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# **The Impact of Social Security on Household Welfare: Evidence from a Transition Country**

Nguyen Viet Cuong

## **Abstract**

Although there is no doubt that social security can help poverty reduction, their effect on poverty reduction can vary for different situations. This paper uses fixed-effects regression to estimate the effects of social security transfers including contributory pensions and social allowances on consumption expenditure of receiving households, and subsequently investigates the impact of the social security transfers on poverty in Vietnam. It is found that both pensions and social allowances increase expenditure of households, especially expenditure on non-food consumption. Pensions have a higher effect on expenditure than social allowances. Pensions and social allowances reduce poverty of the recipients as well as the whole population.

JEL Classification: H55, I32, D63

Key words: Social security, pensions, social allowances, poverty, household welfare, Vietnam.

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## 1. Introduction

There is a broad consensus that economic growth is a necessary but not sufficient condition for poverty reduction. How strong a poverty-reducing effect economic growth has, depends on what happens to income distribution. Nowadays, many developing countries follow a pro-poor growth policy to promote both economic growth and poverty reduction. A strategy of pro-poor growth does not only focus on economic growth, but also affects the pattern of income distribution so that the poor can benefit from economic growth proportionally more than the rich, which will reduce the welfare gap between the poor and the rich, and finally eliminate poverty.<sup>1</sup> One of important policies of income redistribution is to provide social security transfers for the poor, vulnerable, and other targeted groups. Social security transfers are often provided in cash, but sometimes in kind or in vouchers. Cash transfers are relatively easy to deliver and allow the recipients to use cash in their optimal way.<sup>2</sup>

The important role of the social security transfers in improving household welfare can be found in a large number of studies. For example, empirical studies such as Barrientos and DeJong (2006), Maluccio (2005), Gertlert (2000), Behrman and Hoddinott (2000), Parker and Skoufias (2001), Skoufias and McClafferty (2001) show that programs providing conditional cash transfers help the recipients reduce child labor, increase child schooling, and improving nutrition and health. Positive effect of social security transfers on income and consumption are also found in Devereux (2002), Hoddinott (2000), Sadoulet et al. (2001), etc. Regarding impact on poverty, Morley and Cody (2003) find the Progresa program in Mexico helps the beneficiaries reduce the poverty gap by 36 percent.

However, the social transfers are not always a panacea for poverty reduction. There are several reasons why a social transfer program has negligible impact on poverty reduction. Firstly, there can be high leakage rate of social transfer programs. Any

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<sup>1</sup> For discussion of pro-poor growth, for example, see Bhagwati (1988), McKay (1996), World Bank (1996), Goudie and Ladd (1999), Kakwani and Ernesto (2000), Jörgen and Bigsten (2000), Perkins et al. (2001), etc.

<sup>2</sup> The advantage of cash transfer are discussed in DFID (2005), Farrington and Slater (2006), Barrientos and DeJong (2006), Gelan (2006).

program would have leakage problems, i.e., the program covers not only eligible but also ineligible people. For example, in the Progresa program which are often mentioned as a successful targeting program, the 60 percent richest of population receive 20 percent of program benefits (Barrientos and DeJong, 2006). The problem is also popular in developed countries. The poorest tend to receive less from social security program than the middle and the richest (Friedman and Friedman, 1979; Howe and Longman, 1992; Castles and Mitchell, 1993). Secondly, the receipt of social transfers can mitigate the incentive to work of the recipients. The recipients become too dependent on social assistance, and they can fall into poverty when not receiving assistance (Dreze, 2005; Sahn and Alderman; 1996). In an extreme situation, income of recipients of social transfer would have been lower than their income if they had not received the social transfers. In this case, the social transfers would have detrimental effects on the recipients' income and poverty reduction. Thirdly, there are some arguments that income redistribution can harm economic growth, thereby poverty reduction in the long run. For example, the Harrod-Domar model argues that economic development depends heavily on capital stock, and greater inequality would lead to higher growth rates.<sup>3</sup> Social transfers often require large funds from the State budget. As a result, the State can apply heavy or progressive taxation, which mitigate production and investment (Arrow, 1979; Lindbeck et al., 1994).

Vietnam has committed itself to follow the “*growth with equity*” strategy as a principle to the development. Vietnam has achieved high economic growth with the annual GDP growth rate of around 6 percent during over the past 10 years. The poverty incidence has been reduced remarkably from 58 to 16 percent between 1993 and 2006. The government of Vietnam has maintained an extensive social security system. There are several studies aiming to measure the effect of social security on household welfare. Van de Wall (2002) examined the poverty targeting and impact of Vietnam's public safety net on the poverty incidence using Vietnam Living Standard Surveys (VLSS) 1993 and 1998. She found that social insurance and subsidies did not reach the poor well. The percentage of households receiving benefits was very similar in expenditure quintiles. For example, around 9.5 and 11.6 percent of the poorest (the lowest expenditure quintile)

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<sup>3</sup> See Domar (1946) and Harrod (1939).

received social insurance and subsidies in 1998, respectively. Meanwhile, these figures for the richest (the highest expenditure quintile) were 13.9 and 7.3 percent. Social transfers helps to reduce the poverty incidence by around 2.8 percentage points. Evan et al. (2006) measure the impact of social transfers by comparing poverty rates with social transfers and poverty rates based on counterfactual expenditures which were calculated by subtracting social transfers from the actual expenditures. They find that all types of social security transfers reduce the poverty incidence by 4.6 percent. Van den Berg and Nguyen (2011) measure the effect of total public transfers on household income and poverty. They find a large positive effect on income and consumption but a little effect of public transfers on poverty reduction.

The objective of the paper is to examine how well social security including pensions and social allowances reach the poor and to which extent these social security transfers affect household consumption and poverty in Vietnam. Unlike Van den Berg and Nguyen (2010) which consider the effect of all the public transfers, we estimate the effect of pensions and social allowances separately. In addition, we consider the effect of pensions and social allowances on expenditures and share of expenditures on different items including rice, non-rice food, health and education, durables and other non-foods. Data used in this paper are from two Vietnam Household Living Standard Surveys 2004 and 2006.

The paper is structured into 5 sections. The second describes data source, social security system in Vietnam. The third section presents the method to measure the impact of social transfers. Next, the fourth section presents the empirical findings on transfer impact. Finally, the fifth section concludes.

## **2. Pensions and social allowances in Vietnam**

The study relies on data from the two Vietnam Household Living Standard Surveys (VHLSS), which were conducted by the General Statistics Office of Vietnam (GSO) with technical support from the World Bank (WB) in the years 2004 and 2006. The 2004 and 2006 VHLSSs covered 9189 and 9188 households, respectively. The samples are

representative for the national, rural and urban, and regional levels. The 2004 and 2006 VHLSSs set up a panel of 4216 households, which are representative for the whole country, and for the urban and rural population.

The surveys contain household and commune data. Household data include basic demography, employment and labor force participation, education, health, income, expenditure, housing, fixed assets and durable goods, participation of households in poverty alleviation programs, and especially information on pensions and social allowances that households had received during the 12 months before the interview. Data on commune characteristics consist of demography and general situation of communes, general economic conditions and aid programs, non-farm employment, agriculture production, local infrastructure and transportation, education, health, and social affairs. However, the commune data are only available for rural areas.

According to VHLSSs, the proportion of people with per capita expenditure under the poverty line dropped dramatically from 58 percent in 1993 to 37 percent in 1998. The poverty rate continued to decrease to 20 and 16 percent in 2004 and 2006, respectively. However, the poverty rate remains rather high in rural areas, at 20 percent in 2006.<sup>4</sup>

One of important policies on poverty reduction is the social security net. In Vietnam, the social security net includes a large number of programs which can be divided into two types. The first one can be called social insurance which is based on a contribution scheme. To receive benefits from the social insurance, beneficiaries have to contribute to the budget of the social insurance. The social insurance consists of mandatory health insurance and pensions. The health insurance has been operated by Vietnam Health Insurance since 1995 (Evans et al., 2006). The pensions have been implemented by Vietnam Social Insurance since 1962 (Giang, 2004). However, before 1995 it covered only the State sector. After that the pensions have been expanded to covers the employees from the state-owned enterprises and private ones. Both health insurance and pensions are compulsory for employees in State organizations, State-owned enterprises, and private enterprises with ten employees or more. Employers

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<sup>4</sup> In this study, a household is classified as poor if their per capita expenditure is below the poverty line which is set up by WB and GSO. The poverty line is equivalent to the expenditure level that allows for nutritional needs and some essential non-food consumption such as clothing and housing. The poverty lines in the years 2004 and 2006 are equal to 2077 and 2560 thousands VND, respectively.

deduct a portion of employees' monthly salary to pay contributions to the social insurance. Thus, this scheme is also called the pay-as-you-go basis. In this paper, we are interested in the evaluation of pensions. Pensions include several types of benefits, i.e., maternity benefits, sickness assistances, assistances for industrial injury and occupation diseases, payments for job loss and redundancy, monthly pensions, and death benefits. Most of pension benefits are paid in cash.<sup>5</sup>

The second type of the social security in Vietnam is the assistances and supports from the government and other organizations and enterprises, both domestic and international, to reduce economic shocks and poverty. The most important policies of the social assistances are the National Targeted Programs (NTP) and the social allowances. The NTPs are conducted by the government with the objective to reduce poverty. The NTPs provide the poor with several support programs such as education, health, production, construction of infrastructure, etc. The social allowances are the supports to some groups with difficulties such as war invalids, people with merit to the country during the war, old people and children who do not have someone to take care, people losing working capacity, and households adversely affected by natural calamities. Most of the social allowances are in form of cash. In some cases, the supports can be in kind such as food, clothes, production inputs and materials for housing repairs, etc.<sup>6</sup> In this paper, we investigate the poverty targeting and the impact of social allowances.<sup>7</sup>

It should be noted that if pensions and social allowances are provided for households in kind, VHLSS will report their equivalent values. Of course, households cannot have absolutely accurate valuation of received goods. However, the value of in-kind transfers account for a negligible proportion of the total transfers.

If the poor receive larger pensions and social allowances, the effect of pensions and social allowances on poverty reduction will be higher. Table 1 presents the receiving of pensions by the poor and non-poor in 2004 and 2006. The coverage of pensions was almost unchanged during the period 2004-2006. There were around 10 percent of

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<sup>5</sup> For more information on the pension scheme in Vietnam, see Government, 1993a, 1993b, 1995, 1998 and 2003.

<sup>6</sup> For more information on the social allowances in Vietnam, see Government, 1993b, 2003.

<sup>7</sup> We do not evaluate programs under the NTPs. Since there are many programs, and the treatments of these program cannot be added (not in form of cash).

households receiving pensions. The proportion of pensions-receiving households for the poor was lower than that for the non-poor. In 2004 and 2006, the percentage of the poor receiving transfers was 3.4 and 2.6 percent, respectively. Meanwhile, these figures for the non-poor were 12.8 and 11.6 percent in 2004 and 2006, respectively. As a result, the non-poor accounted for a very large proportion of the pension-receiving households, at 94.8 and 96.6 percent in 2004 and 2006, respectively.

In addition, the non-poor received a higher amount of pensions than the poor, and the difference in the pensions between the poor and non-poor tended to be higher during the period 2004-2006. The percentage of pensions over household income for the poor was a bit higher than for the non-poor.

Table 1: Pensions of the poor and non-poor

Indicators	2004			2006		
	Poor	Non Poor	All	Poor	Non Poor	All
% receiving households	3.4 [0.5]	12.8 [0.5]	11.2 [0.4]	2.6 [0.5]	11.6 [0.5]	10.4 [0.4]
Transfer amount* (thousand VND)	3917.8 [353.9]	8478.0 [226.9]	8241.9 [219.5]	4921.3 [574.2]	11825.5 [336.0]	11591.9 [329.3]
Distribution of receiving households	5.2 [0.7]	94.8 [0.7]	100	3.4 [0.6]	96.6 [0.6]	100
Distribution of transfer amount	2.5 [0.4]	97.5 [0.4]	100	1.4 [0.3]	98.6 [0.3]	100
% of transfers over household income	34.9 [2.6]	29.5 [1.0]	29.6 [1.0]	36.7 [4.2]	35.7 [1.3]	35.7 [1.3]

Note: \* in the price of 2004.  
 Figures in brackets are standard errors. Standard errors are corrected for sampling weight and cluster correlation.  
 Source: Estimation from VHLSSs 2004 and 2006.

The amount and distribution of social allowances across the poor and non-poor are presented in Table 2. In contrast to pensions, social allowances were more pro-poor. In 2004 and 2006, there were 25.4 and 25.6 percent of the poor households receiving social allowances, respectively. The proportion of the non-poor receiving allowances is 10.3 and 12.4 percent for 2004 and 2006, respectively.

Table 2: Social allowances of the poor and non-poor

Indicators	2004			2006		
	Poor	Non Poor	All	Poor	Non Poor	All
% receiving households	25.4 [1.3]	10.4 [0.4]	13.0 [0.4]	25.6 [1.4]	12.4 [0.4]	14.2 [0.4]
Transfer amount* (thousand VND)	589.1 [50.1]	1508.9 [66.1]	1202.1 [50.5]	1028.7 [110.9]	2673.7 [106.9]	2272.1 [89.1]



Indicators	2004			2006		
	Poor	Non Poor	All	Poor	Non Poor	All
Distribution of receiving households	33.4 [1.5]	66.6 [1.5]	100	24.4 [1.4]	75.6 [1.4]	100
Distribution of amount	16.4 [1.6]	83.7 [1.6]	100	11.1 [1.3]	89.0 [1.3]	100
% of transfers over household income	7.5 [0.8]	7.8 [0.5]	7.7 [0.4]	10.1 [1.4]	11.8 [0.5]	11.7 [0.5]

Note: \* in the price of 2004.  
Figures in brackets are standard errors. Standard errors are corrected for sampling weight and cluster correlation.  
Source: Estimation from VHLSSs 2004 and 2006.

However, the poor received smaller average social allowances than the non-poor. The average amount of social allowances received by the poor and non-poor households was 1029 and 2674 thousand VND in 2006, respectively. As a result, the non-poor accounted for 75.6 percent of allowance-receiving households, but 89 percent of the total amount of allowances in 2006.

Table 3 presents per capita expenditure and poverty of households with and households without pensions. It shows that pension-receiving households have higher expenditure and lower poverty than non-receiving households. As expected, expenditure share on foods, both rice and non-rice, is lower for the recipients than the non-recipients. The expenditure share on education and health, durables and other non-food items is for the pension recipients than the non-recipients.

Unlike the pension-receiving households, households receiving social allowances have lower expenditure and higher poverty than those not receiving allowances (Table 4). Households receiving social allowances have lower expenditure share on food but higher expenditure share on non-food items than households not receiving allowances.

Table 3: Expenditure and poverty of households receiving and not receiving pensions

	2004		2006	
	Household with pensions	Household without pensions	Household with pensions	Household without pensions
Per capita expenditure *	6451.0 [324.6]	4356.4 [124.0]	7873.6 [502.7]	4980.9 [132.7]
<i>Per capita expenditure on the following items</i>				
Rice	467.5 [9.5]	450.9 [4.6]	483.5 [10.3]	493.9 [5.3]
Non-rice food	1987.5	1399.3	2439.0	1697.0

	2004		2006	
	Household with pensions	Household without pensions	Household with pensions	Household without pensions
	[95.7]	[39.6]	[116.6]	[42.2]
Durables	857.9	513.7	1229.9	514.5
	[66.6]	[19.7]	[317.6]	[16.7]
Health and education	728.8	544.0	779.7	543.6
	[43.3]	[25.3]	[57.9]	[19.3]
Other non-food items	2409.2	1448.6	2941.5	1731.8
	[170.5]	[57.3]	[214.4]	[71.7]
<i>Share of expenditure on the following items</i>				
Rice	0.1078	0.1531	0.0901	0.1436
	[0.0048]	[0.0034]	[0.0042]	[0.0031]
Non-rice food	0.3273	0.3407	0.3413	0.3607
	[0.0055]	[0.0028]	[0.0065]	[0.0026]
Durables	0.1195	0.0995	0.1181	0.0925
	[0.0038]	[0.0017]	[0.0049]	[0.0014]
Health and education	0.1176	0.1102	0.1101	0.1014
	[0.0054]	[0.0021]	[0.0074]	[0.0019]
Other non-food items	0.3277	0.2965	0.3404	0.3018
	[0.0067]	[0.0031]	[0.0085]	[0.0034]
<i>Poverty indexes</i>				
Poverty rate (P0)	0.0571	0.1896	0.0316	0.1434
	[0.0114]	[0.0098]	[0.0096]	[0.0089]
Poverty gap index (P1)	0.0132	0.0457	0.0074	0.0336
	[0.0033]	[0.0030]	[0.0026]	[0.0026]
Squared poverty gap index (P2)	0.0047	0.0165	0.0025	0.0118
	[0.0015]	[0.0013]	[0.0010]	[0.0011]

Note: All expenditure figures are in thousand VND \* in the price of 2004. Expenditure figures are per capita, that is 'Household expenditure divided by household size'. Figures in brackets are standard errors.

Although the poor also received pensions and social allowances, the non-poor received much higher amount of pensions and social allowances. However this targeting analysis does not take into account that consumption that is used to define the poor and non-poor can be affected already by pensions and social allowances. Some non-poor can be poor without pensions and social allowances. It is expected that transfers can help poverty reduction. The issues of impact evaluation of pensions and social allowances on household welfare and poverty will be discussed in the following sections.<sup>8</sup>

<sup>8</sup> Table A.1 and A.2 in Appendix presents means and standard deviations of characteristic variables of households with and without transfers.

Table 4: Expenditure and poverty of households receiving and not receiving allowances

	2004		2006	
	Household with allowances	Household without allowances	Household with allowances	Household without allowances
Per capita expenditure *	3326.2 [126.0]	4795.2 [143.1]	4355.5 [182.6]	5423.9 [160.9]
<i>Per capita expenditure on the following items</i>				
Rice	447.8 [6.3]	453.5 [4.9]	493.3 [7.6]	492.8 [5.5]
Non-rice food	1109.0 [38.7]	1522.7 [44.9]	1506.5 [58.0]	1816.1 [47.5]
Durables	323.4 [26.4]	589.4 [23.4]	391.8 [20.5]	618.3 [43.4]
Health and education	394.6 [28.3]	592.6 [26.7]	508.9 [43.5]	576.8 [20.2]
Other non-food items	1051.5 [63.5]	1637.0 [67.8]	1455.1 [98.2]	1919.9 [82.8]
<i>Share of expenditure on the following items</i>				
Rice	0.1963 [0.0065]	0.1400 [0.0033]	0.1657 [0.0053]	0.1335 [0.0031]
Non-rice food	0.3528 [0.0053]	0.3370 [0.0027]	0.3652 [0.0055]	0.3577 [0.0027]
Durables	0.0770 [0.0031]	0.1058 [0.0017]	0.0820 [0.0026]	0.0973 [0.0015]
Health and education	0.1041 [0.0046]	0.1121 [0.0021]	0.1014 [0.0047]	0.1024 [0.0020]
Other non-food items	0.2698 [0.0053]	0.3050 [0.0032]	0.2857 [0.0060]	0.3091 [0.0036]
<i>Poverty indexes</i>				
Poverty rate (P0)	0.3472 [0.0247]	0.1461 [0.0085]	0.2424 [0.0212]	0.1126 [0.0080]
Poverty gap index (P1)	0.1118 [0.0104]	0.0304 [0.0021]	0.0655 [0.0077]	0.0248 [0.0023]
Squared poverty gap index (P2)	0.0483 [0.0055]	0.0096 [0.0009]	0.0257 [0.0041]	0.0082 [0.0009]
Note: All expenditure figures are in thousand VND * in the price of 2004. Expenditure figures are per capita, that is 'Household expenditure divided by household size'. Figures in brackets are standard errors.				

### 3. Impact evaluation method

#### *The impact on household expenditure*

To assess the impact of the receiving of pensions and allowances, we assume income or consumption can be specified as follows:

$$\ln(Y_{it}) = \beta_0 + T_t\beta_1 + X_{it}\beta_2 + D_{it}\beta_3 + v_i + u_{it}, \quad (1)$$

where  $\ln(Y_{it})$  is logarithm of expenditures per capita of household  $i$  at time  $t$ .  $T_t$  is a year dummy, with a one for 2006; This dummy variable enables to control for common macroeconomic changes between the two years.  $X$  is a vector of household and community level control variables.  $D$  is a vector of two dummy variables indicating whether a household obtain pensions and social allowances.  $v_i$  and  $u_{it}$  are unobserved variables which are time-invariant and time-variant, respectively.<sup>9</sup>

In addition to the impact on household welfare indicators, we also the impact of remittances on the consumption pattern of households. Following Adams (2005) and Adams and Cuecuecha (2010), we start with the Engel function:

$$C_{ij} = \alpha_j + \delta_j Y_i + \eta_j(Y_i) \log(Y_i) \quad (2)$$

where  $C_{ij}$  is the expenditure on item  $j$  of household  $i$ .  $Y_i$  is the total expenditure, and  $Y_i = \sum_j C_{ij}$ . Then the share of expenditure on item  $j$  in the total expenditure is expressed as follows:

$$\frac{C_{ij}}{Y_i} = \frac{\alpha_j}{Y_i} + \delta_j + \eta_j \log(Y_i) \quad (3)$$

To examine whether receipts of pensions and allowances can change the expenditure share, we add these variables, other control variables, the time variables to equation (3) as follows:

$$\frac{C_{ijt}}{EXP_{it}} = \frac{\alpha_j}{Y_{it}} + \delta_j + \eta_j \log(Y_{it}) + T_t\alpha_j + X_{it}\beta_j + D_{it}\gamma_j + \pi_{ij} + \varepsilon_{ijt} \quad (4)$$

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<sup>9</sup> We do not use the transfer size as the intervention variable, since the transfer size is continuous variable, and the semi-log function of consumption will impose an unrealistic assumption on the increasing marginal impact of transfers on consumption. We do not use the logarithm of transfers in the right-hand side, since there are many households without transfers, and taking logarithm of zero returns missing values. In addition, using the dummy variable of transfer receipt can reduce measurement error of transfer data.

The marginal effect of the receipts of pensions and allowances on the share of expenditure on item  $j$  is measured by parameter  $\gamma_j$ .

The main problem in estimating the equation is the endogeneity of transfer receipt. Receipt of pensions as well as social allowances can be correlated with unobserved characteristics of households. In this study, we use fixed-effect regressions to reduce endogeneity bias. Fixed-effects regressions assume that unobserved variables which are correlated with the receipt of pensions as well as social allowances are time-invariants. By transformation of data, fixed-effects model remove these time-invariant unobserved variables ( $v_i$  in equation (1) and  $\pi_{ij}$  in equation (4)).

### *The impact on expenditure poverty*

In this paper, poverty is measured by three Foster-Greer-Thorbecke poverty indexes which can all be calculated using the following formula (Foster, Greer and Thorbecke, 1984). Since poverty indexes are not a continuous function of expenditure, we cannot estimate the effect of pensions and allowances on poverty indexes by deriving the derivative of poverty index with respect to the variable of pensions and allowances. However, we can measure the impact of pensions and social allowance receipt on a poverty index  $P_t$  of the recipients at the time  $t$  using as the follow formula:

$$\Delta P_{t(D=1)} = P_t(Y_1 | D = 1) - P_t(Y_0 | D = 1), \quad (5)$$

where  $Y_1$  and  $Y_0$  denote the expenditure of the transfer-receiving households in the presence and absence of the transfers, respectively. Suppose we measure the effect of pension receipt, and  $D$  denotes the receipt of pensions. The effect of allowance receipt is estimated using the same estimation strategy. The first term in the right-hand side of (5) is the poverty measure of the receiving households with pensions, and this term is observed and estimated directly from the data. The second term in the right-hand side of (5) is the counterfactual measure of poverty, *i.e.*, the poverty index of the receiving households if they had not received pensions. This term is not observed directly, and it is

estimated using the estimated parameters in equation (1). Using equation (1), the observed expenditure of household  $i$  at time  $t$  can be expressed as follows:

$$Y_{it} = \exp(\hat{\beta}_0 + T_t \hat{\beta}_1 + X_{it} \hat{\beta}_2 + D_{it} \hat{\beta}_3 + \hat{v}_i + \hat{u}_{it}), \quad (6)$$

where the ‘hat’ parameters denote the estimators of the corresponding parameters, and ‘exp’ denotes the exponential function. Expenditure of a household, who received pensions (or allowances), in the absence of the pensions (or allowances) is estimated by substituting zero for the  $D$  variable:

$$\hat{Y}_{it} = \exp(\hat{\beta}_0 + T_t \hat{\beta}_1 + X_{it} \hat{\beta}_2 + \hat{v}_i + \hat{u}_{it}) \quad (7)$$

Adding and subtracting  $D_{it} \hat{\beta}_3$  in equation (7) and after simple algebra, we can get:

$$\begin{aligned} \hat{Y}_{it} &= \exp\left[(\hat{\beta}_0 + T_t \hat{\beta}_1 + X_{it} \hat{\beta}_2 + \hat{v}_i + \hat{u}_{it}) + D_{it} \hat{\beta}_3 - D_{it} \hat{\beta}_3\right] \\ &= \exp\left[\ln(Y_{it}) - D_{it} \hat{\beta}_3\right] \\ &= Y_{it} \exp(-D_{it} \hat{\beta}_3) \\ &= Y_{it} \exp(-\hat{\beta}_3). \end{aligned} \quad (8)$$

The last line of equation (8) comes from the fact that households receiving pensions have observed value of the  $D$  variable equal to 1. We can use  $\hat{Y}_{it}$  to estimate  $P_t(Y_0 | D = 1)$  - the poverty index of the receiving households in the absence of pensions.

It is possible to estimate the impact of the receipt of pensions or social allowances on the total poverty as follows:

$$\Delta P_t = P_t(Y) - P_t(Y_0), \quad (9)$$

where  $P(Y)$  is the observed poverty index of all population (in which the recipients received pensions or allowances), and  $P(Y_0)$  is the poverty index of all population if the recipients had not received the pensions or social allowances. It should be noted that (9) is different from the effect on poverty if all the households receive pensions (or allowances):

$$\Delta P_t^{ALL} = P_t(Y_1) - P_t(Y_0), \quad (10)$$

where  $P_i(Y_1)$  is the poverty indexes if all the households receive pensions or allowances. In this study, we do not estimate (10) since it is unrealistic that pensions as well as allowances are provided for all the households at a point of time.

We estimate the standard error of the estimates of the impact on poverty indexes by using a non-parametric bootstrap technique.<sup>10</sup>

#### **4. Results of impact estimation**

In this section, we present empirical findings on the impact pensions and social allowances on expenditure pattern and poverty using the fixed-effect regression. Dependent variables include per capita expenditure and expenditure share on food and non-food items. The explanatory variables in regressions include demography, household land, education, and availability of car road to villages. The list of the explanatory variables is presented in Table A.1 and A.2. It should be noted that the explanatory variables should not be affected by the transfers (Heckman et al. 1997). Time-invariants variables are removed by fixed-effects regressions. Thus variables such as urbanity or regional dummies are not included. The full regression results are reported in Tables A.3 and A.4 of Appendix. Tables 5 and 6 present only the estimated coefficient of the pension and allowance receipt.

Table 5 shows that receiving pensions and allowances increases per capita expenditure by around 6 percent and 3.4 percent, respectively. The average expenditure of households receiving pensions and social allowances is 7873.6 and 4355.5 thousand VND, respectively. Thus the effect of the receipt of pensions and allowances on expenditure of the receiving household is around 472 and 148 thousand VND, respectively.

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<sup>10</sup> This bootstrap is implemented by repeatedly drawing samples from the original sample of the VHLSS panel data. Since the VHLSSs sample selection follows stratified random cluster sampling, communes instead of households are bootstrapped in each stratum (Deaton, 1997). The bootstrap is made of communes (*i.e.*, clusters) within provinces. The number of replications is 500.

The receipt of pensions mainly increases non-food consumption including health care and education, and other non-food consumption excluding durables. It should be noted that we combine expenditure on health and expenditure on education so that the variable of spending on health and expenditure is larger than 0 for all households and we can get log of this variable. The receipt of allowances reduces the rice consumption but increases the non-rice food consumption. It also increases non-food consumption including health care and education, and other non-food consumption excluding durables.

Table 5: Impacts of the receipt of pensions and allowances on per capita expenditure

Explanatory variables	Dependent variables					
	Logarithm of per capita expenditure	Log of per capita expenditure on rice	Log of per capita expenditure on non-rice food	Log of per capita expenditure on durables	Log of per capita expenditure on health and education	Log of per capita expenditure on other non-food items
Receiving of pensions (yes=1)	0.0598** [0.0294]	-0.0223 [0.0308]	0.0419 [0.0403]	-0.0486 [0.0631]	0.0775* [0.0443]	0.2332* [0.1295]
Receiving of allowances (yes=1)	0.0339** [0.0154]	-0.0320* [0.0174]	0.0666*** [0.0238]	-0.0349 [0.0430]	0.0208* [0.0122]	0.1401** [0.0662]
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8432	8438	8438	8438	8438	8438
R-squared	0.19	0.04	0.19	0.05	0.12	0.01

Robust standard errors in brackets.  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.  
Source: Estimation from panel data VHLSSs 2004-2006.

Table 6 shows the effect of pensions and allowances on expenditure shares. Receiving pensions does not have a statistically significant effect on expenditure shares. However, receiving allowances change the expenditure pattern of households. More specifically, it reduces the share of expenditure on rice and durables, but increases the expenditure share on non-rice food consumption.

Table 6: Impacts of the receipt of pensions and allowances on share of expenditure on different items

Explanatory variables	Dependent variables				
	Share of expenditure on rice	Share of expenditure on non-rice food	Share of expenditure on durables	Share of expenditure on health and education	Share of expenditure on other non-food items
Receiving of pensions (yes=1)	-0.0027 [0.0047]	-0.0019 [0.0090]	-0.0083 [0.0053]	0.0029 [0.0095]	0.0100 [0.0105]



Explanatory variables	Dependent variables				
	Share of expenditure on rice	Share of expenditure on non-rice food	Share of expenditure on durables	Share of expenditure on health and education	Share of expenditure on other non-food items
Receiving of allowances (yes=1)	-0.0058** [0.0026]	0.0146** [0.0059]	-0.0038* [0.0027]	-0.0039 [0.0056]	0.0004 [0.0054]
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	8438	8438	8438	8438	8438
R-squared	0.39	0.08	0.04	0.09	0.10

Robust standard errors in brackets.  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.  
Source: Estimation from panel data VHLSSs 2004-2006.

Table 7 presents the estimates of pensions' impact on poverty of the population. It shows that pensions contribute to poverty reduction of the recipients. All the estimates are statistically significant. Pensions reduce the poverty incidence (P0) for the recipients by around 2.7 and 1.1 percentage points for 2004 and 2006. They also decrease the poverty gap index (P1) and poverty severity index. In 2006, pensions helped the recipients decrease the poverty gap index (P1) by around 17 percent and poverty severity index (P2) by around 20 percent. The effect of pensions on the total poverty was very small, since pensions covered only around 3 percent of the poor households.

Table 7: The impact of pensions on poverty

	2004			2006		
	With pensions	Without pensions	Impact	With pensions	Without pensions	Impact
<b>Poverty of recipients</b>						
P0	0.0628*** [0.0085]	0.0893*** [0.0161]	-0.0265** [0.0133]	0.0439*** [0.0078]	0.0550*** [0.0102]	-0.0110** [0.0056]
P1	0.0131*** [0.0023]	0.0167*** [0.0034]	-0.0036* [0.0019]	0.0114*** [0.0023]	0.0138*** [0.0029]	-0.0024* [0.0013]
P2	0.0042*** [0.0010]	0.0054*** [0.0014]	-0.0012* [0.0007]	0.0040*** [0.0010]	0.0049*** [0.0012]	-0.0010* [0.0006]
<b>All poverty</b>						
P0	0.1949*** [0.0057]	0.1977*** [0.0059]	-0.0028** [0.0014]	0.1597*** [0.0059]	0.1608*** [0.0060]	-0.0011* [0.0006]
P1	0.0472*** [0.0019]	0.0476*** [0.0019]	-0.0004** [0.0002]	0.0383*** [0.0019]	0.0385*** [0.0019]	-0.0002* [0.0001]
P2	0.0170*** [0.0009]	0.0171*** [0.0009]	-0.0001* [0.0001]	0.0137*** [0.0009]	0.0138*** [0.0009]	-0.0001* [0.0001]

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Figures in brackets are standard errors.

Standard errors are corrected for sampling weights and estimated using bootstrap (non-parametric) with 500 replications.

Source: Estimation from VHLSSs 2004 and 2006.

The impact estimation of social allowances is presented in Table 8. Estimates of impact on the poverty incidence are statistically significant at the 10% level. The receipt of social allowances reduced the poverty incidence of the recipients by around 2.3 and 1.7 percentage points in 2004 and 2006, respectively. Social allowances also helped the recipients decrease their poverty gap and poverty severity.

Table 8: Impact of social allowances on poverty

	2004			2006		
	With transfers	Without transfers	Impact	With transfers	Without transfers	Impact
<b>Poverty of recipients</b>						
P0	0.3850*** [0.0178]	0.4083*** [0.0250]	-0.0233* [0.0151]	0.3037*** [0.0180]	0.3202*** [0.0218]	-0.0166* [0.0098]
P1	0.1169*** [0.0073]	0.1241*** [0.0096]	-0.0072* [0.0043]	0.0865*** [0.0080]	0.0924*** [0.0093]	-0.0059* [0.0035]
P2	0.0488*** [0.0040]	0.0525*** [0.0051]	-0.0037* [0.0021]	0.0352*** [0.0046]	0.0380*** [0.0052]	-0.0028* [0.0016]
<b>All poverty</b>						
P0	0.1949*** [0.0057]	0.1981*** [0.0060]	-0.0032* [0.0019]	0.1597*** [0.0059]	0.1623*** [0.0062]	-0.0026* [0.0015]
P1	0.0472*** [0.0019]	0.0482*** [0.0020]	-0.0010* [0.0006]	0.0383*** [0.0019]	0.0392*** [0.0021]	-0.0009* [0.0006]
P2	0.0170*** [0.0009]	0.0175*** [0.0010]	-0.0005* [0.0003]	0.0137*** [0.0009]	0.0141*** [0.0010]	-0.0004* [0.0002]

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Figures in brackets are standard errors.

Standard errors are corrected for sampling weights and estimated using bootstrap (non-parametric) with 500 replications.

Source: Estimation from VHLSSs 2004 and 2006.

Social allowances also contribute to reduction of the total poverty. It is interesting that the impacts of social allowances on total poverty reduction are higher than the impacts of pensions. This is because social allowances cover a larger proportion of the poor than pensions.

## 5. Conclusions

Social security transfers are often mentioned as important external sources of income for the poor and vulnerable household to cope with socioeconomic shocks and to get rid of poverty. Using data from the household surveys, we investigate how well contributory

pensions and social assistance allowances reach the poor and to which extent these transfers affect household expenditure and poverty.

It is found that the non-poor households tended to receive larger pensions than the poor households. This is because pensions are based on the contributory scheme. Only people who worked in formal sectors can have pensions, and the non-poor are more likely to have formal jobs than the poor. Only 2.6 percent of the poor households received pensions in 2006, while this figure for the non-poor was 11.6 percent. In contrast, social allowances reached the poor better than pensions. The proportion of households receiving social allowances was 25.6 and 12.4 percent for the poor and non-poor households, respectively. Regarding the average amount of transfers, the non-poor received higher amount of transfers, both pensions and allowances, than the poor.

To measure impact of pensions and social allowances, we apply the fixed-effect regression using panel data. It is showed that the receipt of pensions and allowances increases per capita expenditure by around 6 percent and 3.4 percent, respectively. The effect of pensions was much larger than that of social allowances, since the average amount of pensions was substantially larger than the average amount of social allowances. Interestingly, pensions and allowances mainly increase expenditure on health care, education and non-food consumption excluding durables. Social allowances also have a positive effect on non-rice consumption but a negative effect on rice consumption.

Compared with social allowances, recipients of pensions were more successful in getting rid of poverty. Pensions reduced the poverty incidence (P0) for the recipients by around 2.7 and 1.1 percentage points in 2004 and 2006, respectively. They also decreased both the poverty gap index (P1) and poverty severity index (P2) of the recipients by around 17 and 20 percent in 2006.

Meanwhile, impact estimates of social allowances on the poverty incidence are also negative and statistically significant. The receipt of social allowances reduced the poverty incidence of the recipients by around 2.3 and 1.7 percentage points in 2004 and 2006, respectively. Social allowances also helped the recipients decreased their poverty gap and poverty severity.

Pensions as well as social allowances also contribute to reduction of the total poverty. It is interesting that the impacts of social allowances on total poverty reduction are higher than the impacts of pensions. This is because social allowances cover a larger proportion of the poor than pensions. Since the coverage of pensions and social allowances is rather small, their impacts on total poverty are very small.

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## Appendix

Table A.1: Descriptive statistics of households with and without pensions

Variables	Type	2004		2006	
		Household with pensions	Household without pensions	Household with pensions	Household without pensions
<u>Household variables</u>					
Ratio of members younger than 16 to total household members	Continuous	0.1032 [0.0071]	0.2534 [0.0045]	0.0966 [0.0075]	0.2209 [0.0041]
Ratio of members older than 60 to total household members	Continuous	0.2581 [0.0156]	0.1077 [0.0043]	0.2770 [0.0177]	0.1188 [0.0044]
Ratio of female members to total household members	Continuous	0.5071 [0.0084]	0.5135 [0.0036]	0.5138 [0.0092]	0.5176 [0.0034]
Household size	Discrete	4.0446 [0.0900]	4.3894 [0.0372]	3.9100 [0.0992]	4.2781 [0.0371]
Ratio of members with technical degree to total household members	Continuous	0.1894 [0.0142]	0.0512 [0.0030]	0.2235 [0.0148]	0.0544 [0.0029]
Ratio of members with post secondary to total household members	Continuous	0.1027 [0.0129]	0.0231 [0.0028]	0.1303 [0.0155]	0.0253 [0.0027]
Area of annual crop land per capita (m2)	Continuous	0.4175 [0.0450]	0.7222 [0.0346]	0.3125 [0.0380]	0.7977 [0.0443]
Area of perennial crop land per capita (m2)	Continuous	0.1212 [0.0406]	0.2204 [0.0259]	0.1457 [0.0370]	0.2529 [0.0275]
<u>Commune variables</u>					
Car road to village (yes = 1)	Binary	0.5260 [0.0369]	0.6225 [0.0184]	0.4954 [0.0372]	0.6694 [0.0179]
Observations		438	3778	432	3784
Standard errors in parentheses. Source: Estimation from VHLSSs 2004-2006.					

Table A.2: Descriptive statistics of households with and without allowances

Variables	Type	2004		2006	
		Household with allowances	Household without allowances	Household with allowances	Household without allowances
<u>Household variables</u>					
Ratio of members younger than 16 to total household members	Continuous	0.2648 [0.0104]	0.2326 [0.0045]	0.2276 [0.0103]	0.2042 [0.0041]
Ratio of members older than 60 to total household members	Continuous	0.1600 [0.0118]	0.1177 [0.0047]	0.1836 [0.0128]	0.1271 [0.0047]
Ratio of female members to total household members	Continuous	0.5301 [0.0085]	0.5098 [0.0036]	0.5328 [0.0086]	0.5145 [0.0036]
Household size	Discrete	4.7369 [0.1026]	4.2871 [0.0360]	4.6281 [0.1044]	4.1709 [0.0366]
Ratio of members with technical degree to total household members	Continuous	0.0449 [0.0051]	0.0696 [0.0041]	0.0569 [0.0054]	0.0751 [0.0040]
Ratio of members with post secondary to total household members	Continuous	0.0246 [0.0047]	0.0329 [0.0035]	0.0230 [0.0034]	0.0388 [0.0040]
Area of annual crop land per capita (m2)	Continuous	0.9265 [0.0741]	0.6492 [0.0333]	0.9985 [0.0839]	0.7021 [0.0409]
Area of perennial crop land per capita (m2)	Continuous	0.2325 [0.0617]	0.2059 [0.0239]	0.2441 [0.0405]	0.2411 [0.0270]
<u>Commune variables</u>					
Road to village (yes = 1)	Binary	0.6918 [0.0252]	0.5986 [0.0198]	0.7203 [0.0237]	0.6387 [0.0193]
Observations		690	3526	701	3515
Standard errors in parentheses. Source: Estimation from VHLSSs 2004-2006.					

Table A.3: Fixed-effects regressions of logarithm of per capita consumption expenditures and logarithm of per capita expenditure on different items

Explanatory variables	Logarithm of per capita expenditure	Log of per capita expenditure on rice	Log of per capita expenditure on non-rice food	Log of per capita expenditure on durables	Log of per capita expenditure on health and education	Log of per capita expenditure on other non-food items
Receiving of pensions (yes=1)	0.0598** [0.0294]	-0.0223 [0.0308]	0.0419 [0.0403]	-0.0486 [0.0631]	0.0775* [0.0443]	0.2332* [0.1295]
Receiving of allowances (yes=1)	0.0339** [0.0154]	-0.0320* [0.0174]	0.0666*** [0.0238]	-0.0349 [0.0430]	0.0208* [0.0122]	0.1401** [0.0662]
Time effect (2006 variable)	0.1220*** [0.0068]	0.0709*** [0.0078]	0.1879*** [0.0083]	0.1233*** [0.0157]	0.1378*** [0.0102]	0.0168 [0.0259]
Proportion of household members younger than 16	-0.1048 [0.0671]	-0.0219 [0.0549]	-0.1294* [0.0684]	-0.2003 [0.1298]	-0.2635*** [0.0837]	-0.2674 [0.1755]
Proportion of household members older than 60	-0.2242*** [0.0551]	0.1984 [0.2134]	-0.1354* [0.0768]	-0.1346 [0.1725]	-0.4177*** [0.1063]	0.2139 [0.2973]
Proportion of female members	-0.1945*** [0.0659]	0.0265 [0.0965]	-0.0182 [0.0824]	-0.2282* [0.1354]	-0.2716** [0.1149]	-0.4229 [0.2687]
Household size	-0.1589*** [0.0253]	-0.0663** [0.0269]	-0.1833*** [0.0294]	-0.1725*** [0.0460]	-0.1806*** [0.0394]	0.1896** [0.0748]
Household size squared	0.0068*** [0.0024]	0.0026 [0.0021]	0.0086*** [0.0028]	0.0044 [0.0038]	0.0066* [0.0036]	-0.0126** [0.0062]
Proportion of hh. members with technical degree	0.1206** [0.0526]	0.0167 [0.0544]	0.1215** [0.0605]	0.2509*** [0.0955]	0.2268*** [0.0725]	-0.4278** [0.2008]
Proportion of hh. members with post secondary	0.1338 [0.0929]	0.1274 [0.1382]	0.1344 [0.1040]	0.1960 [0.1591]	0.3324** [0.1381]	-1.4694*** [0.3921]
Area of annual crop land per capita (1000 m2)	0.2969** [0.1490]	-0.011 [0.0180]	0.0052 [0.0200]	0.0421 [0.0478]	0.0035 [0.0280]	0.0496 [0.0655]
Area of perennial crop land per capita (1000 m2)	0.0259*** [0.0048]	0.0153*** [0.0057]	0.0280*** [0.0094]	0.0255** [0.0121]	0.0274*** [0.0071]	0.0541*** [0.0196]
Road to village (yes = 1)	0.0085*** [0.0019]	0.0023 [0.0057]	0.0162* [0.0088]	0.0141 [0.0113]	0.0320*** [0.0087]	0.0025 [0.0192]
Constant	8.5065*** [0.1679]	6.2435*** [0.1082]	7.6859*** [0.0909]	6.3150*** [0.1494]	7.7714*** [0.1172]	5.1914*** [0.2660]
Observations	8432	8438	8438	8438	8438	8438
R-squared	0.19	0.04	0.19	0.05	0.12	0.01

Robust standard errors in brackets.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Source: Estimation from panel data VHLSSs 2004-2006.

Table A.4: Fixed-effects regressions of share of expenditures on different items

Explanatory variables	Share of expenditure on rice	Share of expenditure on non-rice food	Share of expenditure on durables	Share of expenditure on health and education	Share of expenditure on other non-food items
Receiving of pensions (yes=1)	-0.0027 [0.0047]	-0.0019 [0.0090]	-0.0083 [0.0053]	0.0029 [0.0095]	0.0100 [0.0105]
Receiving of allowances (yes=1)	-0.0058** [0.0026]	0.0146** [0.0059]	-0.0038* [0.0027]	-0.0039 [0.0056]	0.0004 [0.0054]
1/per capita expenditure	210.61*** [22.77]	-249.31*** [29.64]	-95.79*** [22.78]	78.80*** [30.35]	55.68** [28.07]
Log of per capita expenditure	-0.0416*** [0.0057]	-0.1172*** [0.0100]	-0.0442*** [0.0095]	0.1059*** [0.0131]	0.0971*** [0.0126]
Time effect (2006 variable)	0.0057*** [0.0010]	0.0239*** [0.0022]	-0.0054*** [0.0012]	-0.0056** [0.0022]	-0.0187*** [0.0023]
Proportion of household members younger than 16	0.0101 [0.0068]	0.0238 [0.0160]	0.0048 [0.0095]	0.001 [0.0162]	-0.0397*** [0.0153]
Proportion of household members older than 60	-0.0058 [0.0091]	0.0114 [0.0204]	-0.0201* [0.0110]	-0.0587*** [0.0198]	0.0732*** [0.0205]
Proportion of female members	0.0013 [0.0088]	0.0321 [0.0206]	-0.0015 [0.0101]	-0.0125 [0.0203]	-0.0193 [0.0177]
Household size	-0.0112*** [0.0028]	-0.0225*** [0.0061]	-0.0109*** [0.0034]	0.0046 [0.0061]	0.0400*** [0.0051]
Household size squared	0.0007*** [0.0003]	0.0015*** [0.0005]	0.0004 [0.0003]	-0.0005 [0.0005]	-0.0021*** [0.0004]
Proportion of hh. members with technical degree	0.0065 [0.0048]	0.0176 [0.0124]	0.0058 [0.0086]	0.0248* [0.0146]	-0.0547*** [0.0148]
Proportion of hh. members with post secondary	0.0105 [0.0068]	0.0121 [0.0229]	0.0188 [0.0187]	0.0414 [0.0263]	-0.0829*** [0.0251]
Area of annual crop land per capita (1000 m2)	-0.0011 [0.0027]	-0.0013 [0.0047]	0.0041 [0.0028]	-0.0003 [0.0048]	-0.0014 [0.0052]
Area of perennial crop land per capita (1000 m2)	0.0008 [0.0006]	0.0013 [0.0020]	-0.0001 [0.0009]	-0.0016 [0.0014]	-0.0004 [0.0020]
Road to village (yes = 1)	-0.0004 [0.0005]	0.0002 [0.0018]	-0.0002 [0.0009]	0.0024* [0.0014]	-0.002 [0.0017]
Constant	0.4528*** [0.0556]	1.4209*** [0.0950]	0.5334*** [0.0879]	-0.5918*** [0.1212]	-0.8152*** [0.1161]
Observations	8438	8438	8438	8438	8438
R-squared	0.39	0.08	0.04	0.09	0.1

Robust standard errors in brackets.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Source: Estimation from panel data VHLSSs 2004-2006.