Simulation of the Costs and Benefits of Delayed Retirement: Evidence from Vietnam

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Abstract

Vietnam is experiencing one of the fastest rates of population ageing in the world, yet has a low retirement age at 55 for women and 60 for men. This paper identifies the impacts of raising the retirement age and assesses how these would translate into either net costs or net gains for the Vietnamese economy in the long term. First, the paper uses national and household-level data to assess how a change in the employment rate of older workers would impact the employment status and wages of younger workers and impact the school attendance of their grandchildren. Second, this paper conducts a cost-benefit analysis to assess the net annual benefit of raising the retirement age according to four policy scenarios. This calculation is used to project the net benefits of each scenario over 33 years. The paper finds that increasing the employment rate will not impact the employment rate of younger workers, and will only negatively impact their wages in households where an older woman would stop helping with housework in order to resume formal employment. Given these findings, this paper concludes that raising the retirement age will result in a net gain in all four policy scenarios and that gains will increase the higher the retirement age is raised. The gains from raising women's retirement age will exceed those of raising men's age in the long term as the female share of the formal workforce continues to grow.

Keyword: Retirement age, delayed retirement, simulation, older people, Vietnam.

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1. Introduction

Vietnam's 50 million workers are a cornerstone of its economic success. The impressive economic growth rates and plunging poverty rates can be attributed to the on-going structural transformation from an agriculturally-based economy toward manufacturing and services and the shift of workers out of low-productivity primary production and into higher productivity manufacturing and services, particularly into wage employment. Demographics trends may threaten the pace of progress, though. Vietnam is an aging society. As of 2018, the share of the population that is of prime working age (15-64) has begun to decline, in favor of the continued increase in the share of workers age 65 or older. This puts Vietnam's economic growth at risk solely in that the number of potential workers will begin to decrease in the foreseeable future.

The current pension laws exacerbate the problem since they encourage more skilled workers to leave the labor force long before their productive lives have ended. Women are eligible to retire and collect pensions (hereafter referred to as the "retirement age") at age 55 and men at age 60. Transition matrices show that older workers in wage- and benefit-paying jobs begin to abandon work in the 55+ age category, while those who do not have access to pension benefits continue working. Vietnam has a low retirement age. A normal norm for minimum age for pension collection is 65 years old. Vietnamese people's longevity is on par with developed countries, averaging 75.8 years.

The cost of the low retirement age goes beyond the fiscal costs of paying out pensions for an average of 20 years (15 years for men), incurring economic costs. Increasing the retirement age can reduce the social pensions paid to older people (Nguyen, 2013; 2020). If productive women retire at age 55, they are not producing output, and thus no longer contributing to economic growth. Since jobs expand with the labor force, this is, indeed, lost output and not simply a substitution of older workers by younger workers. Thus the government of Vietnam consider to increase the retirement age to 62 for men and 60 for women.

One concern with retirement age delay is a decrease in the labor market participation of young people. Under assumptions of the fixed labor demand and perfect substitution between old and young workers, retirement age delay reduces employment for younger

people. However, these assumptions might not hold (e.g., Kalwij et al. 2010; Böheim, 2014). The empirical findings are mixed. Several studies such as Staubli and Zweimüller (2013), Boeri et al. (2016), and Bertoni and Brunello (2017) show a positive effect of delayed retirement on employment of older people and a negative effect on youth. However, other empirical studies do not find a significant effect of the employment of older people on labor market outcomes of other age groups (e.g., Jousten et al. 2010; Kalwij et al. 2010; Munnell and Wu, 2013; Böheim, 2014). In this study, we also examine this issue for the case of Vietnam.

Extended retirement age increases the number of older people working in the formal sector. Given the number of employers unchanged in at least the short-term, the increase in the labor supply of older people can reduce the labor price (the wage) and labor supply of younger people. As a result, extended retirement age can cause unemployment of young people. However, several studies argue that this view only holds under assumptions of the fixed labor demand or amount of work and perfect substitution between old and young workers. When these assumptions do not hold, the effect of delayed retirement age will be different.

The empirical findings are mixed. Staubli and Zweimüller (2013) and Bertoni and Brunello (2017) show a positive effect of delayed retirement on employment of older people and a negative effect on youth employment in Austria and Italy, respectively. Boeri et al. (2016) also confirm this negative effect of delayed retirement youth employment in Italy. Vestad (2013) find that early retirees are replaced by youngers in Norway.

Böheim (2014) argues that "Keeping older workers in the workforce longer not only doesn't harm the employment of younger workers, but might actually help both". Empirical data do not show a trade-off between young employment and employment of older people. Younger and older workers are complements for each other rather than substitutes. Gruber and Wise (2010) find a positive correlation between employment of older people and employment of younger ones. Jousten et al. (2010) do not find a link between elderly retirement and employment the young and the prime-age populations in Belgium. Similarly, Munnell, A., & Wu (2013) do not find a significant effect of the employment of older people on labor market outcomes of other age groups in the US as well China. Burtless (2013) find a little evidence that aging workforce affects productivity. Kalwij et al. (2010) does not

support the hypothesis that employment of the young and old are substitutes and finds some minor complementarities. This suggests that encouraging later retirement will have no adverse effect on youth employment.

Most previous studies focus on the high-income countries. The effect of delayed in low- and middle-income countries might be different for several reasons. Firstly, the informal sector in the low- and middle-income countries is large. The pensions are applied for the formal sector, and workers in the formal section are more lily to be skilled. There is still a large room for the growth of the formal sector. As a result, there is a need for the skilled labor and the growth of the formal sector can absorb the older workers. Secondly, in low- and middle-income countries, older people, especially female ones, are more likely to do housework and take care of children. Yu et al. (2019) find a positive effect of grandparental childcare on young females' labor force participation. For the case of Vietnam, Dang et al. (2019) conclude that child care (kindergarten attendance) helps mothers as well as fathers participate more into labor market in Vietnam. This suggests that if grandparents can take care of children, parents are more likely to be employed. Delayed retirement age might reduce the labor market participation of younger household members, especially female ones.

The objective of this study is to measure the costs and identify the trade-offs of Vietnam's low retirement age. It explores several research questions as follows:

1. What are the current situations of workers in the formal and informal sector in Vietnam? Are there gender differences?

2. To what extent does employment of older people affect employment of young people in Vietnam?

3. What is the estimated incremental GDP contribution of longer female labor force participation relative to different scenarios: retirement age at 60 for women, 62 and 65 for both men and women? What is the cost today and what is the cost over the next generation (30 years) given the demographic profile and the shifting trends in pensions eligibility (as the labor force increasingly formalizes)?

5. What is the estimated cost of foregone labor by other age groups if older workers remain in the labor force?

The report is structured into five sections. The second section describes the data sets used in this study. The third section estimates the effect of labor market participation of older age people on younger people. The fourth section projects the benefit of extended retirement age over time. Finally, the fifth section concludes.

2. Data set and descriptive analysis

This study relies on three recent Vietnam Household Living Standard Surveys (henceforth referred to as VHLSS) in 2012, 2014, and 2016. The VHLSSs were conducted by the General Statistics Office of Vietnam (GSO) with technical assistances from the World Bank. The sample size of each VHLSS is 45 thousand households, representative at the provincial level.

The surveys contain detailed information on individuals, households and commune data. Individual-level data include basic demography, employment and labor force participation, education, health. Household-level data include income, expenditure, housing, fixed assets and durable goods, participation of households in poverty alleviation programs. In addition, there are commune-level data including general economic conditions and aid programs, non-farm employment local infrastructure and transportation, education, health, and social affairs.

Table 1 present an overall picture of employment of people aged from 15 in Vietnam. The percentage of people who have worked during the past 12 months in the population (excluding students) was 83% in 2016. 17% of people were not working because of different reasons such as 'health problems', 'housework', 'don't find a job', and others. The unemployment rate (unemployed are those who cannot find a job during the past year) was very low, less than 1% in 2016. The proportion of working people with a wage job increased from 38.7% in 2012 to 41.6% in 2016. The proportion of working people having a skilled work and a formal job also slightly increased. In this study, a job in the formal sector is defined as a job with social insurance. Formal job means better and long-term employment.

Males have a higher rate of working as well as the average number of working hours than females. The different is quite similar in 2012 and 2016. There is a large gender difference in the rate of having wage job. In 2016, 48% of males had a wage job, while this rate was only 35% for females. Males also had a higher rate of skilled work than females, though the gap in this variable was smaller than the gap in the rate of having a wage job.

However, it's interesting that females had a higher rate of formal jobs than males, and the gap was widened over time. In 2016, 20% of working females had a formal job, while 17% of males had a formal job. Possibly, women want to have a stable job with social insurance, and they are more likely to work in the textile, garment and footwear sectors, which employ more formal workers.

Table 1. Employment in Vietnam

Variables	2012			2016		
	Male	Female	Total	Male	Female	Total
Have a work (excluding students) (%)	88.2	79.9	83.9	87.7	78.8	83.1
Number of working hours during the past month	185.3	173.5	179.5	187.3	175.3	181.4
Have a wage job (%)	45.4	31.9	38.7	47.7	35.4	41.6
Have a skilled work (%)	56.4	49.8	53.2	58.0	53.1	55.6
Have social insurance (%)	16.0	16.3	16.2	17.3	19.9	18.6
Monthly wage (thousand VND)	4182.4	3521.8	3914.8	5094.1	4335.3	4776.9
Hourly wage (thousand VND)	24.2	20.6	22.8	28.4	24.3	26.7

Note: This table is computed for people aged from 15 (excluding people who are studying).
Working hour, wage job, skilled work, job with social insurance, and wage are computed for working people.
The wage is measured in the price of 2016.
Source: VHLSSs 2012 and 2016

The retirement-aged population makes up a special demographic in the workforce. The employment rate for men continues to be higher than that of women for all age groups, yet for both genders, employment rates drop consistently as workers age. Though 90.5 percent of workers are still employed at age 50-54 in 2016, this share dropped to 57.6 percent for workers aged 65-69 (Table 2). The number of hours worked and wages see a similar decline for older worker. These trends are to be expected as workers succumb to old age, sickness, and disability—a fact which is reflected in the growing share of workers of both genders who reported these as their primary reasons for not working as they get older (Table 3).

Formal workers, however, retire much earlier and at higher rates than workers that will not receive a pension, as seen by employment rates of formal workers drop substantially when they hit retirement age. The share of women working in formal jobs drops from 10.1 percent of those aged 50-54 to 2.4 of those aged 55-59, whereas the share of men working in formal jobs drops from 13.3 percent among those aged 55-59 to 4.8 percent among those aged 60-64 (Table 4). Notably, the share of men working in formal jobs is almost unchanged

between those aged 50-54 and 55-59, even as the employment rate of their female co-workers drops as they hit their earlier retirement age. All of these factors suggest that the retirement age for men and women in formal jobs is a significant driver of their decision to stop working in their primary. That said, what this data does not capture is the share of people formerly employed in formal jobs that shifted to other forms of employment—such as self-employment—after retirement. This, coupled with the fact employment rates remain high in informal sectors where there is no retirement age or pension to encourage retirement, reflects how a large share retirement-aged men and women are largely capable of continuing to work past their respective retirement ages

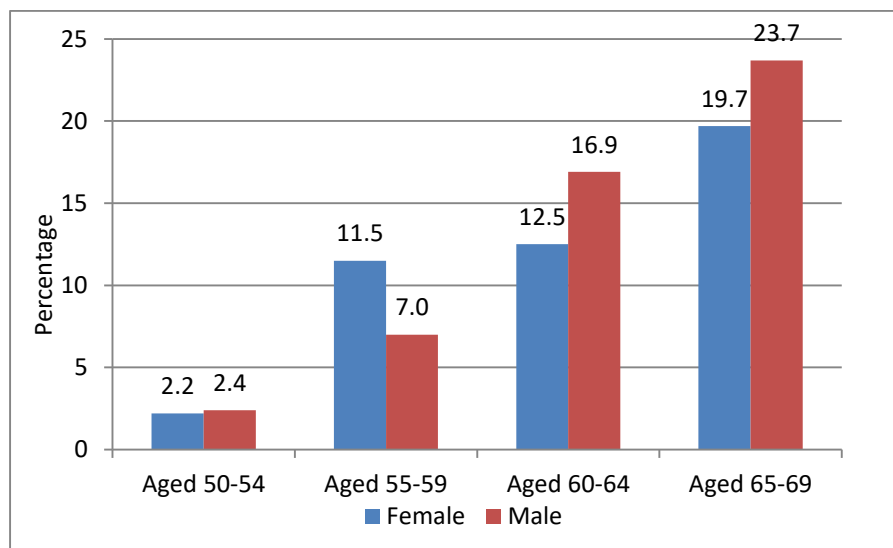Table 2. Employment by age groups and gender, 2016

Variables	Gender	Aged 50-54	Aged 55-59	Aged 60-64	Aged 65-69
Percentage of working people	Female	87.5	78.1	67.4	53.3
	Male	93.6	87.3	75.5	63.3
	Total	90.5	82.5	71.1	57.6
Percentage of people having a wage job	Female	23.3	13.8	10.6	7.8
	Male	39.6	34.7	21.2	12.7
	Total	31.5	24.3	15.8	10.2
Percentage of people having a skilled work	Female	46.0	39.8	37.2	35.5
	Male	57.9	55.0	47.1	42.9
	Total	52.0	47.5	42.0	39.0
Percentage of having a social insurance job	Female	10.1	2.4	0.7	0.3
	Male	13.7	13.3	4.8	1.5
	Total	11.9	7.9	2.7	0.9
Number of working hours during the past month	Female	170.8	152.9	130.8	116.4
	Male	183.8	168.5	146.2	125.5
	Total	177.3	160.8	138.3	120.7
Monthly wage (thousand VND)	Female	4385.1	3134.4	2371.0	2075.8
	Male	5203.0	5176.7	4218.4	3069.3
	Total	4903.1	4604.2	3583.8	2666.4
Hourly wage (thousand VND)	Female	26.2	20.1	19.5	14.2
	Male	30.0	31.4	28.0	23.8
	Total	28.6	28.2	25.1	19.9

Source: Estimation from the 2016 VHLSS.

An important issue is the receipt of contributory pension among older people. Males are more likely to receive pensions than females (Figure 1). For peopled age 55-59, the proportion of receiving pension is higher for women than men, since the retirement age is 55 for women and 60 for men. If the retirement age is extended to 60 for women, those who are aged 55-59 and have pension will be affected. If the retirement age is increased to 65 for both women and men, women aged 55-59 and men aged 60-64 who have been working in the formal sector will be affected.

Figure 1. Percentage of people with contributory pensions

3. Assessing the impact of a raised retirement age

In this section, we look at four different ways in which raising the retirement age could impact the labor force, with the goal of understanding what we should consider as a potential cost or benefit of such a policy. First, we calculate the impact on the pensioners themselves, conducting an impact-evaluation analysis to predict what share of them we could expect to continue working if the retirement age were higher, as well as what we could expect their average wages to be. Next, we look at how the inclusion of these additional workers could affect the labor force, using VHLSS data to assess the relationship between higher employment rates among retirement-aged workers and younger workers in the national labor force, younger workers within their household, and children within their households.

3.1. Impact on younger worker employment

In Vietnam, the current retirement age is the same for all the women as well as for all the men. There is no variation in the retirement age across any dimension. The retirement age is not yet extended. Thus, we cannot estimate the effect of retirement age on employment and wage of younger people. However, we can estimate the effect of having a wage job of older

people on employment and wage of younger people. This effect indicates cost of delayed retirement age. More specifically, we will estimate the effect of the proportion of people aged 55-64 working or having a wage job on the working of younger people. We will use the provincial-level data which are computed from the VHLSSs from 2002 to 2016.

Estimation of the impact of a socio-economic factor is very challenging due to the endogeneity problem. To examine the effect of the proportion of employment of older people on employment of younger people, we will employ panel-data regressions. More specifically, an outcome variable, i.e., the proportion of working of people aged 16-24, is assumed to be a function of the proportion of working of older people and other explanatory variables as follows:

$$y_{i,t} = \beta_1 + Older_{i,t}\beta_2 + Older_{i,t}\beta_3 + X_{i,t}\beta_4 + T_t\beta_5 + v_i + u_{i,t},$$

where y_{it} is an outcome of interest (the proportion of working or the proportion of wage-paying job) of province i in year t. $Older_{i,t}$ is the share of older people who are working (or having a wage job) in province i in year t. $X_{i,t}$ is a vector of explanatory variables including the population of different age groups, education and age of the population groups, the share of urban population, the share of ethnic minority population. T_t is a vector of year dummies. The error term is decomposed into time-invariant component v_i and time-variant component u_{it}. The effect of the current employment and lagged employment of older people on younger people's employment are measured by β_2 and β_3, respectively.
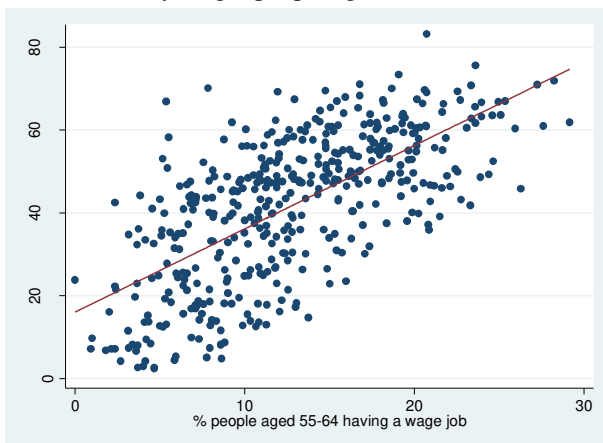
As mentioned, the estimation of urbanization can be biased due to the correlation between employment of older people and errors. Finding a convincing instrument for employment of older people is challenging. In this study, we first use panel data to eliminate the time-invariant component v_i by the first-differencing of equation. A widely-used Generalized Method of Moments (GMM) developed by Holtz-Eakin and others (1988), and Arellano and Bond (1991) are used in this study. The GMM-type instruments for the above differenced endogenous variables are higher order lags of these variables.

Figure 2 presents the proportion of people aged 55-64 having a wage job and the proportion of younger people having a wage job of provinces over during 2002-2010, which are computed from the VHLSSs 2002, 2004, 2006, 2008, 2010, 2012, 2014, and 2016. It shows a strongly positive correlation between the proportion of having a wage job of older
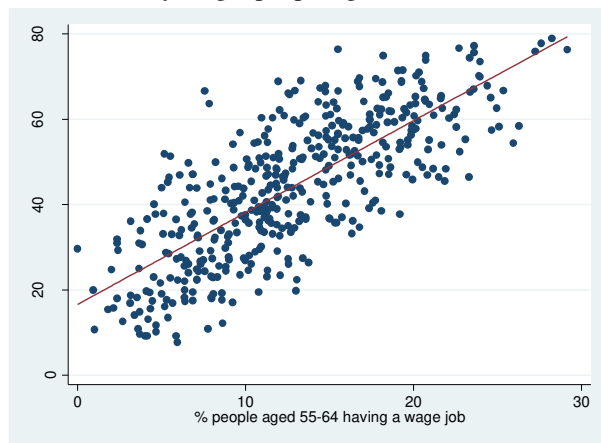
and younger people. Provinces which have a higher rate of older people with a wage job also have a higher rate of young people with a wage job.

Figure 2. Employment of people aged 55-64 and employment of younger people
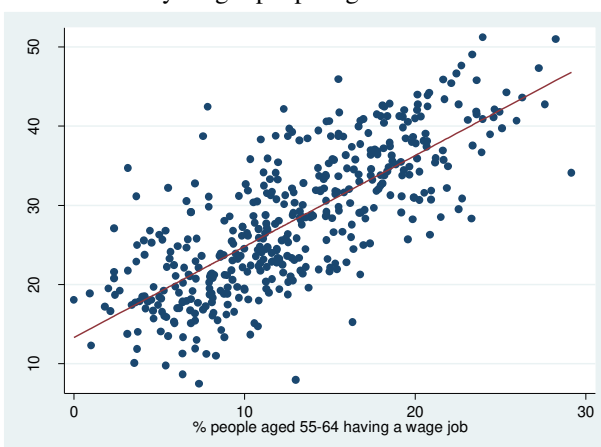
Source: Estimation from VHLSSs from 2002 to 2016.

To estimate the effect of the employment of older people, we use the GMM model. Table 3 reports only the coefficients of the employment rate of the older people and its lag. We estimate the effect of both the proportion of working and the proportion of having a wage job of older people on employment of different age groups. It shows that most coefficients are positive, and all the coefficients are not statistically significant. It suggests that there is no evidence on that substitution between older workers and younger ones. Hence, increasing the retirement age would not have a negative effect on employment of younger people.

Table 3. Effect of employment of people aged 55-64 on employment of younger people

Explanatory variables	Dependent variables			
	Proportion of people aged 15-24 are working	Proportion of people aged 25-34 are working	Proportion of people aged 35-44 are working	Proportion of people aged 45-54 are working
Proportion of people aged 55-64 are working	0.2833	0.3616	0.1947	0.2386
	(0.679)	(0.284)	(0.194)	(0.403)
Lag of the proportion of people aged 55-64 are working	0.0969	0.0689	0.0264	0.1632
	(0.312)	(0.130)	(0.089)	(0.185)
Proportion of people aged 55-64 having a wage job	0.7899	0.0532	0.2603	0.6511
	(1.045)	(0.632)	(0.664)	(0.491)
Lag of the proportion of people aged 55-64 having a wage job	-0.2054	0.0097	0.1775	-0.0078
	(0.860)	(0.520)	(0.547)	(0.404)

Control variables include log of population of different age groups, the average schooling years and the average age of different age groups, the proportion of urban population, and the proportion of ethnic minority population.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.
Source: estimation from VHLSSs from 2002 to 2016

3.2. Impact on younger worker employment (within household)

This section examines the effect of working of older people on employment of young people in the same households. We use the individual-level data from VHLSSs 2010 to 2016. We compare employment of young members in households in which older household members (aged 55-64) have a wage job and employment of young members in households in which older household members do not have a wage job.

We use regression to estimate the effect of the labor market participation of older members on younger members. The econometric model is written as follows:

$$y_{i,j} = \beta_1 + Older_j\beta_2 + X_{i,j}\beta_3 + O_j\beta_4 + H_j\beta_5 + u_i,$$

where y_{it} is an outcome of interest (employment variables) of younger member (aged below 55) i in household j. $Older_j$ is a dummy indicating the oldest member aged 55-64 having a wage job or participating in the labor market. $X_{i,j}$ is a vector of control variables of younger people, while O_j is a vector of control variables of older people. H_j are household-level control variables. We first estimate the effect of the labor market participation of male older member, and then female older member. In few households, there might be more than one

member aged 55-64. Thus, we use the employment status of the oldest member (but still aged 55-64).

The main problem in estimating β_2 is the endogeneity of the working of older people. It means that individuals living in a household in which an older person is working are different from individuals living in another household in which an older person is not working. Omitted variables in equation (1), such as household economic characteristics, can affect working statuses of both younger and older people. To solve this problem, we use instrumental-variable regression (Wooldridge, 2010). A valid instrument should be correlated with working status of older people but not working status of younger people. In this study, we use age of older people as the instrument. This variable strongly affects the employment of the older people, but we expect that this variable does not affect the employment of the older people in the same household.

It should be noted that we also tried the regression discontinuity estimation which compare employment of younger household members among households with older people aged around 55 for men and 60 for women. This is the retirement age, and the proportion of people working in the formal section should decrease significantly after this age. However, there is not a jump in the proportion of formal jobs at this age. Thus, we cannot use this estimation method.

As mentioned, there can be more than one older member in a family. To examine this issue, we regress employment and wage of younger people on the variable 'the number of older people with a wage job' living in the same families (In Table 9 above, we estimate the effect of employment of the oldest member). In addition, if an older member is not working, she or he can do housework. In the 2014 and 2016 VHLSSs there is a question on whether a household member is not working because of housework. Thus, we also estimate the effect of 'older people doing housework' on employment of younger household members. It should be noted that we use age as the instrument for the wage job of older people. Thus age cannot be used as the instrument for the variable 'doing housework'. We are not able to find a good instrument for the variable of 'doing housework'. The estimate of the effect of 'doing housework' might be biased though we control a number of explanatory variables. The result should be interpreted with caution. It can measure the association between doing housework and employment of younger people instead of causality.

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Table 4 reports the coefficients of the main variables of interest, which are the working and doing housework of older people. We estimate the effect for separate samples of women and men. It shows that the number of older people with a wage job in the family does not have a significant effect on employment as well as wage of younger household members. The effect is small and not significant in the three samples of older people. These findings are similar to those from Table 4.

We find a positive and significant effect of older people doing housework on monthly wage of younger households. If a woman aged 55 to 59 is doing housework, this is associated with a 15.6% increase in monthly wage of younger household members. For women aged 60-64, this association is 17.1%. For men aged 60-64, this association is 15.9, but it is not significant. In Vietnam, it is fairly common that grandparents stay with parents and children. Older people can do housework and childcare for adults. Adults can spend more time on working or find a wage job. This finding is consistent with finding from Dang et al. (2019) that childcare helps to increase wage for parents.

Table 4. Effect of having a wage job of older people on employment of other household members

Sample	Explanatory variables	2SLS		
		Have a work	Have a wage job	Log of monthly wage
Effects of having a wage job of women aged 55-59 on employment of other household members	Number of older people having a wage job	0.0464	-0.1030	0.1423
		(0.182)	(0.341)	(0.364)
	Older people doing housework	0.0115	0.0250	0.1562*
		(0.031)	(0.060)	(0.083)
Effects of having a wage job of women aged 60-64 on employment of other household members	Number of older people having a wage job	0.1354	0.3604	0.3155
		(0.265)	(0.491)	(0.379)
	Older people doing housework	0.0024	0.0660	0.1709**
		(0.042)	(0.080)	(0.084)
Effects of having a wage job of men aged 60-64 on employment of other household members	Number of older people having a wage job	0.1197	-0.0750	0.0147
		(0.205)	(0.293)	(0.426)
	Older people doing housework	0.0689	0.1154	0.1585
		(0.065)	(0.103)	(0.171)

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.
Source: Estimation from the 20014 and 2016 VHLSSs.

3.3. Impact on retirement-aged workers

The main objective of the study is to forecast the cost and benefit of extended retirement age for women and men. We explore four scenarios as follows:

- Scenario 1: Increasing the retirement age of women from 55 to 60. The retirement age of men is unchanged, at 60.
- Scenario 2: Increasing the retirement of women from 55 to 60, and the retirement age of men from 60 to 62. This scenario is currently proposed by the Ministry of Labor, Invalid and Social Affair.
- Scenario 3: Increasing the retirement of women from 55 to 62, and the retirement age of men from 60 to 62. Thus, both men and women at 62.
- Scenario 4: Increasing the retirement of women from 55 to 65, and the retirement age of men from 60 to 65. Thus, both men and women at 65.

An impact of a program or a policy on a beneficiary group is defined as the difference in an outcome of the beneficiary group in the presence of the program and the outcome in the absence of the program. In this study, the program is defined as the extension of retirement age (four scenarios). The current situation is regarded as the situation in the absence of the program. Situations under the four scenarios of retirement age extension are situations in the presence of the program. However, these situations are not observed yet. They are called counterfactual in the terminology of impact evaluation, and they need to be estimated. Our main purpose is to estimate employment and wages of older people if the retirement age is extended.

It should be noted that in this study the policy of extended retirement age has not been implemented. Our study only forecasts the potential effect of proposed extension of retirement age instead of measuring causality of the extension of retirement age. In traditional impact evaluation of a program, the program has been implemented, and the main research question is to answer what would happen to the participants in the program if they had not participated.

A key assumption in this study is that employers comply with the extended retirement age. This assumption is reasonable for at least the public sector. For the private sector, employers might end the contract with the workers before the retirement age and replace them with younger workers. However, Kalwij et al. (2010) does not support the hypothesis

that employment of the young and old are substitutes and even finds some minor complementarities. Older workers in the formal sector have more experienced and skills. If the retirement age is increased, older workers are expected to have more incentive to continue working and employers are more likely to hire them.

For our study, when the retirement age is increased, it has a direct effect on people who are working in the formal sector. For the informal sector, there are not retirement ages applied for them, and there is no effect of the extension of retirement age on this group. For illustration of the main idea of impact evaluation, we discuss the estimation method for the first scenario (i.e., increasing the retirement age for women from 55 to 60). Under this scenario, women aged 55 to 59, who have contributory pensions are affected. We do not assume that all these people will have to work if retirement age is extended. Some people cannot work because of health and other purposes. There are two questions "How many percent of the pensioners would continue to work if the retirement age had been extended to 60?", and "If they work, how much they can earn?".

Figure 3 presents the description of different groups used in the impact evaluation. 11.5% of women aged 55 to 59 had contributory pensions in 2016, while 89.5% did not have contributory pensions. After retirement, people have three mutually exclusive choices: (i) continue to have a wage job (10.5%), (ii) self-employed (33.9%), and (iii) not working (55.2%). It shows that the percentage of not working for people with pensions is remarkably higher than that for people without pensions.

For retired people who are still having a wage job, there would be a small effect on their working if the retirement age is increased. We assume that there are no effects on this group. Thus, the employment effect of retirement age extension is mainly on women in the formal sector (who are pensioners in the VHLSSs) and not working after the current retirement age. In the VHLS data, they are women who received contributory pensions and were not working. In terminology of impact evaluation, the treatment group is women with contributory pensions and not working, while the control group is the remaining people (Figure 3).

To estimate the effect of the retirement age extension on employment, we use the propensity score matching (Rosenbaum and Rubin, 1983). The idea is that we find people in

the control group who have very similar observed characteristics as the treatment group. These similar people are called the matched control group, and their employment can be used to 'mimic' the employment of the treatment group if the retirement age is extended. To find the similar control group, we use the propensity score matching with kernel weights and bandwidth of 0.01. We tried several matching estimators including nearest neighbor matching, kernel matching and Mahalanobis matching. These methods yield very similar results, and we cannot reject the equality of the estimates between methods. In this report, we use the results from kernel matching for interpretation. The matching method is discussed in more detailed in the Appendix.

Regarding wages, the extension of retirement age has an effect on women who have pensions but not working and those self-employed. In this matching, the treatment group consists of matched people in the previous matching step and self-employed people. The control group includes wage earners (regardless of having contributory pensions or not). We also use the propensity score matching to find a control group which have similar characteristics as the treatment group. We use wages of a matched control group as the proxy of wages for the treatment group.

Table 5 presents the distribution of population by the receipt of contributory pension and employment status for female and male. It shows a large difference in the proportion of working between pensioners and non-pensioners. This implies that having contributory pension can reduce the proportion of working.

Table 5. Employment by pension status

Having pension	Working	Female			Male		
		Aged 55-59	Aged 60-64	Total	Aged 55-59	Aged 60-64	Total
Having pension	Not working	3.63	3.4	7.04	1.83	3.55	5.38
	Wage jobs	0.72	0.34	1.06	0.76	1.08	1.84
	Self-employed	2.23	1.61	3.83	1.52	2.34	3.86
Not having pension	Not working	8.93	10.55	19.48	5.63	6.56	12.19
	Wage jobs	5.43	2.73	8.15	17.02	5.52	22.54
	Self-employed	36.31	24.13	60.44	31.96	22.23	54.19
	Total	57.24	42.76	100	58.71	41.29	100

Source: Estimation from the 2016 VHLSS.

Figure 3. Impact evaluation groups
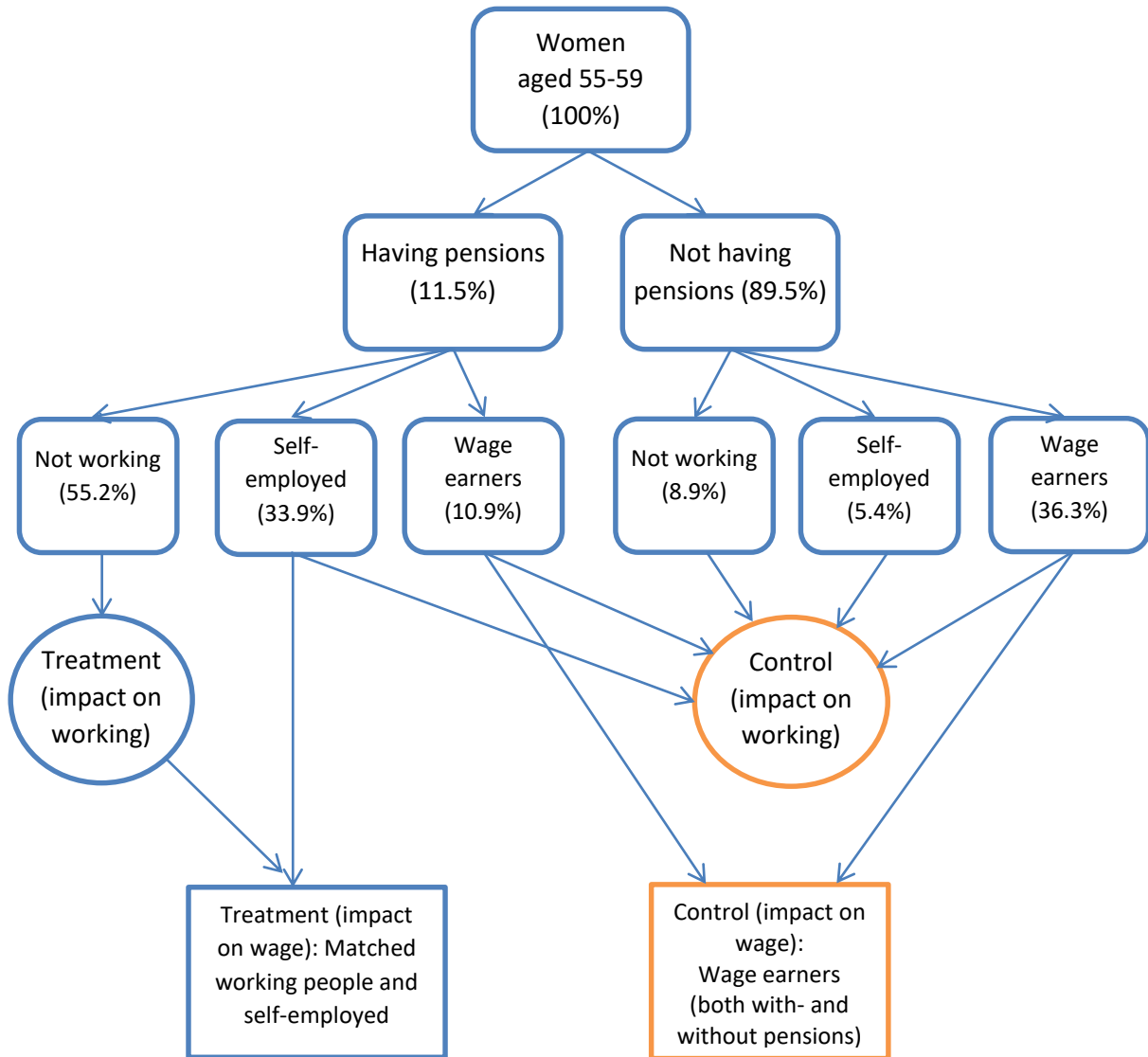
Table 6 presents the average treatment effect (ATT) of the extension of retirement age on employment and wage for male and female. The treatment group has the rate of working as well as monthly wage equal to zero. The row 'unmatched' reports outcomes of treatment and control, and the row ATT reports outcomes of the treatment and matched control groups. The matched control group includes individuals those who have similar characteristics as the control group. The difference is the estimate of the cost of early

retirement. In other words, it measures the benefit on employment and wages that the retired group could earn if they contribute to work.

If retirement age is extended to 60 for women, those who are aged 55 to 59 are still working in the formal sector. However, not all of them continue to work. The results show that 80.3% of them would continue to work, and the average wage for these people is estimated to be 5,866.8 thousand VND.

If the retirement age is extended to 64 for women, 72.3% of women aged 60-64 will continue to work. This rate is lower than the rate for women aged 55 to 59, since older people face more health problems which can deter them from working. The monthly wage that they could earn is also lower, at 3,489 thousand VND.

The effect of the extension of retirement age is also estimated for men from 60 to 64. It is estimated that 78.7% of men continue to work in the formal sector if they do not retire. The average wage they could earn is 6,307 thousand VND. This wage is remarkably higher than wage of women of the same age. Again, this reflects the gender inequality in wage.

Table 6. Effect of on working and monthly wage

Samples	Outcome variables	Sample	Treated	Controls	Difference	S.E.
Women aged 55-59	Have a work	Unmatched	0	84.4	-84.4***	2.0
		ATT	0	80.3	-80.3***	1.8
	Monthly wage (thousand VND)	Unmatched	0	3334.5	-3334.5***	211.3
		ATT	0	5866.8	-5866.8***	620.6
Women aged 60-64	Have a work	Unmatched	0	74.4	-74.4***	2.5
		ATT	0	72.3	-72.3***	2.9
	Monthly wage (thousand VND)	Unmatched	0	3489.0	-3489.0***	125.9
		ATT	0	5147.0	-5147.0***	268.4
Men aged 60-64	Have a work	Unmatched	0	83.8	-83.8***	2.2
		ATT	0	78.7	-78.7***	1.7
	Monthly wage (thousand VND)	Unmatched	0	4777.1	-4777.1***	220.5
		ATT	0	6307.2	-6307.2***	393.1

ATT is Average Treatment Effect.
*** p<0.01, ** p<0.05, * p<0.1.
Source: Estimation from the 2016 VHLSS.

4. Projected benefit of extension of retirement age

4.1. The benefit of extension of retirement age

This section estimates and projects the total benefit and cost of retirement age extension in the future. There are four scenarios which are discussed in the previous sections. We use the first scenario (retirement age of women is increased to 60) to illustrate the estimation method. Firstly, the total benefit is computed as the total wage that women aged 55-59 can earn. This total wage is computed using the 2016 VHLSS as follows:

Benefit = Not working * Working rate * Wage + Self-employed * Wage,

where 'Not working' is the total number of women aged 55-59 who have contributory pension but not working. The working rate is estimated at 80.3% (in Table 14). The monthly wage which is estimated equal to 5,866.8 thousand VND (Table 14). The first term of the right-hand side of equation (1) measures the benefit for women who are not working under early retirement but will work under retirement age extension. 'Self-employed' is the total number of women aged 55-59 who have contributory pension and are currently self-employed. This group will continue to have a wage job if the retirement age is extended. For other scenarios, the computation method is similar.

We multiply the monthly wage with 12 to get the total annual wage. Table 15 shows that the total benefit under Scenario 1 is 10619.4 billion VND for one year. Table 15 reports the benefit and cost in billion VND and also equivalent values in million US$ in parentheses. In Scenario 2, the benefit from working of women 55-59 is the same. However, in this scenario, the retirement age of men is increased to 62. Men aged 60 and 61 continue to work, and they can bring the total wage of 4,595.4 billion VND. In total, the benefit of the second scenario is 15,214.9 billion VND. The third scenario has the benefit of 18,309.9 billion VND. The fourth scenario has the highest benefit, which is equal to 27,463.2 billion.

As mentioned, the impact of a program is the difference between the status in the presence of the program and the status in the absence of the program. When older people are not retired, their benefit of doing housework for younger people is no longer available. The previous section shows that wage of adults is around 15% higher when retired people are doing housework. The cost of delayed retirement age is estimated by the effect of 'doing housework' of older people (Table 15) multiplied by the wage of youngers people. We assume that when a woman aged 55-59 does not do housework, it reduces wage of an adult by 15.2%. For a woman and a man aged 60-64 not doing housework, the wage of a younger

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is reduced by 17.1% and 15.9%. It should be noted that if there is only one older person having a wage job instead of not doing housework, the wage-reducing effect is computed for only one younger person. If there are two older people doing a wage job instead of housework, the wage-reducing effect is computed for two people, and so on.

Not all people are not working after retirement. Figure 6 shows that 33.9% of pensioners are self-employed, and income from self-employment vanishes if these self-employed people are not retired. Using the 2016 VHLSS, we estimate that the average wage is 62% higher than average self-employed income. Using this information, we can compute the total forgone self-employed income for self-employed people.

Table 7 shows that the cost of not doing housework under Scenarios 1, 2, 3 and 4 is 915.6; 12,44.6; 15,79.9; and 2,370.6 billion VND, respectively. The forgone self-employment income is higher. In Scenarios 1 and 2, this cost is equal to 2,812.0 and 4,139.8 billion VND, respectively. In Scenarios 3 and 4, the cost is equal to 4,940.1 and 7,473.1 billion VND, respectively.

Finally, we can estimate the net benefit of the extension of retirement age as follow:

Net Benefit = Benefit – Cost of forgone housework – Forgone self-employed income.

The net benefit is higher if the age of retirement is higher. Table 10 shows that the net benefit of Scenario 1 is 6,891.9 billion VND, equivalent to 0.152% of GDP. The net benefit of Scenario 2 is higher, at 9,830.4 billion VND (0.218% of GDP). In Scenario 3, the net benefit is equal to at 11,789.8 billion VND (0.262% of GDP). Scenario 4 brings the highest benefit at 17,619.5 billion VND (0.391% of GDP)

Table 7. Cost and benefit of later retirement

Scenario	Groups who have late retirement	Benefit: Increased wage (billion VND)	Cost of not doing housework (billion VND)	Self-employed income (billion VND)	Net income increased (billion VND)	Share in GDP (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Scenario 1: Women retire at 60	Women retire at 60	10,619.4	915.6	2,812.0	6,891.9	0.153
		(473.0)	(40.8)	(125.3)	(307.0)	
Scenario 2: Women retire at 60, and men at 62	Women retire at 60	10,619.4	915.6	2,812.0	6,891.9	0.153
		(473.0)	(40.8)	(125.3)	(307.0)	
	Men retire at 62	4,595.4	329.0	1,327.9	2,938.6	0.065

Scenario	Groups who have late retirement	Benefit: Increased wage (billion VND)	Cost of not doing housework (billion VND)	Self-employed income (billion VND)	Net income increased (billion VND)	Share in GDP (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		(204.7)	(14.7)	(59.1)	(130.9)	
	Total	15,214.9	1,244.6	4,139.8	9,830.4	0.218
		(677.7)	(55.4)	(184.4)	(437.9)	
Scenario 3: Both women and men retire at 62	Women retire at 62	13,714.5	1,250.9	3,612.3	8,851.3	0.197
		(610.9)	(55.7)	(160.9)	(394.3)	
	Men retire at 62	4,595.4	329.0	1,327.9	2,938.6	0.065
		(204.7)	(14.7)	(59.1)	(130.9)	
	Total	18,309.9	1,579.9	4,940.1	11,789.8	0.262
		(815.6)	(70.4)	(220.0)	(525.2)	
Scenario 4: Both women and men retire at 65	Women retire at 65	17,398.2	1,650.0	4,564.8	11,183.4	0.248
		(775.0)	(73.5)	(203.3)	(498.1)	
	Men retire at 65	10,064.9	720.6	2,908.3	6,436.1	0.143
		(448.3)	(32.1)	(129.5)	(286.7)	
	Total	27,463.2	2,370.6	7,473.1	17,619.5	0.391
		(1,223.3)	(105.6)	(332.9)	(784.8)	

Note: Figure in parentheses are million USD. The exchange rate in Jan 2016 is 22,450 VND = 1 USD.
The benefit and cost are estimated for one year.
Source: Estimation from the 2016 VHLSS.

4.2. Projection of benefit over time

In this section, we present the projection of benefit over time. We assume that 2016 is the first year to implement the extension of retirement age under three scenarios, and we project the effect until 2049. This can be considered as the forecast of the net benefit from the first year of implementation to 33 years later. For projection, we need two parameters. The first parameter is the population of male and female projected until 2049. We use the population forecast from General Statistical Office and UNFPA (2016) under the assumption of a middle fertility rate. The second parameter is the rate of workers in the formal sector over time. We compute the rate of workers in the formal sector using the 2016 VHLSS and assume that this rate is constant over time for age cohorts. For example, the rate of formal jobs for women aged 60 in 2046 (30 years later from the 2016 VHLSS) will be the same as the rate of formal jobs of women aged 30 in the 2016 VHLSS. The formal sector will be expanded for the

whole economy, but for the same cohort this rate can decrease as age increases. Thus, we assume that these two opposite effects are cancelled out, and we can use the current rate of the formal sector to project the future rate for the same age cohort.

It should be noted that according to the recent proposal of the Ministry of Labor, Invalid and Social Affair, the retirement age of women is increased by only 6 months in the first year of implementation, then one year in the second year, and 5 years after 10 years. It means that women retire at 55.5 years old in the first year of implementation, then 56 in the second year, and 60 in the tenth year of implementation. For men, the retirement age is extended by four months for each year. It means that men retire at 62 after 6 years of implementation.

Table 8 and Figure 4 present the net benefit of extended retirement age projected over time. In the first year, the benefit is small since there is benefit only for women aged 55 or men aged 60. Moreover, this benefit is computed for only 6 months for women and 3 months for men. The full benefit is computed for women after 10 years and for men after 8 years. The benefit is accumulated over years until all people in the age group are working. The benefit increases over time, since the number of older people who are still working is higher and the share of people having a formal job is increasing. In the year 2049, the benefit of the extension of retirement age accounts for 1.21% of GDP in the scenario 1; 1,51% of GDP in scenario 2; 1.89% of GDO in scenario 3; and 2.82% in scenario 4. It should be noted that the benefit of scenarios 1 to 3 decreases over 2048-2049, since the total population of women aged 55-62 and men aged 60-62 is reduced (because of a decreasing fertility trend).

Table 8. Projected benefit of extended retirement age over time

Years	Net income gain (billion VND)				Share in GDP (%)			
	Scenario 1: Women retire at 60	Scenario 2: Women retire at 60, and men at 62	Scenario 3: Both women and men retire at 62	Scenario 4: Both women and men retire at 65	Scenario 1: Women retire at 60	Scenario 2: Women retire at 60, and men at 62	Scenario 3: Both women and men retire at 62	Scenario 4: Both women and men retire at 65
2016	689.2	1178.9	1178.9	1178.9	0.02	0.03	0.03	0.03
2017	1427.0	2482.1	2482.1	2482.1	0.03	0.06	0.06	0.06
2018	2204.1	3886.5	3886.5	3886.5	0.05	0.09	0.09	0.09
2019	3027.8	5394.0	5394.0	5394.0	0.07	0.12	0.12	0.12
2020	3999.4	7265.0	7265.0	7265.0	0.09	0.16	0.16	0.16
2021	5026.2	9062.4	9062.4	9062.4	0.11	0.20	0.20	0.20
2022	6216.9	10577.8	10577.8	10316.8	0.14	0.23	0.23	0.23
2023	7596.7	12186.2	12186.2	12764.1	0.17	0.27	0.27	0.28
2024	9091.1	13546.1	13546.1	14867.5	0.20	0.30	0.30	0.33
2025	10928.2	15429.7	15429.7	16100.0	0.24	0.34	0.34	0.36
2026	11653.4	16452.8	17119.9	18743.6	0.26	0.37	0.38	0.42
2027	12419.7	17790.8	18834.6	21453.1	0.28	0.40	0.42	0.48
2028	13351.0	18725.9	21063.2	24527.1	0.30	0.42	0.47	0.54
2029	14299.3	19568.4	23269.4	27790.2	0.32	0.43	0.52	0.62
2030	14874.9	20496.6	24638.6	31426.2	0.33	0.46	0.55	0.70
2031	16056.0	22186.0	26631.5	34657.4	0.36	0.49	0.59	0.77
2032	17469.4	23512.7	28041.8	37753.2	0.39	0.52	0.62	0.84
2033	19062.1	25201.3	30158.0	41944.0	0.42	0.56	0.67	0.93
2034	21216.5	27952.6	33217.4	46969.4	0.47	0.62	0.74	1.04
2035	23644.3	30586.1	35994.0	52014.3	0.53	0.68	0.80	1.16
2036	26144.9	33357.0	39265.9	56021.0	0.58	0.74	0.87	1.24
2037	28857.9	36179.7	42877.0	60630.9	0.64	0.80	0.95	1.35
2038	32232.9	39952.6	47425.3	66150.2	0.72	0.89	1.05	1.47
2039	34898.4	43504.1	51923.5	71653.5	0.78	0.97	1.15	1.59
2040	37261.1	46075.7	55367.7	76878.8	0.83	1.02	1.23	1.71
2041	39705.5	48726.1	58820.9	82384.1	0.88	1.08	1.31	1.83
2042	41916.0	52593.5	63730.0	89241.5	0.93	1.17	1.42	1.98
2043	43253.3	55299.3	67942.9	95323.8	0.96	1.23	1.51	2.12
2044	46040.7	58610.2	72157.1	102364.0	1.02	1.30	1.60	2.27
2045	48965.0	62530.9	76104.9	109949.4	1.09	1.39	1.69	2.44
2046	51476.6	65350.4	79535.4	116581.9	1.14	1.45	1.77	2.59
2047	53541.7	67363.6	82450.7	121470.9	1.19	1.50	1.83	2.70
2048	54957.6	68593.2	84224.2	124550.9	1.22	1.52	1.87	2.77
2049	54335.3	68139.9	85166.5	126901.0	1.21	1.51	1.89	2.82

Note: the benefit is measured in the price of Jan 2016.
Source: Estimation from the 2016 VHLSS.

Figure 4. Projected benefit of extended retirement age over time
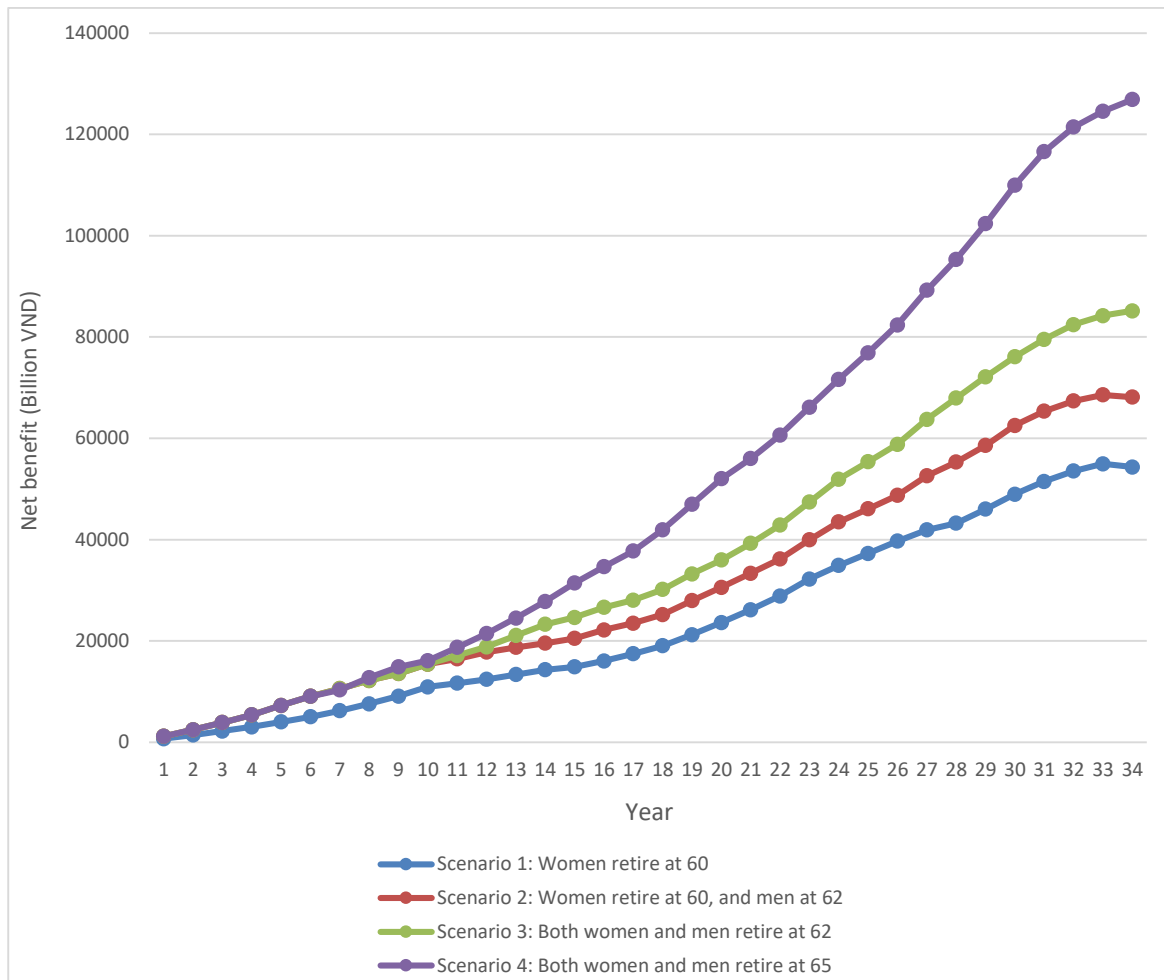
We measure the benefit of the retirement age extension as the share of GDP. We assume that wage and GDP grow at the same growth rate. Thus, the share of benefit in GDP does not depend on the change in GDP and wage. The effect of retirement age extension is increased over time because of the increasing population of older and the increasing share of formal sector over time. It should be noted that the growth of wages was higher than the growth rate during the past years. For example, during the 2014-2016 period, the average wage increased by around 10% annually (Table 1), while the GDG growth rate was around 6% in the same period. Thus, the benefit of the retirement age extension will be larger than our projected benefit if the average wage and GDP in the future continue to increase at a similar rate as the previous period.

Table 9 compares the benefit of extended retirement age between men and women. For comparison, we limit the sample to the age 60-64, that is we compare the net benefit

between women aged 60-64 and men aged 60-64. We estimate the total effect of full implementation (i.e., assuming all people aged 60-64 are working since 2016). The total benefit from the male aged 60-64 is higher than that from women aged 60-64, since the share of working and the wage of male are higher than that of female. However, in the future women will have a higher share of working in the formal sector and a higher population size (since they have a longer life expectancy). As a result, in the years after 2041 (the 25th year after the implementation), the benefit from female is higher than benefit from male (Figure 10).

Table 9. Projected benefit of extended retirement age over time for female and male

Years	Net income gain (billion VND)		Share in GDP (%)	
	Female aged 60-64 are working	Male aged 60-64 are working	Female aged 60-64 are working	Male aged 60-64 are working
2016	1021.0	1531.2	0.02	0.03
2017	2092.1	3165.1	0.05	0.07
2018	3198.6	3996.8	0.07	0.09
2019	4337.1	5467.1	0.10	0.12
2020	5498.7	8740.4	0.12	0.19
2021	5736.8	9151.9	0.13	0.20
2022	5945.3	9938.1	0.13	0.22
2023	6124.4	10380.9	0.14	0.23
2024	6312.0	10836.6	0.14	0.24
2025	6672.8	10949.3	0.15	0.24
2026	6991.8	11575.6	0.16	0.26
2027	7415.8	11939.8	0.16	0.27
2028	7931.8	12338.4	0.18	0.27
2029	8436.6	12723.3	0.19	0.28
2030	9137.0	13417.3	0.20	0.30
2031	9728.1	14030.1	0.22	0.31
2032	10353.3	14103.9	0.23	0.31
2033	11115.1	14784.6	0.25	0.33
2034	11883.8	15524.1	0.26	0.34
2035	12341.6	16028.4	0.27	0.36
2036	13320.8	16555.3	0.30	0.37
2037	14497.8	17275.2	0.32	0.38
2038	15822.1	18095.2	0.35	0.40
2039	17621.1	19134.0	0.39	0.42
2040	19647.6	19970.0	0.44	0.44
2041	21734.2	20944.3	0.48	0.47
2042	24009.2	23316.3	0.53	0.52
2043	26824.1	25246.4	0.60	0.56
2044	29051.2	27272.2	0.65	0.61

Years	Net income gain (billion VND)		Share in GDP (%)	
	Female aged 60-64 are working	Male aged 60-64 are working	Female aged 60-64 are working	Male aged 60-64 are working
2045	31019.1	29965.2	0.69	0.67
2046	33044.7	32060.7	0.73	0.71
2047	34882.2	33046.9	0.77	0.73
2048	35990.7	33602.5	0.80	0.75
2049	38321.7	34244.1	0.85	0.76

Source: Estimation from the 2016 VHLSS.

Figure 5. Projected benefit of extended retirement age over time for female and male
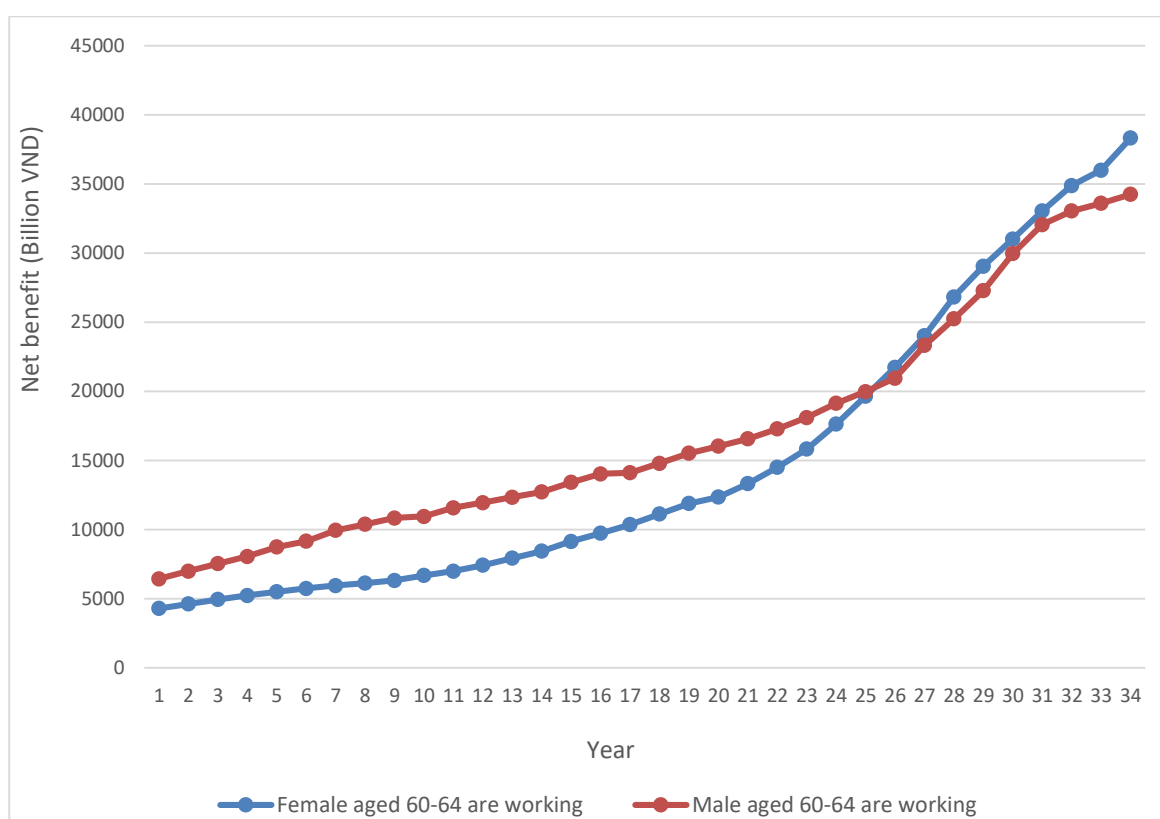
Source: Estimation from the 2016 VHLSS.

5. Conclusions

In Vietnam, the retirement age for women and men is 55 and 60, respectively. Yet, there are a large proportion of people still working after the retirement age. 78.1% of women aged 55-59 and 67.4% of women aged 60-64 were still working in 2016. 75.5% of men aged 60-64 were working in 2016. Even for people who are not working, they are doing housework and

childcare for their children. Given the improved health as well as the increased population of older people, it is necessary to consider increasing the retirement age in Vietnam.

This report examines the effect of extension of retirement age in Vietnam under three scenarios: (i) retirement age of women is increased to 60; (ii) retirement age of women is increased to 60, and retirement age of men is increased to 62, (iii) retirement age of both women and men is increased to 62, (iv) retirement age of both women and men is increased to 65.

If retirement age is increased, people who are working in the formal sector can have a longer time of working and can increase their wages. We do not find a significant effect of labor market participation of older people on younger people's employment. This suggests that retirement age delay would not affect the labor demand as well as wages for young workers. However, working in the formal sector means reduction of housework for their families and also forgone self-employment income. The net benefit of the increase in retirement age is the total wages that older people can earn minus the cost of not doing housework and the forgone self-employment income. The results show that the net benefit of Scenario 1 is 6891.9 billion VND, equivalent to 0.152% of GDP. The net benefit of Scenario 2 is higher, at 9,830.4 billion VND (0.218% of GDP). In Scenario 3, the net benefit is equal to at 11,789.8 billion VND (0.262% of GDP). Scenario 4 brings the highest benefit at 17,619.5 billion VND (0.391% of GDP).

We project the benefit of the extension of retirement age over 33 years to come. The benefit is larger over time, since the number of older people is higher and the share of people having a formal job is increasing. In the year 2049, the benefit of the extension of retirement age accounts for 1.21% of GDP in the scenario 1; 1,51% of GDP in scenario 2; 1.89% of GDO in scenario 3; and 2.82% in scenario 4. However, in 2048 and 2049 the benefit of scenarios from 1 to 3 decreases, since the total population of women aged 55-64 and men aged 60-64 is reduced.

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