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## Do Public Transfers Crowd-out Private Transfers? Evidence from the Thai Socio-Economic Panel Survey

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### Abstract

There exists both theoretical and empirical evidence, which shows that public transfer programs crowd-out private transfers. This study takes advantage of three waves of Thai Socio-Economic Panel Survey, during the period 2005-2007 to investigate the connection between public transfers and private transfers in Thailand. Thai agricultural households who have been one of the main targets of Thai government transfers over the past several decades are used as a sample group. The Tobit, probit and logit model are used to estimate and to check the robustness of the results of the relationships between private and public transfers. The empirical results revealed that crowding-out exists, especially the households in the Northeastern region. Therefore, in order to avoid dead-weight loss, public transfer should be implemented with care. Targeting household groups should increase the effectiveness of public transfers programme and then actually raises Thai household welfare.

*Keywords:* Public transfers, private transfers, crowding-out, Thailand.

*JEL Classification:* C33, E62, H53

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## **Introduction**

Private transfers are one of the important informal insurance arrangements among households, especially poor households, in developing countries. Apart from providing insurance during economic hardships for those households, they also provide a social benefit in terms of creating harmony and strengthening the community. Similar to private transfers, public transfers are also widely implemented in developing countries as anti-poverty instruments. Both of them are often implemented when other informal insurance arrangements are weak. Nevertheless, even though both types of transfers can help lessen economic hardship for poor households to a great extent, there exists both theoretical and empirical evidence which show that public transfer programs crowd-out private transfers (Cox and Jimenez, 1992; Jensen, 2004; Gerardi and Tsai, 2014).

Several studies have investigated the crowding-out relationship. However, the empirical results are still mixed. For example, Jensen (2004) and Kang and Lee (2003) found a strong crowding-out effect; Rosenzieg and Wolpin (1994) and Cox and Jakubson (1995) found a partial effect; whereas Payne (1998) and Kang (2004) found no crowding-out effect. Thus, understanding and investigating the relationship between private transfers and public transfers before the implementation of public transfer programs may help reduce deadweight losses if any relationship exists.

In the context of the Thai economy, there have been many public transfer programs implemented over the past decades as a result of the failure of a liberal economic policy in tackling poverty and income inequality. The Thai government uses public transfer as a means of income redistribution by allocating the fund under social welfare programs. Public transfers may take the form of cash or in-kind support for example, the minimum agricultural price policies, debt suspension coverage for farmers, and the 15-year free education policy, etc.; or they may be in the form of income support to the vulnerable members of the society by providing jobs when in retirement or in an emergency situation, through public work and other employment programs. Meanwhile, private transfers refer to the payment in cash or in-kind that transfers among households, individual, or from a private entity (foundation or insurance agency) to households or individuals. In addition, as a Buddhist country, it is often claimed that private transfers, or donations appear always in Thai society, especially in rural society. Households which are richer, or well-off often transfer their payment either in-cash, or in-kind forms to other households which are poorer, or worse-off. This transfer behavior of Thai households can occur both in the case of normal times and troubled times of other households.

Hence, understanding more about private transfers is important for policy-makers to decide public transfers in order to complement private transfers or promote private transfers as resource of income redistribution. Unfortunately, little research on the private transfer is found in developing countries including Thailand. Therefore this study wants to investigate the connection between public transfers and private transfers, and the welfare loss in Thailand. Agricultural households are the sample group in this paper since they have been the main target of Thai government transfers over the past several decades, especially as a

result of Thai grass roots or populist policies. The data set use in this paper comes from the Thai Socio-Economic Panel Surveys, collected by the National Statistical Office (NSO), Thailand. The three waves of Thai Socio-Economic Panel Survey during the period of the year 2005 to 2007 is used to investigate the crowding out of private transfers from public transfers in Thailand in this study. Cox's model is employed to examine the crowding-out effect of public transfers on private transfers. The Tobit regression model is applied as the main econometric approach to analyze the relation of public and private transfers relationship. This study also test the robustness of an investigation by using probit and logit regression due to concerns in measurement errors in the collecting transfer data and checking the veracity of the coefficients in the regression model. If the crowding-out effect exists, it may reflect that besides being unsuccessful in poverty reduction and welfare loss, these public welfares may reduce private transfers, which are the main informal insurance arrangements of poor households.

### **Literature review**

Private transfers are important for reallocating resources, income and wealth. Cox and Jimenez (1990) report that more than half of the households in some countries engage in private transfers. The importance of private transfers has induced economists to explore the motivation of transfers. Several models of transfer have been studied including altruism and exchange. The altruism model states that the donor's well-being is directly related to the well-being of the recipients. The model predicts that donors will increase the amount of assistance provided to the recipients in response to decreases in the recipients' income. However, in the case of the exchange model the donor expects a return from the recipient, namely a future repayment.

The discussion about transfer motives is crucial because the two models predict different effect between private transfer responses to public transfers. For example, altruists would cut transfers payment to the recipients who get the government aid. However, if private transfers are part of an exchange, public transfers need not to crowd out on private transfers.

The empirical studies of the crowding-out effect of public transfer on private transfers are prevalent, since the altruistic and exchange motive models are developed by Becker (1974). However, the existing evidence on the extent and magnitude is still ambiguous.

The literatures, which indicate that there exists evidence of the crowding-out effect of private transfers on public transfers is initiated by the study of Cox and Jimenez (1992). Using data from the Peruvian Living Standards Survey, Cox and Jimenez (1992) investigated the impact of social security systems on private transfers. Their results showed that social security systems crowd-out private transfers from younger to older generations even if this displacement is less than anticipated by models. Similar to the case of Peru, Cox and Jimenez (1993) who examine the connection between public transfer and private transfers in the Philippines, they found that both an unemployment insurance system and a social security system reduce

private transfers. Payne (1998) uses 430 non-profit firms data during 1982 to 1992 examining the crowding-out effect of the government grants on private donations. His results revealed that the government grants crowd-out private donations under a 2SLS specification. Using household panel data from Korea for 1995 to 1998, Kang and Sawada (2003) examine the impact of public transfer on private transfer before and during the financial crisis. They found that public transfer causes a strong crowding-out on private transfer. Likewise, Kang and Lee (2003) apply Honore's panel fixed effect censored model estimate to Korean data. Their result revealed that there is also a strong crowding-out effect of public transfers on private transfers.

Under a different technique, Albarran and Attanasio (2003) use a randomized experimental technique to investigate whether public transfer displaces private transfer in Mexico. They also found that public transfer crowds-out private transfer, especially in villages where the variance of income is smaller. Using data from South Africa, Jensen (2004) examines the displacement of old age public pensions by private transfer. His result showed that each rand of public pension income leads to a 0.25-0, 30 rand reduction in private transfer from children living away from home. Similarly, Juarez (2009) uses the Mexican Income and Expenditure Survey for the period 1996 to 2004. She found that there is a large crowding-out effect of public programs for the elderly. In addition, Gerardi and Tsai (2014) use an instrument variable strategy, and data from Taiwan to examine the effect of Social Entitlement Programs on private transfers. Their result revealed that public programs to the elderly crowd-out the private transfer behavior of their adult children.

Not only testing the connection between public transfer and private transfers, Cullen and Gruber (2000) investigated the crowding-out effect of unemployment insurance on spousal labor supply. Their results showed that increases in unemployment insurance lower labor supply among wives of unemployed husbands, and the reduction in spousal hours of work is quite large. Schoeni (2002) uses data from a supplement to the Panel Study of Income Dynamics to examine whether unemployment insurance displace familial assistance. He also found that unemployment insurance displaces familial assistance by as much as 24-40 cent per dollar.

On the other hand, some literature indicates that a crowding-out effect does not exist, or exists on only a small-scale. Andreoni (1993) presented an experimental test to examine whether government contribution to public goods crowd-out private contribution. His result showed that crowding-out is incomplete. Rosenzweig and Wolpin (1994) use two longitudinal data to investigate the interactions among parents, adult children, and the government. They found that public transfers have little effect on the incidence of parental aid. In addition, Cox and Jakubson (1995) investigated the connection between public transfers and private interfamily transfers. Their results revealed that private transfer is not crowded-out by public transfer, but public transfer can be magnified by private transfer instead. Payne (1998) also found no the crowding-out of public transfer on private donation under an OLS specification even if he found that there exists a crowding-out effect under a 2SLS specification. Similarly, using household data from Nepal for

1995/1996, Kang (2004) investigated the connection between public transfer and private transfers. His results showed that public transfers do not exert any crowding-out effects on private transfers.

Considering Thailand, which Buddhism is main religious country, the well-known aspects of Thai culture such as generosity and charitableness, especially in rural society, is recognized for a long time period. Private transfers are the prominence of resources redistribution that can eventually have an impact on economic inequality. Apinunmahakul (2014) examines Thai donations, which may be in cash, or in-kind payments to both religious and non-religious organizations. By using 2,557 samples from 19 provinces all over the country, the main results show that: 1) money donation is the most preferred of donation types, 2) religious belief is the main reason for donation, and 3) rural people tend to donation more than urban people. Kanchanachitra (2014) explores Thai household characteristics that influence giving behaviors in three categories; contributions to persons outside household, contributions made to religious activities, and contributions made to charitable institutions/organizations. By using Socio-Economic Survey 2011 (SES 2011) conducted by the National Statistical Office of Thailand (NSO), she found that households that have more members increase overall giving in all categories, meanwhile an increase in the number of children reduce giving in all categories. Moreover, a rural household contributes more on religious activities than an urban household. The Office of the National Economic and Social Development Board (NESDB, 2012) also reports the percentage of Thai households' expenditures per month from the year 1999 to the year 2011. The average percentage of Thai household's donation per month is placed on the top five ranks from the overall Thai households' expenditures per month. In addition, the average percentage of Thai household's donation during the year 1999 to the year 2011 was 5.63 percent from the total expenditure per month. The highest percentage of Thai household's donation per month was 6.13 in the year 2000, whereas the lowest percentage of Thai household's donation per month was 4.21 in the year 2009.

In the theoretical model in the next section, there are two directions of the impact of public transfers on private transfers. The result depends on two types of motivation of private transfers. The private transfers may be motivated by either altruism, or an exchange framework. If the transfers are motivated by the altruism motive, public transfers will crowd-out the private transfer. On the other hand, if the transfers are motivated by the exchange motive, private transfers will be not crowded-out by public transfers because the recipient compensates the donor by providing them some kind of service (Cox, 1987).

### **Theoretical background**

Cox (1987) has developed the private transfer model by adopting two motive models from Becker (1974) and Bernhiem and others (1985); that is, the altruism model and the exchange model, respectively. With the altruism model, the donor cares about the well-being of the recipients, whereas the donor expects a return from the recipient in the case of the exchange model. Consequently, Cox's private transfer model

generates two predictions regarding the relationship between a transfer donor and a transfer recipient. The solution of this relationship thus has an important impact on public transfer programs.

There are two individuals in Cox's model: a transfer donor and a transfer recipient. The transfer donor's utility function is

$$U_d = U_d(c_d, s, V_r(c_r, s)), \quad (1)$$

where  $U_d$  is the donor utility,  $c_d$  is the donor's consumption,  $s$  is the recipient's service,  $V_r$  is the recipient's utility,  $c_r$  is the recipient's consumption, and then it is assumed that  $\partial U_d / \partial c_d > 0$ ,  $\partial U_d / \partial s > 0$ ,  $\partial V_r / \partial c_r > 0$  and  $\partial V_r / \partial s < 0$ . In addition, we assume that consumption is a normal good for individuals and that the donor is altruistic if  $\partial U_d / \partial V_r > 0$ . Two individuals have a budget constraints as follows:

$$c_d \leq y_d - T, \quad (2)$$

and

$$c_r \leq y_r + T, \quad (3)$$

where  $y_i$ ,  $i = d, r$ , denotes the donor and recipient incomes and  $T$  denotes transfers from the donor to the recipient. Finally, to solve the donor's maximization problem, the nonnegative constraint, which states that the recipient entering the relationship cannot lower his threat point utility  $V_o(y_r, 0)$ , must also be included; and this non-negativity constraint is written as

$$V_r(c_r, s) \geq V_o(y_r, 0). \quad (4)$$

Cox (1987) has indicated that the donor's transfer can be motivated by either an altruistic motive or an exchange motive, depending on whether this nonnegative constraint is binding or not. If this constraint is not binding, the donor is effectively altruistic. Public transfers will be offset by corresponding private transfers. On the other hand, if this constraint is binding, the transfer behaviour is motivated by the exchange motive. Private transfers will be not crowded-out by public transfers because the donor expects compensation from the recipient instead.

## Methods and Data

In this section we describe our data and the variables used for our empirical work, and then the empirical specifications are presented.

The data set used to analyse the impact of public transfers on private transfer comes from the Thai Socio-Economic Panel Survey collected by the National Statistical Office (NSO), Thailand. This dataset is similar to Thai Household Socio-Economic Surveys (SES), which is the only cross-sectional dataset of Thailand that reports the socioeconomic data of Thai households including income, expenditures, debt, and income distribution of household in all provinces and in both municipal and non-municipal areas; however, it is panel data and contains fewer details. The Thai Socio-Economic Panel Survey reports the socioeconomic data for sample households that were interviewed repeatedly from 76 provinces all over the country both inside and outside municipal areas, over the three-year period from 2005 to 2007. Approximately 6,000

households were selected in the first round even if they contributed a response rate of about 96.2 and 93.1 percentages for the second and third round, respectively. However, because this paper investigates whether Thai public transfers, especially Thai grass roots policies, crowd-out private transfers, crop farmer households were chosen because they are the main target group of these policies. Furthermore, with the acceptance of James Scott's Moral Economy of the Peasant in 1976, together with all the well-known aspects of Thai culture, these households tend highly to use private transfers in their community, as noted by Ravallion and Dearden (1988) who stated that "neighbourliness and reciprocity are widely thought to be more important in villages than cities".

All of the variables used in this paper are summarized in table 1. Private transfers and public transfers are reported as one of the income components in the income part of the dataset. In this income section, household members were asked separately for each transfer datum as:

*"Did you receive money in cash or in-kind from the following sources in the past twelve months prior to the interviewing day, and how much?"*

*Assistance from other persons outside the household*

*Assistance from government"*

For private transfers, if the respondent answers yes and receives money from other persons outside the household, this type of income received is referred to as private transfers; meanwhile for public transfers, if the respondent answers yes and receives money from government, this type of income received is referred to as public transfers. Consequently, these variables are used as a proxy of private and public transfers respectively in order to investigate whether private transfers is crowded-out by public transfers in Thailand. If there is a crowding-out from the government welfares, it may imply that the more the public transfers, the more private transfers are crowded-out.

Both transfers are also adjusted by the Provincial Consumer Price Index (PCPI) provided by the Internal Commercial Department of the Ministry of Commerce during each year of panel data in order to obtain the real value from the nominal figures derived from each survey round.

Table1 Mean and standard deviations of main variables for the entire sample (currency unit:baht)

Variable	Variables description	Mean	Std. Dev.
Nonmember_transfer ( <i>Pri</i> )	Transfer receipt from nonmember households	15848.870	52011.080
Public_transfer ( <i>Pub</i> )	Transfer receipt from government	1474.134	16826.570
Head_illness ( <i>H-III</i> )	Illness of household's head	0.018	0.136
Head_age ( <i>H-age</i> )	Age of household's head	52.276	13.059
Head_age_squared ( <i>H-age</i> <sup>2</sup> )	Squares of age of household's head	2903.380	1431.461
Members_0_5 ( <i>Mem0-5</i> )	Number of household's members who age under 6	0.317	0.549
Males_6_11 ( <i>M6-11</i> )	Number of household's males members who age between 6 to 11	0.235	0.478
Females_6_11 ( <i>F6-11</i> )	Number of household's females members who age between 6 to 11	0.208	0.453
Males_12_17 ( <i>M12-17</i> )	Number of household's males members who age between 12 to 17	0.217	0.458
Females_12_17 ( <i>F12-17</i> )	Number of household's females members who age between 12 to 17	0.211	0.453
Males_primary ( <i>MPr18-64</i> )	Number of household's males members who age between 18 to 64 and have primary level of education	0.804	0.629
Females_primary ( <i>FPr18-64</i> )	Number of household's females members who age between 18 to 64 and have primary level of education	0.913	0.567
Males_secondary ( <i>MSe18-64</i> )	Number of household's males members who age between 18 to 64 and have secondary level of education	0.297	0.524
Females_secondary ( <i>FSe18-64</i> )	Number of household's females members who age between 18 to 64 and have secondary level of education	0.219	0.446
Males_postsecondary ( <i>MPo18-64</i> )	Number of household's males members who age between 18 to 64 and have postsecondary level of education	0.088	0.303
Females postsecondary ( <i>FPo18-64</i> )	Number of household's females members who age between 18 to 64 and have postsecondary level of education	0.142	0.378
Members_65up ( <i>Mem 65up</i> )	Number of household's members who age over 64	0.336	0.619

Notes: Data used in this study is annual data

Apart from transfer variables, this study also controls household characteristics with a set of household characteristic variables, such as household experience, in which we used the household head's age and its square as a proxy of this variable, and the number of household members, which are classified by

age, gender, and education level. Mostly, the size and prevalence of private transfers are related to household characteristics such as income before private transfers; or demographic characteristics such as age, level of education and a household headed by a female (Cox, Galasso and Jinimez, 2006). The private transfers tend to flow to the poorest household, the un-employed household, the elderly, the very young, and to households headed by women. Hence, the relationships of private transfers to the elderly, the very young and the female household heads, are positive. However, the relationship between private transfers and education is possibly more complex as, the private transfers might have a positive or negative relationship with the educational level of the potential recipients. Cox and others (2006) also finds that the recipient segment of receiving private transfers is higher for the ill group than for the healthy group. In addition, poor households have substantial difficulties when coping with idiosyncratic risk more than rich household. This study therefore includes idiosyncratic shock; that is, a household head's illness, to examine whether households that face this type of shock are targeted by private transfers. Finally, we also control for the unobserved effects of aggregate shocks such as floods, drought and other natural disasters. It is also important to study the needs of individual/households that are confronting losses due to adverse personal, economic hardships, or other catastrophes such as illness, poor harvests, and unemployment (Marduch, 1999).

### Conceptual Framework

Following the private transfer model presented by Cox (1987), we apply this model to test the relationship between private transfers and public transfers, and express it as follows:

$$Pri_{it} = \alpha_0 + \alpha_1 Pub_{it} + \alpha_2 S_{it} + \alpha_3 X_{it} + \lambda_t + \epsilon_{it} \quad (5)$$

where  $i$  denotes household and  $t$  denotes time.  $Pri$  and  $Pub$  are private and public transfers respectively,  $S$  is the idiosyncratic shock, in which we used a household head's illness as a proxy, and  $X$  is the set of household characteristic variables.  $\lambda$  is the aggregate shocks where we used the interaction between region and household characteristics variables as a proxy and  $\epsilon_{it}$  is the unobserved stochastic term. If  $\alpha_1$  is **negatively significant**, it implies that public transfers **crowd-out private transfers**. On the other hand, if  $\alpha_1$  is **positive and significant**, it is called a **crowding-in effect** of public transfers.

Private transfer data may be either undervalued or overvalued and are non detects. As private transfer data is employed as a dependent variable, dependent variables that are continuous, but a value occurs outside the range of a measuring instrument, are known as censored variables. A regression model generally used to deal with censored data is the Tobit model. Therefore, the Tobit model is used in this study in order to estimate the linear relationships between private transfers and public transfers. In addition, the random effect probit regression and panel logit model are applied to make the test more robust. Subsequently, Tobit, probit and logit model are the three linear regressions most widely used for analyzing data with limited-dependent or qualitative dependent variables. The difference between logit and probit models lies in the assumption about the distribution of the error. The logit is the inverse cumulative distribution

function (quantile function) of the logistic distribution, while the probit is the inverse cumulative distribution function (quantile function) of the normal distribution.

**Empirical results**

**Main empirical findings**

The random effect tobit regression for the whole country and for each region, which is our main result, is reported in table 2. The results revealed that there is a crowding-out effect of public transfers in Thai agricultural household transfers. The estimated coefficients of public transfers are negatively significant at the 1 percent level for the whole country, and for the Northeastern region. In addition, the magnitude of crowding-out effect of public transfers is greater in the Northeastern region than in other regions. These results are consistent with several studies such as those of Cox and Jimenez (1992), Payne (1998), Kang and Lee (2003), Kang and Sawada (2009), and Gerardi and Tsai (2014). Nevertheless, we found no such crowding-out effect for public transfers in the Northern, Southern regions and the combined group including the Central, Eastern, and Western regions.

Table 2 Random Effect Tobit Regressions  
 Dependent variable: Transfer receipt from nonmember of households

Regions :	(1)	(2)	(3)	(4)	(5)
Variables :					
Government transfer	-0.457 (0.222)***	-0.784 (0.315)***	-0.360 (0.519)	-0.229 (0.201)	0.459 (0.465)
Head_illness	-5345.957 (10099.650)	-123.495 (11799.190)	-18043.400 (30395.240)	-17838.410 (19337.690)	-30665.960 (32987.820)
Head_age	4207.696 (859.2423)***	2828.410 (982.924)***	9205.302 (2915.986)***	1931.967 (1601.179)	5691.334 (3191.218)**
Head_age_squared	-23.125 (8.041)***	-12.239 (9.458)	-60.577 (27.063)***	-4.797 (14.423)	-34.927 (27.907)
Members 0_5	11383.180 (2998.437)***	8375.108 (3373.196)***	52986.800 (10094.680)***	1094.710 (6188.551)	-19285.110 (9503.409)***
Males 6_11	138.068 (3480.093)	-117.919 (3939.179)	2369.363 (13211.320)	7132.562 (7028.453)	-3135.001 (8836.121)
Females 6_11	2769.305 (3611.968)	3584.351 (4071.263)	4771.287 (11745.360)	-65.234 (7498.124)	8762.651 (11646.310)
Males 12_17	-15551.300 (3769.020)***	-17100.040 (4470.725)***	-18354.530 (12971.320)	-6307.029 (6330.014)	-11241.010 (9753.244)
Females 12_17	-5759.344 (3776.266)	-4221.743 (4519.775)	-8963.010 (11157.700)	-6696.219 (6847.408)	-8713.763 (11842.440)
Males_primary	-22034.420	-22440.670	-44876.940	4335.165	-16215.770

	(2878.501)***	(3452.936)***	(9144.243)***	(5391.373)	(7268.009)***
Females_primary	5158.822	5031.256	5151.978	-937.713	4929.106
	(3261.902)	(4109.038)	(9763.072)	(5982.968)	(7563.181)
Males_secondary	-14643.420	-13171.450	-15053.190	-4068.509	-24082.670
	(3408.009)***	(4237.323)***	(10053.590)	(6227.187)	(8466.289)***
Females_secondary	-3211.724	-3283.265	-33535.100	14165.450	14000.700
	(3907.470)	(4748.694)	(12511.400)***	(6712.082)***	(10003.790)
Males_postsecondary	-19288.550	-24088.300	-42059.090	12522.070	-19153.800
	(5559.366)***	(7704.752)***	(15059.390)***	(8509.426)	(13761.920)
Females_postsecondary	5126.092	-5786.167	12136.340	8776.129	6452.944
	(4450.434)	(6872.027)	(11400.560)	(6510.163)	(10001.020)
Members_65up	2686.183	2957.638	-1820.233	3302.042	1787.925
	(3668.890)	(4832.920)	(10618.233)	(5897.277)	(9169.722)
Year 2006	7314.213	-2545.729	21527.500	22543.880	12952.900
	(3282.718)***	(3792.017)	(10166.920)***	(6845.901)***	(8613.685)
Year 2007	14518.390	4105.424	33623.500	17657.550	27801.110
	(3059.957)***	(3532.080)	(9444.371)***	(6506.003)***	(7982.832)***
Cons	-216497.500	-139494.500	-409282.400	-125441.700	-270548.700
	(42063.370)***	(27021.780)***	(81265.840)***	(43342.520)***	(98303.760)***
Number of observations	5650	2819	1325	745	761
Number of censored observation	3372	1495	861	497	519
Log likelihood	-30601.373	-17506.143	-6412.182	-3276.001	-3245.474
F-test (provinces dummies insignificant)	197.540***	74.380***	17.430	28.28***	31.40

- Notes:** 1.) All regions = (1), Northeast region = (2), North region = (3), South region = (4), and Central, East and West = (5)  
 2.) Standard errors in brackets under coefficients  
 3.) \* significant at 10 percent; \*\* significant at 5 percent; \*\*\*significant at 1 percent

From the theoretical view, this implies that private transfers in Thai agricultural households may be motivated by both altruism and self-interested exchange. One of the possible reasons for this evidence is there may be public transfer programs that differ in what they provide to agricultural households for each region, for example, agricultural subsidies, a transfer for floods etc. In addition, households that are located in different regions may face different types of economic hardships, cultures, and other natural disasters. This may also cause differences in the private transfers for each region. Furthermore, as the Thai government has launched populist policies for poor people exclusively in the Northeastern region, the poorest region of Thailand, the effect of public transfers that crowd-out private transfers obviously exist in this region.

We find no relationship between a household head's illness and private transfers in any region. There were nevertheless many remarkable relationships between the set of household characteristic variables and private transfers. First, we find that the household head's age is positively significant at the 1 percent

level in most regions. This result is similar to the studies of Ravallion and Dearden (1988) and Pan (2009), which have indicated that this relationship reveals a targeting toward older ages of a household head for this type of transfer. Secondly, we also find that household members whose age is under 6 are targeted. Finally, it should be noted that most male household members aged over 11 have a negative relationship with this type of transfer in most regions. This indicates that the more adults in the household, the less likelihood there is of households receiving transfers from other households.

Considering the education level, male members of households at each education level, including primary school, secondary school and post-secondary school have significant a negative relationship with private transfers in each region, excluding the southern region. The result also indicates that male members are less likely to receive transfers compared to female members of households. The gender effect is consistent with other studies of private transfers that find the disproportion of private transfers targeted towards female members.

### **Tests for robustness**

Private transfer data may be either undervalued or overvalued as a result of measurement errors. We therefore increase the robustness of our test by using the random effect probit regression and panel logit model also, as shown in table 3 and table 4, respectively.

The estimation results of the random effect probit regression are mostly consistent with the random effect Tobit regression results. The estimated coefficients on public transfers are still negative and significant for the case of the whole country and the Northeastern region. The result is consistent with the random effect tobit regression. The magnitude of crowding out effect of public transfers is also greater in the Northeastern region. However, the impact of crowding-out effect of public transfers is quite small and insignificant when we estimated the coefficient of public transfers by using the random effect probit regression and panel logit model. Additionally, both household members, whose age is under 6 and age of household heads are still targeted by this type of transfer, while household members over 11 years of age have a negative relationship with this transfer in most regions. Unlike the random effect probit regression, the logit regression reveals that most of the significant variables found in the two previous estimations are found in the case of the whole country. Nevertheless, the estimated coefficient on public transfers of this estimation approach is still negatively significant. This reaffirms that there is evidence of a crowding-out effect on public transfers in Thailand.

Table 3 Random Effect Probit Regressions

Dependent variable: Transfer receipt from nonmember of households

Regions :	(1)	(2)	(3)	(4)	(5)
<b>Variables :</b>					
Government transfer	-7.46e-06 (3.36e-06)***	-0.001 (5.41e-06)***	-3.82e-06 (5.22e-06)	-4.70e-06 (3.92e-06)	-1.41e-06 (8.94e-06)
Head_illness	-0.057 (0.172)	0.353 (0.253)	-0.504 (0.363)	-0.383 (0.421)	-0.809 (0.625)
Head_age	0.072 (0.014)***	0.061 (0.018)***	0.098 (0.035)***	0.031 (0.037)	0.073 (0.063)**
Head_age_squared	-0.001 (0.001)***	-0.001 (0.001)	-0.001 (0.001)*	-0.001 (0.001)	-0.001 (0.001)
Members_0_5	0.131 (0.051)***	0.155 (0.066)***	0.379 (0.127)***	0.121 (0.130)	-0.326 (0.171)**
Males_6_11	-0.041 (0.058)	-0.037 (0.077)	-0.119 (0.160)	0.058 (0.147)	-0.136 (0.162)
Females_6_11	0.080 (0.061)	0.070 (0.079)	0.141 (0.148)	-0.113 (0.159)	0.395 (0.223)**
Males_12_17	-0.285 (0.061)***	-0.359 (0.084)***	-0.329 (0.156)***	-0.031 (0.128)	-0.168 (0.176)
Females_12_17	-0.194 (0.062)***	-0.237 (0.086)***	-0.215 (0.138)	-0.125 (0.139)	-0.149 (0.218)
Males_primary	-0.348 (0.049)***	-0.382 (0.068)***	-0.550 (0.117)***	0.060 (0.116)	-0.323 (0.137)***
Females_primary	-0.034 (0.055)	-0.104 (0.081)	-0.038 (0.124)	0.001 (0.129)	0.056 (0.144)
Males_secondary	-0.288 (0.056)***	-0.315 (0.083)***	-0.245 (0.123)***	-0.055 (0.129)	-0.501 (0.155)***
Females_secondary	-0.142 (0.064)***	-0.214 (0.091)***	-0.439 (0.146)***	0.225 (0.144)	0.178 (0.185)
Males_postsecondary	-0.464 (0.090)***	-0.525 (0.146)***	-0.747 (0.183)***	-0.103 (0.184)	-0.199 (0.238)
Females_postsecondary	0.021 (0.074)	-0.173 (0.131)	0.112 (0.140)	0.073 (0.141)	0.086 (0.189)
Members_65up	0.005 (0.063)	-0.107 (0.096)	0.025 (0.136)	0.096 (0.129)	0.150 (0.174)
Year 2006	0.125 (0.052)***	-0.020 (0.073)	0.229 (0.114)***	0.832 (0.142)***	0.260 (0.155)*
Year 2007	0.371 (0.049)***	0.298 (0.069)***	0.557 (0.107)***	0.257 (0.131)**	0.471 (0.148)***

Cons	-3.699 (0.708)***	-2.544 (0.510)***	-4.150 (0.987)***	-1.994 (0.959)***	-4.369 (1.923)***
Number of observations	5650	2819	1325	745	761
Log likelihood	-3117.647	-1618.156	-699.799	-389.567	-361.616
F-test (provinces dummies insignificant)	223.870***	65.150***	23.440	38.720***	41.930***

- Notes:** 1.) All regions = (1), Northeast region = (2), North region = (3), South region = (4), and Central, East and West = (5)  
 2.) Standard errors in brackets under coefficients  
 3.) \* significant at 10 percent ; \*\* significant at 5 percent ; \*\*\*significant at 1 percent

Table 4 Random Effect Logit Regressions

Dependent variable: Transfer receipt from nonmember of households

Regions :	(1)	(2)	(3)	(4)	(5)
<b>Variables :</b>					
Government transfer	-0.001 (6.44e-06)***	-0.001 (0.001)	-8.42e-06 (0.001)	-7.93e-06 (6.81e-06)	-1.81e-06 (0.001)
Head_illness	-0.082 (0.294)	0.547 (0.488)	-1.131 (0.862)	-0.635 (0.708)	-1.402 (1.073)
Head_age	0.140 (0.027)***	-0.131 (0.062)***	0.176 (0.137)	0.059 (0.063)	0.136 (0.112)
Head_age_squared	-0.001 (0.001)***	0.001 (0.001)***	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Members 0_5	0.242 (0.087)***	0.102 (0.201)	-0.066 (0.410)	0.208 (0.224)	-0.528 (0.295)**
Males 6_11	-0.072 (0.100)	0.162 (0.260)	0.016 (0.606)	0.105 (0.259)	-0.249 (0.284)
Females 6_11	0.143 (0.104)	0.065 (0.274)	0.585 (0.607)	-0.183 (0.277)	0.684 (0.386)**
Males 12_17	-0.497 (0.106)***	-0.319 (0.275)	-0.082 (0.580)	-0.080 (0.225)	-0.292 (0.309)
Females 12_17	-0.353 (0.108)***	-0.554 (0.313)**	-0.188 (0.532)	-0.228 (0.244)	-0.287 (0.386)
Males_primary	-0.617 (0.084)***	-0.613 (0.201)***	-0.880 (0.369)***	0.090 (0.199)	-0.566 (0.241)***
Females_primary	-0.081 (0.095)	-0.223 (0.232)	-0.187 (0.404)	0.003 (0.224)	0.095 (0.252)
Males_secondary	-0.505 (0.097)***	-0.474 (0.219)***	-0.418 (0.359)	-0.105 (0.224)	-0.889 (0.275)***
Females_secondary	-0.269 (0.111)***	-0.362 (0.237)	-0.655 (0.378)**	0.391 (0.248)	0.315 (0.324)

Males_postsecondary	-0.802 (0.156)***	-0.438 (0.364)	-0.437 (0.567)	-0.166 (0.313)	-0.366 (0.414)
Females_postsecondary	0.023 (0.126)	0.230 (0.369)	0.081 (0.415)	0.128 (0.241)	0.158 (0.327)
Members_65up	0.013 (0.108)	-0.012 (0.348)	-0.603 (0.536)	0.162 (0.222)	0.263 (0.303)
Year 2006	0.215 (0.090)***	-0.085 (0.131)	0.561 (0.228)***	0.661 (0.243)***	0.445 (0.271)
Year 2007	0.629 (0.086)***	0.481 (0.128)***	1.219 (0.251)***	0.420 (0.228)**	0.811 (0.259)***
Cons	-6.714 (1.247)***	-	-	-3.539 (1.674)**	-7.758 (3.373)***
Number of observations	5650	2819	1325	745	761
Log likelihood	-3113.909	-410.623	-167.478	-389.485	-361.709
Hausman test's result	(Random Effect)	(Fixed Effect)	(Fixed Effect)	(Random Effect)	(Random Effect)
F-test (provinces dummies)	217.26***	-	-	36.920***	39.540***
insignificant					

**Notes:** 1.) All regions = (1), Northeast region = (2), North region = (3), South region = (4), and Central, East and West = (5)  
2.) Standard errors in brackets under coefficients  
3.) \* significant at 10 percent; \*\* significant at 5 percent; \*\*\*significant at 1 percent

## Discussion

As with households in developing countries, private transfers are one of the important informal insurance arrangements among households, especially poor households in Thailand. In the meantime, over the past decades, the Thai government has launched several public welfare programs, known as grass-roots or populist policies. These public transfers should actually increase the overall well-being of households, if they do not crowd-out private transfers. However, the private transfers model indicates that there is the possibility of a crowding-out effect for public transfers. This paper thus takes advantage of the three waves of Thai Socio-Economic Panel Survey for the period 2005-2007 to investigate the relationship between these two types of transfers.

The results from many econometric methods indicate that crowding-out exists but not in every region. Interestingly, the estimated coefficients of public transfers are negatively significant only in the Northeastern region and in the whole country's case. These results imply that the private transfers of some households in Thailand, especially households in the Northeastern region, will be mitigated when they find an increase in the well-being of other households due to public transfers. During the year 2001 to 2006, many populist policies under Prime Minister Thaksin Shinawatra were launched. This populist set of economic policies aimed at rural people, who are the majority of the country's population. The main projects created to the grass root sector include 30-Baht Health Care scheme, the Village Fund program, and the One Tambon

One Product program (OTOP) (Tangpianpat, 2010). Therefore, there exists evidence, which show the crowding-out effect of the government populist policies on private transfers in the Thai's rural society especially Northeastern region. Consequently, the government should be aware that the net effectiveness of public welfare programs may be weak on the distribution of well-being, and may increase social deadweight losses which come from the inefficient of income redistribution and crowding-out effect of public transfers on private transfers.

The study finds that household heads who are elderly and female members tend to receive any increase in private transfers. The gender effect is consistent with many studies of private transfers that find that transfers are excessively targeted toward female more than male. Kaufman and Lindauer (1986) find a positive relationship between transfers and female status. The reason for targeting transfers to female household members is related to the temporary migration of husband, who works at temporary jobs away from home in order to remit money to their wives and children. Another reason is that females tend to live longer than males and may receive a greater share of the old-age transfers. In addition, the private transfers are generally targeted toward elderly (Cox, Galasso and Jinimez, 2006). Retired adults older than 70 years do not provide any net private transfers, but neither do they rely on them as a significant source of economic support, especially family support. Cox and others (2006) find that there is a negative impact between the private old age support and the public pension system transfers. In addition, the elderly in most of the world need financial support, receiving it in the form of assistance from families rather than public pensions (Cox, 2003). The results also show that private transfers tend to target children less than sixed years old. The age pattern for private transfers in many studies indicate that they are more likely to occur during periods in which earnings are low, either when households are very young or very old-aged; and are less likely to occur when they are middle-aged (Cox, Eser and Jinimez, 1998). The key findings of this study confirm the Thailand data of the National Transfer Account in the year 2004, which find per capita value in household members, aged 0-19 years from public transfer and private transfer accounted for 12,934 and 33,031 baht, respectively. Per capita value in household members aged 20-64 years, from public transfer and private transfer, accounted for -6,747 and -17,834 baht, respectively. Lastly, per capita value in household members aged over 65 years, from public transfer and private transfer, accounted for -2,080 and 18,910 Baht, respectively. Therefore, in order to avoid dead-weight loss, the public welfares to the elderly, to the younger and to the female-headed households will be implemented with care.

## **Conclusion**

This study shows that there exists the empirical evidence of a crowding-out effect of the relationship between public and private transfers. Therefore, the implementation of public welfare programs from the Thai government should be more cautious. Some recommendations from the result of this study are proposed as follows. First, the government should avoid the use of the types of public transfer which crowd-out private

transfers, especially the implementation of public transfers, which produce a large amount of dead-weight loss. However, Morduch (1999) has indicated that public transfers can be complemented by private transfers, rather than displace private action to protect a household's welfare from adverse shocks. These public welfare policies, are mostly subject to indirect intervention, include promoting savings, providing a supportive setting for institutions working to improve credit, (such as microfinance institutions), implementing crop and health insurance, and employment guarantee schemes. Therefore, these policies should be implemented by the Thai government as an alternative welfare policy to avoid both the crowding-out of private transfers and the government expenditure's burden from direct public transfers.

Second, it should be noted that there are no significant transfers from non-member households to households in which the household head is ill. If the household head is the main earner of these households, it is possible that these households may face a troubled time. In addition, there is no guarantee for the amount of money receive from private transfers at the catastrophe period. Thus, the government should transfer either in-cash, or in-kind for these households, even if it results in the crowding-out effect. However, as mentioned earlier, public transfers can be complemented by private transfers. The government may find types of public welfare programs, which do not result in the crowding-out effect, or result in the least crowding-out effect in this case. Third, as old-age and child recipients are the main target of public transfer in Thailand, the government policies to support these people should be aware of the effect of crowding-out of public transfers on private transfers. Considering public welfares for the elderly, the Thai government should focus more on public transfer-in kind such as community care for the elderly, rather than direct public transfers in cash. Moreover, children are also targeted in both public and private transfers. The Thai government should provide support to increase family and community strengths in order to promote the welfare of children. In order to avoid any crowding-out effect, public transfers to children and older people should channelled back to the working age population through transfers to intergeneration intra-households.

Finally, even though this paper has shown that there exists some evidence of the crowding-out of public transfers on private transfers in Thailand. Due to the data limitations, this paper nevertheless uses only some type of private and public transfer data, and used only agricultural households as a proxy. This should limit the impact of public transfers on private transfers. To investigate more directly, future studies may examine separately the impact of any specific public transfer programs, for example, 30 baht universal health care, unemployment insurance, on private transfers. In addition, using the whole households in Thailand should portray more about the connection between public transfers and private transfers in Thailand.

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## Appendix

Table 1A Descriptive statistics of data set

	2005	2006	2007
<b>The proportion of agricultural households from the total samples</b>			
All regions	0.333	0.286	0.357
Northeast region	0.165	0.144	0.178
North region	0.078	0.067	0.084
South region	0.045	0.037	0.047
Central East and West	0.045	0.039	0.048
<b>The proportion of public transfers and private transfers in agricultural households</b>			
Private transfers	0.359	0.387	0.460
Public transfers	0.067	0.119	0.189