DISCUSSION PAPER SERIES

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ABSTRACT

How Do Age-Related Policy Reforms Promote Employment among Older Adults in Singapore?*

This study uses data from the Singapore Life Panel to investigate the effects of age-related policy reforms on older adult labor supply behaviors in Singapore. We first evaluate the impact of the Retirement and Re-employment Act (RRA) reform in 2017, which raised the maximum re-employment age from 65 to 67 years for those who were able to claim pension benefits at age 64. We find that the RRA reform reduced the probability of unemployment among people aged 66 years by 5.8 percentage points and increased the probability to continue working in the longest-held job during the lifetime by 11.4 percentage points. Second, we examine the impact of the pension-eligibility age reform of 2018, which raised the pension-eligibility age from 64 to 65 years for those who were protected by the mandatory labor protection and re-employment policy up to the age of 67 years. This rise in the pension-eligibility age increased the probability of full-time employment by 8.2 percentage points and reduced the probability of part-time employment by 5.7 percentage points among people aged 64 years. These two reforms promoted employment among older adults in different ways. Specifically, enhanced employment protection at age 66 increased the older adults' labor supply in the extensive margin, resulting in a welfare improvement for older adults since those who had been underemployed were less likely to be so after the reform. Still, their ineligibility to claim their pension at age 64 lowered their economic well-being because it increased their labor supply in the intensive margin to supplement the delay in pension benefits.

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1. Introduction

Aging populations, which configure the natural result of rising life expectancies and low birth rates, pose challenges to the sustainability of the social security systems of a country and exert a downward impact on its labor force participation. To alleviate these issues, governments worldwide have implemented and been implementing policy reforms, such as raising the pension-eligibility age (PEA) and securing employment protection for older adults (OECD, 2006). Since the number of individuals aged 60 years and above will be more than 1.4 billion by 2030, assessing the effects of these reforms to provide an evidence base for policy development is an increasingly urgent matter (WHO, 2021).

Singapore is one of the most rapidly aging societies in the world, with a life expectancy of 83.15 years and a total fertility rate of 1.14 (World Development Indicators, 2018). In fact, to address the increased burden on the labor force in relation to the rise in numbers for the older adult population, the Singaporean government implemented two age-related policy reforms, one in 2017 and another in 2018. The first reform, enacted in 2017, was related to the Retirement and Re-employment Act (RRA), which provides labor protection by mandating employers to continue to hire older adult workers beyond the retirement age of 62 years until the maximum re-employment age.[1] The 2017 RRA reform increased the maximum re-employment age from 65 to 67 years for workers born after July 1, 1952, meaning that older adult workers born after this date can continue in their current employment until age 67, but those born before could only do so until the age of 65. The 2018 reform raised the PEA from 64 to 65 years for individuals born after 1954. Therefore, Singaporeans born before 1953 could start claiming their pension payments at age 64, but those born after 1954 had to wait until reaching age 65.

The Singaporean setting is unique because the mandatory retirement age (currently age 62) is set at a younger age than the PEA, and the maximum re-employment age is set beyond the PEA.

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[1] In Singapore, the mandatory retirement age is 62, but employers are also mandated to offer "re-employment" to eligible employees who turn 62 up to the legally defined maximum re-employment age. The re-employment contracts are at least one-year contracts and are renewable yearly up to the maximum re-employment age. Employees who reach age 62 have three options to choose from: (i) accept the "re-employment" offer from the current employer; (ii) find jobs by themselves or become self-employed; (iii) leave the labor force (retire). Section 2.1 further describes the details of the RRA policy and possible employment options after an employee reaches the mandatory retirement age.

In contrast, European and other Asian countries have a statutory mandatory retirement age set as an age in which employment contracts can be terminated and the older adult worker is first entitled to claim pension benefits (i.e., retirement age coincides with PEA by definition). This entails that the employer has the option, not the obligation, to extend the employment contract beyond that retirement age. However, in Singapore, employers are legally mandated to continue employing older adult workers beyond their PEA until the maximum re-employment age. All labor options and pension decisions available to Singaporeans in different age groups are displayed in Figure A.1 in the Appendix.

In the current study, we used these two policy reforms in Singapore as experiments to investigate two issues: (i) the effect of enhancing employment protection for older adult workers already eligible for pension payments on employment and pension claims and (ii) the effect of increasing the PEA for those who are covered by a mandatory employment protection policy (up until the re-employment age) on employment and pension claims. By analyzing these policy reforms independently, we can examine whether the labor demand side policy reform (i.e., RRA reform) can stimulate employment among older adult workers who are eligible to claim pension benefits and retire, as well as whether the labor supply side policy reform (i.e., increasing PEA) can stimulate employment among older adult workers who are protected by the labor demand side policy.

To identify the effects of the 2017 RRA reform on employment among older adults, we compare data from (i) individuals born between January 1 and June 30, 1952, whose maximum re-employment age was 65 years to (ii) those born between July 1 and December 31, 1952, whose maximum re-employment age was changed from 65 to 67 years. Since both groups could claim pension benefits at age 64—a lower age than their maximum re-employment age—studying this policy reform allows us to zero in on the effect of the reform in labor supply at age 66 and whether it enhances employment protection for workers who are eligible to claim pension benefits. This, in turn, enables us to analyze whether the RRA reform was an effective tool for increasing employment among older adults in Singapore. Specifically, we can investigate whether older adults at age 66 are less likely to be underemployed *after* the reform; if this is so, it would mean they had wanted to work before the reform but could not do so, presumably because of the

termination of their employment protection and their inability to find new employment opportunities due to low labor demands for older adult workers.

To estimate the causal effects of the 2018 PEA reform, we compare data from (1) individuals born in 1953 (i.e., PEA of 64 years) to (2) those born in 1954 (i.e., PEA of 65 years). For both cohorts, eligible employees were allowed to work until the maximum re-employment age of 67, which is older than the PEA applicable to them (i.e., either 64 or 65 years). This enables us to examine the pure labor supply effect of the PEA reform at age 64 for those who were covered by the employment protection policy until the age of 67.

Using data from the Singapore Life Panel (SLP), which includes a wide range of information about the economic, social, and health conditions of older adults in Singapore, we estimate the impact of the policy reforms of interest. Our empirical analyses yielded the following results. First, we find that the RRA reform reduces the probability of being unemployed by 5.8 percentage points and increases the probability to continue working in the longest-held job by 11.4 percentage points among older adults aged 66 years. These results signify that (i) older adult Singaporeans were underemployed before the RRA reform, and (ii) that the reform was effective in helping older adults by enabling them to be employed for longer in their extant jobs. Second, we find that the PEA reform influences the older adult labor supply at the intensive margin: at age 64, the probability of full-time employment increased by 8.2 percentage points, while that of part-time employment decreased by 5.7 percentage points. In other words, becoming ineligible to claim a pension at age 64 moves more older adults from working part- to full-time.

When analyzing the impact of increasing the PEA by education levels, we find that respondents with primary education or less experience greater reductions than others in their satisfaction with both their household income and their economic situation. Hence, in the Singaporean context, where employment is protected beyond the PEA until the maximum re-employment age of 67, older adult workers with limited education decide to work more hours in order to increase their work income and replace the delay in receiving pension benefits. This means that an increase in PEA from age 64 to 65 leads to a loss in economic well-being for 64-year-olds with limited education—although this loss might have been much larger without the RRA reform, since older adults would then have been left with neither a job nor pension benefits.

This study contributes to the literature in two ways. First, we estimate the effect of a mandatory labor protection policy reform on employment among older adults who are already eligible for claiming pension benefits. Few previous studies have been conducted in such a setting (i.e., wherein older adults enjoy mandatory labor protection policy protection and are eligible for pension claims).[2] Second, we provide evidence regarding the effects of increasing the PEA on employment among older adults who are still covered by a mandatory labor protection policy. Meanwhile, most of the current literature estimates the effect of increasing PEA on employment using data from countries with no mandatory employment protection policy for older adults, including the studies by: Coile and Gruber (2007), Gustman and Steinmeier (2005), Coile (2015), and Bütler (2009) in the United States of America; Staubli and Zweimüller (2013) and Manoli and Weber (2016) in Austria; Atalay and Barrett (2015) in Australia; Mastrobuoni (2009) in Italy.

The research that comes the closest to ours is that by Kondo and Shigeoka (2017), who study how employment among older adults in Japan is affected by increasing the age until which employers are legally obliged to offer continuous employment.[3] The key difference between their Japanese setting and our Singaporean setting is that Japanese labor protection for older adults lasts only until the PEA. This is because the Japanese government's labor protection law was enacted

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[2] Two exceptions to this pattern are the studies by Behaghel et al. (2008) and Neumark and Song (2013). Behaghel et al. (2008) analyze a form of employment protection for all older adults in France after age 50. Neumark and Song (2013) examine the Age Discrimination Law, which protects workers in the United States of America beyond the PEA for Social Security benefits.

[3] There are two notable differences between the study by Kondo and Shigeoka (2017) and our research. First, Kondo and Shigeoka (2017) study the impact of the Elderly Employment Stabilization Law (ESSL) revision (i.e., the effect of increasing the maximum age for mandated continued employment from age 62–63) on workers who are *not* yet eligible to claim pension benefits (given that the PEA in Japan is of 63). In contrast, we study the effect of the RRA revision (which increased the maximum age for continued re-employment from ages 65 to 67) on Singapore workers who were *already* eligible to claim pension benefits (given the Singaporean PEA of 64). Therefore, we examine the effect of a labor protection policy when older adults are *already eligible* for a pension, enabling for a focus solely on the effect of the labor protection policy. Second, Kondo and Shigeoka (2017) examine the effect of increasing the PEA (from age 62 to 63) in the *absence* of a mandatory continued employment policy at those PEA ages (since the maximum age for mandatory continued employment remained at age 60). In contrast, we study the effect of increasing the PEA (from age 64 to 65) for workers whom *still enjoyed* the protection of a re-employment policy (until age 67). Therefore, we examine the effect of increasing the PEA while older adults are still protected by a mandatory re-employment policy—enabling us to estimate the pure effect of the PEA increase. More recently, Nakazawa (2022) study the effects of increasing the PEA for public pension benefits from 60–65 years on workers' retirement decisions in Japan. Though the policy setting was the same as that in the study by Kondo and Shigeoka (2017), Nakazawa (2022) did not separately examine the effects of a mandatory continued employment reform.

to safeguard employment for and prevent older adults from spending nonworking time without receiving pension benefits. In contrast, the Singaporean government provides labor protection beyond the PEA, so we are able to examine the effect of two concomitant protective policies for older adults, while Kondo and Shigeoka (2017) examined the effect of one policy in the *absence* of the other.

The remainder of this paper is organized as follows. Section 2 presents the institutional background of Singapore's retirement and pension systems. Section 3 describes the data used in this study. Section 4 presents the empirical identification strategy. Section 5 presents the empirical results. Section 6 discusses the robustness checks. Finally, Section 7 concludes the paper.

2. Institutional Background

2.1 The Retirement and Re-employment Act

The RRA protects older adult workers' rights for employment and re-employment.[4] Under the RRA, employers cannot ask their employees to retire before the minimum retirement age, which is set at 62 years. In accordance with the RRA, employers must also offer re-employment (continued employment) to eligible employees who turn 62 so that they can continue working in the organization up to the maximum re-employment age. When the employee is eligible for re-employment but the employer is unable to offer a position, the employer must either help the employee find another job or offer the employee a one-off employment assistance payment.

Due to increasing economic pressure caused by its aging labor force, the government of Singapore revised the RRA in 2017 by raising the maximum re-employment age from 65 to 67 years: through the revision, individuals born after July 1, 1952, can now enjoy re-employment protection until age 67. The revised RRA was first read in November 2016 and officially passed in January 2017.

In Table 1, Columns 1–3 summarize the application of the RRA reform by listing the minimum retirement age and maximum re-employment age by birth cohort. The distinctive birth date-based cutoff (i.e., for those born before and after July 1, 1952) provides us with a unique opportunity to examine the effect of the revised RRA on employment among Singaporean older

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[4] The RRA is applicable only to individuals who are working as employees, hence not applying to those who are self-employed.

adults.

2.2 The Pension Policy Landscape

2.2.1 The Central Provident Fund and the Pension Schemes

Singapore's pension system primarily relies on the Central Provident Fund (CPF), which was introduced in 1955 and is a mandatory defined-contribution system based on three individual accounts: the ordinary account (OA), special account (SA), and MediSave account.[5] All working Singaporeans and permanent residents of any age are required to contribute to their CPF accounts.[6] Contributions are made by both employers and employees every month, up to an earnings cap. Contributions are allocated among the three accounts according to an age-based ratio. Then, at age 55, a fourth individual account, the Retirement Account (RA), is created to help Singaporeans prepare for retirement; upon reaching this age, the individual chooses how much of the savings from the OA and SA are transferred to the RA. Individuals' future monthly pension payouts depend on the amount they have in the RA account upon their first claim of pension benefits. Individuals can claim pension benefits upon reaching the PEA or they can delay it until age 70. Instead of receiving pension payments automatically at a particular age, individuals need to inform the CPF Board about the desired time for the onset of pension payouts.[7]

2.2.2 Relationship Between Work and Pension Claim

In contrast to most other countries, Singapore imposes no earnings test for pension claims, and older adults are entitled to receive their pension in full even while working. When working, the worker and the employer contribute to older adult workers' OA and SA. Workers above age 55 can choose either (i) to top up their RA with their OA and SA balances up to a ceiling amount

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[5] Contributions made to the OA can be used to finance housing loans and child education. The SA is meant for financial needs after retirement and can be used for investments in retirement-related financial products. The MediSave account is used to cover out-of-pocket medical spendings and health insurance premiums for the account owner and the immediate family members.

[6] All self-employed individuals who are Singaporeans or permanent residents in the country and earn an annual Net Trade Income (NTI) of more than 6,000 SGD are required to contribute only to their MediSave account; for these people, contributions to their OA and SA accounts are voluntary, but if one contributes to the OA, one must also contribute to the SA, and vice versa.

[7] At age 70, if they have not already done so, the pension is automatically claimed and payments start to be sent to the individual.

(i.e., earning up to 6% of annual interest) or (ii) to leave their savings in the OA (i.e., earning up to 2.5% annual interest) or SA account (i.e., earning up to 4% annual interest). For every year of delay in pension claim after the PEA, older adults can earn up to 6% interest from their RA account.[8]

2.2.3 Reforms in Pension-Eligibility Age

In Table 1, Column 3 summarizes how the PEA reform applies to each birth cohort. The PEA was initially set at 60 years, but was raised to 62 years in 1999 to match the minimum retirement age of 62 years. It was then raised to 63 years in 2012, 64 years in 2015, and 65 years in 2018 to encourage older adult labor force participation. We focus on the PEA reform of 2018. The 2018 revision describes that individuals born in 1954 become eligible for pension benefits only at age 65, whereas those born in 1953 become eligible at age 64. Similar to the situation for the RRA reform, these birth date-based cutoffs offer the opportunity to investigate the effect of the increase in PEA on employment among older adults.

3. Data

3.1 The Singapore Life Panel

We use data from the SLP, a monthly longitudinal data set collected since August 2015. It is a nationally representative data set of the Singaporean older adult population who were 50–70 years old in 2015. The initial sample included 12,500 individuals, and the monthly sample ranged from 7,000–9,000 individuals. The design of the survey is similar to that of the Health and Retirement Study (HRS) conducted in the United States of America, but different questions are asked at four different frequencies: monthly, quarterly, annually, and one-off.[9] Demographic information, such as birth date (month and year), marital status, sex, education, and race are collected both at baseline and every month. Individual labor status and subjective well-being measurements are surveyed every month, and pension claiming status is collected annually. The

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[8] The 6 percent interest can only be earned for the first 30,000 SGD when combining CPF balances.
[9] A detailed description of the SLP survey's design and sample methodology can be found in Vaithianathan et al. (2021).

SLP also surveyed individuals' work history in two waves.[10] The birth date data enable us to identify who is affected by the RRA and PEA reforms.

Regarding employment status, the SLP uses a multiple-choice question, wherein respondents may choose one or more of the following answers that apply to them: "working for pay," "unemployed and looking for work," "temporarily laid off," "on sick or other leave," "disabled," "retired," "homemaker," "self-employed," "student," and "others." The advantage of having respondents report multiple labor statuses lies in allowing for those analyzing the data set to capture the comprehensive dynamics in labor supply behavior at the individual level. Under this setting, we classify respondents into one of the following employment categories: "working for pay" (including self-employment), "unemployed," "retired," and "disabled." Table 2 presents the definitions for employment status.[11]

This study is interested in looking at the following outcome variables: four mutually exclusive employment statuses (working for pay, unemployed, retired, and disabled) and full- and part-time work.[12] We also utilize data pertaining to the SLP's work history questions, which inquire about the respondents' longest-held job. We use the ages at which respondents started and ended their longest-held job to determine whether they were working in their longest-held job at specific ages,[13] which serves for investigating whether the policy enabled respondents to continue working in their longest-held job. To check the welfare impacts of the policy reforms, we further examine data on measures of subjective well-being in the SLP, including job satisfaction, income

[10] The work history items were included in the questionnaire for the first time in wave 26 (September 2017) and for the second time in wave 48 (July 2019).

[11] In our SLP sample, among those who answered "self-employed," only 10.1% also checked that they were "working for pay." Therefore, we classify as "working" all those who responded "working for pay," "self-employed," or both. Those who checked "temporarily laid-off" are classified as "unemployed." Those who only checked "sick or other leave" (i.e., 0.4% of the sample) are classified as "working for pay."

[12] In the SLP, if the respondent answers "working for pay," the person should then answer to another item on whether one usually works (i) less than 35 hours per week, (ii) 35 hours per week or more, or (iii) "it varies: sometimes less, sometimes more than 35 hours per week." We classify respondents as full-time workers when they answer both "working for pay" and "35 hours per week or more." We classify respondents as part-time workers when they answer both "working for pay" and "less than 35 hours per week" or "it varies: sometimes less, sometimes more than 35 hours per week."

[13] We refer here to the work history items that were included in the September 2017 and July 2019 waves. Specifically, the SLP asked respondents who affirmed being currently working for pay or self-employed: "Thinking about your working life as a whole, is this the job in which you have worked for the longest period of time?" The respondents answer either (1) "yes, this is the job I have had for the longest time," or (2) "no, I worked another job for longer." The SLP also asked the respondents, "In what year did you start working in your longest-held job?" and "In what year did you leave your longest job?"

satisfaction, and household income situation.

Our main sample comprises both sexes because there are no sex-related differences in the labor and pension policies in Singapore. We exclude individuals who had not worked as employees in their longest-held jobs during their working life since the RRA is only applicable to employees.[14] Specifically, our data set comprises the period from August 2015 to March 2020. For the analysis regarding the PEA reform, we restrict the sample to individuals born between January 1, 1953, and December 31, 1954, totalizing 312 men and 308 women.[15] For the RRA reform, we restrict the sample to individuals born in 1952, totalizing 124 men and 130 women.[16]

Table 3 presents the summary statistics. For the treatment and control groups (defined in Section 4), the demographic characteristics and health variables are similar. Among the four groups (i.e., treatment group for RRA and the treatment group for PEA, as well as the control group for RRA and control group for PEA), over 70% are married and nearly 50% are of the female sex, indicating that labor force attachment is similar for both sexes in Singapore.

To check for sample balance between the treatment and control groups, we regress the treatment dummy (RRA and PEA reforms) on the demographic and health characteristics as the outcome variables. The estimates are reported in Table A.1 in the Appendix. No estimate showed significant differences by group for either policy.

4. Labor Supply Model and Empirical Strategy

4.1 Labor Supply Decisions

We present a simple static labor supply model to predict the impact of the RRA and PEA policy reforms on decisions by older adults about whether and how much to work. The models capture the main features of the RRA policy and pension system in Singapore to provide simple frameworks for interpreting the empirical results regarding the labor supply behaviors of older

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[14] Workers categorized as employees include those who answered that they worked in a "private firm or company," the "public sector, including government ministries, civil service and statutory boards," or a "not-for-profit organization, such as a charity, non-governmental organization (NGO), advocacy group, union or religious group."

[15] For individuals born after 1955, we could gather very limited information on their work status at age 65 since most had yet to turn 65 by the time of the survey; accordingly. we exclude them from our sample.

[16] We exclude individuals born in 1951 since their PEA was set at age 63, while the PEA for those born after January 1, 1952 (and before December 31, 1954) was set at age 64 (see Table 1).

adults.[17]

We start by describing the labor supply decisions of 66-year-old Singaporeans before and after the RRA reform. Before the reform, any 66-year-old Singaporean would have had to leave their job at age 65, which was the age at which their re-employment contract was terminated; if the 66-year-old wanted to continue working, one would have had to find a new job independently, configuring a potentially difficult endeavor considering the weak demand for older adult workers in the country. With the RRA reform, the maximum re-employment was expanded to age 67. In this scenario, 66-year-olds who were underemployed before the reform (i.e., they could not work but would have liked to do so) were given the right to come back to work, characterizing an increase in labor supply at the extensive margin (i.e., a move from Point A to Point A' in Figure 1). In contrast, 66-year-olds who faced no constraints regarding working hours (i.e., were satisfied with their labor, leisure, and income conditions) could upkeep their conditions regardless of the reform; therefore, we would observe no changes in their employment status and working hours.

We now describe the labor supply decisions of 64-year-old Singaporeans before the pension reform, who were eligible to claim pension benefits at age 64. In Figure 2, we compare a scenario in which a 64-year-old Singaporean does not claim pension benefits (budget line YZ in Figure 2) with that in which one does claim the benefits (budget line Y'Z' in Figure 2). Under the national pension system, older adults can claim pension benefits while continuing to work without suffering tax consequences (e.g., those imposed in other countries by an earnings test). Therefore, claiming pension benefits will simply result in a positive income effect, moving the budget line in a parallel fashion from line YZ to line Y'Z' (Figure 2); note that Figure 2 describes the *static* labor supply decision, which differs from a *dynamic* life-cycle labor supply decision. In a dynamic framework, 64-year-olds who decide not to claim pension benefits will be able to enjoy higher benefits when they claim them later on (this dynamic framework is not accounted for in Figure 2). If such dynamics were accounted for, the 64-year-old could decide not to claim pension benefits at age 64 (even with the positive income effect at this age, as shown in Figure 2), but instead to claim them at a later age to receive *larger* pension benefits.

A 64-year-old Singaporean who does not yet claim pension benefits at age 64 will choose

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[17] Figure A.1 in the Appendix lists the available employment and pension choices for Singaporeans starting at age 20.

the combination of labor, leisure, and income that provides the most utility (i.e., Point A in Figure 2 Panel A). This will lead to a reduction in working hours from Point A to A', namely, a change in labor supply at the intensive margin. Meanwhile, 64-year-old Singaporeans who claim pension benefits at age 64 will choose Point A' (in Figure 2, Panel B), meaning that they leave the labor force from Point A to A', leading to a change in the labor supply at the extensive margin.

Accordingly, when we compare the change in labor supply decisions before and after the PEA reform, we see that 64-year-old Singaporeans could choose either Point A or A' before the pension reform (since the PEA was 64 years); however, *after* the pension reform, they can choose only Point A (since the PEA became 65 years). Therefore, we would observe different employment behaviors before and after the reform from those aged 64 years: their working hours are longer after the reform (Point A' to Point A in Figure 2 Panel A) and (ii) there are higher employment rates after the reform (Point A' to Point A in Figure 2 Panel B).

4.2 Effects of the Retirement and Re-employment Act Reform

As aforementioned, due to the 2017 RRA reform, employers are now required to offer re-employment up to the age of 67 for individuals born after July 1, 1952, but only up to the age of 65 for those born earlier. We defined individuals born in the first (i.e., from January 1 to June 30, 1952) and second halves of 1952 (i.e., from July 1 to December 31, 1952) as the control and treatment groups for RRA, respectively. We estimate the effects of increasing the maximum re-employment age by comparing the labor market behavior of those in the treatment with those in the control group for RRA. Specifically, we estimate the following equation for those aged between 64 and 67 years:

$$y_{it} = \sum_{a=65}^{67} \alpha_a A_{a,i} + \sum_{a=64}^{67} \beta_a A_{a,i} \times T_i + \delta X_{it}' + \lambda_t + \varepsilon_i \ (1),$$

where y_{it} represents an outcome variable (such as a dummy for working for pay); $A_{a,i}$ is a dummy variable indicating that individual i was a years old at the survey date; T_i is a dummy variable indicating that individual i was born between July 1 and December 31, 1952 (treatment group for RRA). In addition, X_{it} is a set of controls, including education, sex, race, birth date, marital status, self-rated health, chronic condition dummies (e.g., heart disease, stroke, cancer, hypertension, arthritis, and diabetes), and unemployment rate in the survey year. Further, λ_t is

the fixed effects of survey wave. The coefficient of interest, β_a, represents the effect of the RRA reform on the outcome variable at age a. The identifying assumption is that, in the absence of the RRA reform, the change in y_{it} would have been the same for both groups after controlling for background characteristics. Under this assumption, β_a represents the average causal effect of the RRA reform on the outcome variable. Standard errors are clustered at the individual level.

Our main estimates of interest are β_{65} and β_{66} since they reflect the effect of the RRA reform at ages 65 and 66, respectively. This is because those aged 65 and 66 were not covered by the mandatory employment protection policy before the RRA reform, but were covered after the reform. Meanwhile, those aged 64 years were covered by the employment protection policy both before *and* after the reform.

There is also interest in the β_{67} estimate, representing the effect of the RRA reform at age 67. Considering that 67-year-old workers in both the treatment and control groups for RRA were not covered by the employment protection policy neither before *nor* after the reform, we examine the lasting effect of the RRA reform when the treatment group for RRA is one year beyond the maximum re-employment age compared with the control group for RRA, which is three years beyond it.

4.2.1 Effect of Announcing the Retirement and Re-employment Act Reform on Pension Claims

The RRA reform bill was first read on November 7, 2016, and enacted on January 9, 2017, in the Parliament of Singapore. Despite this reform introducing changes for the maximum re-employment age, the PEA remained the same at this point in time. When the RRA reform bill was first read (November 2016), the control group for RRA (born between January 1 and June 30, 1952) and the older half of the treatment group for RRA (born between July 1 and October 31, 1952, hereinafter treatment group A for RRA) had already reached age 64, meaning that they could have already claimed their pension at age 64, not knowing about the impending RRA reform. Notwithstanding, the younger half of the treatment group for RRA (born between November 1 and December 31, 1952; hereinafter, treatment group B for RRA) were only 63 years old when the bill was first read, meaning that they had the direct opportunity of postponing their claim of pension benefits beyond age 64 due to knowing about the RRA reform through its official announcement. Accordingly, to examine the potential effect of reform announcement, we replace

T_i in equation (1) with T_i^A or T_i^B, which are dummy variables indicating that individual I belongs to the treatment group A (born between July 1 and October 31, 1952) or B for RRA (born between November 1 and December 31, 1952), respectively. The resulting Equation (2) is as follows:

$$y_{it} = \sum_{a=65}^{67} \alpha_a A_{a,i} + \sum_{a=64}^{67} \beta_a A_{a,i} \times T_i^A + \sum_{a=64}^{67} \beta_a A_{a,i} \times T_i^B + \delta X_{it}' + \lambda_t + \varepsilon_i \quad (2)$$

We also examine whether individuals in treatment group B for RRA are more likely to claim their pension at a later age than treatment group A for RRA. This pattern suggests that increasing the maximum re-employment age could lead workers to postpone pension claiming. We also examine the extent to which a decision by individuals in treatment group B for RRA to postpone pension claiming until *after* age 64 would affect their decisions about continuing to work at ages 65 or 66.

4.3 Effects of Increasing the Pension-Eligibility Age

We previously described that the 2018 reform raised the PEA to 65 years for individuals born after January 1, 1954, whereas it remained at 64 years for those born in and before 1953. For those born between 1953 and 1954, the maximum re-employment age was 67, so the RRA reform allowed them to continue working at their jobs at that time even *after* reaching the PEA. Accordingly, by comparing the changes in the outcome variables among those born in 1954 (the treatment group for PEA, with a PEA of 65 years) and in 1953 (the control group for PEA, with a PEA of 64 years), we can examine the pure labor supply effect of the PRA reform in Singapore. We estimate the following equation for those between the ages of 62 and 66 years:

$$y_{it} = \sum_{a=63}^{66} \alpha_a A_{a,i} + \sum_{a=62}^{66} \beta_a A_{a,i} \times T_i + \delta X_{it}' + \lambda_t + \varepsilon_i \quad (3),$$

where T_i is a dummy variable indicating whether individual i belongs to the treatment group for PEA. The specifications for A_{ai}, X_{it}, and λ_t are the same as those for Equation (1). Standard errors are clustered at the individual level.

In our analysis, we restrict the age range from 62 (minimum mandatory retirement age) to 66 years. Within this range, individuals born in 1952 and 1953 were eligible for pension claiming since age 64 (i.e., since 2017), whereas those born in 1954 became eligible only at age 65 (i.e., in 2019). Here, we are interested in estimating β_a at the age of 64. Although neither the treatment

nor the control groups for PEA were eligible for pension claiming at ages 62 or 63, there might be significant effects on β_a at ages 62 or 63. This is because the treatment group for PEA, whose members were not eligible for pension claiming at age 64, may have increased their attachment to the labor market before age 64 to a greater degree than the control group for PEA. Note that there might also be significant effects on β_a at age 65 because individuals in the control group for PEA had already been eligible for pension claiming for a year, while those in treatment group for PEA became eligible only in that year. Therefore, by reporting the estimates for β_a from ages 62 to 66, we identify how the PEA reform impacts employment before and after workers become eligible for pension claiming.

5. Empirical Results

5.1 Effects of the Retirement and Re-employment Act Reform

Table 4 presents the estimates of the impact of the RRA reform on employment, with Columns 1 to 4 reporting the impact of the reform on the four mutually exclusive labor categories: working for pay, unemployed, retired, and disabled. The dependent variables are dummy variables that are equal to 1 if an individual is in the state of the question and 0 otherwise.

As discussed in Section 4, if Singaporean older adults were under-employed before the RRA reform, we expected to observe an increase in labor supply at the extensive margin after the reform (Figure 1). The empirical results confirm this expectation: individuals in the treatment group for RRA (i.e., born after July 1, 1952, and with a maximum re-employment age of 67 years) are 5.8 percentage points less likely to be unemployed at age 66 than those in the control group for RRA (born before July 1, 1952, and with a maximum re-employment age of 65 years). The treatment group for RRA is also 4.5 percentage points more likely to be working and 1.0 percentage points more likely to be retired than the control group for RRA, albeit the results for these estimates are non-significant.

Column 5 in Table 4 reports the effects of the RRA reform on the probability of individuals to continue working in their longest-held job. The SLP surveyed work history only in September 2017 and July 2019, when individuals in the treatment group had not yet reached the age of 67 years (they were still 66 years old in July 2019). Therefore, we restrict the sample for the analysis

on the probability to continue working on the longest-held job to ages 64–66. Since the goal of the RRA reform was helping older adults to continue working in their current jobs at the time, we expected positive effects on the probability continue working in their longest-held jobs. The empirical results confirm this assumption. The reform indeed increases the probability to continue working in the longest-held job at age 66 by 11.4 percentage points.

We also observe a decrease in unemployment at age 65 of 2.3 percentage points, and an increase in working for pay at age 65 and in the probability to continue working in the longest-held job at age 65 by 2.7 and 5.4 percentage points, respectively. Nonetheless, these estimates for age 65 are all statistically insignificant and much smaller than those for age 66. Therefore, the RRA reform affected the 65-year-olds only slightly and the 66-year-olds more extensively by enabling the latter to continue to work in their longest-held jobs and to be less likely to be unemployed.

5.1.1 Effect of Announcing the Retirement and Re-employment Act Reform on Pension Claims

As discussed in Section 4.2, the RRA reform may have influenced pension claim decisions for individuals in treatment group B for RRA (i.e., not yet 64 years old when the RRA was first read in November 2016). To test this hypothesis, we examined the impact of the reform using Equation (2) with treatment groups A and B for RRA. The findings are reported in Table 5, wherein Columns 1–4 report the effects on employment. Both groups have similar estimates: a reduction in unemployment at age 66, which is consistent with the main regression results. The effects are larger for treatment group B (6.7 percentage points) than treatment group A for RRA (5.4 percentage points), albeit not to a statistically significant extent.

Column 5 reports the effects on the probability to continue working in the longest-held job. For those aged 66 years, this probability increased by 12.3 percentage points in treatment group A and 7.7 percentage points in treatment group B for RRA. These findings suggest that the 11.4-percentage-point increase in the probability to continue working in the longest-held job for those aged 66 years shown in Table 4 is driven by the increase in treatment group A for RRA.

Column 6 reports the effects of the reform on pension claim status for both treatment groups. Because treatment group A for RRA were already older than 64 years by the time of the RRA reform announcement, we observe no difference in pension claim decisions between

treatment group A for RRA and the control group between the ages of 64 and 67 years. However, treatment group B for RRA is 10.7 percentage points less likely than the control group to make pension claims at age 65 (although not to a statistically significant extent), and 18.6 percentage points more likely than the control group to make pension claims at age 66 (to a statistically significant extent). In other words, more individuals in treatment group B for RRA decided to delay pension claims from age 65 to 66 than in the control group. Further, the estimates show that, after individuals in treatment groups A and B for RRA learned that they could continue working until age 67, more people in group B than group A for RRA decided to delay pension claims.

In summary, providing labor protection beyond the PEA not only reduced unemployment rates but also increased the probability to continue working in the longest-held jobs among Singaporean older adults. Additionally, the maximum re-employment age extension introduced by the RRA reform led to delays in pension claims. Accordingly, our findings suggest that Singaporean older adult workers were underemployed before the RRA reform, desired to continue working if possible, and that they are willing to postpone pension claims if they can continue to work.

5.2 Effects of Increasing the Pension-Eligibility Age

Table 6 presents the estimates of the effects of the PEA reform on employment and pension claims. After the PEA reform, the treatment group for PEA (born in 1954) could claim their pension at age 65 and onwards, whereas the control group for PEA (born in 1953) was able to do so at age 64 and onwards. Therefore, the expectation is for a reduction in pension claims at age 64. Column 7 confirms this hypothesis. We find a strong and significant reduction in the probability of pension claims, with the treatment group being 65.7 percentage points less likely than the control group to claim pension benefits at age 64. The treatment group is also 23.0 percentage points more likely than the control group to wait until age 66 for claiming pension benefits, albeit both groups enjoyed a maximum re-employment age of 67 years.

As discussed in Section 4, increasing the PEA could lead to changes in labor supply either at the extensive or intensive margins. We used two sets of outcome variables to test our hypothesis. Columns 1–4 in Table 6 report the results for the four mutually exclusive employment categories,

providing evidence for the effects of PEA reform on labor supply at the extensive margin. We find that the treatment group for PEA is less likely to be retired (7.6 percentage points) and more likely to be working (5.5 percentage points) at age 64 than the control group for PEA, albeit the differences are not statistically significant. Columns 5–6 report the results for labor supply changes at the intensive margin. The PEA reform led to a 8.2-percentage-point increase in the probability to continue working full-time at age 64 and to a 5.7-percentage-point decline in the probability to continue working part-time at age 64, with these estimates being significant at the 10 percent level.

The results show that the increases in the PEA changed older adult labor supply in Singapore more at the intensive than at the extensive margin. Because the maximum re-employment age is set at a higher point than the PEA, older adult workers in Singapore typically choose not to retire at the PEA. Thus, we do not observe many changes in labor supply at the extensive margin. However, the lack of a pension income due to an increase in the PEA incentivizes older adult workers to increase their working hours, since working full-time (vs. part-time) enables them to compensate for the lost income from not receiving pension benefits.

One major criticism related to the PEA reform is its potential to be harmful for workers with weaker labor market positions (Staubli and Zweimüller, 2013). For example, less-educated workers may treat pension benefits as a vital supplement to their current income, thus being hurt by an increase in the PEA, whereas the added income related to pension benefits is less essential for workers with higher education. To test this hypothesis, we estimate the effect of PEA on subjective well-being by education. The items for the outcome variables were responded on a five-point Likert scale ranging from 1–5 (5, *very satisfied*; 1, *not satisfied at all*), and the scores were later recoded into binary variables, with 1 being either "very satisfied" or "satisfied" and 0 otherwise.

Table 7 reports the empirical results of the effects of increasing the PEA on subjective well-being by education. Among the three education groups, individuals with primary or less education suffer significantly from the PEA increase, as it leads to a statistically significant 13.2-percentage-point reduction in satisfaction with own economic situation at age 64; it also leads to a statistically insignificant reduction of 12.6 and 5.2 percentage points in workers' job satisfaction

and household income satisfaction at age 64, respectively. In contrast, only positive and insignificant impacts on subjective well-being are found for the secondary and post-secondary educated groups.

In summary, the PEA reform in Singapore has led to (i) delays in pension claiming and (ii) increases in labor supply at the intensive margin by motivating older adults to switch from working part- to full-time. However, and similar to the effects observed in many other countries, it also led to (iii) negative effects on the subjective well-being of individuals with less education.

6. Robustness Checks

6.1 Falsification Test for the Retirement and Re-employment Act Reform

We conduct falsification tests for the RRA reform to verify whether policy change alone, rather than the potential confounding effect of cohort-specific shocks, explains our estimates. To do so, we examine the baseline results for the RRA reform using two alternative cohorts: individuals born in 1951 and those born in 1953. We chose these cohorts because the maximum re-employment age for individuals born in the first and second halves of the years in these two cohorts do not differ, namely, the re-employment age is 65 and 67 years for all those born in 1951 and 1953, respectively; these two cohorts also show no differences in PEA (63 and 64 years, respectively). Therefore, we expect no significant effects regarding the midyear birth cutoff (June 30). We estimate Equation (1) separately for each cohort by comparing the data of individuals born in the first and second halves of each year. Tables 8 and 9 report the results for the 1951 and 1953 cohorts, respectively. Both Tables show no statistically significant estimates for either cohort; furthermore, the signs are opposite. This confirms that the results in Table 5 are related to only to the changes evoked by the RRA reform.

6.2 Effects of Increasing the Pension-Eligibility Age on Employment of the Self-Employed

In the main analysis, we restrict our sample to employed workers at their longest-held job in their lifetime because this makes them subject to the RRA protection, while self-employed workers are not. Nevertheless, self-employed workers *are* affected by PEA changes since pension payouts depend on the individual pension account balance in Singapore. The nature of self-

employment suggests that self-employed workers have greater flexibility in choosing working hours. Since they are unaffected by the RRA, self-employed workers face less hinderances regarding the period of choice for retiring than employed workers. Therefore, as PEA increases, we expect for the labor supply status of self-employed workers to change at the extensive margin. To examine this issue, we estimate Equation (3) using a sample of those who reported that they their longest-held job was a self-employed one. Table 10 presents the results of these analyses.

Similar to the results for the employed workers (i.e., -0.657 for age 64; Table 6), increasing the PEA leads to a significant reduction of 43.3 percentage points for pension claims at age 64 among those whose self-employment was their longest-held job. In addition, a one-year increase in the PEA leads to a 51.7-percentage-point reduction in pension claims at age 65. We also find significant increases of 18.7 and 25.8 percentage points in the probability to be working at ages 65 and 66, respectively; there are also significant decreases of 20.7 and 30.5 percentage points in the probability of retiring at these two ages, respectively. These robustness findings confirm that the PEA reform led those who were self-employed to delay their pension claims and be more attached to the labor force. The absence of the RRA reform for these workers makes their labor supply change more at the extensive margin.

7. Conclusion

In this study, we analyze two policy reforms in Singapore: the RRA reform in 2017 and the PEA reform in 2018. The former increased the maximum re-employment age from 65 to 67 years for individuals born after July 1, 1952, whereas the latter increased the PEA from 64 to 65 years for individuals born after 1954. By analyzing the effects of these two policy reforms, we identify two effects on labor supply: the effect of a labor protection policy when older adults are concomitantly eligible for claiming pension benefits, and the effect of increasing the PEA for older adults under the protection of a mandatory labor protection and re-employment policy.

We find significant effects for the increase in maximum re-employment age (from 65 to 67 years) on labor supply among older adult workers. The increase leads to a 5.8-percentage-reduction in the probability of being unemployed; a 11.4-percentage-point increase in the probability to continue working in the longest-held job; a positive effect on delaying pension

claims among older adults. The results suggest that Singaporean older adults were underemployed before the RRA reform, and that the reform led them to decide to remain working for a longer period at their current jobs and to delay pension claims. Furthermore, given the incentives in the Singaporean context (e.g., no earnings test for determining pension benefits, and mandatory labor protection until a maximum re-employment age), older adults are rather willing to continue working beyond both the retirement age and the PEA.

We also find economically significant responses among older adults to the increase in the PEA, but mostly at the intensive margin. A one-year increase in the PEA increases the full-time working rate by 8.2 percentage points and decreases the part-time working rate by 5.7 percentage points. Furthermore, we find that increasing the PEA could hurt the well-being of less-educated older adults. Given the context of Singapore, in which (i) the PEA is independent of retirement age and (ii) employees are protected by policy up to a maximum re-employment age, older adults can use their pension benefits as a supplement to their work income.

Thus, the findings show that the two policy reforms, combined with the pension system in Singapore, provide an excellent example of an effective labor policy "package" for older adult employment. Providing labor protections for older adult workers beyond PEA generates benefits in two aspects: first, it could effectively delay pension claims and hence alleviate the financial pressure on the sustainability of the social security systems imposed by ageing; second, it offers employment opportunities for under-employed older adult workers. Therefore, to successfully motivate older adults to delay their pension claims and work longer, governments should consider separating PEA and retirement age and provide employment protection beyond PEA.

Our research on pension age and maximum re-employment age could be extended in several directions, but herein we provide two examples. One would be to explore how raising the maximum re-employment age influences employers' hiring decisions, and another would be to further examine the effect of employment protection on joint decision-making within families.

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Tables

Table 1. Legal age limits in Singapore with the Retirement and Re-employment Act reform by cohorts.

Cohort birth date	Retirement system		Pension system
	Minimum retirement age	**Maximum re-employment age**	**Pension-eligibility age**
1949	62	65	62
1950	62	65	63
1951	62	65	63
Jan–Jun, 1952	62	65	64
Jul–Dec, 1952	62	67	64
1953	62	67	64
1954	62	67	65
1955	62	67	65

Table 2. Employment status definition.

Variable	Definition
Working	Refers to those who responded "working for ,pay" or "self-employed."
Unemployed	Refers to those who responded "unemployed" and who did not report "working for pay."
Retired	Refers to those who responded "retired," "homemaker," or "student," and did not respond "working for pay" or "unemployed."
Disabled	Refers to those who responded "disabled" and not "working for pay," not "retired," not "homemaker," not "unemployed," and not "student."

Table 3. Summary statistics.

Panel A. Sample for the Retirement and Re-employment Act reform analysis at age 66 years.

Variable	Born between January 1 and June 30, 1952		Born between July 1, 1952 and December 31, 1952	
	Mean	SD	Mean	SD
Demographic characteristics				
Married	0.77	0.42	0.73	0.45
Female	0.53	0.50	0.49	0.50
Chinese	0.93	0.25	0.88	0.32
Malay	0.03	0.16	0.04	0.21
Other race	0.04	0.19	0.07	0.26
Employment variables				
Working	0.52	0.50	0.53	0.50
Unemployed	0.06	0.24	0.03	0.18
Retired	0.41	0.49	0.42	0.49
Disabled	0.00	0.03	0.01	0.10
Health variables				
Excellent health	0.02	0.15	0.02	0.14
Very good health	0.11	0.31	0.16	0.36
Good health	0.44	0.50	0.44	0.50
Fair health	0.38	0.48	0.31	0.46
Poor health	0.05	0.22	0.07	0.26
Hypertension	0.11	0.31	0.12	0.33
Heart disease	0.06	0.23	0.05	0.21
Stroke	0.00	0.00	0.00	0.07
Cancer	0.02	0.14	0.02	0.15
Arthritis	0.05	0.23	0.04	0.18
Diabetes	0.09	0.28	0.08	0.28
N	1,284		1,449	

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life.

Panel B. Sample for the pension-eligibility age analysis at age 64 years.

Variable	Born in 1953		Born in 1954	
	Mean	SD	Mean	SD
Demographic characteristics				
Married	0.79	0.40	0.80	0.40
Female	0.51	0.50	0.49	0.50
Chinese	0.91	0.29	0.89	0.31
Malay	0.03	0.18	0.05	0.22
Other race	0.06	0.24	0.06	0.23
Employment variables				
Working	0.57	0.50	0.63	0.48
Unemployed	0.04	0.19	0.06	0.23
Retired	0.38	0.49	0.29	0.46
Disabled	0.00	0.02	0.00	0.02
Health variables				
Excellent health	0.02	0.13	0.01	0.12
Very good health	0.13	0.33	0.14	0.34
Good health	0.46	0.50	0.44	0.50
Fair health	0.34	0.47	0.35	0.48
Poor health	0.06	0.23	0.06	0.23
Hypertension	0.10	0.31	0.10	0.30
Heart disease	0.02	0.14	0.02	0.13
Stroke	0.01	0.08	0.00	0.03
Cancer	0.01	0.10	0.01	0.10
Arthritis	0.02	0.15	0.03	0.17
Diabetes	0.07	0.25	0.09	0.28
N	3,149		3,709	

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life.

Table 4. Effects of the Retirement and Re-employment Act reform on labor status.

	Working	Unemployed	Retired	Disabled	Working in longest-held job (Sample: ages 64–66)
Subject to RRA Reform * Age 64	0.007	-0.006	-0.007	0.005	-0.028
	(0.063)	(0.025)	(0.063)	(0.005)	(0.086)
Subject to RRA Reform * Age 65	0.027	-0.023	-0.006	0.0019	0.054
	(0.063)	(0.025)	(0.064)	(0.002)	(0.065)
Subject to RRA Reform * Age 66	0.045	-0.058*	0.010	0.002	0.114*
	(0.064)	(0.030)	(0.065)	(0.003)	(0.065)
Subject to RRA Reform * Age 67	-0.042	-0.036	0.082	-0.004	-
	(0.065)	(0.030)	(0.066)	(0.004)	-
Age 65	0.053	0.0004	-0.033	-0.019	-0.047
	(0.081)	(0.024)	(0.081)	(0.013)	(0.101)
Age 66	0.110	0.019	-0.107	-0.022	-0.088
	(0.113)	(0.036)	(0.114)	(0.017)	(0.127)
Age 67	0.167	0.014	-0.160	-0.022	-
	(0.147)	(0.045)	(0.149)	(0.017)	-
R^2	0.080	0.035	0.081	0.241	0.087
N	11,859	11,856	11,859	11,859	7,388
Mean of dependent variable	0.56	0.054	0.38	0.002	0.405

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level. The analysis on longest-held job is restricted to ages 64–66 because no respondents in the treatment group had reached age 67 by July 2019, which was the last wave wherein the survey contained questions about individuals' longest-held job. RRA, Retirement and Re-employment Act.

Table 5. The effects of the announcement of the Retirement and Re-employment Act reform on pension claims.

	Working	Unemployed	Retired	Disabled	Working in longest-held job (Sample: ages 64–66)	Pension claim
Treatment Group A * Age 64	0.013	-0.004	-0.012	0.003	-0.026	0.023
	(0.069)	(0.025)	(0.070)	(0.005)	(0.096)	(0.101)
Treatment Group A * Age 65	0.024	-0.024	0.001	-0.0001	0.078	0.097
	(0.069)	(0.025)	(0.069)	(0.003)	(0.073)	(0.085)
Treatment Group A * Age 66	0.047	-0.054*	0.006	0.0009	0.123*	0.039
	(0.070)	(0.030)	(0.071)	(0.003)	(0.073)	(0.099)
Treatment Group A * Age 67	0.022	-0.048	0.027	-0.001	-	-0.026
	(0.089)	(0.037)	(0.090)	(0.004)	-	(0.109)
Treatment Group B * Age 64	-0.009	-0.010	0.008	0.011	-0.033	0.097
	(0.082)	(0.032)	(0.081)	(0.015)	(0.104)	(0.135)
Treatment Group B * Age 65	0.033	-0.020	-0.021	0.009	-0.007	-0.107
	(0.084)	(0.033)	(0.085)	(0.008)	(0.083)	(0.126)
Treatment Group B * Age 66	0.045	-0.067*	0.015	0.007	0.077	0.186*
	(0.086)	(0.036)	(0.086)	(0.007)	(0.082)	(0.103)
Treatment Group B * Age 67	0.165	0.010	-0.159	-0.016	-	0.068
	(0.129)	(0.045)	(0.132)	(0.011)	-	(0.498)
Age 65	0.048	-0.001	-0.029	-0.018*	-0.050	0.355***
	(0.075)	(0.023)	(0.075)	(0.010)	(0.096)	(0.074)
Age 66	0.106	0.018	-0.107	-0.018	-0.112	0.290
	(0.102)	(0.036)	(0.103)	(0.011)	(0.117)	(0.268)
Age 67	0.165	0.010	-0.159	-0.016	-	0.068
	(0.129)	(0.045)	(0.132)	(0.011)	-	(0.498)
R^2	0.079	0.034	0.080	0.241	0.089	0.720
N	11,859	11,856	11,859	11,859	7,388	2,430
Mean of dependent variable	0.54	0.05	0.41	0.003	0.405	0.54

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level. The analysis on longest-held job is restricted to ages 64–66 because no respondents in the treatment group had reached age 67 by July 2019, which was the last wave wherein the survey contained questions about individuals' longest-held job.

Table 6. Effects of increasing the pension-eligibility age on pension claims.

	Working	Unemployed	Retired	Disabled	Full-time employment	Part-time employment	Pension claim
Subject to PEA Reform * Age 62	0.066	-0.004	-0.062	-0.0000	0.126**	-0.060	-
	(0.051)	(0.023)	(0.049)	(0.0001)	(0.050)	(0.037)	-
Subject to PEA Reform * Age 63	0.043	0.010	-0.052	-0.0004	0.097**	-0.061*	-
	(0.048)	(0.023)	(0.047)	(0.0003)	(0.047)	(0.035)	-
Subject to PEA Reform * Age 64	0.055	0.022	-0.076	-0.0002	0.082*	-0.057*	-0.657***
	(0.049)	(0.024)	(0.048)	(0.0011)	(0.047)	(0.034)	(0.045)
Subject to PEA Reform * Age 65	0.033	0.022	-0.055	0.0004	0.057	-0.057*	0.119
	(0.050)	(0.023)	(0.049)	(0.0007)	(0.047)	(0.033)	(0.179)
Subject to PEA Reform * Age 66	-0.058	0.031	0.029	-0.002	-0.044	-0.069	0.230***
	(0.085)	(0.047)	(0.083)	(0.002)	(0.075)	(0.048)	(0.039)
Age 63	0.004	-0.014	0.009	0.0003	0.052	-0.054**	0.0001
	(0.037)	(0.015)	(0.035)	(0.0003)	(0.037)	(0.026)	(0.0003)
Age 64	-0.024	-0.033	0.055	0.0008	0.085	-0.115**	0.655***
	(0.066)	(0.025)	(0.064)	(0.0005)	(0.066)	(0.048)	(0.045)
Age 65	-0.033	-0.044	0.078	-0.0000	0.125	-0.180***	0.710***
	(0.097)	(0.038)	(0.094)	(0.001)	(0.095)	(0.067)	(0.041)
Age 66	-0.055	-0.051	0.106	0.0004	0.149	-0.245***	0.771***
	(0.125)	(0.049)	(0.123)	(0.001)	(0.121)	(0.086)	(0.177)
R^2	0.041	0.021	0.059	0.005	0.046	0.024	0.757
N	27,195	27,191	27,195	27,195	27,195	27,195	16,982
Mean of dependent variable	0.56	0.05	0.38	0.003	0.35	0.16	0.48

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level.

Table 7. Effects of increasing the pension-eligibility age on subjective well-being by education.

	Job satisfaction			Household income satisfaction			Economic situation satisfaction		
	Primary education	Secondary education	Post-secondary education	Primary education	Secondary education	Post-secondary education	Primary education	Secondary education	Post-secondary education
Subject to PEA Reform * Age 62	0.080	0.076	0.124*	0.128	0.068	0.109	0.084	0.048	0.107
	(0.082)	(0.057)	(0.068)	(0.090)	(0.056)	(0.069)	(0.069)	(0.063)	(0.082)
Subject to PEA Reform * Age 63	-0.061	0.053	0.081	-0.016	0.095*	0.085	-0.074	0.026	0.071
	(0.079)	(0.057)	(0.069)	(0.083)	(0.056)	(0.066)	(0.070)	(0.059)	(0.075)
Subject to PEA Reform * Age 64	-0.126	0.063	0.047	-0.052	0.113	0.075	-0.132*	0.068	0.073
	(0.084)	(0.058)	(0.068)	(0.085)	(0.061)	(0.066)	(0.076)	(0.061)	(0.075)
Subject to PEA Reform * Age 65	-0.040	0.036	0.014	-0.020	0.078	0.055	-0.167**	0.019	0.080
	(0.077)	(0.057)	(0.070)	(0.083)	(0.060)	(0.071)	(0.078)	(0.061)	(0.077)
Subject to PEA Reform * Age 66	-0.153	0.016	-0.022	-0.034	0.057	-0.033	-0.173	0.070	-0.037
	(0.121)	(0.107)	(0.109)	(0.145)	(0.110)	(0.108)	(0.110)	(0.105)	(0.138)
Age 63	0.082	0.037	0.090*	0.066	0.025	0.084*	0.109*	0.015	0.081
	(0.063)	(0.042)	(0.047)	(0.0674)	(0.044)	(0.047)	(0.059)	(0.046)	(0.056)
Age 64	0.067	0.057	0.191**	0.0473	0.066	0.178**	0.069	-0.018	0.127
	(0.111)	(0.073)	(0.083)	(0.1181)	(0.077)	(0.085)	(0.101)	(0.084)	(0.093)
Age 65	-0.085	0.108	0.268**	-0.0498	0.133	0.252**	-0.033	-0.006	0.179
	(0.155)	(0.108)	(0.123)	(0.1629)	(0.112)	(0.124)	(0.137)	(0.122)	(0.134)
Age 66	-0.154	0.133	0.330**	-0.1456	0.220	0.301*	-0.145	-0.027	0.217
	(0.199)	(0.141)	(0.165)	(0.2098)	(0.149)	(0.166)	(0.180)	(0.161)	(0.177)
R^2	0.191	0.202	0.193	0.1861	0.214	0.219	0.210	0.182	0.145
N	5,105	12,195	10,066	5,132	12,243	10,103	5,131	12,230	10,102
Mean of dependent variable	0.47	0.54	0.61	0.37	0.44	0.52	0.37	0.43	0.52

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level.

Table 8. Falsification test for the Retirement and Re-employment Act Reform using the 1951 cohort.

	Working	Unemployed	Retired	Disabled	Working in longest-held job (Sample: ages 64–66)
Born in second-half of 1951 * Age 64	0.029	0.005	-0.018	-0.016	-0.076
	(0.068)	(0.014)	(0.068)	(0.015)	(0.100)
Born in second-half of 1951 * Age 65	0.064	0.009	-0.058	-0.014	0.012
	(0.065)	(0.017)	(0.066)	(0.013)	(0.095)
Born in second-half of 1951 * Age 66	0.057	0.023	-0.068	-0.012	0.049
	(0.065)	(0.021)	(0.065)	(0.011)	(0.066)
Born in second-half of 1951 * Age 67	0.049	0.019	-0.060	-0.008	-
	(0.064)	(0.026)	(0.066)	(0.009)	-
Age 65	0.043	0.008	-0.063	0.012	-0.044
	(0.092)	(0.031)	(0.091)	(0.012)	(0.108)
Age 66	0.061	0.030	-0.102	0.010	-0.075
	(0.124)	(0.042)	(0.123)	(0.011)	(0.172)
Age 67	0.070	0.033	-0.112	0.009	-
	(0.152)	(0.056)	(0.154)	(0.010)	-
R^2	0.065	0.044	0.053	0.064	0.080
N	10,063	10,062	10,063	10,063	4,744
Mean of dependent variable	0.54	0.05	0.41	0.003	0.405

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level.

Table 9. Falsification test for the Retirement and Re-employment Act Reform using the 1953 cohort.

	Working	Unemployed	Retired	Disabled	Working in longest-held job (Sample: ages 64–66)
Born in the second-half of 1953 * Age 64	-0.014 (0.061)	0.032 (0.024)	-0.018 (0.061)	0.0007 (0.002)	0.037 (0.062)
Born in the second-half of 1953 * Age 65	-0.027 (0.062)	0.017 (0.023)	0.010 (0.061)	-0.0002 (0.0004)	0.014 (0.062)
Born in the second-half of 1953 * Age 66	-0.022 (0.063)	0.010 (0.026)	0.016 (0.064)	-0.003 (0.003)	-0.175 (0.111)
Age 65	0.023 (0.080)	-0.010 (0.030)	-0.013 (0.078)	0.0001 (0.002)	0.057 (0.042)
Age 66	0.030 (0.117)	-0.015 (0.042)	-0.015 (0.116)	0.0001 (0.003)	0.103 (0.083)
R^2	0.068	0.030	0.072	0.010	0.0539
N	11,276	11,274	11,276	11,276	5,725
Mean of dependent variable	0.54	0.05	0.41	0.003	0.405

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level.

Table 10. Effects of increasing the pension-eligibility age using the self-employed sample.

	Working	Unemployed	Retired	Disabled	Full-time employment	Part-time employment	Pension claim (Sample: ages 62–65)
Subject to PEA Reform * Age 62	0.110	-0.011	-0.100	0.0006	0.035	0.037	0.0005
	(0.115)	(0.024)	(0.109)	(0.0006)	(0.082)	(0.092)	（0.002）
Subject to PEA Reform * Age 63	0.117	0.016	-0.134	0.0004	-0.022	0.028	-0.007
	(0.097)	(0.017)	(0.093)	(0.0005)	(0.083)	(0.095)	(0.005)
Subject to PEA Reform * Age 64	0.142	0.010*	-0.156	0.0031	-0.079	0.017	-0.433***
	(0.104)	(0.006)	(0.103)	(0.0032)	(0.095)	(0.085)	(0.143)
Subject to PEA Reform * Age 65	0.187*	0.021	-0.207**	-0.0006	-0.038	0.062	-0.517***
	(0.102)	(0.013)	(0.099)	(0.0006)	(0.104)	(0.086)	(0.156)
Subject to PEA Reform * Age 66	0.258*	0.047	-0.305***	0.0003	0.073	-0.168**	-
	(0.138)	(0.061)	(0.096)	(0.0006)	(0.197)	(0.066)	-
Age 63	0.129	-0.019	-0.111	0.0002	0.129*	0.038	0.001
	(0.083)	(0.019)	(0.081)	(0.0004)	(0.068)	(0.063)	(0.002)
Age 64	0.290**	-0.015	-0.276**	0.0005	0.228**	0.097	0.414***
	(0.140)	(0.020)	(0.138)	(0.0006)	(0.112)	(0.124)	(0.142)
Age 65	0.398*	-0.008	-0.395**	0.0053	0.261	0.141	0.457***
	(0.202)	(0.021)	(0.197)	(0.0052)	(0.158)	(0.186)	(0.157)
Age 66	0.530**	-0.001	-0.533**	0.0044	0.342	0.198	-
	(0.263)	(0.029)	(0.257)	(0.0043)	(0.213)	(0.223)	-
R^2	0.121	0.007	0.133	0.0004	0.062	0.128	0.703
N	3,781	3,780	3,781	3,781	3,781	3,781	2,213
Mean of dependent variable	0.73	0.02	0.25	0.002	0.11	0.13	0.012

Note: The sample is restricted to those who had self-employment as the longest-held job. The regressions control for the fixed effects of birth-year and wave, unemployment rate in each survey year, education, marital status, race, self-rated health status, and whether they had ever had heart disease, stroke, cancer, hypertension, arthritis, or diabetes. Robust standard errors are clustered at the individual level. For the analysis of pension claim status, those aged 66 years are not included in the sample because there is not much information on pension claim status for this cohort in the data set, and this is due to: data on pension claim status being collected annually; the survey data being available only until March 2020.

Figures

Figure 1. Effect of increasing the maximum re-employment age from 65–67 years.
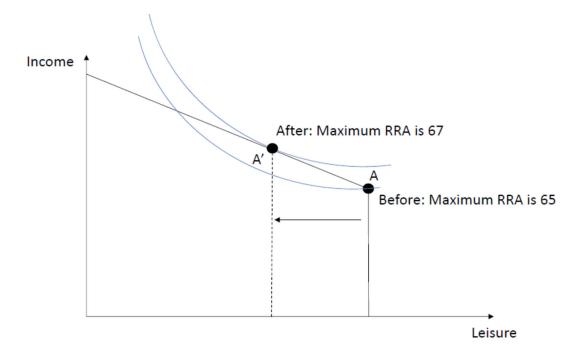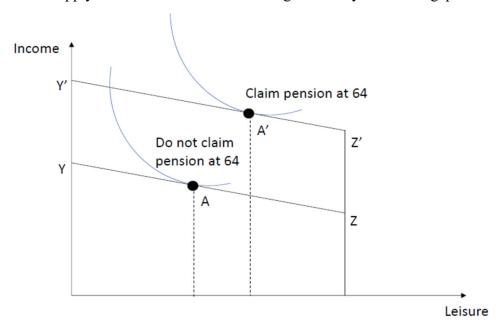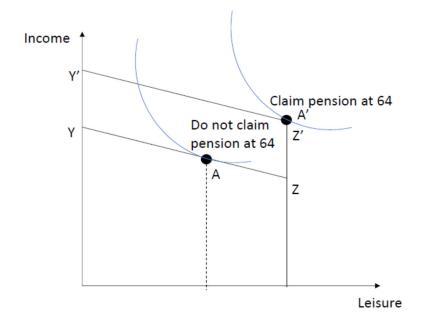
Figure 2. Difference between claiming pension and not claiming pension at age 64.

Panel A. Labor supply behavior at the intensive margin for 64-year-old Singaporeans.
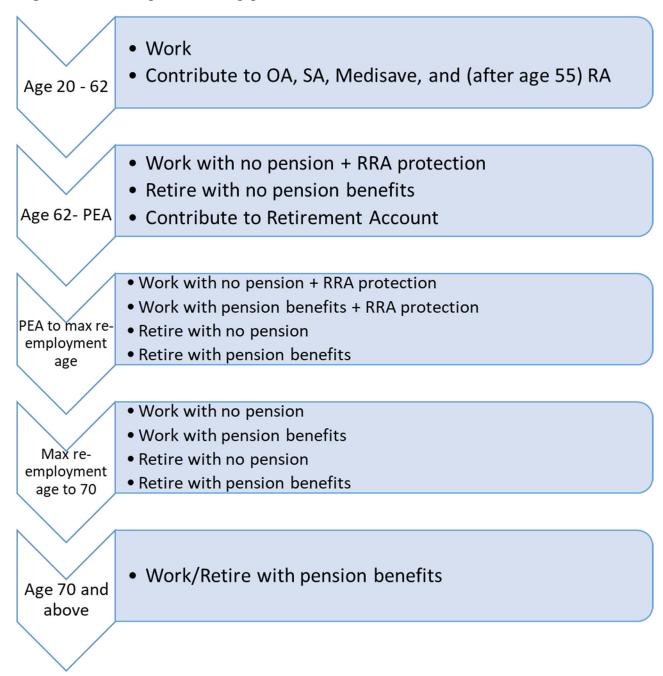

Panel B. Labor supply behavior at the extensive margin for 64-year-old Singaporeans.

Appendix

Figure A.1. Labor options for Singaporeans.

```
Age 20 - 62          • Work
                     • Contribute to OA, SA, Medisave, and (after age 55) RA

Age 62- PEA          • Work with no pension + RRA protection
                     • Retire with no pension benefits
                     • Contribute to Retirement Account

PEA to max re-       • Work with no pension + RRA protection
employment           • Work with pension benefits + RRA protection
age                  • Retire with no pension
                     • Retire with pension benefits

Max re-              • Work with no pension
employment           • Work with pension benefits
age to 70            • Retire with no pension
                     • Retire with pension benefits

Age 70 and           • Work/Retire with pension benefits
above
```

Note: Definitions of the abbreviations: OA – Ordinary Account; SA – Special Account; RA – Retirement Account; RRA – Retirement and Re-employment Act

Table A.1. Balancing test between cohorts subject to and cohorts not subject to the Retirement and Re-employment Act or pension-eligibility age reforms

| | Independent Variable | | | |
| | Subject to RRA reform | | Subject to PEA reform | |
Variable	Estimate	SE	Estimate	SE
Married	-0.027	0.050	-0.001	0.028
Female	-0.048	0.057	-0.019	0.036
Chinese	-0.044	0.032	-0.008	0.023
Malay	0.011	0.022	0.016	0.015
Other race	0.033	0.025	-0.009	0.018
Excellent health	-0.018	0.016	-0.004	0.007
Very good health	0.024	0.031	0.019	0.018
Good health	0.002	0.047	0.003	0.026
Fair health	-0.029	0.046	-0.003	0.025
Poor health	0.021	0.024	-0.014	0.013
Hypertension	0.019	0.026	-0.004	0.014
Heart disease	-0.012	0.022	-0.005	0.006
Stroke	0.002	0.004	-0.003	0.002
Cancer	0.004	0.013	0.003	0.005
Arthritis	-0.015	0.019	0.002	0.007
Diabetes	-0.002	0.025	0.011	0.015

Note: The sample is restricted to those who have worked as employees in their longest-held jobs during their working life. We regress whether the cohort was subject to the Retirement and Re-employment Act reform or whether the cohort was subject to pension-eligibility age reform by demographic and health characteristics. Columns 2 and 4 report the OLS estimates of the Retirement and Re-employment Act and pension-eligibility age reforms, respectively. Robust standard errors are clustered at the individual level. PEA, pension-eligibility age. RRA, Retirement and Re-employment Act.