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Abstract

This paper analyzes whether the government intervention on the firm's employment policy has an effect on the employment of the elderly. The pensionable age has increased in Japan. As a result, this policy makes a difference between the mandatory retirement age and the pensionable age. The Japanese government has obliged firms to employ elderly workers until they arrive at the pensionable age. According to the literature, the labor force participation rate of the elderly male workers increases after the implementation of this policy. However, according to the result in this paper, after omitting the unobserved heterogeneity and controlling the worker's demographics, there is no effect on the employment of the elderly workers. This paper discusses why the effect of the government intervention on the demand side of the elderly labor market has no effect on the employment of the elderly. According to this discussion, it is possible that the firms avoid the cost which they will burden from the employment of the elderly worker by using measures which are not illegal while they only follow the directions which the law directly requires.
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1 Introduction

The retirement related policy such as a reform of pension system has become important in developed countries to sustain social security system. Many developed countries have faced the same problems of decreasing birthrate and an ageing population. As a population ages, the cost of social security and social welfare increases, eroding the country's budget. Many developed countries have reformed pension system to reduce the cost of social security and social welfare. Many developed countries such as the United States, England and Korea have already decided to increase pension eligibility age for some next decades. Japan has already increased pension eligibility age. Pension reforms in developed countries are expected to influence the retirement. As Gruber and Wise (1998) discuss the relationship between social security system and retirement in the developed countries, the relationship has generated a lot of attention in economics. In many developed countries, the regulation about the mandatory retirement system also has been reconsidered when they reform the pension system after 2000. For example, with respect to the UK, Germany and France, they have reformed the law which regulates the mandatory retirement age. In the US, the mandatory retirement system have been abolished in 1960s.

In the US, there are some studies to provide the direct evidence which analyzes the effect of the abolition of the mandatory retirement age.[1] I will discuss these literature in this paper. (Neumark and Stock (1999), Ashenfelter and Card (2002), von Wachter (2002) and Adams (2003)) Ashenfelter and Card (2002) analyze only the labor market of university professors. According to these results, the employment of the workers which are protected by the law increases. Except in the US, there is not enough evidence with respect to the effect of reforming the regulation about the mandatory retirement age although some developed countries have reformed the regulations with respect to the mandatory retirement system. In fact, the result in this paper is different compared to the result in the US. I will discuss why the result is inconsistent with the US.

In Japan, the Japanese government has changed the basic pension eligibility age from 60 to 65 so as to decrease the payment amount of public pension. In Japan, many firms set their mandatory retirement age to around 60. As a result, many elderly people arrive at the mandatory retirement age before they start to receive their public pension. The Japanese government has recently encouraged firms to re-employ elderly people after reaching the mandatory retirement age until they arrive at the basic pensionable age (Flat-rate part).[2] This regulation is called the Elderly Employment Stabilization Law (EESL). Kondo and Shigeoka (2016) was the first study to analyze this policy.[3] They estimated the probability of being a salaried worker at ages 60-65. They compared the 1945 birth year cohort with the 1946 birth year cohort. The result was that the 1946 birth year cohort was more likely

[1] Since Lazear (1979), the theoretical research to answer why there is a mandatory retirement has developed. For example, the related studies are Lazear (1981), Burkhauser and Ouinn (1983), Lazear and Moore (1984) and Lang (1989).

[2] The government allowed firms which used a restrictive reemployment system not to remove their restrictive reemployment system.

[3] Clark and Ogawa (1992) estimate the effect of the change in the mandatory retirement policy on the wage profile before the EESL.

to be a salaried worker at ages 60 and 61 by 2.4, 3.2 percent. This effect seems to be small. However, they have some weaknesses because of data limitation as I explained in this paper.

The goal of this paper is to estimate the effect of the EESL on the employment of the elderly and discuss how a firm reacts to this policy after the implementation of the EESL. According to the result in this paper, before 2013, I do not find any significant positive effect on the employment of the elderly. I will discuss why there is no effect of the EESL on the employment of the elderly. According to the Ministry of Health, Labour and Welfare, there is an exemption with respect the implementation of the EESL before 2013 and there is no clear statement with respect to wage contract when a firm makes a contract with a worker who wants to continue to work in the firm after the mandatory retirement age. In addition, there is an important exception. Before 2013, a firm can restrict the workers who can get a reemployment offer by accepting the agreement from a labor union. There is an "escape route" to run away from the cost which they will burden. It is possible that the firms have used these "escape routes". As I will explain, most of firms react to this policy by introducing a reemployment system without abolishing the mandatory retirement system or increasing the mandatory retirement age, which means that many firms choose a reaction which enables them to use these "escape routes". I will discuss this point in this paper.

There are many related literature to analyze the government intervention on the labor market. However, the number of studies directly analyzing the effect of changing the mandatory retirement policy on the employment of the elderly is small. I will discuss the literature in this paper. I provide the evidence showing what happened after the implementation of the government intervention on the demand side of the elderly labor market. The paper is organized as follows. In section 2, I discuss what is the effect of the EESL and review literature. In section 3, I describe the data. In section 4, I explain the estimation procedure. In section 5, I report the results. Finally, in section 6, I conclude.

2 Discussion and Literature Review

2.1 What is the EESL?

With respect to the EESL, Kondo and Shigeoka (2016) explains the details. Please see Kondo and Shigeoka (2016) if you wan to know the details of the EESL. I will explain it briefly. The Japanese pension program is divided into two parts; The basic pension (Flat-rate part) and the income-related pension (Wage proportional part). The pension eligibility age of these two programs are different. I show the pension eligibility age presented in Motegi et al. (2016). In Japan, the pension eligibility age has gradually increased. For employees in the private company or the public sector, the pension including the basic pension and the income-related pension, which is called the Employees' Pension Insurance or the Mutual Aid Insurance, are provided. For self-employed workers, only the basics pension, which is called the National Pension Insurance, is provided by the government.

The EESL is a law which obliges a firm to increase the mandatory retirement age or omit the mandatory retirement system or give a reemployment offer and employ workers arriving

at the mandatory retirement age until they arrive at the basic pensionable age (Flat-rate part) after 2006. Depending on the birth year of the elderly workers, the pensionable age increases. The mandatory retirement age is around age 60 in Japan. As a result, for example, the elderly people with birth year 1945 arrive at the mandatory retirement age before they arrive at the basic pensionable age (Flat-rate part)(age 63) if the mandatory retirement age is age 60. The government prepares this law to fill a gap between the pensionable age (Flat-rate part) and the mandatory retirement age. The figure 1 shows this fact. The year in the figure 1 means birth year (e.g. 1947, 1948). For example, with respect to workers with the birth year between 1944 and 1945, there is a gap between the pensionable age (Flat-rate part) and the age 60. The blue line shows the age when a worker receives pension (Flat-rate part). With respect to the workers with the birth year after 1946, the government obliges firms to increase the mandatory retirement age or abolish the mandatory retirement system or give a reemployment offer and employ workers arriving at the mandatory retirement age until they arrive at the pensionable age (Flat-rate part). This is the summary of the EESL.

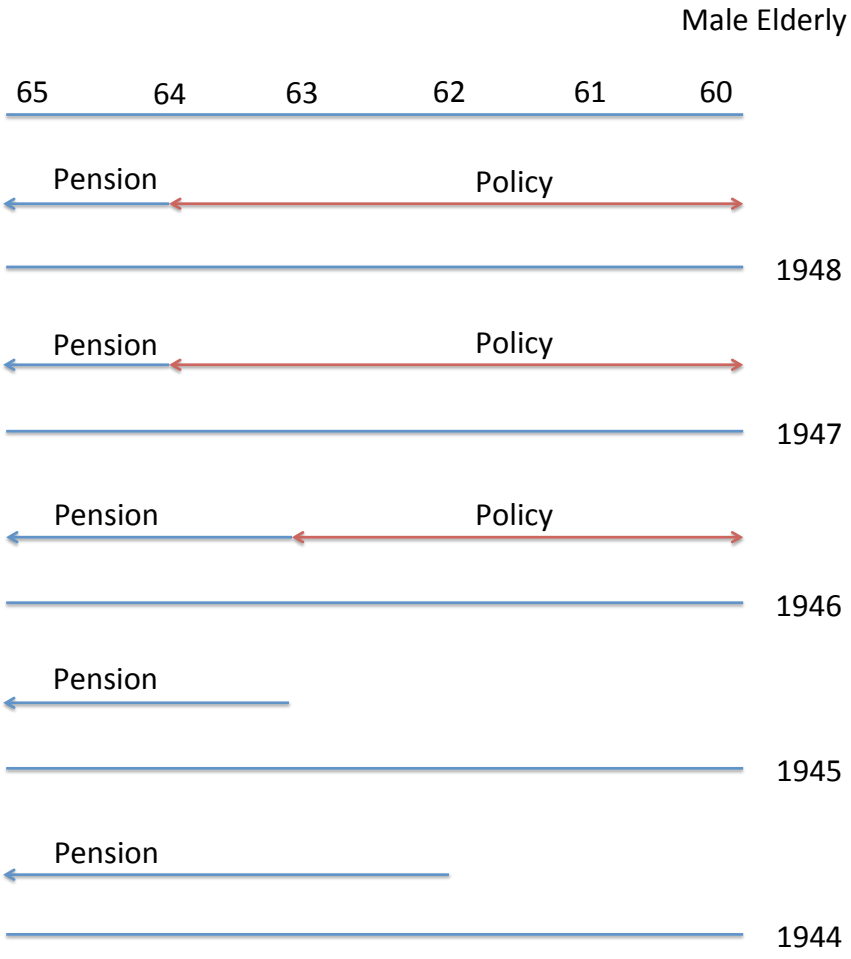
However, in the EESL, there is a important exception. Before 2013, a firm can restrict the workers who can get a reemployment offer by accepting the agreement from a labor union. This exception has been omitted after 2013 and a firm is obliged to employ all workers who want to continue to work in the firm after the mandatory retirement age. In addition, there is no clear statement in the law with respect to wage contract when a firm gives a reemployment offer to a worker arriving at the mandatory retirement age. As I will explain in the section 6, many firms introduce the reemployment system without increasing the mandatory retirement age or omitting the mandatory retirement age. When a firm makes a reemployment contract with a worker, they discuss the decrease rate of wage with the worker who intend to work in the firm after the mandatory retirement age. The law does not concretely oblige anything with respect to the decrease rate of wage contract.

Table 1: Public Pension Reform in Japan

Birth Cohort	Public pension reform year	Pensionable age			
		Employees' pension		Mutual aid pension	
		Flat-rate part	Wage proportional part	Flat-rate part	Wage proportional part
		Men		**Men & Women**	
-1941.4.1	-	60	60	60	60
1941.4.2-1943.4.1	2001	61	60	61	60
1943.4.2-1945.4.1	2004	62	60	62	60
1945.4.2-1947.4.1	2007	63	60	63	60
1947.4.2-1949.4.1	2010	64	60	64	60
1949.4.2-1953.4.1	2013	65	60	65	60
1953.4.2-1955.4.1	2013	65	61	65	61
1955.4.2-1957.4.1	2016	65	62	65	62
1957.4.2-1959.4.1	2019	65	63	65	63
1959.4.2-1961.4.1	2022	65	64	65	64
1961.4.2-	2025	65	65	65	65
		Women			
-1932.4.1	-	55	55		
1932.4.2-1934.4.1	1987	56	56		
1934.4.2-1936.4.1	1990	57	57		
1936.4.2-1937.4.1	1993	58	58		
1937.4.2-1938.4.1	1993	58	58		
1938.4.2-1940.4.1	1996	59	59		
1940.4.2-1946.4.1	2001	60	60		
1946.4.2-1948.4.1	2006	61	60		
1948.4.2-1950.4.1	2009	62	60		
1950.4.2-1952.4.1	2012	63	60		
1952.4.2-1954.4.1	2015	64	60		
1954.4.2-1958.4.1	2018	65	60		
1958.4.2-1960.4.1	2018	65	61		
1960.4.2-1962.4.1	2021	65	62		
1962.4.2-1964.4.1	2024	65	63		
1964.4.2-1965.4.1	2027	65	64		
1965.4.2-	2030	65	65		

Source: Ministry of Health, Labor and Welfare

Figure 1: The Elderly Employment Stabilization Law



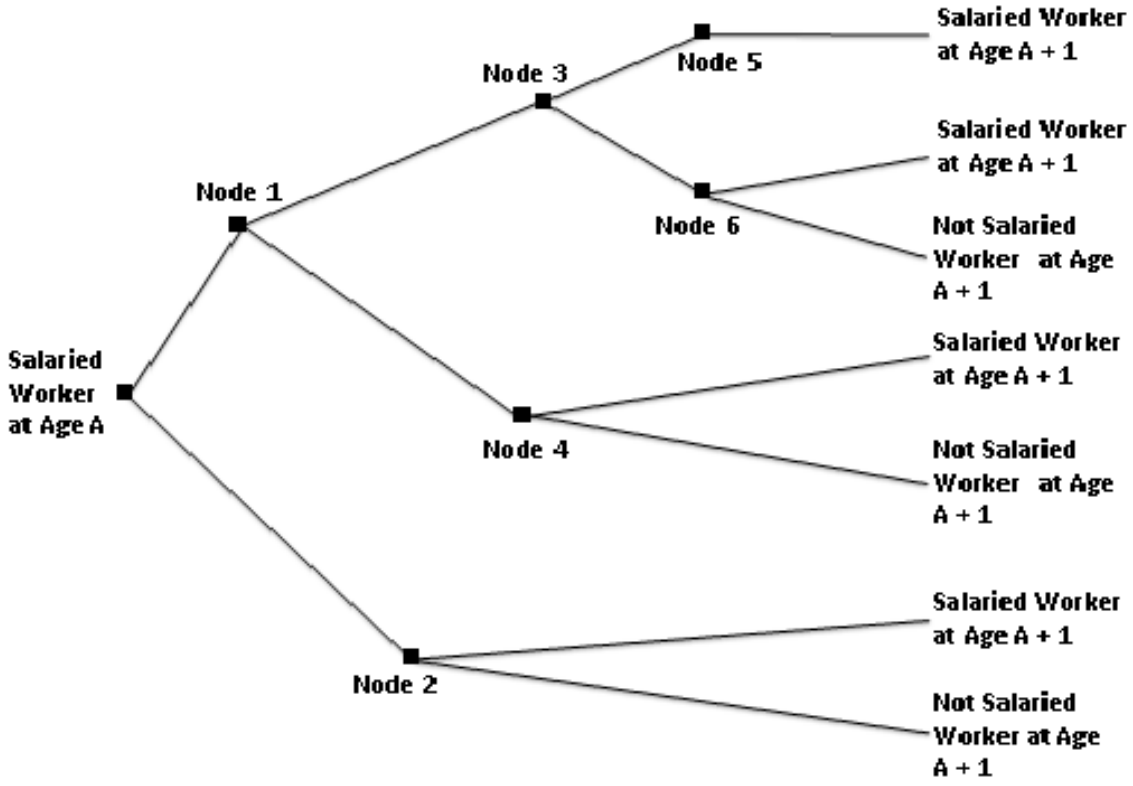
2.2 What is the effect of the EESL?

In this section, we will hypothesise what happened after the implementation of the EESL. The EESL is a policy which makes Japanese firms continue to employ workers up to the (Flat-rate part) pensionable age. This policy makes firms change their employment system. As a result, this policy works as a restriction for firms. If we precisely understand the impact of this policy, we have to analyze some channels which influence the outcome of whether a worker works or not. For example, one is whether firms increase the number of offers to re-employ workers (Channel (2)). The other is whether firms rescind or increase the mandatory retirement age (Channel (1)). Another is whether workers accept the offer or not (Channel (3)). If we only consider whether a worker work or not after the mandatory retirement age, we cannot distinguish between three channels. The result in the literature (Kondo and Shigeoka (2016)) catch the whole effect which combine these effects on each channel. In this paper, to clarify and understand what is the effect of the EESL, I will discuss the factors which decide the impact of this policy with respect to the labor participation rate after the implementation of the EESL. By using this framework, we can understand what the literature and this paper estimate. This framework helps us to interpret the result.

I will explain retirement path of a worker after the mandatory retirement age (Figure 2). Let us assume that only one cohort exists. I explain the meaning of each node in Figure 2.

- Node 1: A worker i faces the mandatory retirement age.
- Node 2: A worker i does **not** face the mandatory retirement age.
- Node 3: A worker i receives a re-employment offer at age A.
- Node 4: A worker i does **not** receive a reemployment offer at age A.
- Node 5: A worker i **accepts** a reemployment offer at age A.
- Node 6: A worker i **rejects** a reemployment offer at age A.

Figure 2: Retirement Path of Worker after the Mandatory Retirement Age



Then, I define the following sets.

$$A^{T}_{\text{salaried}} = \left\{ i \middle| \ i \text{ is a salaried worker at age } T. \ \right\}$$

$$A_{\text{node } k} = \left\{ i \middle| \ i \text{ is on node } k. \ \right\}$$

Then, I consider the meaning of the following probability.

$$\Pr\left\{ i \in A^{A+1}_{\text{salaried}} \middle| \ i \in A^{A}_{\text{salaried}} \ \right\} \tag{1}$$

I define the following probability in the following way to simplify the notation.

$$\Pr\left\{ A^{A+1}_{\text{salaried}} \middle| \ A^{A}_{\text{salaried}} \ \right\} = \Pr\left\{ i \in A^{A+1}_{\text{salaried}} \middle| \ i \in A^{A}_{\text{salaried}} \ \right\} \tag{2}$$

I want to discuss the policy effects of the EESL by using the following expression. I show that there are three important paths which through this policy influences workers and firms.

$$\begin{aligned}
&\Pr\left\{ A^{A+1}_{\text{salaried}} \middle| \ A^{A}_{\text{salaried}} \ \right\} \\
&= \Pr\left\{ A^{A+1}_{\text{salaried}} \middle| A_{\text{node 5}} \right\} \underbrace{\Pr\left\{ A_{\text{node 5}} \middle| A_{\text{node 3}} \right\}}_{\text{Effect Channel (1)}} \underbrace{\Pr\left\{ A_{\text{node 3}} \middle| A_{\text{node 1}} \right\}}_{\text{Effect Channel (2)}} \underbrace{\Pr\left\{ A_{\text{node 1}} \middle| A^{A}_{\text{salaried}} \right\}}_{\text{Effect Channel (3)}} \\
&+ \Pr\left\{ A^{A+1}_{\text{salaried}} \middle| A_{\text{node 6}} \right\} \left(1 - \underbrace{\Pr\left\{ A_{\text{node 5}} \middle| A_{\text{node 3}} \right\}}_{\text{Effect Channel (1)}} \right) \underbrace{\Pr\left\{ A_{\text{node 3}} \middle| A_{\text{node 1}} \right\}}_{\text{Effect Channel (2)}} \underbrace{\Pr\left\{ A_{\text{node 1}} \middle| A^{A}_{\text{salaried}} \right\}}_{\text{Effect Channel (3)}} \\
&+ \Pr\left\{ A^{A+1}_{\text{salaried}} \middle| A_{\text{node 4}} \right\} \left(1 - \underbrace{\Pr\left\{ A_{\text{node 3}} \middle| A_{\text{node 1}} \right\}}_{\text{Effect Channel (2)}} \right) \underbrace{\Pr\left\{ A_{\text{node 1}} \middle| A^{A}_{\text{salaried}} \right\}}_{\text{Effect Channel (3)}} \\
&+ \Pr\left\{ A^{A+1}_{\text{salaried}} \middle| A_{\text{node 2}} \right\} \left(1 - \underbrace{\Pr\left\{ A_{\text{node 1}} \middle| A^{A}_{\text{salaried}} \right\}}_{\text{Effect Channel (3)}} \right)
\end{aligned}$$

I define the above expression for one cohort. To consider the difference of (1) between two cohorts, I introduce another cohort. To simplify the discussion, consider that there are only two cohorts $C1$ and $C2$. In addition, there is only one mandatory retirement age A. Assume that the policy is introduced after cohort $C1$ faced the mandatory retirement age and some people did not face the mandatory retirement age because some firms did not introduce the mandatory retirement system. I analyze the difference between cohort $C1$ and cohort $C2$. Let me omit the discussion of the difference of the following terms of (3) to focus on the effects on the demand side of the labor market.[4]

[4]The effect on the four terms of (3) is caused by the difference in the characteristics of workers who arrive at nodes 2, 4, 5, and 6. In fact, when workers arrive at nodes 2, 4, 5, and 6, workers decide whether they will

$$\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 5}}\right\},\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 6}}\right\},\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 4}}\right\},\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 2}}\right\} \quad (3)$$

By the way, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 5}}\right\} = 1$ because a salaried worker will become a salaried worker when he accepts a reemployment offer. The first effect which comes up on Effect Channel (1) represents the path of the effect of acceptance of reemployment by workers. Some firms may decrease wages to reduce employment cost when they reemploy workers after the mandatory retirement age. If the amount of offered wage is very low when workers are reemployed, these workers may reject the offer. As a result, the acceptance rate may decrease. The second effect on Effect Channel (2) represents the path of the effect that a firm prepares an office where workers are able to work after the mandatory retirement age. Effect Channel (3) represents the path that some firms rescind or increase the mandatory retirement age after the EESL. Then, we define $\Delta\Pr\left\{A^{A+1}_{\text{salaried}}\middle|\ A^{A}_{\text{salaried}}\right\}$ as the difference of $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|\ A^{A}_{\text{salaried}}\right\}$ between $C1$ and $C2$. Finally, I can derive the following relationship by the definition of probability measure.

$$\Delta\Pr\left\{(A^{A+1}_{\text{salaried}})^{c}\middle|\ A^{A}_{\text{salaried}}\right\} = -\Delta\Pr\left\{A^{A+1}_{\text{salaried}}\middle|\ A^{A}_{\text{salaried}}\right\} \quad (4)$$

I discuss the relationship between (4) and the result of the literature. Kondo and Shigeoka (2016) estimates $\hat{\beta}_{61} - \hat{\beta}_{60} = 0.032 - 0.024 = 0.008$. Let δ_1 and δ_2 be the factors which are included in $\beta_{61} - \beta_{60}$. I will explain in the next section. I explain the relationship $\beta_{61} - \beta_{60} = -\Delta\Pr\left\{(A^{61}_{\text{salaried}})^{c}\middle|\ A^{60}_{\text{salaried}}\right\} + \delta_1 + \delta_2 = \Delta\Pr\left\{A^{61}_{\text{salaried}}\middle|\ A^{60}_{\text{salaried}}\right\} + \delta_1 + \delta_2$ in the next section. I use the relationship (4).

2.3 Literature Review

2.3.1 Literature Review: What Did The Literature Estimate?

Kondo and Shigeoka (2016) used a dummy variable of being a salaried worker. The outcome is influenced by the effects from multiple channels. I will explain this in detail. They used the following outcome.

$$y_i = \begin{cases} 1 & \text{if } i \text{ is a salaried worker at survey year.} \\ 0 & \text{if } i \text{ is not a salaried worker at survey year.} \end{cases} \quad (5)$$

They analyzed two cohorts which had the same pension eligibility age. If I consider this environment, they utilize an environment where the difference of the following probabil-

try to be a salaried worker or not. If workers arrive at node 6, they have to apply to another firm. Whether they become a salaried worker at age $A+1$ or not depends on the state variables which workers have on nodes 2, 4, 5, and 6. With the introduction of the EESL, the distribution of the characteristics of workers on nodes 2, 4, 5, and 6 changes. However, these influences are not clear.

ities $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 5}}\right\}$, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 6}}\right\}$, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 4}}\right\}$, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 2}}\right\}$ between the two cohorts is small. As I explained, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 5}}\right\} = 1$. For example, let us consider $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 2}}\right\}$. If two workers (workers 1, 2) with different pension eligibility ages arrive at node 2, it is possible that the decision of these workers are different conditional worker's demographics. If the pension eligibility age of one cohort (worker 1) is age $A+1$ and the other (worker 2) is age $A+2$, the worker 2 is more willing to work conditional the worker's demographics. I can discuss the terms $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 6}}\right\}$, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 4}}\right\}$, $\Pr\left\{A^{A+1}_{\text{salaried}}\middle|A_{\text{node 2}}\right\}$ in the same way.

Age_i is a vector of age dummy variables. $Age_{it} = 1$ means that the dummy variables except the age t dummy variable are zero in vector Age_i and the age t dummy variable is equal to one. Kondo and Shigeoka (2016) estimated the following parameter[5]. $T_i = 1$ if birth year of i is 1946.

$$\begin{aligned}\beta_{61} - \beta_{60} = &\Big(\Pr[y_i = 1|T_i = 1, X_i = x, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 1, X_i = x, Age_{i60} = 1]\Big) \\ &- \Big(\Pr[y_i = 1|T_i = 0, X_i = x, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 0, X_i = x, Age_{i60} = 1]\Big)\end{aligned}$$

Then, I can rewrite this parameter in the following way. Here, $\Pr[y_i = 1|X_i = x, T_i = 1, Age_{i60} = 1] = \alpha_{60} + \beta_{60} + \gamma + \delta' x$.

$$\begin{aligned}&\Big(\Pr[y_i = 1|T_i = 1, X_i = x, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 1, X_i = x, Age_{i60} = 1]\Big) \\ &\quad - \Big(\Pr[y_i = 1|T_i = 0, X_i = x, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 0, X_i = x, Age_{i60} = 1]\Big) \\ &\qquad = \underbrace{\Big[\Big(\Pr[y_i = 1|T_i = 1, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 1, Age_{i60} = 1]\Big)}_{\text{Part 1}} \\ &\qquad \underbrace{- \Big(\Pr[y_i = 1|T_i = 0, Age_{i61} = 1] - \Pr[y_i = 1|T_i = 0, Age_{i60} = 1]\Big)\Big]}_{} \\ &\qquad - \Big[\Big(\int \delta' x dF(x|T_i = 1, Age_{i61} = 1) - \int \delta' x dF(x|T_i = 1, Age_{i60} = 1)\Big) \\ &\qquad\qquad - \Big(\int \delta' x dF(x|T_i = 0, Age_{i61} = 1) - \int \delta' x dF(x|T_i = 0, Age_{i60} = 1)\Big)\Big]\end{aligned}$$

I analyze Part 1. I can give an interpretation of Part 1. Let me define y_i^t.

$$y_i^t = \begin{cases} 1 & \text{if } i \text{ is a salaried worker at age } t. \\ 0 & \text{if } i \text{ is not a salaried worker at at age } t. \end{cases} \tag{6}$$

[5]They assume $E[\epsilon_i|X_i = x, T_i = t, Age_i = a] = 0$

Part 1 can be rewritten in the following way.

$$\underbrace{\Big(\Pr[y_i=1|T_i=1,Age_{i61}=1]-\Pr[y_i=1|T_i=1,Age_{i60}=1]\Big)}_{\text{Part 1}}$$
$$-\Big(\Pr[y_i=1|T_i=0,Age_{i61}=1]-\Pr[y_i=1|T_i=0,Age_{i60}=1]\Big)$$
$$=\underbrace{-\Big(\Pr[y_i^{61}=0,y_i^{60}=1|T_i=1]-\Pr[y_i^{61}=0,y_i^{60}=1|T_i=0]\Big)}_{\text{Part 2 (This part equals } -\Delta\Pr\left\{(A^{61}_{\text{salaried}})^c\middle|\ A^{60}_{\text{salaried}}\right\})}$$
$$+\Big(\Pr[y_i^{61}=1,y_i^{60}=0|T_i=1]-\Pr[y_i^{61}=1,y_i^{60}=0|T_i=0]\Big)$$

Let me assume that the population of one cohort is fixed. If the mandatory retirement age is age 60, Part 2 in the following expression means $\Delta\Pr\left\{(A^{61}_{\text{salaried}})^c\middle|\ A^{60}_{\text{salaried}}\right\}$. This is the difference in $\Pr\left\{(A^{61}_{\text{salaried}})^c\middle|\ A^{60}_{\text{salaried}}\right\}$ between cohort 1945 and cohort 1946.
It is possible that the influence of the following parts are small if I consider the meaning of each part.

- $$-\delta_1=\Big(\int\delta' x dF(x|T_i=1,Age_{i61}=1)-\int\delta' x dF(x|T_i=1,Age_{i60}=1)\Big)$$
  $$-\Big(\int\delta' x dF(x|T_i=0,Age_{i61}=1)-\int\delta' x dF(x|T_i=0,Age_{i60}=1)\Big)$$
  Remark: The difference in difference of conditional expectation about $\delta' x$ between age 61 and age 60. Kondo and Shigeoka (2016) used region dummies and the unemployment rate as control variables.
- $\delta_2=\Pr[y_i^{61}=1,y_i^{60}=0|T_i=1]-\Pr[y_i^{61}=1,y_i^{60}=0|T_i=0]$
  Remark: The difference in the probability of being a salaried worker at age 61 while they are not a salaried worker at age 60.

I derive the relationship $\beta_{61}-\beta_{60}=-\Delta\Pr\left\{(A^{61}_{\text{salaried}})^c\middle|\ A^{60}_{\text{salaried}}\right\}+\delta_1+\delta_2=\Delta\Pr\left\{A^{61}_{\text{salaried}}\middle|\ A^{60}_{\text{salaried}}\right\}+\delta_1+\delta_2$. I use the relationship (4). Kondo and Shigeoka (2016) estimates $\hat{\beta}_{61}-\hat{\beta}_{60}=0.032-0.024=0.008$. It is possible that this magnitude is produced by $\Delta\Pr\left\{(A^{61}_{\text{salaried}})^c\middle|\ A^{60}_{\text{salaried}}\right\}$ and small factors δ_1 and δ_2. The estimate of Kondo and Shigeoka (2016) was influenced by multiple channels from all the effects on the three channels which I discuss the section 2.2.

2.3.2 Literature Review: The Effect of the Government Intervention on the Elderly Labor Market in the US

I will discuss the literature in the US. Since 1980s, the studies about the retirement has continued. (e.g. Fields and Mitchell (1984), Alan and Thomas (1986) and Slade (1987))

With respect to the mandatory retirement in the US, Neumark (2003) explains in detail the history and the literature.[6] Some studies have focused on the government intervention on the supply side of the labor market. (e.g. Staubli and Zweimüller (2013) and Neumark and Song (2013)) I will discuss the results in the US which are deeply related to this paper. Since around 1990 in the US, many literature have provided evidence with respect to how a firm discriminates a worker based on the worker's age. (e.g. Hutchens (1988), Hirsch et al. (2000) and Adams (2002)) Johnson and Neumark (1997) analyze the consequences of age discrimination in the workplace. Lahey (2008) analyzes the effect of age discrimination law on the labor market.

The following four studies directly analyze the abolition of the mandatory retirement system. I will discuss what this paper do and find in the next section based on the discussion of these literature.

- Neumark and Stock (1999)
  - After the implementation of age discrimination laws, the labor force participation of workers protected by age discrimination laws increases.
  - With respect to other workers which age discrimination laws do not protect, the effect is not clear.
  - They indicate that age discrimination laws steepen age-earnings profiles for workers entering the labor market.
- Ashenfelter and Card (2002)
  - A special exemption from the 1986 Age Discrimination Act allowed colleges and universities not to abolish compulsory retirement at age 70 until 1994.
  - After the abolition of mandatory retirement, the retirement rates at 70 and 71 year old fell by two thirds after 1994.
- von Wachter (2002)
  - Overall, the labor force of workers 65 and older increases by 10 percent to 20 percent after the end of mandatory retirement. Neither job tenure nor wage of older workers were affected.
- Adams (2003)
  - This literature analyzes the effect of age discrimination laws on employment, hiring and retirement.
  - With respect to employment, the labor force participation rate increase in the workers which the laws protect.
  - However, there is no clear effect with respect to the workers which the laws do not protect.
  - With respect to hiring and retirement, there is no effect.

[6] Hurd (1990) explains research on the elderly from a broader perspective.

2.4 What do this paper do and find?

This paper analyzes the effect of the government intervention to the demand side of the elderly labor market on the employment of the elderly. According to the literature review, with respect to the workers which age discrimination laws protect, the labor force participation rate increases. However, as I discuss in the following sections, I do not find the same evidence in Japan. I discuss why I do not get the same result which many literature have analyzed in the US.

Finally, I will discuss why the result is different from Kondo and Shigeoka (2016). This is due to the difference in the estimation procedure. The estimation procedure in this paper omits the unobserved heterogeneity and control important demographics. The answer from this paper is that there is no significant effect if we control and omit the factors which cause a bias of the coefficient. In addition, Kondo and Shigeoka (2016) indicate that the effect of the EESl is weak even though there is a significant effect.

3 Data

I use the Preference Parameters Study provided by the Osaka University Institute of Social and Economic Research.[7] The Preference Parameters Study of Osaka University is mainly conducted for calculating parameters of preferences defining utility function; time preference, risk aversion, habit formation, externality. The panel survey has been conducted every year since 2004. The surveyed people are drawn from men and women aged 20-69 years old. This survey is conducted by a self-administered placement method. I use the dataset from 2003 to 2013. I use only the samples whose birth year between 1941 and 1950. The response rate is 71.1 percent at 2003. This panel data is suitable for this study because this data includes the labor force participation around age 60 with respect to the samples with birth year between 1941 and 1950.

In Japan, there is the dataset focusing only on the survey of the elderly people whose name is the Japanese Study of Aging and Retirement (JSTAR).[8] The Japanese Study of Aging and Retirement (JSTAR) is a panel survey of elderly people aged 50 or older conducted by the Research Institute of Economy, Trade and Industry, Hitotsubashi University, and, more recently, the University of Tokyo. However, the JSTAR has been conducted since 2007, which means that the labor participation information before age 60 is not available with respect to the elderly people whose birth year is around 1945. As a result, I use the Preference Parameters Study. This dataset is the most suitable panel data for this study. In section 5 which is main results in this paper, I use the Preference Parameters Survey. However, I use the JSATR in section 6 to discuss our results. I explain what data of the JSTAR I use in section 6.

Finally, in section 6, I use another dataset which is the Fact-finding Survey on the Work Conditions among Small and Medium-sized Enterprises (Chusho kigyo rodo jijo jittai chosa)

[7] See the website (http://www.iser.osaka-u.ac.jp/surveydata/engpanelsummary.html) if you want to know the detail of the Preference Parameters Study.

[8] See the website (http://www.rieti.go.jp/en/projects/jstar/) if you want to know the detail of the JSTAR.

conducted by National Federation of Small Business Associations.[9] The surveyed firms are drawn from the firms whose number of employees is less than 300. This survey is conducted by a self-administered placement method. This is a repeated cross section data. With respect to firms whose number of employees is more than 300, a public repeated cross section data is not available. In this survey, the information about the mandatory retirement policy among small and medium-sized enterprises is available. In addition, there is no panel data of the Japanese firms at this moment. With respect to the Study of Employment in Small Companies, I also explain which data I use in section 6.

[9]See the website (https://ssjda.iss.u-tokyo.ac.jp/Direct/gaiyo.phpeid0407langeng) if you want to know the detail of the Fact-finding Survey on the Work Conditions among Small and Medium-sized Enterprises.

4 Estimation Procedure

In this section, I will explain the estimation procedure. I use only samples whose birth year between 1941 and 1950. I estimate the following equation. This is similar to the difference in difference method.

$$y_{it} = \beta_0 + \lambda_t + \beta_1 1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\} + \gamma' x_{it} + a_i + \epsilon_{it} \tag{7}$$

y_{it} is an indicator equal to one when a respondent works at period t. λ_t is a time fixed effect. a_i is an individual fixed effect. x_{it} are control variables at period t. x_{it} include a respondent age, family structure, whether a respondent arrives at their basic pensionable age (Flat-rate part) and the amount of asset in the previous wave. I analyze the difference in the labor force participation after age 60 between people with birth year between 1941 and 1945 and people with birth year between 1946 and 1950. The coefficient β_1 identify this effect. The following relationship shows this point.

$$\begin{aligned}
&(E[y_{it'}|\lambda_{t'} = \lambda', 1\{60 \leq age_{it'}\}1\{1946 \leq birthyear_i \leq 1950\} = 1, x_{it'} = x, a_i = a] \\
&\quad - E[y_{it}|\lambda_t = \lambda, 1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\} = 0, x_{it} = x, a_i = a]) \\
&- (E[y_{it'}|\lambda_{t'} = \lambda', 1\{60 \leq age_{it'}\}1\{1946 \leq birthyear_i \leq 1950\} = 0, x_{it'} = x, a_i = a] \\
&\quad - E[y_{it}|\lambda_t = \lambda, 1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\} = 0, x_{it} = x, a_i = a]) \\
&= \beta_1
\end{aligned}$$

I will show the trend of labor force participation rate in Figure 3 and 4. According to Figure 3 and 4, before age 60, there is no difference in the trend between people with birth year from 1941 and 1945 and people with birth year from 1946 and 1950. According to Figure 3 and 4, the male labor force participation rate of people with birth year between 1946 and 1950 is larger than people with birth year between 1941 and 1945 after age 60. However, the labor force participation rate of people with birth year between 1946 and 1950 is also larger than people with birth year between 1941 and 1945 before age 60. As a result, it is possible that this is not due to the effect of the government intervention. Next, I will comment on Figure 5 and 6. According to Figure 5 and 6, there is a difference in the ratio of self employment worker. As birth year is larger, the ratio of self employment worker becomes larger. Of course, self employment workers are not subject to the government intervention. According to these discussions, the labor force participation of people with birth year between 1941 and 1945 is smaller than people with birth year between 1946 and 1950 after age 60 although the ratio of people which is subject to the government intervention is samller. It is possible that the effect of the government intervention is weak.

Next, I will discuss the trend of labor force participation of a particular group. I make the following group; male elderly who is both working and not self-employed at the first wave (birth year from 1941 to 1945) and male elderly who is both working and not self-employed at the sixth wave (birth year from 1946 to 1950). This group seems to be directly influenced

by this policy. In Figure 7, I show the trend of labor force participation between male elderly who is both working and not self-employed at the first wave (birth year from 1941 to 1945) and male elderly who is both working and not self-employed at the sixth wave (birth year from 1946 to 1950). Before age 60, the trend is the same while there is a difference in the labor force participation between people with birth year from 1941 to 1945 and people with birth year from 1946 to 1950 after age 60. However, it is possible that this is not due to the EESL. I will check this point in the estimation part. I have to control the factors of respondent demographics and business cycle and so on. This group is a main target to analyze in this paper because the effect of the government intervention seems to directly influence this group.

I have to explain some weaknesses of this paper. The Preference Parameters Study asks respondents only respondent birth year. As a result, I do not know an exact age when the respondent is interviewed. In addition, I do not know exactly wether a respondent arrives at their basic pensionable age (Flat-rate part). In this paper, I set age = survey year - birth year. I set the basic pensionable age (Flat-rate part) based on Table 2. However, I do not know the birth month. I set that the pension eligibility age of people with the birth year A is equal to that of people with the birth date between $A.4.2$ and $A + 1.4.1$.

I estimate the equation (7) by separating the following groups and report the results in the next section. With respect to Group 2, I focus on the samples who work just before age 60. Wth respect to Group 3, I focus on the samples who work as an (not self-employed) employee just before age 60. Finally, with respect to Group 4, I focus on the sample who are not working just before age 60.

- Group 1: (birth year from 1941 to 1945) all female and male elderly vs (birth year from 1946 to 1950) all female and male elderly
- Group 2: (birth year from 1941 to 1945) female and male elderly working at the first wave vs (birth year from 1946 to 1950) female and male elderly working at the sixth wave
- Group 3: (birth year from 1941 to 1945) male elderly who is both working and not self-employed at the first wave vs (birth year from 1946 to 1950) male elderly who is both working and not self-employed at the sixth wave
- Group 4: (birth year from 1941 to 1945) female and male elderly who is not working at the first wave vs (birth year from 1946 to 1950) female and male elderly who is not working at the sixth wave

Figure 3: Labor Participation (Male)(The Preference Parameters Study)(Blue: birth year from 1941 to 1945, Red: birth year from 1946 to 1950)

Figure 4: Labor Participation (Female)(The Preference Parameters Study)(Blue: birth year from 1941 to 1945, Red: birth year from 1946 to 1950)

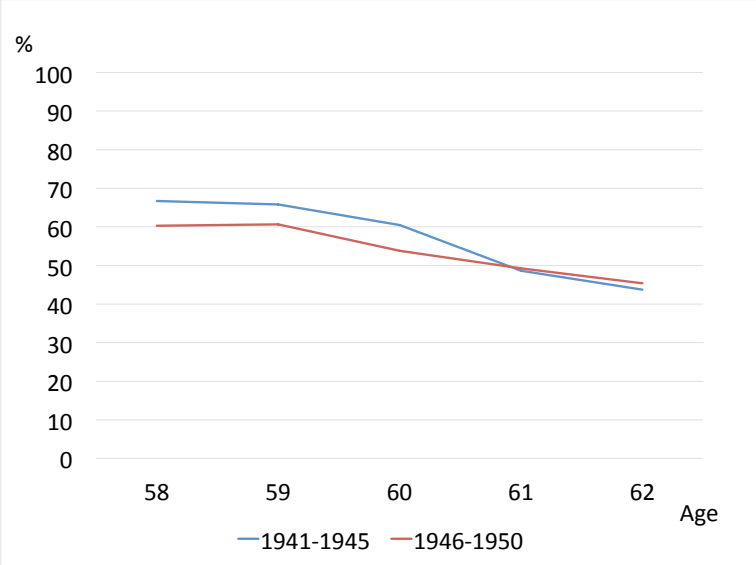


Figure 5: The Ratio of Self Employed Worker (Male)(The Preference Parameters Study)(Blue: birth year from 1941 to 1945, Red: birth year from 1946 to 1950)

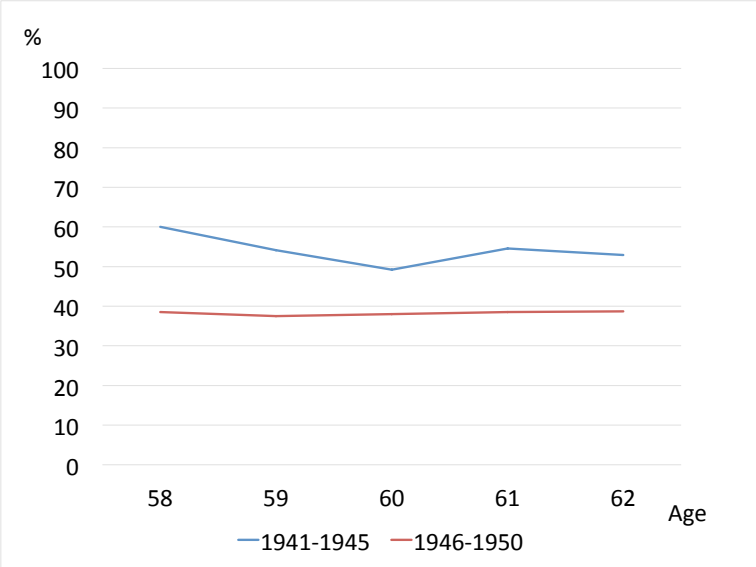


Figure 6: The Ratio of Self Employed Worker (Male)(Census 2005)

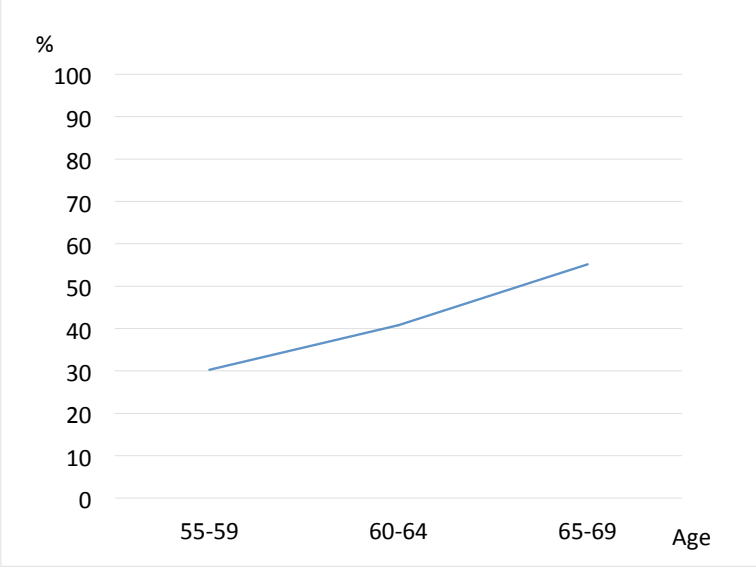
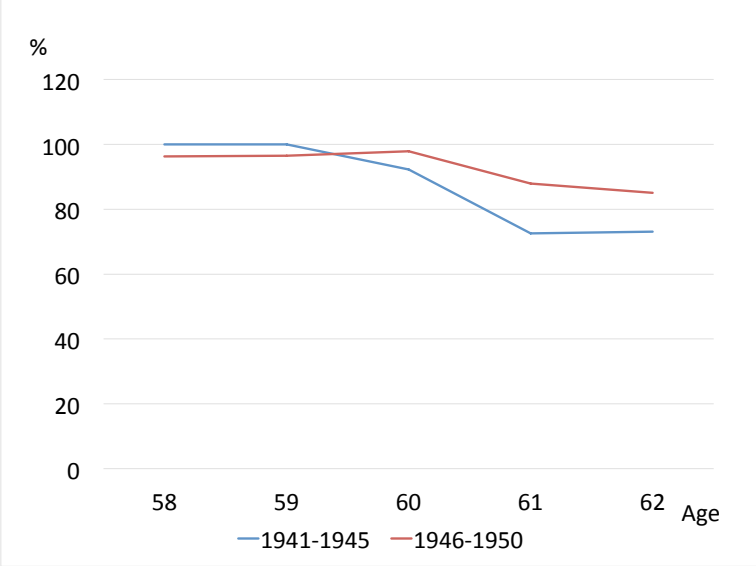


Figure 7: Labor Participation (Male, Not Self Employed)(The Preference Parameters Study)(Blue: birth year from 1941 to 1945, Red: birth year from 1946 to 1950)



5 Results

I will discuss the results in this paper. I will discuss the Table 2. This is the result of Group 3. This is a main result. These elderly people seem to be directly influenced by the EESL. As we can observe, the coefficient of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ is significantly negative of the OLS. However, when I omit the unobserved heterogeneity, the coefficient of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ is not significant. The OLS estimator of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ has a bias. The coefficent of living with a parent is significantly negative. It is possible that this implies the decrease of labor supply due to informal care of their parents. I cannot confirm this fact because of data limitation. According to this result, the effect of the goverment intervention is weak. I will discuss why I get this result in the next section. I will compare the result here with the result which Kondo and Shigeoka (2016) estimate. According to Kondo and Shigeoka (2016), the labor force participation rate of salaried workers with birth year 1946 is significantly larger than that of salaried workers with birth year 1945 at ages 60 and 61 by 2.4, 3.2 percent. The impact is small. However, they use the repeated cross sectional data and do not control educational characteristics and other demographics. When I omit the unobserved heterogeneity and control demographics of workers, I cannot confirm the significant increase in the labor participation rate. However, the weakness of this paper is that the sample size is small. In fact, the standard error of the coefficient of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ in FE result is large. The absolute value of the coefficient $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ is comparatively large.

Next, I will discuss the Table 3. This is the result of Group 1. This result shows the difference in the labor force participation between the elderly workers with birth year between

1941 and 1945 and the elderly workers with birth year between 1946 and 1950 by gender. As I observe in the Table 3, I cannot get the significant result both in female and male labor force participation when I omit the unobserved heterogeneity. In this analysis, the standard error of the coefficient of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$ is comparatively small and the sample size is comparatively large. Table 4 shows the result of Group 2 ((birth year from 1941 to 1945) male elderly who is both working and not self-employed at the first wave vs (birth year from 1946 to 1950) male elderly who is both working and not self-employed at the sixth wave). Also in this case, the labor force participation rate of female and male workers does not significantly increase when I estimate the model without omitting the unobserved heterogeneity. When I omit the unobserved heterogeneity, I cannot get the significant effect of the coefficient of $1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$.

Finally, I will discuss the Table 5. This is the result of Group 4 ((birth year from 1941 to 1945) female and male elderly who is not working at the first wave vs (birth year from 1946 to 1950) female and male elderly who is not working at the sixth wave). While I cannot the significant increase in the labor force participation rate in the Group 1, 2 and 3, I find the significant decrease in the labor force participation rate between the elderly worker with birth year between 1941 and 1945 and the elderly worker with birth year between 1946 and 1950. When I omit the unobserved heterogeneity, there is a decrease in the labor force participation rate both in female and male workers. This implies that the inflow of the elderly workers who do not work around age 60 into the labor market decreases after the implementation of the EESL. Especially for male workers, the effect is large. However, I cannot check whether this effect is caused by the EESL or not. Because of the data limitation, for example, I cannot compare the labor force participation around age 60 between the workers with birth year from 1941 to 1945 and the workers with birth year from 1936 to 1940.

Table 2: Labor Force Participation 1

	(1) Male_Not_Selfemployed_OLS	(2) Male_Not_Selfemployed_FE
$1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$	0.3242***	0.1599
	(0.0669)	(0.2926)
age	-0.1571	0.1862
	(0.2139)	(0.2348)
age squared	0.0013	-0.0020
	(0.0017)	(0.0019)
married	0.0784	-0.0589
	(0.0567)	(0.0631)
the number of children	0.0915***	-0.0164
	(0.0172)	(0.0286)
living with a parent	-0.0514	-0.1665***
	(0.0409)	(0.0518)
less than high school	-0.0654	0.0064
	(0.0450)	(0.0570)
high school	0.0136	0.0832
	(0.0330)	(0.0584)
N	713	713

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The coefficients of asset level dummies in the previous period (high, middle),
a dummy of arriving at the basic pensionable age, wave dummies and regional dummies are omitted.

Table 3: Labor Force Participation 2

	(1) Female_OLS	(2) Male_OLS	(3) Female_FE	(4) Male_FE
$1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$	0.0533	0.1144***	0.0060	0.0540
	(0.0348)	(0.0380)	(0.0306)	(0.1377)
age	-0.0235	-0.0344	0.0362	-0.0772
	(0.0985)	(0.0866)	(0.0999)	(0.1072)
age squared	-0.0001	0.0000	-0.0004	0.0003
	(0.0008)	(0.0007)	(0.0008)	(0.0009)
married	-0.1751***	0.1323***	-0.0861	-0.0524
	(0.0276)	(0.0348)	(0.0542)	(0.0382)
the number of children	0.0631***	0.0474***	0.0067	-0.0060
	(0.0127)	(0.0095)	(0.0287)	(0.0195)
living with a parent	-0.0064	-0.0178	0.0405	-0.1028***
	(0.0400)	(0.0245)	(0.0424)	(0.0278)
less than high school	0.1332***	0.0028	0.0043	0.0238
	(0.0418)	(0.0254)	(0.0461)	(0.0538)
high school	-0.0039	0.0300	-0.0121	0.0423
	(0.0359)	(0.0193)	(0.0366)	(0.0436)
N	2306	2444	2306	2444

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The coefficients of asset level dummies in the previous period (high, middle),
a dummy of arriving at the basic pensionable age, wave dummies and regional dummies are omitted.

Table 4: Labor Force Participation 3

	(1) Female_Work_OLS	(2) Male_Work_OLS	(3) Female_Work_FE	(4) Male_Work_FE
$1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$	0.2161***	0.1671***	0.0661	0.0748
	(0.0510)	(0.0476)	(0.0588)	(0.1575)
age	-0.5415**	0.0349	0.0744	0.1831
	(0.2340)	(0.1556)	(0.2272)	(0.1729)
age squared	0.0040**	-0.0004	-0.0008	-0.0019
	(0.0019)	(0.0013)	(0.0018)	(0.0014)
married	-0.1108***	0.0590	-0.0145	-0.0630
	(0.0394)	(0.0475)	(0.0547)	(0.0616)
the number of children	0.0914***	0.0508***	0.0357	-0.0218
	(0.0195)	(0.0129)	(0.0395)	(0.0269)
living with a parent	-0.1544***	0.0031	-0.0613	-0.1059***
	(0.0566)	(0.0297)	(0.0597)	(0.0391)
less than high school	0.1196	-0.0464	-0.0011	-0.0026
	(0.0729)	(0.0311)	(0.0863)	(0.0545)
high school	0.0578	-0.0491**	-0.0305	0.0408
	(0.0695)	(0.0236)	(0.0719)	(0.0386)
N	785	1118	785	1118

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The coefficients of asset level dummies in the previous period (high, middle),
a dummy of arriving at the basic pensionable age, wave dummies and regional dummies are omitted.

Table 5: Labor Force Participation 4

	(1) Female_Not_Work_OLS	(2) Male_Not_Work_OLS	(3) Female_Not_Work_FE	(4) Male_Not_Work_FE
$1\{60 \leq age_{it}\}1\{1946 \leq birthyear_i \leq 1950\}$	-0.1018***	0.0666	-0.0578*	-0.2666*
	(0.0378)	(0.0658)	(0.0323)	(0.1558)
age	-0.1470	-0.2102*	0.0639	-0.0903
	(0.1058)	(0.1269)	(0.1124)	(0.1514)
age squared	0.0008	0.0014	-0.0006	0.0005
	(0.0009)	(0.0010)	(0.0009)	(0.0013)
married	-0.1824***	0.1932***	-0.0940	0.0048
	(0.0335)	(0.0495)	(0.0631)	(0.0245)
the number of children	0.0572***	0.0388***	-0.0051	0.0055
	(0.0145)	(0.0140)	(0.0373)	(0.0274)
living with a parent	0.0565	-0.0443	0.1154**	-0.1093***
	(0.0483)	(0.0389)	(0.0563)	(0.0395)
less than high school	0.0331	0.0458	-0.0142	0.0543
	(0.0483)	(0.0379)	(0.0378)	(0.0840)
high school	-0.0791**	0.0635**	-0.0198	0.0519
	(0.0390)	(0.0287)	(0.0270)	(0.0643)
N	1521	1326	1521	1326

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The coefficients of asset level dummies in the previous period (high, middle),
a dummy of arriving at the basic pensionable age, wave dummies and regional dummies are omitted.

6 Discussion: What happened after the implementation of EESL?

As I discussed, I do not observe that there is the effect of the government intervention on the employment of the elderly workers. In this section, I will consider why there is no effect of the EESL on the employment of the elderly people. To understand the mechanism of this policy effect, I confirm that we need to consider some channels of this policy effect. I discuss this point in the section 2.2. Then, we have the following three questions.

- 1. Did the probability to receive a reemployment offer increase? (Channel 2)
- 2. Did the number of firms which abolished or increase the mandatory retirement age increase? (Channel 3)
- 3. Did the acceptance rate of reemployment offers decrease by low wages offer by firms? (Channel 1)

With respect to 1 and 2 (Channel 2 and 3), I can partly answer the questions because there is a dataset to imply these facts. On the other hand, with respect to question 3, I cannot answer it because there is no available data to clearly observe this point.

Table 8 shows whether a firm carries out the employment policy which the EESL requires.[10] In 2006 and 2007, almost all firms carry out the employment policy which the EESL requires. According to Table 9, most of firms obey the EESL by introducing the reemployment system.

Next, I will answer the question 1 by using the JSATR. There is a sharp increase in the ratio of people receiving a reemployment offer after arriving at the mandatory retirement age. I show the Figure 10. Reemployment offer 1 means the ratio of workers receiving a reemployment offer from the firm where they arrive at the mandatory retirement age. Reemployment offer 2 means the ratio of workers receiving a reemployment offer from the firm where they arrive at the mandatory retirement age or the affiliated firms (including Reemployment offer 1). According to Figure 10, there is a sharp increase in the ratio of workers receiving a reemployment offer after the workers with 1946 birth year arrive at the mandatory retirement age. According to Figure 10, the ratio of firms obeyig the EESL increases after the workers with birth year 1946 arrive at the mandatory retirement age. According this figure (reemployment 2), the ratio of workers receiving the reemployment offer increases by about 10 percent. This part approximately shows the ratio of workers who cannot get the reemployment offer without the EESL. It is possible that the rejection rate of receiving the offer in this group is high. According to Usui et al. (2015), male employees at age 54 gradually move to part-time work or retire after beginning to receive pension. Those who continue to work cannot choose their optimal working hours although they want to choose more working hours. Potentially, it is possible that there are some elderly people

[10] See the website http://www.mhlw.go.jp/stf/houdou/0000101253.html (Japanse web site)

who cannot continue to work although he/she wants to continue to work if he/she receives a reemployment offer.

With respect to the mandatory retirement age, there is a change in the distribution between 2004 and 2008 at least with respect to the firms whose number of employees is less than 300. According to Table 11, the ratio of firms preparing the mandatory retirement age more than age 64 in 2004 is larger than that in 2008.

According to these facts, the firms change the employment policy after 2006 by mainly giving a reemployment offer or increasing the mandatory retirement age. However, according to this paper and the literature, the employment of the elderly workers do not largely change after the workers with birth year 1946 arrives at age 60. The firms have obeyed the government directions; introducing the reemployment system or abolishing the mandatory retirement age or increasing the mandatory retirement age. The analysis of Channel 1 is important when we understand what happened after the implementation of the EESL. This will be an important future work. It is possible that the firm tried to reduce the cost of obeying the EESL by decreasing the wage after the mandatory retirement age when they make an contract with the workers arriving at the mandatory retirement age. There is no clear statement with respect to wage contract when a firm gives a reemployment offer to a worker. Kondo (2016) finds a decline in earnings of the elderly workers who reached age 60 after 2006. This evidence is based on only observable wage. The offered wage when making a contract of the reemployment after the implementation of the EESL should be analyzed. It is possible that some workers reject an offer because of the offered wage is too low.

Figure 8: The Ratio of Firms Preparing the Employment Measures for the Aged (The Employment of the Elderly Workers)(Ministry of Health, Labor and Wealfare)

Figure 9: The Ratio of the Employment Measures for the Aged (All Firms Preparing the Employment Measures)(The Employment of the Elderly Workers)(Ministry of Health, Labor and Wealfare)

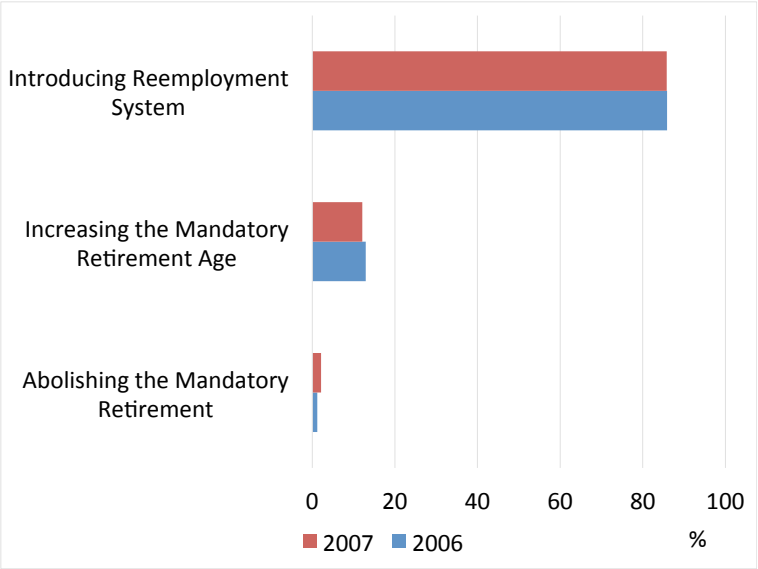


Figure 10: The Ratio of Receiving Reemployment Offer (JSTAR)

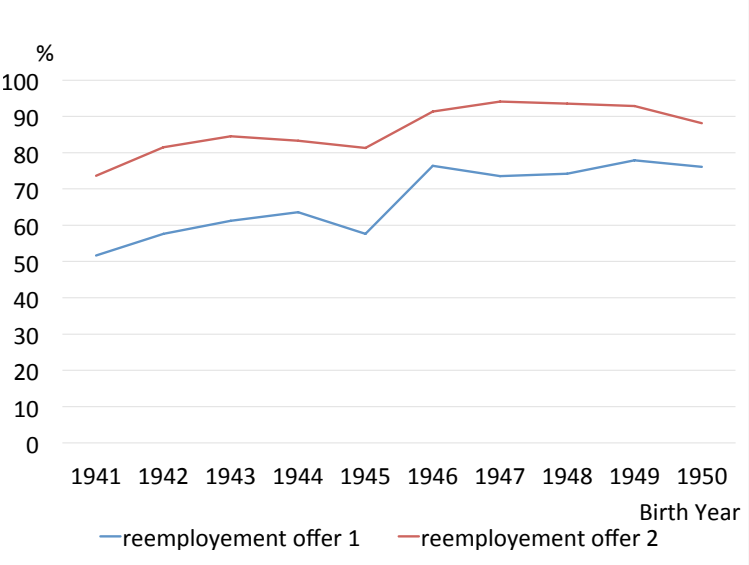
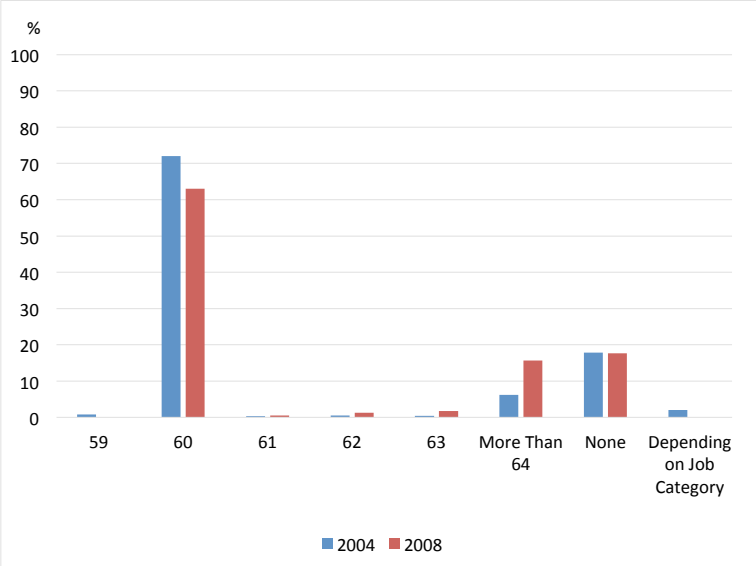


Figure 11: Employment Policy for Elderly Workers at 2004 and 2008: Retirement Age (Only Small and Medium Sized Enterprises: Less than 300 workers)(Fact-finding Survey on the Work Conditions among Small and Medium-sized Enterprises (Chusho kigyo rodo jijo jittai chosa))(MRA: Mandatory Retirement Age)



Finally, I show the change in the wage contract when a worker receives a reemployment offer form the firm where he/she arrives at the mandatory retirement age. Figure 12 shows whether worker's wage decreases or not after reemployment. This figure shows the ratio of whether worker's wage decreases or not after reemployment. According to this figure, the ratio of receiving a decreased wage after reemployment increases by 10 percent after a worker with birth year more than 1946 arrives at the mandatory retirement age. However, I do not know this is due to the EESL. It is favourable that I compare the worker with birth year 1945 and the worker with birth year 1946. However, the enough sample size is not available with respect to only workers with birth year around 1945 and 1946. In addition, I show the Figure 13. The figure 13 shows the distribution of the wage decrease rate when receiving a reemployment offer. According to this figure, there is an increase in the ratio of the wage decrease rate between 30 percent and 70 percent. However, this is also not the dataset which includes only workers with birth year around 1945 and 1946.

Figure 12: The Ratio of Whether Wage Decreases After Reemployment (Reemployment Contract)(Only Workers Receiving a Reemployment Offer)(JSTAR)(before 1945: birth year before 1945, after 1946: birth year after 1946)

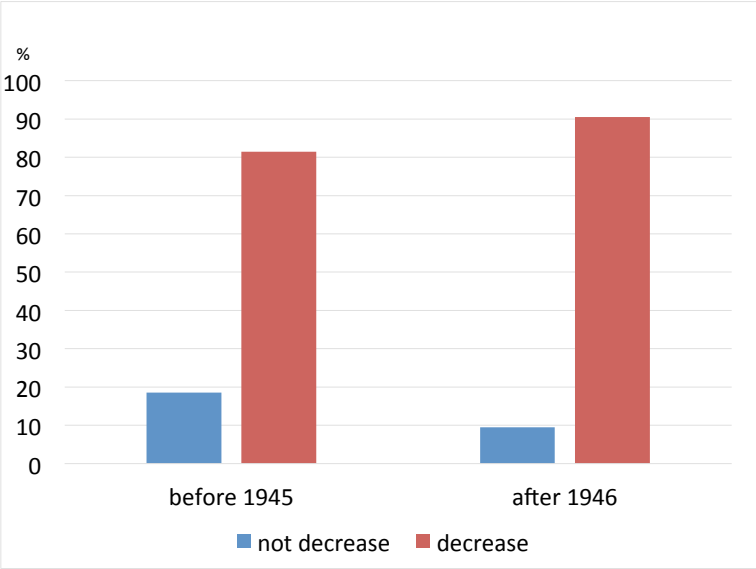
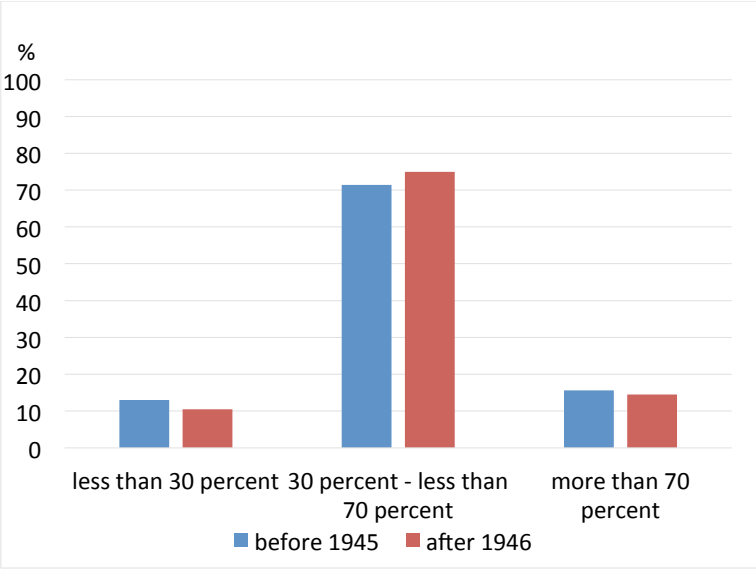


Figure 13: The Ratio of Wage Decrease After Reemployment (Reemployment Contract)(Only Workers Receiving a Reemployment Offer)(JSTAR)(before 1945: birth year before 1945, after 1946: birth year after 1946)



7 Conclusion

This paper analyzes the effect of the government intervention to the demand side of the labor market on the employment of the elderly. In this paper, I show that there is no significant effect of the EESL on the employment of the elderly. In addition, I also show that the inflow of the elderly people not working around age 60 into the labor market is significantly negative. According to the discussion in section 6, the firms obey the government's directions; introducing the reemployment system or abolishing the mandatory retirement or increasing the mandatory retirement age. This suggests that a firm have tried to reduce the cost they will burden because of the government policy by using the actions which the government does not prohibit. The number of reemployment offers has increased after the implementation of the EESL.

There is no clear statement in the law with respect to wage contract when a firm gives a reemployment offer to a worker arriving at the mandatory retirement age. As I have explained in the section 6, many firms introduce the reemployment system or increase the mandatory retirement age without abolishing the mandatory retirement age. When a firm makes a reemployment contract with a worker, they discuss the decrease rate of wage with the worker who intend to work in the firm after the mandatory retirement age. The law does not concretely oblige anything with respect to the decrease rate of wage contract. The following question is important to directly analyze the reason why the employment of the elderly worker has not increased.

- 3. Did the acceptance rate of reemployment offers decrease by low wages offer by firms? (Channel 1)

Especially, the effect on Channel 1 is very interesting. In this study, I show that there was no positive effect on the employment of the elderly. However, firms might decrease an offered wage because they have to give an offer to reemploy. After the mandatory retirement age, firms can offer wage rate which is not regulated strictly. As a result, firms have an incentive to decrease an offered wage. This is an interesting future work.

References

Adams, S. J. (2002). Passed Over for Promotion Because of Age: An Empirical Analysis of the Consequences. *Journal of Labor Research*, 23(3):447–461.

Adams, S. J. (2003). Age discrimination legislation and the employment of older workers. *Labour Economics*, 11:219–241.

Alan, G. L. and Thomas, S. L. (1986). A Structural Retirement Model. *Econometrica*, 54(3):555–584.

Ashenfelter, O. and Card, D. (2002). Did the Elimination of Mandatory Retirement Affect Faculty Retirement? *The American Economic Review*, 92(4):957–980.

Burkhauser, R. V. and Ouinn, J. F. (1983). Is Mandatory Retirement Overrated? Evidence From The 1970s. *The Journal of Human Resources*, 18(3):337–358.

Clark, R. L. and Ogawa, N. (1992). The Effect of Mamdatory Retirement on Earnings Profiles in JAPAN. *Industrial and Labor Relations Review*, 45(2):258–266.

Fields, G. S. and Mitchell, O. S. (1984). Economic Determinants of The Optimal Retirement Age: An Empirical Investigation. *The Journal of Human Resources*, 19(2):245–262.

Gruber, J. and Wise, D. A. (1998). Social Security and Retirement: An International Comparison. *American Economic Review, Papers and Proceedings of the Hundred and Tenth Annual Meeting of the American Economic Association*, 88(2):158–163.

Hirsch, B. T., Macpherson, D. A., and Hardy, M. A. (2000). Occupational Age Structure and Access for Older Workers. *Industrial and Labor Relations Review*, 53(3):401–418.

Hurd, M. D. (1990). Research on the Elderly: Economic Status, Retirement, and Consumption and Saving. *Journal of Economic Literature*, 28(2):565–637.

Hutchens, R. (1988). Do Job Opportunities Decline with Age. *Industrial and Labor Relations Review*, 42(1):89–99.

Johnson, R. W. and Neumark, D. (1997). Age Discrimination, Job Separations, and Employment Status of Older Workers. *The Journal of Human Resources*, 32(4):779–811.

Kondo, A. (2016). Effects of increased elderly employment on other workers employment and elderlys earnings in Japan. *IZA Journal of Labor Policy*, 5(2):1–23.

Kondo, A. and Shigeoka, H. (2016). The Effectiveness of Demand-side Government Intervention to Promote Elderly Employment : Evidence from Japan . *Industrial and Labor Relations Review, forthcoming*.

Lahey, J. (2008). State Age Protection Laws and the Age Discrimination in Employment Act. *Journal of Law and Economics*, 51(3):433–460.

Lang, K. (1989). Why was there mandatory retirement? *Journal of Public Economics*, 39:127–136.

Lazear, E. P. (1979). Why Is There Mandatory Retirement? *Journal of Political Economy*, 87(6):1261–1284.

Lazear, E. P. (1981). Agency, Earnings Profiles, Productivity, and Hours Restrictions. *The American Economic Review*, 71(4):606–620.

Lazear, E. P. and Moore, R. L. (1984). Incentives, Productivity, And Labor Contracts. *The Quarterly Journal of Economics*, 99(2):275–296.

Motegi, H., Nishimura, Y., and Terada, K. (2016). Des Retirement Change Lifestyle Habits? *The Japanese Economic Review*, 67(2):169–191.

Neumark, D. (2003). Age Discrimination Legislation in the United States. *Contemporary Economic Policy*, 21(3):297–317.

Neumark, D. and Song, J. (2013). Do stronger age discrimination laws make Social Security reforms more effective? *Journal of Public Economics*, 108:1–16.

Neumark, D. and Stock, W. A. (1999). Age Discrimination Laws and Labor Market Efficiency. *The Journal of Political Economy*, 107(5):1081–1125.

Slade, F. P. (1987). Retirement Status and State Dependence: A Longitudinal Study of Older Men. *Journal of Labor Economics*, 5(1):90–105.

Staubli, S. and Zweimüller, J. (2013). Does raising the early retirement age increase employment of older workers ? *Journal of Public Economics*, 108:17–32.

Usui, E., Shimizutani, S., and Oshio, T. (2015). Are Japanese Men of Pensionable Age Underemployed or Overemployed? *RIETI Discussion Paper Series*, 15-E-099.

von Wachter, T. (2002). The End of Mandatory Retirement in the US: Effects on Retirement and Implicit Contracts. *CENTER FOR LABOR ECONOMICS UNIVERSITY OF CALIFORNIA, BERKELEY WORKING PAPER*, 5.