

Aging, Poverty, and the Role of a Social Pension in Vietnam*

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January 2008

Abstract

By using the Vietnam Household Living Standard Survey in 2004, this paper seeks to quantify the potential role and impacts of a social pension scheme for reducing elderly poverty in Vietnam. We simulate how the poverty rate, poverty gap, and poverty severity of the elderly would have been changed in the counterfactual situation that such a scheme had been introduced to Vietnam in the past. We consider a number of categorical targeting groups of elderly people along with various transfer parameters to assess the impacts of the scheme on social welfare. We find that, depending on the characteristics of the social pension, there would be beneficial poverty reductions, but also large leakages to the non-poor people. For a variety of measures, our results suggest that targeting the elderly in rural areas might be the most effective use of limited resources. Also, simulations for different budgetary constraints show that, even with limited budgeting, a social pension scheme would significantly reduce poverty incidence for the elderly. For example, the elderly poverty gap could be reduced by almost 60 percent with a program that costs one percent of GDP.

Keywords: aging, poverty, social pensions, Vietnam

JEL Classification: H55, I32, I38

* We would like to thank all the participants of the workshop for visiting scholars held at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg (Austria) for their useful discussions. Special thanks go to Dr. Larry Willmore, a research scholar at the Institute, for organizing the workshop, as well as providing a variety of insightful suggestions on policy debates about social pensions. In addition, Giang Thanh Long would like to thank the Japan Science Society for providing a generous funding through the Sasakawa Scientific Research Grant No. 19-103 to conduct the research. We are, however, solely responsible for the contents of this paper.

1. Introduction

Rapid declines in fertility rates and mortality rates along with substantial improvements in health care systems have resulted in the growth of elderly populations around the world, and this trend is expected to continue in the coming years. With the definition of an elderly person as aged 60 years and over, the medium-variant population projections of the United Nations (2007) show that the number of elderly people will increase from 672 million in 2005 (or 10 percent of the world population) to around 2 billion people in 2050 (or 22 percent of the world population). Particularly in the developing countries that grow old before becoming rich, population aging will especially present various challenges for public policies in the coming decades. In addition, under profound social and economic changes stemming from modernization and urbanization, the weakening of family bonds also suggests an urgent task for the old-age security in developing countries, where social security systems are underdeveloped with extremely limited coverage (Schwarz (2003); United Nations (2005); UN-DESA (2007)).

As one of the best performing developing economies in the world, Vietnam is experiencing the changes just described. The aforementioned projections indicate that the elderly population in Vietnam will increase significantly from 7.5 percent of the whole population in 2005 to about 26 percent in 2050. Moreover, swift economic transformation since *Doi moi* (renovation) programs in 1986 has had significant impacts on all areas of society, resulting in substantial improvements in living standards for many people, including the elderly. However, while such remarkable successes have been widely acknowledged, many groups of elderly people are still living in poor and vulnerable conditions. The majority of elderly are still living in rural and disadvantaged areas, and only a small percentage of the elderly in Vietnam are receiving public pensions, while others are living on their own and/or supported by family members (MOLISA, 2005). In addition, a potentially worrisome issue for supporting the elderly is that the past decade has witnessed a continuous decline in the multi-generational family model, in which the number of elderly who lived as dependents declined, while the number of elderly who lived alone or in households with only elderly increased (Giang and Pfau, 2007a; ILSSA and UNFPA, 2007). Thus, any reduction in family support caused by such trends will leave the elderly behind with further vulnerabilities. The above situation demands that policy makers and social researchers provide more attention to discussing and introducing social welfare programs that can protect the elderly people in Vietnam.

Recently, social pensions, which are sometimes known as non-contributory pensions (NCP) or cash transfer programs for the elderly, have emerged in many countries in Africa, Asia, and Latin America. A number of studies show that these schemes are playing an important role in reducing poverty for both the elderly and their families, as well as extending coverage of the social protection systems (see, for instance, Case and Deaton (1998); Barrientos and Lloyd-Sherlock (2003); HAI (2006); and Lloyd-Sherlock (2006)). Researchers have also examined the likely impacts of social pension programs for countries where they do not yet exist. These studies are usually completed by simulating the impact of a social pension program had it been created at some point in the past, and they generally find the potential for significant reductions in the elderly poverty (see, for example, Matsaganis *et al.* (2000) for Greece; Gassman and Behrendt (2006) for Senegal and Tanzania; and Kakwani *et al.* (2006) for Kenya).

In Vietnam, a social pension scheme was implemented in 2004 to provide a benefit of 65,000 VND (about 4 USD) per month to the elderly aged 90 and over who did not have a contributory pension. In April 2007, the eligible age was revised to 85 and over, and the benefit was increased to 120,000 VND (about 7 USD) per month. Yet more than two-thirds of

the eligible individuals have not received any benefit, and even some provinces have not carried out this scheme (NACSA, 2006). A recent report (ILSSA and UNFPA, 2007) shows that the impacts of the current scheme still have been limited in terms of both coverage and poverty reduction, though it has been able to help the recipients overcome certain difficulties.

Under swift social and economic changes and expected aging population in the coming years for Vietnam, two urgent questions are how an extended social pension scheme can help to reduce poverty for millions of elderly people, and how much such a scheme will cost. Previously, Weeks *et al.* (2004) and Giang and Pfau (2008) simulated a *universal* old-age pension scheme in Vietnam, and they find that such a scheme would cost about 2-3 percent of the GDP. However, with limited financial capacities for a country like Vietnam, it is necessary for a social pension scheme to be effective in various aspects, including financial costs, poverty reduction, and welfare improvement. And as such, different scenarios for a social pension scheme need to be further explored.

Guided by these research and policy needs, our paper aims to simulate how the poverty incidence of the elderly in Vietnam would have been changed in the presence of a social pension scheme. We consider a number of categorical targeting groups of elderly people along with various transfer parameters to assess the impacts of the scheme on social welfare. The categorical targets include focusing on such groups as rural elderly, female elderly, elderly who do not otherwise receive social security benefits, and so on. We compare different programs based on their overall costs by varying the categorical target groups, the eligible age for benefits, and the benefit levels. In general, we find that there would be obvious tradeoffs: more expenditure would result in more poverty reduction, but also lead to more costs and leakages. More importantly, even with limited budgeting, our simulations imply that a social pension scheme would significantly reduce poverty incidence for the elderly. In particular, we find evidence that focusing a program on rural elderly would be the most effective in a number of ways, and that the programs with lower eligibility ages and lower benefits would have a bigger impact on poverty than the programs with comparable costs that provide higher benefits but also have higher eligibility ages.

The remainder of the paper is organized as follows. We will present our data and estimation methodology in Section 2. Then, the empirical results and policy implications will be discussed in Section 3. The last section will provide concluding remarks.

2. Data and Methodology

2.1. Data

To pursue the research objectives, we will use the Vietnam Household Living Standard Survey in 2004 (namely VHLSS 2004). This is one of the four household surveys in Vietnam over the past decade conducted by the General Statistics Office (GSO) along with other international agencies, as a part of the World Bank's Living Standard Measurement Surveys (LSMS). Descriptions of this survey can be found in World Bank (2005) and GSO (2007). Unless otherwise noted, our calculations will use sample weights to make the data representative for the entire population in Vietnam.

The survey is organized by household, but it also includes some characteristics for individuals in the household, such as age, gender, relationship to the household head, marital status, working status, wages, health status, and educational attainment. This structure lets us identify the elderly people (aged 60 and over), as well as the elderly households (which include at least one elderly person). The VHLSS 2004 includes 39,696 individuals in 9,189 households, in which the number of elderly people and the number of elderly households are 3,806 and 2,784, respectively. At the household level, the survey provides information on the

sources of income, household expenditures, ownership of consumer durables, business and agricultural activities, poverty incidence, participation in the poverty alleviation programs, social insurance, wealth, and housing conditions.

However, the data also have some limitations. Besides wages, most income sources are only identified at the household level, so it is not clear which member is the source of household income. Similarly, expenditure is identified at household level, so we do not know who is spending, and can only identify per-capita expenditure within the household. Also, wealth data are only available at the household level. These problems limit our ability to analyze intra-household sharing.

2.2. Methodology

The main aims of our paper are to quantify the potential role and to estimate the financial cost of a social pension scheme in reducing the elderly poverty in Vietnam. Our analysis will apply static micro-simulation techniques with the VHLSS 2004 data. We will first consider various groups of elderly as scheme targets in order to see how the proposed schemes would be able to reduce elderly poverty, and how much they would cost. Then, under different fixed budget levels, we will simulate a number of alternatives to look for the most effective scheme in terms of poverty reduction and welfare improvement. Finally, we will investigate how the program costs would increase over time as a result of continued population aging.

Measuring Poverty Incidence

This paper will measure poverty using the poverty rate, poverty gap, and poverty severity. We will apply these measures for the recipient population, the overall elderly population, and the total population of all ages. The poverty rate represents the percentage of population whose expenditures are lower than the official poverty line. In 2004, the official poverty line was measured by per-capita expenditure per year and was 2,077 thousand Vietnamese dong (VND). The poverty gap indicates how much money is needed to close the gap between per capita expenditure and the official poverty line for each member of the population (it is zero for the non-poor), while poverty severity is calculated as the sum of squares of individual poverty gaps, which puts extra weight on those experiencing more extreme poverty.

To examine the sensitivity of these poverty measures to the poverty line, we will introduce three poverty lines: (i) 50 percent of the official line, which allows for a focus on extreme poverty; (ii) 100 percent of the official line; and (iii) 167 percent of the official line, which corresponds to the commonly used relative poverty line of 50 percent of per-capita GDP, and this allows for consideration of those above the official poverty line but still vulnerable to poverty.

Regarding the official poverty measure, one problem is that it is based on per-capita expenditure, which is estimated by dividing total expenditure of a household by the number of household members. As indicated in many studies, such as Deaton (1997) and Barrientos (2006), such a measure is established for the household as a whole rather than for particular individuals, and it may underestimate or overestimate poverty rates under different household settings. Underestimation could occur when a household member is deprived of consumption by other members, and overestimation could occur, for instance, if larger households can enjoy economies of scale from living together that reduce their overall needed expenditures. Therefore, to mitigate possible biases of the official poverty measure, we will introduce an alternative equivalence scale. As such, our paper will consider two measures for household expenditure: (i) officially-used per-capita expenditure or the “official per-capita equivalence scale”; and (ii) the “alternative adult equivalence scale”. The latter is adopted from Barrientos (2005), and can be defined with the following equation:

$$\text{Alternative Adult Equivalence Expenditure} = \frac{\text{Total Household Expenditure}}{1 + [\# \text{ adult} - 1 + \beta * \# \text{ children}]^\alpha}$$

where $\beta=0.5$; and $\alpha=0.75$. When $\beta=1$ and $\alpha=1$, we get the “official per-capita equivalence scale”. When β is less than unity, the formula recognizes that expenditures for children need not to be as large as those for adults, and the α term accounts for the economies of scale enjoyed by larger households.

Categorical Targeting Groups

In this paper, we will consider the following seven categories of elderly social pension beneficiaries. As will be discussed later, these categories are chosen based on an attempt to find more vulnerable groups. Note that none of these categories include means-testing of income or wealth, because the administrative burden of such programs in Vietnam would be immense. Eligible elderly for the following categories should be relatively easy to identify:

- (1) All elderly (namely, **ALL**). This is a universal scheme.
- (2) Only elderly who are not otherwise receiving benefits from the pre-existing social security programs (namely, **SOC**);
- (3) All elderly receive benefits, but each married elderly only receives 75 percent of the proposed benefit (namely, **M75**);
- (4) Only elderly living in areas classified as rural (namely, **RUR**);
- (5) Only female elderly (namely, **FEM**);
- (6) Only elderly who are living alone (namely, **ALO**);
- (7) Only elderly living in the Northwest and Central Highlands regions, which are the poorest regions in Vietnam (namely, **REG**).

Measuring Impact and Effectiveness of the Proposed Social Pension Schemes

In our estimation, we will calculate how the poverty rate, poverty gap, and poverty severity of the elderly would have been changed, in percentage terms, if a social pension scheme had been introduced in the past in Vietnam. The higher the percentage change, the more effective the scheme would be.

Another measure for the effectiveness of the proposed schemes is the percentage of benefit cost that would have been used to reduce poverty incidence for the elderly recipients, the overall elderly population, and the total population of Vietnam. This provides an idea about the leakage rate of benefits to non-poor elderly, to poor non-elderly, and to non-poor non-elderly.

For the potential impact on welfare, we will estimate changes in utility of the elderly population and the total population, which are measured as the sum of changes in the logarithms of their respective expenditures. Individual expenditures will be estimated using both of the previously mentioned equivalence scales. This measure of utility allows for diminishing returns from expenditures such that benefits received by the poor will have a greater impact, and it does not require setting any poverty line. Also, since we will not collect taxes as a source for paying benefits in our simulations, utility changes will be always positive, and it is matter of finding the program with the largest impact for a given cost.

Main Assumptions for Simulating Impacts of the Proposed Social Pension Schemes

We use the VHLSS 2004 data to simulate a counterfactual situation in which a social pension scheme had been introduced in the past. To do this, we first assume that the eligible

elderly's benefits from the social pension scheme will be added to their household's total expenditures, and then divided equally among each member of the household. This is a necessary assumption, because we are unable to account for differentiated individual expenditures within the household. Under this assumption, the proposed social pension scheme would reduce poverty incidence for various groups of people, including poor elderly, non-poor elderly, poor non-elderly, and non-poor non-elderly.

Second, we assume that everything other than the social pension benefit will remain the same. In other words, the elderly and their relatives or family members will not change their behaviors in response to the potential gain from such a social pension scheme. Also, there will be no macroeconomic feedbacks from the introduction of a scheme. We must admit that these assumptions are obviously strong, since there would be a number of potential biases in introducing a social pension scheme for different elderly categories. For instance, the social pension scheme for elderly living alone might encourage this behavior. To the extent that such behaviors occur, program costs would be increased beyond our estimates.

Third, we also assume that such a social pension scheme would be operated under limited budgeting. We will first assume that the total benefit cost of the proposed scheme must be about 1 percent of GDP in 2004, and we find the programs that match this criterion. To find the programs with specific total costs, we vary the categorical target groups, the eligibility ages, and the benefit levels while calculating total costs and searching for matches. Then the total cost will be allowed to vary between 0.25 percent and 1.5 percent of GDP, which is common range for many developing countries that are considering a social pension program (see, for instance, Schwarz (2003); Willmore (2007); and UN-DESA (2007)). Under these cost constraints, we will find the most effective program in terms of poverty reduction and welfare improvement for the different poverty lines and equivalence scale measures, which will provide information about the robustness and sensitivity of the results to different assumptions.

Simulating the Future Costs of the Proposed Social Pension Schemes under Population Aging

To estimate the future costs of the proposed social pensions, we will apply a simulation method proposed by Willmore (2007). This simulation will not consider administrative costs for the scheme operation. Suppose that the number of the eligible elderly accounts for $e(\%)$ of the total population, and the social pension benefit provided to each person is equal to $b(\%)$ of per-capita GDP. The total expenditure of the scheme without administrative costs will be $t(\%)$ of GDP, in which $t=e*b$. This estimate implies that the benefit is not linked to the poverty line, because the poverty line grows with inflation rather than GDP. To the extent that GDP will grow faster than inflation, it indicates a growth of the benefit in terms of its percentage of the poverty line. Also, more eligible elderly or a higher benefit means more expected costs for the scheme. We will use the data from the population projections of United Nations (2007) for Vietnam during 2005-2050, which are based on three scenarios for fertility rates, including low-variant, medium-variant, and high-variant fertility rates. The low fertility rate leads to a high elderly rate (as a percent of the population), and this is our high cost scenario. The medium cost scenario represents the UN's best forecast, and the low cost scenario includes a high fertility rate and so a low elderly rate. To get consistent projections, we will first adjust the UN forecasts for elderly rates upward so that the 2005 values match the elderly rate in the VHLSS 2004 (7.6 percent and 9.9 percent, respectively).

3. Findings and Discussion

First, our discussion will describe a number of characteristics and the current poverty status of the elderly in Vietnam. Subsequently, we will present a detailed analysis about the introduction of a social pension scheme for the elderly in Vietnam.

3.1. Demographic Characteristics and Poverty Status of the Elderly

Table 1 provides general information about the elderly in Vietnam in 2004 for a number of characteristics.

Table 1: Demographic Characteristics and Poverty Status of the Elderly, 2004

Official poverty line is 2,077 thousand VND per capita;

Poverty rates are calculated using the official per-capita equivalence scale

Indicators	Percent of Elderly Population (%)	Poverty Rates for Varying Poverty Lines		
		50% Official	100% Official	167% Official
Elderly People		1.5	17.9	47.2
Age				
60 – 69	49.7	0.9	14.7	42.1
70 – 79	35.2	1.8	21.0	51.4
80 and older	15.1	2.6	21.0	54.4
Gender				
Male	41.6	1.2	16.4	44.0
Female	58.4	1.7	18.9	49.5
Marital Status				
Married	60.5	1.2	15.8	44.2
Non-married	39.5	2.0	21.1	51.9
Areas				
Urban	26.7	0.1	4.3	16.3
Rural	73.3	2.0	22.8	58.5
Region				
Red River Delta	25.8	0.7	16.3	45.2
North East	10.5	1.3	25.2	64.1
North West	1.9	4.6	53.2	72.9
North Central Coast	12.6	4.3	31.2	62.1
South Central Coast	9.9	2.8	21.6	55.0
Central Highlands	3.4	3.7	24.1	53.7
South East	15.4	0.3	2.8	13.7
Mekong River Delta	20.6	0.5	13.1	50.0
Living Arrangements				
Only Elderly	20.7	1.8	16.8	45.5
With Children	75.5	1.4	18.6	48.7
With Others, no Children	3.8	1.1	10.5	32.2
Receiving Social Security?				
Yes	34.9	1.3	15.7	40.0
No	65.1	1.5	18.6	51.1

Source: Authors' estimates using VHLSS 2004.

By age, young elderly (aged 60-69) accounted for about 50 percent of the elderly population, while the oldest elderly (aged 80 and over) accounted for about 15 percent. The estimates show that, by all three poverty lines, the elderly at more advanced ages generally experienced higher poverty rates than did the younger elderly.

Regarding gender, female elderly were more prevalent and experienced a higher poverty rate than did their male counterparts. Meanwhile, about 60 percent of the elderly were married. By all three poverty thresholds, the married elderly had significantly lower poverty rates than did their non-married counterparts, most of whom were widows.

In terms of residential areas, more than 70 percent of the elderly were still living in rural areas. This number, however, has been declining over the past decade on the account of the emerging urbanization (Giang and Pfau, 2007a). The results show that, by any of three

poverty thresholds, the urban elderly had a substantially lower poverty rate than did their rural counterparts. Similarly, the results for residential regions show that more than 70 percent of the elderly were living in the four largest agricultural regions in Vietnam, i.e., the Red River Delta, the Northeast, the Southeast, and the Mekong River Delta. The elderly living in these regions had lower poverty rates than did the elderly living in other regions. In particular, with all three poverty thresholds, the elderly living in the Northwest experienced the most poverty, and the elderly living in the Southeast region experienced the least.

By living arrangements, more than 75 percent of the elderly were living with their children, and about 20 percent of the elderly were living in households with only elderly (this is the group we assign to the “ALO” category). As shown in Giang and Pfau (2007a), the percentage of households with only elderly tended to increase in recent years, while the percentage of the elderly living with children tended to decrease. Distinguishing further by marital status and living arrangements, Giang and Pfau (2008) find a worrisome situation in that more than 80 percent of elderly living alone were female elderly living in rural areas. The estimated results in Table 1 show that the elderly households with only elderly had the highest poverty rate under the first poverty line, while the households where the elderly were living with children had the highest rate under the second and third poverty lines. This situation can be understood by the fact that larger households tend to have lower per-capita expenditures.

Finally, only 35 percent of the elderly were in households receiving some forms of social security benefits. The number was even much lower when considering only pensions (Giang and Pfau, 2008). The results show that the recipient elderly households had lower poverty rates than did their non-recipient counterparts.

Table 1 highlights our choice of the seven categorical targets, which tend to reflect the groups with higher poverty rates.

3.2. Impacts of the Proposed Social Pension Schemes on Poverty

We now consider the potential impacts of different social pension schemes on elderly poverty in Vietnam, as well as their respective financial costs. Table 2 presents our estimates, which are based on the assumption that *a pension of 50 percent of the official poverty line is provided to all eligible people aged 60 and over*. It is important to note that these estimates are not directly comparable, because of the differing number of recipients and the differing costs. However, we first provide an overview of how the impacts differ among the seven categories, and in subsequent tables we will analyze programs with the same costs.

In general, the estimates show that the total benefits paid would vary from 436 billion VND (or 0.06 percent of GDP in 2004) for a scheme introduced in the two poorest regions to 8,179 billion VND (or 1.14 percent of GDP in 2004) for a universal scheme. Except for a scheme proving benefits to the elderly living alone, more than 50 percent of the estimated costs would be spent by non-elderly people in the elderly households, meaning that the leakage rates in all proposed schemes would be high. Again, this result occurs on account of our assumption that the recipient’s benefit becomes a part of the household’s spending resources, and is subsequently shared by all household members.

Regarding the impacts on poverty, the estimates provide useful information of the possible reduction in poverty rates and poverty gaps for the direct recipients, the whole elderly population, and the whole population in Vietnam. Generally, the estimates indicate that the magnitude of reductions in poverty rates and poverty gaps for the elderly would vary for different targeting categories. For instance, in the case of a universal scheme, the poverty rate of the direct recipients would decrease from 17.9 percent (without scheme) to 9.3 percent (with scheme), while that of the whole population in Vietnam would decrease from 19.3 percent to 17.4 percent.

Table 2: Estimated Impacts of the Proposed Social Pension Schemes

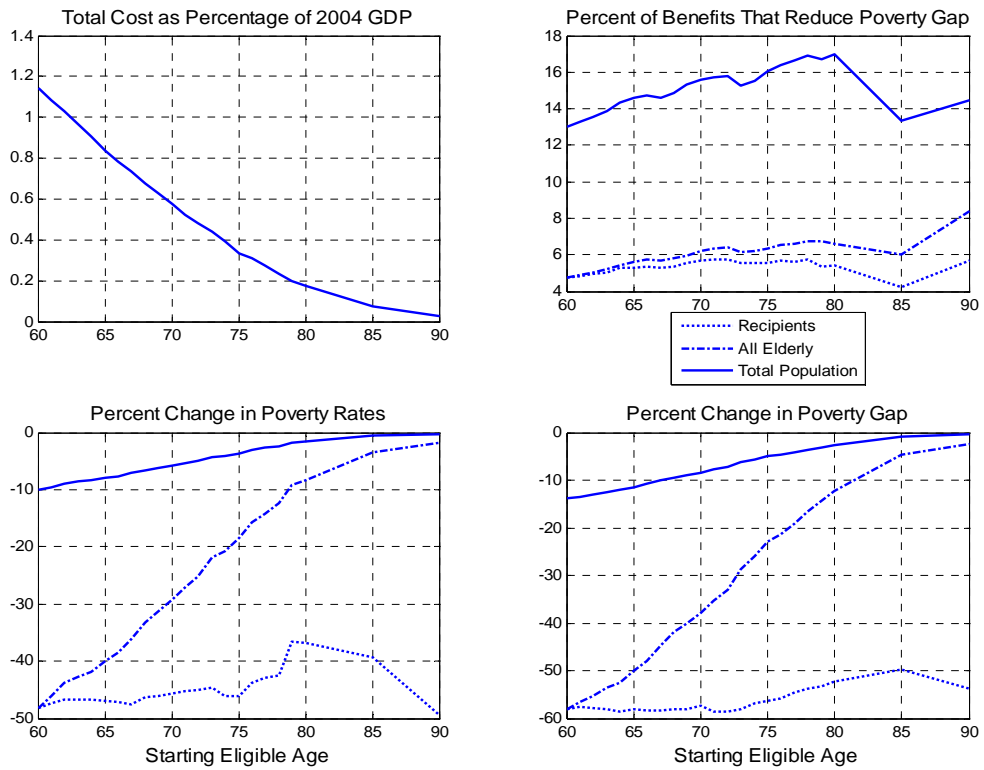
*A pension of 50% of poverty line is provided to eligible people aged 60 and over;
Poverty is calculated using the official poverty line and the official per-capita equivalence scale*

Indicators	All Elderly (ALL)	No Social Security (SOC)	Married (receiving 75% benefits) (M75)	Only Rural (RUR)	Only Females (FEM)	Living Alone (ALO)	Poorest Regions (REG)
Total Benefits Paid	8178.8	7111.2	6941.6	5997.7	4778.2	1690.6	435.9
(As Percent of GDP)	1.14	0.99	0.97	0.84	0.67	0.24	0.06
% Spent by Recipients	47.52	47.68	38.91	48.73	33.32	100	39.19
% Spent by Elderly	47.52	47.68	46.25	48.73	46.66	100	39.19
% Spent by Non-Elderly	52.48	52.32	53.75	51.27	53.34	0	60.81
Direct Recipients							
Ex-Ante Poverty Rate	17.89	17.56	18.26	22.83	18.91	16.84	34.67
Ex-Post Poverty Rate	9.27	9.01	10.28	12.07	11.48	1.83	25.23
% Change Poverty Rate	-48.20	-48.71	-43.71	-47.13	-39.29	-89.15	-27.24
Ex-Ante Poverty Gap	670.5	551.9	582.3	637.4	411.5	129.8	92.8
Ex-Post Poverty Gap	280.6	227.3	275.5	272.4	205.0	4.00	49.1
% Change Poverty Gap	-58.15	-58.81	-52.7	-57.26	-50.19	-96.95	-47.09
Elderly							
Ex-Ante Poverty Rate	17.89	17.89	17.89	17.89	17.9	17.89	17.89
Ex-Post Poverty Rate	9.27	10.45	9.97	10	12.0	14.78	17.38
% Change Poverty Rate	-48.2	-41.59	-44.28	-44.11	-32.8	-17.35	-2.81
Ex-Ante Poverty Gap	670.5	670.5	670.5	670.5	670.5	670.5	670.5
Ex-Post Poverty Gap	280.6	345.9	314.2	305.5	391.6	544.6	626.8
% Change Poverty Gap	-58.15	-48.41	-53.14	-54.43	-41.6	-18.78	-6.52
Total Population							
Ex-Ante Poverty Rate	19.27	19.27	19.27	19.27	19.3	19.27	19.27
Ex-Post Poverty Rate	17.35	17.63	17.51	17.55	18.0	18.96	19.13
% Change Poverty Rate	-9.97	-8.53	-9.12	-8.9	-6.5	-1.59	-0.72
Ex-Ante Poverty Gap	7659.6	7659.6	7659.6	7659.6	7659.6	7659.6	7659.6
Ex-Post Poverty Gap	6595.3	6762.3	6691.1	6657.1	6941.5	7533.7	7523
% Change Poverty Gap	-13.9	-11.71	-12.64	-13.09	-9.4	-1.64	-1.78
% Benefits that Reduces Poverty Gap for:							
Recipients	-4.77	-4.56	-4.42	-6.08	-4.32	-7.45	-10.03
Elderly	-4.77	-4.56	-5.13	-6.08	-5.84	-7.45	-10.03
Total Population	-13.01	-12.62	-13.95	-16.71	-15.03	-7.45	-31.33

Source: Authors' estimates using VHLSS 2004.

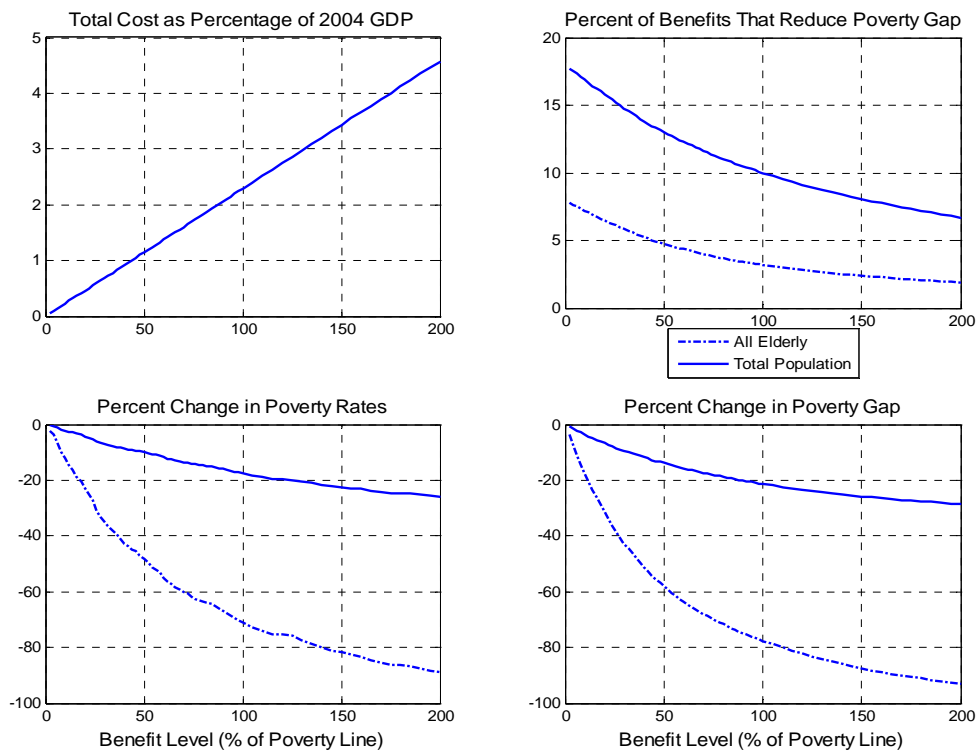
The last panel of Table 2 can help to compare the financial effectiveness of different proposed social pension models, which is measured by the percentage of benefits that help to reduce the poverty gap. In this sense, the scheme providing benefits to the elderly in the two poorest regions would be most effective, as it would have highest percentages of benefits used to reduce poverty gaps for the direct recipients (10.03 percent), the whole elderly population (10.03 percent), and the whole population in Vietnam (31.33 percent). A program targeting rural residents or a program targeting females follows in terms of the portion of benefits that are devoted to reducing the poverty gap for the total population.

Figure 1: Varying the Starting Eligible Age for a Universal Scheme with a Benefit of 50% of Poverty Line



Source: Author's estimates using VHLSS 2004.

Figure 2: Varying the Benefit Level for All Elderly aged 60 and over



Source: Author's estimates using VHLSS 2004.

Figure 1 and Figure 2 provide additional information about the costs and impacts when we vary two key parameters: the starting eligible age and the benefit level. Both figures are created for the universal targeting scheme, in which all elderly at least as old as the eligible age would receive a benefit. These figures are made using the official poverty line to measure poverty, and using the official per-capita equivalence scale. They help to show how such a universal scheme under different assumptions would reduce poverty rates and poverty gaps for the elderly and the whole population in Vietnam. We also can see how financially costly such a scheme would be.

In Figure 1, we assume a benefit level equal to 50 percent of the official poverty line, and we vary the starting eligible age from 60 to 90. The total benefits paid will decrease as the eligible age is higher. Figure 1 also illustrates that the leakage rate of such a scheme would be high, as the percentage of benefits that help to reduce poverty gap for the recipients would be lower than that for the whole elderly population, which in turn would be lower than that for the whole population of Vietnam. For the whole population, leakages to the non-poor would be minimized with a starting eligible age of about 80, when about 17 percent of the benefits paid would reduce the poverty gap. The lower panel of Figure 1 shows how the poverty rate and poverty gap of the recipients, the whole elderly population, and the whole population of Vietnam would be changed with the presence of the proposed scheme. In general, these graphs show diminishing poverty reduction for the whole elderly population and the whole population of Vietnam as the starting eligible age is higher. As for recipients, the starting eligible age does not have much impact on the portion of benefits that reduce the poverty gap.

Conversely, in Figure 2 we present a universal social pension scheme for all elderly aged 60 and over, and we vary the benefit level from 5 percent to 200 percent of the official poverty line. Because this is a universal scheme for all elderly, the recipient population is always the same as the elderly population. The total benefit cost will be increased as the benefit level increases, and the leakage rate of the proposed scheme also increases with increasing benefits. Poverty continues to be reduced with higher benefits, but the poverty reduction occurs at diminishing rate.

Given limited government revenue, we now consider in Table 3 all the alternatives of a social pension scheme in Vietnam, in which *the target for spending would be approximately 1 percent of GDP in 2004*, which was 715,000 billion VND or about 49 billion USD. In addition, our estimates for all seven categorical targeting schemes assume that *the poverty line is measured as 100 percent of the official line, and equivalence scale is the official per-capita expenditure*. Under these assumptions, we can estimate the starting eligible age (which can range from 60 to 90) and benefit level (which can range from 5 percent to 200 percent of the official poverty line) provided to the eligible elderly. Also, we can measure the percentage changes in poverty gap, poverty severity, and utility for the elderly population and the whole population of Vietnam. The most effective programs could be chosen from the list, depending on the desired outcome measure. For instance, Table 3 shows that we would choose a scheme providing to the rural elderly aged 60 and over a benefit of 60 percent of official poverty line, because this scheme generally would be most successful to reduce the poverty gap and poverty severity and enhance utility by the most in comparison with other schemes. In particular, this program could reduce the elderly poverty gap by 59.68 percent and the total poverty gap by 14.86 percent. And though each program would have a slight difference in total benefit cost, it is important that we generally find for any given category that bigger poverty reduction occurs with lower starting eligible ages and lower benefit levels. This provides an important policy recommendation: *it would be better to reduce the eligible age and reduce the benefit level than to increase the eligible age and increase the benefit level for any given total program cost*.

**Table 3: Choices for Programs that Cost about 1% of GDP in 2004
(between 7,075 and 7,225 billion VND)**

Poverty line is the official poverty line; Poverty is calculated using the official per-capita equivalence scale

Cat.	Starting Age	Benefit Level as % of Official Poverty Line	Total Cost	Change in poverty gap for elderly (%)	Change in poverty gap for all (%)	Change in poverty severity for elderly (%)	Change in poverty severity for all (%)	Change in utility for elderly (%)	Change in utility for all (%)
ALL	64	55	7128.7	-55.22	-12.98	-59.90	-14.7	1.51	0.33
ALL	65	60	7187.3	-54.70	-12.93	-59.23	-14.63	1.52	0.33
ALL	69	80	7191	-49.36	-12.19	-53.19	-13.49	1.48	0.33
SOC	60	50	7111.2	-48.41	-11.71	-51.11	-13.04	1.43	0.32
SOC	63	60	7203.6	-48.94	-12.00	-51.00	-13.11	1.48	0.33
SOC	68	85	7096.8	-43.50	-11.17	-45.22	-11.99	1.43	0.32
RUR	60	60	7197.2	-59.68	-14.86	-65.54	-17.19	1.65	0.37
RUR	63	70	7188.2	-58.63	-14.68	-64.30	-16.83	1.66	0.37
RUR	65	80	7161.5	-57.67	-14.51	-62.75	-16.46	1.65	0.36
RUR	66	85	7138.2	-56.91	-14.23	-61.72	-15.97	1.64	0.36
RUR	67	90	7094.4	-53.83	-13.69	-58.42	-15.33	1.62	0.36
RUR	75	200	7224.2	-34.83	-10.04	-36.96	-10.67	1.34	0.33
M75	65	70	7220.1	-54.88	-13.29	-59.55	-15.04	1.49	0.34
M75	68	85	7195.2	-50.56	-12.57	-54.43	-13.94	1.45	0.33
FEM	60	75	7167.3	-52.19	-12.52	-56.15	-13.94	1.45	0.33
FEM	64	95	7212.8	-51.73	-12.64	-54.63	-13.75	1.45	0.34

Note: **ALL**: for all elderly (or universal); **SOC**: for non-recipients of social security; **M75**: universal, but each married elderly gets only 75% of the proposed benefit; **RUR**: for only rural elderly; and **FEM**: for only female elderly.

Source: Authors' estimates using VHLSS 2004.

It is also noted that the categories "ALO" (for elderly living alone) and "REG" (for elderly living in the two poorest regions of Vietnam) do not show up in Table 3, because the numbers of elderly in these two groups are too small to be able to spend 1 percent of GDP with benefits less than 200 percent of the official poverty line.

Moving forward, Table 4 provides a robustness check by expanding the results of Table 3 to include a range of total spending levels, additional poverty lines, and both types of expenditure scales. We vary the total benefit spending for a social pension in Vietnam from about 0.25 percent to about 1.5 percent of the GDP in 2004. This is a common range from cost projections for a social pension scheme in many developing economies (UN-DESA, 2007). Because we vary these additional details, in Table 4 we only list the programs that provide an optimal result for various outcome measures. This would be equivalent to showing the two rows of pension schemes for rural elderly from Table 3 that have boldfaced results, and only showing the numbers that are boldfaced in Table 3.

As can be seen in the table, for any given poverty line and equivalence scale, there would be an obvious tradeoff between the starting eligible age and the benefit level, though the impacts of each proposed scheme on the elderly poverty would vary. For example, under the official poverty line and the official per-capita equivalence scale measures, at the total cost of 0.25 percent of GDP in 2004, we can choose either a scheme providing a benefit of 20 percent of the poverty line to all rural elderly aged 65 and over or a scheme providing a benefit of 25 percent of the poverty line to all rural elderly aged 68 and over. Furthermore, which scheme we will finally choose depends on which criteria of impacts we are considering. In the

aforementioned cases, for example, if we are focusing on poverty reduction, we will choose the former scheme as it could be able to reduce all poverty indices by the most for the whole elderly population and the whole population of Vietnam, while we will choose the latter scheme if we are considering the potential impact on our social welfare function.

Table 4: The Most Effective Social Pension Schemes under a Variety of Conditions

POVERTY LINE = 50% OF THE OFFICIAL POVERTY LINE									
Equivalence scale is the official per-capita equivalence scale									
<i>Total cost as % of GDP in 2004</i>	<i>Category</i>	<i>Starting Age</i>	<i>Benefit Level as % of official poverty line</i>	<i>Change of poverty gap for elderly</i>	<i>Change of poverty gap for all</i>	<i>Change of poverty severity for elderly</i>	<i>Change of poverty severity for all</i>	<i>Change in utility for elderly</i>	<i>Change in utility for all</i>
0.25	RUR	65	20	-49.86	-12.98	-59.82	-15.47		
	ALO	63	60					0.7323	
	RUR	68	25						0.1022
0.5	RUR	65	40		-21.27		-22.82		0.1943
	RUR	67	45	-70.6		-78.4			
	ALO	66	140					1.218	
0.75	RUR	60	45	-80.62	-26.12	-85.29	-26.8		0.2821
	RUR	65	60					1.2923	
1	RUR	60	60	-86.32	-29.32		-29.81		0.367
	RUR	63	70			-91.33			
1.5	RUR	65	120	-88.96	-30.94	-93.35	-30.04	2.3121	0.518
Equivalence scale is the alternative adult equivalence scale									
0.25	ALL	69	20		-49.31	-98.83	-51.36		
	RUR	68	25					0.4636	0.0979
	FEM	61	20	-94.58					
0.5	ALL	69	40	-96.87	-50.78	-99.23	-51.56		
	RUR	63	35						0.1855
	RUR	65	40					0.8743	
0.75	ALL	65	45	-96.87	-50.78	-99.23	-51.56		
		68	55						
		69	60						
		70	65						
	M75	66	55	-96.87	-50.78	-99.23	-51.56		
RUR	60	45					1.238	0.2701	
1	ALL	60	44	-100	-52.22	-100	-51.94		
	ALL	61	46						
	ALL	63	52						
	RUR	60	60						0.3514
	RUR	63	70					1.6099	
1.5	ALL	63	78	-100	-52.22	-100	-51.94		
	M75	64	96	-100	-52.22	-100	-51.94		
	RUR	61	94					2.2635	0.5029
POVERTY LINE = 100% OF THE OFFICIAL POVERTY LINE									
Equivalence scale is the official per-capita equivalence scale									
<i>Total cost as % of GDP in 2004</i>	<i>Category</i>	<i>Age</i>	<i>Benefit Level as % of official poverty line</i>	<i>Change of poverty gap for elderly</i>	<i>Change of poverty gap for all</i>	<i>Change of poverty severity for elderly</i>	<i>Change of poverty severity for all</i>	<i>Change in utility for elderly</i>	<i>Change in utility for all</i>
0.25	RUR	65	20	-24.57	-5.08	-29.71	-6.29		
	RUR	68	25						0.1022
	ALO	63	60					0.7323	
0.5	RUR	63	35		-8.92		-10.72		
	RUR	65	40	-40.70	-9.00	-46.41	-10.72	0.901	0.1943
	RUR	67	45						
0.75	RUR	60	45	-52.71	-12.11	-57.59	-14.31		0.2821
	RUR	65	60					1.2923	

1	RUR	60	60	-59.68	-14.86	-65.54	-17.19		0.367
	RUR	63	70					1.6591	
1.5	RUR	65	120	-66.91	-18.11	-71.03	-19.93	2.3121	0.518
Equivalence scale is the alternative adult equivalence scale									
0.25	RUR	65	20			-13.7			
	RUR	68	25						0.0979
	M75	70	25				-17.1		
	ALO	61	55	-47.79				-53.17	
0.5	ALO	63	60					0.7106	
	RUR	63	35				-73.62	-27.85	
0.75	RUR	65	40	-65.85	-22.23				0.8743
	RUR	60	45	-77.61	-28.2	-84.96	-33.98	1.2386	0.2701
1	RUR	60	60	-85.57	-32.58	-90.3	-37.74		0.3514
	RUR	63	70					1.6099	
1.5	RUR	60	90	-91.78			-94.52		0.5039
	RUR	61	94			-37.71		-41.81	2.2635
POVERTY LINE = 167% OF THE OFFICIAL POVERTY LINE									
Equivalence scale is the official per-capita equivalence scale									
<i>Total cost as % of GDP in 2004</i>	<i>Category</i>	<i>Age</i>	<i>Benefit Level as % of official poverty line</i>	<i>Change of poverty gap for elderly</i>	<i>Change of poverty gap for all</i>	<i>Change of poverty severity for elderly</i>	<i>Change of poverty severity for all</i>	<i>Change in utility for elderly</i>	<i>Change in utility for all</i>
0.25	RUR	68	25						0.1022
	ALO	63	60	-14.69		-16.6		0.7323	
0.5	RUR	63	40	-21.45	-4.29	-28.6	-6.04		0.1943
	ALO	66	140					1.218	
0.75	RUR	60	45						0.2821
	RUR	65	60	-29.96		-38.02	-8.38	1.2923	
	RUR	69	80		-6.17				
1	RUR	60	60				-10.53		0.367
	RUR	63	70			-45.67		1.6591	
	RUR	65	80	-37.04	-7.85				
1.5	RUR	65	120	-47.21	-10.7	-54.74	-13.53	2.3121	0.518
Equivalence scale is the alternative adult equivalence scale									
0.25	RUR	65	20				-7.58		
	RUR	68	25			-5.17			0.0979
	ALO	61	55				-34.05	0.7073	
	ALO	67	75	-27.33					
0.5	RUR	65	40	-34.65	-9.6	-45.85	-13.37	0.8743	0.186
	RUR	60	45				-18.02		0.2701
0.75	RUR	65	60	-47.42	-13.39	-58.59		1.254	
	RUR	60	60	-57.54	-16.86	-68.68	-21.76	1.5979	0.3514
1.5	RUR	65	120	-68.06	-20.79	-74.74	-24.72	2.2436	0.4959

Source: Authors' estimates using VHLSS 2004.

The table also allows us to observe the diminishing returns to poverty reduction as the total costs increase. For instance, with the official poverty line and the official per-capita equivalence scale, the most effective program costing about 0.5 percent of GDP could be able to reduce elderly poverty by 40.7 percent. Beyond this, the additional poverty reduction when increasing spending from 0.5 percent to 1 percent of GDP would only be 19 percentage points, and when costs increase from 1 percent to 1.5 percent of GDP, the marginal reduction in the elderly poverty would be only an additional 7.2 percentage points. This detail illustrates that strong poverty reduction could be achieved even with only a rather limited budget for the social pension. Related to this point, we note that when we look at severe poverty by using a poverty threshold that is 50 percent of the official poverty line, even with spending of only 0.5 percent of GDP, we can eliminate more than 70 percent of severe elderly poverty, and more than 20 percent severe poverty for the whole population.

In addition, we also note that for the various poverty lines and equivalence scales, the category “rural” (RUR) shows up repeatedly across the range of expenditures. This means that under limited budgeting and desired poverty reduction, targeting rural areas would provide the most effective use of limited resources to reduce poverty for the elderly.

Another interesting finding from Table 4 is that under different poverty lines and total cost levels, the proposed social pension schemes using the alternative adult equivalence scale would generally have greater impacts on poverty reduction than those using the official per-capita equivalence scale. This provides another important policy implication: *preciseness in poverty measurements is extremely crucial in evaluating social program impacts.*

3.3. Future Costs for the Proposed Schemes under Demographic Changes

A number of studies on social pensions, such as UN-DESA (2007), show that the biggest concern for any developing country in implementing such a scheme is whether the cost of the scheme would be feasible, given various economic constraints. This question is important for the case of Vietnam as well, and in this section we attempt to project the costs of these programs to assess the impacts of population aging and other potential demographic trends. As mentioned earlier, we will use a simulation approach proposed by Willmore (2007) to estimate the expected financial costs of the proposed social pension schemes in Vietnam through 2050. We will focus on simulating costs for different schemes for categories “ALL” (universal scheme) and “RUR” (for rural elderly). The initial cost in 2004 of each program we consider is about 1 percent of GDP. For example, we will estimate future costs for a universal scheme providing a benefit of 55 percent of the official poverty line to all elderly aged 64 and over, or a scheme providing a benefit of 60 percent of the official poverty line to all rural elderly aged 60 and over.

In our estimates, we use the data from the population projections of United Nations (2007) for Vietnam in the period 2005-2050, which provide three aforementioned population scenarios. Due to slight differences in elderly-related data between United Nations (2007) and VHLSS 2004, we first calibrate data from these sources, so as to get the elderly population projections consistent. For the projections of rural elderly population, we assume that the rural rate of the elderly population will be the same as that of the general population of Vietnam. This is a necessary assumption, because we are unable to estimate the future rural rate of the elderly population independently. This assumption is also supported by the findings in Giang and Pfau (2007a) that the rural rate of the elderly was relatively close to that of the non-elderly over time.

Since United Nations (2007) only provides the rural rate projections for the general population until 2030, we expand the projections to 2050 with an assumption that rate of reductions in rural rate will be diminishing from 2030 onward. Furthermore, we develop the high and low cost scenarios for the rural elderly rates by adding or subtracting 5 percentage points to the medium scenario. As illustration, Table 5 provides our calibrated and projected results for the elderly and rural elderly aged 60 and over.

Table 5: Calibrated and Projected Rates of Elderly and Rural Elderly aged 60 and over

	Year	2004	2010	2015	2020	2025	2030	2035	2040	2045	2050
% Rural Population (UN+Modification)	Medium	74.1	71.7	68.9	65.8	62.4	58.7	55.3	52.2	49.4	47
	Low	74.1	66.7	63.9	60.8	57.4	53.7	50.3	47.2	44.4	42.0
	High	74.1	76.7	73.9	70.8	67.4	63.7	60.3	57.2	54.4	52.0
% Elderly (aged 60 and over,	Medium	9.9	10.1	11.4	13.3	15.7	18.2	20.6	23.1	25.6	28.4
	Low	9.9	10.0	11.2	12.8	14.9	17.0	19.0	20.8	22.5	24.3

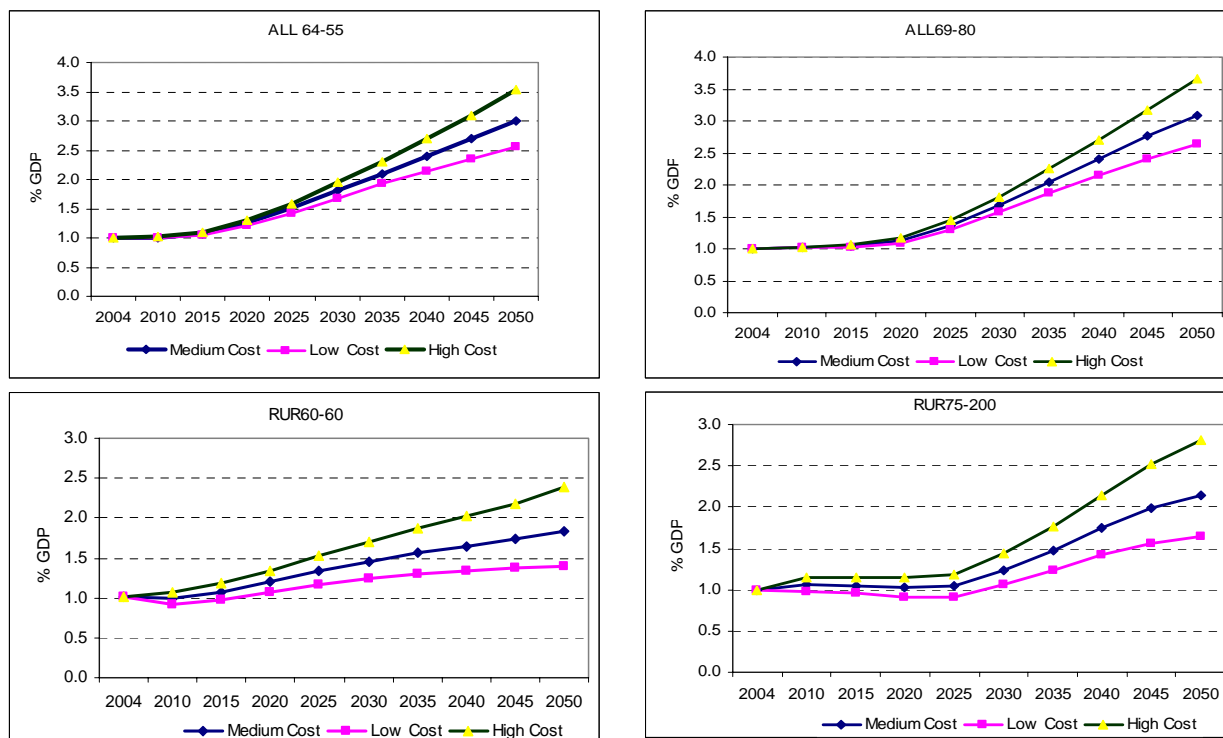
UN+Modification)	High	9.9	10.2	11.7	13.8	16.6	19.5	22.6	25.9	29.3	33.4
% Rural Elderly (aged 60 and over, UN+Modification)	Medium	7.3	7.3	7.9	8.7	9.8	10.7	11.4	12.1	12.6	13.3
	Low	7.3	6.7	7.1	7.8	8.5	9.1	9.5	9.8	10.0	10.2
	High	7.3	7.8	8.6	9.8	11.2	12.4	13.6	14.8	16.0	17.4

Note: Modifications are described in the text.

Source: Authors' estimates using United Nations (2007) and VHLSS 2004.

Figure 3: Future Costs of the Proposed Social Pension Schemes, 2004-2050
For categories "ALL" and "RUR".

Poverty line is the official poverty line; Poverty is calculated using the official per-capita equivalence scale



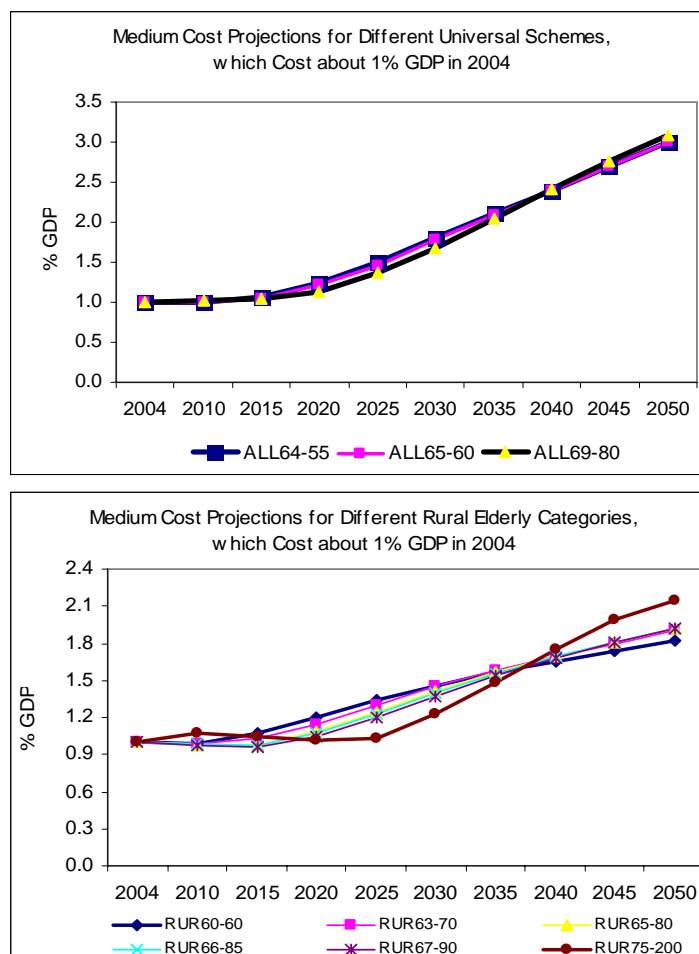
Source: Authors' estimates using data from United Nations (2007) and VHLSS 2004.

The upper panel of Figure 3 presents the estimated future costs for two universal social pension schemes, in which the one on the left provides a benefit of 55 percent of the official poverty line to all elderly aged 64 and over, and the other on the right provides a benefit of 80 percent of the official poverty line to all elderly aged 69 and over. We can see that population aging will lead to large-scale projected increases in the program costs, as the medium cost projections for both of these programs in 2050 will be about 3 percent of GDP.

Meanwhile, the lower panel of Figure 3 shows the estimated future costs for two social pension schemes targeting rural elderly, in which the one on the left provides a benefit of 60 percent of the official poverty line to all elderly living in rural areas, while the other on the right provides a benefit of 200 percent of the official poverty line to all elderly aged 75 and over. As shown in the Figure, the projected costs will increase more slowly on account of the projected future urbanization, and the medium cost projections for both of these programs in 2050 will be about 2 percent of GDP.

Figure 4 compares the medium cost projections for different social pensions in the two above-mentioned categories, i.e. ALL and RUR. The upper panel of the figure shows the estimates for universal schemes, while the lower panel presents the estimates for rural targeting schemes. The initial cost in 2004 of these schemes is about 1 percent of GDP. From

this figure, we can see that programs with higher eligibility ages and higher benefits will initially experience lower cost increases because the oldest elderly rates will grow more slowly, but eventually in the next 40 years these programs will grow in costs and exceed the costs of other programs as the oldest elderly become a more dominant force.

Figure 4: Cost Comparison within a Category

Source: Authors' calculations using data from United Nations (2007) and VHLSS 2004.

4. Concluding Remarks

Under current social and economic changes and limited coverage of the social protection system, it is suggested that Vietnam have an appropriate social assistance scheme for protecting the elderly. Using VHLSS 2004 with micro-simulation techniques, we generally found that a social pension scheme would help to significantly reduce poverty incidence for the elderly. The estimated results also indicate that focusing on rural areas, of which some population groups are chronically poor, would be the most effective in poverty reduction under limited financial capacity. More importantly, schemes providing lower benefits to wider group of beneficiaries would be more effective in poverty reduction and welfare improvement, and have lower costs than those providing higher benefits to limited beneficiaries. These findings results are quite robust for different measures of poverty lines and equivalence scales.

Overall, this paper indicates that, even if budgeting is limited, a social pension scheme would be able to help lift a number of elderly people out of poverty, and it is suggested that Vietnam expand the current social pension system with more attention to the elderly living in rural areas. There are, however, still two important questions that we need to discuss in a greater detail: how to finance and manage such an expansionary scheme? In subsequent research, we will bring more discussions on these issues under the Vietnamese context.

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