

# Journal of Economics and Sustainable Development

ISSN 2222-1700 (Paper)

ISSN 2222-2865 (Online)

Vol 4 No. 2

2013



International Institute for Science, Technology & Education  
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# Crowding-out Effect of Cash Transfer Programs on Inter-household Transfers: Evidence from Indonesian Family

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## Abstract

Inter-household transfers have important role in developing countries landscape. Many people in developing countries must depend on financial transfer from their family as main source of any kind of social security. In a society with kinship ties are still strong, informal private transfers has a function as service providers and social security safety net during economic crises. The presence of the public transfer is expected to be neutralized (crowd-out) by the response of private transfers. This paper aims to examine existence of crowding-out effect of public transfer on private transfer using data from Indonesia Family Life Survey (IFLS). By controlling for any characteristic respondent and cultural background, the empirically results show that crowding-out effect is statistically significant. As a suggestion, identification of the target domestic anti-poverty programs should also include family tie variables as the key variable.

**Keywords:** crowding-out, public transfer, private transfer, Indonesia

## 1. Introduction

The relationship between household became one of the main features in the analysis of development microeconomics. As an economic unit, the household's role is crucial in efforts to improve the welfare of its members. Households are a service provider to a ripe old age (old-age security) as well as the place for children who are not yet economically self-sufficient. Households also serve as a safety net if part of its members experiencing economic hardship. This happens especially in a society that has not been reached by the services of financial institutions and credit (liquidity constraints). Domestic service is not just a transfer of money, but also non-financial transfers such as transfers of food or form of assistance services to help take care of the household.

Studies conducted in several developing countries showed that most (20 to 90 percent) of households reported receiving and gives transfers between households. Amount of transfer is reached 2 to 20 percent of total household income (Park C., 2003). Based on data from Indonesia Family Life Survey 3 (IFLS-3), as much as 56 percent of households reported giving financial transfers to non-coresident family. For households receiving net transfers (net recipients), the magnitude of the transfer covers 7 percent of the average monthly household expenditure. These calculations do not include the amount of transfer between relatives (inter-sibling), the transfer of non-household family member as well as the magnitude of transfers that occur within the same household (intra-household transfers).

Despite having an important role, the existence of inter-household transfers are threatened to weaken in the long run. One of the reasons is the demographic transition that indicates the trend of shrinking of fertility rate which led to the shrinking number of household members. In 1975 the fertility rate in Indonesia is at 5.3 and shrank sharply to 2.5 in 1995. The fertility rate is expected to decline which is predicted become 1.85 in the 2025 (Abikusno, 2007). IFLS survey showed that the average number of household members Indonesia in IFLS-1 (1993) is 4.56 and 4.13 in the IFLS-3 (2000). The survey results IFLS-4 (2007) showed that the average number of household members is 3.17. The shrinking number of household members potentially reduces the frequency of cross-household transfers, as occurred in many developed countries today.

Understanding of the private transfer behavior is important to the design of public policies that will be chosen by the government. In a society with kinship ties are still strong, informal private transfers has a function as service providers and social security safety net during economic crises. The presence of the public transfer is expected to be neutralized by the response of private transfers. Process pressure or crowding-out occurs if the donor households reduce the amount of transfer along with the public transfers from the government.

Based on the background of these problems, the research questions to be answered is whether the crowding-out effect of public transfers on private transfers exist in Indonesia? As a developing country that is known to have

very strong ties of kinship, the study of the effects of crowding-out in Indonesia is very relevant in line with the government's program to reduce the negative impact of global economic crisis and rising crude oil prices.

Empirical studies on the effects of crowding-out so far done with two approaches. First, the crowding-out effect is estimated by the derivative transfer coefficient. Technically, this coefficient would be one in the case of full crowding-out. That is, each additional penny of public transfers will be responded with a reduction in private transfers in exactly the same amount. Second, the crowding-out effect is evaluated based on the pattern of private transfer. Crowding-out effect can be traced if a private transfer has a negative correlation with income of recipients.

Main weaknesses of the two approaches is crowding-out effect is not estimated directly through the connection between public transfers by private transfer. Does the negative relationship between private transfers to income recipients would indicate a crowding-out effect, is still completely unanswered. To fill this empirical gap, this study will examine the effect of crowding-out directly from the government transfers such as direct cash assistance. The remainder of the paper organized as follow. Section 2 discusses the literature review. Section 3 describe the methodological issues and data. Section 4 analyses the empirical findings and then, Section 5 summarize the analysis.

## 2. Literature Review

Empirical research on crowding-out effect was initially carried out in developed countries since the decade of the 1990s. The results generally indicate that the crowding-out effect is not too strong. Empirical studies on crowding-out effect in developed countries have been criticized by Cox *et al.* (2004). First, it is irrelevant to examine this effect in developed countries that have long held a formal social security system. Second, linear estimation techniques may not be representative enough to capture the full association between the amounts of transfer and income received. Theoretically, if the relationship between the amounts of transfer and the recipient income is negative, then the addition of extra income (public transfers) will be reduce the amount of private transfers received.

Cox *et al.* (2004) conducted a study of household transfers in developing countries with a new approach. By using the Family Income and Expenditure Data Survey (FIES) Filipinos in 1988, Cox *et al.* (2004) reconstructs a new method for detecting the pattern of transfer. The estimation method used is the regression threshold that can capture non-linear relationship between the magnitudes of transfer and income received. The results showed that there is a change in the pattern of transfer related to increasing of household income recipients. However, the changes are not extreme, but only a decrease in the slope of the relationship between transfers and income. In the case of urban households, the coefficient of income is below the threshold of -0.389 and -0.008 at the turn into the above threshold. In the case of rural households of each coefficient is -0.398 and -0.032 intended.

Some researchers used a different estimation model to estimate the transfer equation. In the case of Nepal, Kang (2004) using a linear model. The data used are the Nepal Living Standard Survey (NLSS) of 1995/1996 that includes approximately 3.310 households. The results showed that the income of the recipient household is negatively related to the amount of transfer. This indicates the existence of altruism motive. The use of threshold regression was also conducted by Kazianga (2006) for the case of Burkina Faso, a country with relatively low income levels, has no formal public transfer system but has a well-known tradition of mutual aid (gift giving). In this study, researchers specifically address the endogeneity issue that often overlooked in previous studies. The results showed that the altruistic transfer can be identified at an intermediate level of income while on a low income level of this motif could not be found. This conclusion is certainly different from the pattern of household transfers as hypothesized by Cox *et al.* (2004). Based on these results the researchers suggest that the transfer of public policy or other government programs for low-income communities will not be pressed (crowd out) by the inter-household transfers.

Other types of specifications that used in the estimation of inter-household transfers are a quadratic relationship between the amounts of transfer and the recipient income. These specifications are used by Gomes and Sciuilli (2007) in estimating a transfer model in Bulgaria. The results showed that the pattern of relation to the income transfer is inverted U-shaped. This suggests that the low level of income transfer motive is the exchange, until at a certain level turned into altruistic.

Application of the model Cox *et al.* (2004) in India is used by Sharma and Lal (2009) in examining the transfer behavior in the rural households. The results showed a pattern similar to the case of Filipinos, under the income threshold coefficient is -0.575 while the above threshold is -0.0008 (coefficient of income above the threshold

was not statistically significant). Researchers found that the smaller the magnitude of the transfer if the household is retired. While the greater acceptance of transfer to households with higher education levels. Education that recipient households are more highly educated households received transfers from another is not explained in more detail by researchers.

Research on patterns of inter-household transfers in Indonesia conducted by Gibson *et al.* (2011) who studied the pattern of transfer in several countries, namely Indonesia, Papua New Guinea (PNG), Vietnam and China. OLS estimation results indicate that there is a significant negative correlation between the magnitude of the transfer recipient households with incomes in the case of Indonesia, China and PNG. Significance of this relationship is lost when the researchers used the approach Instrumental Variable (IV). In this case the income instrumented with size and quality of the home.

The main problem of previous studies is the use of linear estimation and non-linear in testing the effects of crowding-out is not done directly. The possibility of a crowding-out is only estimated based on the relationship (negative) between the amounts of transfer and recipient income. Kang (2004) showed that although the relationship between income and transfer is negative, but the crowding-out effect of public transfers on private transfers are not shown. To ensure the existence of crowding-out effect, this article directly tested the impact of public transfers on private transfers across households in Indonesia. Public transfer that referred in this study is the direct cash assistance or Bantuan Langsung Tunai (BLT).

### 3. Methodology and Data

Testing the impact of a policy often face the problem of unavailability of counterfactual that it is difficult to estimate the results obtained truly depict the pure impact of a policy. To obtain the counterfactual (control group) with characteristics similar to the treatment group (households receiving public transfers), this study will use the approach of propensity score matching (PSM). The steps in the PSM method can be summarized as follows (Khander, Koolwal, and Samad, 2010). First, estimate the model of program participation:

$$P_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e \quad (1)$$

Pooling treatment and control groups and regress to a number of explanatory variables based on participation decision. Explanatory variables that use are criteria of the program as determined by governments. Model estimation used in (1) is the logistic regression that results probability value or propensity score households to get the program. The next step is defines common support where distribution propensity score between treatment and control group are intersection.

Next step, use the balancing test to examine that the distribution of treatment and control groups statistically are equal. Formally, the balancing test is:

$$P(X|T=1) = P(X|T=0) \quad (2)$$

If sufficient sample is obtained in the common support and the balancing test has been passed, the final step is applying difference test between treatment and control group outcome (treatment effect on treated, *TOT*).

$$TOT = E(Y^T | T=1, P(X)) - E(Y^C | T=0, P(X)) \quad (3)$$

The approach that is used to determine the magnitude of the Average Treatment on the Treated (ATT) as well as their significance test is using Stratification Matching. This procedure partitions the common support into different intervals and calculates the public transfer's impact within each interval. A weighted average of these impact interval estimates yields overall program impact, taking share of participant in each interval as the weights (Khander, Koolwal, & Samad, 2010).

The data used in this research is the result of a survey of household Life aspects of Indonesia (SAKERTI) or Indonesia Family Life Survey (IFLS). Two last waves (IFLS-3 and IFLS-4) will be used as the basis for estimation. IFLS-3 would serve as a baseline to identify household treatment and control household. The unit of analysis is the household that includes approximately 10.269 units of households on IFLS-3 and 12.987 units household on IFLS-4. Some characteristics of the households that are used as explanatory variables including the floor area per capita, types of flooring, types of walls of the House, the availability of toilets, drinking water source, lighting, fuel use, education and the work of the head of the family. IFLS-3 reported receiving the transfer as much public 3.68 percent. The government program in tackling the impact of rising crude oil pricing since mid-2005 in the form of Direct Cash Assistance (BLT) is a popular form of public transfer. Table 1 presents data on household characteristics based on matching sample and recipient of public transfers.



#### 4. Results

The first stage of what should be done is to determine relevant explanatory variables to identify groups of treatment (recipients of government transfers) and that does not receive government transfers. The government has released a number of variables that are used as the basis for determining the target home program. Most of these variables will be used to find a control group with similar characteristic with a group of households that receiving public transfers. To ensure that the variables or characteristics of the chosen are not affected by the existence of the program, the baseline data used was from the beginning IFLS (IFLS-3). Meanwhile, data on transfers between households taken from the survey results in the next period (IFLS-4).

Table 2 shows the magnitude of the transfers received by households based on the sample donor (the origin of the funds). These data indicate that transfers from a neighbor's relatively large compared to other private transfer. The transfer of the child to the parents also relatively large compared with the transfer from parent to child. The results of the estimation model of program participation to obtain propensity score in each group can be observed in the sample Table 3. The explanatory variable in question is the type of floor, walls of the house, the availability of toilets, drinking water, sources of information are used, fuel for cooking as well as the level of education and type of work head of household. The floor area of variable is not included because it is not qualified test balancing.

The calculation results indicate that unless this type of flooring is used, all variable are significant in conventional level. Significance of several explanatory variables indicates that the variables used are relevant to identified target beneficiary households public transfers. Based on propensity score from the previous process, the next step is to determine the common support spanning group treatment (BLT recipients) and the control group. Test results showed that the STATA region of common support points is in the range 0,702 to 0,073. So far the results showed that the assumption of PSM approach has been fulfilled. Matching balancing test results have been fulfilled, so the test difference between the group treatments and control group could be applying. Significance of the difference the average outcome between the two groups can be inferred to happen due to government programs.

According to some estimates, there are eight interval block treatment and control that is consistent with the regions of common support detected. Number of household treatment and household controls on each interval can be noted in Table 3. The overall total of the sample household 8.802 is divided into groups of household's control (6.420 households) and household group of recipients or treated (2.382 households). The number of households control and treated at each interval can be noted in detail in Table 4. Outcome in this research is the magnitude of the financial transfer who accepted household sample from family members, neighbors and friends who do not live in one household. Test results against any possibility of crowding-out effect can be observed in Table 5.

Table 5 shows that in general the effects of crowding-out transfer in the form of direct cash aid public against private transfers proved to be quite significant. In total, recipient household receive private transfer 10 BLT percent less compared to non-household BLT. The largest decrease in the transfer originates from either parents or foster parents siblings. The public have urgent transfer transfers from parents almost 40 percent. While a decrease in transfers of children and suffering each for 21.9 per cent and 17.5 per cent. Decreases in transfers from neighbors are also relatively large IE more or less amounted to 24.5 per cent. The results of this research show that the existence of the public in the form of giving of money transfer cash as in the program had reduced quite a bit BLT allocation for private transfers received by households of members of his family were not staying housemates.

#### 5. Conclusion

Using the quasi approach of the propensity score matching, this research shows indication of crowding-out effect of public transfers to private transfers. In contrast to previous research that examines the effect of crowding out indirectly, this research uses direct cash aid programs as the variable of interest. Cash assistance programs designed to help the poor economic hardship as a result of the economic crisis turned out to have less favorable effects i.e. reduced the role transfer between households as informal social safety net. Role of transfer between households as social safety net has been running long enough in developing countries, including Indonesia.

Crowding-out effects have an impact on the effectiveness of government transfer policies reduced since it will be

opposed through the decline of private transfer. As a suggestion, the identification of targeted household in anti-poverty programs should also include poverty variables as household ties key variables. Poor households who do not have relatives should get top priority in public transfer programs.

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Table 1. Indicator of Household Sample

Variables	Indicator	Observation	Share (%)
Size of house	< 8 m <sup>2</sup>	2.366	27,21
	≥ 8m <sup>2</sup>	6.330	72,79
Flooring Type	Bamboo/Lumber/Board	2.396	27,55
	Other	6.300	72,45
Wall Type	Bamboo/Lumber/Board	3.150	36,22
	Other	5.546	63,78
Toiled	Own Toiled	5.503	63,38
	Other	3.180	36,62
Source of Drinking	Mineral/Pipe Water	2.361	27,19
	Other	6.322	72,81
Lighting	Electric	7.816	90,01
	Other	867	9,99
Stove	Firewood/charcoal	3.203	36,89
	Other	5.480	63,11
Education	Elementary	3.165	36,40
	Other	5.530	63,60
Type of Occupation	Casual Worker	1.619	18,62
	Other	7.076	81,38
Receipt Public Transfer	Yes	2.345	26,98
	No	6.348	73,02

Source: IFLS-3 (2000) & IFLS-4 (2007)

Table 2. Summary Statistic of Household Transfer (in logarithmic form)

Source of Transfer	Mean	St.dev	Min	Max
Total	13,348	1,919	6,907	22,669
Parents	12,578	1,730	7,824	21,821
Siblings	12,392	1,657	7,600	21,416
Child	13,369	1,833	8,517	22,515
Step Parents	11,914	1,850	8,517	20,723
Other Family	11,834	1,523	6,907	21,416
Neighbor	14,919	1,593	8,881	20,723
Friend	11,791	1,842	6,907	20,728

Source: IFLS-4, author's calculation

Table 3. Propensity Score Model Estimation\*)

Independent Variables	Coefficient	Std. Error	z	P> z
Flooring	-0,047	0,042	-1,12	0,263
Wall	0,441	0,039	11,22	0,000
Toilet	0,432	0,032	13,49	0,000
Drinking Water	0,209	0,037	5,60	0,000
Electricity	0,222	0,050	4,41	0,000
Stove	0,158	0,034	4,56	0,000
Education	0,458	0,032	14,30	0,000
Occupation	0,065	0,038	1,68	0,093
Constanta	-1,407	0,036	-38,04	0,000

\*) Dependent variables: Receipt public cash transfer (BLT)

Table 4. Number of Treated and Control Group for Each Block

PSCORE	Control	Treated	Total
0,073	1.013	68	1.081
0,100	1,713	229	1.942
0,150	540	115	655
0,200	1.543	506	2.049
0,300	595	398	993
0,400	516	409	925
0,500	324	415	739
0,600	176	243	418
Total	6.420	2.382	8.802

Table 5. Average Treatment of Treated on Household Transfers\*)

Source of Transfer	ATT	Std. Error	t
Total	-0,101	0,048	-2,100
Parents	-0,392	0,042	-9,278
Siblings	-0,219	0,040	-5,413
Child	-0,175	0,045	-3,888
Step Parents	-0,372	0,041	-9,053
Other Family	-0,146	0,040	-3,673
Neighbor	-0,245	0,041	-6,011
Friend	-0,036	0,048	-0,748

\*) number treat=2,343 control=6,339

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