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# Cash transfers and temptation goods: An analysis on the impact of cash transfers on poor households’ consumption of sugar-sweetened beverages in the Philippines

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Sugar intake has been increasing globally and locally for individuals. Meanwhile, Philippine institutions continue to provide cash transfers (CTs) to poor households. Past literature found varying results of the impact of transfers on expenditure, consumption, and temptation goods. Most studies focused on alcohol and tobacco consumption and neglected the impact of cash transfers on the consumption of sugar-sweetened beverages (SSBs). Thus, this paper used propensity score matching and average treatment effects on the treated (ATET) evaluation method to compare the consumption of poor households with transfers to their consumption if they had not received cash transfers and determine the characteristics of households who were likely to receive transfers. The likelihood of poor households receiving CTs was significantly affected by some of the household head’s characteristics (age, educational attainment, and class of worker), household characteristics (household type, number of children below 18 years old, salaries and wages, and region of residence), and household facilities (water source, type of toilet facility, and type of roof). CTs were found to significantly decrease soft drinks consumption but did not significantly affect consumption of other SSBs. Policy responses related to increasing awareness of the health effects of these drinks like requiring warning labels, monitoring advertisements, and imposing restrictions on the amount of sugar added are highly recommended to decrease consumption of the said beverages.

## 1. INTRODUCTION

Sugar intake has been increasing on a global scale despite high-sugar diets being associated with morbid diseases. Among Southeast Asian countries, the Philippines suffers the greatest reduction in productive years due to obesity (Helble & Francisco, 2017). To bring people out of poverty, governments and private institutions have cash transfer (CT) programs where some are designed to allow the beneficiaries to consume healthier food, make the children stay in school, and make families have regular checkups. Though most results were consistent that cash transfers improved the well-being of the beneficiaries, it was unclear how transfers affect the beneficiaries’ consumption of unhealthy commodities.

The objective of this study is to determine the characteristics of households who were likely to receive cash transfers and compare the consumption of poor households with CTs to their consumption if they had not received CTs. Evaluating the impact of transfers on household consumption of sugar-sweetened beverages can help generate better recommendations for cash transfer policies and supplementary interventions.

## 2. LITERATURE REVIEW

Previous literature implied the presence of the freedom of choice of individuals on the goods they want to consume when they receive cash transfer payments. With this, the individual can spend the additional money on durable and non-durable goods and on healthy and unhealthy goods. Studies had shown the impact of cash transfer schemes but had obtained different results. Moreover, the literature found heterogeneity in program impacts and varying effects of cash transfers on consumption, food expenditure, and temptation goods.

Overall, conditional cash transfers (CCT) were found to have positive effects on schooling but had varying health impacts on poor households (Baird et al., 2014; Fiszbein & Schady, 2009; Cooper et al., 2020). In the Philippines, the Pantawid Pamilyang

Pilipino Program (4Ps), a CCT scheme, had an overall positive effect on the health of beneficiaries. 4Ps was found to significantly reduce stunting in children 6–36 months of age and improve the health and nutrition of children (Chaudhury et al., 2013).

Moreover, food expenditures of poor households who received CTs not only increased, but the kind of food they ate became more nutritious as well (Maitra & Ray, 2003; Perova, 2010; Adato & Bassett, 2008; Audsley et al., 2010). Households were found to buy more protein-rich food, but the household caloric intake only increased for poor households (Tiwari et al., 2016; Attanasio et al., 2005; Braido et al., 2012). However, the increase in consumption is not limited to nutritious food as Evans and Popova (2017) reviewed 19 studies and found that some respondents used the cash transfers they received to purchase temptation goods such as alcohol and tobacco. Food expenditures of CCT beneficiaries in Peru increased by 10% to 20% and had a higher likelihood to buy chocolates, candies, soft drinks, and restaurant meals when they have the cash on hand (Dasso & Fernandez, 2014). Colen et al. (2018) also found in a study in Africa that a rise in income would increase the risk of households overconsuming sugar and fats. Moreover, Dasso and Fernandez (2014) found no change in the consumption of nutritious food even after receiving cash transfers and had only observed that people were more inclined to buying more tasty and expensive food after being given the transfers.

Bazzi et al. (2012) and Cooper et al. (2020) indicated the presence of heterogeneity in program impacts according to the location of residence, baseline income, exposure to rice price shocks, subgroups, and demographic differences. Furthermore, food quantity and quality increased for relatively generous, regular, and predictable transfers, whereas food expenditures did not change for smaller, lumpy, and irregular ones (Tiwari et al., 2016). On the other hand, Evans and Popova (2017) reported no significant change in tobacco and alcohol consumption due to the control of women on the household income, together with the flypaper effect. The flypaper effect is the awareness of the

household that the purpose of transfer payments is for education and health (Evans & Popova, 2017). CCT programs were effective in stimulating healthy behaviors after examining 13 programs in Latin-American countries but should be accompanied by supply-side interventions, sufficient supply of health services, and interventions raising health practices to maximize effects (Ranganathan & Lagarde, 2012; Perova, 2010).

### 3. FRAMEWORK

#### **Consumer Preferences, the Budget, and Income Elasticity**

A rational household would maximize the household's utility given a fixed budget. In general, the quantity consumed by a household increases as the household's income increases. It is only when the household considers a good to be an inferior good that the quantity consumed decreases as income increases (Besanko & Braeutigam, 2014). The magnitude of the change in quantity with respect to the change in income is the income elasticity of demand.

Households may have different income elasticities for each good. This may also vary on the current level of consumption of a household. An increase in income (e.g., cash transfers) may encourage households to shift their consumption from less healthy food to more healthy food. However, the additional income may also increase household consumption of unhealthy goods such as SSBs.

#### **Temptation Goods**

Most goods that individuals consume are also the goods that they want their future selves to consume. Temptation goods are goods that individuals would not want their future selves to consume but do so at the moment because it generates positive utility (Banerjee & Mullainathan, 2010). Temptation goods require a level of self-control to be avoided. With a small budget that requires efficient allocation, poor households suffer a great deal when they consume temptation goods. Alcohol and cigarettes are considered temptation goods since they bring positive utility in the present, but the individual consuming them would not want their future self to smoke or drink. Sugar-sweetened beverages can be considered as temptation goods as well because they provide no nutritional value and do not help the poor in the long run but bring positive utility at the time of consumption. A household can be tempted to buy SSBs at the moment, which will cost them in the long run.

#### **Information Asymmetry, Perceived Benefit, and the 'Health Halo'**

Perception plays a large role in the preferences of individuals, especially in consumable products. Although household heads would want to provide the best commodities for the household members, a household may mistake an unhealthy good as a healthy one because of information asymmetry.

Learning about a product's health risk dissuades consumption of sweetened beverages (Kaur et al., 2017; Talati et al., 2017). However, Duffy et al. (2021) found that despite the presence of at least one nutrition-related claim in the front of the packaging in 97% of the 2,059 sugar-sweetened fruit drinks they sampled, the nutrition-related claims did not necessarily mean that the beverage was any healthier. Goods that have healthful claims

despite being unhealthy may be perceived as healthy goods. The literature calls this the "health halo effect." Similarly, warning labels that inform buyers about the unhealthy contents of products effectively dissuade consumers from continuing their purchase (Acton et al., 2019; Lima et al., 2019; Billich et al., 2018; Moran & Roberto, 2018).

What is important is how individuals perceive this risk and whether they know about the risks. Some conditional cash transfers require their beneficiaries to undergo regular checkups and attend health seminars. Seminars contribute to the reduction of information asymmetry, which could change the preferences of the beneficiary households. However, as Moran and Roberto (2018) pointed out, health warnings may have a greater impact on sugar-sweetened beverages that were previously perceived as healthful (e.g., fruit juice, energy drinks) than on sugar-sweetened beverages that were not (e.g., soda).

### 4. METHODOLOGY

From the 2015 Family Income and Expenditure Survey (FIES) of the Philippine Statistics Authority, the study only examined 8,363 poor households based on the national poverty threshold of ₱21,936 in the first semester of 2015 (Philippine Statistics Authority, 2016). Respondents who received cash receipts from domestic sources were considered beneficiaries of cash transfers and were classified as treated observations for this study. In contrast, those who did not receive cash receipts from domestic sources were considered untreated. Moreover, the sugar-sweetened beverage expenditures examined in this study were soft drinks, fruit and vegetable juice powder, concentrates and ready-to-drink juices, other non-alcoholic beverages like energy drinks, instant coffee, and powdered cocoa.

The study used the propensity score matching technique together with the average treatment effect on the treated (ATET) evaluation framework. First, the probit model was employed to estimate the probability of households receiving the treatment (cash transfers) conditional on the independent variables (the household characteristics and income). The predicted probabilities then served as the propensity scores of the household observations. The treated households would be matched with untreated households with similar propensity scores based on four matching methods—nearest neighbor matching with one neighbor restricted by a caliper width of 0.2, nearest neighbor matching with five neighbors with a caliper width of 0.2, kernel matching, and propensity score weighting by the odds. Then, the study used the ATET framework as suggested by Cameron and Trivedi (2005) and Ratkovic (2014) to determine the effect (whether gain or loss) of a treatment or program on the SSB consumption of the treated households per matched sample. ATET would compare the outcome of the treated households and the potential outcome if they did not receive treatment, which would be based on the outcome of the untreated households that were close matches of the treated households (Katchova, 2013). The ATET results per matching method were also compared for sensitivity analysis.

## 5. RESULTS AND DISCUSSION

### Socio-Economic Variables That Affect the Likelihood of Receiving Cash Transfers

Households that were more likely to receive domestic transfers were those with older household heads who were high school undergraduates with more children aged less than 18 years old. Extended families were also more likely to receive CTs, but households with heads who were working for a private establishment, self-employed without any employee, the employer in own family-operated farm or business, and working without pay in own family-operated farm or business were less likely to receive CTs than those with unemployed HHs. Moreover, the salaries and wages of the household were also found to significantly increase the likelihood of the household to receive transfers, yet small in probability value. On the other hand, households located in particular regions—Regions V, VIII, IX, X, XI, Caraga, IVA, and IVB were more likely to receive CTs than those in NCR, although those living in ARMM had a lesser likelihood of receiving the treatment compared to those in NCR. Households with toilet facilities that were classified as “others” were more likely to receive transfers than those with no toilet facility. Lastly, households with roofs made from light materials such as nipa and those made from mixed but predominantly strong materials were also less likely to receive CTs than those with roofs made of strong materials.

### Most Appropriate Matching Method

Among the four methods, the most appropriate method is propensity score weighting by the odds. This method entails assigning weights for each treated and untreated observation based on their calculated propensity scores, which would utilize all the observations in the dataset. The weighting technique adjusts for selection biases as the weights adjust for the influence of the treatment or program (Olmos & Govindasamy, 2015). The matched sample from the said method had the lowest values for the standardized differences of the covariates and had the covariate variance ratios closest to one among the four methods based on the numerical diagnostics conducted. Moreover, its overidentification test check for covariate balance confirmed that the covariates were balanced. This is consistent with Stuart (2010)’s study that had advised propensity score weighting by the odds as the most appropriate choice in estimating average treatment effects on the treated when there are more treated observations than untreated.

### Average Treatment Effect on the Treated (ATET)

The effect of cash transfers was only significant on the consumption of soft drinks with a 45 to 55 decrease in consumption, whereas the effect on the rest of the sugar-sweetened beverage classifications, including the totality of the sugar-sweetened beverage consumption, were not statistically different from zero in the matching methods. The similar coefficients and the consistent significance (insignificance) of these results show the robustness of the results through different matching methods.

CTs were found to negatively affect the consumption of soft drinks, but the results were insignificant for vegetable and fruit

juice powders, concentrates and ready-to-drink juices, instant coffee, powdered cocoa, and other beverages. Overall, cash transfers have no statistical effect on the overall consumption of sweetened beverages for poor households in the Philippines. Treated households did not spend more nor less on SSBs despite a higher income. Instead, treated households either saved or allocated the excess income on other commodities that may have been more beneficial for the household. This may also have been because the total consumption of SSBs only constituted to 2.76% of a household’s average total expenditure. Nonetheless, cash transfer programs seem to be effective in reducing the consumption of soft drinks in households and this may be attributed to the health seminars that educate poor households about healthier food alternatives.

Table 1  
*Summary of the Average Treatment Effects on the Treated (ATET) on Consumption of All Sugar-sweetened Beverages Using the Different Matching Methods*

Category	ATET			Propensity score weighting by the odds
	Nearest neighbor with radius matching (one neighbor)	Nearest neighbor with radius matching (five neighbors)	Kernel matching	
Soft drink	** -55.13	** -45.63	** -50.38	** -50.43
Fruit and vegetable juice powder	0.77	-5.13	-3.64	2.90
Concentrates and ready-to-drink juice	6.28	7.66	8.41	8.86
Other non-alcoholic beverage (energy drink)	-0.59	2.91	1.98	3.20
Instant coffee	-49.70	-59.14	-39.84	-25.55
Powdered cocoa	-3.73	3.97	17.42	-1.39
Sugar-sweetened beverage	-102.10	-95.36	-66.06	-62.40

\*p<0.10, \*\*p<0.05, \*\*\*p<0.01

## 6. CONCLUSION

The effect of cash transfers was insignificant for all SSBs except for soft drinks. However, the income elasticities of consumption of all SSBs were positive. Though treated households had a lower income elasticity of demand for soft drinks than untreated households, treated households had greater income elasticity of demand for SSBs in general. This implies that the positive income effect is only overshadowed by the negative substitution effect,

which may be attributed to the health seminars that some treated households attended. The statistically insignificant effect of cash transfers in mitigating the consumption of other SSBs and the positive income elasticity of demand, however, demonstrates a large room for improvement for policy. Although the Philippine government has started implementing an ingredient-based tax on SSBs, studies emphasized that taxes should be accompanied by other interventions such as improved labeling, subsidy programs, reformulation, and restrictions in marketing practices (Perova, 2010; Ranganathan & Lagarde, 2012; Cornelsen & Carriedo, 2015).

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