Furthermore, in Section 12 – Appendix D, we can see the relationship between the value of total social safety nets used on various characteristics. Unsurprisingly, we see

that households with lower levels of household income (see Figure 6) or employment income (see Figure 7) tend have higher values of total social safety nets utilized. What is more interesting is that households that are closer to town tend to receive higher values of social safety nets utilized (see Figure 10) which may indicate that these social safety nets are more readily available to urban (as opposed to extremely rural) households. The trends regarding the household size (Figure 12) are relatively consistent throughout.

Table 2: Proportion of Social Safety Net Utilization by Region.

| **Region** | **None** | **Money** | **Food** | **Both** |
|---|---|---|---|---|
| Barisal | 0.4314 | 0.2544 | 0.1197 | 0.1945 |
| Chittagong | 0.5672 | 0.3372 | 0.0357 | 0.0599 |
| Dhaka | 0.5933 | 0.2725 | 0.0495 | 0.0847 |
| Khulna | 0.5121 | 0.2931 | 0.0928 | 0.1020 |
| Rajshahi | 0.5569 | 0.3211 | 0.0569 | 0.0652 |
| Rangpur | 0.4203 | 0.2045 | 0.1370 | 0.2383 |
| Sylhet | 0.5067 | 0.3585 | 0.0566 | 0.0782 |

## 4 Empirical Strategy

This paper exploits variation in household characteristics (as mentioned earlier) with a primary focus on the number of underweight children and non-children to analyze the determinants of social safety net utilization by estimating a multinomial logit model. With that objective, we construct an indirect utility function ($v_{ij}$) where $i$ represents the household and $j$ represents the utilization type; this $j$ can be one of four mutually exclusive types: "None", "Money", "Food", or "Both". For the household $i$ and utilization type $j$, the indirect utility of the household is as follows:

$$\begin{aligned} v_{ij} = {} & \alpha_j + \gamma_j \cdot (u(c_i) - k_i) + \beta_j^1 \cdot \mathbf{1}_{ncUW_i=1} + \beta_j^2 \cdot \mathbf{1}_{ncUW_i=2} + \beta_j^3 \cdot \mathbf{1}_{ncUW_i=3} + \\ & \eta_j^1 \cdot \mathbf{1}_{nncUW_i=1} + \eta_j^2 \cdot \mathbf{1}_{nncUW_i=2} + \ldots + \eta_j^6 \cdot \mathbf{1}_{nncUW_i=6} + \eta_j^7 \cdot \mathbf{1}_{nncUW_i=7} + \\ & \xi_j^1 \cdot \mathbf{1}_{nc_i=1} + \xi_j^2 \cdot \mathbf{1}_{nc_i=2} + \xi_j^3 \cdot \mathbf{1}_{nc_i=3} + \xi_j^4 \cdot \mathbf{1}_{nc_i=4} + \xi_j^5 \cdot \mathbf{1}_{nc_i=5} + \\ & \lambda_j^2 \cdot \mathbf{1}_{nnc_i=2} + \lambda_j^3 \cdot \mathbf{1}_{nnc_i=3} + \ldots + \lambda_j^{11} \cdot \mathbf{1}_{nnc_i=11} + \lambda_j^{13} \cdot \mathbf{1}_{nnc_i=13} + \lambda_j^{14} \cdot \mathbf{1}_{nnc_i=14} + \\ & \theta_j^1 \cdot \mathbf{1}_{region_i=Chittagong} + \theta_j^2 \cdot \mathbf{1}_{region_i=Dhaka} + \ldots + \theta_j^6 \cdot \mathbf{1}_{region_i=Sylhet} + \\ & \omega_j \cdot income_i + \nu_j \cdot \mathbf{1}_{cropConsumed_i=1} + \mu_j \cdot \mathbf{1}_{atleastHS_i=1} + \zeta_j \cdot timeToTown_i + \varepsilon_{ij} \end{aligned} \tag{1}$$

where $u(c_i) = \frac{c^{1-\sigma}-1}{1-\sigma}$ is the standard CRRA utility function for a specific level of relative risk aversion which uses annual expenditure data to estimate $c_i$. The value $k_i$ is the associated opportunity cost (lost wages) incurred for signing up to utilize any social safety

net – this cost is zero if no social safety set is utilized and is (assumed to be) one week's worth of (annual) employment income if any social safety net is utilized. This difference is referred to as the "adjusted utility". For this paper, a value of $\sigma = 1.30$, based on estimates using data from the Gallup World Poll [8], is used in the multinomial logit estimation. The choice probability of household $i$ utilizing social safety net $j$ is given by:

$$p_{ij} = \frac{e^{\hat{v}_{ij}}}{\sum_{l=1}^{4} e^{\hat{v}_{il}}} \tag{2}$$

where $\hat{v}_{ij} = v_{ij} - \varepsilon_{ij}$.

It is important to note that a key assumption made here, and throughout this paper, is that households are eligible for every social safety net and can readily utilize any social safety net (after forgoing a small portion of income in order to sign up to get the benefits). The validity of this assumption is tested with the data to see if there existed any eligibility cutoffs. Looking specifically at household and employment income, no clear income cutoff seemed to preclude households from utilizing a social safety net. Furthermore, when looking at rurality[7], there, again, was no eligibility cutoff. Lastly, there did not seem to be any cutoffs based on the household size either. Of course, these are ad hoc methods (the results of which can be found in Section 12 – Appendix D), to test for eligibility criteria but future research can be focused on identifying which, if any, available social safety nets have some eligibility criteria. Presumably, some criteria does exist, but a cursory look at the most common criteria did not indicate an eligibility cutoff. However, based on the distribution of total value of social safety nets on income (as seen in Figure 6 and Figure 7), poorer households tended to utilize more social safety nets (as the aggregate value is much higher). This may indicate that there are not necessarily eligibility cutoffs but rather criteria for how much or how many social safety nets a household is allowed to utilize based on its income level in a given year.

To summarize the effects of the number of underweight children and non-children on social safety net utilization, an Ordinary Least Squares (OLS) regression is run on the estimated marginal effects. This is done to see how the likelihood of utilization of a specific social safety net type is related to a unit increase in the number of underweight children or non-children.

Four regressions will look at the marginal effect of the number of underweight children. For social safety net type $j$, the OLS equation looks as follows[8]:

$$ME_i^j = \alpha_i + \beta \cdot ncUW_i + \varepsilon_i \tag{3}$$

[7] Rurality is estimated by the time it takes a household member to travel to the nearest town.
[8] Where $i \in \{1, 2, 3\}$.

Additionally, four similar regressions will look at the marginal effect of the number of underweight non-children. For social safety net type $j$, the OLS equations looks as follows[9]:

$$ME_i^j = \alpha_i + \beta \cdot nncUW_i + \varepsilon_i \tag{4}$$

# 5 Results

Although a multinomial logit model can indicate which characteristics of a household are more likely to choose one type of social safety net relative to a reference group[10], we cannot make any conclusions regarding the changes in magnitude. In order to find magnitudes of change, we must first identify the marginal effects of each variable. These marginal effects can be found in Table 3.

Table 3: Marginal Effects for the Multinomial Logit Model.

| Type | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| None | numChildUnderweight | 1 - 0 | 0.0075 |
| None | numChildUnderweight | 2 - 0 | 0.0056 |
| None | numChildUnderweight | 3 - 0 | 0.0546 |
| None | numNonChildUnderweight | 1 - 0 | -0.0011 |
| None | numNonChildUnderweight | 2 - 0 | -0.0110 |
| None | numNonChildUnderweight | 3 - 0 | 0.0083 |
| None | numNonChildUnderweight | 4 - 0 | 0.0061 |
| None | numNonChildUnderweight | 5 - 0 | 0.0679 |
| None | numNonChildUnderweight | 6 - 0 | 0.1114 |
| None | numNonChildUnderweight | 7 - 0 | 0.0896 |
| Money | numChildUnderweight | 1 - 0 | 0.0022 |
| Money | numChildUnderweight | 2 - 0 | -0.0187 |
| Money | numChildUnderweight | 3 - 0 | 0.1251 |
| Money | numNonChildUnderweight | 1 - 0 | -0.0124 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0043 |
| Money | numNonChildUnderweight | 3 - 0 | -0.0070 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0081 |
| Money | numNonChildUnderweight | 5 - 0 | -0.0874 |
| Money | numNonChildUnderweight | 6 - 0 | -0.2905 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0836 |
| Food | numChildUnderweight | 1 - 0 | -0.0053 |
| Food | numChildUnderweight | 2 - 0 | 0.0036 |
| Food | numChildUnderweight | 3 - 0 | -0.0711 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0054 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0158 |
| Food | numNonChildUnderweight | 3 - 0 | -0.0020 |

[9] Where $i \in \{1, 2, 34, 5, 6, 7\}$.

[10] The full multinomial logit results can be found in 9 where the reference group is "None".

| Type | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| Food | numNonChildUnderweight | 4 - 0 | 0.0136 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0712 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0710 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0712 |
| Both | numChildUnderweight | 1 - 0 | -0.0044 |
| Both | numChildUnderweight | 2 - 0 | 0.0095 |
| Both | numChildUnderweight | 3 - 0 | -0.1086 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0081 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0225 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0007 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0279 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0906 |
| Both | numNonChildUnderweight | 6 - 0 | 0.2501 |
| Both | numNonChildUnderweight | 7 - 0 | -0.1020 |

**Full tables can be found in Section 9 – Appendix A.*

Interestingly, having one underweight child (compared to having no underweight children) seems to increase the likelihood of a household to use no social safety nets or only monetary social safety nets by .75 and .22 percentage points, respectively. Moreover, the likelihood of utilizing either only food or both types of social safety nets falls by .53 and .44 percentage points respectively. It is important to point out that the sum of these changes is zero which should always be the case as the total probability must still sum to one.

As the marginal effects are based on the specific number of underweight children and non-children, an OLS regression is run on the marginal effects to estimate the changes of the likelihood of social safety net utilization due to a unit increase in the number of underweight children and non-children.

Table 4 and Table 5 show the results of the eight OLS regressions. Interestingly, both regressions indicate that the effect of a unit increase in the number of underweight children or non-children correlates with an increase in the likelihood of utilizing no social safety net by roughly two percentage points. However, that is where the similarities end. From Table 4, we can see that the unit increase in the number of underweight children correlates with a six percentage point increase in the likelihood of only utilizing social safety nets that provide cash transfers. For all the nutritional variables and choices, this correlation is the largest. Furthermore, from Table 5, a similar unit increase in the number of underweight non-children correlates with a one percentage point decrease in the likelihood of utilizing the same type of social safety net. While the demand for social safety nets that only provide food transfers negatively correlate with the number of underweight children and non-children, it more negatively correlates with the number of underweight children (three percentage point decrease) compared to the number of underweight non-children (one percentage point decrease). Lastly, the relationship between the change in the likelihood of utilizing both types of social safety nets and the number of underweight children and non-children is negative and positive, respectively. A

unit increase in the number of underweight children correlates with a five percentage point decrease in the likelihood of utilizing both social safety net types while a unit increase in the number of underweight non-children increases that likelihood by one percentage point. These results indicate differential effects of the number of individuals underweight based on their age.

These differential effects can be partially explained by the types of food transfers provided by the social safety nets in Bangladesh. As the primary food transfers come in the form of rice and wheat, households may not have the necessary nutrients required to help underweight children. Special (and nutritious) food must be bought to assist in child nutrition which can explain why the demand for social safety nets that provides cash transfers positively correlate with the number of underweight children. However, for non-children, it may be a mix of more calories and specialized nutrition which explains why the demand for both types of social safety nets positively correlate with the number of underweight non-children. These results indicate that the nutritional effects on household choice vary based on which types of household members (child and non-child) are suffering from (extreme) malnutrition.

Table 4: OLS Regression For Marginal Effect of the Number of Children Underweight By Utilization Type.

| | None | Money | Food | Both |
|---|---|---|---|---|
| (Intercept) | −0.02 | −0.09 | 0.04 | 0.07 |
| Number of Underweight Children | 0.02 | 0.06 | −0.03 | −0.05 |
| $R^2$ | 0.72 | 0.63 | 0.65 | 0.65 |
| Num. obs. | 3 | 3 | 3 | 3 |

Table 5: OLS Regression For Marginal Effect of the Number of Non-Children Underweight By Utilization Type.

| | None | Money | Food | Both |
|---|---|---|---|---|
| (Intercept) | −0.04 | 0.01 | 0.03 | 0.00 |
| Number of Underweight Non-Children | 0.02 | −0.01 | −0.01 | 0.01 |
| $R^2$ | 0.80 | 0.06 | 0.65 | 0.02 |
| Num. obs. | 7 | 7 | 7 | 7 |

The policy implications of these results depend on the goals of the government. For a

developing country like Bangladesh, its primary objective should be to reduce the reliance on "Food" social safety nets due to the government costs for in-kind transfers (which are higher than those of cash transfers) but also to help the local economy. This can be achieved by developing infrastructure that targets the nutritional needs of households, including investment in infrastructure aimed at reducing the number of non-children underweight which would, in theory, increase the demand for solely monetary social safety nets while reducing the demand for both monetary and food social safety nets. However, in the context of human capital investment, creating more social safety nets that provide more nutritional in-kind food transfers may be highly beneficial for (malnourished) children as early childhood intervention and investment can vastly improve human capital in the future.

# 6 Robustness

## 6.1 World Health Organization

One primary issue could potentially be the data used to categorize "underweight". A common standard in health literature is that the fifth percentile BMI at any age is considered the cutoff but the CDC data is focused on the American population. There is a valid argument to be made that other countries will have different cutoffs. Although BMI data for Bangladesh is not readily available, using World Health Organization (WHO) data for categorization may lead to varying results. The comparison of marginal effects using CDC and WHO data (along with the absolute differences) can be seen in Table 6.

Table 6: Comparison of Marginal Effects for the Multinomial Logit Model: CDC versus WHO Data.

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| None | numChildUnderweight | 1 - 0 | 0.0075 | -0.0060 | 0.0135 |
| None | numChildUnderweight | 2 - 0 | 0.0056 | -0.0082 | 0.0138 |
| None | numChildUnderweight | 3 - 0 | 0.0546 | 0.0308 | 0.0238 |
| None | numNonChildUnderweight | 1 - 0 | -0.0011 | -0.0020 | 0.0008 |
| None | numNonChildUnderweight | 2 - 0 | -0.0110 | -0.0097 | 0.0013 |
| None | numNonChildUnderweight | 3 - 0 | 0.0083 | 0.0218 | 0.0136 |
| None | numNonChildUnderweight | 4 - 0 | 0.0061 | 0.0154 | 0.0093 |
| None | numNonChildUnderweight | 5 - 0 | 0.0679 | 0.0531 | 0.0149 |
| None | numNonChildUnderweight | 6 - 0 | 0.1114 | 0.0687 | 0.0427 |
| None | numNonChildUnderweight | 7 - 0 | 0.0896 | 0.0961 | 0.0065 |

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| Money | numChildUnderweight | 1 - 0 | 0.0022 | 0.0172 | 0.0150 |
| Money | numChildUnderweight | 2 - 0 | -0.0187 | -0.0324 | 0.0138 |
| Money | numChildUnderweight | 3 - 0 | 0.1251 | 0.1430 | 0.0178 |
| Money | numNonChildUnderweight | 1 - 0 | -0.0124 | -0.0170 | 0.0047 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0043 | 0.0043 | 0.0000 |
| Money | numNonChildUnderweight | 3 - 0 | -0.0070 | -0.0208 | 0.0138 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0081 | -0.0107 | 0.0188 |
| Money | numNonChildUnderweight | 5 - 0 | -0.0874 | -0.0847 | 0.0027 |
| Money | numNonChildUnderweight | 6 - 0 | -0.2905 | -0.2954 | 0.0049 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0836 | 0.0696 | 0.0140 |
| Food | numChildUnderweight | 1 - 0 | -0.0053 | 0.0008 | 0.0061 |
| Food | numChildUnderweight | 2 - 0 | 0.0036 | -0.0251 | 0.0286 |
| Food | numChildUnderweight | 3 - 0 | -0.0711 | -0.0690 | 0.0022 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0054 | -0.0001 | 0.0054 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0158 | -0.0162 | 0.0004 |
| Food | numNonChildUnderweight | 3 - 0 | -0.0020 | 0.0034 | 0.0055 |
| Food | numNonChildUnderweight | 4 - 0 | 0.0136 | 0.0113 | 0.0023 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0712 | -0.0712 | 0.0000 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0710 | -0.0710 | 0.0000 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0712 | -0.0712 | 0.0000 |
| Both | numChildUnderweight | 1 - 0 | -0.0044 | -0.0120 | 0.0076 |
| Both | numChildUnderweight | 2 - 0 | 0.0095 | 0.0657 | 0.0562 |
| Both | numChildUnderweight | 3 - 0 | -0.1086 | -0.1048 | 0.0038 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0081 | 0.0190 | 0.0109 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0225 | 0.0216 | 0.0009 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0007 | -0.0045 | 0.0052 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0279 | -0.0160 | 0.0118 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0906 | 0.1027 | 0.0121 |
| Both | numNonChildUnderweight | 6 - 0 | 0.2501 | 0.2976 | 0.0476 |
| Both | numNonChildUnderweight | 7 - 0 | -0.1020 | -0.0945 | 0.0075 |

**Full tables can be found in Section 10 – Appendix B.*

Although the absolute differences between the marginal effects do vary, the sign stays relatively consistent. The only instances where the sign of the marginal effect changes is when it is close to zero (which indicates that the marginal effect is not that large to begin with). To further check the robustness, OLS regressions are run on the data and the results can be seen in Table 7 and Table 8. The results from the OLS regression using WHO data are extremely similar to those using CDC data (Table 4 and Table 5) which indicate that our model is robust to different categorizations of "underweight".

Table 7: OLS Regression For Number of Children Underweight Using WHO Data.

| | None | Money | Food | Both |
|---|---|---|---|---|
| (Intercept) | −0.03 | −0.08 | 0.04 | 0.08 |
| Number of Underweight Children | 0.02 | 0.06 | −0.03 | −0.05 |
| $R^2$ | 0.71 | 0.48 | 0.98 | 0.30 |
| Num. obs. | 3 | 3 | 3 | 3 |

Table 8: OLS Regression For Number of Non-Children Underweight Using WHO Data.

| | None | Money | Food | Both |
|---|---|---|---|---|
| (Intercept) | −0.03 | 0.01 | 0.03 | 0.00 |
| Number of Underweight Non-Children | 0.02 | −0.01 | −0.01 | 0.01 |
| $R^2$ | 0.91 | 0.07 | 0.63 | 0.04 |
| Num. obs. | 7 | 7 | 7 | 7 |

## 6.2 Levels of Risk Aversion

The results found in the paper may also vary due to the levels of relative risk aversion so, as a check for robustness, we also investigate how the results, if at all, would change based on slightly varying levels of relative risk aversion. This is important because the value of $\sigma = 1.30$ was based on estimations and, if our model is robust, slight perturbations should not dramatically change our results. We also include a regression using risk neutral preferences ($\sigma = 0$). Again, we see slight variations when changing our level of relative risk aversion slightly but we do see, as expected, dramatic changes when we assume risk neutrality.

Table 9: Marginal Effects with Varying Levels of Risk Aversion

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| None | numChildUnderweight | 1 - 0 | -0.0424 | 0.0067 | 0.0075 | 0.0060 |
| None | numChildUnderweight | 2 - 0 | -0.0380 | 0.0064 | 0.0056 | 0.0095 |
| None | numChildUnderweight | 3 - 0 | 0.0037 | 0.0494 | 0.0546 | 0.0557 |
| None | numNonChildUnderweight | 1 - 0 | -0.0641 | 0.0000 | -0.0011 | -0.0009 |
| None | numNonChildUnderweight | 2 - 0 | -0.1230 | -0.0070 | -0.0110 | -0.0106 |
| None | numNonChildUnderweight | 3 - 0 | -0.0864 | 0.0043 | 0.0083 | 0.0089 |
| None | numNonChildUnderweight | 4 - 0 | -0.0173 | 0.0038 | 0.0061 | 0.0054 |
| None | numNonChildUnderweight | 5 - 0 | -0.0259 | 0.0651 | 0.0679 | 0.0678 |
| None | numNonChildUnderweight | 6 - 0 | 0.0076 | 0.1091 | 0.1114 | 0.1118 |
| None | numNonChildUnderweight | 7 - 0 | -0.0120 | 0.0873 | 0.0896 | 0.0890 |

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| Money | numChildUnderweight | 1 - 0 | 0.0365 | 0.0039 | 0.0022 | 0.0038 |
| Money | numChildUnderweight | 2 - 0 | 0.0406 | -0.0251 | -0.0187 | -0.0239 |
| Money | numChildUnderweight | 3 - 0 | -0.0011 | 0.1263 | 0.1251 | 0.1235 |
| Money | numNonChildUnderweight | 1 - 0 | 0.0291 | -0.0134 | -0.0124 | -0.0144 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0871 | -0.0012 | 0.0043 | -0.0017 |
| Money | numNonChildUnderweight | 3 - 0 | 0.0661 | -0.0148 | -0.0070 | -0.0190 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0183 | -0.0179 | 0.0081 | -0.0100 |
| Money | numNonChildUnderweight | 5 - 0 | 0.0182 | -0.0898 | -0.0874 | -0.0804 |
| Money | numNonChildUnderweight | 6 - 0 | -0.0176 | -0.2934 | -0.2905 | -0.2933 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0157 | 0.0806 | 0.0836 | 0.0814 |
| Food | numChildUnderweight | 1 - 0 | -0.0004 | -0.0044 | -0.0053 | -0.0034 |
| Food | numChildUnderweight | 2 - 0 | -0.0071 | -0.0116 | 0.0036 | -0.0052 |
| Food | numChildUnderweight | 3 - 0 | -0.0007 | -0.0699 | -0.0711 | -0.0716 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0140 | 0.0031 | 0.0054 | 0.0042 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0108 | -0.0162 | -0.0158 | -0.0114 |
| Food | numNonChildUnderweight | 3 - 0 | 0.0004 | 0.0093 | -0.0020 | 0.0051 |
| Food | numNonChildUnderweight | 4 - 0 | 0.0002 | 0.0251 | 0.0136 | 0.0193 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0063 | -0.0700 | -0.0712 | -0.0713 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0000 | -0.0698 | -0.0710 | -0.0711 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0015 | -0.0700 | -0.0712 | -0.0713 |
| Both | numChildUnderweight | 1 - 0 | 0.0064 | -0.0062 | -0.0044 | -0.0064 |
| Both | numChildUnderweight | 2 - 0 | 0.0045 | 0.0303 | 0.0095 | 0.0197 |
| Both | numChildUnderweight | 3 - 0 | -0.0019 | -0.1058 | -0.1086 | -0.1075 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0210 | 0.0102 | 0.0081 | 0.0111 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0467 | 0.0243 | 0.0225 | 0.0237 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0199 | 0.0012 | 0.0007 | 0.0051 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0012 | -0.0110 | -0.0279 | -0.0147 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0140 | 0.0947 | 0.0906 | 0.0839 |
| Both | numNonChildUnderweight | 6 - 0 | 0.0101 | 0.2542 | 0.2501 | 0.2525 |
| Both | numNonChildUnderweight | 7 - 0 | -0.0022 | -0.0979 | -0.1020 | -0.0992 |

**Full tables can be found in Section 10 – Appendix B.*

Using the data in Table 9, we run similar OLS regressions as before and see that, in Table 10 and Table 11, the coefficients for the marginal effect of a unit increase in the number of children and non-children are robust to small perturbations in the level of relative risk aversion but change dramatically when compared to risk-neutrality. However, we have shown that our results are robust to small sensitivity checks regarding the level of relative risk aversion in Bangladeshi households around its estimated value.

Table 10: OLS Regression Coefficients For Marginal Effect of Number of Children Underweight For Varying Levels of Risk Aversion.

| | None | Money | Food | Both |
|---|---|---|---|---|
| $\sigma = 0$ | 0.02 | −0.02 | −0.00 | −0.00 |
| $\sigma = 1.25$ | 0.02 | 0.06 | −0.03 | −0.05 |
| $\sigma = 1.30$ | 0.02 | 0.06 | −0.03 | −0.05 |
| $\sigma = 1.35$ | 0.02 | 0.06 | −0.03 | −0.05 |

Table 11: OLS Regression Coefficients For Marginal Effect of Number of Non-Children Underweight For Varying Levels of Risk Aversion.

| | None | Money | Food | Both |
|---|---|---|---|---|
| $\sigma = 0$ | 0.0 | −0.01 | −0.00 | −0.01 |
| $\sigma = 1.25$ | 0.02 | −0.01 | −0.01 | 0.01 |
| $\sigma = 1.30$ | 0.02 | −0.01 | −0.01 | 0.01 |
| $\sigma = 1.35$ | 0.02 | −0.01 | −0.02 | 0.01 |

# 7 Limitations

The primary limitation that must be addressed is the critical assumption made throughout this paper: each household is eligible and can readily choose any social safety net available. Commonly, these forms of social safety nets are available to households within a certain income level or predominantly rural households (or perhaps both). However, when looking at social safety net utilization by household income, employment income, and the time to the nearest town, there is no evidence of an explicit eligibility cutoff in those regards[11] (these results can be see in Section 12 – Appendix D). One explanation could be that these social safety nets do not have any eligibility requirements in these categories. However, based on the relationship between the total value of social safety nets utilized and income (as seen in Section 12), poorer households tended to have total value of social safety nets that were much higher than those of richer households. This indicates that there is a possibility that there are various income *tiers* that may preclude certain households from getting more social safety nets. However, a very real third possibility must also be discussed: measurement error. Specifically, in regards to employment income that was only available for the last 30 days, there can be issues of

[11] Although less common, identifying cutoffs based on household size are attempted and also included in Section 12

measurement accuracy. Firstly, there is a strong likelihood that households do not report accurate employment income due to the relatively long recall period. Furthermore, this value was extrapolated linearly to estimate the annual income which tacitly assumes that the household collects the same amount of employment income each month which is not necessarily the case. Overall, this may lead to an overestimate of the annual income which may hide the income eligibility that exists with these various social safety nets. A similar issue can be found in estimating annual food expenditure as we only have information on food expenditure in the past week (which was then linearly extrapolated for the whole year).

Furthermore, many of the questions asked during the BIHS survey have *extremely* long recall periods. For instance, aside from employment income, all other income sources have recall periods that tend to be a year long. This long recall period can lead to inaccuracies as many households, most likely, estimated these values and gave them to the surveyor.

It is also important to note that the final results of the OLS regression use estimated values (the estimated marginal effects). By OLS assumptions, the results are consistent, but the standard errors will not be, so they are not included in the tables provided in this paper. Furthermore, the assumption of the Independence of Irrelevant Alternatives is assumed to be valid when estimating the multinomial logit model.

A natural aspect of marginal effects is that, as one choice probability increases, others must decrease. In all the testing done, the marginal effect of the number of underweight children and non-children on the likelihood of households not utilizing any social safety net is positive which is startling. It can partially be explained by the fact that the likelihood of utilization of "Money" or "Both" (in the case of underweight children and non-children, respectively) both increase but it may also hint that there are other omitted variables that are not controlled for which can lead to this incongruity. Additionally, our model proxies for nutrition through the number of underweight children and non-children but other variables could also be included to create a better estimate of household nutrition. Furthermore, our model characterizes "children" as household members who are no more than six years of age but the results may change if the categorization of "child" changes.

Also, our model assumes that all households have the same level of relative risk aversion and, moreover, the opportunity cost associated with gaining access and utilizing any social safety net is one week's worth of employment income[12] and this opportunity cost is the same regardless of how many social safety nets they utilized which is most likely not the case.

On a more conceptual basis, this paper focuses on extensive margins and, although the magnitude of social safety net utilization is briefly discussed, it is not readily applied in this paper and intensive margins are not specifically examined. Lastly, we do not have any information on how the monetary social safety nets were utilized by the households.

[12]This value is zero if no social safety net is utilized.

Our analysis primarily assumes that these cash transfers are predominantly used for purchasing more specialized and nutritious food but this is not necessarily the case.

# 8 Conclusion

This paper aims to investigate the relationship between nutrition and social safety net utilization using evidence from the Bangladesh Integrated Household Survey, a nationally representative survey of Bangladeshi households in 2019. Using a multinomial logit model, we find evidence that there are differential effects of the number of underweight household members by the type of household member (child or non-child) on the social safety nets utilized. We see that a unit increase in the number of underweight children correlate with an increase in the likelihood of a household utilizing social safety nets that only provide cash transfers by six percentage points and a decrease in the likelihood of utilizing both types of social safety nets by five percentage points. Similar increases in the number of underweight non-children correlate with a one percentage point decrease and one percentage point increase, respectively.

The policy implications of these results depend on the goals of the government. For a developing country like Bangladesh, its primary objective should be to reduce the reliance on "Food" social safety nets due to the government costs for in-kind food transfers but also to help the local economy. This can be achieved by developing infrastructure that targets the nutritional needs of households, including investment in infrastructure aimed at reducing the number of underweight non-children. However, in the context of human capital investment, creating more social safety nets that provide more nutritional in-kind food transfers may be highly beneficial to (malnourished) children as early childhood intervention and investment can vastly improve human capital in the future.

Next steps to this research may include more incorporation of other parameters that may explain utilization that would, hopefully, lead to a decrease in the likelihood of a household choosing "None" as the number of underweight children or non-children increase. Also, extensive research into eligibility as well as incorporating the magnitudes of social safety net utilization and additional proxies for household nutrition can also be beneficial to this research. Lastly, incorporating a nested logit model could also be a fruitful expansion of this research design.

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# 9 Appendix A - Full Tables

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Table 12: Probit Model for Utilizing Any Social Safety Net.

| | Model 1 | Model 4 |
|---|---|---|
| (Intercept) | 102.2544*** | 56.4015** |
| | (19.6439) | (20.4984) |
| adjUtility | −31.7754*** | −17.2578** |
| | (5.9443) | (6.2217) |
| as.factor(numNonChildUnderweight)1 | 0.0770 | 0.1182 |
| | (0.1778) | (0.1876) |
| as.factor(numNonChildUnderweight)2 | 0.0805 | 0.2266 |
| | (0.2780) | (0.2977) |
| as.factor(numNonChildUnderweight)3 | −0.4731 | 0.1075 |
| | (0.7275) | (0.7687) |
| as.factor(numNonChildUnderweight)4 | −16.4911 | −14.3802 |
| | (2033.3113) | (1357.0665) |
| as.factor(numNonChildUnderweight)5 | −3703.9511 | −1984.6754 |
| | (51357.3347) | (85161.2628) |
| as.factor(numNonChildUnderweight)6 | −141836.0284 | −77005.1561 |
| | (434843.8940) | (323507.5835) |
| as.factor(numNonChildUnderweight)7 | −255915.9459 | −94927.0901 |
| | (208909.4727) | (291735.4936) |
| as.factor(numChildUnderweight)1 | −0.2245 | −0.2495 |
| | (0.2505) | (0.2870) |
| as.factor(numChildUnderweight)2 | −0.1687 | −0.4971 |
| | (0.7303) | (0.8270) |
| as.factor(numChildUnderweight)3 | −21.3950 | −19.3196 |
| | (57082.8878) | (42050.7205) |
| as.factor(numChildren)1 | | 0.1412 |
| | | (0.2043) |
| as.factor(numChildren)2 | | −0.0483 |
| | | (0.3541) |
| as.factor(numChildren)3 | | 1.1489 |
| | | (0.6994) |
| as.factor(numChildren)4 | | 3.8155** |
| | | (1.3375) |
| as.factor(numChildren)5 | | 6.0011 |
| | | (169553.1281) |
| as.factor(numNonChildren)2 | | −0.1374 |
| | | (0.2706) |
| as.factor(numNonChildren)3 | | −0.1057 |

| | Model 1 | Model 4 |
|---|---|---|
| | | (0.2869) |
| as.factor(numNonChildren)4 | | −0.3009 |
| | | (0.3335) |
| as.factor(numNonChildren)5 | | −1.2345* |
| | | (0.5827) |
| as.factor(numNonChildren)6 | | −0.5889 |
| | | (0.6903) |
| as.factor(numNonChildren)7 | | −14.2194 |
| | | (1003.2654) |
| as.factor(numNonChildren)8 | | −23.8252 |
| | | (120889.5083) |
| as.factor(numNonChildren)9 | | −24124.3635 |
| | | (33403.6319) |
| as.factor(numNonChildren)10 | | −24280.8645 |
| | | (562393.2406) |
| as.factor(numNonChildren)11 | | −44048.3399 |
| | | (193740.7375) |
| as.factor(numNonChildren)13 | | −88730.2808 |
| | | (362793.3961) |
| as.factor(numNonChildren)14 | | −41874.1132 |
| | | (100746.1743) |
| as.factor(region)Chittagong | | −0.4469 |
| | | (0.3036) |
| as.factor(region)Dhaka | | −0.6142* |
| | | (0.2830) |
| as.factor(region)Khulna | | −1.0403* |
| | | (0.4144) |
| as.factor(region)Rajshahi | | −0.8787* |
| | | (0.3875) |
| as.factor(region)Rangpur | | −0.5737 |
| | | (0.3808) |
| as.factor(region)Sylhet | | −1.1525** |
| | | (0.3855) |
| householdIncome | | −0.0000*** |
| | | (0.0000) |
| as.factor(cropConsumed)1 | | −1.3154*** |
| | | (0.1929) |
| as.factor(atleastHS)1 | | −1.0488 |
| | | (0.7307) |
| timeToTown | | −0.0002 |

| | Model 1 | Model 4 |
|---|---|---|
| | | (0.0020) |
| AIC | 1328.5753 | 1200.9843 |
| BIC | 1407.7981 | 1458.4584 |
| Log Likelihood | −652.2876 | −561.4921 |
| Deviance | 1304.5753 | 1122.9843 |
| Num. obs. | 5442 | 5442 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 13: Marginal Effects for Probit Model.

| | Marginal Effect |
|---|---|
| adjUtility | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)1 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)2 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)3 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)4 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)6 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildUnderweight)7 | −1.0000*** |
| | (0.0000) |
| as.factor(numChildUnderweight)1 | 0.0000 |
| | (0.0000) |
| as.factor(numChildUnderweight)2 | 0.0000 |
| | (0.0000) |
| as.factor(numChildUnderweight)3 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)1 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)2 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)3 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)4 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)2 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)3 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)4 | 0.0000 |

| | Marginal Effect |
|---|---|
| | (0.0000) |
| as.factor(numNonChildren)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)6 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)7 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)8 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)9 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)10 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)11 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)13 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)14 | −1.0000*** |
| | (0.0000) |
| as.factor(region)Chittagong | 0.0000 |
| | (0.0000) |
| as.factor(region)Dhaka | 0.0000 |
| | (0.0000) |
| as.factor(region)Khulna | 0.0000 |
| | (0.0000) |
| as.factor(region)Rajshahi | 0.0000 |
| | (0.0000) |
| as.factor(region)Rangpur | 0.0000 |
| | (0.0000) |
| as.factor(region)Sylhet | 0.0000 |
| | (0.0000) |
| householdIncome | 0.0000 |
| | (0.0000) |
| as.factor(cropConsumed)1 | 0.0000 |
| | (0.0000) |
| as.factor(atleastHS)1 | 0.0000 |
| | (0.0000) |
| timeToTown | 0.0000 |
| | (0.0000) |
| Num. obs. | 5442 |

| | Marginal Effect |
|---|---|
| Log Likelihood | −561.4921 |
| Deviance | 1122.9843 |
| AIC | 1200.9843 |
| BIC | 1458.4584 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 14: Multinomial Logit Model For Money (1), Food (2), or Both (3) where None is the Reference Group.

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 1: (Intercept) | $101.7761^{***}$ | $101.7761^{***}$ | $3.9511^{***}$ | $-0.6989^{***}$ |
| | (0.0347) | (0.0347) | (0.0000) | (0.0000) |
| 1: adjUtility | $-31.7810^{***}$ | $-31.7810^{***}$ | $-1.6466^{***}$ | $-0.2051^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)1 | 0.0259 | 0.0259 | $0.0135^{***}$ | $-0.0222^{***}$ |
| | (0.0465) | (0.0465) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)2 | $0.0694^{*}$ | $0.0694^{*}$ | $0.0943^{***}$ | $0.2781^{***}$ |
| | (0.0291) | (0.0291) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)3 | $-0.4978^{***}$ | $-0.4978^{***}$ | $-0.3141^{***}$ | $-0.2603^{***}$ |
| | (0.0034) | (0.0034) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)4 | $-340.4060^{***}$ | $-340.4060^{***}$ | $-5.8059^{***}$ | $-0.1453^{***}$ |
| | (0.0006) | (0.0006) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)5 | $-999.4432^{***}$ | $-999.4432^{***}$ | $-68.0656^{***}$ | $-18.5161^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)6 | −41196.4962 | −41196.4962 | $-4281.2998^{***}$ | $-646.6018^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)7 | −1744.8984 | −1744.8984 | $-769.2768^{***}$ | $-62.9392^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)1 | $-0.1798^{***}$ | $-0.1798^{***}$ | $-0.1161^{***}$ | $-0.1887^{***}$ |
| | (0.0079) | (0.0079) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)2 | $-0.1280^{***}$ | $-0.1280^{***}$ | $-0.0041^{***}$ | $-0.2219^{***}$ |
| | (0.0008) | (0.0008) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)3 | $-1896.5757^{***}$ | $-1896.5757^{***}$ | $-106.7774^{***}$ | $-4.4766^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: (Intercept) | $100.5253^{***}$ | $100.5253^{***}$ | $3.7195^{***}$ | $-0.6293^{***}$ |
| | (0.0456) | (0.0456) | (0.0000) | (0.0000) |
| 2: adjUtility | $-31.7810^{***}$ | $-31.7810^{***}$ | $-1.6468^{***}$ | $-0.2052^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)1 | $0.0568^{*}$ | $0.0568^{*}$ | $0.0501^{***}$ | $0.1071^{***}$ |
| | (0.0243) | (0.0243) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)2 | $-0.3830^{***}$ | $-0.3830^{***}$ | $-0.4355^{***}$ | $0.0008^{***}$ |
| | (0.0065) | (0.0065) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)3 | $-0.7056^{***}$ | $-0.7056^{***}$ | $-0.6035^{***}$ | $-0.2599^{***}$ |
| | (0.0016) | (0.0016) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)4 | $-340.6135^{***}$ | $-340.6135^{***}$ | $-6.0626^{***}$ | $0.0027^{***}$ |
| | (0.0003) | (0.0003) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)5 | $-12133.1602^{***}$ | $-12133.1602^{***}$ | $-1255.6159^{***}$ | $-207.0097^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)6 | $-30045.2104^{***}$ | $-30045.2104^{***}$ | $-2146.2438^{***}$ | $-212.5343^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)7 | −5330.1454 | −5330.1454 | $-1264.9288^{***}$ | $-182.7588^{***}$ |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)1 | $-0.3979^{***}$ | $-0.3979^{***}$ | $-0.2806^{***}$ | $-0.2781^{***}$ |
| | (0.0073) | (0.0073) | (0.0000) | (0.0000) |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 2: as.factor(numChildUnderweight)2 | $-0.4522^{***}$ | $-0.4522^{***}$ | $-0.1903^{***}$ | $-0.0878^{***}$ |
| | (0.0005) | (0.0005) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)3 | $-19378.4724^{***}$ | $-19378.4724^{***}$ | $-1994.2820^{***}$ | $-220.8072^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: (Intercept) | $100.7496^{***}$ | $100.7496^{***}$ | $3.8073^{***}$ | $-1.3629^{***}$ |
| | (0.0406) | (0.0406) | (0.0000) | (0.0000) |
| 3: adjUtility | $-31.7810^{***}$ | $-31.7810^{***}$ | $-1.6467^{***}$ | $-0.2051^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)1 | $0.2201^{***}$ | $0.2201^{***}$ | $0.2180^{***}$ | $0.1120^{***}$ |
| | (0.0367) | (0.0367) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)2 | $0.3598^{***}$ | $0.3598^{***}$ | $0.3682^{***}$ | $0.4720^{***}$ |
| | (0.0237) | (0.0237) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)3 | $-0.2662^{***}$ | $-0.2662^{***}$ | $-0.1161^{***}$ | $-0.2266^{***}$ |
| | (0.0027) | (0.0027) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)4 | $-340.4512^{***}$ | $-340.4512^{***}$ | $-5.8627^{***}$ | $-0.5132^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)5 | $-998.6112^{***}$ | $-998.6112^{***}$ | $-67.0908^{***}$ | $-17.4247^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)6 | $-18642.5813^{***}$ | $-18642.5813^{***}$ | $-445.9157^{***}$ | $-109.3179^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)7 | $-4200.7185^{***}$ | $-4200.7185^{***}$ | $-1178.7685^{***}$ | $-144.3816^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)1 | $-0.2330^{***}$ | $-0.2330^{***}$ | $-0.1152^{***}$ | $-0.2448^{***}$ |
| | (0.0082) | (0.0082) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)2 | $-0.1310^{***}$ | $-0.1310^{***}$ | $0.1512^{***}$ | $-0.0537^{***}$ |
| | (0.0008) | (0.0008) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)3 | $-24064.6245^{***}$ | $-24064.6245^{***}$ | $-2226.3325^{***}$ | $-310.1412^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Chittagong | | | $0.1922^{***}$ | $0.5103^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Dhaka | | | $-0.1553^{***}$ | $-0.1481^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Khulna | | | $-0.6798^{***}$ | $-0.6545^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Rajshahi | | | $-0.3564^{***}$ | $-0.3048^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Rangpur | | | $-0.7566^{***}$ | $-0.9600^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Sylhet | | | $-0.6433^{***}$ | $-0.3619^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: householdIncome | | | $-0.0000^{***}$ | $-0.0000^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(cropConsumed)1 | | | $-1.2883^{***}$ | $-0.9612^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(atleastHS)1 | | | $-0.8034^{***}$ | $-0.1233^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: timeToTown | | | $-0.0043^{***}$ | $-0.0053^{***}$ |
| | | | (0.0007) | (0.0007) |
| 2: as.factor(region)Chittagong | | | $-1.4427^{***}$ | $-1.0282^{***}$ |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Dhaka | | | −1.2035*** | −1.1534*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Khulna | | | −1.1847*** | −1.0156*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Rajshahi | | | −1.4269*** | −1.1845*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Rangpur | | | −0.5165*** | −0.6069*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Sylhet | | | −1.7523*** | −1.3584*** |
| | | | (0.0000) | (0.0000) |
| 2: householdIncome | | | −0.0000*** | −0.0000*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(cropConsumed)1 | | | −1.6975*** | −1.1653*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(atleastHS)1 | | | −2.1587*** | −1.5602*** |
| | | | (0.0000) | (0.0000) |
| 2: timeToTown | | | 0.0007 | 0.0000 |
| | | | (0.0007) | (0.0007) |
| 3: as.factor(region)Chittagong | | | −1.3750*** | −1.0283*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Dhaka | | | −1.0912*** | −1.0321*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Khulna | | | −1.4404*** | −1.4139*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Rajshahi | | | −1.6462*** | −1.4630*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Rangpur | | | −0.3586*** | −0.4549*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Sylhet | | | −1.9924*** | −1.6688*** |
| | | | (0.0000) | (0.0000) |
| 3: householdIncome | | | −0.0000*** | −0.0000*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(cropConsumed)1 | | | −1.6672*** | −1.3468*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(atleastHS)1 | | | −1.3798*** | −0.7138*** |
| | | | (0.0000) | (0.0000) |
| 3: timeToTown | | | 0.0014* | 0.0001 |
| | | | (0.0007) | (0.0007) |
| 1: as.factor(numChildren)1 | | | | 0.0665*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)2 | | | | 0.0528*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)3 | | | | 0.4940*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)4 | | | | 2.8645*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)5 | | | | 52.6962*** |
| | | | | (0.0000) |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 1: as.factor(numNonChildren)2 | | | | $-0.4947^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)3 | | | | $-0.4830^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)4 | | | | $-0.5478^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)5 | | | | $-0.9570^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)6 | | | | $-0.8847^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)7 | | | | $-1.2230^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)8 | | | | $-59.8081^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)9 | | | | $-245.1510^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)10 | | | | $-44.7770^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)11 | | | | $-42.0636^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)13 | | | | $34.5015^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)14 | | | | $45.1598^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)1 | | | | $0.1638^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)2 | | | | $0.3575^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)3 | | | | $0.3987^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)4 | | | | $-170.0231^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)5 | | | | $-87.3642^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)2 | | | | $-0.5577^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)3 | | | | $-1.2517^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)4 | | | | $-1.7647^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)5 | | | | $-2.3227^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)6 | | | | $-2.4161^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)7 | | | | $-2.2616^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)8 | | | | $-61.3621^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)9 | | | | $-934.3989^{***}$ |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)10 | | | | −294.1585*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)11 | | | | −520.8879*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)13 | | | | −174.2360*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)14 | | | | −316.7919*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)1 | | | | 0.1800*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)2 | | | | 0.1972*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)3 | | | | 0.4642*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)4 | | | | −201.3877*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)5 | | | | −285.1247*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)2 | | | | −0.0535*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)3 | | | | 0.1748*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)4 | | | | 0.0718*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)5 | | | | −0.2277*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)6 | | | | −0.4304*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)7 | | | | −0.7526*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)8 | | | | −59.8090*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)9 | | | | −242.6237*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)10 | | | | −88.9717*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)11 | | | | −39.7858*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)13 | | | | −35.6627*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)14 | | | | 48.3501*** |
| | | | | (0.0000) |
| AIC | 5878.7272 | 5878.7272 | 5491.5554 | 5616.3574 |
| BIC | 6116.3957 | 6116.3957 | 5927.2809 | 6388.7799 |
| Log Likelihood | −2903.3636 | −2903.3636 | −2679.7777 | −2691.1787 |
| Deviance | 5806.7272 | 5806.7272 | 5359.5554 | 5382.3574 |
| Num. obs. | 5442 | 5442 | 5442 | 5442 |
| K | 4 | 4 | 4 | 4 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 15: Marginal Effects for the Multinomial Logit Model.

| Choice | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| None | atleastHS | 1 - 0 | 0.0128 |
| None | cropConsumed | 1 - 0 | 0.0387 |
| None | numChildren | 1 - 0 | -0.0040 |
| None | numChildren | 2 - 0 | -0.0053 |
| None | numChildren | 3 - 0 | -0.0196 |
| None | numChildren | 4 - 0 | -0.1727 |
| None | numChildren | 5 - 0 | -0.5321 |
| None | numChildUnderweight | 1 - 0 | 0.0075 |
| None | numChildUnderweight | 2 - 0 | 0.0056 |
| None | numChildUnderweight | 3 - 0 | 0.0546 |
| None | numNonChildren | 10 - 1 | 0.1040 |
| None | numNonChildren | 11 - 1 | 0.1024 |
| None | numNonChildren | 13 - 1 | -0.5126 |
| None | numNonChildren | 14 - 1 | -0.5126 |
| None | numNonChildren | 2 - 1 | 0.0198 |
| None | numNonChildren | 3 - 1 | 0.0223 |
| None | numNonChildren | 4 - 1 | 0.0266 |
| None | numNonChildren | 5 - 1 | 0.0380 |
| None | numNonChildren | 6 - 1 | 0.0383 |
| None | numNonChildren | 7 - 1 | 0.0449 |
| None | numNonChildren | 8 - 1 | 0.1121 |
| None | numNonChildren | 9 - 1 | 0.1889 |
| None | numNonChildUnderweight | 1 - 0 | -0.0011 |
| None | numNonChildUnderweight | 2 - 0 | -0.0110 |
| None | numNonChildUnderweight | 3 - 0 | 0.0083 |
| None | numNonChildUnderweight | 4 - 0 | 0.0061 |
| None | numNonChildUnderweight | 5 - 0 | 0.0679 |
| None | numNonChildUnderweight | 6 - 0 | 0.1114 |
| None | numNonChildUnderweight | 7 - 0 | 0.0896 |
| None | region | Chittagong - Barisal | 0.0075 |
| None | region | Dhaka - Barisal | 0.0266 |
| None | region | Khulna - Barisal | 0.0372 |
| None | region | Rajshahi - Barisal | 0.0328 |
| None | region | Rangpur - Barisal | 0.0282 |
| None | region | Sylhet - Barisal | 0.0359 |
| Money | adjUtility | | -0.0045 |

| Choice | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| Money | atleastHS | 1 - 0 | 0.0651 |
| Money | cropConsumed | 1 - 0 | 0.0074 |
| Money | householdIncome | | 0.0000 |
| Money | numChildren | 1 - 0 | -0.0082 |
| Money | numChildren | 2 - 0 | -0.0178 |
| Money | numChildren | 3 - 0 | 0.0175 |
| Money | numChildren | 4 - 0 | 0.3456 |
| Money | numChildren | 5 - 0 | 0.7050 |
| Money | numChildUnderweight | 1 - 0 | 0.0022 |
| Money | numChildUnderweight | 2 - 0 | -0.0187 |
| Money | numChildUnderweight | 3 - 0 | 0.1251 |
| Money | numNonChildren | 10 - 1 | 0.1097 |
| Money | numNonChildren | 11 - 1 | -0.1292 |
| Money | numNonChildren | 13 - 1 | 0.7263 |
| Money | numNonChildren | 14 - 1 | -0.0661 |
| Money | numNonChildren | 2 - 1 | -0.0217 |
| Money | numNonChildren | 3 - 1 | 0.0049 |
| Money | numNonChildren | 4 - 1 | 0.0209 |
| Money | numNonChildren | 5 - 1 | 0.0105 |
| Money | numNonChildren | 6 - 1 | 0.0325 |
| Money | numNonChildren | 7 - 1 | 0.0118 |
| Money | numNonChildren | 8 - 1 | 0.0037 |
| Money | numNonChildren | 9 - 1 | -0.1726 |
| Money | numNonChildUnderweight | 1 - 0 | -0.0124 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0043 |
| Money | numNonChildUnderweight | 3 - 0 | -0.0070 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0081 |
| Money | numNonChildUnderweight | 5 - 0 | -0.0874 |
| Money | numNonChildUnderweight | 6 - 0 | -0.2905 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0836 |
| Money | region | Chittagong - Barisal | 0.1593 |
| Money | region | Dhaka - Barisal | 0.0900 |
| Money | region | Khulna - Barisal | 0.0491 |
| Money | region | Rajshahi - Barisal | 0.0975 |
| Money | region | Rangpur - Barisal | -0.0575 |
| Money | region | Sylhet - Barisal | 0.1080 |
| Money | timeToTown | | -0.0006 |
| Food | adjUtility | | -0.0013 |
| Food | atleastHS | 1 - 0 | -0.0491 |
| Food | cropConsumed | 1 - 0 | -0.0113 |

| Choice | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| Food | householdIncome | | -0.0000 |
| Food | numChildren | 1 - 0 | 0.0042 |
| Food | numChildren | 2 - 0 | 0.0165 |
| Food | numChildren | 3 - 0 | -0.0014 |
| Food | numChildren | 4 - 0 | -0.0679 |
| Food | numChildren | 5 - 0 | -0.0676 |
| Food | numChildUnderweight | 1 - 0 | -0.0053 |
| Food | numChildUnderweight | 2 - 0 | 0.0036 |
| Food | numChildUnderweight | 3 - 0 | -0.0711 |
| Food | numNonChildren | 10 - 1 | -0.1575 |
| Food | numNonChildren | 11 - 1 | -0.1575 |
| Food | numNonChildren | 13 - 1 | -0.1575 |
| Food | numNonChildren | 14 - 1 | -0.1575 |
| Food | numNonChildren | 2 - 1 | -0.0208 |
| Food | numNonChildren | 3 - 1 | -0.0806 |
| Food | numNonChildren | 4 - 1 | -0.1045 |
| Food | numNonChildren | 5 - 1 | -0.1132 |
| Food | numNonChildren | 6 - 1 | -0.1162 |
| Food | numNonChildren | 7 - 1 | -0.0954 |
| Food | numNonChildren | 8 - 1 | -0.1186 |
| Food | numNonChildren | 9 - 1 | -0.1575 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0054 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0158 |
| Food | numNonChildUnderweight | 3 - 0 | -0.0020 |
| Food | numNonChildUnderweight | 4 - 0 | 0.0136 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0712 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0710 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0712 |
| Food | region | Chittagong - Barisal | -0.0639 |
| Food | region | Dhaka - Barisal | -0.0494 |
| Food | region | Khulna - Barisal | -0.0162 |
| Food | region | Rajshahi - Barisal | -0.0408 |
| Food | region | Rangpur - Barisal | -0.0002 |
| Food | region | Sylhet - Barisal | -0.0459 |
| Food | timeToTown | | 0.0002 |
| Both | adjUtility | | -0.0016 |
| Both | atleastHS | 1 - 0 | -0.0288 |
| Both | cropConsumed | 1 - 0 | -0.0348 |
| Both | householdIncome | | -0.0000 |
| Both | numChildren | 1 - 0 | 0.0080 |

| Choice | Variable | Contrast | Marginal Effect |
|---|---|---|---|
| Both | numChildren | 2 - 0 | 0.0067 |
| Both | numChildren | 3 - 0 | 0.0034 |
| Both | numChildren | 4 - 0 | -0.1050 |
| Both | numChildren | 5 - 0 | -0.1053 |
| Both | numChildUnderweight | 1 - 0 | -0.0044 |
| Both | numChildUnderweight | 2 - 0 | 0.0095 |
| Both | numChildUnderweight | 3 - 0 | -0.1086 |
| Both | numNonChildren | 10 - 1 | -0.0562 |
| Both | numNonChildren | 11 - 1 | 0.1843 |
| Both | numNonChildren | 13 - 1 | -0.0562 |
| Both | numNonChildren | 14 - 1 | 0.7362 |
| Both | numNonChildren | 2 - 1 | 0.0227 |
| Both | numNonChildren | 3 - 1 | 0.0534 |
| Both | numNonChildren | 4 - 1 | 0.0569 |
| Both | numNonChildren | 5 - 1 | 0.0646 |
| Both | numNonChildren | 6 - 1 | 0.0454 |
| Both | numNonChildren | 7 - 1 | 0.0387 |
| Both | numNonChildren | 8 - 1 | 0.0028 |
| Both | numNonChildren | 9 - 1 | 0.1411 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0081 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0225 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0007 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0279 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0906 |
| Both | numNonChildUnderweight | 6 - 0 | 0.2501 |
| Both | numNonChildUnderweight | 7 - 0 | -0.1020 |
| Both | region | Chittagong - Barisal | -0.1029 |
| Both | region | Dhaka - Barisal | -0.0672 |
| Both | region | Khulna - Barisal | -0.0702 |
| Both | region | Rajshahi - Barisal | -0.0894 |
| Both | region | Rangpur - Barisal | 0.0296 |
| Both | region | Sylhet - Barisal | -0.0980 |
| Both | timeToTown | | 0.0003 |

# 10 Appendix B - Robustness

## 10.1 WHO Data

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Table 16: Probit Model for Utilizing Any Social Safety Net Using WHO Data.

| | Model 1 | Model 4 |
|---|---|---|
| (Intercept) | 103.6563*** | 56.1927** |
| | (19.6490) | (20.4583) |
| adjUtility | −32.2130*** | −17.1990** |
| | (5.9456) | (6.2095) |
| as.factor(numNonChildUnderweight)1 | 0.0972 | 0.1294 |
| | (0.1776) | (0.1874) |
| as.factor(numNonChildUnderweight)2 | 0.1155 | 0.3209 |
| | (0.2785) | (0.2980) |
| as.factor(numNonChildUnderweight)3 | −1.0790 | −0.6149 |
| | (1.0156) | (1.0457) |
| as.factor(numNonChildUnderweight)4 | −16.4581 | −14.4998 |
| | (2042.5073) | (1445.9995) |
| as.factor(numNonChildUnderweight)5 | −3753.5184 | −1976.6331 |
| | (123509.2566) | (149279.9815) |
| as.factor(numNonChildUnderweight)6 | −143791.2356 | −76744.0701 |
| | (260184.3611) | (166104.9195) |
| as.factor(numNonChildUnderweight)7 | −259441.1642 | −94602.5597 |
| | (207752.0985) | (289633.6255) |
| as.factor(numChildUnderweight)1 | 0.1166 | 0.0770 |
| | (0.2725) | (0.3055) |
| as.factor(numChildUnderweight)2 | −0.1382 | 0.2707 |
| | (1.0300) | (1.0787) |
| as.factor(numChildUnderweight)3 | −2591.9139 | −1382.6865 |
| | (47453132.8145) | (47453132.8148) |
| as.factor(numChildren)1 | | 0.0590 |
| | | (0.1999) |
| as.factor(numChildren)2 | | −0.1880 |
| | | (0.3491) |
| as.factor(numChildren)3 | | 0.9160 |
| | | (0.6742) |
| as.factor(numChildren)4 | | 3.4401** |
| | | (1.3035) |
| as.factor(numChildren)5 | | 6.2791 |
| | | (165754.8932) |
| as.factor(numNonChildren)2 | | −0.1314 |
| | | (0.2703) |

| | Model 1 | Model 4 |
|---|---|---|
| as.factor(numNonChildren)3 | | −0.1104 |
| | | (0.2860) |
| as.factor(numNonChildren)4 | | −0.2945 |
| | | (0.3327) |
| as.factor(numNonChildren)5 | | −1.2360* |
| | | (0.5807) |
| as.factor(numNonChildren)6 | | −0.5480 |
| | | (0.6894) |
| as.factor(numNonChildren)7 | | −14.2208 |
| | | (1020.2851) |
| as.factor(numNonChildren)8 | | −24.0533 |
| | | (116706.7417) |
| as.factor(numNonChildren)9 | | −24042.0257 |
| | | (31979.8416) |
| as.factor(numNonChildren)10 | | −24197.8018 |
| | | (565114.4766) |
| as.factor(numNonChildren)11 | | −43898.9920 |
| | | (190570.4034) |
| as.factor(numNonChildren)13 | | −88428.9346 |
| | | (361106.1212) |
| as.factor(numNonChildren)14 | | −41731.0514 |
| | | (100768.5316) |
| as.factor(region)Chittagong | | −0.4428 |
| | | (0.3034) |
| as.factor(region)Dhaka | | −0.5989* |
| | | (0.2827) |
| as.factor(region)Khulna | | −1.0265* |
| | | (0.4143) |
| as.factor(region)Rajshahi | | −0.8754* |
| | | (0.3872) |
| as.factor(region)Rangpur | | −0.5556 |
| | | (0.3805) |
| as.factor(region)Sylhet | | −1.1561** |
| | | (0.3862) |
| householdIncome | | −0.0000*** |
| | | (0.0000) |
| as.factor(cropConsumed)1 | | −1.3157*** |
| | | (0.1930) |
| as.factor(atleastHS)1 | | −1.0260 |
| | | (0.7306) |

| | Model 1 | Model 4 |
|---|---|---|
| timeToTown | | −0.0003 |
| | | (0.0021) |
| AIC | 1328.3074 | 1200.7354 |
| BIC | 1407.5302 | 1458.2096 |
| Log Likelihood | −652.1537 | −561.3677 |
| Deviance | 1304.3074 | 1122.7354 |
| Num. obs. | 5442 | 5442 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 17: Marginal Effects for Probit Model Using WHO Data.

| | Marginal Effect |
|---|---|
| adjUtility | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)1 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)2 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)3 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)4 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildUnderweight)6 | $-1.0000^{***}$ |
| | (0.0000) |
| as.factor(numNonChildUnderweight)7 | $-1.0000^{***}$ |
| | (0.0000) |
| as.factor(numChildUnderweight)1 | 0.0000 |
| | (0.0000) |
| as.factor(numChildUnderweight)2 | 0.0000 |
| | (0.0000) |
| as.factor(numChildUnderweight)3 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)1 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)2 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)3 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)4 | 0.0000 |
| | (0.0000) |
| as.factor(numChildren)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)2 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)3 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)4 | 0.0000 |

| | Marginal Effect |
|---|---|
| | (0.0000) |
| as.factor(numNonChildren)5 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)6 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)7 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)8 | 0.0000 |
| | (0.0000) |
| as.factor(numNonChildren)9 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)10 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)11 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)13 | −1.0000*** |
| | (0.0000) |
| as.factor(numNonChildren)14 | −1.0000*** |
| | (0.0000) |
| as.factor(region)Chittagong | 0.0000 |
| | (0.0000) |
| as.factor(region)Dhaka | 0.0000 |
| | (0.0000) |
| as.factor(region)Khulna | 0.0000 |
| | (0.0000) |
| as.factor(region)Rajshahi | 0.0000 |
| | (0.0000) |
| as.factor(region)Rangpur | 0.0000 |
| | (0.0000) |
| as.factor(region)Sylhet | 0.0000 |
| | (0.0000) |
| householdIncome | 0.0000 |
| | (0.0000) |
| as.factor(cropConsumed)1 | 0.0000 |
| | (0.0000) |
| as.factor(atleastHS)1 | 0.0000 |
| | (0.0000) |
| timeToTown | 0.0000 |
| | (0.0000) |
| Num. obs. | 5442 |

| | Marginal Effect |
|---|---|
| Log Likelihood | −561.3677 |
| Deviance | 1122.7354 |
| AIC | 1200.7354 |
| BIC | 1458.2096 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 18: Multinomial Logit Model For Money (1), Food (2), or Both (3) where None is the Reference Group Using WHO Data.

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 1: (Intercept) | $103.1789^{***}$ | $103.1789^{***}$ | $3.5775^{***}$ | $-0.4681^{***}$ |
| | (0.0356) | (0.0356) | (0.0000) | (0.0000) |
| 1: adjUtility | $-32.2183^{***}$ | $-32.2183^{***}$ | $-1.5368^{***}$ | $-0.2715^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)1 | 0.0329 | 0.0329 | $-0.0036^{***}$ | $-0.0100^{***}$ |
| | (0.0470) | (0.0470) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)2 | $0.1129^{***}$ | $0.1129^{***}$ | $0.1867^{***}$ | $0.2864^{***}$ |
| | (0.0289) | (0.0289) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)3 | $-1.0918^{***}$ | $-1.0918^{***}$ | $-0.8054^{***}$ | $-1.0199^{***}$ |
| | (0.0031) | (0.0031) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)4 | $-325.3958^{***}$ | $-325.3958^{***}$ | $-6.6281^{***}$ | $-0.6279^{***}$ |
| | (0.0006) | (0.0006) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)5 | $-1311.9350^{***}$ | $-1311.9350^{***}$ | $-60.6833^{***}$ | $-9.4150^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)6 | −35888.2006 | −35888.2006 | $-3806.6546^{***}$ | $-805.8316^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)7 | −2329.9235 | −2329.9235 | $-713.0387^{***}$ | $-107.5541^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)1 | $0.1834^{***}$ | $0.1834^{***}$ | $0.1755^{***}$ | $0.2326^{***}$ |
| | (0.0050) | (0.0050) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)2 | $-0.1814^{***}$ | $-0.1814^{***}$ | $0.0423^{***}$ | $0.1000^{***}$ |
| | (0.0003) | (0.0003) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)3 | −1803.5416 | −1803.5416 | $-34.1020^{***}$ | $-1.1835^{***}$ |
| | | | (0.0000) | (0.0000) |
| 2: (Intercept) | $101.9218^{***}$ | $101.9218^{***}$ | $3.3572^{***}$ | $-0.1674^{***}$ |
| | (0.0464) | (0.0464) | (0.0000) | (0.0000) |
| 2: adjUtility | $-32.2182^{***}$ | $-32.2182^{***}$ | $-1.5370^{***}$ | $-0.2716^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)1 | 0.0361 | 0.0361 | $0.0010^{***}$ | $0.0633^{***}$ |
| | (0.0242) | (0.0242) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)2 | $-0.3395^{***}$ | $-0.3395^{***}$ | $-0.3669^{***}$ | $-0.0007^{***}$ |
| | (0.0066) | (0.0066) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)3 | $-1.3860^{***}$ | $-1.3860^{***}$ | $-1.1908^{***}$ | $-0.8748^{***}$ |
| | (0.0013) | (0.0013) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)4 | $-325.5715^{***}$ | $-325.5715^{***}$ | $-6.8130^{***}$ | $-0.4242^{***}$ |
| | (0.0003) | (0.0003) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)5 | $-13000.7603^{***}$ | $-13000.7603^{***}$ | $-1428.1439^{***}$ | $-338.0952^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)6 | $-22684.5888^{***}$ | $-22684.5888^{***}$ | $-1660.8819^{***}$ | $-208.7269^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)7 | $-6150.3748^{***}$ | $-6150.3748^{***}$ | $-1178.8167^{***}$ | $-225.9663^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)1 | $0.0196^{***}$ | $0.0196^{***}$ | $0.0579^{***}$ | $0.1713^{***}$ |
| | (0.0052) | (0.0052) | (0.0000) | (0.0000) |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 2: as.factor(numChildUnderweight)2 | $-0.5144^{***}$ | $-0.5144^{***}$ | $0.0232^{***}$ | $-0.2251^{***}$ |
| | (0.0002) | (0.0002) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)3 | $-8097.4631^{***}$ | $-8097.4631^{***}$ | $-614.0676^{***}$ | $-63.6807^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: (Intercept) | $102.1429^{***}$ | $102.1429^{***}$ | $3.4378^{***}$ | $-1.1253^{***}$ |
| | (0.0415) | (0.0415) | (0.0000) | (0.0000) |
| 3: adjUtility | $-32.2182^{***}$ | $-32.2182^{***}$ | $-1.5368^{***}$ | $-0.2714^{***}$ |
| | (0.0221) | (0.0221) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)1 | $0.3017^{***}$ | $0.3017^{***}$ | $0.2726^{***}$ | $0.2554^{***}$ |
| | (0.0370) | (0.0370) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)2 | $0.3834^{***}$ | $0.3834^{***}$ | $0.4112^{***}$ | $0.4859^{***}$ |
| | (0.0235) | (0.0235) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)3 | $-0.8602^{***}$ | $-0.8602^{***}$ | $-0.6321^{***}$ | $-0.9877^{***}$ |
| | (0.0025) | (0.0025) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)4 | $-325.5595^{***}$ | $-325.5595^{***}$ | $-6.7140^{***}$ | $-0.7801^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)5 | $-1310.9078^{***}$ | $-1310.9078^{***}$ | $-59.7325^{***}$ | $-8.2400^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)6 | $-17236.5789^{***}$ | $-17236.5789^{***}$ | $-272.3573^{***}$ | $-28.7329^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)7 | $-2950.0467^{***}$ | $-2950.0467^{***}$ | $-1116.9985^{***}$ | $-189.6315^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)1 | 0.0003 | 0.0003 | $0.0444^{***}$ | $0.0355^{***}$ |
| | (0.0050) | (0.0050) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)2 | $0.1199^{***}$ | $0.1199^{***}$ | $0.5750^{***}$ | $0.7594^{***}$ |
| | (0.0004) | (0.0004) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)3 | $-10130.3872^{***}$ | $-10130.3872^{***}$ | $-689.4626^{***}$ | $-163.0999^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Chittagong | | | $0.1830^{***}$ | $0.3484^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Dhaka | | | $-0.1527^{***}$ | $-0.1452^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Khulna | | | $-0.6814^{***}$ | $-0.9942^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Rajshahi | | | $-0.3404^{***}$ | $-0.4710^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Rangpur | | | $-0.7998^{***}$ | $-1.0884^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(region)Sylhet | | | $-0.6700^{***}$ | $-0.6697^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: householdIncome | | | $-0.0000^{***}$ | $-0.0000^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(cropConsumed)1 | | | $-1.2716^{***}$ | $-1.2326^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: as.factor(atleastHS)1 | | | $-0.7605^{***}$ | $-0.0235^{***}$ |
| | | | (0.0000) | (0.0000) |
| 1: timeToTown | | | $-0.0044^{***}$ | $-0.0040^{***}$ |
| | | | (0.0007) | (0.0006) |
| 2: as.factor(region)Chittagong | | | $-1.4713^{***}$ | $-1.2858^{***}$ |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Dhaka | | | −1.2049*** | −1.2721*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Khulna | | | −1.1875*** | −1.4746*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Rajshahi | | | −1.4120*** | −1.5513*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Rangpur | | | −0.5559*** | −0.8969*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(region)Sylhet | | | −1.7949*** | −1.7240*** |
| | | | (0.0000) | (0.0000) |
| 2: householdIncome | | | −0.0000*** | −0.0000*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(cropConsumed)1 | | | −1.6861*** | −1.4188*** |
| | | | (0.0000) | (0.0000) |
| 2: as.factor(atleastHS)1 | | | −2.1158*** | −1.0308*** |
| | | | (0.0000) | (0.0000) |
| 2: timeToTown | | | 0.0006 | 0.0012 |
| | | | (0.0007) | (0.0007) |
| 3: as.factor(region)Chittagong | | | −1.3799*** | −1.1973*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Dhaka | | | −1.0936*** | −1.0278*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Khulna | | | −1.4474*** | −1.6880*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Rajshahi | | | −1.6305*** | −1.6779*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Rangpur | | | −0.4061*** | −0.6197*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(region)Sylhet | | | −2.0115*** | −2.0252*** |
| | | | (0.0000) | (0.0000) |
| 3: householdIncome | | | −0.0000*** | −0.0000*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(cropConsumed)1 | | | −1.6517*** | −1.6187*** |
| | | | (0.0000) | (0.0000) |
| 3: as.factor(atleastHS)1 | | | −1.3408*** | −0.5648*** |
| | | | (0.0000) | (0.0000) |
| 3: timeToTown | | | 0.0013 | 0.0014* |
| | | | (0.0007) | (0.0007) |
| 1: as.factor(numChildren)1 | | | | −0.0298*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)2 | | | | −0.1373*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)3 | | | | 0.7811*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)4 | | | | 3.0191*** |
| | | | | (0.0000) |
| 1: as.factor(numChildren)5 | | | | 74.2060*** |
| | | | | (0.0000) |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| 1: as.factor(numNonChildren)2 | | | | $-0.3111^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)3 | | | | $-0.3171^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)4 | | | | $-0.3949^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)5 | | | | $-0.8680^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)6 | | | | $-0.4996^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)7 | | | | $-1.4884^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)8 | | | | $-98.8546^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)9 | | | | $-325.7551^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)10 | | | | $-45.2906^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)11 | | | | $-57.8831^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)13 | | | | $20.8247^{***}$ |
| | | | | (0.0000) |
| 1: as.factor(numNonChildren)14 | | | | $70.5261^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)1 | | | | $0.0151^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)2 | | | | $0.2059^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)3 | | | | $-0.4439^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)4 | | | | $-240.7243^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numChildren)5 | | | | $-124.3868^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)2 | | | | $-0.4211^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)3 | | | | $-1.1545^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)4 | | | | $-1.6814^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)5 | | | | $-2.3265^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)6 | | | | $-2.2299^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)7 | | | | $-2.7213^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)8 | | | | $-100.3732^{***}$ |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)9 | | | | $-1205.9457^{***}$ |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)10 | | | | −385.8328*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)11 | | | | −709.6978*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)13 | | | | −214.7220*** |
| | | | | (0.0000) |
| 2: as.factor(numNonChildren)14 | | | | −433.9345*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)1 | | | | 0.1147*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)2 | | | | 0.0167*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)3 | | | | 0.4343*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)4 | | | | −268.9345*** |
| | | | | (0.0000) |
| 3: as.factor(numChildren)5 | | | | −441.3228*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)2 | | | | 0.0064*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)3 | | | | 0.2759*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)4 | | | | 0.1560*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)5 | | | | −0.2551*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)6 | | | | −0.1012*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)7 | | | | −0.9874*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)8 | | | | −99.1412*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)9 | | | | −323.4186*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)10 | | | | −108.2142*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)11 | | | | −55.5831*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)13 | | | | −41.2107*** |
| | | | | (0.0000) |
| 3: as.factor(numNonChildren)14 | | | | 73.9865*** |
| | | | | (0.0000) |
| AIC | 5877.8025 | 5877.8025 | 5489.7051 | 5555.2555 |
| BIC | 6115.4709 | 6115.4709 | 5925.4306 | 6327.6780 |
| Log Likelihood | −2902.9012 | −2902.9012 | −2678.8525 | −2660.6278 |
| Deviance | 5805.8025 | 5805.8025 | 5357.7051 | 5321.2555 |
| Num. obs. | 5442 | 5442 | 5442 | 5442 |
| K | 4 | 4 | 4 | 4 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 19: Comparison of Marginal Effects for the Multinomial Logit Model: CDC versus WHO.

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| None | atleastHS | 1 - 0 | 0.0128 | 0.0076 | 0.0052 |
| None | cropConsumed | 1 - 0 | 0.0387 | 0.0406 | 0.0019 |
| None | numChildren | 1 - 0 | -0.0040 | -0.0003 | 0.0037 |
| None | numChildren | 2 - 0 | -0.0053 | 0.0011 | 0.0064 |
| None | numChildren | 3 - 0 | -0.0196 | -0.0218 | 0.0023 |
| None | numChildren | 4 - 0 | -0.1727 | -0.1681 | 0.0047 |
| None | numChildren | 5 - 0 | -0.5321 | -0.5334 | 0.0014 |
| None | numChildUnderweight | 1 - 0 | 0.0075 | -0.0060 | 0.0135 |
| None | numChildUnderweight | 2 - 0 | 0.0056 | -0.0082 | 0.0138 |
| None | numChildUnderweight | 3 - 0 | 0.0546 | 0.0308 | 0.0238 |
| None | numNonChildren | 10 - 1 | 0.1040 | 0.0882 | 0.0158 |
| None | numNonChildren | 11 - 1 | 0.1024 | 0.0910 | 0.0114 |
| None | numNonChildren | 13 - 1 | -0.5126 | -0.5243 | 0.0118 |
| None | numNonChildren | 14 - 1 | -0.5126 | -0.5246 | 0.0121 |
| None | numNonChildren | 2 - 1 | 0.0198 | 0.0107 | 0.0091 |
| None | numNonChildren | 3 - 1 | 0.0223 | 0.0131 | 0.0092 |
| None | numNonChildren | 4 - 1 | 0.0266 | 0.0172 | 0.0094 |
| None | numNonChildren | 5 - 1 | 0.0380 | 0.0287 | 0.0094 |
| None | numNonChildren | 6 - 1 | 0.0383 | 0.0220 | 0.0164 |
| None | numNonChildren | 7 - 1 | 0.0449 | 0.0390 | 0.0059 |
| None | numNonChildren | 8 - 1 | 0.1121 | 0.1076 | 0.0045 |
| None | numNonChildren | 9 - 1 | 0.1889 | 0.1775 | 0.0114 |
| None | numNonChildUnderweight | 1 - 0 | -0.0011 | -0.0020 | 0.0008 |
| None | numNonChildUnderweight | 2 - 0 | -0.0110 | -0.0097 | 0.0013 |
| None | numNonChildUnderweight | 3 - 0 | 0.0083 | 0.0218 | 0.0136 |
| None | numNonChildUnderweight | 4 - 0 | 0.0061 | 0.0154 | 0.0093 |
| None | numNonChildUnderweight | 5 - 0 | 0.0679 | 0.0531 | 0.0149 |
| None | numNonChildUnderweight | 6 - 0 | 0.1114 | 0.0687 | 0.0427 |
| None | numNonChildUnderweight | 7 - 0 | 0.0896 | 0.0961 | 0.0065 |
| None | region | Chittagong - Barisal | 0.0075 | 0.0152 | 0.0077 |
| None | region | Dhaka - Barisal | 0.0266 | 0.0261 | 0.0005 |
| None | region | Khulna - Barisal | 0.0372 | 0.0433 | 0.0061 |
| None | region | Rajshahi - Barisal | 0.0328 | 0.0370 | 0.0041 |
| None | region | Rangpur - Barisal | 0.0282 | 0.0323 | 0.0041 |
| None | region | Sylhet - Barisal | 0.0359 | 0.0419 | 0.0061 |
| Money | adjUtility | | -0.0045 | -0.0051 | 0.0006 |

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| Money | atleastHS | 1 - 0 | 0.0651 | 0.0563 | 0.0088 |
| Money | cropConsumed | 1 - 0 | 0.0074 | 0.0049 | 0.0025 |
| Money | householdIncome | | 0.0000 | 0.0000 | 0.0000 |
| Money | numChildren | 1 - 0 | -0.0082 | -0.0100 | 0.0018 |
| Money | numChildren | 2 - 0 | -0.0178 | -0.0235 | 0.0056 |
| Money | numChildren | 3 - 0 | 0.0175 | 0.0703 | 0.0527 |
| Money | numChildren | 4 - 0 | 0.3456 | 0.3362 | 0.0094 |
| Money | numChildren | 5 - 0 | 0.7050 | 0.7016 | 0.0034 |
| Money | numChildUnderweight | 1 - 0 | 0.0022 | 0.0172 | 0.0150 |
| Money | numChildUnderweight | 2 - 0 | -0.0187 | -0.0324 | 0.0138 |
| Money | numChildUnderweight | 3 - 0 | 0.1251 | 0.1430 | 0.0178 |
| Money | numNonChildren | 10 - 1 | 0.1097 | 0.1243 | 0.0146 |
| Money | numNonChildren | 11 - 1 | -0.1292 | -0.1217 | 0.0075 |
| Money | numNonChildren | 13 - 1 | 0.7263 | 0.7369 | 0.0106 |
| Money | numNonChildren | 14 - 1 | -0.0661 | -0.0956 | 0.0295 |
| Money | numNonChildren | 2 - 1 | -0.0217 | -0.0082 | 0.0135 |
| Money | numNonChildren | 3 - 1 | 0.0049 | 0.0176 | 0.0127 |
| Money | numNonChildren | 4 - 1 | 0.0209 | 0.0338 | 0.0129 |
| Money | numNonChildren | 5 - 1 | 0.0105 | 0.0273 | 0.0167 |
| Money | numNonChildren | 6 - 1 | 0.0325 | 0.0523 | 0.0198 |
| Money | numNonChildren | 7 - 1 | 0.0118 | 0.0210 | 0.0092 |
| Money | numNonChildren | 8 - 1 | 0.0037 | 0.0165 | 0.0129 |
| Money | numNonChildren | 9 - 1 | -0.1726 | -0.1510 | 0.0215 |
| Money | numNonChildUnderweight | 1 - 0 | -0.0124 | -0.0170 | 0.0047 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0043 | 0.0043 | 0.0000 |
| Money | numNonChildUnderweight | 3 - 0 | -0.0070 | -0.0208 | 0.0138 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0081 | -0.0107 | 0.0188 |
| Money | numNonChildUnderweight | 5 - 0 | -0.0874 | -0.0847 | 0.0027 |
| Money | numNonChildUnderweight | 6 - 0 | -0.2905 | -0.2954 | 0.0049 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0836 | 0.0696 | 0.0140 |
| Money | region | Chittagong - Barisal | 0.1593 | 0.1569 | 0.0024 |
| Money | region | Dhaka - Barisal | 0.0900 | 0.0950 | 0.0050 |
| Money | region | Khulna - Barisal | 0.0491 | 0.0474 | 0.0017 |
| Money | region | Rajshahi - Barisal | 0.0975 | 0.1052 | 0.0077 |
| Money | region | Rangpur - Barisal | -0.0575 | -0.0500 | 0.0075 |
| Money | region | Sylhet - Barisal | 0.1080 | 0.1081 | 0.0001 |
| Money | timeToTown | | -0.0006 | -0.0005 | 0.0001 |
| Food | adjUtility | | -0.0013 | -0.0016 | 0.0002 |
| Food | atleastHS | 1 - 0 | -0.0491 | -0.0371 | 0.0120 |
| Food | cropConsumed | 1 - 0 | -0.0113 | -0.0108 | 0.0005 |

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| Food | householdIncome | | -0.0000 | -0.0000 | 0.0000 |
| Food | numChildren | 1 - 0 | 0.0042 | 0.0001 | 0.0041 |
| Food | numChildren | 2 - 0 | 0.0165 | 0.0174 | 0.0009 |
| Food | numChildren | 3 - 0 | -0.0014 | -0.0408 | 0.0394 |
| Food | numChildren | 4 - 0 | -0.0679 | -0.0679 | 0.0001 |
| Food | numChildren | 5 - 0 | -0.0676 | -0.0675 | 0.0001 |
| Food | numChildUnderweight | 1 - 0 | -0.0053 | 0.0008 | 0.0061 |
| Food | numChildUnderweight | 2 - 0 | 0.0036 | -0.0251 | 0.0286 |
| Food | numChildUnderweight | 3 - 0 | -0.0711 | -0.0690 | 0.0022 |
| Food | numNonChildren | 10 - 1 | -0.1575 | -0.1572 | 0.0003 |
| Food | numNonChildren | 11 - 1 | -0.1575 | -0.1572 | 0.0003 |
| Food | numNonChildren | 13 - 1 | -0.1575 | -0.1572 | 0.0003 |
| Food | numNonChildren | 14 - 1 | -0.1575 | -0.1572 | 0.0003 |
| Food | numNonChildren | 2 - 1 | -0.0208 | -0.0200 | 0.0008 |
| Food | numNonChildren | 3 - 1 | -0.0806 | -0.0820 | 0.0014 |
| Food | numNonChildren | 4 - 1 | -0.1045 | -0.1054 | 0.0009 |
| Food | numNonChildren | 5 - 1 | -0.1132 | -0.1142 | 0.0010 |
| Food | numNonChildren | 6 - 1 | -0.1162 | -0.1210 | 0.0048 |
| Food | numNonChildren | 7 - 1 | -0.0954 | -0.1042 | 0.0088 |
| Food | numNonChildren | 8 - 1 | -0.1186 | -0.1149 | 0.0037 |
| Food | numNonChildren | 9 - 1 | -0.1575 | -0.1572 | 0.0003 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0054 | -0.0001 | 0.0054 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0158 | -0.0162 | 0.0004 |
| Food | numNonChildUnderweight | 3 - 0 | -0.0020 | 0.0034 | 0.0055 |
| Food | numNonChildUnderweight | 4 - 0 | 0.0136 | 0.0113 | 0.0023 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0712 | -0.0712 | 0.0000 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0710 | -0.0710 | 0.0000 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0712 | -0.0712 | 0.0000 |
| Food | region | Chittagong - Barisal | -0.0639 | -0.0727 | 0.0088 |
| Food | region | Dhaka - Barisal | -0.0494 | -0.0586 | 0.0092 |
| Food | region | Khulna - Barisal | -0.0162 | -0.0289 | 0.0127 |
| Food | region | Rajshahi - Barisal | -0.0408 | -0.0547 | 0.0139 |
| Food | region | Rangpur - Barisal | -0.0002 | -0.0123 | 0.0121 |
| Food | region | Sylhet - Barisal | -0.0459 | -0.0530 | 0.0070 |
| Food | timeToTown | | 0.0002 | 0.0002 | 0.0000 |
| Both | adjUtility | | -0.0016 | -0.0019 | 0.0002 |
| Both | atleastHS | 1 - 0 | -0.0288 | -0.0268 | 0.0020 |
| Both | cropConsumed | 1 - 0 | -0.0348 | -0.0347 | 0.0001 |
| Both | householdIncome | | -0.0000 | -0.0000 | 0.0000 |
| Both | numChildren | 1 - 0 | 0.0080 | 0.0102 | 0.0022 |

| Choice | Variable | Contrast | CDC | WHO | Absolute Difference |
|---|---|---|---|---|---|
| Both | numChildren | 2 - 0 | 0.0067 | 0.0050 | 0.0016 |
| Both | numChildren | 3 - 0 | 0.0034 | -0.0076 | 0.0111 |
| Both | numChildren | 4 - 0 | -0.1050 | -0.1003 | 0.0047 |
| Both | numChildren | 5 - 0 | -0.1053 | -0.1006 | 0.0047 |
| Both | numChildUnderweight | 1 - 0 | -0.0044 | -0.0120 | 0.0076 |
| Both | numChildUnderweight | 2 - 0 | 0.0095 | 0.0657 | 0.0562 |
| Both | numChildUnderweight | 3 - 0 | -0.1086 | -0.1048 | 0.0038 |
| Both | numNonChildren | 10 - 1 | -0.0562 | -0.0554 | 0.0008 |
| Both | numNonChildren | 11 - 1 | 0.1843 | 0.1878 | 0.0035 |
| Both | numNonChildren | 13 - 1 | -0.0562 | -0.0554 | 0.0008 |
| Both | numNonChildren | 14 - 1 | 0.7362 | 0.7774 | 0.0412 |
| Both | numNonChildren | 2 - 1 | 0.0227 | 0.0175 | 0.0053 |
| Both | numNonChildren | 3 - 1 | 0.0534 | 0.0513 | 0.0022 |
| Both | numNonChildren | 4 - 1 | 0.0569 | 0.0543 | 0.0026 |
| Both | numNonChildren | 5 - 1 | 0.0646 | 0.0582 | 0.0064 |
| Both | numNonChildren | 6 - 1 | 0.0454 | 0.0468 | 0.0014 |
| Both | numNonChildren | 7 - 1 | 0.0387 | 0.0442 | 0.0055 |
| Both | numNonChildren | 8 - 1 | 0.0028 | -0.0093 | 0.0121 |
| Both | numNonChildren | 9 - 1 | 0.1411 | 0.1307 | 0.0104 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0081 | 0.0190 | 0.0109 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0225 | 0.0216 | 0.0009 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0007 | -0.0045 | 0.0052 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0279 | -0.0160 | 0.0118 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0906 | 0.1027 | 0.0121 |
| Both | numNonChildUnderweight | 6 - 0 | 0.2501 | 0.2976 | 0.0476 |
| Both | numNonChildUnderweight | 7 - 0 | -0.1020 | -0.0945 | 0.0075 |
| Both | region | Chittagong - Barisal | -0.1029 | -0.0993 | 0.0036 |
| Both | region | Dhaka - Barisal | -0.0672 | -0.0625 | 0.0047 |
| Both | region | Khulna - Barisal | -0.0702 | -0.0618 | 0.0083 |
| Both | region | Rajshahi - Barisal | -0.0894 | -0.0874 | 0.0020 |
| Both | region | Rangpur - Barisal | 0.0296 | 0.0300 | 0.0005 |
| Both | region | Sylhet - Barisal | -0.0980 | -0.0971 | 0.0009 |
| Both | timeToTown | | 0.0003 | 0.0003 | 0.0000 |

## 10.2 Varying Levels of Risk Aversion

**Note on Reading The Following Tables: adjUtility**i** is simply a byproduct of how the model was constructed; all adjUtility's relate to the same variable (adjUtility) – the CRRA utility of the household less the assumed Opportunity Cost (foregone wages) of utilizing a Social Safety Net.*

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Table 20: Probit Model of Utilization of Any Social Safety Net with Varying Levels of Risk Aversion.

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| (Intercept) | −0.0232 | 34.5539** | 56.4015** | 91.9575** |
| | (0.1801) | (12.2812) | (20.4984) | (34.5549) |
| adjUtility2 | −0.0000*** | | | |
| | (0.0000) | | | |
| as.factor(numNonChildUnderweight)1 | 0.2459*** | 0.1174 | 0.1182 | 0.1188 |
| | (0.0659) | (0.1876) | (0.1876) | (0.1875) |
| as.factor(numNonChildUnderweight)2 | 0.4848*** | 0.2249 | 0.2266 | 0.2282 |
| | (0.0950) | (0.2977) | (0.2977) | (0.2976) |
| as.factor(numNonChildUnderweight)3 | 0.5918*** | 0.1049 | 0.1075 | 0.1097 |
| | (0.1757) | (0.7688) | (0.7687) | (0.7687) |
| as.factor(numNonChildUnderweight)4 | −0.0180 | −13.4033 | −14.3802 | −15.3658 |
| | (0.2923) | (831.4017) | (1357.0665) | (2224.4237) |
| as.factor(numNonChildUnderweight)5 | 1.9501 | −1013.5733 | −1984.6754 | −3775.2575 |
| | (1.0570) | (52377.2789) | (85161.2628) | (135135.2255) |
| as.factor(numNonChildUnderweight)6 | −0.3284 | −39992.5055 | −77005.1561 | −145188.3055 |
| | (1.0173) | (187925.3917) | (323507.5835) | (573756.0141) |
| as.factor(numNonChildUnderweight)7 | 12.2007 | −49325.9192 | −94927.0901 | −178930.4375 |
| | (324.7460) | (172526.8370) | (291735.4936) | (452980.0531) |
| as.factor(numChildUnderweight)1 | 0.1237 | −0.2504 | −0.2495 | −0.2485 |
| | (0.0877) | (0.2871) | (0.2870) | (0.2870) |
| as.factor(numChildUnderweight)2 | 0.2605 | −0.4959 | −0.4971 | −0.4983 |
| | (0.2435) | (0.8272) | (0.8270) | (0.8269) |
| as.factor(numChildUnderweight)3 | −0.7179 | −18.3267 | −19.3196 | −20.3140 |
| | (0.9461) | (25501.5876) | (42050.7205) | (69396.2289) |
| as.factor(numChildren)1 | 0.0896 | 0.1451 | 0.1412 | 0.1369 |
| | (0.0684) | (0.2045) | (0.2043) | (0.2042) |
| as.factor(numChildren)2 | 0.0318 | −0.0466 | −0.0483 | −0.0506 |
| | (0.1143) | (0.3541) | (0.3541) | (0.3540) |
| as.factor(numChildren)3 | −0.2454 | 1.1554 | 1.1489 | 1.1418 |
| | (0.2926) | (0.6996) | (0.6994) | (0.6992) |
| as.factor(numChildren)4 | −0.3120 | 3.8307** | 3.8155** | 3.8015** |
| | (0.7461) | (1.3369) | (1.3375) | (1.3381) |
| as.factor(numChildren)5 | 0.2914 | 5.6391 | 6.0011 | 5.0171 |
| | (1.3399) | (95489.4215) | (169553.1281) | (227090.6164) |
| as.factor(numNonChildren)2 | 0.0237 | −0.1324 | −0.1374 | −0.1438 |
| | (0.1610) | (0.2707) | (0.2706) | (0.2703) |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| as.factor(numNonChildren)3 | 0.7290*** | −0.0988 | −0.1057 | −0.1140 |
| | (0.1572) | (0.2872) | (0.2869) | (0.2864) |
| as.factor(numNonChildren)4 | 1.0740*** | −0.2938 | −0.3009 | −0.3095 |
| | (0.1605) | (0.3338) | (0.3335) | (0.3330) |
| as.factor(numNonChildren)5 | 1.4531*** | −1.2272* | −1.2345* | −1.2434* |
| | (0.1719) | (0.5829) | (0.5827) | (0.5824) |
| as.factor(numNonChildren)6 | 1.5401*** | −0.5824 | −0.5889 | −0.5971 |
| | (0.1969) | (0.6906) | (0.6903) | (0.6899) |
| as.factor(numNonChildren)7 | 2.0547*** | −13.2207 | −14.2194 | −15.2209 |
| | (0.2700) | (610.3188) | (1003.2654) | (1650.4029) |
| as.factor(numNonChildren)8 | 2.0066*** | −22.4765 | −23.8252 | −23.8124 |
| | (0.3596) | (62191.5990) | (120889.5083) | (118939.5856) |
| as.factor(numNonChildren)9 | 2.3420*** | −12524.8531 | −24124.3635 | −45492.8178 |
| | (0.4869) | (20181.3684) | (33403.6319) | (54879.6426) |
| as.factor(numNonChildren)10 | 1.7786 | −12595.6616 | −24280.8645 | −45811.3549 |
| | (1.0238) | (512600.7032) | (562393.2406) | (82284.6676) |
| as.factor(numNonChildren)11 | 2.5050* | −22871.4065 | −44048.3399 | −83058.6470 |
| | (1.2380) | (111206.8890) | (193740.7375) | (273601.2018) |
| as.factor(numNonChildren)13 | 2.3215 | −46088.6206 | −88730.2808 | −167281.0258 |
| | (459.2586) | (216545.0745) | (362793.3961) | (575721.6328) |
| as.factor(numNonChildren)14 | 15.0498 | −21745.9499 | −41874.1132 | −78953.3101 |
| | (217.5326) | (61430.3054) | (100746.1743) | (162925.7798) |
| as.factor(region)Chittagong | −0.5350*** | −0.4434 | −0.4469 | −0.4507 |
| | (0.1276) | (0.3037) | (0.3036) | (0.3035) |
| as.factor(region)Dhaka | −0.6569*** | −0.6134* | −0.6142* | −0.6151* |
| | (0.1182) | (0.2831) | (0.2830) | (0.2828) |
| as.factor(region)Khulna | −0.1850 | −1.0427* | −1.0403* | −1.0382* |
| | (0.1395) | (0.4146) | (0.4144) | (0.4142) |
| as.factor(region)Rajshahi | −0.3692** | −0.8736* | −0.8787* | −0.8833* |
| | (0.1370) | (0.3871) | (0.3875) | (0.3878) |
| as.factor(region)Rangpur | 0.1750 | −0.5696 | −0.5737 | −0.5783 |
| | (0.1407) | (0.3810) | (0.3808) | (0.3806) |
| as.factor(region)Sylhet | −0.5499*** | −1.1491** | −1.1525** | −1.1555** |
| | (0.1337) | (0.3856) | (0.3855) | (0.3853) |
| householdIncome | −0.0000*** | −0.0000*** | −0.0000*** | −0.0000*** |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(cropConsumed)1 | −0.4003*** | −1.3168*** | −1.3154*** | −1.3144*** |
| | (0.0606) | (0.1928) | (0.1929) | (0.1928) |
| as.factor(atleastHS)1 | −0.2436 | −1.0437 | −1.0488 | −1.0538 |
| | (0.1451) | (0.7307) | (0.7307) | (0.7307) |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| timeToTown | −0.0000 | −0.0002 | −0.0002 | −0.0002 |
| | (0.0006) | (0.0020) | (0.0020) | (0.0020) |
| adjUtility3 | | −8.9672** | | |
| | | (3.1454) | | |
| adjUtility1 | | | −17.2578** | |
| | | | (6.2217) | |
| adjUtility4 | | | | −32.5301** |
| | | | | (12.1632) |
| AIC | 7000.8976 | 1200.7813 | 1200.9843 | 1201.3064 |
| BIC | 7258.3718 | 1458.2555 | 1458.4584 | 1458.7805 |
| Log Likelihood | −3461.4488 | −561.3907 | −561.4921 | −561.6532 |
| Deviance | 6922.8976 | 1122.7813 | 1122.9843 | 1123.3064 |
| Num. obs. | 5442 | 5442 | 5442 | 5442 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 21: Marginal Effects for the Probit Model with Varying Levels of Risk Aversion.

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| adjUtility2 | $-0.0000^{***}$ | | | |
| | (0.0000) | | | |
| as.factor(numNonChildUnderweight)1 | $0.0612^{***}$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0164) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)2 | $0.1206^{***}$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0233) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)3 | $0.1464^{***}$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0421) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)4 | $-0.0045$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0725) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)5 | $0.3969^{**}$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.1306) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)6 | $-0.0799$ | $-1.0000^{***}$ | $-1.0000^{***}$ | $-1.0000^{***}$ |
| | (0.2400) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildUnderweight)7 | $0.5401^{***}$ | $-1.0000^{***}$ | $-1.0000^{***}$ | $-1.0000^{***}$ |
| | (0.0308) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildUnderweight)1 | 0.0308 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0219) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildUnderweight)2 | 0.0650 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0607) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildUnderweight)3 | $-0.1667$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.1967) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildren)1 | 0.0223 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0170) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildren)2 | 0.0079 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0284) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildren)3 | $-0.0601$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0704) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildren)4 | $-0.0760$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.1767) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numChildren)5 | 0.0727 | 0.0000 | 0.0000 | 0.0000 |
| | (0.3335) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)2 | 0.0059 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0400) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)3 | $0.1803^{***}$ | 0.0000 | 0.0000 | 0.0000 |
| | (0.0380) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)4 | $0.2615^{***}$ | 0.0000 | 0.0000 | 0.0000 |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0368) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)5 | 0.3379*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0342) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)6 | 0.3461*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0354) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)7 | 0.4143*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0359) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)8 | 0.4056*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0460) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)9 | 0.4396*** | −1.0000*** | −1.0000*** | −1.0000*** |
| | (0.0488) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)10 | 0.3742** | −1.0000*** | −1.0000*** | −1.0000*** |
| | (0.1418) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)11 | 0.4522*** | −1.0000*** | −1.0000*** | −1.0000*** |
| | (0.1009) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)13 | 0.4361 | −1.0000*** | −1.0000*** | −1.0000*** |
| | (42.4234) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(numNonChildren)14 | 0.5403*** | −1.0000*** | −1.0000*** | −1.0000*** |
| | (0.0222) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Chittagong | −0.1295*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0298) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Dhaka | −0.1597*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0279) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Khulna | −0.0456 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0341) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Rajshahi | −0.0900** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0325) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Rangpur | 0.0437 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0351) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(region)Sylhet | −0.1324*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0308) | (0.0000) | (0.0000) | (0.0000) |
| householdIncome | −0.0000*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(cropConsumed)1 | −0.0993*** | 0.0000 | 0.0000 | 0.0000 |
| | (0.0150) | (0.0000) | (0.0000) | (0.0000) |
| as.factor(atleastHS)1 | −0.0597 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0350) | (0.0000) | (0.0000) | (0.0000) |
| timeToTown | −0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | (0.0001) | (0.0000) | (0.0000) | (0.0000) |
| adjUtility3 | | 0.0000 | | |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.30$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | | (0.0000) | | |
| adjUtility1 | | | 0.0000 | |
| | | | (0.0000) | |
| adjUtility4 | | | | 0.0000 |
| | | | | (0.0000) |
| Num. obs. | 5442 | 5442 | 5442 | 5442 |
| Log Likelihood | −3461.4488 | −561.3907 | −561.4921 | −561.6532 |
| Deviance | 6922.8976 | 1122.7813 | 1122.9843 | 1123.3064 |
| AIC | 7000.8976 | 1200.7813 | 1200.9843 | 1201.3064 |
| BIC | 7258.3718 | 1458.2555 | 1458.4584 | 1458.7805 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 22: Multinomial Logit Model with Varying Levels of Risk Aversion.

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| 1: (Intercept) | $-0.1556^{***}$ | $-0.6584^{***}$ | $-0.6989^{***}$ | $-0.9248^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: adjUtility2 | $-0.0000^{***}$ | | | |
| | (0.0000) | | | |
| 1: as.factor(numNonChildUnderweight)1 | $0.2371^{***}$ | $-0.0563^{***}$ | $-0.0222^{***}$ | $-0.0375^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)2 | $0.5597^{***}$ | $0.1863^{***}$ | $0.2781^{***}$ | $0.2375^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)3 | $0.4070^{***}$ | $-0.1929^{***}$ | $-0.2603^{***}$ | $-0.3247^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)4 | $0.1007^{***}$ | $-0.2002^{***}$ | $-0.1453^{***}$ | $-0.1918^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)5 | $0.1199^{***}$ | $-19.1682^{***}$ | $-18.5161^{***}$ | $-16.0635^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)6 | $-0.0816^{***}$ | $-704.4313^{***}$ | $-646.6018^{***}$ | $-577.5028^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildUnderweight)7 | $0.0810^{***}$ | $-68.6628^{***}$ | $-62.9392^{***}$ | $-53.9235^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)1 | $0.2166^{***}$ | $-0.1779^{***}$ | $-0.1887^{***}$ | $-0.1359^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)2 | $0.2201^{***}$ | $-0.2847^{***}$ | $-0.2219^{***}$ | $-0.3483^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildUnderweight)3 | $-0.0118^{***}$ | $-4.1462^{***}$ | $-4.4766^{***}$ | $-4.3122^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildren)1 | $0.1474^{***}$ | $0.0512^{***}$ | $0.0665^{***}$ | $0.0313^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildren)2 | $-0.0148^{***}$ | $0.0070^{***}$ | $0.0528^{***}$ | $0.0146^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildren)3 | $0.0085^{***}$ | $1.1901^{***}$ | $0.4940^{***}$ | $0.8977^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildren)4 | $0.0386^{***}$ | $3.2270^{***}$ | $2.8645^{***}$ | $2.8878^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numChildren)5 | $0.0573^{***}$ | $50.9942^{***}$ | $52.6962^{***}$ | $45.7127^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)2 | $-1.0350^{***}$ | $-0.3152^{***}$ | $-0.4947^{***}$ | $-0.4255^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)3 | $-0.2579^{***}$ | $-0.2867^{***}$ | $-0.4830^{***}$ | $-0.4187^{***}$ |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)4 | $0.1967^{***}$ | $-0.4116^{***}$ | $-0.5478^{***}$ | $-0.4868^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)5 | $0.5661^{***}$ | $-0.8230^{***}$ | $-0.9570^{***}$ | $-1.0289^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)6 | $0.6200^{***}$ | $-0.5496^{***}$ | $-0.8847^{***}$ | $-0.8781^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)7 | $0.7056^{***}$ | $-1.2493^{***}$ | $-1.2230^{***}$ | $-1.4180^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)8 | $0.5075^{***}$ | $-67.6597^{***}$ | $-59.8081^{***}$ | $-54.5739^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)9 | $0.0850^{***}$ | $-259.9876^{***}$ | $-245.1510^{***}$ | $-218.9231^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)10 | $0.0498^{***}$ | $-48.5910^{***}$ | $-44.7770^{***}$ | $-39.9333^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)11 | $0.0876^{***}$ | $-44.4500^{***}$ | $-42.0636^{***}$ | $-35.4977^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)13 | $0.0399^{***}$ | $37.9273^{***}$ | $34.5015^{***}$ | $33.3421^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(numNonChildren)14 | $0.0256^{***}$ | $49.1188^{***}$ | $45.1598^{***}$ | $40.6577^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Chittagong | $0.2043^{***}$ | $0.4657^{***}$ | $0.5103^{***}$ | $0.4215^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Dhaka | $-0.2175^{***}$ | $-0.0716^{***}$ | $-0.1481^{***}$ | $-0.1694^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Khulna | $0.1843^{***}$ | $-0.6962^{***}$ | $-0.6545^{***}$ | $-0.6861^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Rajshahi | $0.1709^{***}$ | $-0.5205^{***}$ | $-0.3048^{***}$ | $-0.3702^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Rangpur | $0.0805^{***}$ | $-1.0576^{***}$ | $-0.9600^{***}$ | $-1.1559^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(region)Sylhet | $0.1397^{***}$ | $-0.4537^{***}$ | $-0.3619^{***}$ | $-0.4625^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: householdIncome | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(cropConsumed)1 | $-0.2004^{***}$ | $-1.1362^{***}$ | $-0.9612^{***}$ | $-0.9679^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: as.factor(atleastHS)1 | $0.0474^{***}$ | $-0.2963^{***}$ | $-0.1233^{***}$ | $-0.1888^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 1: timeToTown | $-0.0026^{***}$ | $-0.0039^{***}$ | $-0.0053^{***}$ | $-0.0035^{***}$ |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0000) | (0.0007) | (0.0007) | (0.0006) |
| 2: (Intercept) | $-1.0332^{***}$ | $-0.3480^{***}$ | $-0.6293^{***}$ | $-0.6275^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: adjUtility2 | $-0.0000$ | | | |
| | (0.0000) | | | |
| 2: as.factor(numNonChildUnderweight)1 | $0.3390^{***}$ | $0.0477^{***}$ | $0.1071^{***}$ | $0.0845^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)2 | $0.0884^{***}$ | $-0.0837^{***}$ | $0.0008^{***}$ | $0.0632^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)3 | $0.1900^{***}$ | $0.0038^{***}$ | $-0.2599^{***}$ | $-0.1690^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)4 | $0.0360^{***}$ | $0.2018^{***}$ | $0.0027^{***}$ | $0.1025^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)5 | $-0.0495^{***}$ | $-228.7581^{***}$ | $-207.0097^{***}$ | $-189.6338^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)6 | $-0.0098^{***}$ | $-233.4860^{***}$ | $-212.5343^{***}$ | $-192.5666^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildUnderweight)7 | $-0.0023^{***}$ | $-199.8574^{***}$ | $-182.7588^{***}$ | $-165.9029^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)1 | $0.0843^{***}$ | $-0.2610^{***}$ | $-0.2781^{***}$ | $-0.2014^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)2 | $-0.0347^{***}$ | $-0.3593^{***}$ | $-0.0878^{***}$ | $-0.3203^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildUnderweight)3 | $-0.0189^{***}$ | $-242.4548^{***}$ | $-220.8072^{***}$ | $-200.4508^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildren)1 | $0.1658^{***}$ | $0.1072^{***}$ | $0.1638^{***}$ | $0.1034^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildren)2 | $0.1310^{***}$ | $0.2885^{***}$ | $0.3575^{***}$ | $0.3220^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildren)3 | $-0.1529^{***}$ | $-0.0439^{***}$ | $0.3987^{***}$ | $-0.5601^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildren)4 | $-0.0210^{***}$ | $-188.9668^{***}$ | $-170.0231^{***}$ | $-156.9873^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numChildren)5 | $-0.0061^{***}$ | $-96.2489^{***}$ | $-87.3642^{***}$ | $-79.5933^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)2 | $-0.4889^{***}$ | $-0.4649^{***}$ | $-0.5577^{***}$ | $-0.6098^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)3 | $-0.2294^{***}$ | $-1.1587^{***}$ | $-1.2517^{***}$ | $-1.3271^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)4 | $-0.2457^{***}$ | $-1.7517^{***}$ | $-1.7647^{***}$ | $-1.8191^{***}$ |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)5 | $0.0044^{***}$ | $-2.3494^{***}$ | $-2.3227^{***}$ | $-2.5118^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)6 | $-0.1558^{***}$ | $-2.3012^{***}$ | $-2.4161^{***}$ | $-2.6060^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)7 | $0.1026^{***}$ | $-2.6568^{***}$ | $-2.2616^{***}$ | $-2.8292^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)8 | $0.0267^{***}$ | $-69.1062^{***}$ | $-61.3621^{***}$ | $-56.6255^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)9 | $-0.0625^{***}$ | $-1027.4052^{***}$ | $-934.3989^{***}$ | $-849.9322^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)10 | $-0.0102^{***}$ | $-322.1228^{***}$ | $-294.1585^{***}$ | $-266.4919^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)11 | $-0.0127^{***}$ | $-571.3592^{***}$ | $-520.8879^{***}$ | $-470.8756^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)13 | $-0.0011^{***}$ | $-190.1683^{***}$ | $-174.2360^{***}$ | $-157.7530^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(numNonChildren)14 | $-0.0046^{***}$ | $-344.8724^{***}$ | $-316.7919^{***}$ | $-284.1565^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Chittagong | $-1.0931^{***}$ | $-1.1162^{***}$ | $-1.0282^{***}$ | $-1.1145^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Dhaka | $-0.7733^{***}$ | $-1.1665^{***}$ | $-1.1534^{***}$ | $-1.2231^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Khulna | $0.1402^{***}$ | $-1.1950^{***}$ | $-1.0156^{***}$ | $-1.1892^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Rajshahi | $-0.3978^{***}$ | $-1.5948^{***}$ | $-1.1845^{***}$ | $-1.3817^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Rangpur | $0.7515^{***}$ | $-0.8267^{***}$ | $-0.6069^{***}$ | $-0.9310^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(region)Sylhet | $-0.4454^{***}$ | $-1.4647^{***}$ | $-1.3584^{***}$ | $-1.4757^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: householdIncome | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(cropConsumed)1 | $-0.4363^{***}$ | $-1.2922^{***}$ | $-1.1653^{***}$ | $-1.1073^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: as.factor(atleastHS)1 | $-0.4794^{***}$ | $-1.3885^{***}$ | $-1.5602^{***}$ | $-1.8589^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 2: timeToTown | $0.0014^{***}$ | 0.0009 | 0.0000 | 0.0009 |
| | (0.0000) | (0.0007) | (0.0007) | (0.0006) |
| 3: (Intercept) | $-0.6978^{***}$ | $-1.1865^{***}$ | $-1.3629^{***}$ | $-1.4856^{***}$ |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: adjUtility2 | $-0.0000^{***}$ | | | |
| | (0.0000) | | | |
| 3: as.factor(numNonChildUnderweight)1 | $0.3761^{***}$ | $0.1041^{***}$ | $0.1120^{***}$ | $0.1341^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)2 | $0.7459^{***}$ | $0.4232^{***}$ | $0.4720^{***}$ | $0.4688^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)3 | $0.4139^{***}$ | $-0.1176^{***}$ | $-0.2266^{***}$ | $-0.1925^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)4 | $0.0211^{***}$ | $-0.2459^{***}$ | $-0.5132^{***}$ | $-0.3153^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)5 | $0.2141^{***}$ | $-18.0154^{***}$ | $-17.4247^{***}$ | $-15.0344^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)6 | $0.1024^{***}$ | $-119.4960^{***}$ | $-109.3179^{***}$ | $-99.2075^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildUnderweight)7 | $-0.0034^{***}$ | $-157.3592^{***}$ | $-144.3816^{***}$ | $-129.3472^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)1 | $0.1664^{***}$ | $-0.2601^{***}$ | $-0.2448^{***}$ | $-0.2178^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)2 | $0.1351^{***}$ | $0.0883^{***}$ | $-0.0537^{***}$ | $-0.0701^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildUnderweight)3 | $-0.0297^{***}$ | $-340.0029^{***}$ | $-310.1412^{***}$ | $-280.7567^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildren)1 | $0.2053^{***}$ | $0.1684^{***}$ | $0.1800^{***}$ | $0.1455^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildren)2 | $0.0686^{***}$ | $0.1248^{***}$ | $0.1972^{***}$ | $0.1093^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildren)3 | $0.0947^{***}$ | $0.9027^{***}$ | $0.4642^{***}$ | $1.0203^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildren)4 | $-0.0310^{***}$ | $-223.0548^{***}$ | $-201.3877^{***}$ | $-185.6003^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numChildren)5 | $-0.0069^{***}$ | $-311.7750^{***}$ | $-285.1247^{***}$ | $-257.3485^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)2 | $-1.4154^{***}$ | $-0.0954^{***}$ | $-0.0535^{***}$ | $-0.1808^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)3 | $-0.1074^{***}$ | $0.1873^{***}$ | $0.1748^{***}$ | $0.0481^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)4 | $0.2268^{***}$ | $0.0390^{***}$ | $0.0718^{***}$ | $-0.0520^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)5 | $0.6647^{***}$ | $-0.2897^{***}$ | $-0.2277^{***}$ | $-0.5073^{***}$ |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)6 | $0.5161^{***}$ | $-0.2368^{***}$ | $-0.4304^{***}$ | $-0.5537^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)7 | $0.2593^{***}$ | $-0.9393^{***}$ | $-0.7526^{***}$ | $-1.0621^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)8 | $0.0236^{***}$ | $-67.9954^{***}$ | $-59.8090^{***}$ | $-54.7473^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)9 | $0.3756^{***}$ | $-257.8344^{***}$ | $-242.6237^{***}$ | $-216.8413^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)10 | $-0.0109^{***}$ | $-98.4706^{***}$ | $-88.9717^{***}$ | $-81.7319^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)11 | $0.0424^{***}$ | $-42.2621^{***}$ | $-39.7858^{***}$ | $-33.4713^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)13 | $-0.0018^{***}$ | $-39.3298^{***}$ | $-35.6627^{***}$ | $-32.7273^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(numNonChildren)14 | $0.0537^{***}$ | $52.1238^{***}$ | $48.3501^{***}$ | $43.4790^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Chittagong | $-0.9745^{***}$ | $-1.0702^{***}$ | $-1.0283^{***}$ | $-1.0566^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Dhaka | $-0.6894^{***}$ | $-0.9512^{***}$ | $-1.0321^{***}$ | $-1.0091^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Khulna | $-0.1534^{***}$ | $-1.4144^{***}$ | $-1.4139^{***}$ | $-1.3940^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Rajshahi | $-0.6581^{***}$ | $-1.7042^{***}$ | $-1.4630^{***}$ | $-1.4960^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Rangpur | $0.9348^{***}$ | $-0.5763^{***}$ | $-0.4549^{***}$ | $-0.6338^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(region)Sylhet | $-0.7020^{***}$ | $-1.7797^{***}$ | $-1.6688^{***}$ | $-1.7216^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: householdIncome | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ | $-0.0000^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(cropConsumed)1 | $-0.6476^{***}$ | $-1.4946^{***}$ | $-1.3468^{***}$ | $-1.3082^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: as.factor(atleastHS)1 | $-0.3103^{***}$ | $-0.6997^{***}$ | $-0.7138^{***}$ | $-0.7000^{***}$ |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| 3: timeToTown | $0.0016^{***}$ | $0.0013^{*}$ | 0.0001 | $0.0013^{*}$ |
| | (0.0000) | (0.0007) | (0.0007) | (0.0007) |
| 1: adjUtility3 | | $-0.2240^{***}$ | | |
| | | (0.0000) | | |
| 2: adjUtility3 | | $-0.2240^{***}$ | | |

| | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|
| | | (0.0000) | | |
| 3: adjUtility3 | | $-0.2239^{***}$ | | |
| | | (0.0000) | | |
| 1: adjUtility1 | | | $-0.2051^{***}$ | |
| | | | (0.0000) | |
| 2: adjUtility1 | | | $-0.2052^{***}$ | |
| | | | (0.0000) | |
| 3: adjUtility1 | | | $-0.2051^{***}$ | |
| | | | (0.0000) | |
| 1: adjUtility4 | | | | $-0.1857^{***}$ |
| | | | | (0.0000) |
| 2: adjUtility4 | | | | $-0.1858^{***}$ |
| | | | | (0.0000) |
| 3: adjUtility4 | | | | $-0.1856^{***}$ |
| | | | | (0.0000) |
| AIC | 11458.6064 | 5596.6288 | 5616.3574 | 5636.1352 |
| BIC | 12231.0289 | 6369.0513 | 6388.7799 | 6408.5577 |
| Log Likelihood | −5612.3032 | −2681.3144 | −2691.1787 | −2701.0676 |
| Deviance | 11224.6064 | 5362.6288 | 5382.3574 | 5402.1352 |
| Num. obs. | 5442 | 5442 | 5442 | 5442 |
| K | 4 | 4 | 4 | 4 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 23: Marginal Effects with Varying Levels of Risk Aversion

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| None | atleastHS | 1 - 0 | 0.0190 | 0.0148 | 0.0128 | 0.0152 |
| None | cropConsumed | 1 - 0 | 0.0734 | 0.0400 | 0.0387 | 0.0394 |
| None | numChildren | 1 - 0 | -0.0365 | -0.0029 | -0.0040 | -0.0026 |
| None | numChildren | 2 - 0 | -0.0055 | -0.0030 | -0.0053 | -0.0037 |
| None | numChildren | 3 - 0 | -0.0008 | -0.0444 | -0.0196 | -0.0374 |
| None | numChildren | 4 - 0 | -0.0038 | -0.1941 | -0.1727 | -0.1762 |
| None | numChildren | 5 - 0 | -0.0081 | -0.5343 | -0.5321 | -0.5317 |
| None | numChildUnderweight | 1 - 0 | -0.0424 | 0.0067 | 0.0075 | 0.0060 |
| None | numChildUnderweight | 2 - 0 | -0.0380 | 0.0064 | 0.0056 | 0.0095 |
| None | numChildUnderweight | 3 - 0 | 0.0037 | 0.0494 | 0.0546 | 0.0557 |
| None | numNonChildren | 10 - 1 | -0.0068 | 0.0941 | 0.1040 | 0.1046 |
| None | numNonChildren | 11 - 1 | -0.0150 | 0.0923 | 0.1024 | 0.1025 |
| None | numNonChildren | 13 - 1 | -0.0060 | -0.5224 | -0.5126 | -0.5117 |
| None | numNonChildren | 14 - 1 | -0.0062 | -0.5224 | -0.5126 | -0.5117 |
| None | numNonChildren | 2 - 1 | 0.2142 | 0.0126 | 0.0198 | 0.0200 |
| None | numNonChildren | 3 - 1 | 0.0522 | 0.0144 | 0.0223 | 0.0228 |
| None | numNonChildren | 4 - 1 | -0.0340 | 0.0203 | 0.0266 | 0.0273 |
| None | numNonChildren | 5 - 1 | -0.1207 | 0.0307 | 0.0380 | 0.0426 |
| None | numNonChildren | 6 - 1 | -0.1191 | 0.0260 | 0.0383 | 0.0406 |
| None | numNonChildren | 7 - 1 | -0.1292 | 0.0397 | 0.0449 | 0.0513 |
| None | numNonChildren | 8 - 1 | -0.0854 | 0.1027 | 0.1121 | 0.1131 |
| None | numNonChildren | 9 - 1 | -0.0300 | 0.1761 | 0.1889 | 0.1889 |
| None | numNonChildUnderweight | 1 - 0 | -0.0641 | 0.0000 | -0.0011 | -0.0009 |
| None | numNonChildUnderweight | 2 - 0 | -0.1230 | -0.0070 | -0.0110 | -0.0106 |
| None | numNonChildUnderweight | 3 - 0 | -0.0864 | 0.0043 | 0.0083 | 0.0089 |
| None | numNonChildUnderweight | 4 - 0 | -0.0173 | 0.0038 | 0.0061 | 0.0054 |
| None | numNonChildUnderweight | 5 - 0 | -0.0259 | 0.0651 | 0.0679 | 0.0678 |
| None | numNonChildUnderweight | 6 - 0 | 0.0076 | 0.1091 | 0.1114 | 0.1118 |
| None | numNonChildUnderweight | 7 - 0 | -0.0120 | 0.0873 | 0.0896 | 0.0890 |
| None | region | Chittagong - Barisal | 0.0429 | 0.0108 | 0.0075 | 0.0131 |
| None | region | Dhaka - Barisal | 0.0945 | 0.0238 | 0.0266 | 0.0299 |
| None | region | Khulna - Barisal | -0.0225 | 0.0371 | 0.0372 | 0.0419 |
| None | region | Rajshahi - Barisal | 0.0214 | 0.0383 | 0.0328 | 0.0385 |
| None | region | Rangpur - Barisal | -0.1141 | 0.0308 | 0.0282 | 0.0377 |
| None | region | Sylhet - Barisal | 0.0295 | 0.0370 | 0.0359 | 0.0419 |
| Money | adjUtility2 | | -0.0000 | -0.0044 | -0.0045 | -0.0041 |
| Money | atleastHS | 1 - 0 | 0.0260 | 0.0456 | 0.0651 | 0.0628 |
| Money | cropConsumed | 1 - 0 | -0.0107 | 0.0033 | 0.0074 | 0.0024 |
| Money | householdIncome | | -0.0000 | -0.0000 | 0.0000 | -0.0000 |
| Money | numChildren | 1 - 0 | 0.0196 | -0.0074 | -0.0082 | -0.0081 |
| Money | numChildren | 2 - 0 | -0.0073 | -0.0165 | -0.0178 | -0.0163 |
| Money | numChildren | 3 - 0 | 0.0013 | 0.0830 | 0.0175 | 0.0504 |
| Money | numChildren | 4 - 0 | 0.0088 | 0.3641 | 0.3456 | 0.3492 |
| Money | numChildren | 5 - 0 | 0.0116 | 0.7043 | 0.7050 | 0.7047 |
| Money | numChildUnderweight | 1 - 0 | 0.0365 | 0.0039 | 0.0022 | 0.0038 |
| Money | numChildUnderweight | 2 - 0 | 0.0406 | -0.0251 | -0.0187 | -0.0239 |
| Money | numChildUnderweight | 3 - 0 | -0.0011 | 0.1263 | 0.1251 | 0.1235 |

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| Money | numNonChildren | 10 - 1 | 0.0109 | 0.1273 | 0.1097 | 0.1262 |
| Money | numNonChildren | 11 - 1 | 0.0173 | -0.1155 | -0.1292 | -0.1056 |
| Money | numNonChildren | 13 - 1 | 0.0084 | 0.7439 | 0.7263 | 0.7426 |
| Money | numNonChildren | 14 - 1 | 0.0038 | -0.0509 | -0.0661 | -0.0344 |
| Money | numNonChildren | 2 - 1 | -0.1452 | -0.0032 | -0.0217 | -0.0057 |
| Money | numNonChildren | 3 - 1 | -0.0431 | 0.0240 | 0.0049 | 0.0224 |
| Money | numNonChildren | 4 - 1 | 0.0394 | 0.0388 | 0.0209 | 0.0375 |
| Money | numNonChildren | 5 - 1 | 0.0976 | 0.0319 | 0.0105 | 0.0266 |
| Money | numNonChildren | 6 - 1 | 0.1217 | 0.0550 | 0.0325 | 0.0470 |
| Money | numNonChildren | 7 - 1 | 0.1476 | 0.0367 | 0.0118 | 0.0293 |
| Money | numNonChildren | 8 - 1 | 0.1115 | 0.0228 | 0.0037 | 0.0291 |
| Money | numNonChildren | 9 - 1 | 0.0060 | -0.1390 | -0.1726 | -0.1381 |
| Money | numNonChildUnderweight | 1 - 0 | 0.0291 | -0.0134 | -0.0124 | -0.0144 |
| Money | numNonChildUnderweight | 2 - 0 | 0.0871 | -0.0012 | 0.0043 | -0.0017 |
| Money | numNonChildUnderweight | 3 - 0 | 0.0661 | -0.0148 | -0.0070 | -0.0190 |
| Money | numNonChildUnderweight | 4 - 0 | 0.0183 | -0.0179 | 0.0081 | -0.0100 |
| Money | numNonChildUnderweight | 5 - 0 | 0.0182 | -0.0898 | -0.0874 | -0.0804 |
| Money | numNonChildUnderweight | 6 - 0 | -0.0176 | -0.2934 | -0.2905 | -0.2933 |
| Money | numNonChildUnderweight | 7 - 0 | 0.0157 | 0.0806 | 0.0836 | 0.0814 |
| Money | region | Chittagong - Barisal | 0.0913 | 0.1576 | 0.1593 | 0.1540 |
| Money | region | Dhaka - Barisal | -0.0044 | 0.0948 | 0.0900 | 0.0889 |
| Money | region | Khulna - Barisal | 0.0384 | 0.0532 | 0.0491 | 0.0510 |
| Money | region | Rajshahi - Barisal | 0.0653 | 0.1030 | 0.0975 | 0.0989 |
| Money | region | Rangpur - Barisal | -0.0519 | -0.0514 | -0.0575 | -0.0566 |
| Money | region | Sylhet - Barisal | 0.0609 | 0.1084 | 0.1080 | 0.1036 |
| Money | timeToTown | | -0.0006 | -0.0005 | -0.0006 | -0.0005 |
| Food | adjUtility2 | | 0.0000 | -0.0014 | -0.0013 | -0.0013 |
| Food | atleastHS | 1 - 0 | -0.0233 | -0.0412 | -0.0491 | -0.0547 |
| Food | cropConsumed | 1 - 0 | -0.0175 | -0.0098 | -0.0113 | -0.0089 |
| Food | householdIncome | | -0.0000 | -0.0000 | -0.0000 | -0.0000 |
| Food | numChildren | 1 - 0 | 0.0056 | 0.0017 | 0.0042 | 0.0026 |
| Food | numChildren | 2 - 0 | 0.0078 | 0.0150 | 0.0165 | 0.0176 |
| Food | numChildren | 3 - 0 | -0.0092 | -0.0397 | -0.0014 | -0.0490 |
| Food | numChildren | 4 - 0 | -0.0017 | -0.0677 | -0.0679 | -0.0694 |
| Food | numChildren | 5 - 0 | -0.0013 | -0.0674 | -0.0676 | -0.0690 |
| Food | numChildUnderweight | 1 - 0 | -0.0004 | -0.0044 | -0.0053 | -0.0034 |
| Food | numChildUnderweight | 2 - 0 | -0.0071 | -0.0116 | 0.0036 | -0.0052 |
| Food | numChildUnderweight | 3 - 0 | -0.0007 | -0.0699 | -0.0711 | -0.0716 |
| Food | numNonChildren | 10 - 1 | -0.0018 | -0.1610 | -0.1575 | -0.1686 |
| Food | numNonChildren | 11 - 1 | -0.0034 | -0.1610 | -0.1575 | -0.1686 |
| Food | numNonChildren | 13 - 1 | -0.0010 | -0.1610 | -0.1575 | -0.1686 |
| Food | numNonChildren | 14 - 1 | -0.0015 | -0.1610 | -0.1575 | -0.1686 |
| Food | numNonChildren | 2 - 1 | -0.0062 | -0.0229 | -0.0208 | -0.0292 |
| Food | numNonChildren | 3 - 1 | -0.0092 | -0.0846 | -0.0806 | -0.0911 |
| Food | numNonChildren | 4 - 1 | -0.0218 | -0.1096 | -0.1045 | -0.1141 |
| Food | numNonChildren | 5 - 1 | -0.0202 | -0.1192 | -0.1132 | -0.1231 |
| Food | numNonChildren | 6 - 1 | -0.0283 | -0.1243 | -0.1162 | -0.1298 |
| Food | numNonChildren | 7 - 1 | -0.0142 | -0.1124 | -0.0954 | -0.1187 |
| Food | numNonChildren | 8 - 1 | -0.0114 | -0.1141 | -0.1186 | -0.1403 |

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| Food | numNonChildren | 9 - 1 | -0.0103 | -0.1610 | -0.1575 | -0.1686 |
| Food | numNonChildUnderweight | 1 - 0 | 0.0140 | 0.0031 | 0.0054 | 0.0042 |
| Food | numNonChildUnderweight | 2 - 0 | -0.0108 | -0.0162 | -0.0158 | -0.0114 |
| Food | numNonChildUnderweight | 3 - 0 | 0.0004 | 0.0093 | -0.0020 | 0.0051 |
| Food | numNonChildUnderweight | 4 - 0 | 0.0002 | 0.0251 | 0.0136 | 0.0193 |
| Food | numNonChildUnderweight | 5 - 0 | -0.0063 | -0.0700 | -0.0712 | -0.0713 |
| Food | numNonChildUnderweight | 6 - 0 | -0.0000 | -0.0698 | -0.0710 | -0.0711 |
| Food | numNonChildUnderweight | 7 - 0 | -0.0015 | -0.0700 | -0.0712 | -0.0713 |
| Food | region | Chittagong - Barisal | -0.0561 | -0.0689 | -0.0639 | -0.0699 |
| Food | region | Dhaka - Barisal | -0.0392 | -0.0558 | -0.0494 | -0.0567 |
| Food | region | Khulna - Barisal | 0.0088 | -0.0278 | -0.0162 | -0.0296 |
| Food | region | Rajshahi - Barisal | -0.0259 | -0.0541 | -0.0408 | -0.0527 |
| Food | region | Rangpur - Barisal | 0.0521 | -0.0097 | -0.0002 | -0.0133 |
| Food | region | Sylhet - Barisal | -0.0279 | -0.0493 | -0.0459 | -0.0521 |
| Food | timeToTown | | 0.0001 | 0.0002 | 0.0002 | 0.0002 |
| Both | adjUtility2 | | -0.0000 | -0.0017 | -0.0016 | -0.0016 |
| Both | atleastHS | 1 - 0 | -0.0218 | -0.0193 | -0.0288 | -0.0233 |
| Both | cropConsumed | 1 - 0 | -0.0452 | -0.0335 | -0.0348 | -0.0329 |
| Both | householdIncome | | -0.0000 | -0.0000 | -0.0000 | -0.0000 |
| Both | numChildren | 1 - 0 | 0.0113 | 0.0086 | 0.0080 | 0.0082 |
| Both | numChildren | 2 - 0 | 0.0050 | 0.0045 | 0.0067 | 0.0023 |
| Both | numChildren | 3 - 0 | 0.0088 | 0.0012 | 0.0034 | 0.0360 |
| Both | numChildren | 4 - 0 | -0.0034 | -0.1022 | -0.1050 | -0.1036 |
| Both | numChildren | 5 - 0 | -0.0022 | -0.1026 | -0.1053 | -0.1040 |
| Both | numChildUnderweight | 1 - 0 | 0.0064 | -0.0062 | -0.0044 | -0.0064 |
| Both | numChildUnderweight | 2 - 0 | 0.0045 | 0.0303 | 0.0095 | 0.0197 |
| Both | numChildUnderweight | 3 - 0 | -0.0019 | -0.1058 | -0.1086 | -0.1075 |
| Both | numNonChildren | 10 - 1 | -0.0023 | -0.0605 | -0.0562 | -0.0623 |
| Both | numNonChildren | 11 - 1 | 0.0011 | 0.1842 | 0.1843 | 0.1717 |
| Both | numNonChildren | 13 - 1 | -0.0013 | -0.0605 | -0.0562 | -0.0623 |
| Both | numNonChildren | 14 - 1 | 0.0039 | 0.7343 | 0.7362 | 0.7147 |
| Both | numNonChildren | 2 - 1 | -0.0628 | 0.0135 | 0.0227 | 0.0149 |
| Both | numNonChildren | 3 - 1 | 0.0002 | 0.0462 | 0.0534 | 0.0459 |
| Both | numNonChildren | 4 - 1 | 0.0164 | 0.0506 | 0.0569 | 0.0494 |
| Both | numNonChildren | 5 - 1 | 0.0433 | 0.0566 | 0.0646 | 0.0540 |
| Both | numNonChildren | 6 - 1 | 0.0257 | 0.0434 | 0.0454 | 0.0422 |
| Both | numNonChildren | 7 - 1 | -0.0042 | 0.0361 | 0.0387 | 0.0381 |
| Both | numNonChildren | 8 - 1 | -0.0147 | -0.0114 | 0.0028 | -0.0018 |
| Both | numNonChildren | 9 - 1 | 0.0343 | 0.1239 | 0.1411 | 0.1178 |
| Both | numNonChildUnderweight | 1 - 0 | 0.0210 | 0.0102 | 0.0081 | 0.0111 |
| Both | numNonChildUnderweight | 2 - 0 | 0.0467 | 0.0243 | 0.0225 | 0.0237 |
| Both | numNonChildUnderweight | 3 - 0 | 0.0199 | 0.0012 | 0.0007 | 0.0051 |
| Both | numNonChildUnderweight | 4 - 0 | -0.0012 | -0.0110 | -0.0279 | -0.0147 |
| Both | numNonChildUnderweight | 5 - 0 | 0.0140 | 0.0947 | 0.0906 | 0.0839 |
| Both | numNonChildUnderweight | 6 - 0 | 0.0101 | 0.2542 | 0.2501 | 0.2525 |
| Both | numNonChildUnderweight | 7 - 0 | -0.0022 | -0.0979 | -0.1020 | -0.0992 |
| Both | region | Chittagong - Barisal | -0.0781 | -0.0994 | -0.1029 | -0.0972 |
| Both | region | Dhaka - Barisal | -0.0508 | -0.0629 | -0.0672 | -0.0621 |
| Both | region | Khulna - Barisal | -0.0247 | -0.0626 | -0.0702 | -0.0633 |

| Choice | Variable | Contrast | $\sigma = 0$ | $\sigma = 1.25$ | $\sigma = 1.3$ | $\sigma = 1.35$ |
|---|---|---|---|---|---|---|
| Both | region | Rajshahi - Barisal | -0.0607 | -0.0872 | -0.0894 | -0.0847 |
| Both | region | Rangpur - Barisal | 0.1139 | 0.0303 | 0.0296 | 0.0321 |
| Both | region | Sylhet - Barisal | -0.0625 | -0.0960 | -0.0980 | -0.0934 |
| Both | timeToTown | | 0.0002 | 0.0003 | 0.0003 | 0.0003 |

# 11 Appendix C - GIS Maps: Utilization by Region

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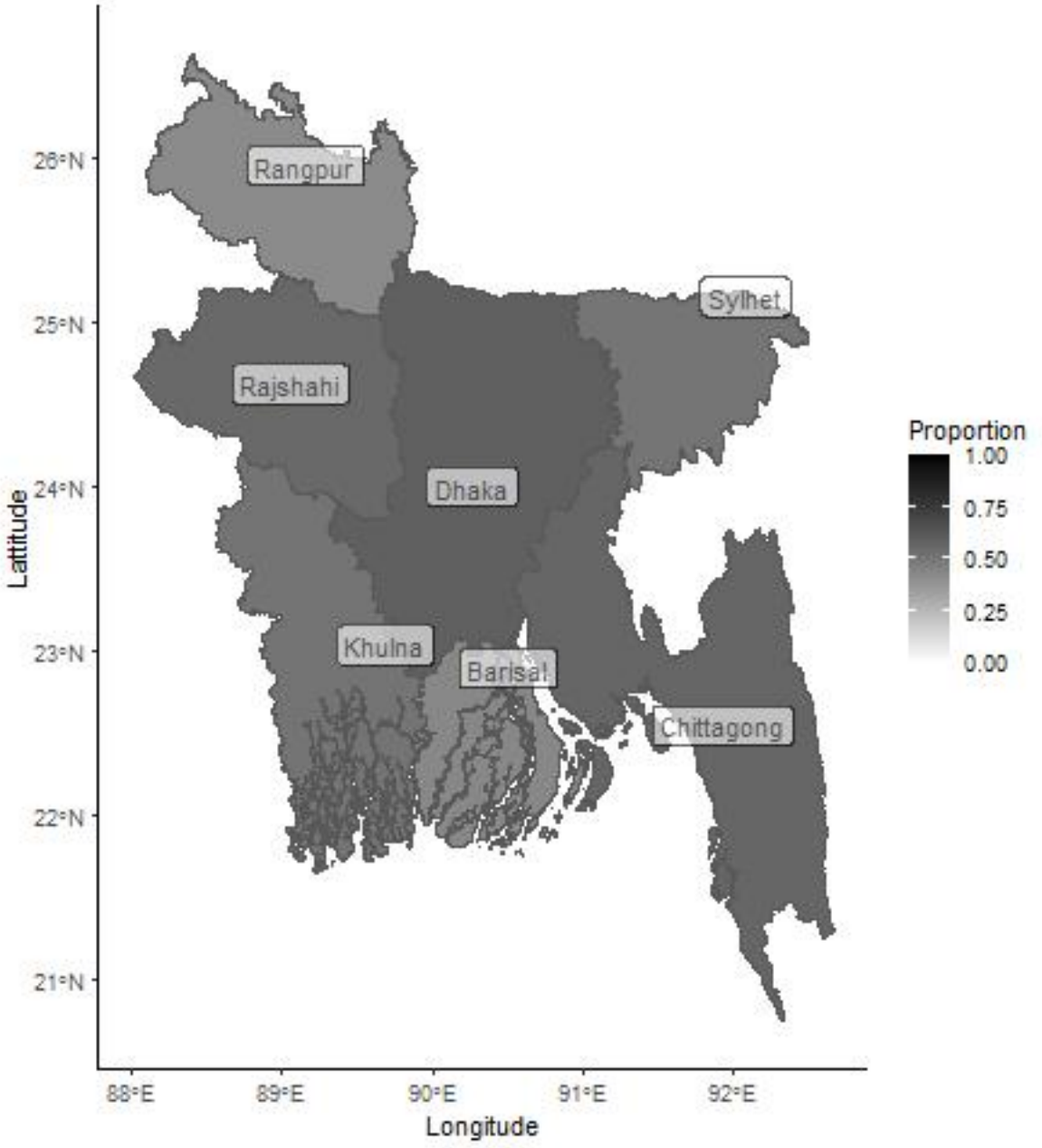


Figure 1: Proportion of households that did not utilize any Social Safety Nets.

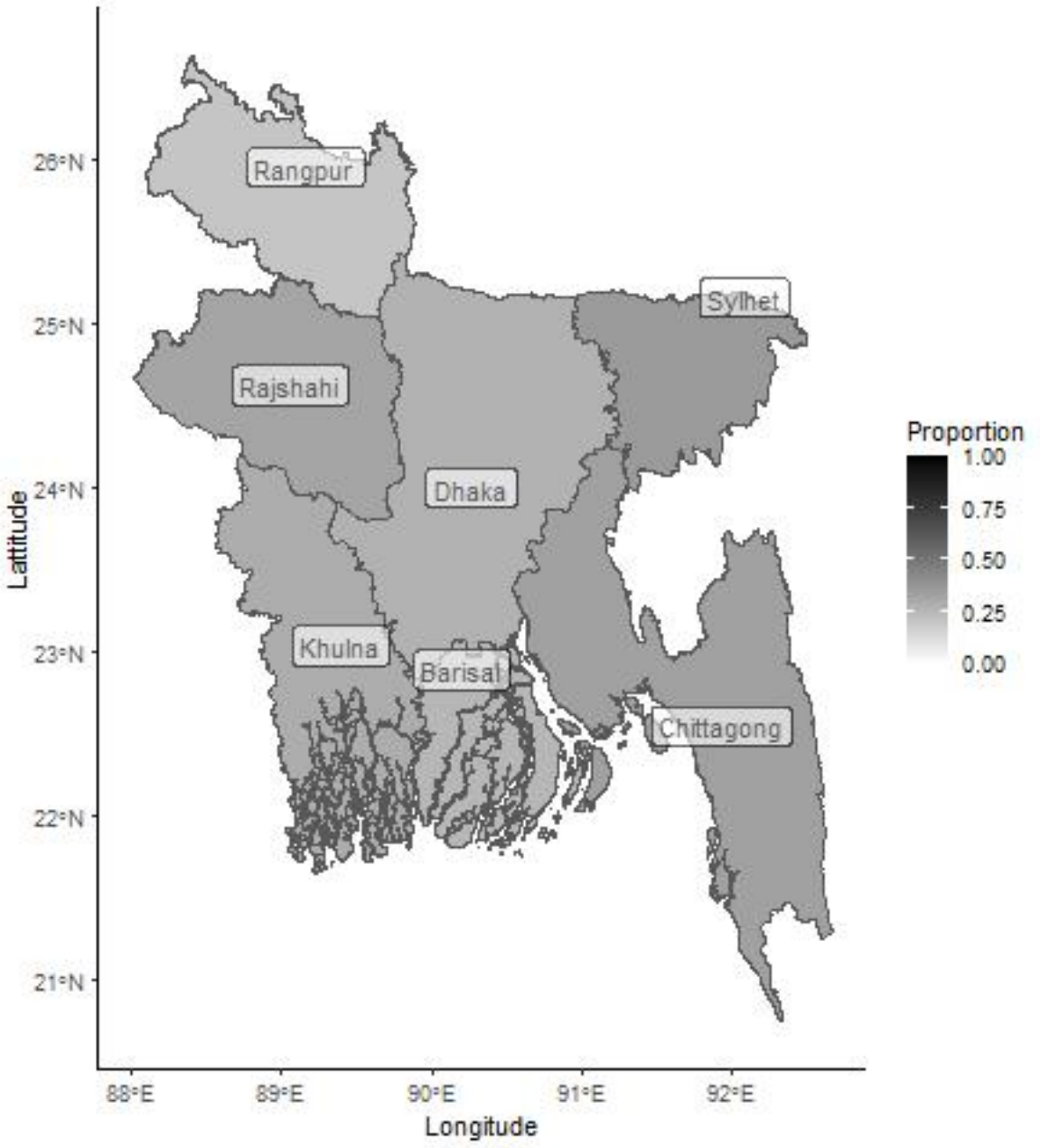


Figure 2: Proportion of households that only utilized monetary Social Safety Nets.

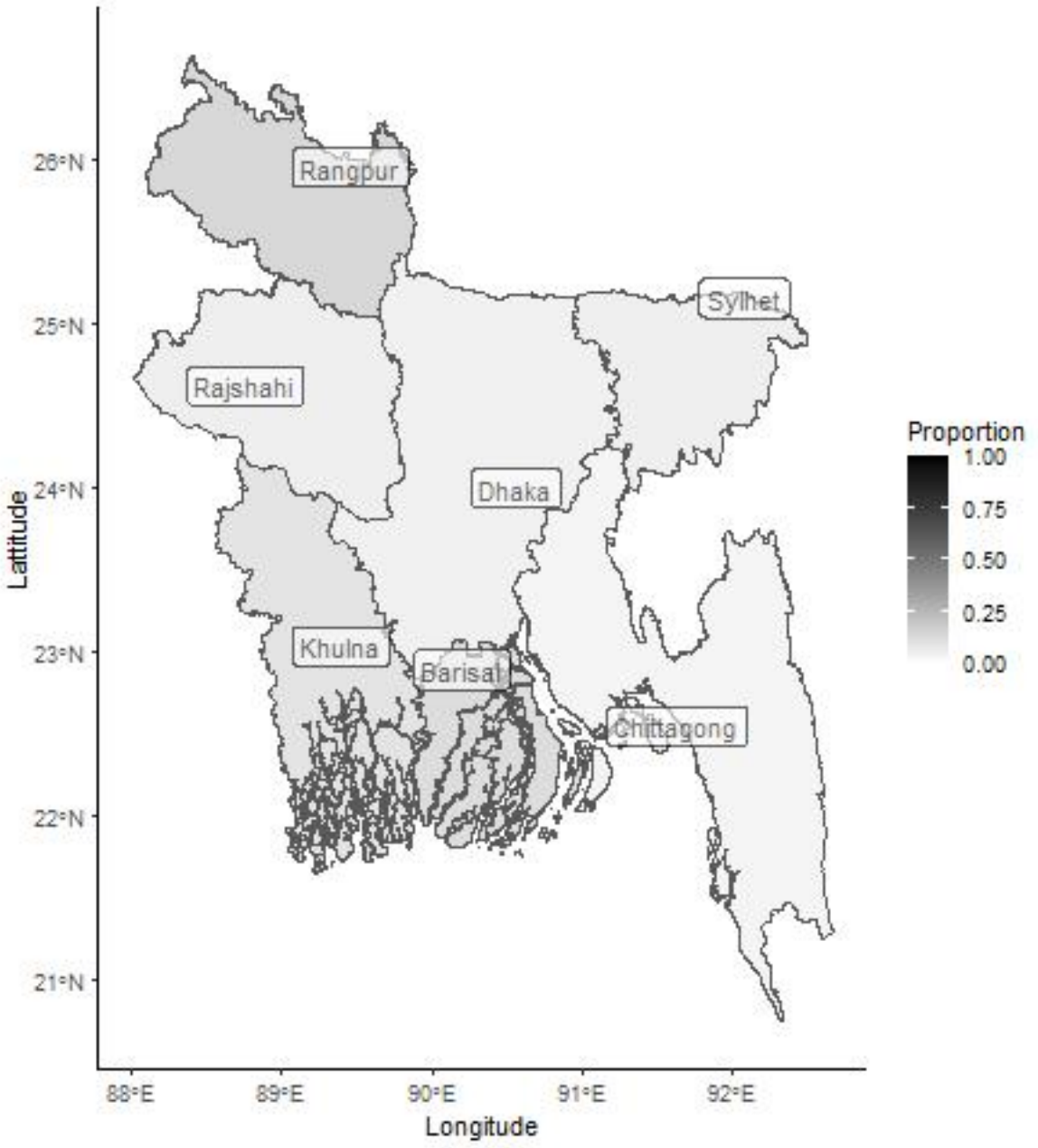


Figure 3: Proportion of households that only utilized food Social Safety Nets.

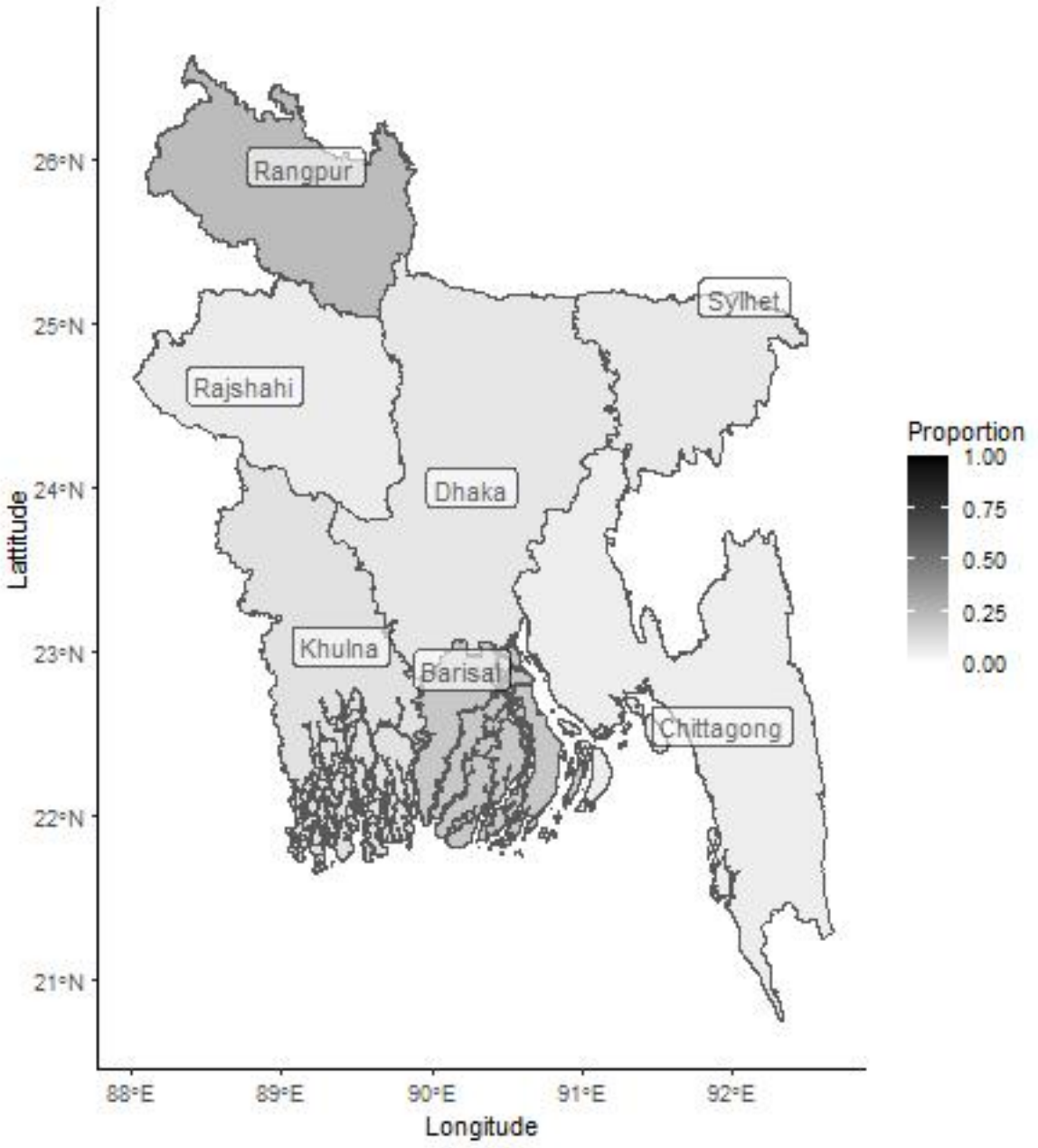


Figure 4: Proportion of households that utilized both Social Safety Nets.

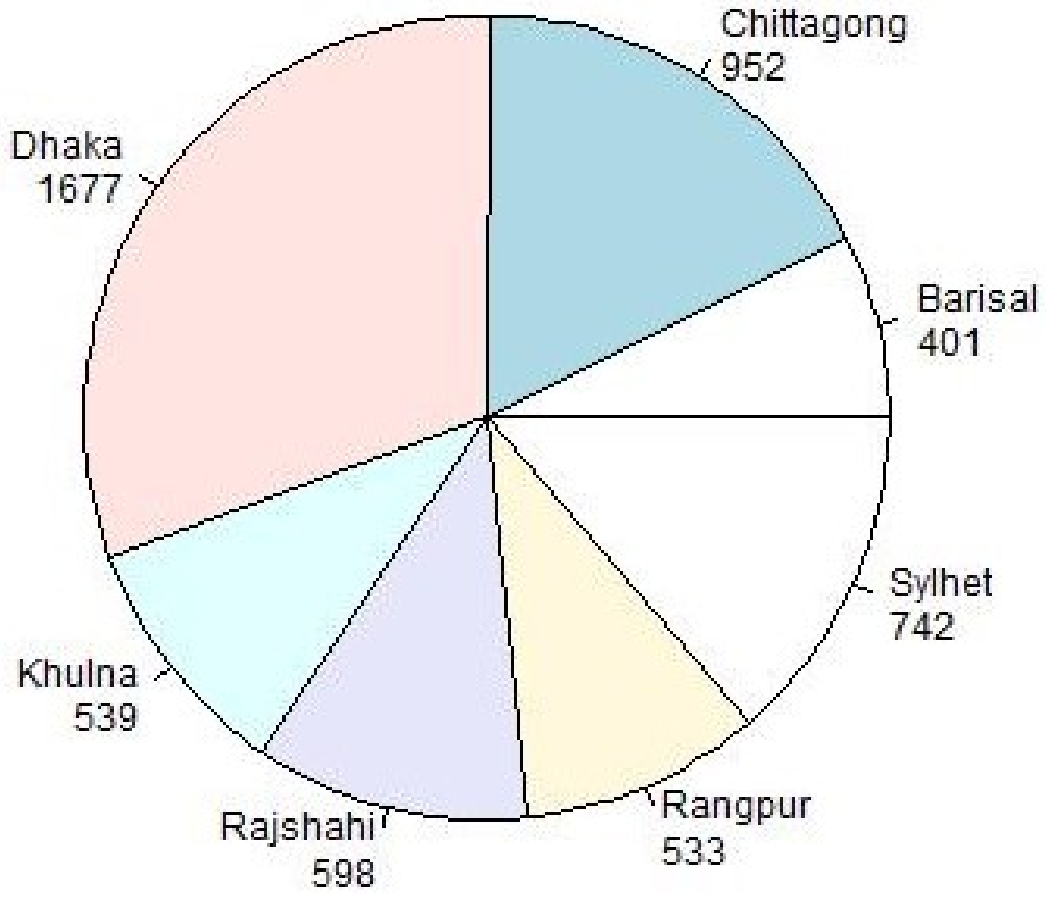


Figure 5: Number of Households in Survey by Region

# 12 Appendix D - Additional Graphs: Distribution and Eligibility

**Note on Graphs: Choice Utilization of 1 indicates **any** Social Safety Net was utilized and a 0 indicates **no** Social Safety Net was utilized.*

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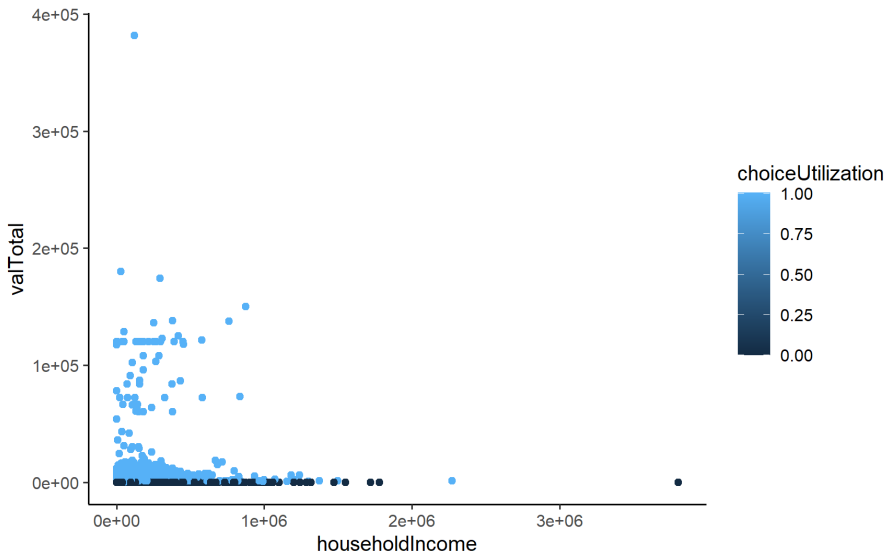


Figure 6: Scatter plot of total value of Social Safety Nets utilized versus total household income.

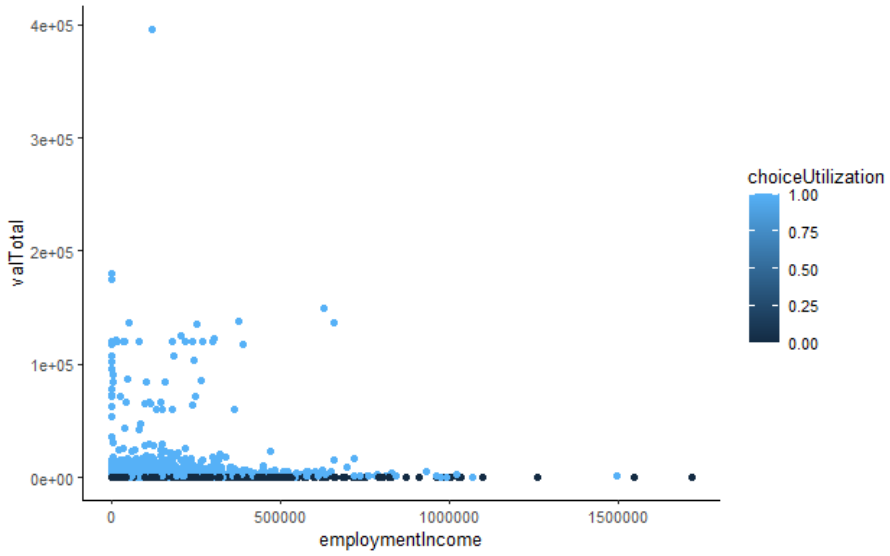


Figure 7: Scatter plot of total value of Social Safety Nets utilized versus total employment income.

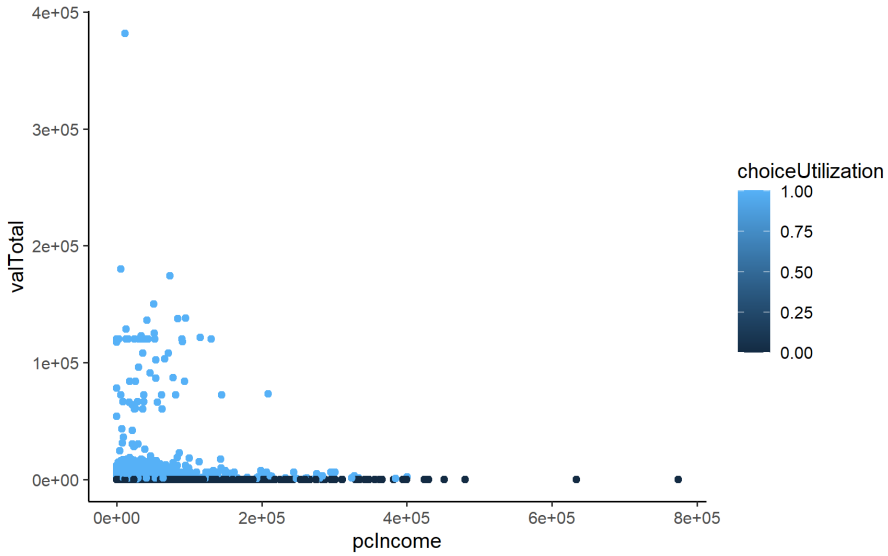


Figure 8: Scatter plot of total value of Social Safety Nets utilized versus household income per member.

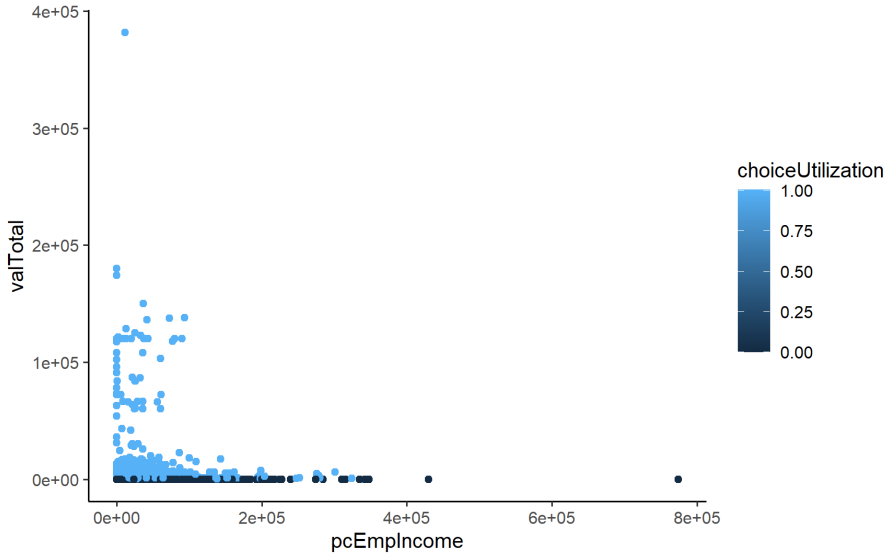


Figure 9: Scatter plot of total value of Social Safety Nets utilized versus employment income per member.

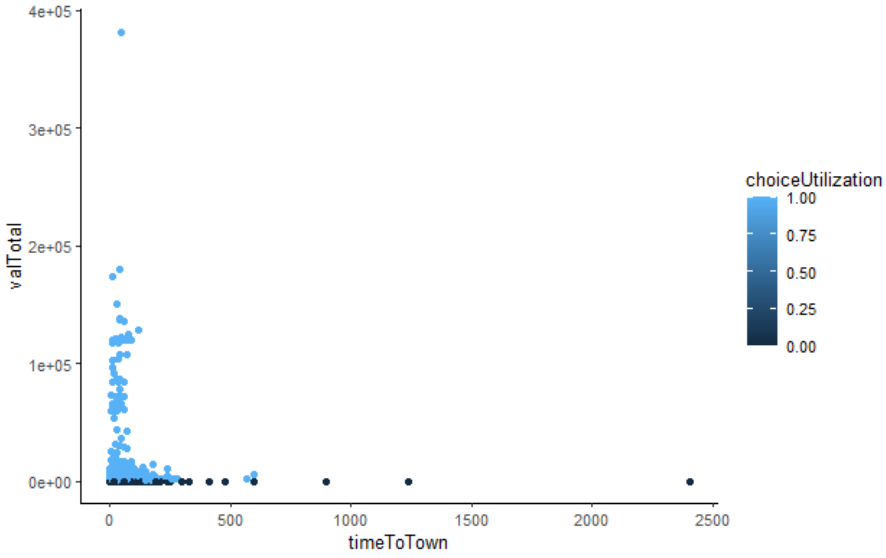


Figure 10: Scatter plot of total value of Social Safety Nets utilized versus Rurality (via time to nearest town).

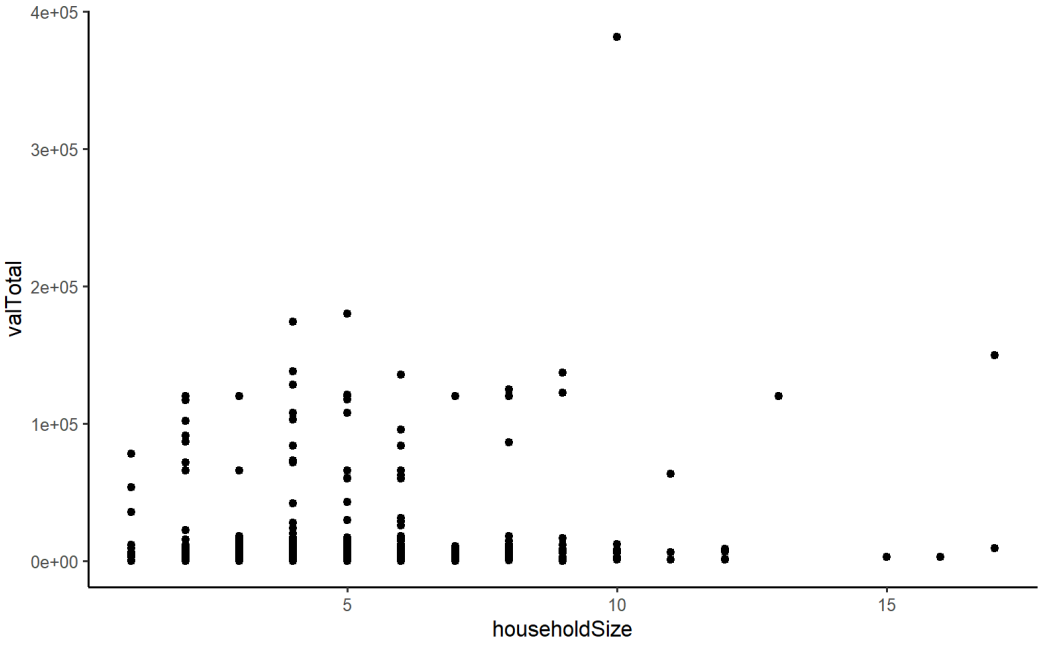


Figure 11: Household Size and Utilization Level

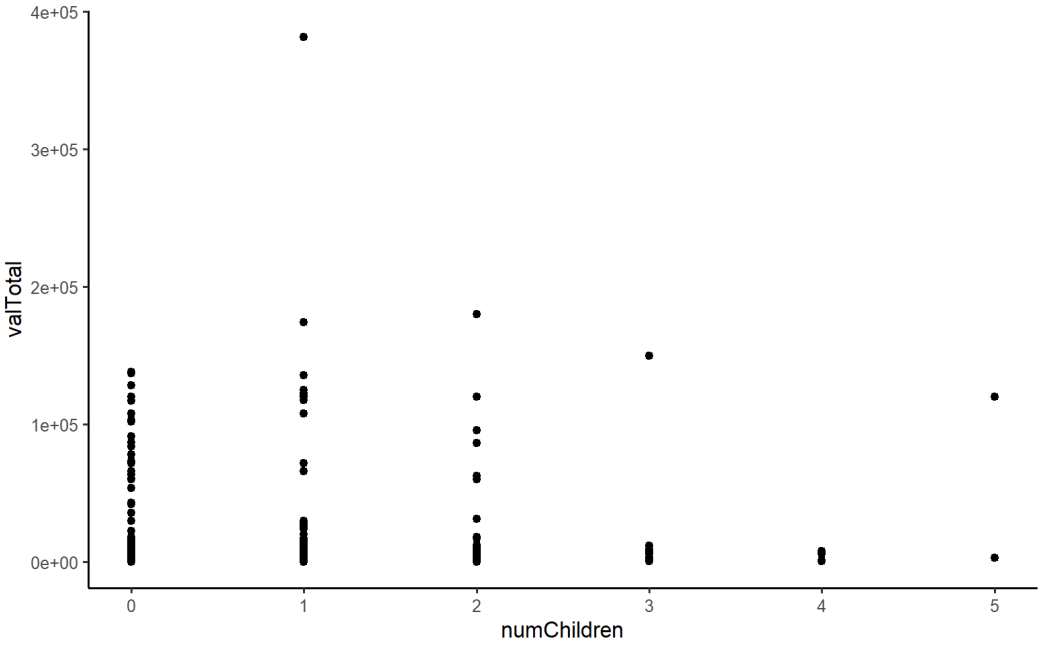


Figure 12: Number of Children and Utilization Level

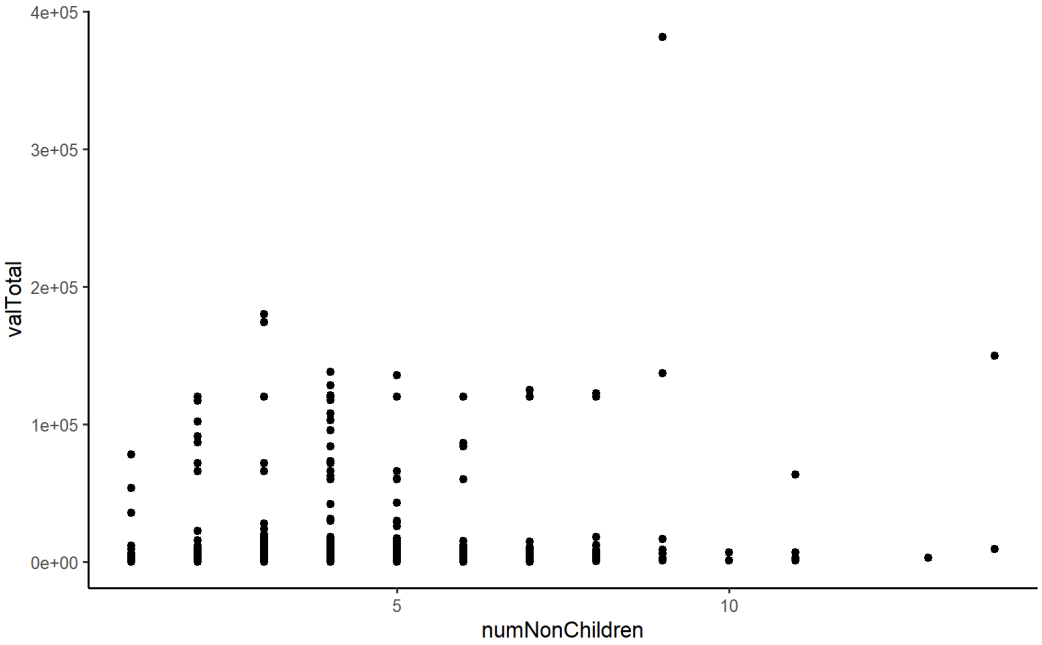


Figure 13: Number of Non-Children and Utilization Level