

Article

Can Conditional Cash Transfers Narrow Gender Gaps in Poverty Reduction ? Evidence from the Poorest Regions in the Philippines

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Abstract

In 2008, the Philippines launched the *Pantawid Pamilyang Pilipino Program* or *4Ps*, a conditional cash transfer (CCT) initiative to reduce poverty and promote human capital development. While there is copious literature on the national-level impacts of a conditional cash transfer (CCT) program on poverty, fewer studies have focused on its heterogeneous impacts across different regions and demographic groups within the regions. Using two cross-sectional datasets from 2011, when the *4Ps* data was first recorded, and 2017, nearly a decade into its implementation, this study examines the effect of the *4Ps* on per capita income and the probability of being poor. Specifically, this study focuses on the two poorest regions in the country and assesses how the effect differs by the gender of the household head within these regions. The results show that in 2011, the *4Ps* was effective in reducing poverty only for male-headed households, while female-headed households saw no significant benefits, suggesting a widening poverty gap between genders. By 2017, the program's effectiveness diminished, with no significant poverty reduction for either male-or female-headed households, indicating that the program's long-term impact may be limited. These findings have important implication for future CCT programs and the need for gender-specific strategies.

Keywords: *conditional cash transfer program, Pantawid Pamilya (4Ps), gender-specific differences, household head*

1. Introduction

Conditional cash transfer (CCT) programs around the world have been central to poverty alleviation efforts by providing financial aid to poor households in exchange for fulfilling

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human capital development conditions, such as ensuring children's school attendance or regular health check-ups (Fiszbein & Schady, 2009). These programs often target women, particularly the mothers, as the primary recipients (e.g., Brazil's *Bolsa Familia*, Mexico's *Oportunidades*, and the Philippines' *Pantawid Pamilyang Pilipino Program*, etc.). The rationale behind this approach is that women, especially in low-income households, are more likely to prioritize spending on essential needs such as food, education, and healthcare; thereby, fostering better outcomes for the entire household (Ambler & de Brauw, 2017; Bonilla et al., 2017; Schady & Rosero, 2008).

However, while targeting of women is intended to empower them economically and socially within the household, the broader impact of CCT programs on gender dynamics remains convoluted. Studies have shown that CCTs can improve women's bargaining power and intra-household decision-making in some contexts (Ambler & de Brauw, 2017; Bonilla et al., 2017; Somville et al. 2020), reduce spousal abuse (Díaz & Saldarriaga, 2022; Heath et al., 2020), and increase their economic independence (Sugiyama & Hunter, 2020). Yet, a couple of research indicates that these benefits may not be uniform across different household structures. For instance, CCTs can lead to inefficiencies and disagreements between spouses regarding resource allocation, which can result in poor outcomes for the household as a whole (De Rock et al., 2022). Moreover, the effects of CCTs on gender dynamics may be particularly pronounced in the poorest regions, where traditional gender roles and economic disparities are more deeply entrenched. Female-headed households in developing countries face structural disadvantages compared to male-headed households due to existing gendered roles, economic constraints, and social expectations (Megged, 2020; Posel et al., 2023; Saad et al., 2022). Male household heads, on the other hand, may face different benefits or challenges from CCT programs, as traditional norms reinforce male authority over financial resources (Griffin, 2013; Ke, 2020). This dynamic may unintentionally limit the empowerment of women within households, even though the primary goal of CCT programs is poverty alleviation rather than direct empowerment.

While extensive literature on CCT programs exist (Adato & Hoddinott, 2010; Cecchini & Madariaga, 2011; Fiszbein & Schady, 2009), most of these studies have focused on national-level impacts without disaggregating the effects across regions. Moreover, how these programs affect male-and female-headed households differently, especially in economically marginalized regions, is less understood. This study addresses this gap by assessing the gender differences in the impacts of *Pantawid Pamilyang Pilipino Program* (4Ps), the Philippines' flagship poverty-alleviation program, specifically focusing on per capita income and the probability of being poor among household heads in the poorest and most vulnerable regions in the Philippines.

In this study, two of the most economically disadvantaged regions in the Philippines — BARMM and Eastern Visayas — were chosen. The Bangsamoro Autonomous Region in

Muslim Mindanao (BARMM), formerly known as the Autonomous Region in Muslim Mindanao (ARMM), is the largest region in the Philippines in terms of land area. However, the region has consistently ranked as one of the poorest regions in the country due to several factors: (a) history of armed conflict and political instability, (b) lack of infrastructure, (c) limited education and employment opportunities, and (d) cultural and religious marginalization (Herbert, 2024; Oxford Business Group, 2019). On the other hand, Eastern Visayas is another region that consistently struggles with high poverty rates. This region often faces economic vulnerabilities due to several reasons: (a) geographical isolation, (b) agricultural dependence yet exposure to strong typhoons and other natural disasters, and (c) high incidence of poverty and unemployment (Philippine Statistics Authority, 2023; Recuerdo, 2023). Both two regions experience not only high poverty rates but also exacerbated vulnerability to external shocks, slowing down their economic growth and development. This makes the two regions a compelling choice for the analysis of this study.

This study utilizes two cross-sectional datasets from the Annual Poverty Indicator Survey (APIS), a nationally representative household survey in the Philippines that contains a rich set of variables for a non-experimental evaluation of the *4Ps*, in the years 2011 and 2017. The entropy balancing method was used to estimate the effect of the *4Ps* on per capita income and the probability of being poor. By evaluating the effect of *4Ps* on the said outcomes in 2011 and 2017 — capturing both the early and more mature stages of the program — this study provides a more nuanced understanding of how gender differences manifest within the most economically marginalized areas.

The rest of the paper is arranged as follows. Section 2 provides background about the *4Ps* in the Philippines. Section 3 presents the literature review. Section 4 deliberates the data and methodology. Section 5 presents and discusses the empirical results. Finally, Section 6 concludes the study.

2. The *Pantawid Pamilyang Pilipino Program (4Ps)*

Patterned after the successful CCT Programs in Latin American and the Caribbean countries (Adato & Hoddinot, 2010; Lavinias, 2013), the Philippine Government, spearheaded by the Department of Social Welfare and Development (DSWD), initiated a similar CCT program called the *Pantawid Pamilyang Pilipino Program (4Ps)*. It was conceptualized when the country was experiencing a decade of economic growth yet did not translate to poverty reduction. It has become the nation's poverty-reduction flagship program and is currently the third largest CCT program (Acosta & Velarde, 2015) and the “fastest expanding conditional cash transfer” program (Yemtsov, 2015) in the world.

The *Pantawid Pamilyang Pilipino Program (4Ps)* or *Pantawid Pamilya* in the Philippines

started as a pilot program in 2007. It was composed of no more than 4,500 beneficiary households with the coverage of four rural municipalities (*Sibagat* and *Esperanza* in Agusan del Sur and *Lopez Jaena* and *Bonifacio* in Misamis Occidental) and two urban cities (*Pasay City* and *Caloocan City* in Metro Manila). After the global financial crisis and price shocks, the *4Ps* was scaled up and fully implemented in March 2008, through the World Bank's technical assistance. At that time, only about 6000 households were covered. Since then, the *4Ps* had a several phases of expansion which were funded by different international organizations.

In 2011, the program had about 1 million beneficiary households. The year after that, the *4Ps* was complemented by the so-called Modified Conditional Cash Transfer (MCCT) which is categorized into three: a) for families in need of special protection, b) for homeless and street families, and c) for extended age coverage. In response to the impact evaluation studies conducted by the World Bank and Philippine Institute for Development Studies (PIDS), the government approved the expansion of education grants to all existing children beneficiaries until they finish high school and to all high school level beneficiaries. Given its rapid expansion, there was also a series of changes in terms of selection criteria over the period 2008–2014 (Asian Development Bank, 2015). Fast forward to 2019, the Republic Act No. 11310 was enacted, otherwise known as “*An Act Institutionalizing the Pantawid Pamilyang Pilipino Program (4Ps)*”.

The program targets the identified poor and near-poor households, with eligibility largely determined by the proxy means test (PMT) model by the National Household Targeting System for Poverty Reduction (NHTS-PR). Like most of the established CCTs around the world, the *4Ps* has also two components¹⁾—health and education. Under the health component, the program provides an amount not lower than Php 750 (~15 USD) per month for a maximum of 12 months to each family beneficiary for their health and nutrition expenses. On the other hand, the education component provides different amounts per child enrolled (i.e., Php 300 (~6 USD)/month per child enrolled in daycare and elementary programs, Php 500 (~10 USD)/month per child enrolled in junior high school, and Php 700 (~14 USD)/month per child enrolled in senior high school per for one school) to meet the educational expenses. Moreover, each family beneficiary receives cash for up to a maximum of three children under the educational grant. These grants are given to the mothers, who are the direct program recipients. However, if the mother is absent or is no longer part of the household, the father becomes the grantee (Department of Social Welfare and Development, 2021).

3. Literature Review

3.1. *Conditional Cash Transfer (CCT) programs around the world and their outcomes*

The history of CCT programs can be traced back in 1990s, when countries such as Mexico (*Programa de Educación, Salud y Alimentación*, or PROGRESA — now called Oportunidades), Brazil (*Bolsa Família* Program — currently the largest in the world), and Bangladesh (*Food for Education* Program) developed programs entailing transfers to investments in human capital (Adato & Hoddinott, 2010). In Mexico and Brazil, it started as a social experiment beginning with the traditional food subsidy programs and gradually replacing it with cash grants given only to the poorest families. Similarly in Bangladesh in 1993, the program has given the poor families free monthly rations of rice or wheat in exchange for sending their children to primary school.

With the rapid expansion of CCTs in the early 2000s, it is no surprise that there is a large volume of published studies evaluating the impacts of conditional cash transfer programs on the direct outcomes for which they are designed — education (Schultz, 2000; Maluccio & Flores, 2004; Glewwe & Olinto, 2004; Behrman, et al., 2009) and nutrition (Gertler, 2004; Morris, et al., 2004). Other outcomes on food consumption (Attanasio & Mesnard, 2006; Hoddinott & Skoufias, 2004), child labor (Skoufias & parker, 2001; Filmer & Schady, 2009), gender (Adato, et al., 2009; Baird, et al., 2009), and political participation (Alviar & Pearson, 2009) were also investigated. However, studies of CCT programs on poverty outcomes remain limited, even though the ultimate goal of CCTs is to alleviate poverty in the short and long run.

Fiszbein and Schady (2009) would argue that CCTs in general have shown favorable evidence in improving the lives of the poor — poor households were well targeted, consumption levels were raised, and poverty was reduced — on a large scale. Hincapie (2012) assessed the *Familias en Acción*, the largest CCT program in Colombia, using quantile regression methodology and difference-in-difference estimators. She found out that the program has a positive impact on household income and that the impacts are more pronounced for those households belonging to lower quantiles of the income distribution. However, much of the current literature on the impacts of CCT on poverty pays particular attention at the national level. Thus, there is a relatively small body of literature that is concerned with the actual heterogeneous impacts of the CCT on poverty at the sub-national level or across the regions in a certain country. This study seeks to address this gap by exploring the regional-level effects of the *4Ps*, the Philippines' flagship CCT program, on poverty outcomes, with a focus on two most economically disadvantaged regions in the

country.

3.2. Intrahousehold Gender Dynamics in CCTs

A body of research has explored the gender dynamics within households that receive conditional cash transfers, highlighting how these programs shape decision-making and resource allocation. Braido et al. (2012) investigated whether women empowered by CCTs indeed allocate household resources towards pro-child and pro-family goods. The findings showed that program participation led to an increase in food expenditure, although the effect was not attributed to women being cash transfer recipients. Conversely, a study by Rubalcava et al. (2009) analyzed the impact of Mexico's PROGRESA (now called *Oportunidades*) program's cash transfer on resource allocations focusing on women's share of household income and examined variations in income and timing of PROGRESA benefit payments. Employing a social experiment, they found that PROGRESA income shifts household power balance, with women allocating more resources towards future investments. These studies have consistently shown that when women, particularly mothers, are the primary recipients of cash transfers, there is a greater focus on child welfare, health, and education, illustrating the far-reaching effects of CCTs on household outcomes.

In terms of labor market outcomes, Del Boca et al. (2021) evaluated the impact of a cash transfer program on low-income household members and found that fathers assigned to the conditional cash transfer program are more likely to work by 14% than those assigned to an unconditional cash transfer program. Another study in the Philippines by Tabuga et al. (2021) found that the *4Ps* reveal a significant gender disparity in labor market outcomes, with males enjoying stable employment while women often excluding themselves for unpaid household and family duties. This suggests that traditional gender roles influence how men and women respond to the incentives provided by CCT programs. This study aims to contribute to the existing literature by exploring whether there is gender differences based on household head roles while analyzing the effects of the *4Ps* program on poverty outcomes.

3.3. Impact Evaluation Studies on 4Ps in the Philippines

Chaudhury and Okamura (2012) conducted the first study in the Philippines to establish the causal influence of the *4Ps* on school enrollment using the difference-in-difference (DID) and regression discontinuity design (RDD) techniques. The study pointed out that enrollment among younger children has improved and that *4Ps* household beneficiaries are more likely to enroll their younger children compared to non-*4Ps* household beneficiaries. Strikingly, it was shown that the program had no effect on increasing enrollment among older students aged 13-17 years old, as the majority of youngsters aged 15-17 years old no longer get *4Ps*' grants as of 2011.

Orbeta Jr. et al. (2014) conducted a second-wave impact study of *4Ps* utilizing RDD. They found that although the cash grants are not enough to completely keep the children from working, the program has reduced the incidence of child labor for both *4Ps* and Non-*4Ps* households. They also found that the cash grants do not encourage dependency nor spending on vice goods. In the study, self-rated poverty was reported to be lower by 7 percentage points and the *4Ps* parents were said to be more optimistic about their children's future. Despite numerous positive impacts, the study concluded that the program still faces some challenges such as the lack of adequate services to serve more poor households and the beneficiaries' lack of appreciation of the interventions.

Using a poverty simulation approach, Son and Florentino (2008) had noted that the education component alone of the *4Ps* could lift 31.1 percent of poor households out of poverty and could decrease the national poverty gap measure by 52.5 percent if the program is accurately targeted at children in all poor households nationwide. Likewise, Velarde and Fernandez (2011) used simple simulation impact analysis and found that the program can reduce poverty incidence among *4Ps* household beneficiaries and in program areas by up to 6.2 and 2.6 percentage points, respectively. As no study has been done to analyze the actual impacts of the *4Ps* on poverty, the use of non-experimental evaluation methods has been deemed appealing. Tutor (2014) utilized propensity score matching (PSM) methodology to analyze the effect of the program on consumption from the 2011 Annual Poverty Indicator Survey (APIS). The study found no effect on per capita expenditure among the total sample, with only carbohydrates and clothing (in per capita monthly terms) and education and clothing (as expenditure shares) having significant positive effects. In addition, heterogeneous impacts were observed among the bottom 20% of the income distribution — that is, there is a stronger impact on consumption among the poorest fifth of households. The study, however, was limited in using only one cross-sectional data set and did not explore the heterogeneity impacts across the regions in the Philippines.

4. Data and Methodology

4.1. *Data source and sampling*

This study uses the Annual Poverty Indicator Survey dataset since it is designed to be a nationally representative household survey in the Philippines which contains a rich set of variables for a non-experimental evaluation of the *4Ps* (Tutor, 2014). In addition, the APIS contains income and non-income indicators related to poverty, in the absence of FIES, which is deemed sufficient to gauge the poverty level in the Philippines. The author used the APIS 2011 and APIS 2017 for data of comparison, respectively.

The APIS 2011 was utilized as the baseline data since it was the first nationwide sample

survey to provide information about the *4Ps* beneficiaries (Reyes, et al., 2015). It uses the 2003 master sample created for household surveys with the results from the 2000 Census of Population and Housing (CPH) as basis. The sampling is done by a three-stage sampling scheme within each region: a) *primary sampling units* (PSUs), b) *sample enumeration areas* (EAs), and c) *sample of housing units*. The PSUs and EAs involve selecting with probability proportional to the 2000 Census while the housing units were selected using systematic sampling based on each sample EAs. There were 43,833 eligible sample households but 42,063 were successfully interviewed.

On the other hand, the APIS 2017 was chosen in this study because it is the most recent APIS in which most of the survey questions were aligned with the 2011 questionnaire. It uses the 2013 master sample where each sampling domain is subdivided into PSUs. There were about 81,000 PSUs formed and then systematic samples were drawn from these PSUs to form a replicate. The APIS 2017 used a quarterly sample replicate which generated 10,478 eligible sample households. Among these eligible sample households, 10,159 were successfully interviewed.

4.2. Variables

The treatment variable was derived from the question in the APIS 2011 survey “*In the last 6 months (January — June 2011), has any member of your family received payments from any of the following cash sources? 4Ps — Yes, No*”. The same question in the APIS 2017 survey was used, with self-reported participation in the *4Ps*. It was assumed that if one member is a beneficiary, it counts as one household, even if there are multiple beneficiaries in one household. In the 2011 dataset, there are 3,065 *4Ps* households, which means 7.3% of the total sample ($N=42,063$) are in the treated group. This makes 1.2 million *4Ps* households or 23.4% of the total population below the national poverty threshold when weights are being employed. On the other hand, out of the total sample ($N=10,159$) in APIS 2017, there are 1,837 *4Ps* households or 18.1% are in the treated group. When weighted, this translates to 3.9 million *4Ps* households or 16.9% of the total population below the national poverty threshold.

In measuring income poverty as the outcome variable, two indicators were considered. One is the long-established and straightforward indicator, which is per capita income, and the other one is the probability of being poor. The per capita income is derived from the total family income which includes “*salaries and wages from jobs and businesses, incomes from entrepreneurial activities and from other sources such as cash receipts, gifts, support, relief, and other forms of assistance*” for the period of January to June of that year divided by the total number of families (Philippine Statistics Authority, 2011). The latter variable is an indicator which is equal to 1 if the per capita income is below or equal the regional poverty threshold, or in other words, ‘regional poor’.²⁾ The regional poverty thresholds for

the years 2011 and 2017 were calculated using interpolation method. The 2011 estimates were based on the 2009 and 2012 official annual capita poverty threshold, while the 2017 estimates were derived from the 2015 and 2018 official annual per capita poverty threshold.

4.3. Descriptive Statistics

Table 1 presents the descriptive statistics for key outcome variables, treatment indicators, and regional dummies for both 2011 and 2017. In 2011, the mean per capita income for all households was Php 25,635, with female-headed households reporting a notably higher average income of Php 34,214 compared to Php 23,335 for male-headed households. This difference suggests that, at baseline, female-headed households had higher income levels despite relatively smaller share in the population. The probability of being poor was lower among female-headed households (15.4%) than male-headed households (28.2%), reinforcing the observation that female-headed households appeared better off in terms of income and poverty status. Regarding *4Ps* distribution, a slightly lower percentage of female-

Table 1. Descriptive Statistics in both years 2011 and 2017

	All households		Male-headed households		Female-headed households	
	Mean	SD	Mean	SD	Mean	SD
2011						
<i>Outcome variables</i>						
Per capita income (in nominal terms)	25,635.380	37,561.960	23,334.790	34,827.670	34,213.910	45,341.460
Probability of being poor	0.255	0.436	0.282	0.450	0.154	0.361
<i>Treatment variable</i>						
Non- <i>4Ps</i> beneficiaries	0.927	0.260	0.916	0.277	0.969	0.174
<i>4Ps</i> beneficiaries	0.073	0.260	0.084	0.277	0.031	0.174
<i>Regional dummies</i>						
Bangsamoro Autonomous Region of Muslim Mindanao (BARMM)	0.054	0.227	0.055	0.227	0.053	0.225
Eastern Visayas	0.044	0.205	0.051	0.220	0.018	0.133
2017						
<i>Outcome variables</i>						
Per capita income (in nominal terms)	38,737.870	67,404.030	35,863.240	65,722.620	48,842.500	72,119.290
Probability of being poor	0.178	0.383	0.197	0.398	0.114	0.318
<i>Treatment variable</i>						
Non- <i>4Ps</i> beneficiaries	0.819	0.385	0.798	0.402	0.895	0.306
<i>4Ps</i> beneficiaries	0.181	0.385	0.202	0.402	0.105	0.306
<i>Regional dummies</i>						
Bangsamoro Autonomous Region of Muslim Mindanao (BARMM)	0.042	0.201	0.050	0.217	0.015	0.122
Eastern Visayas	0.062	0.241	0.063	0.243	0.058	0.233

Covariate Distributions Before and After Entropy Balancing Scheme

headed households (3.1%) were part of the program compared to male-headed households (8.4%). The regional distribution also shows that 5.4% of all households resided in BARMM, with similar shares between male and female-headed households. However, a smaller proportion of female-headed households (1.8%) lived in Eastern Visayas compared to 5.1% of male-headed households.

In 2017, the average per capita income rose significantly to Php 38,738 for all households. Female-headed households continued to show higher mean incomes (Php 48,843) compared to male-headed households (Php 35,863), consistent with the trend observed in 2011. The probability of being poor decreased to 17.8% for all households, with female-headed households exhibiting a lower poverty rate (11.4%) compared to male-headed households (19.7%). Once again, female-headed households have a smaller share of *4Ps* beneficiaries (10.5%) than male-headed households (20.2%). Regional distribution remained consistent, with BARMM representing 4.2% of all households and Eastern Visayas (6.2%). Similar regional patterns by household head gender were observed, with female-headed households having a smaller share in both BARMM (1.5%) and Eastern Visayas (5.8%).

4.4. Empirical Strategy

To examine the effect of the *4Ps* on the per capita income and the probability of being poor, we employ entropy balancing. This method adjusts for observable differences between the treatment and control groups to reduce potential bias arising from covariate imbalance (Hainmueller, 2012). While this approach reduces potential bias from covariate imbalance, it relies on the assumption that all relevant confounders are observable and included in the model. Therefore, the estimates should be interpreted as the effect of the treatment on the outcome, conditional on observed covariates.

The empirical strategy involves two main steps: (1) entropy balancing and (2) regression analysis. First, entropy balancing we implement to ensure that the control group is reweighted such that the means, variances, and skewness of the covariates match those of the treatment group. The covariates include: (a) household composition, (b) household head's and spouse's educational attainment, (c) dwelling characteristics (i.e., roof and wall materials, toilet, water source), (d) ownership of household assets, and (e) other household characteristics. These covariates are selected based on their potential influence on both treatment and the outcome, in order to mitigate omitted variable bias. The reweighting procedure adjusts the weights for control group observations such that the following balancing conditions are met for each covariate.

$$\begin{aligned}\mathbb{E}(X|T=1) &= \mathbb{E}(X|T=0, w), \\ \text{Var}(X|T=1) &= \text{Var}(X|T=0, w),\end{aligned}$$

Table 2. Covariate Distributions Before (Pre-) and After (Post-Matching) Entropy Balancing using APIS 2011

Covariates	Means Control			Variances Control		
	Treated	Before	After	Treated	Before	After
No. of FM aged 0-2 years old	0.3847	0.2343	0.3846	0.3504	0.244	0.3503
No. of FM aged 3-5 years old	0.5338	0.251	0.5337	0.4461	0.256	0.446
No. of FM aged 6-11 years old	1.367	0.6005	1.367	1.039	0.7351	1.039
No. of FM aged 12-14 years old	0.6865	0.3144	0.6864	0.4862	0.3217	0.4862
No. of FM aged 15-18 years old	0.6059	0.4053	0.6058	0.6122	0.4586	0.6122
=1 if the HH head is married	0.9057	0.7558	0.9057	0.08543	0.1846	0.08543
=1 if the HH head is male	0.9096	0.779	0.9096	0.08223	0.1722	0.08224
=1 if the HH head is working	0.9507	0.8093	0.9507	0.04685	0.1544	0.04686
=1 if the HH head has some elementary	0.4254	0.2263	0.4255	0.2445	0.1751	0.2445
=1 if the HH head has finished elementary	0.2551	0.1835	0.2552	0.1901	0.1498	0.1901
=1 if the HH head has some high school	0.1361	0.1142	0.1361	0.1176	0.1011	0.1176
=1 if the HH head has finished high school	0.1308	0.227	0.1309	0.1138	0.1755	0.1138
=1 if the spouse has some elementary	0.2891	0.1169	0.2892	0.2056	0.1032	0.2055
=1 if the spouse has finished elementary	0.2486	0.131	0.2487	0.1869	0.1139	0.1869
=1 if the spouse has some high school	0.153	0.09206	0.1531	0.1296	0.08358	0.1296
=1 if the spouse has finished high school	0.1403	0.1725	0.1403	0.1207	0.1428	0.1207
=1 if roof is made up of strong materials	0.5237	0.809	0.5236	0.2495	0.1545	0.2494
=1 if roof is made up of light materials	0.3883	0.1201	0.3883	0.2376	0.1057	0.2375
=1 if roof is made up of salvaged materials	0.00555	0.00439	0.00555	0.00552	0.004366	0.00552
=1 if walls are made up of strong materials	0.4183	0.6969	0.4183	0.2434	0.2112	0.2433
=1 if walls are made up of light materials	0.3837	0.1534	0.3838	0.2365	0.1298	0.2365
=1 if walls are made up of salvaged materials	0.0261	0.01092	0.02611	0.02543	0.0108	0.02543
Floor size	34.07	51.89	34.07	768	2348	768
=1 if has access to electricity	0.6323	0.8759	0.6322	0.2326	0.1087	0.2325
=1 if closed pit toilet	0.11	0.0391	0.11	0.09789	0.03758	0.09789
=1 if open pit toilet	0.05808	0.01982	0.05809	0.05472	0.01943	0.05471
=1 if pail system toilet	0.01272	0.00249	0.01273	0.01257	0.002481	0.01257
=1 if overhang toilet	0.01011	0.00531	0.01012	0.01002	0.00528	0.01002
=1 if no toilet	0.152	0.04736	0.1521	0.129	0.04512	0.129
=1 if WS is dwelling	0.1289	0.437	0.1289	0.1123	0.246	0.1123
=1 if WS is yard/plot	0.06101	0.05926	0.06102	0.05731	0.05575	0.0573
=1 if WS is public tap	0.185	0.06734	0.1851	0.1508	0.0628	0.1508
=1 if WS is protected well	0.293	0.2771	0.2931	0.2072	0.2003	0.2072
=1 if WS is unprotected well	0.1194	0.04369	0.1195	0.1052	0.04179	0.1052
=1 if WS is developed spring	0.09103	0.04639	0.09104	0.08277	0.04424	0.08276
=1 if WS is undeveloped spring	0.06819	0.02198	0.0682	0.06356	0.02149	0.06355
=1 if WS is river/stream/pond/lake/dam	0.01697	0.0081	0.01697	0.01668	0.008038	0.01668
=1 if WS is rainwater	0.00424	0.00572	0.00424	0.00423	0.005686	0.00422
=1 if owns a television	0.3879	0.742	0.388	0.2375	0.1915	0.2375
=1 if owns a DVD player	0.2284	0.4967	0.2285	0.1763	0.25	0.1763
=1 if owns a stereo/audio player	0.02447	0.1543	0.02448	0.02388	0.1305	0.02388
=1 if owns a refrigerator	0.03719	0.2921	0.03721	0.03582	0.2068	0.03582
=1 if owns a stove/oven	0.01892	0.2264	0.01893	0.01857	0.1751	0.01857
=1 if owns a motorcycle	0.1054	0.2186	0.1054	0.09431	0.1708	0.09431
=1 if owns a cellphone	0.4936	0.7376	0.4936	0.25	0.1936	0.25
=1 if owns a personal computer	0.01011	0.1619	0.01013	0.01002	0.1357	0.01002
=1 if has OFW member	0.03426	0.1614	0.03427	0.03309	0.1354	0.03309
=1 if does not have wage income	0.4196	0.3553	0.4196	0.2436	0.2291	0.2435
=1 if HH head is self-employed	0.5364	0.3261	0.5363	0.2488	0.2198	0.2487
=1 if located in rural area	0.8303	0.5186	0.8303	0.1409	0.2497	0.1409
=1 if belongs to bottom 30%	0.7889	0.2873	0.7888	0.1666	0.2048	0.1666

Note: FM — family members; HH — household; WS — water source

Table 3. Covariate Distributions Before (Pre-) and After (Post-Matching) Entropy Balancing using APIS 2017

Covariates	Means Control			Variances Control		
	Treated	Before	After	Treated	Before	After
No. of FM aged 0-2 years old	0.3087	0.2205	0.3086	0.3148	0.2281	0.3148
No. of FM aged 3-5 years old	0.3876	0.2562	0.3876	0.3442	0.2581	0.3442
No. of FM aged 6-11 years old	1.104	0.4615	1.104	0.9745	0.5598	0.9744
No. of FM aged 12-14 years old	0.6347	0.2223	0.6347	0.5054	0.2366	0.5054
No. of FM aged 15-18 years old	0.6962	0.2932	0.6962	0.6266	0.3385	0.6266
=1 if the HH head is married	0.8797	0.7365	0.8796	0.1059	0.1941	0.1059
=1 if the HH head is male	0.8715	0.758	0.8715	0.112	0.1835	0.112
=1 if the HH head is working	0.92	0.7957	0.9199	0.07366	0.1626	0.07366
=1 if the HH head has some elementary	0.4469	0.2191	0.447	0.2473	0.1711	0.2472
=1 if the HH head has finished elementary	0.1432	0.09253	0.1432	0.1227	0.08397	0.1227
=1 if the HH head has some high school	0.1731	0.1167	0.1732	0.1432	0.1031	0.1432
=1 if the HH head has finished high school	0.1889	0.295	0.189	0.1533	0.208	0.1533
=1 if the spouse has some elementary	0.2858	0.1065	0.2859	0.2042	0.09514	0.2042
=1 if the spouse has finished elementary	0.1198	0.05684	0.1198	0.1055	0.05361	0.1055
=1 if the spouse has some high school	0.1383	0.08351	0.1383	0.1192	0.07655	0.1192
=1 if the spouse has finished high school	0.2248	0.2165	0.2249	0.1744	0.1697	0.1744
=1 if roof is made up of strong materials	0.6941	0.8377	0.6939	0.2125	0.136	0.2124
=1 if roof is made up of light materials	0.1753	0.08291	0.1754	0.1446	0.07605	0.1446
=1 if roof is made up of salvaged materials	0.00925	0.00805	0.00926	0.00917	0.007987	0.00917
=1 if walls are made up of strong materials	0.386	0.6605	0.386	0.2371	0.2243	0.237
=1 if walls are made up of light materials	0.2869	0.1367	0.287	0.2047	0.1181	0.2047
=1 if walls are made up of salvaged materials	0.02885	0.02295	0.02886	0.02803	0.02243	0.02803
Floor size	39.76	54.39	39.76	1287	4184	1289
=1 if has access to electricity	0.8753	0.9469	0.8753	0.1092	0.0503	0.1092
=1 if closed pit toilet	0.05117	0.02079	0.05118	0.04858	0.02036	0.04857
=1 if open pit toilet	0.03811	0.0143	0.03811	0.03667	0.0141	0.03667
=1 if pail system toilet	0.00327	0.00204	0.00327	0.00326	0.002039	0.00326
=1 if overhang toilet	0.03375	0.01166	0.03376	0.03263	0.01152	0.03262
=1 if no toilet	0.1094	0.04578	0.1095	0.0975	0.04369	0.0975
=1 if WS is dwelling	0.2123	0.5125	0.2124	0.1673	0.2499	0.1673
=1 if WS is yard/plot	0.1187	0.07907	0.1187	0.1046	0.07282	0.1046
=1 if WS is public tap	0.1045	0.04013	0.1046	0.09365	0.03853	0.09364
=1 if WS is protected well	0.2918	0.2336	0.2919	0.2068	0.1791	0.2067
=1 if WS is unprotected well	0.09962	0.04146	0.09964	0.08974	0.03974	0.08972
=1 if WS is developed spring	0.07295	0.03977	0.07296	0.06766	0.0382	0.06765
=1 if WS is undeveloped spring	0.04736	0.01742	0.04737	0.04514	0.01712	0.04513
=1 if WS is river/stream/pond/lake/dam	0.01361	0.00649	0.01361	0.01343	0.006447	0.01343
=1 if WS is rainwater	0.01034	0.00349	0.01035	0.01024	0.003473	0.01024
=1 if owns a television	0.6184	0.7748	0.6183	0.2361	0.1745	0.236
=1 if owns a DVD player	0.2373	0.328	0.2375	0.1811	0.2205	0.1811
=1 if owns a stereo/audio player	0.05988	0.1425	0.05989	0.05633	0.1222	0.05631
=1 if owns a refrigerator	0.1285	0.4226	0.1285	0.112	0.244	0.112
=1 if owns a stove/oven	0.03593	0.155	0.03594	0.03466	0.131	0.03465
=1 if owns a motorcycle	0.2602	0.3212	0.2603	0.1926	0.2181	0.1926
=1 if owns a cellphone	0.8198	0.8718	0.8197	0.1478	0.1118	0.1478
=1 if owns a personal computer	0.05661	0.2556	0.05663	0.05344	0.1903	0.05343
=1 if has OFW member	0.1116	0.2067	0.1116	0.0992	0.164	0.09919
=1 if does not have wage income	0.2814	0.2884	0.2816	0.2023	0.2052	0.2023
=1 if HH head is self-employed	0.3838	0.2474	0.3839	0.2366	0.1862	0.2365
=1 if located in rural area	0.7665	0.5119	0.7664	0.1791	0.2499	0.1791
=1 if belongs to bottom 30%	0.6848	0.2569	0.6847	0.216	0.1909	0.2159

Note: FM=family members; HH=household; WS=water source

$$Skewness(X|T=1) = Skewness(X|T=0, w),$$

where $T=1$ indicates the treatment group, $T=0$ indicates the control group, and w denotes the reweighted control group. After applying the entropy balancing weights, covariate balance is tested by comparing the pre-and post-balancing standardized mean differences between the control and treatment groups. Tables 2 and 3 also show the columns for covariate distribution after employing the entropy balancing technique in both 2011 and 2017, respectively. It is known that lack of balance raises selection bias concerns, however, after employing the entropy balancing technique, it can be observed that the covariate distributions between the *4Ps* and Non-*4Ps* households are now well-balanced. The covariates were adjusted up to the second moment. Overall, the results imply that the covariate balance is achieved.

After employing the entropy balancing method, we estimate the effect of the treatment variable on the outcome variable using weighted least square regression, with the entropy balancing weights applied to the control group, using the following specification:

$$Y_i = \alpha + \beta T_i + \gamma X_i + \epsilon_i,$$

where Y_i represents the outcomes (per capita income and probability of being poor) for household i ; T_i is the treatment indicator which equals to 1 if household i is assigned to the treatment group (*4Ps*); X_i is a vector of covariates, and ϵ_i denotes the error term. The coefficient β provides an estimate of the difference in the outcome between the treatment and control groups, after adjusting for differences in observable covariates.

5. Results and Discussion

5.1. Regional-Level Analysis: Most Economically Disadvantaged Regions

Table 4 shows the average treatment effect of the *4Ps* on the per capita income and probability of being poor. Columns 2 and 3 report the impact of the program for 2011, and columns 5 and 6 for 2017. Columns 1 and 4 indicates the number of observations on both years, respectively. The results show that the ATE of the *4Ps* on the per capita income is significant at the regional level. This finding aligns with Tutor (2014), which found no effect on per capita total expenditure at the national level but there were heterogeneity impacts among the different types of expenditure, with stronger effects among the bottom 20 % (or the poorest).

In 2011, the treatment effect in BARMM region indicated a 28% increase in the per capita income while indicated a treatment effect of 17% increase in the per capita income in Eastern Visayas region. Likewise, the table also shows the average treatment effect of the

Table 4. Average Treatment Effect on the Outcomes in BARMM and Eastern Visayas on both years

	2011			2017		
	<i>No. of obs</i> (1)	<i>Per Capita Income</i> (2)	<i>Probability of being Poor</i> (3)	<i>No. of obs</i> (4)	<i>Per Capita Income</i> (5)	<i>Probability of being Poor</i> (6)
BARMM	1,854	0.283*** (0.034)	-0.195*** (0.038)	427	0.098** (0.048)	-0.143*** (0.057)
Eastern Visayas	2,283	0.170*** (0.040)	-0.127*** (0.036)	629	-0.080 (0.059)	0.041 (0.064)

*Standard errors are in parentheses. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$*

4Ps on the probability of being poor. It can be observed that two of the most marginalized regions show a decrease in the probability of being poor: 20% in BARMM and 13% in the Eastern Visayas. In 2017, a positive but reduced impact on the per capita income of only 10% and a 14% decrease in the probability of being poor can be seen in BARMM, but significance was no longer found in the Eastern Visayas. In general, the effect of the 4Ps diminishes over time, with the 2017 results showing weaker effects compared to 2011. However, the program appears to have been effective in BARMM for both years, as shown by the significant impact on both income poverty outcomes. In Eastern Visayas, the results show minimal long-term effect, particularly in 2017, indicating a possible geographical variation in the effectiveness of the program. The over results also support the findings of Fernandez and Olfindo (2011) that the program was successfully rolled out to the poorest households. Similarly, Hincapie (2012) also found that the CCT program in Colombia has increased the household income and that the impacts were larger at the lower quintiles of the income distribution. This result is not unexpected even after years of the implementation, given that CCT programs generally prioritize the poorest groups (Cecchini & Madariaga, 2011).

5.2. Gender-Specific Analysis: Household Head Gender within Poorest Regions

Table 5 provides two key findings regarding the impact of the 4Ps in the poorest regions. First, the effect of the 4Ps consistently reduces poverty for male-headed households but not for female-headed households. Specifically, the treatment effect indicates 29% increase in per capita income and 20% reduction in probability of being poor in BARMM; 19% increase in per capita income and 15% reduction in probability of being poor in Eastern Visayas. However, no statistically significant poverty reduction was observed for female-headed households in either region. This divergence in the program's impact may suggest a widening gap between male and female-headed households in 2011. Male-headed households benefitted more from the cash transfers, while female-headed households, despite the mothers being the primary recipients of the grant, did not experience a significant reduc-

Table 5. Average Treatment Effect on the Outcomes, by Household Head Gender

	2011			2017		
	<i>No. of obs</i>	<i>Per Capita Income</i>	<i>Probability of being Poor</i>	<i>No. of obs</i>	<i>Per Capita Income</i>	<i>Probability of being Poor</i>
<i>BARMM</i>						
HH=0 (male)	1,693	0.288*** (0.035)	-0.196*** (0.040)	393	0.094* (0.050)	-0.113* (0.066)
HH=1 (female)	161	0.130 (0.138)	-0.179 (0.185)	34	0.256 (0.223)	-0.203 (0.214)
<i>Eastern Visayas</i>						
HH=0 (male)	1,809	0.191*** (0.041)	-0.145*** (0.037)	499	-0.088 (0.066)	0.050 (0.070)
HH=1 (female)	474	-0.112 (0.126)	0.162 (0.107)	130	0.020 (0.128)	-0.091 (0.149)

Note: HH indicates the household head's gender

*Standard errors are in parentheses. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$*

tion in income poverty. These findings are consistent with previous studies that highlight how CCTs may not adequately address gender-specific barriers to poverty alleviation. For instance, Tabuga et al. (2021) found that women in the household, tend to exclude themselves from stable labor market participation due to unpaid caregiving duties, which may explain their inability to convert cash transfers into long-term poverty reduction.

Second, the effectiveness of the 4Ps diminished by 2017. Unlike in 2011, there were no statistically significant reductions in the probability of being poor for either male-or female-headed households in BARMM or Eastern Visayas by 2017. While the increase in per capita income only for male-headed households in BARMM remained statistically significant, it decreased from 20% in 2011 to only 9 % in 2017. No significant improvements in per capita income were observed for either household head gender in Eastern Visayas during this period.

The diminishing impact over time may reflect a plateauing effect commonly observed in cash transfer programs, where initial gains in poverty reduction and income improvement taper off as households face other structural challenges (Beauchair et al., 2018; League & Fitz, 2023; Handa et al., 2019). Filmer and Schady (2014) argued that the long-term success of CCTs is often contingent on broader economic conditions and the availability of employment opportunities. In regions like BARMM and Eastern Visayas, where local labor markets remain weak, cash transfers may only provide short-term relief rather than sustained poverty reduction.

5.3. Robustness checks

For robustness checks, entropy balancing method was implemented using different target moments. The distribution balance of 57 covariates in its first, second, and third moments were checked. There were no changes in the signs and significance levels for both regions,

however, the magnitude seems to respond in the order of moments — the higher the moment of covariates, the smaller the magnitude had become by a little margin. In any case, these changes in the magnitudes do not alter the main results on the outcomes brought by the *4Ps*. Overall, it implies that using different approaches yet has the similar framework does not change much the inference of the study and that the estimated treatment effect of the *4Ps* is fairly robust.³⁾

6. Conclusion

This study contributes to the growing body of literature on gender-specific impacts of CCT programs, particularly focusing on household headship in the poorest regions of the Philippines. By analyzing the *4Ps* in the periods 2011 and 2017, we identified significant gender disparities between male-and female-headed households.

The results suggest that while the *4Ps* can be effective in reducing poverty for male-headed households, it is less effective for female-headed households. This outcome points to a potential limitation in the program's design, which assumes that cash transfers directed toward women will automatically result in poverty alleviation for female-headed households. Structural barriers — such as unequal access to labor markets, gendered household roles, and care responsibilities — may hinder the economic mobility of female-headed households, thus widening the poverty gap and gender disparities.

Moreover, the lack of significant impact in 2017 raises concerns about the long-term sustainability of the *4Ps*. While the program initially proved effective for male-headed households substantially, its inability to deliver similar outcomes in the later period may indicate a need for additional complementary interventions — such as labor market support or skills development programs — to ensure that the benefits of cash transfers are sustained over time. Additionally, the continued lack of effect on female-headed households points to the need for gender-specific policy measures that address the unique challenges faced by women in these regions.

It is also important to note this study's limitations. Since it is not based on a randomized control trial (RCT), establishing causality is difficult, limiting its ability to fully measure the impact of the program. Although matching methods like entropy balancing can help overcome selection bias in observational studies, it should be noted that they can only control for observable selection biases and may generate unreliable results if unobservable biases exist, such as systematic differences between treatment and control groups (Hainmueller, 2012). Additionally, the available data restricts the analysis to the regional level, whereas provincial-level data would offer more deeper insights. With the structure of the data, this study lacks the ability to track the program's impact over time. Future research could ad-

dress these issues by utilizing more detailed datasets and employing methodologies that better account for potential biases in observational data and capture the long-term effects of the *4Ps*.

Despite these limitations, this study offers several policy recommendations. First, future iterations of the *4Ps* could enhance its effectiveness by refining the targeting mechanism to ensure that the most vulnerable households, especially in rural and disadvantaged areas, receive adequate and sustained support. In addition, gender-specific strategies should be developed to address the disparities in outcomes between male-and female-headed households, ensuring that the program equally benefits all household types. To further promote gender equity, conditionalities should include components that empower women economically, such as providing access to vocational training, financial literacy programs, and entrepreneurship support specifically tailored to female beneficiaries. Integrating gender-sensitive monitoring frameworks can also help track and address unique challenges faced by women, especially in regions where cultural norms may limit their participation in the labor market. By implementing these gender-focused policies, the *4Ps* could better address the underlying causes of poverty and inequality across household headships.

Note

- 1) Amounts were based on 2021 USD-PHP average exchange rate
- 2) The Philippine Statistics Authority (PSA) usually expresses the poverty threshold as the “monthly income needed by a family of five for their minimum basic food and non-food needs”. However, it is worth noting that the APIS surveys only cover January to June of that year.
- 3) Results available from the author upon request.

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