DISCUSSION PAPER SERIES

# The Impact of Demand- and Supply-side Interventions on Older Adults in the Labor Market

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# The impact of demand- and supply-side interventions on older adults in the labor market

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**Abstract**

This study examines the combined impact of the demand-side (revision of the Elderly Employment Stabilization Law in 2013) and the supply-side (extension of the pension eligible age) interventions on older male employees' work decisions. Employing a difference-in-differences framework for specification strategy, we find significant positive impacts on employment and negative impacts on unemployment. The treatment group was more likely to stay in the labor force after the mandatory retirement age. The results suggest that simultaneous changes in policies affected both sides of behavior in the labor market.

**Keywords**

Labor market; older adults; pension reform; employment promotion policy; retirement; difference-in-differences; Japan

JEL classification code

J14; J18; J21; J23; J26

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## 1. Introduction

Aging populations and low fertility rates have become a serious threat to social security systems in developed countries, and Japan is no exception. The Japanese government conducted major pension reforms in 2000 and revised the Elderly Employment Stabilization Law (EESL) in 2013 to stimulate the employment of older adults. We examine the effect of the 2013 revision of the EESL, along with the one-year extension of the pensionable age on the work decisions of older male employees.

## 2. Institutional background

Japan's public pension system provides Employee Pension Insurance (EPI) for employees. The EPI benefits consist of two parts: a fixed amount and a remuneration-based amount. The pensionable age for EPI was 60 years until 2000 but has since been raised through a series of pension reforms. The Pension Reform Act of 1994 undertook to increase the pensionable age of the EPI's fixed part incrementally from 60 to 65 years for male employees, starting in 2001. In 2000, another pension reform act undertook to gradually increase the pensionable age for the EPI's remuneration-based part from 60 to 65 years for male employees, starting in 2013. Cohorts born in 1953 and 1954[1] were the first to be affected by these reforms as they had expected to receive pension benefits from the age of 61.

In Japan, most companies have a mandatory retirement policy where regular workers are required to retire when they reach a certain age. Since 1998, employers are no longer allowed to set a mandatory retirement age below 60. Most Japanese employees generally retire in the month when they turn 60. After the pension reform, the gap between retirement and pensionable age had indeed become a concern for older workers.

By revising the EESL in 2006, the Japanese government mandated employers to offer older workers continuous employment up to the higher pensionable age. Employers could, however, refuse to provide employment opportunities to the workers who did not meet the criteria set by their labor-management agreement. In contrast, the EESL revision in 2013 mandated firms to employ workers who wished to continue employment until the age of 65, with penalties. How do the strengthened provisions of the revised EESL, combined with the extension of the pensionable age in the remuneration-based part of the EPI, affect labor force participation, (un)employment, and the income of older adults? To examine the impacts of these demand- and supply-side

[1] Throughout this paper, ''cohort born in year X'' is identified as those born between April of year X and March of the following year. This is because Japan's fiscal year starts in April and ends in March of the following calendar year. Most regulations on social security and employment rely on this rule.

interventions on older adults in the labor market, we employ a difference-in-differences framework for specification strategy and compare affected and unaffected cohorts.

## 3. Literature review

Few studies have examined the effects of the 2006 EESL revision along with the one-year extension of the pensionable age; all the studies showed that the revision increased the employment rate among older workers (Kondo and Shigeoka, 2017; Yamamoto, 2008). Kondo and Shigeoka (2017) investigated the effect of the revision of the EESL and the extension of the pensionable age of the EPI's fixed part. Comparing cohorts born in 1945 and 1946, they found that the latter cohort was more likely to be employed in their early 60s.

Yamada (2017) examines the effect of the 2013 EESL revision, combined with the extension of the pensionable age in the remuneration-based part of the EPI, on the employment of older adults. He concluded that the EESL revision and pension reform had a positive effect on the employment rate but an insignificant effect on the unemployment rate. In contrast, Jiang (2021), who also examined the effect of this revision, found almost no impact on the employment of older men.

The present study extends the existing literature in three ways. First, we compare cohorts affected and not affected in greater detail. We set cohorts born in 1953 and 1954 as the treatment group and cohorts born in 1951 and 1952 as the control group. Individuals in the treatment group turned 60 in either 2013 or 2014. We also compare narrower and closest cohorts born in 1952 and in 1953 to check the robustness of the results. Second, we examine comprehensive sets of outcomes, namely, labor force participation, employment, unemployment, and monthly income including/excluding pension benefits. As the pensionable age was raised at a time when the EESL was tightened, it is difficult to distinguish the demand- and supply-side effects clearly. However, the motive to stay in the labor force reflects a supply-side response to the extension of the pensionable age, while actual employment and unemployment can be viewed as a demand-side response to the revision of the EESL. We evaluate these effects empirically. Third, we include two types of monthly income: income from any source, including pension, and income that excludes pension.

## 4. Data

This study uses data from the Longitudinal Survey of Middle-aged and Elderly Persons (LSMEP) conducted by Japan's Ministry of Health, Labour and Welfare since 2005. The LSMEP is a nationwide, population-based survey. The respondents are 34,240 middle-aged individuals aged 50–59 at the baseline, who are tracked annually. The respondents are chosen randomly

through stratified two-stage sampling. We use data from the fifth to the twelfth wave of the LSMEP. We focus on male respondents because women are less likely to work as regular employees in the cohorts under consideration. The sample includes19,871 person–year observations for respondents aged 58 to 62 years.

## 5. Empirical specification

Our identification strategy relies on comparing outcomes between cohorts born in either 1953 or 1954 (treatment group) and those born in either 1951 or 1952 (control group). Continued employment opportunities at age 60 begin to differ between the treatment and control groups after the EESL revision in 2013. The eligibility age of the EPI's remuneration-based part of the treatment group was raised to 61 by the pension reform, while the eligibility age for the control group remained at 60, as shown in Table 1. Thus, when the older adults in the treatment group reached age 60, they could continue working but could not receive any public pension benefits. Exploiting these variations in exposure to the EESL revision and the pension reform by group, we examine the combined impact of the demand-side (EESL revision) and the supply-side (pension reform) interventions on older adults' decisions to continue working.

[Table 1 around here]

We set age at 59 as the baseline and estimate the following model:

$$Y_{it} = \alpha_1 + \beta_2 Treat_i + \sum_a Age_{ai}(\alpha_a + \beta_a Treat_i) + \delta_1 Educ_i + \delta_2 Unempr_t + \delta_3 Marital_{it} + e_{it}, \quad (a = 58, 60, 61, \text{and } 62),$$

where $Y_{it}$ denotes one of the five outcomes for individual $i$ at $t$: a dummy for being in the labor force ($LF_i$), employment ($E_i$), unemployment ($U_i$), and the natural logarithm of the monthly earning including/excluding pension benefits ($\ln Inc1_i$, $\ln Inc2_i$)[2]. $Treat_i$ is a dummy variable equal to one if the individual $i$ belongs to the treatment group. $Age_{ai}$ is a dummy variable equal to one if an individual $i$'s age is $a$.

The parameter $\beta_{a=60}$ measures the effect of the intervention on the outcomes at age 60 relative to age 59. We control for the education level of individual $i$ ($Educ_i$). Moreover, because

[2] The variables are defined as follows: =1 if the respondent is in paid work or unemployment, =0 otherwise; =1 if he is in paid work, =0 otherwise; =1 if he is in unemployment, =0 otherwise; =the natural logarithm of (his monthly earning+1); includes his monthly public pension benefits, while excludes these benefits.

labor market status at age $a$ could differ among cohorts, we control for average unemployment rates at $t$ ($Unempr_t$). We also control for the marital status of individual $i$ at $t$ ($Marital_{it}$).

## 6. Estimation results

Table 2 summarizes the estimation results[3]. Column (1) shows that the treatment group is significantly more likely to stay in the labor force at age 60 than the control group by 2.3 percentage points, which indicates the supply-side of response to the pension reform. Columns (2) and (3) show the significant positive impact on employment and the significant negative impact on unemployment, which could be seen as demand-side of behavior.

[Table 2 around here]

Income including pension benefits, shown in Column (4), is negatively affected by the treatment, because the treatment group lost an opportunity to receive pension benefits at age 60. Income other than pension benefits is not significant in Column (5); however, it has a significantly positive impact when comparing neighboring cohorts, namely, the cohort born in 1952 and the cohort born in 1953, as shown in Column (10). The older adults in the treatment group may work more than those in the control group during the year between their retirement and the age when they become eligible for a pension. The results from the balanced panel data are robust, as shown in the supplementary table (Table O2).

## 7. Conclusions

We examined the combined impact of the demand-side (EESL revision in 2013) and the supply-side (EPI pension reform) interventions on the work decisions of older male employees. We found evidence that suggests actual employment and unemployment reflect a demand-side response to the revision of the EESL and that the motive to stay in the labor force reflects a supply-side response to the extension of the pensionable age.

[3] Supplemntary Table O1 summarizes the descriptive statistics and show that there is littled difference between the treatment and control groups. We have checked the pre-treatment balances between the treatment and control groups. As shown in Supplementary Figure O1 there are no visual differences in the pre-treatment dynamics of the two groups.

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Table 1: Pension eligible age and employment related legally obliged age for Japanese men

| Birth year-month of respondents | Pension eligible age of the EPI remuneration-based part | The lower bound of mandatory retirement age | Age until which employers have to secure employment |
|---|---|---|---|
| 1951.4-1952.3 | 60 | 60 | 65 |
| 1952.4-1953.3 | 60 | 60 | 65 |
| 1953.4-1954.3 | 61 | 60 | 65 |
| 1954.4-1955.3 | 61 | 60 | 65 |

Table 2: The combined impact of the demand-side and the supply-side interventions on outcomes for the elderly

| Dependent variable: | $LF_i=1$ | $E_i=1$ | $U_i=1$ | $\ln(Inc1)_i$ | $\ln(Inc2)_i$ |
|---|---|---|---|---|---|
| Sample: Unbalanced panel | Treatment: born in 1951/1952, Control: born in 1953/1954 | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| Treatment*Age60 | 0.023** | 0.034*** | -0.011* | -0.123** | 0.087 |
| | (0.011) | (0.012) | (0.005) | (0.055) | (0.071) |
| Observations | | 19,871 | | 16,940 | |
| Individuals | | 4,497 | | 4,333 | |
| R-squared | 0.062 | 0.066 | 0.008 | 0.075 | 0.095 |
| Sample: Unbalanced panel | Treatment: born in 1952, Control: born in 1953 | | | | |
| | (6) | (7) | (8) | (9) | (10) |
| Treatment*Age60 | 0.032** | 0.042** | -0.010 | -0.080** | 0.146* |
| | (0.014) | (0.015) | (0.006) | (0.035) | (0.074) |
| Observations | | 9,650 | | 8,313 | |
| Individuals | | 2,170 | | 2,110 | |
| R-squared | 0.047 | 0.048 | 0.006 | 0.058 | 0.083 |

Notes:

1) *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

2) Standard errors in parentheses are adjusted for two levels of clustering (individuals and cohort×age).

3) Estimates associated with other explanatory variables are reported in Supplementary Table O2.

Supplementary Table O1: Descriptive statistics

| | | All | By cohort | | | |
|---|---|---|---|---|---|---|
| | | | 7 | 8 | 9 | 10 |
| Sample size | | 19,871 | 6,055 | 5,214 | 4,436 | 4,166 |
| Variable | Definition | | | Mean | | |
| *E* | =1 if the respondent is in paid work, =0 otherwise | 0.877 | 0.866 | 0.876 | 0.882 | 0.890 |
| | | (0.328) | (0.340) | (0.330) | (0.323) | (0.313) |
| *LF* | =1 if the respondent is in paid work or is in unemployment, =0 otherwise | 0.908 | 0.899 | 0.907 | 0.911 | 0.918 |
| | | (0.29) | (0.302) | (0.291) | (0.285) | (0.275) |
| *U* | =1 if the respondent is in unemployment, =0 otherwise | 0.030 | 0.032 | 0.031 | 0.029 | 0.028 |
| | | (0.171) | (0.177) | (0.174) | (0.167) | (0.164) |
| ln(*Inc1* ) | the natural logarithm of the respondent's monthly earning (including his monthly public pension benefits) | 3.268 | 3.194 | 3.335 | 3.244 | 3.316 |
| | | (1.268) | (1.284) | (1.228) | (1.298) | (1.255) |
| ln(*Inc2* ) | the natural logarithm of the respondent's monthly earning (excluding his monthly public pension benefits) | 3.115 | 3.008 | 3.154 | 3.113 | 3.217 |
| | | (1.418) | (1.457) | (1.412) | (1.426) | (1.350) |
| *Treat* | =1 if the respondent belongs to the treatment group, =0 otherwise | 0.433 | 0.000 | 0.000 | 1.000 | 1.000 |
| | | (0.495) | (0.000) | (0.000) | (0.000) | (0.000) |
| *Age58* | =1 if the respondent's age is 58, =0 otherwise | 0.213 | 0.218 | 0.213 | 0.211 | 0.206 |
| | | (0.409) | (0.413) | (0.410) | (0.408) | (0.405) |
| *Age60* | =1 if the respondent's age is 60, =0 otherwise | 0.195 | 0.191 | 0.197 | 0.195 | 0.199 |
| | | (0.396) | (0.393) | (0.398) | (0.397) | (0.399) |
| *Age61* | =1 if the respondent's age is 61, =0 otherwise | 0.188 | 0.184 | 0.189 | 0.189 | 0.192 |
| | | (0.391) | (0.388) | (0.391) | (0.392) | (0.394) |
| *Age62* | =1 if the respondent's age is 62, =0 otherwise | 0.102 | 0.099 | 0.100 | 0.107 | 0.104 |
| | | (0.303) | (0.299) | (0.300) | (0.310) | (0.305) |
| *High school* | =1 if the respondent has completed high school, =0 otherwise | 0.466 | 0.482 | 0.464 | 0.462 | 0.452 |
| | | (0.499) | (0.500) | (0.499) | (0.499) | (0.498) |
| *Junior college* | =1 if the respondent has completed techmocal college or junior college, =0 otherwise | 0.091 | 0.083 | 0.077 | 0.109 | 0.098 |
| | | (0.287) | (0.276) | (0.267) | (0.312) | (0.298) |
| *University* | =1 if the respondent has completed university or graduate school, =0 otherwise | 0.302 | 0.260 | 0.322 | 0.298 | 0.341 |
| | | (0.459) | (0.438) | (0.467) | (0.457) | (0.474) |
| *Unempr* | yearly unemployment rate | 4.481 | 4.929 | 4.612 | 4.247 | 3.917 |
| | | (0.622) | (0.412) | (0.570) | (0.504) | (0.480) |
| *Marital* | =1 if the respondent is unmarried, separated, or divorced, =0 otherwise. | 0.874 | 0.873 | 0.871 | 0.863 | 0.892 |
| | | (0.332) | (0.333) | (0.335) | (0.344) | (0.310) |

Notes:
1) Figures reported in  in parentheses are standard deviation.
2) As for Log (earning+pension) and Log (earning), sample size is 16,940 (all), 5,034 (cohort 7), 4,481 (cohort 8), 3,832 (cohort 9), and 3,593 (cohort 10), respectively.

Supplementary Table O2: The combined impact of the demand-side and the supply-side interventions on employment for the elderly

Panel A: Unbalanced panel

| | Treatment: born in 1951/1952, Control: born in 1953/1954 | | | | | Treatment: born in 1952, Control: born in 1953 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Dependent variable: | $LF_i$=1 | $E_i$=1 | $U_i$=1 | ln$Inc1_i$ | ln$Inc2_i$ | $LF_i$=1 | $E_i$=1 | $U_i$=1 | ln$Inc1_i$ | ln$Inc2_i$ |
| Treatment*Age58 | 0.003 | 0.005 | -0.001 | 0.009 | 0.002 | -0.000 | 0.000 | -0.001 | -0.015 | -0.027 |
| | (0.012) | (0.018) | (0.006) | (0.076) | (0.081) | (0.022) | (0.032) | (0.011) | (0.095) | (0.105) |
| Treatment | -0.005 | -0.005 | -0.000 | -0.016 | 0.001 | -0.008 | -0.006 | -0.002 | -0.035 | -0.013 |
| | (0.013) | (0.015) | (0.005) | (0.062) | (0.067) | (0.015) | (0.019) | (0.007) | (0.059) | (0.057) |
| Treatment*Age60 | 0.023** | 0.034*** | -0.011* | -0.123** | 0.087 | 0.032** | 0.042** | -0.010 | -0.080** | 0.146* |
| | (0.011) | (0.012) | (0.005) | (0.055) | (0.071) | (0.014) | (0.015) | (0.006) | (0.035) | (0.074) |
| Treatment*Age61 | 0.021 | 0.009 | 0.012** | -0.146 | -0.051 | 0.012 | 0.003 | 0.010 | -0.161 | -0.098* |
| | (0.014) | (0.015) | (0.005) | (0.091) | (0.085) | (0.017) | (0.020) | (0.006) | (0.090) | (0.048) |
| Treatment*Age62 | 0.037*** | 0.024* | 0.013*** | 0.068 | 0.100 | 0.033* | 0.017 | 0.016* | 0.087 | 0.045 |
| | (0.010) | (0.012) | (0.004) | (0.053) | (0.075) | (0.016) | (0.019) | (0.007) | (0.050) | (0.053) |
| Age58 | 0.007** | 0.000 | 0.006 | -0.011 | -0.008 | 0.011 | 0.001 | 0.010 | 0.001 | 0.003 |
| | (0.003) | (0.007) | (0.005) | (0.057) | (0.059) | (0.007) | (0.015) | (0.008) | (0.056) | (0.056) |
| Age60 | -0.068*** | -0.096*** | 0.028*** | -0.224*** | -0.441*** | -0.079*** | -0.112*** | 0.033*** | -0.217*** | -0.434*** |
| | (0.011) | (0.010) | (0.005) | (0.033) | (0.062) | (0.008) | (0.014) | (0.008) | (0.032) | (0.087) |
| Age61 | -0.098*** | -0.106*** | 0.008 | -0.215*** | -0.569*** | -0.102*** | -0.111*** | 0.010 | -0.162** | -0.494*** |
| | (0.012) | (0.015) | (0.005) | (0.059) | (0.074) | (0.015) | (0.021) | (0.011) | (0.060) | (0.064) |
| Age62 | -0.121*** | -0.129*** | 0.008 | -0.326*** | -0.710*** | -0.115*** | -0.125*** | 0.010 | -0.278*** | -0.610*** |
| | (0.014) | (0.017) | (0.006) | (0.063) | (0.075) | (0.023) | (0.030) | (0.013) | (0.086) | (0.102) |
| High school | -0.011 | -0.002 | -0.010 | 0.236*** | 0.195** | -0.036* | -0.045** | 0.009 | 0.125 | 0.044 |
| | (0.013) | (0.017) | (0.007) | (0.062) | (0.077) | (0.017) | (0.018) | (0.005) | (0.088) | (0.107) |
| Junior college | 0.034** | 0.046** | -0.012 | 0.365*** | 0.377*** | 0.011 | 0.006 | 0.004 | 0.291** | 0.283** |
| | (0.014) | (0.018) | (0.009) | (0.069) | (0.081) | (0.016) | (0.020) | (0.010) | (0.102) | (0.110) |
| University | 0.001 | 0.015 | -0.014** | 0.578*** | 0.581*** | -0.026 | -0.027 | 0.002 | 0.461*** | 0.416*** |
| | (0.014) | (0.018) | (0.007) | (0.065) | (0.078) | (0.019) | (0.021) | (0.006) | (0.090) | (0.101) |
| Unempr | -0.005 | -0.011 | 0.006 | -0.074 | -0.056 | -0.004 | -0.009 | 0.005 | 0.017 | 0.066 |
| | (0.011) | (0.013) | (0.004) | (0.051) | (0.059) | (0.015) | (0.018) | (0.007) | (0.050) | (0.057) |
| Marital | 0.174*** | 0.207*** | -0.033*** | 0.746*** | 0.833*** | 0.122*** | 0.146*** | -0.024** | 0.594*** | 0.684*** |
| | (0.021) | (0.022) | (0.007) | (0.076) | (0.079) | (0.020) | (0.021) | (0.009) | (0.075) | (0.081) |
| Constant | 0.820*** | 0.785*** | 0.035 | 2.769*** | 2.593*** | 0.886*** | 0.874*** | 0.012 | 2.608*** | 2.315*** |
| | (0.060) | (0.072) | (0.026) | (0.273) | (0.317) | (0.077) | (0.094) | (0.040) | (0.291) | (0.314) |
| Observations | 19,871 | 19,871 | 19,871 | 16,940 | 16,940 | 9,650 | 9,650 | 9,650 | 8,313 | 8,313 |
| Individuals | 4,497 | 4,497 | 4,497 | 4,333 | 4,333 | 2,170 | 2,170 | 2,170 | 2,110 | 2,110 |
| R-squared | 0.062 | 0.066 | 0.008 | 0.075 | 0.095 | 0.047 | 0.048 | 0.006 | 0.058 | 0.083 |

Panel B: Balanced panel

| | Treatment: born in 1951/1952, Control: born in 1953/1954 | | | | | Treatment: born in 1952, Control: born in 1953 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Dependent variable: | $LF_i$=1 | $E_i$=1 | $U_i$=1 | ln$Inc1_i$ | ln$Inc2_i$ | $LF_i$=1 | $E_i$=1 | $U_i$=1 | ln$Inc1_i$ | ln$Inc2_i$ |
| Treatment*Age58 | 0.002 | -0.000 | 0.003 | 0.014 | 0.006 | -0.002 | -0.003 | 0.001 | -0.021 | -0.022 |
| | (0.010) | (0.015) | (0.007) | (0.069) | (0.080) | (0.015) | (0.026) | (0.011) | (0.050) | (0.060) |
| Treatment | 0.004 | -0.000 | 0.004 | -0.026 | -0.006 | 0.003 | 0.003 | -0.001 | -0.026 | 0.007 |
| | (0.012) | (0.014) | (0.006) | (0.071) | (0.078) | (0.012) | (0.017) | (0.009) | (0.063) | (0.061) |
| Treatment*Age60 | 0.022** | 0.037*** | -0.016** | -0.129** | 0.093 | 0.029** | 0.040** | -0.012 | -0.076* | 0.154* |
| | (0.009) | (0.010) | (0.006) | (0.051) | (0.073) | (0.010) | (0.014) | (0.007) | (0.039) | (0.082) |
| Treatment*Age61 | 0.018 | 0.006 | 0.011** | -0.156 | -0.063 | 0.012 | -0.000 | 0.012 | -0.209* | -0.133* |
| | (0.011) | (0.013) | (0.005) | (0.098) | (0.084) | (0.014) | (0.017) | (0.007) | (0.113) | (0.061) |
| Treatment*Age62 | 0.031*** | 0.019 | 0.011** | 0.011 | 0.009 | 0.016 | -0.003 | 0.020* | -0.069 | -0.182*** |
| | (0.010) | (0.013) | (0.005) | (0.071) | (0.121) | (0.013) | (0.018) | (0.009) | (0.051) | (0.054) |
| Age58 | 0.007** | 0.004 | 0.003 | -0.013 | -0.011 | 0.013** | 0.004 | 0.009 | 0.011 | 0.002 |
| | (0.003) | (0.004) | (0.005) | (0.040) | (0.045) | (0.004) | (0.011) | (0.007) | (0.024) | (0.020) |
| Age60 | -0.066*** | -0.097*** | 0.031*** | -0.190*** | -0.422*** | -0.071*** | -0.103*** | 0.031** | -0.188*** | -0.399*** |
| | (0.010) | (0.010) | (0.007) | (0.030) | (0.059) | (0.008) | (0.016) | (0.010) | (0.029) | (0.070) |
| Age61 | -0.095*** | -0.105*** | 0.010 | -0.200*** | -0.555*** | -0.092*** | -0.100*** | 0.008 | -0.144** | -0.462*** |
| | (0.013) | (0.015) | (0.006) | (0.051) | (0.063) | (0.013) | (0.021) | (0.013) | (0.054) | (0.068) |
| Age62 | -0.118*** | -0.131*** | 0.013* | -0.282*** | -0.676*** | -0.102*** | -0.110*** | 0.009 | -0.196* | -0.496*** |
| | (0.015) | (0.019) | (0.007) | (0.073) | (0.098) | (0.022) | (0.031) | (0.016) | (0.094) | (0.122) |
| High school | -0.017 | -0.003 | -0.014 | 0.168* | 0.120 | -0.053** | -0.067*** | 0.014** | -0.025 | -0.104 |
| | (0.016) | (0.023) | (0.009) | (0.092) | (0.108) | (0.016) | (0.019) | (0.006) | (0.112) | (0.127) |
| Junior college | 0.023 | 0.038 | -0.015 | 0.322*** | 0.329** | -0.009 | -0.017 | 0.008 | 0.117 | 0.112 |
| | (0.017) | (0.024) | (0.010) | (0.105) | (0.119) | (0.017) | (0.021) | (0.010) | (0.140) | (0.146) |
| University | -0.008 | 0.007 | -0.015* | 0.484*** | 0.486*** | -0.048** | -0.056** | 0.008 | 0.297** | 0.251* |
| | (0.017) | (0.022) | (0.008) | (0.091) | (0.107) | (0.018) | (0.021) | (0.007) | (0.117) | (0.131) |
| Unempr | -0.005 | -0.013 | 0.008* | -0.072 | -0.052 | 0.004 | -0.002 | 0.006 | -0.003 | 0.074 |
| | (0.011) | (0.013) | (0.004) | (0.055) | (0.067) | (0.012) | (0.017) | (0.008) | (0.056) | (0.068) |
| Marital | 0.162*** | 0.189*** | -0.026*** | 0.773*** | 0.882*** | 0.110*** | 0.134*** | -0.023** | 0.641*** | 0.741*** |
| | (0.024) | (0.025) | (0.008) | (0.101) | (0.107) | (0.022) | (0.025) | (0.010) | (0.120) | (0.123) |
| Constant | 0.837*** | 0.823*** | 0.014 | 2.828*** | 2.627*** | 0.879*** | 0.876*** | 0.003 | 2.805*** | 2.371*** |
| | (0.062) | (0.073) | (0.026) | (0.335) | (0.392) | (0.066) | (0.095) | (0.046) | (0.394) | (0.437) |
| Observations | 16,720 | 16,720 | 16,720 | 9,760 | 9,760 | 8,115 | 8,115 | 8,115 | 4,910 | 4,910 |
| Individuals | 3,344 | 3,344 | 3,344 | 1,952 | 1,952 | 1,623 | 1,623 | 1,623 | 982 | 982 |
| R-squared | 0.058 | 0.059 | 0.007 | 0.075 | 0.099 | 0.046 | 0.047 | 0.006 | 0.057 | 0.086 |

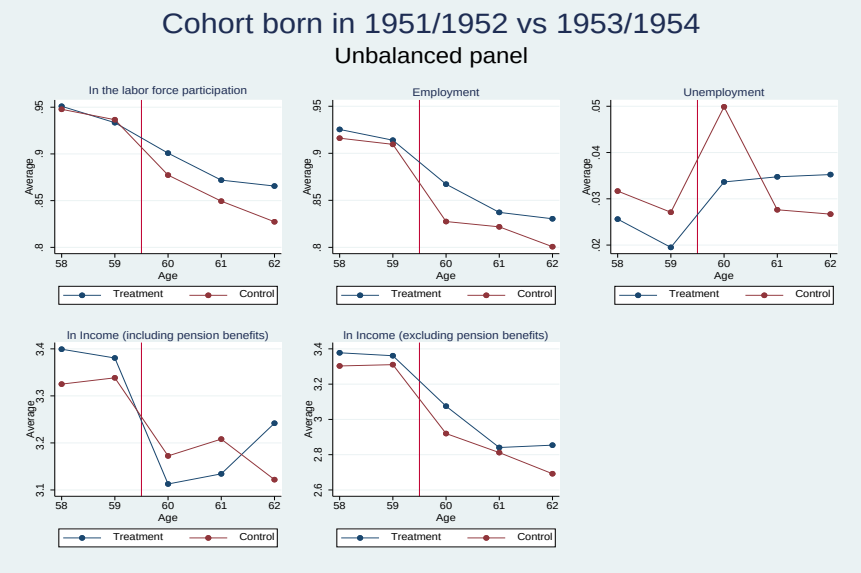
Notes:

1) *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

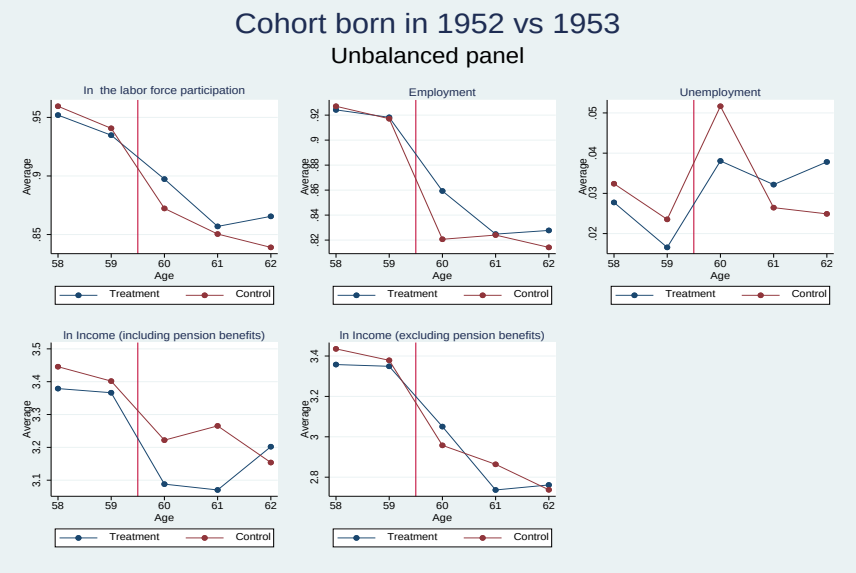
2) Standard errors in parentheses are adjusted for two levels of clustering (individuals and cohort×age).

Supplementary Figure O1: Parallel trends assumtion

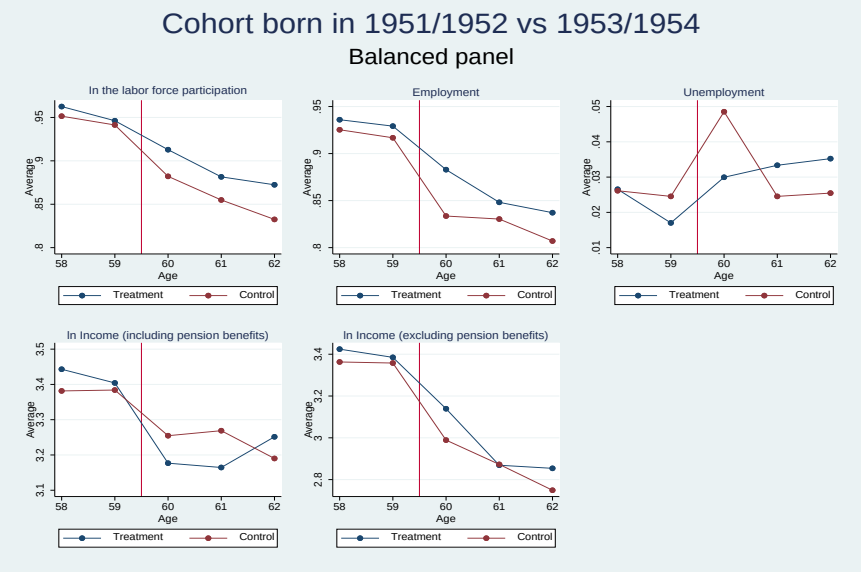
Panel 1A:



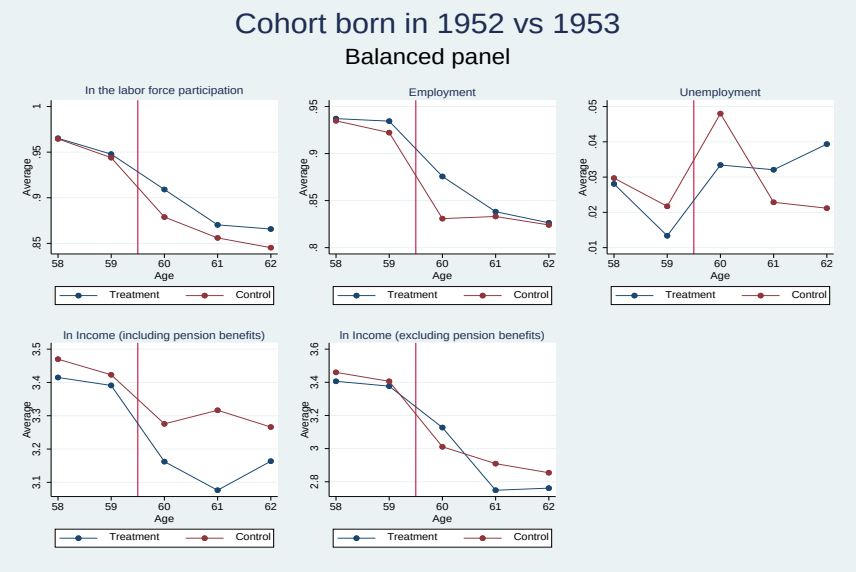

Panel 1B:




Panel 2A:




Panel 2B:




Note: We plot the means of the outcome over age for both groups.