The Impact of Conditional Cash Transfers on Low-Income Individuals in Indonesia

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Most governments claim that Conditional Cash Transfer (CCT) programs benefit poor people. This study aims to analyze the impact of conditional cash transfers on low-income individuals in Indonesia. This study used consumption expenditures as a poverty measure and found that the Program Keluarga Harapan (PKH) has significant impact on an individual's consumption. However, households in the lowest wealth quantile were found to not take advantage of those benefits due to the current CCT design. Moreover, the heterogeneity of the CCT can generate substantial inequality, as household incomes in the lowest quantile fall. Therefore, governments should be more generous to households in the lowest wealth quantile, and carefully manage the program based on the needs of CCT beneficiaries.

Keywords: Conditional Cash Transfer; Indonesia; Inequality; Lowest Wealth Quantile; Program Keluarga Harapan

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INTRODUCTION

In 2015, *The State of Social Safety Nets*, a World Bank study, concluded that the coverage of social safety net policies in developing countries represents only one-third of the total poorest quantile. As a result, many anti-poverty programs cannot lift people out of poverty and fail to result in more inclusive societies (Dollar & Kraay, 2002; Filmer, 1999; Honjo et al., 1997; Squire, 1993). Ravallion (2016) noted that anti-poverty policies in many countries, especially in developing countries, have been ineffective because program interventions are not directly targeted.

One of the preferred programs for reducing poverty is the Conditional Cash Transfer (CCT). Some studies found that CCT improves the welfare of the poor. In Indonesia, research conducted by *Tim Nasional Percepatan Penanggulangan Kemiskinan* (TNP2K) in 2018 showed that the CCT *Program Keluarga Harapan* (PKH) positively impacted per capita expenditures (PCE) in Indonesia by 4.8%

per month. The same Indonesian program raised PCE by 3% per month compared to the CCT program in the Philippines (*Pantawid Pamilyang Pilipino Program*; Chaudhury et al., 2013; Tutor, 2014). In Nicaragua, the effect of the *Red de Proteccion* was quite significant at 18% (Maluccio & Flores, 2005). Meanwhile, in Colombia, PCE grew by 15% through *Familias de Accion* (Attanasio & Mesnard, 2006).

Research on the impact of CCT also yields positive conclusions on reducing inequality. A study conducted by Soares et al. (2009) concluded that CCTs helped governments in Brazil, Mexico, and Chile reduce inequality in welfare from the mid-1990s to the mid-2000s. They found CCTs reduced inequality by 21% in Brazil and Mexico, and by 15% in Chile (Soares et al., 2009). Lagarda et al. (2017) implied that institutional weaknesses caused inequality in Latin American countries. Comparing stunting between rich and poor groups of children in Indonesia, Rizal and van Doorslaer (2019) found that PKH decreased the total rate of inequality among people with stunting.

Almost all research examining the effects of CCT has revolved around issues in education, such as school enrolment (Behrman et al., 2005; de Janvry et al., 2006; Schultz, 2004), class attendance (de Janvry et al., 2006; Hadna & Kartika, 2017; World Bank, 2015), inequality of educational opportunities (Ham, 2014), student cognitive capacities (Ponce & Bedi, 2010), and academic outcomes (Juan et al., 2012; Schultz, 2004). Studies on the effects of CCT in improving health outcomes also exist. CCT programs have positively affected infant health, for example, in Mexico (Fernald et al., 2008; Millán et al., 2019), Latin American countries (Owusu-Addo & Cross, 2014), Zimbabwe (Robertson et al., 2013), and other Sub-Saharan countries (Garoma et al., 2017). CCT has also reduced chronic malnutrition (Farrington & Slater, 2006) and stunting prevalence in the Philippines (Kandpal et al., 2016) and Indonesia (Cahyadi et al., 2018). In terms of gender issues, CCT affected neither intra-household gender relations nor the relative position of women within households in Indonesia (Arif et al., 2013) and Latin America (Franzoni & Voorend, 2012; Molyneux & Thomson, 2011). CCT also relates to social inclusion (Rawlings, 2006) and equality between rural and urban populations (Krishnakumar & Juárez, 2012).

Despite those successes, there have been many criticisms of CCT programs, such as the argument that they are paternalistic, and of the ways low-income families spend the transfers (Ravallion, 2016). In addition, many fundamental questions remain unanswered about CCT effectiveness, including long-term welfare impacts, synergies between program components, trade-offs between transfer sizes and beneficiaries, and the balance between short-term transfer objectives and long-term human development objectives (Rawlings & Rubio, 2005).

To date, research has not examined the impact of CCTs on the distribution of consumption expenditures among the poor (Kamakura & Mazzon, 2014), especially among each quantile of low-income groups targeted by CCT. This issue needs to be investigated more deeply because studies show that cash transfers, including CCT, do not automatically reduce poverty (Golan et al., 2017). Critics of CCT claim that most poor households spend cash transfers on overconsumption, encouraging new, unsustainable lifestyles (Kamakura & Mazzon, 2014). Consumption expenditure as a welfare indicator was mainly pioneered by the welfarist (utility) movement in economics, which measures the welfare of the people through their buying and selling

behaviors on the market (Ravallion, 2016). However, a working paper published by the National Bureau of Economic Research in 2018 on PKH in Indonesia could not decisively measure the extent to which the program affects consumption expenditures. In conclusion, the objective of the CCT program remains to direct the spending of low-income families to be more focused on education and health, as a way to break the chain of family poverty (Cahyadi et al., 2018).

Based on this research gap, this paper addresses the following question: What is the impact of PKH on the distribution of consumption expenditures among each quantile of lower-income groups? First, this question focuses on identifying and comparing the impact(s) of PKH on the distribution of consumption expenditures among the highest and lowest quantiles of poverty groups. This paper also discusses the weaknesses of PKH in Indonesia, primarily in reducing inequality among low-income individuals.

The PKH impact indicator of this study is consumption expenditure among the poor because it is easier to describe the welfare levels of those elements, and the results are more valid in terms of size. In addition, some experts have previously warned that poorly managed anti-poverty programs can disproportionately impact clients and lead to greater inequality (Aghion et al., 1999; Beaudoin, 2006; Bergh & Nilsson, 2014; Ravallion, 1995, 1997, 2016). Hence, research on poverty should look more closely at what happens among the poor when they partake in the program. In this case, however, conducting impact assessment studies by grouping the poor into quantiles with similar problems and characteristics can be problematic because the poor also have relatively sharp social and economic stratifications.

Furthermore, this research assumes that households in the lowest wealth quantile may have the most difficulty obtaining consumption expenditure than the next higher quantile. This inability occurs because the CCT program does not fit all, nor do program materials and solutions that do not address the unique problems of the poorest groups. Consequently, CCT inadvertently maintains inequality of consumption expenditure among the poor.

This study offers two significant contributions. First, substantially limited studies have sufficiently analyzed the impact of CCT on each quantile of recipients. Failure to capture this aspect may lead to bias as the models estimate only the conditional means of the responses. Second, most studies have evaluated the impact of CCT using Ordinary Least Square, Average Treatment Effect, or attempted to address endogeneity using the Instrumental Variable approach. While this paper follows the latter approach, we adopted an Instrumental Variable Quantile Regression (IVQR) approach because it is more suitable when capturing and comparing the consumption expenditure impacts of CCT on different quantiles.

This paper closely examines the efficacy of PKH in Indonesia through a case study from 2019 in Yogyakarta. The poverty data is alarming because this province is the most impoverished region on Java Island. In 2019, the data from the Indonesian Statistics Bureau showed that the poverty rate was 10.62%. Moreover, the Gross Regional Domestic Product (GRDP) in Yogyakarta has always ranged in the lowest category on Java Island. Likewise, the level of inequality measured by the Yogyakarta Gini Ratio in 2019 shows the highest inequality at 0.42 points.

THEORETICAL FRAMEWORK

Experts often compare the effectiveness of CCT with Unconditional Cash Transfer (UCT) (Baird et al., 2014; Schubert & Slater, 2006). They posit that it is easier to implement UCT than CCT (Haushofer & Shapiro, 2016): UCT does not reduce recipients' work motivation (Banerjee et al., 2017). Also, UCT has a positive impact on the consumption behavior of beneficiaries, focusing on food consumption, health, and education rather than spending on luxury goods (Haushofer & Shapiro, 2016). UCT was found to not increase cigarette and alcohol consumption (Evans & Popova, 2014). However, long-term evidence showed that the impact of CCT on sustainable human development is more significant than that of UCT (Baird et al., 2014). Past research showed that a dollar unit spent on CCT is eight times more effective than a dollar unit spent on UCT (de Janvry et al., 2006). Compared to in-kind assistance, both models of cash transfer are more effective. Studies conclude that cash transfers provide more opportunities for parents to allocate money for their children's health and welfare (Kamakura & Mazzon, 2014 ; Miller & Neanidis, 2015). This study aims to examine CCT because it is considered the most prominent poverty alleviation program.

The basic idea of CCT is that incentives given to households are to keep their children in school and diligently check their health (Ravallion, 2016). However, this strict requirement is seen by critics as a form of paternalism because it ignores poor people's ability to identify the real needs of their families. On the other hand, CCT proponents believe that households remain poor because parents do not give children the right to obtain an adequate education. Instead, they prioritize helping their families meet life's necessities (Ravallion, 2016).

Studies on the effectiveness of CCT show a weakness in targeting or directed marketing. Initially, targeting suppressed program leakage due to incorrectly focused target groups (Ravallion, 2016). However, targeting has weaknesses, such as biases in determining target groups which is more profitable by local elites, and in determining poverty lines to choose the target groups. Mirrlees (1971) highlighted these weaknesses regarding trade-offs between equity and efficiency of administrative capacity (Ravallion, 2016). Equity refers to the right of all poor people to fulfill their needs. In contrast, efficiency refers to the government strategy that prioritizes target groups due to limited resources.

The paternalistic nature of CCT can be studied by comparing its impact across the distribution of consumption expenditures. The comparisons indicate how poor individuals can use the incentives to increase their consumption expenditures. The assumption is that spending on the education and health sectors is the most effective. However, there may also be more effective consumption expenditures outside those sectors. This raises the question of to what extent the poor use CCT incentives.

The targeting issue is also valuable to study when comparing CCT use by different quantiles. The analysis technique measures the correlation of CCT use with consumption expenditure per quantile. The assumption is that the poorest low-income individuals should benefit the same as or more than those in the higher quantiles. Ravallion (2016) explicitly encourages the avoidance of paternalism in poverty alleviation programs. Instead, programs must be straightforward about various low-income people's characteristics and understand the data limitations (one size does not fit all).

Several approaches to measuring the level of people's prosperity include welfare, utilities, abilities, and opportunities. The welfare approach essentially measures people's interests through their ability to buy or sell goods in the market. This approach assesses their perceptions of several well-being indicators, such as fulfilling good nutrition. The question of the people's perceptions of fulfilling good nutrition are what can be achieved, what benefits them, and whatever people maximize in their own choices (Ravallion, 2016; Slesnick, 1996; Stutzer & Frey, 2004). The utility approach considers people as rational beings who seek to maximize profits for themselves (Ravallion, 2016). According to this approach, people will only choose to address those needs that fit their budgets and uses. Sen (1981; 1985) proposed the capabilities approach, considering the varying capacities of people to access available resources. Rather than commodities, he emphasized the minimum standard of living, such as life expectancy, nutrition, education, and health. The opportunity approach adds that unequal outcomes are not problems, as long as equal efforts are considered. Efforts are only possible if the circumstances support them (Ravallion, 2016).

This study uses a welfare approach, which measures welfare with consumption expenditure by looking at income and consumption-based practices. The consumption-based method has been widely used, especially in developing countries (Cutler & Katz, 1992; Ravallion, 1992; Sen, 1981; Slesnick, 1996; Stutzer & Frey, 2004). Theoretically, consumption expenditure is assumed to be a suitable poverty measure because it captures individual living standards via the consumption of goods and services. In addition, some researchers reported a more significant correlation between consumption expenditures and subjective well-being than income and subjective well-being (Meyer & Sullivan, 2011). Consumption expenditures are also more accurate than income when examining the living standards of the poor in the lowest wealth quantile (Meyer & Sullivan, 2011). This consideration is due to the nature of consumption expenditure questions, which appear to be less sensitive for the poor than income questions. Moreover, developing countries rely on the informal sector, often attempting to under-report income as tax avoidance (Schneider & Enste, 2000). Finally, money is not the salary for people who depend primarily on agriculture; instead, agricultural goods are the salary, though turning these goods into cash can be problematic (Coudouel et al., 2013).

Regarding aggregation, measuring welfare should be at the individual level. However, numerous studies attempt to explain how every individual within a household is likely to have different conditions (Duflo, 2003; Quisumbing et al., 1995). Therefore, the actual consumption of the individual is a better indicator of living standards, than the consumption of households, mainly because poor individuals can be part of wealthy households and vice versa (Falkingham & Namazie, 2002). In addition, household-based poverty measures may fail to capture individual living standards when financial shocks hit. For instance, sickness and job displacement may lead to substantial reductions in the well-being of individuals, even when they do not bring reductions in household welfare.

When it comes to methodological issues, the endogeneity of the CCT must obtain robust estimates. As discussed in Zuluaga et al. (2020), the conventional econometrics model to estimate the impact of CCT cannot set aside issues of selectivity, endogeneity, and optimization.

$$CT_i = Z'_i + X_i\beta + \varepsilon$$
$$lnY_i = \propto CT_i + X_i\beta + \varepsilon$$

Where CT_i is assumed to be exogenous, Z'_i refers to a vector of instrumental variable that is related to CT_i, and uncorrelated to poverty, lnY_i. Furthermore, $X_i\beta$ refers to control variables, and ε is the error term.

This study identifies the impact of poverty on different quantiles of our variable interest to estimate the effect of PKH on poverty level. As in the Least Square Regression, conventional techniques are no longer helpful. They only allow us to calculate the link between our explanatory variables and the conditional means of the dependent variable poverty.

On the other hand, quantile regression is an alternative approach that allows us to identify the link between explanatory variables and specific quantiles of dependent variables. In this study, we can estimate the impact(s) of PKH on particular groups of individuals, such as the lowest or highest consumption expenditure groups.

As explained by Koenker and Hallock (2001), conventional Ordinary Least Square techniques allow us to estimate $\propto$, which refers to the impact of variables X on the conditional mean of Y. A Quantile Regression offers an estimation of beta by calculating $\propto(\tau)$ for any quantile $(\tau)\varepsilon$, $(0,1)$, which reflects the impact of variables X on certain quantiles the distribution of Y.

However, it is essential to note that the IVQR should be chosen when endogeneity is the issue. As Hansen (2005) described, IVQR can obtain robust estimates by addressing endogeneity issues. It provides an estimate for any quantiles of the distribution of a dependent variable. Thus, this research goes one step further by calculating an alternative approach, namely the IVQTE. This technique can obtain robust estimates under endogeneity and, at the same time, provide an estimation of quantile treatment effect without functional assumptions.

DATA AND METHODOLOGY

Data

The sources for this study were derived from research on poverty in Yogyakarta conducted by the Center for Population and Policy Studies (CPPS) at Universitas Gadjah Mada in 2019. The dataset was collected by individuals who assessed respondent characteristics, financial activities, education, employment, and regional infrastructure. This study used this dataset to cover the most comprehensive PKH program, providing specific trends at the Indonesian regional level. There were 3,933 responses used in the research that focused only on low-income individuals. Nine sub-districts out of four districts selected as samples were chosen from the local government's policy for Yogyakarta, which determined the sub-districts as the poorest in Yogyakarta. The nine sub-districts include rural areas, namely Girisubo, Playen, Semin, Nglipar, Samigaluh, Girimulyo, Lendah, Pajangan, and Tempel. These areas have these characteristics in common: populations that rely on the agricultural sector, low education levels, geographic constraints, inadequate infrastructure, and many residents who became labor migrants.

The selection of the low-income individuals as samples in each sub-district was based on the Integrated Database (Basis Data Terpadu [BDT]) issued by the Indonesian Ministry of Social Affairs. The use of the BDT as a sampling frame guarantees that the entire population in the BDT consisted of low-income individuals. The number of samples per sub-district was 450 with random techniques, and the total number of respondents obtained from random results was 4,050. This amount is approximately 20% of the total of low-income individuals that met the criteria as PKH recipients in the nine sub-districts. After conducting interviews according to a structured questionnaire, the total number of interviewed respondents was 3,933. The number of respondents decreased because some had moved residences, provided incorrect target group data, or died. In addition, some of the low-income people were already in more prosperous categories. As a result, almost 55% of the successfully interviewed respondents were PKH recipients, while the rest were still waiting for PKH assistance. Fifty-five percent of the group received the treatment for this category; the remaining 45% was the control group.

This research used a set of variables that informed the socioeconomic inequality of low-income individuals. The first variables included head of the household, age, gender (Milazzo & van de Walle, 2015; Ravallion, 2016; Rosenhouse, 1994), and marital status (Ravallion, 2016). The second group of variables was the capacity of the household head, namely, the level of education (Abuya et al., 2011; Beal et al., 2018). Others were the number of dependent family members (Geberselassie et al., 2018; Mahmudiono et al., 2017; Olinto et al., 2013; Ravallion, 2016) and the employment of the household head (Handayani et al., 2017). Finally, the third group of variables was the behavior, namely the effort (Gans, 1995), of the household head and ownership of health insurance.

Methodology

This study investigates the relationship between PKH on poverty on specific, low-income individual quantiles, which allows us to identify the impact of PKH among the lowest quintile of poverty groups compared to the highest using Instrumental Variable Quintile Treatment Effect. The model was based on the conventional potential (latent) framework. As Hansen and Chernozhukov (2005) discussed, a possible outcomes estimate influenced by variation of observation units is calculated against potential treatment called $t\,\varepsilon$, $(0,1)$ and represented as Y_t. The potential outcomes of Y_t are latent, which reflects the chosen treatment t. Thus, the estimated values of potential outcomes for every observational unit reflect only the impact of possible treatment.

$$Y = Y_t$$

This research estimates the potential outcome of specific quantiles called τ-th under potential treatment t, conditional on some observed characteristics X, and can be described as follows:

$$q(t, X, \tau)$$

Thus, the effect of quantile treatment is as follows:

$$q(1, X, \tau) - q(0, X, \tau)$$

This formula represents the difference in the impact of treatment on each quantile of potential outcomes.

As the treatment in this study is potentially endogenous, an IV identification strategy is employed to obtain robust estimates. Instrumental variable Z is to define potential treatment called T_Z under which the model can estimate the potential outcomes via the nonlinear conditional moment restrictions of quantile regression:

$$P(Y \leq q(t, X, \tau) \parallel X, Z \parallel = \tau$$

Z reflects an instrument that is related to t but uncorrelated to potential outcomes Y.

This study estimates exogenous variations in CCT programs in Indonesia. Z refers to an instrument that is rural municipality officials. Arguably, rural municipalities' officials, who place higher engagement levels on their citizens, may increase the chances of individuals receiving cash under conditional transfer programs. Thus, the variable correlates with CCTs but is mainly beyond the respondents' control and is exogenous to their activities and economic outcomes.

RESULTS

Table 1 describes the variables included in the model specification and reports the summary statistics. The data suggest that approximately 55% of low-income respondents received CCT programs. Some 43% of the respondents were male, and 17% were single. Most respondents had small families of less than three members. Only 10% of the respondents were gainfully employed. The education level of the sample was relatively low, with most respondents being elementary school graduates and only 1% being university graduates. However, the ownership of healthcare accounts was very high in the sample, with most respondents claiming healthcare program membership.

The IVQTR allowed us to obtain information on how the effects of PKH differed at various quantiles of the consumption expenditure distribution (see Table 2). The findings suggest that the treatment group tended to have a higher consumption expenditure than the control group, meaning a positive effect at every percentile of the distribution—the coefficient increased from the lowest to the highest quantile of the distribution regarding consumption expenditure. At the bottom quantile of consumption expenditure, the size of the effect was the smallest (1.596). It is not significant at the 1% level, indicating that PKH did not impact wealthier people. The impact for the highest quantile doubled the impact corresponding to the lowest quantiles. In other words, these results indicated that the poor with lower-level consumption expenditure were likely to obtain fewer benefits from the PKH initiatives. As a result, the poorest people have less chance of improving their quality of life than the wealthiest. Furthermore, the results indicated that, despite being insignificant at the 1% level, individuals categorized as having paid work, high levels of education (university), and access to healthcare are likely to have high consumption expenditures.

Variable	Obs	Mean	Std. Dev.	Min	Max
Poverty	3933	10.32	9.94	0	100
CCT	3933	0.55	0.50	0	1
Effort	3933	0.36	0.48	0	1
Age	3933	52.44	79.24	17	98
Gender	3933	0.43	0.49	0	1
Family members	3933	2.16	1.30	1	10
Marital status	3933	0.17	0.91	0	1
Paid work	3933	0.10	0.30	0	1
Unemployed	3933	0.60	0.49	0	1
Diffable	3933	0.09	0.28	0	1
Retired	3933	0.01	0.09	0	1
Student	3933	0.00	0.04	0	1
Housekeeping	3933	0.05	0.22	0	1
No school	3933	0.29	0.46	0	1
Elementary school	3933	0.34	0.47	0	1
Junior high school	3933	0.18	0.39	0	1
Senior high school	3933	0.17	0.38	0	1
University	3933	0.01	0.09	0	1
Healthcare	3933	0.97	0.18	0	1

Table 1. Descriptive statistics. (compilation by the authors)

Variables	q10	q20	q30	q40	q50	q60	q70	q80	q90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCT	1.596	2.245*	2.839**	2.713**	2.761**	2.832**	3.297**	4.332**	5.951
	(1.309)	(1.255)	(1.130)	(1.143)	(1.254)	(1.260)	(1.636)	(2.149)	(4.608)
Effort	-0.255	0.193	0.651	1.237	1.612	2.165	2.336	3.039	4.894
	(1.267)	(1.284)	(1.318)	(1.341)	(1.585)	(1.516)	(1.876)	(2.732)	(3.492)
Age	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000**	-0.00**	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gender	-0.042	-0.368	-0.324	-0.753	-0.883	-0.793	-0.842	-0.311	-0.790
	(1.159)	(1.136)	(1.164)	(1.211)	(1.288)	(1.354)	(1.772)	(2.368)	(3.766)
Family members	0.855	1.031	1.107	1.285*	1.401**	1.496***	1.522*	1.892	2.556
	(0.698)	(0.635)	(0.775)	(0.757)	(0.712)	(0.520)	(0.860)	(1.151)	(1.565)
Marital status	-0.236	-0.293	-0.518	-0.722	-0.963	-1.243*	-1.542*	-1.844*	-2.874*
	(0.692)	(0.572)	(0.571)	(0.561)	(0.651)	(0.639)	(0.852)	(1.071)	(1.516)
Paid work	-1.928	-2.281	-2.197	-1.698	-1.194	-1.089	-1.255	-1.458	0.442
	(2.687)	(2.343)	(2.365)	(2.629)	(2.825)	(3.026)	(3.749)	(4.743)	(7.562)
Unemployed	-0.401	-0.158	0.144	0.354	0.536	0.768	0.565	0.599	2.559
	(2.169)	(1.864)	(1.819)	(2.036)	(2.112)	(2.462)	(3.084)	(4.125)	(4.827)
Diffable	-2.804	-2.660	-2.670	-2.915	-2.625	-2.784	-3.172	-3.742	-3.377
	(2.254)	(1.881)	(1.808)	(1.966)	(2.164)	(2.420)	(3.019)	(4.262)	(4.548)

Retired	-2.826	-2.940	-3.441	-4.302	-3.907	-4.227	-5.236	-6.986	-7.787
	(4.174)	(4.294)	(3.332)	(3.922)	(5.206)	(4.703)	(5.177)	(5.630)	(8.318)
Student	10.615**	8.692**	7.594*	6.638	5.434	4.127	1.705	-2.858	5.554
	(4.362)	(3.802)	(3.984)	(4.125)	(4.159)	(4.495)	(5.808)	(6.080)	(11.916)
Housekeeping	2.999	3.055	3.326	3.426	3.878	4.826	5.116	2.881	-0.122
	(11.514)	(14.068)	(13.871)	(13.687)	(21.956)	(19.000)	(12.526)	(14.966)	(11.774)
Elementary school	-0.145	-0.248	-0.478	-0.608	-0.597	-0.446	-0.734	-1.065	-0.430
	(1.356)	(1.396)	(1.448)	(1.446)	(1.477)	(1.620)	(2.007)	(2.532)	(3.761)
Junior high school	0.206	0.549	0.430	0.332	0.704	0.738	0.538	0.227	-0.065
	(1.572)	(1.660)	(1.695)	(1.639)	(1.653)	(1.703)	(2.299)	(2.728)	(4.720)
Senior high school	1.402	1.364	1.151	1.153	1.528	1.793	2.350	4.408	5.686
	(2.100)	(2.044)	(2.164)	(2.296)	(2.414)	(2.444)	(3.563)	(5.447)	(11.377)
University	5.077	3.801	2.568	1.475	-0.088	2.134	1.105	-0.026	-2.842
	(16.656)	(13.355)	(13.619)	(18.399)	(17.048)	(42.215)	(51.145)	(55.378)	(44.248)
Healthcare	1.202	1.577	2.131	2.560	2.572	2.364	2.582	3.109	4.326
	(1.749)	(1.533)	(1.553)	(1.675)	(1.782)	(2.184)	(2.669)	(3.072)	(5.463)
Observations	3924	3924	3924	3924	3924	3924	3924	3924	3924

Notes: A constant is included in regressions but not reported. Figures in parentheses are robust standard errors; *, ** and *** represent statistical significance at 10%, 5%, and 1%, respectively.

Table 2. Instrumental variable quintile treatment effect on the distribution of total consumption expenditure. (compilation by the authors)

Table 3 reports IVQTE for the distribution of selected consumption expenditures, further identifying the effects of PKH on the consumption expenditures share. Even though the program's impact on main food is not statistically significant for all the quantiles of main food expenditure, the results suggested that the transfer was spent mainly on vegetables, except for the first (lowest) quantile. The program did not significantly affect the first (lowest) quantile of vegetable expenditure. However, the results turned out to be significant for the second through the ninth quantiles, suggesting that PKH increased the distribution of spending on vegetables. The initial impact on vegetables ranged from 2.857% to 9.897% for the highest quantiles. However, the effects are not statistically significant on fruit expenditures.

Although the data suggested an insignificant relationship between PKH and expenditures on vegetables and fruits, those in the lowest decile group did not necessarily have low consumption of vegetables or fruit. Overall, these group can provide at least two meals a day. However, they usually did not spend money on vegetables and fruits. Thus, the availability of vegetables and fruits, both self-grown and wild vegetables, is still enough to be consumed. Nonetheless, it is essential to note that the land-use change tendency, which reduces agriculture and forest areas, has threatened the food supplies of the most impoverished communities.

Next, Table 3 shows that the program's impact on education expenditure varied. While the effect is not significant for the first to the third quantiles, the program substantially increased education expenditure from the fourth quantile. The program statistically increased education expenditure from 0.682 to 2.094 percentage points for the second-highest quantile. Again, many of the impacts were quite large and

significant at the mean quantiles, suggesting that the program had more influence on individuals at the mean distribution in terms of education spending.

Variable	Dependent variables								
	q10	q20	q30	q40	q50	q60	q70	q80	q90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Main food									
CCT	0.572	0.463	0.494	0.787	1.136	1.384	1.481	0.746	0.297
	(0.739)	(0.990)	(0.521)	(0.629)	(0.919)	(1.013)	(1.312)	(1.106)	(1.247)
Fruits									
CCT	0.000	0.000	0.000	0.000	0.000	-0.000	1.153	1.750	2.544*
	(0.005)	(0.011)	(0.016)	(0.021)	(0.028)	(0.100)	(1.092)	(1.071)	(1.453)
Vegetables									
CCT	2.204	2.857*	3.577***	3.879***	4.303**	5.150***	5.611***	7.562***	9.897***
	(1.378)	(1.490)	(1.385)	(1.383)	(1.996)	(1.709)	(1.946)	(2.150)	(3.775)
Cigarettes									
CCT	0.000	0.000	0.000	0.000	-0.769	-1.419	-3.229	-5.894	-9.617*
	(0.022)	(0.039)	(0.056)	(0.074)	(0.763)	(1.153)	(2.649)	(4.092)	(5.177)
Education									
CCT	0.000	0.000	0.000	0.682*	1.012**	1.303**	1.614*	2.094*	2.624*
	(0.058)	(0.080)	(0.373)	(0.409)	(0.493)	(0.664)	(0.948)	(1.131)	(1.832)
Health									
CCT	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.079	-0.543	-3.138
	(0.012)	(0.018)	(0.025)	(0.033)	(0.162)	(0.188)	(0.234)	(0.993)	(4.048)
Housing									
CCT	-0.077	-0.117	-0.178	-0.312	-0.540	-0.666	-0.832	-0.639	-0.791
	(0.168)	(0.204)	(0.257)	(0.328)	(0.382)	(0.483)	(0.634)	(0.902)	(1.013)
Social activities									
CCT	0.000	0.042	0.063	0.133	0.250	0.098	0.373	0.290	-0.073
	(0.020)	(0.253)	(0.344)	(0.419)	(0.648)	(0.825)	(1.096)	(0.994)	(1.619)
Communication									
CCT	0.000	1.285	2.309*	3.028**	3.514***	4.243***	6.003***	7.325***	11.539***
	(0.083)	(1.334)	(1.260)	(1.266)	(1.301)	(1.628)	(1.935)	(2.207)	(4.316)
Religion									
CCT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.762*
	(0.002)	(0.004)	(0.007)	(0.009)	(0.013)	(0.016)	(0.022)	(0.082)	(0.456)

				Transportation					
CCT	0.000	0.002	1.155	1.386	1.782	2.379*	2.947	5.199	6.909**
	(0.047)	(0.486)	(1.035)	(0.970)	(1.256)	(1.406)	(1.967)	(3.191)	(3.053)
				Total expenditure					
CCT	1.535	2.055	2.435*	2.399*	2.271	2.308	2.291	2.128	3.182
	(1.741)	(1.583)	(1.420)	(1.412)	(1.468)	(1.445)	(1.636)	(2.346)	(4.327)

Notes: A constant is included in regressions but not reported. Figures in parentheses are robust standard errors; *, ** and *** represent statistical significance at 10%, 5%, and 1%, respectively. All regression includes controls for effort, age, gender, family members, marital status, type of jobs, education, and health care.

Table 3. Instrumental variable quintile treatment effect on the distribution of selected consumption expenditure. (compilation by the authors)

The data from the Indonesian Statistics Bureau in 2019 showed that only 14% of household members have not gone to school. This statistic indicates that the burden of low-income people for education expenditures, especially those in the lowest quantile, is minimal. The interpretation of the small percentage of spending on education is that the poorest people, namely those in the lowest quantile, do not have adequate education for their children. Despite government efforts to eliminate primary and secondary education costs, some additional charges attached to children's education, such as school uniforms, transportation, and learning aids, are still not included in the assistance, preventing the poorest group from accessing education. Even though health is a priority for the intervention of PKH in Indonesia, the program impacts on health expenditure were not statistically significant for all quantiles. The interpretation of the small percentage of health expenditure is that the lowest quantile had inadequate access to a health facility for their children or their pregnant wives.

In addition, this study explored the impacts of PKH on the distribution of communication expenditure. Interestingly, the results significantly affected each quantile, except the first and the second-lowest quantile. The program's impact on communication expenditure was statistically significant and ranged from about 2.309 percentage points for the third quantiles to 11.539 percentage points for the highest quantile. In 2018, the data from the Indonesian Statistics Bureau showed that the number of internet users in rural areas was 55.45% of the total population. This number was not significantly different from the people who do not own and use cell phones. Here non-internet users were the most disadvantaged group with little or no spending on communication.

Regarding the program's impact on transportation expenditure, the effect varied and was only significant for the sixth and the highest quantiles. It is also important to note that the program impacted selected expenditures such as cigarettes, housing, social activities, and religion; these were not statistically significant. Overall, this study showed that the PKH program increased consumption expenditure. However, there were heterogeneous impacts of the PKH program. The results indicated that the program's impact was not significant for the poor at the lowest level of expenditures.

DISCUSSION

The findings of this study make two main contributions to the current literature. First, this study implies re-evaluating methods of identifying the 'poor.' Second, it suggests the existing poverty lines are ill-suited, as they force us to segregate the population into poor and non-poor groups. Currently, the essential criteria for determining eligibility and registering beneficiaries rely on the regional poverty line and other additional measures (e.g., elderly, number of children, or a combination of categories). Then, the CCT program will be provided with the same amount to beneficiaries regardless of everyone's levels of wealth. This approach may hinder CCT's targeting efficiency by delivering the money to the poor households in the highest quantile of total wealth. This problem is related to the determination of poverty lines (Ravallion, 2016), which is often an obstacle in measuring poverty because it carries significant implications for the beneficiary group.

Hence, there needs to be a better targeting process in CCT distribution to avoid inequality of CCT beneficiaries if the program's criteria and characteristics depend on wealth levels among beneficiaries. Extra effort is needed, especially in this setting, by grouping the poor by wealth. By grouping the recipients (e.g., the lowest, middle, and highest quantiles), we can assign the different level priorities of the program, from the poorest to the wealthiest groups.

Second, this research also implies the need to make CCT programs more agile and based on the needs for different types and forms of poverty. For example, an impoverished household with low levels of education, which includes women and elderly, and has little money left should receive more cash to improve their survival strategy. Furthermore, the data showed that as many as 43.6% of the heads of these low-income households are elementary school graduates. It is also important to note that Yogyakarta had its highest percentage of elderly in Indonesia in 2018 (18.76%). The number of poor people in Yogyakarta over 64 years old (elderly) is 16%. This group can no longer generate substantial income and needs extra cash to fulfill its needs.

Thus, households in the lowest wealth quantile may need to receive payments quickly. Education investments can be the second priority behind eating well for this group. As shown above, the CCT does not improve the share of expenditure on education among impoverished households. Besides, households in the lowest wealth quantile may never expect business to change their lives. Those in the top quantile may quickly expand their business and earn money, but households at the bottom of the quantile choose not to do so.

This research suggests that CCT beneficiaries should not all receive the same amounts of cash. Low-income individuals in the highest wealth quantiles may receive less money than those in the lowest. Other incentives, such as training vouchers, education vouchers, and transportation incentives may be more suitable for these groups. Although they still need some support to avoid further income decline, they are no longer vulnerable to food insecurity. This finding is related to the view of Ravallion (2016) that the CCT program design is highly paternalistic. This outlook places the poor as a CCT object because it cannot understand their needs. The CCT should provide an excellent opportunity for the poor to determine their own family's needs.

This research finding also suggested that we need a new strategy for assisting the poor. Assistance programs for the poorest beneficiaries may focus on improving access to health, education, sanitation, housing facilities, and abilities to optimize financial management. In terms of food security, it is more appropriate to develop programs that are not providing cash and emergency food aid. Assistance for the poorest beneficiaries is an excellent program because the poorest group spends a large share of their income on food. The data showed that the consumption of the food expenditure per capita of the lowest 10% of the population was the lowest on average (IDR 210,000). However, it was the highest in terms of the proportion of expenditures on food (65.4 %). Also, the value of per capita non-food spending in the lowest quantile was only IDR 111,000 or approximately 34.6%, compared to the non-food expenditure per capita in the highest quantile, which was IDR 3,350,000 or approximately 76.3%.

Furthermore, evaluating the program's effectiveness for the poorest beneficiaries should also be carried out in shorter periods of three to six months, given their limited abilities to optimize their minimal resources. On the other hand, for CCT beneficiaries in the highest wealth quantile, the CCT mentoring scheme may raise productivity and employment capacity. Moreover, these CCT beneficiaries can use technology to apply long-term outcome evaluation and mentoring activities.

Third, this research showed an interesting trend in consumption patterns. The target group of the CCT program is comprised of vulnerable communities, with the hope of a substantial impact on school enrollment. Indeed, this study showed an increase in the share of education. Still, some extra spending also increased (e.g., communication and transportation), especially among households in the highest wealth quantile. This study indicated that the probability of wasting money from the CCT program is relatively higher among the upper poor quantile. This data demonstrated that CCT is likely to contribute to increased inequality among low-income individuals. Thus, it is essential to note that the CCT should not pursue the number of CCT beneficiaries, but rather strengthen assistance to the extremely poor groups, and at the same time, increase the amount of funding. A smaller and more precise targeting scheme can potentially increase the effectiveness of CCT.

Together, the evidence presented in this study suggests the significance of CCT programs similar to those described in previous studies (Attanasio & Mesnard, 2006; Lagarda et al., 2017; Maluccio & Flores, 2005; Rizal & van Doorslaer, 2019). However, this study shines a new light on these debates by highlighting the different impacts among CCT beneficiaries. For example, poor people in the lowest wealth quantile may receive fewer benefits than those in the highest, potentially increasing inequality.

Hence, improving targeting mechanisms used by CCTs should be the main priority for policymakers. This improvement requires political will and revolutionary change in the existing tool. Unfortunately, political will has often failed to emerge due to limited scientific evidence on this issue. This study reminds governments that the poor have problems with their welfare levels. Therefore, governments must serve the poor, especially in developing countries, who often experience limited social spending. In this regard, governments should be more generous to households in the lowest wealth quantile, and carefully manage the program based on the needs of CCT beneficiaries.

CONCLUSION

This study fills the gap in the literature by providing an empirical analysis of the nexus of CCT and inequality in Indonesia. Estimations using the IVQTR ensure the robustness of the findings. The analysis showed that CCT has a positive and statistically significant impact on an individual's consumption. CCT has indeed increased the consumption expenditure of low-income individuals. However, it is essential to note that the coefficient is substantially higher among the highest quantile of the distribution. The lowest quantile of low-income individuals is the slowest to respond to these changes. This means that the program is less effective for relatively more impoverished individuals.

The finding of the impact of CCT on inequality among the poor provides a similar picture of policies at the macro level, which impacts the high Gini Ratio in Yogyakarta. The more prosperous groups have a higher rate of change than those below them in this region. In the end, the novelty of this study is that the current CCT design provides opportunities for gaps between the poor themselves. If the most destitute benefit less from the program and are left behind, the inequalities already experienced will exacerbate.

Given the vital role of CCT in improving an individual's economic welfare, the policy alternative to solving this problem would be readjusting the amount of cash, with the poorest receiving more money than the wealthier recipients. The CCT should not pursue the number of CCT beneficiaries but rather strengthen assistance to the extremely poor groups. The Government of Indonesia may also need to develop tailored economic and social assistance programs for the lowest quantile of CCT recipients. These recipients are likely to have low levels of education and less money in their pockets; most of them are women as well.

This research only examined the impact of CCT in rural areas, and thus, has limitations in terms of scope. Therefore, future research should look at the same issue in urban areas, and make general conclusions regarding the relationship between CCT and the inequality of outcomes among program beneficiaries.

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DISCLOSURE

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