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The Impact of Mandatory Retirement Age on Employment: Evidence from Korea*

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Since 2016, Korean workplaces have been required to set a retirement age of at least 60, prompting the adoption or extension of retirement policies. Using workplace-level panel data combined with administrative employment records, we employ an event-study design to examine the policy's impact. The estimation results indicate that the policy increases employment for older workers aged 55–64 but reduces the employment of young workers aged 15–29, particularly in workplaces with 300 or more employees and in the service industry. The reduction in the employment of young workers can be attributed to the cumulative decline in new hires within this demographic. Notably, workplaces that have adopted the wage peak system—a salary cap on older workers—do not experience a decline in the employment of young workers.

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I. Introduction

The presence of a mandatory retirement age (MRA, hereafter), which obliges workers to retire irrespective of their own intentions, constitutes a fundamental determinant of employment outcomes for older individuals. In Korea, where mandatory retirement provisions are almost universally applied, any attempt to analyze labor demand for older workers or to forecast future trends must necessarily consider the implications of adjustments to the MRA.

Designing a rational framework for retirement age extension and developing associated policies for the employment of older workers require careful assessment of both its potential benefits and unintended consequences. The primary rationale for extending the retirement age is to expand employment opportunities for older workers. If the policy substantially increases labor demand for this group, its economic and social benefits may be considerable. At the same time, concerns have been raised that extending the retirement age could generate crowding-out effects for younger workers. Such concerns arise not only from the mechanical increase in the share of older workers, but also from institutional features of the Korean labor market. Approximately 40 percent of Korean workplaces adopt a seniority-based wage system in which wages rise automatically with tenure (Jang et al., 2022). Consequently, older employees with longer service tend to receive higher wages, and delaying their retirement can increase the labor cost burden for employers. Although the so-called "wage peak system" was introduced to mitigate these costs by capping wages for older employees, its adoption rate remains below 10 percent (Kim et al., 2018). In this context, it is important to examine not only whether the MRA policy increased the employment of older workers, but also whether it reduced opportunities for younger workers, and how such effects varied across workplace characteristics.

The Korean experience with the most recent reform provides a valuable case for this analysis. In 2013, the National Assembly revised the Act on Prohibition of Age Discrimination in Employment and Elderly Employment Promotion, mandating a minimum retirement age of 60, which came into force in 2016. The reform was motivated by demographic pressures—namely, the rising share of older individuals in the labor force—as well as the need to strengthen pension sustainability and stabilize household income among the elderly. However, because the policy was enacted with limited preparation, critics have argued that complementary measures, such as revisions to the seniority-based wage system or policy measures to strengthen employment among young people, were not adequately implemented. Researchers have also raised concerns that enforcing uniform retirement provisions could increase labor costs, reduce managerial flexibility, and generate unintended consequences such as declines in aggregate employment (Choi et al., 2013).

Reflecting these debates, a substantial body of empirical research examines the labor market effects of Korea's retirement age extension. These studies fall into three categories: those focusing on the employment of older workers (Kim, 2021), those analyzing total employment (Nam, 2018; Jung and Kang, 2022), and those investigating intergenerational effects on young or middle-aged workers (Han, 2019; Lee, 2023). The general consensus is that employment among older workers increases. For instance, Han (2019) exploits discontinuities in policy eligibility across birth cohorts and shows that the treated cohorts have significantly higher probabilities of remaining in employment after age 56. Using workplace-level employment insurance records, he also demonstrates that for each additional worker expected to benefit from the policy, the employment of older workers rises by roughly 0.6–0.8 persons. Similarly, Kim (2021), drawing on the Economically Active Population Survey, reports a significant rise in the employment of men aged 55–59 during 2016–2019.

By contrast, other studies highlight potential adverse effects on aggregate employment. Nam (2018), comparing workplaces with and without mandatory retirement rules in the Workplace Panel Survey, finds that employment declined in 2015, during the grace period following the policy announcement. Nam (2018) argues that the employment effects during the grace period may reflect workplaces' efforts to reduce employment before the actual implementation of the extended retirement age. Jung and Kang (2022) suggest another possibility, noting that many workplaces preemptively extended retirement ages between 2013 and 2015. Such extensions can increase the employment of older workers, but if they crowd out other age groups, total employment may decline. Jung and Kang (2022) report that workplaces with a high proportion of older workers experienced reductions in overall employment after the law came into force in 2016. The observed decline in aggregate employment, despite gains for older workers, is attributed either to reductions in the employment of young workers (Han, 2019) or to possible substitution between middle-aged and older workers (Jung and Kang, 2022; Lee, 2023).

Against this background, this study provides a comprehensive assessment of how the MRA extension affected both labor demand for older workers and intergenerational employment dynamics. Our contribution is threefold. First, whereas previous studies have largely focused on estimating the "average" employment effect, we explicitly examine heterogeneity across workplaces. Specifically, we test the hypothesis that the binding force of the reform varies with pre-announcement retirement provisions and analyze whether employment effects differed by workplace characteristics such as workforce size, industry, and wage structures. To this end, we combine workplace-level data from the Workplace Panel Survey with administrative employment records from the Employment Insurance system. Given ongoing policy discussions in Korea regarding a further extension of the MRA, evaluating whether the 2016 reform achieved its stated objectives—and identifying

the types of workplaces where employment effects were concentrated—provides timely and policy-relevant insights.

Second, we extend the scope of analysis to a longer horizon, thereby evaluating the medium- to long-term consequences of the reform. Earlier studies have examined either the grace period between 2013 and 2016 (Nam, 2018) or the immediate years following implementation (Han, 2019; Kim, 2021; Jung and Kang, 2022). Yet, if the policy primarily prolonged the tenure of continuing workers, its effects may unfold only with a time lag. We analyze outcomes through 2022, nine years after the announcement and six years after implementation. This extended horizon allows us to provide new evidence on the dynamic and longer-term consequences of Korea's retirement-age extension.

Third, this study identifies the mechanisms through which employment changes occurred in response to the policy. If the number of employees in a workplace is viewed as a stock, then new hires and separations constitute the flows that alter this stock over time. When a policy such as retirement age extension is implemented, the tenure of workers is prolonged, which in turn can raise employment relative to the pre-policy period. Taking advantage of the dataset that records the exact timing of workers' entry and exit, we are able to disentangle how employment changes unfold across different age groups.

The remainder of this paper is organized as follows. Section 2 presents data and our empirical strategy. Section 3 shows the baseline results and the robustness checks. Section 4 reports additional analyses for heterogeneity, and Section 5 concludes the study.

II. Data and Empirical Strategy

2.1 Data

We employ a unique dataset that combines workplace-level panel data with individual-level employment records. In particular, two datasets are merged: the Workplace Panel Survey (WPS) and records from Korea Employment Insurance (KEI). Thanks to the Korea Labor Institute's cooperation, each KEI record is given a clear workplace identification code that can be combined with the WPS.

The WPS, conducted by the Korea Labor Institute, is a representative dataset for workplaces established in Korea. The survey's main objectives are to identify industry-wide labor demand and employment structures, evaluate human resources management, and provide necessary information to develop policies for a systematic workforce supply. In each survey year, workplaces are required to respond to a series of detailed questions pertaining to various aspects of their operations, including employment trends, financial performance, workplace characteristics, and other pertinent information. Baseline surveys

were conducted in 2005, with the WPS aiming to re-interview workplaces on a biennial basis. A total of 4,985 workplaces were surveyed through the WPS between 2005 and 2022. In the WPS, data on industry classification and wage policy (including the wage peak system) are collected from workplaces.

The KEI serves as the administrative employment record for the assessment of unemployment insurance eligibility, thereby enabling the tracking of individuals who have been employed at any point in time. The data also provide information on the demographic characteristics of the workers, the dates of their entry and exit from the workplace, and the reason for resignation.

It is important to consider the limitations of the dataset when interpreting the results of any analysis. It should be noted that the WPS-KEI dataset is not representative of all workplaces in Korea.[1] The absence of data tracking workers' full employment histories precludes observing cases in which workers were rehired after leaving the company or moved to another workplace. In addition, because day laborers and workers with fewer than 60 monthly working hours are not recorded in the KEI, it is difficult to regard these data as fully representative of all workers in Korea. Therefore, the employment effects identified in this analysis may not necessarily reflect the employment effects across Korea as a whole. However, the analysis utilizing this dataset is significant for two reasons. First, while previous studies have primarily focused on short-term effects in the immediate years following the increase in retirement age, this study tracks the evolution of effects over a nine-year period. Second, the combination of WPS and KEI data enables us to analyze the heterogeneity of employment effects based on workplace characteristics.

Of the 4,985 workplaces, only those that satisfy the following conditions are retained for analysis. First, 292 public institutions and state-owned enterprises surveyed in the WPS are excluded, as our focus is on the response of private enterprises to legal enforcement and changes in employment. Second, 698 workplaces are excluded due to the inability to identify retirees during the period from 2005 to 2012, before the amendment to the Act on older workers' employment, as there were no records of the loss of employment insurance eligibility. Finally, a panel dataset from 2005 to 2022 is constructed, excluding 232 workplaces for which employment status could not be identified. This leaves 3,763 workplaces with 1,001,966 employees that were surveyed in 2012, the year of announcement, and at least once before and at least once after the announcement.

The MRA obligates all workplaces to implement a specific retirement age (60 years old) and older. Nevertheless, the legal binding of the policy may depend on the retirement provisions of workplaces prior to the policy implementation. To illustrate, in workplaces

[1] WPS provides a weighting variable, but this is limited to cross-sectional or longitudinal analyses for workplaces that respond to each survey.

where the retirement age was 60 years old or older prior to the implementation of the policy, its effect on employment would be nullified as long as the retirement age is maintained.[2] On the other hand, for workplaces with a retirement age below 60, the policy is binding in the sense that they are obliged to raise the MRA. In the case of workplaces that do not implement retirement age regulations, the policy becomes binding insofar as it requires the establishment of relevant provisions, which may result in changes to employment dynamics during this process.

Based on the policy's binding conditions, we classify workplaces into two groups. First, the treatment group includes workplaces where the retirement age was 59 or below in 2012, or where some workers aged 55 or older retired before reaching age 60. Second, the control group includes workplaces where the retirement age was 60 or above in 2012, or where all workers aged 55 or older retired after reaching age 60. If the retirement age is identified, workplaces are classified according to the former definition. If it is not identified, the latter criterion is applied.

The specific method for identifying retirement ages is as follows: First, samples of workers who exited or lost their eligibility for employment insurance due to reaching retirement age (code 31 of labor insurance disqualification) are selected from the KEI data set. The ages of these workers at the time of retirement are also collected. Subsequently, the retirement age for each workplace is defined as the mode of retirement age derived from the age distribution of retirees.[3] In some workplaces, there may be years where no retirement occurs, which precludes the possibility of identifying a retirement age for those years. If retirement ages are identified in the years before and after the specific year, and if those retirement ages are the same, it is assumed that the retirement age for the intervening year is also identical. In the absence of any retirees after a retirement age had been identified, it is assumed that the most recent retirement age would be maintained.

Table 1 presents the retirement age policies of workplaces in both the treatment and control groups. The treatment group consists of 3,150 workplaces, of which about two-thirds did not have an explicitly identified MRA but are classified as affected by the policy since older workers had historically retired before age 60. A total of 1,076 workplaces are identified as having operated a mandatory retirement policy below age 60, with the most common ages being 55 (12.6% of the treatment group) and 58 (8.2%), in that order. In the

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[2] The structural changes in the labor market due to the implementation of the MRA may also affect employment in workplaces with a retirement age of 60 years and older. However, this possibility is not considered in the analysis conducted in this study.

[3] The reason for using the mode of retirement age as the criterion for annual retirement age is that the age at which the greatest number of workers retire represents the typical retirement age for that workplace. For example, if in a certain year ten workers aged 55 retire and only one worker aged 58 retires, it would be reasonable to consider 55 as the predominant retirement age for that workplace.

control group of 613 workplaces, the largest share (212 workplaces, 34.6%) set the retirement age at 60. For other retirement ages, the proportions are each below 10%. A total of 101 workplaces (16.5%) set the retirement age at 65 or older. Additionally, 148 workplaces (24.1%) did not have a clearly identifiable retirement age. However, it is confirmed that in all of these workplaces, all older workers retired after age 60, thereby satisfying the control group criteria.

[Table 1] Retirement Age Across Workplaces in 2012

Treatment	Retirement Policy	Number of Workplaces	Percent
Treat	Some workers retired under 60	2,074	65.8
	55	397	12.6
	56	143	4.5
	57	178	5.7
	58	259	8.2
	59	99	3.1
	Subtotal	3,150	100
Control	All worker retired over 60	148	24.1
	60	212	34.6
	61	47	7.7
	62	34	5.5
	63	37	6.0
	64	34	5.5
	65 and over	101	16.5
	Subtotal	613	100
Total		3,763	

Source: Korea Employment Insurance

Next, we examine how the employment of workers within each group of workplaces evolved before and after the policy's announcement and implementation. The combined dataset, which links workers' employment records with workplace characteristics, enables us to assess policy impacts from multiple perspectives. By utilizing the KEI records on workers' entries and exits, we are able to identify whether changes in employment over time stemmed from flows of hiring and separations or from changes in the tenure of employment stayers. Specifically, we construct employment-related variables of each workplace: employment, stayers, hires, or separations. The relationships between each variable are as follows.

$$Employment_{it} = Stayer_{it} + Hire_{it} + AgeEffect_{it}^{inflow}, \quad (1)$$
$$where\ Stayer_{it} = Employment_{it-1} - Separation_{it} - AgeEffect_{it}^{outflow}.$$

$Employment_{it}$ is the number of workers employed in workplace i at the end of the calendar year t. $Stayer_{it}$ refers to the number of continuing workers who joined the workplaces at least by year $t-1$ and remained employed through year t. Among stayers, workers entering and leaving due to age effects associated with the passage of time are excluded. $Hire_{it}$ and $Separation_{it}$ represent the number of individuals hired and separated, respectively, in year t. $AgeEffect_{it}$ counts the net inflow and outflow of individuals in year t due to age effects. When the workforce is divided at the workplace level with age 30 as the cutoff, a 29-year-old turning 30 in year t generates an $outflow$ from the young group and an $inflow$ into the middle-aged group.

Table 2 reports the sample means of employment-related variables for the treatment and control groups in 2012. In terms of total employment, the control group employs an average of 222.1 workers, about 19% less than the treatment group's 274.9 workers. However, reflecting their longer retirement age, control group workplaces employ a larger number of older workers on average. The share of older workers is 16.8% in the control group, roughly three times higher than the 5.8% observed in the treatment group.

For middle-aged workers, both groups show similar shares, accounting for more than two-thirds of total employment (67.4% in the control group and 69.6% in the treatment group). By contrast, the treatment group employs a higher proportion of young workers: 24.6% compared with 15.8% in the control group.

The proportion of large workplaces with 300 or more employees is comparable across groups, at around 20%. Industry composition differs somewhat: in the control group, service industries dominate (54%) relative to manufacturing (39%), whereas in the treatment group, manufacturing accounts for a slightly higher share (47%) than services (44%). Regarding wage policies for older workers, only a small fraction of workplaces had adopted the wage peak system prior to the MRA announcement—6% in the control group and 9% in the treatment group.

[Table 2] Sample Means of Workplaces

Age Group	Variable	Control (obs. 613)	Treat (obs. 3,150)
Older workers (55–64)	Employment	37.3	16.0
	Stayer	21.2	9.0
	Hire	12.1	4.2
	Separation	12.4	4.7
	Age Effect: inflow	4.0	2.8
Middle-aged Workers (30–54)	Employment	149.7	191.3
	Stayer	117.8	157.7
	Hire	26.5	23.7
	Separation	27.5	23.6
	Age Effect: inflow	5.3	9.9
	Age Effect: outflow	4.0	2.8
Young Workers (15–29)	Employment	35.2	67.6
	Stayer	19.6	40.1
	Hire	15.6	27.5
	Separation	11.9	18.1
	Age Effect: outflow	5.3	9.9
All Workers (15–64)	Employment	222.1	274.9
	Stayer	168.0	219.5
	Hire	54.1	55.4
	Separation	50.6	46.1
Workplace Characteristics	> 300 Employees (=1)	0.21	0.19
	Manufacturing (=1)	0.39	0.47
	Service Sector (=1)	0.54	0.44
	Wage Peak System (=1)	0.06	0.09

Source: Korea Employment Insurance

The employment trends observed in the various workplace groups over the analysis period provide a summary of the employment effects of the MRA policy. Table 3 illustrates the mean employment figures by age group for each workplace category between 2005 and 2022.[4] For older workers in control workplaces, employment increased from 24.6 in 2005 to 37.3 in 2012, and further to 43.8 in 2022. Between 2012 and 2022—a period encompassing both the announcement and implementation of the MRA policy—the employment of older workers grew by 17.4%. By contrast, the growth was much sharper in treatment workplaces: the number of older workers rose from 7.9 in 2005 to

[4] Tables A1–A3 in Appendix present the variations in detailed components—stayers, hires, and separations—organized in the order of older, middle-aged, and young workers.

16.0 in 2012 and 33.9 in 2022, representing an increase of 112% between 2012 and 2022. This increase in employment is found to be driven by the rise in stayers. The extension of the retirement age lengthened the tenure of existing older workers, while also allowing middle-aged workers—who could now expect longer employment—to flow into the older age group. Accordingly, the inflow of middle-aged workers into the older group reflects a combination of both age effects and policy effects. In the treatment group, the number of workers transitioning from middle-aged to older ($AgeEffect_{it}^{outflow}$) rose from an average of 2.8 per workplace in 2012 to 4.9 in 2022. By contrast, in the control group, the corresponding figure remained largely stable, increasing only from 4.0 in 2012 to 5.0 in 2022 (see Table A2). Since aging of the workforce occurs in both treatment and control groups, the pronounced rise in transitions within the treatment group can be reasonably attributed, at least in part, to the effect of the policy.

How many older workers in the treatment group workplaces can be regarded as beneficiaries of the retirement-age extension? One way to identify this is to estimate the trajectory of beneficiaries after 2013, based on the birth-year distribution of workers employed in 2012. For workplaces in the treatment group where the retirement age is not directly identifiable, we use the average retirement age of workers aged 55 or older prior to 2012 as a proxy for the retirement age. Workers who reached the original retirement age are assumed to have remained employed until age 60. Figure 1 presents, under these assumptions, the annual number of workers reaching the original retirement age, their cumulative count, and the actual employment trend of older workers among the treatment group. It should be noted that these estimates represent an upper bound on the number of policy beneficiaries, as they are based on the simplifying assumptions that workplaces extended the retirement age in 2013 and that workers employed in 2012 remained continuously employed thereafter. The actual magnitude would vary depending on the timing of retirement-age changes at the workplace level and worker attrition. With this caveat in mind, the average number of beneficiaries per workplace is estimated at 2.4 in 2013, increasing to 5.3 by 2022. This expansion of beneficiaries reflects the inflow of middle-aged workers into the older-worker group, who then became eligible for the extension. By 2022, the cumulative number of beneficiaries is about 20 per workplace, accounting for 59 percent of older workers.

While older workers' employment increased in the treatment group, employment patterns differed across other age groups. Among middle-aged workers, employment figures fluctuated throughout the sample period. In control workplaces, the average rose from 138.8 in 2005 to 149.7 in 2012, before declining to 134.4 in 2022. Treatment workplaces displayed a similar pattern of variation, with employment increasing from 171.3 in 2005 to 199.1 in 2022. For young workers, the contrast between control and treatment workplaces is more pronounced. In the control group, the employment of

young workers remained relatively stable, averaging around 34 between 2013 and 2022. In the treatment group, however, the employment of young workers fell sharply, from 65.7 in 2013 to 51.8 in 2022. This decline in employment is primarily attributable to a reduction in stayers (see Table A3). Young workers tend to exhibit higher turnover rates, and Table A3 shows that separations have remained relatively stable. By contrast, hiring in the treatment group has gradually declined since 2012, leading to a gradual reduction in stayers over time. As a result, by 2022 the level of employment had fallen by 23.4%. The observed differences in employment trends between the two groups suggest the potential presence of the MRA effects and highlight the need to compare the two groups to estimate their magnitude. At the same time, it is necessary to analyze whether such differences persist even after accounting for workplace-specific characteristics as well as time-specific factors.

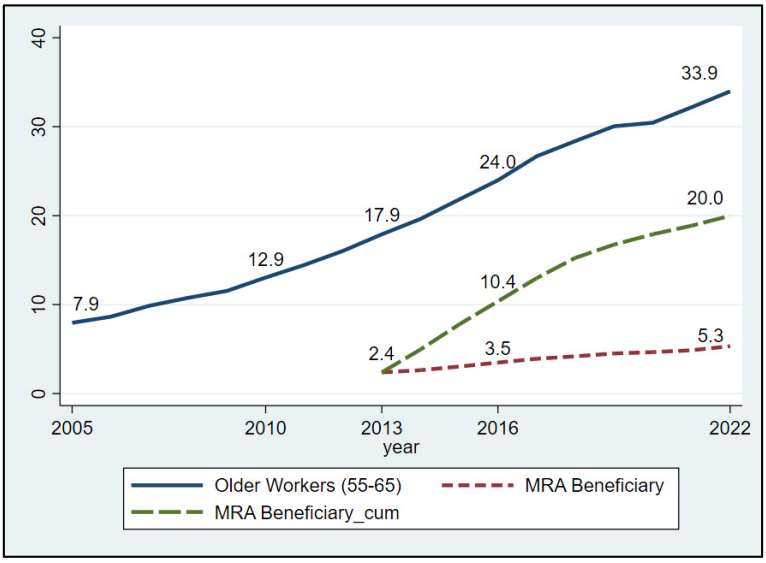
[Table 3] Employment of Workplaces by Year

Year	Control (obs. 613)				Treat (obs. 3,150)			
	Old (55–64)	Mid (30–54)	Young (15–29)	Total (15–64)	Old (55–64)	Mid (30–54)	Young (15–29)	Total (15–64)
2005	24.6	138.8	43.3	206.7	7.9	171.3	78.1	257.3
2006	24.3	139.4	42.8	206.5	8.6	175.0	77.4	261.0
2007	26.1	142.3	42.7	211.1	9.8	178.1	77.0	265.0
2008	28.5	145.7	40.9	215.0	10.7	178.8	74.4	263.9
2009	30.2	148.4	38.5	217.1	11.5	178.0	69.1	258.5
2010	32.4	150.8	38.0	221.1	12.9	182.9	69.4	265.2
2011	34.9	148.4	36.4	219.7	14.4	186.0	68.7	269.1
2012	37.3	149.7	35.2	222.1	16.0	191.3	67.6	274.9
2013	38.8	151.7	34.0	224.5	17.9	197.3	65.7	280.9
2014	39.5	150.3	32.5	222.3	19.6	198.3	64.3	282.2
2015	40.9	145.5	33.0	219.5	21.8	198.5	61.9	282.2
2016	41.8	141.6	32.7	216.1	24.0	195.1	58.3	277.3
2017	43.2	140.2	33.0	216.4	26.7	195.3	55.8	277.7
2018	43.3	140.4	34.3	218.1	28.4	196.5	56.5	281.3
2019	43.0	135.7	34.2	213.0	30.0	198.1	55.6	283.7
2020	40.9	134.3	33.4	208.6	30.4	195.5	51.0	277.0
2021	42.9	134.3	33.7	210.9	32.2	197.9	51.2	281.3
2022	43.8	134.4	34.5	212.8	33.9	199.1	51.8	284.9

Source: Korea Employment Insurance

Note: The two dotted lines represent the years of announcement and the implementation of the MRA policy, respectively.

[Figure 1] Estimated Beneficiaries of the MRA and Employment of Older Workers



Note: The figure plots the annual (the red dashed line) and cumulative (the green long-dashed line) number of workers reaching the original retirement age, together with the actual employment trend of older workers (the blue line) among treatment workplaces. For workplaces without an identifiable retirement age, the average retirement age of workers aged 55 or older before 2012 is used as a proxy. Workers who reached the original retirement age are assumed to have remained employed until age 60.

2.2 Empirical Strategy

We employ an event-study approach to examine how the MRA policy affects employment, under the hypothesis that there was a post-announcement effect of retirement age extension on the employment of older workers. This assumption is supported by the findings of Nam (2018) and Jung and Kang (2022), who document employment effects following the announcement of the MRA. We estimate the following equation:

$$\ln(Y_{it}^{a}) = \beta_0 + \sum_{e=-8}^{-2} \beta_e D_{it}^{e} + \sum_{e=0}^{9} \beta_e D_{it}^{e} + \hat{\theta}_{it}^{a} + \sigma_{rt} + \alpha_i + \tau_t + \varepsilon_{it}, \quad (2)$$
$$where\ D_{it}^{e} = Treat_i^{2012} \times T_t.$$

Y_{it}^{a} is an outcome for age group a in workplace i in year t. In addition to employment, we also designate stayers, hires, and separations as outcome variables in order to identify the sources of employment changes. The age groups are classified into all (15–64), older (55–64), middle (30–54), and young (15–29) workers. D_{it}^{e} represents the treatment status, which is the interaction term between the treatment variable $Treat_i^{2012}$ assigned

a value of 1 to treatment workplaces, and year dummy variable T_t. e stands for the time elapsed since the event began, excluding $e = -1$, the year just before the event to establish the baseline year. In this analysis, the year 2013, when the retirement age extension was announced, is considered the starting point of the event, as it applies to all workplaces. Therefore, $e = t - 2013$, where e is measured relative to the announcement of the retirement age extension in 2013 ($e = 0$), considering the analysis period from 2005 to 2022. Thus, e takes on values from -8 to 9, representing the years before and after the announcement. β_e represents the estimated effect of D_{it}^e on employment, which is of interest. If the parallel trend is satisfied before the announcement of the policy, $\beta_{-8}, \beta_{-7}, \dots, \beta_{-2}$ would not be statistically different from zero, and $\beta_0, \beta_1, \dots, \beta_9$ would be statistically significant if employment effects exist. Given the long 18-year horizon, the observed policy effects may be confounded with age effects. We therefore address age effects in two ways. First, they are offset through comparison with the control group, which is subject to comparable age effects as the treatment group. Second, we explicitly control for employment changes that arise solely from age effects—without any additional hiring or separations—by incorporating this measure into the specification. To construct it, we calculate the cohort distribution of all workers ever employed at each workplace and then compute, for each analysis year, the number of workers expected to fall into each age group. To this end, we construct an estimate of the expected employment level, denoted as $\hat{\theta}_{it}^a$. This measure captures expected employment driven only by age effects, independent of the policy, and is incorporated into our empirical specification as a control. α_i and τ_t are workplace fixed effects, year fixed effects, respectively. Region-time fixed effects (σ_{rt}) are also added to control for differing employment trends across regions.[5] Standard errors are clustered by $\text{region} \times \text{industry}$ considering that workers employed in the same region and industry can influence each other's employment.[6]

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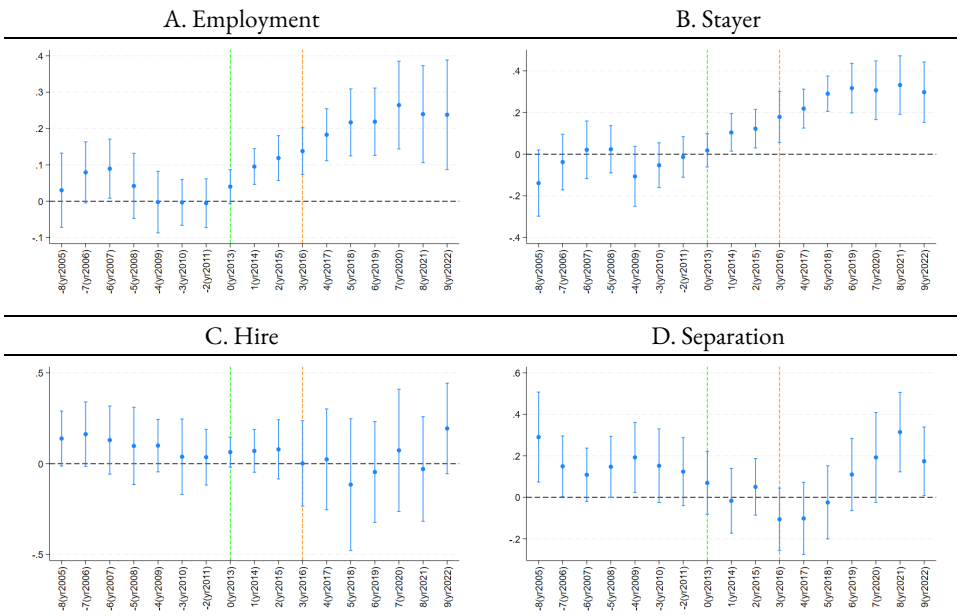
[5] The estimation results are robust to the inclusion of linear trends at the region-by-industry level, which control for heterogeneous employment trajectories across groups.

[6] Korea is divided into seventeen administrative regions: one special city (Seoul), one administrative city (Sejong), nine provinces (Gyeonggi, Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju), and six metropolitan cities (Incheon, Busan, Daegu, Gwangju, Daejeon, and Ulsan). Industries are classified as follows: (1) Manufacturing, (2) Electricity, gas, steam and water supply, (3) Sewerage, waste management, materials recovery, (4) Construction, (5) Wholesale and retail trade, (6) Transportation, (7) Accommodation and food service activities, (8) Information and communication, (9) Financial and insurance activities, (10) Real estate activities, (11) Professional, scientific and technical activities, (12) Business facilities management and business support services, (13) Public administration and defense, (14) Education, (15) Human health and social work activities, (16) Arts, sports and recreation-related services, (17) Membership organizations, repair and other personal services.

III. Baseline Results

Figure 2 depicts the results of estimating equation (2) with the employment variables of older workers as outcomes. Following the announcement of the policy, a consistent upward trajectory in the employment of older workers is observed in treatment workplaces (see Figure 2.A). Over the course of the decade, there was a 24% increase in employment. Compared with the 112% increase in employment observed for the treatment group in Table 3, the estimated effects are smaller, reflecting the influence of employment growth in the control group over the same period as well as the adjustment for age effects. This employment effect is primarily attributable to the accumulation of stayers (see Figure 2.B). Conversely, there is no statistically significant difference in the rate of hiring before and after the MRA announcement (see Figure 2.C). It is notable that the accumulation of stayers was completed by 2020, and the growth in employment also reached a plateau after

[Figure 2] Policy Effects: Employment of Older workers (55–64)

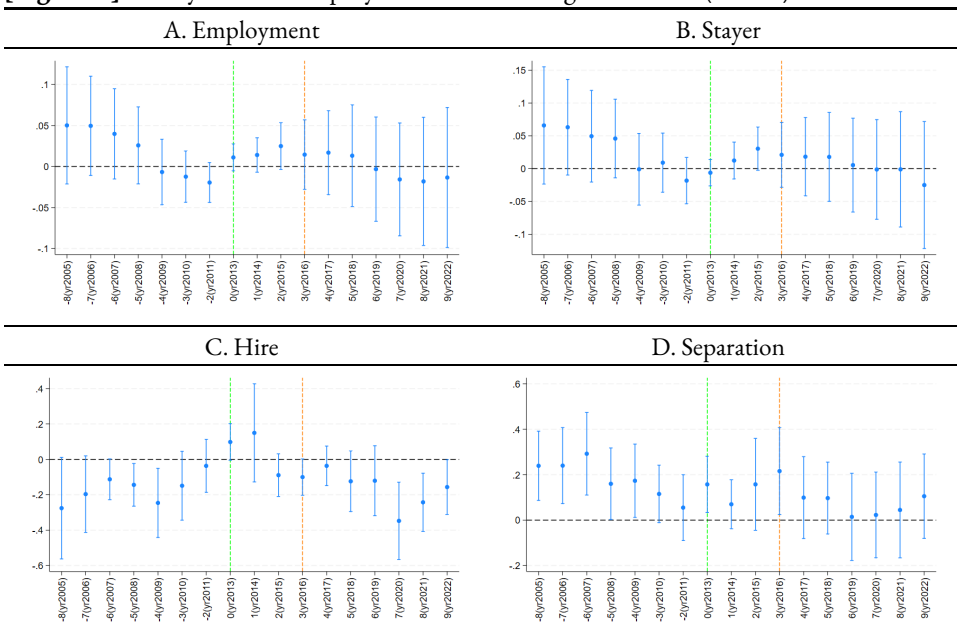


Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. In each regression, observations are weighted by employment size.

this point. Given that initial retirement ages in treated workplaces are from 55 to 59 years, it can be anticipated that those extended to retirement age in 2016 and subsequent years will retire sequentially from 2020 at the latest. Figure 2.D illustrates an increase in the number of older workers leaving their jobs after 2020. These results indicate that the rise in older worker employment is driven not by increased hiring or reduced separations, but rather by longer tenures of stayers who remained in the workplace as a consequence of the MRA policy.

Figure 3 reports the estimation results for middle-aged employment outcomes. Figure 3.A shows no significant differences in middle-aged employment between the treatment and control groups around the announcement of the retirement-age extension. When equation (2) is estimated with employment stayers as the outcome, all coefficients remain statistically indistinguishable from zero throughout the analysis period (see Figure 3.B). Although new hires exhibit a significant decline after 2020, the magnitude is not large enough to affect overall employment. Worker separations likewise show no meaningful change following the policy announcement.

[Figure 3]. Policy Effects: Employment of Middle-aged Workers (30–54)



Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. In each regression, observations are weighted by employment size.

Figure 4 displays the estimation results with the employment of young workers as the outcome. Figure 4.A illustrates a decline in the employment of young workers in treatment workplaces, with a reduction of approximately 29% over the decade following the MRA announcement. Table 3 shows that the employment of young workers in the treatment group declined by about 23% over the ten years since 2012, and the estimated effect indicates an even sharper decline. Figure 4.B indicates that this decline is primarily attributable to a reduction in the number of stayers. On the other hand, descriptive statistics reveal that the hiring scale of treatment workplaces has been decreasing annually since the MRA announcement (see Table A3). Figure 4.C depicts a declining trend in hiring after 2014 ($e > 1$), and this decline is statistically significant after 2020. Given that the rate of job turnover among young people is higher than that of other age groups, the inflow of workers through new hiring is a crucial factor in employment.[7] Although the decrease in hiring is relatively minor, it appears to have a cumulative negative impact on employment. As a result, the decline in the employment of young workers is larger in magnitude than the increase in the employment of older workers, reflecting the prevalence of seniority-based wage schemes under which many older workers occupy higher-paid positions. From a longer-term perspective on employers' hiring plans for young workers, it is also important to consider that middle-aged workers—who constitute the largest share of the current workforce—are now guaranteed longer job tenure. Given these higher expected future labor costs, employers may become even more reluctant to undertake new hiring.

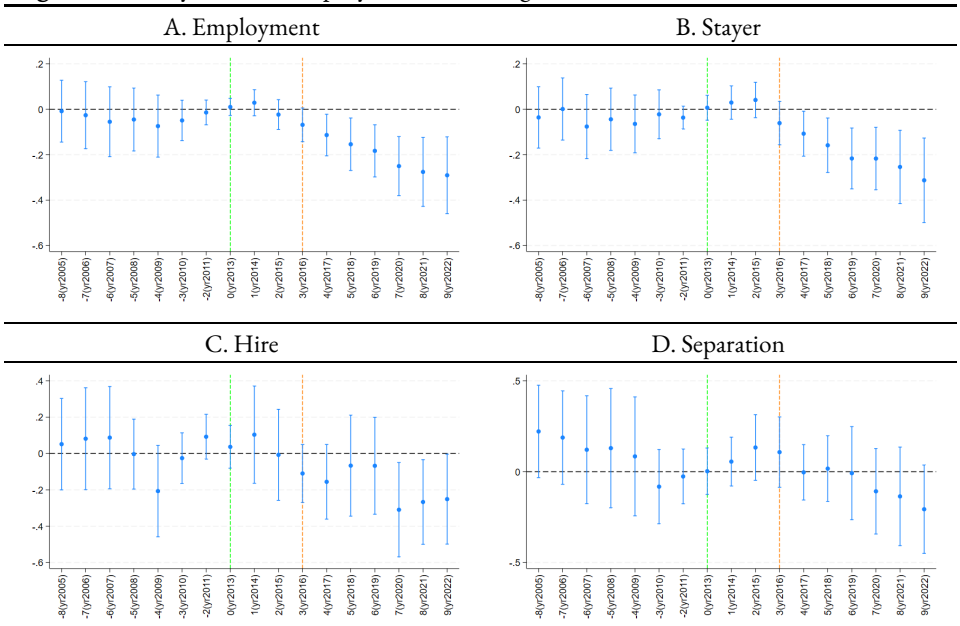
The results of estimating the dependent variable, employment across all generations, are shown in Figure 5. The findings indicate that there has been no change in total employment since the MRA policy was announced. In line with previous analyses, the rise in employment among the older workers is counterbalanced by a decrease in employment of young workers. In addition, the significant decline in new hires observed after 2020 appears to be driven by the reduction in hiring of young workers documented in Figure 4.C.

The baseline finding of this study—that the MRA policy increased the employment of older workers while reducing that of young workers—is largely consistent with the results of Han (2019). However, it differs from other prior studies that suggest either a decline in total employment or substitution between middle-aged and older workers. We believe that these differences largely reflect variations in the underlying data sources. Both this study

[7] Notably, the unemployment rate among people aged 20–29 began rising from 2013 onward while it had been relatively stable from 2000 to 2012. Kim (2022) documents that a decline in the job-finding rate accounts for the majority of this increase in the unemployment rate over the period. While the decline in the job-finding rate among those aged 20–29 cannot be attributed solely to the announcement of the MRA, the possibility that the announcement contributed in part to this trend cannot be ruled out.

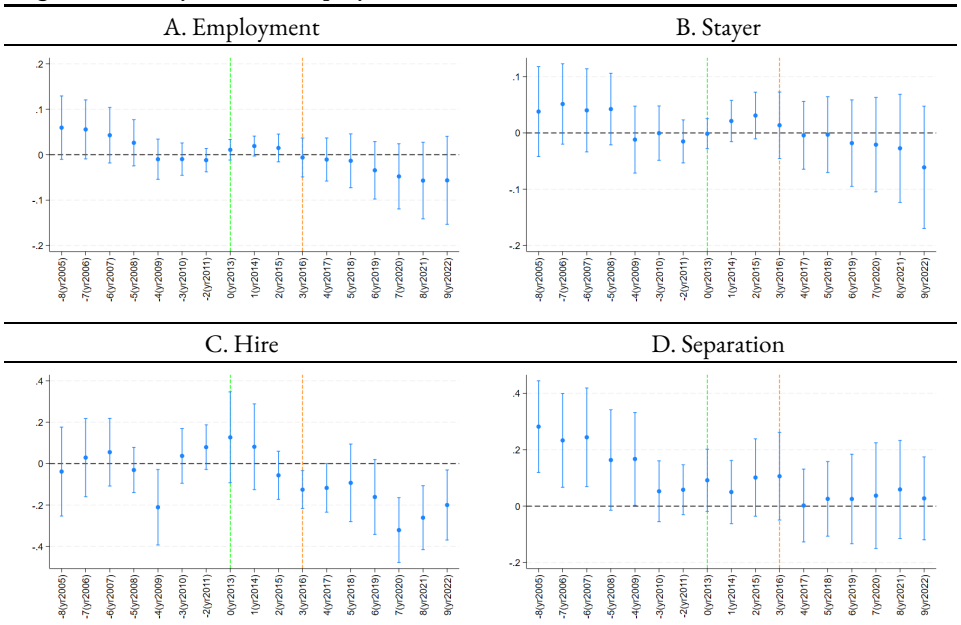
and Han (2019) rely on employment records from KEI, which cover only workers enrolled in employment insurance and therefore exclude individuals not subject to enrollment, such as those working fewer than 60 hours per month. By contrast, Jung and Kang (2022) and Nam (2018) conduct their analyses using WPS data, which are based on headcounts of employees reported by human resources departments of the respective workplaces, and they find a reduction in total employment following the extension of the retirement age. The workplace-level employment counts used in their analyses include workers who are not covered by employment insurance. If the increase in older workers' employment led to a decline in the number of non-insured workers, and the magnitude of this decline exceeded the increase in older workers, then total employment would indeed fall.

[Figure 4] Policy Effects: Employment of Young Workers (15–29)



Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. In each regression, observations are weighted by employment size.

[Figure 5] Policy Effects: Employment of All Workers (15–64)



Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. In each regression, observations are weighted by employment size.

To test the robustness of the baseline results, five additional analyses are conducted. First, we restrict the sample to workplaces where retirement ages are clearly identified. If the estimated effects indeed stem from the retirement age extension, the results should hold even when limiting the sample in this way. The estimation results for the 1,541 workplaces are largely consistent with the baseline findings (see Figure A1).

Second, we redefine workplace retirement ages to include voluntary and honorary retirements, thereby reclassifying the treatment and control groups. Given the rigidities of the Korean labor market, workplaces may encourage employees to leave before the MRA by offering increased severance pay or other incentives. In such cases, employment insurance records may classify separations under codes other than "retirement" (code 31), such as voluntary or honorary retirement (codes 11–13). We therefore redefine retirement ages using both code 31 and codes 11–13 and re-estimate the effects. Although the results are somewhat less precise than those based solely on code 31, the main patterns—an increase in the employment of older workers and a decline in the employment of young workers—are generally consistent (see Figure A2).

Third, we employ an event-study methodology with treatment intensity. In the baseline analysis, the retirement age is defined as the modal age of retirees in each workplace, but this measure does not capture heterogeneity in retirement timing among workers within the same workplace. As an alternative, the treatment intensity is defined as the proportion of older workers who exited the workforce before age 60. This variable, constructed from pre-policy records, is used in place of the treatment dummy, on the expectation that a higher proportion of workers retiring before age 60 corresponds to a stronger policy impact. The estimation results using the intensity variable are consistent with the baseline findings, confirming their robustness (see Figure A3).

Fourth, we exclude workplaces whose retirement ages changed during the pre-trend period, which would make classification into treatment and control ambiguous. Between 2005 and 2012, prior to the policy announcement, 11.9% of workplaces changed their retirement age, either from below 60 to 60 or above (1.5%) or vice versa (10.4%). We exclude these workplaces and re-estimate the model using the remaining 3,284 workplaces whose retirement ages consistently stayed below or above 60 (see Figure A4). Fifth, we conduct the analysis on a balanced panel with 2,810 workplaces (see Figure A5). Both approaches yield results consistent with the baseline analyses: the employment of older workers increased while the employment of young workers decreased.

We then turn to testing the pre-trend assumptions of the difference-in-difference framework. First, to verify the no-anticipation assumption, we conduct a falsification test for the period 2005–2012. Treatment and control workplaces are defined based on retirement age in 2008, which falls within this period. We then test whether any employment effects are observed when workplaces with retirement ages below 60 in 2008 are designated as treated. The estimation results indicate that the placebo treatment has no effect on the older and young worker groups (see Figure A6).

Next, we employ the method proposed by Rambachan and Roth (2023) to test the parallel trend assumption. Roth (2022) argues that simply checking whether pre-trend estimates are statistically indistinguishable from zero is insufficient to validate parallel trends. Building on this critique, Rambachan and Roth (2023) suggest a robust inference framework that places bounds on the relative magnitude of possible post-treatment violations compared to pre-treatment deviations. We apply this method to the employment of older and young workers—the outcomes where statistically significant effects are observed. For estimation, we assign equal weights to the post-treatment years. The results indicate that the estimated effects remain significant up to $\bar{M} = 0.25$ for the employment of older workers and $\bar{M} = 0.3$ for the employment of young workers (see Figure A7). In other words, our results remain valid even if one allows for post-treatment violations up to 25~30% of the maximum pre-treatment deviation. The somewhat lower robustness may reflect the gradual nature of policy effects: the employment of older

workers rises primarily because stayers remain employed longer, rather than through new hires. Under the Rambachan and Roth (2023) framework, treatment effects that appear sharply and immediately after the intervention typically allow for larger values of $\bar{M}$. By contrast, since the MRA generates employment effects only gradually over time, it is naturally associated with lower values of $\bar{M}$.

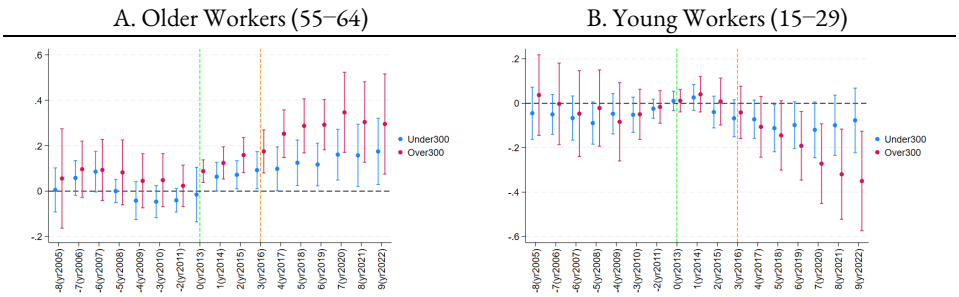
IV. Heterogeneity Analyses

In this section, we examine the heterogeneity of the MRA's employment effects based on the characteristics of workplaces. The workplaces are categorized according to their size, industry, and wage regulations. In general, the impact of the MRA on the employment of middle-aged workers is either negligible or inconclusive. Conversely, the impact on the employment of older and young workers is found to be contingent upon the specific attributes of the workplaces. To provide further insight into the results, additional analysis is presented here, focusing on the impact on the employment of older and young workers. The complete set of estimation results is presented in Tables A8 to A13 in Appendix.

For employment size, we categorize workplaces based on 300 employees. In Korea, the number of employees, specifically 300, is one of the criteria used to differentiate between large enterprises and small and medium-sized enterprises (SMEs, hereafter). In general, larger workplaces offer more favorable working conditions in terms of remuneration and contract length, which may contribute to longer employee tenure. This is why the government postponed the extension of the retirement age for workplaces with fewer than 300 employees for one year, thus allowing SMEs to prepare for the employment impact of the retirement age extension over a longer period of time.

Figure 6 presents the estimation results of equation (2) by workplace size. In workplaces with 300 or more employees, a notable increase in the employment of older workers and a decline in the employment of young workers are observed. In contrast to larger workplaces, there has been no discernible change in the employment of young workers in smaller workplaces. This pattern is consistent with the finding of Kim (2021) that the employment effects of retirement age extension for older workers are concentrated mainly in large workplaces with 300 or more employees. It also implies that, following the MRA, it has become more difficult for young workers to be hired by large workplaces.

[Figure 6] Policy Effects by Workplace Size

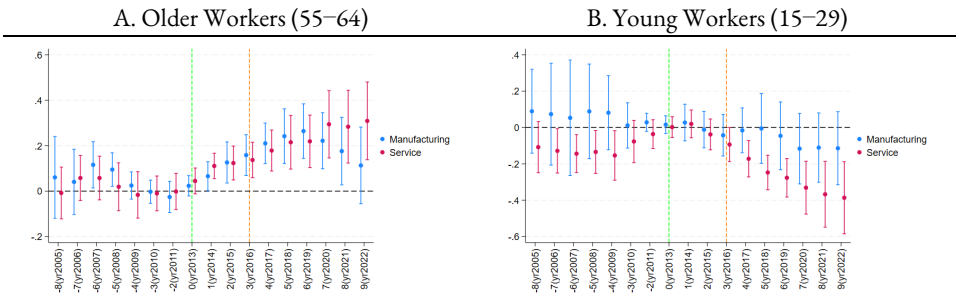


Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. All estimation results for each age group are presented in Figures A8–9 in Appendix. In each regression, observations are weighted by employment size.

The examination of heterogeneity of employment substitution effects in the MRA is facilitated by the inclusion of industry as a criterion, as it allows for the differentiation of main tasks and forms of employment. Our findings indicate that the substitution effect of employment between older and young workers, resulting from an increase in the retirement age, is predominantly influenced by the service industries. In manufacturing workplaces, there is no significant change in the hiring or retention of young workers (see Figures 7 and A10). This indicates that the increase in the employment of older workers in manufacturing does not have a notable impact on the employment of other age groups. In service sector workplaces, by contrast, the employment of young workers shows a declining pattern following the announcement of the MRA policy. Consistent with this pattern, estimation results also show a decline in new hires in the service sector, which stands in contrast to manufacturing (see Figure A11).

Some caution is nevertheless required when interpreting the results as causal. As shown in Figure 7.B, certain pre-treatment coefficients are statistically different from zero, suggesting that the parallel trends assumption may not hold in the service sector subsample. Accordingly, the service sector results are better interpreted as descriptively suggestive of a differential employment pattern, rather than as a causal estimate of the policy effect.

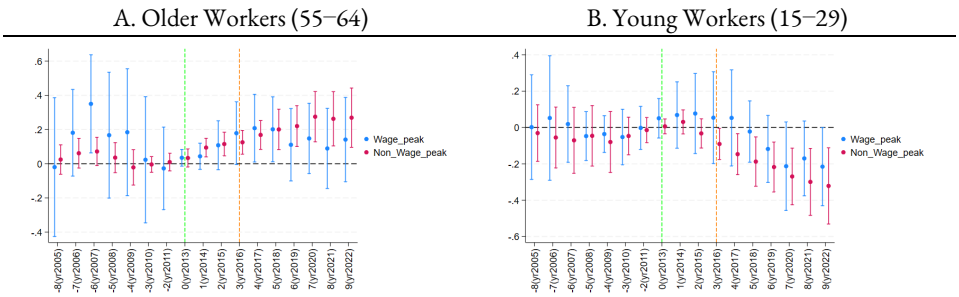
[Figure 7] Policy Effects by Industry



Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. All estimation results for each age group are presented in Figures A10–11 in Appendix. In each regression, observations are weighted by employment size.

With regard to the wage peak system, it is evident that the employment effects vary depending on whether the system is implemented. In workplaces that adopt the wage peak system prior to the announcement of the MRA, no significant employment changes are observed in the treatment group for either older workers or young workers before and after the implementation of the policy. Figure 8 indicates that, although there is a downward trend in the employment of young workers following the announcement of the policy, this is not statistically significant. It is noteworthy that the increase in employment of the older workers in these workplaces also exhibits an upward trend, but is not statistically significant except for a few years. One possible interpretation is that, in workplaces where wages for older workers are already capped, the incentive for employers to reduce hiring of younger workers may be attenuated. The absence of significant employment effects in workplaces adopting the wage peak system is consistent with the hypothesis that the wage adjustment helps mitigate the employment trade-off associated with retirement age extension. Conversely, in workplaces without a wage peak system, the increase in the employment of older workers and the decline in the employment of young workers are more pronounced. Figure 8.B demonstrates a salient reduction in the overall employment of young workers after the policy implementation. However, since the adoption of the wage peak system is itself likely endogenous — workplaces choosing to implement it may differ systematically from those that did not — these results should be interpreted as suggestive rather than causal.

[Figure 8] Policy Effects by Wage Scheme



Note: The figures plot the differences in employment outcomes between treatment and control workplaces around the announcement and implementation of the MRA and 95% confidence intervals. The dotted green and orange lines represent the announcement and the implementation of the MRA policy, respectively. The coefficients estimated from equation (2) are in one-year intervals from the year of treatment. All estimation results for each age group are presented in Figures A12–13 in Appendix. In each regression, observations are weighted by employment size.

V. Conclusion

This study investigates how the newly implemented MRA policy affects not only the employment of older workers but also that of other generations. A dataset comprising workplace-level panel data and individual-level employment records is employed for the purposes of this study. The analysis shows that while the policy has contributed to a gradual increase in the employment of older workers over the past decade, it has also led to a decline in the employment of young workers. During this period, the increase in older workers in workplaces with a retirement age below 60 is found to be driven primarily by extended tenure. However, the expansion in the number of older individuals in employment beyond the original retirement age (prior to the announcement of the policy) results in a reduction in opportunities for younger workers. This is driven by the cumulative effect of a gradual yearly decline in the hiring of young workers. The impact is heterogeneous in terms of employment size, industry, and wage policy. The employment of young workers in workplaces with more than 300 employees is found to have decreased following the implementation of the MRA policy. The adverse impact of the MRA on the employment of young workers is also pronounced among those employed in service industries. These results suggest that the decline in the employment of young workers may be attributed to the financial burden associated with hiring additional older workers, particularly in workplaces with limited resources. The negative impact on the employment of young workers is alleviated in workplaces implementing a wage peak system.

We believe that this study makes the following contributions to the existing literature on the employment effect of MRA. First, we extend the analysis beyond average employment effects by examining heterogeneity across workplaces, testing how the binding force of the policy varies with pre-announcement retirement provisions and workplace characteristics. Second, we extend the analysis horizon to cover up to 2022, thereby providing new evidence on the medium- to long-term consequences of Korea's retirement age extension. Third, by leveraging detailed entry and exit records, we identify the mechanisms behind employment changes and disentangle how the reform affects different age groups through flows of hires and separations.

Our findings should not be interpreted as supporting the 'lump-of-labor' hypothesis, as the analysis is based on workers employed in a subset of workplaces and does not represent employment in the entire Korean labor market. However, our findings suggest that policymakers are required to take a cautious approach when reforming the retirement system. The MRA policy may secure the employment of the current older labor force. However, our estimation results consistently show that encouraging employment of older workers comes at the cost of reduced employment opportunities for young workers in the medium to long term. This may affect future generations by reducing opportunities for young people entering the labor market. They would lose chances to build careers and accumulate productivity-enhancing experience. To mitigate the employment shock on younger workers, the government should implement additional measures, such as a wage peak policy that adjusts seniority-based wage schemes, or job support systems that promote the employment of young workers in conjunction with any retirement policy reforms.

Appendix

[Table A1] Employment of Workplaces by Year: Older Workers (55–64)

	Control (obs. 613)						Treat (obs. 3,150)					
Year	Employ-ment	Stayer	Hiring	Sepa-ration	AgeEff. Inflow	AgeEff. Outflow	Employ-ment	Stayer	Hiring	Sepa-ration	AgeEff. Inflow	AgeEff. Outflow
2005	24.6	14.4	8.1	8.2	2.2	0.0	7.9	4.3	2.2	2.9	1.4	0.0
2006	24.3	13.9	8.4	9.2	2.1	0.8	8.6	4.7	2.5	2.8	1.4	0.2
2007	26.1	13.9	9.1	8.8	3.0	1.2	9.8	5.0	2.7	3.0	2.0	0.3
2008	28.5	15.7	10.0	9.1	2.8	1.0	10.7	6.0	2.8	3.3	1.9	0.3
2009	30.2	17.8	9.0	9.5	3.4	1.0	11.5	6.3	3.0	3.8	2.1	0.3
2010	32.4	18.1	10.6	10.7	3.6	0.8	12.9	7.0	3.4	4.0	2.5	0.3
2011	34.9	19.4	11.8	11.5	3.7	1.0	14.4	7.9	3.9	4.4	2.5	0.3
2012	37.3	21.2	12.1	12.4	4.0	1.3	16.0	9.0	4.2	4.7	2.8	0.4
2013	38.8	23.2	11.6	13.3	4.0	1.2	17.9	10.4	4.4	5.3	3.0	0.5
2014	39.5	23.6	11.4	14.2	4.4	1.2	19.6	11.6	4.6	5.7	3.4	0.5
2015	40.9	25.1	11.1	13.2	4.7	1.3	21.8	13.1	5.0	6.2	3.7	0.5
2016	41.8	25.9	11.2	14.1	4.6	1.2	24.0	14.9	5.2	6.6	3.9	0.5
2017	43.2	28.0	10.4	12.8	4.7	1.6	26.7	17.2	5.4	6.4	4.1	0.7
2018	43.3	28.7	10.6	13.6	4.0	1.5	28.4	19.0	5.7	7.4	3.7	0.6
2019	43.0	28.3	10.3	13.5	4.3	1.6	30.0	20.3	5.5	7.6	4.2	0.8
2020	40.9	28.4	8.0	13.3	4.5	1.7	30.4	20.6	5.3	8.8	4.6	0.9
2021	42.9	29.4	9.0	10.2	4.4	1.6	32.2	21.9	5.7	7.9	4.6	0.9
2022	43.8	30.5	8.3	10.9	5.0	1.9	33.9	22.7	6.4	8.6	4.9	1.0

Source: Korea Employment Insurance

[Table A2] Employment of Workplaces by Year: Middle-aged Workers (30–54)

	Control (obs. 613)						Treat (obs. 3,150)					
Year	Employ-ment	Stayer	Hiring	Sepa-ration	AgeEff. Inflow	AgeEff. Outflow	Employ-ment	Stayer	Hiring	Sepa-ration	AgeEff. Inflow	AgeEff. Outflow
2005	138.8	109.2	24.5	19.5	5.1	2.2	171.3	145.1	17.6	18.3	8.6	1.4
2006	139.4	110.3	24.2	22.6	4.9	2.1	175.0	147.1	19.2	18.5	8.8	1.4
2007	142.3	112.3	25.1	22.1	4.9	3.0	178.1	149.8	19.1	19.3	9.2	2.0
2008	145.7	115.1	25.7	22.7	4.8	2.8	178.8	151.6	19.0	19.9	8.2	1.9
2009	148.4	118.0	24.9	22.9	5.5	3.4	178.0	150.7	17.9	22.1	9.4	2.1
2010	150.8	116.4	29.1	25.9	5.2	3.6	182.9	150.7	23.1	21.3	9.2	2.5
2011	148.4	115.4	27.8	29.5	5.2	3.7	186.0	152.7	23.7	23.4	9.6	2.5
2012	149.7	117.8	26.5	27.5	5.3	4.0	191.3	157.7	23.7	23.6	9.9	2.8
2013	151.7	122.5	24.3	24.9	4.9	4.0	197.3	164.9	23.0	24.9	9.3	3.0
2014	150.3	121.6	24.1	26.4	4.6	4.4	198.3	167.8	22.1	25.9	8.4	3.4
2015	145.5	118.8	22.6	27.4	4.1	4.7	198.5	169.7	20.4	25.6	8.3	3.7
2016	141.6	116.3	21.3	25.2	4.0	4.6	195.1	167.6	19.8	28.0	7.7	3.9
2017	140.2	115.3	20.9	23.8	4.1	4.7	195.3	168.0	20.0	25.4	7.3	4.1
2018	140.4	115.1	21.2	23.0	4.1	4.0	196.5	168.7	20.6	26.2	7.2	3.7
2019	135.7	111.1	20.2	26.1	4.4	4.3	198.1	171.4	19.6	23.5	7.1	4.2
2020	134.3	112.1	17.9	20.3	4.4	4.5	195.5	172.1	16.6	23.0	6.8	4.6
2021	134.3	110.3	19.6	21.7	4.4	4.4	197.9	171.5	19.6	22.4	6.8	4.6
2022	134.4	110.0	20.1	21.3	4.4	5.0	199.1	169.4	22.8	25.3	6.8	4.9

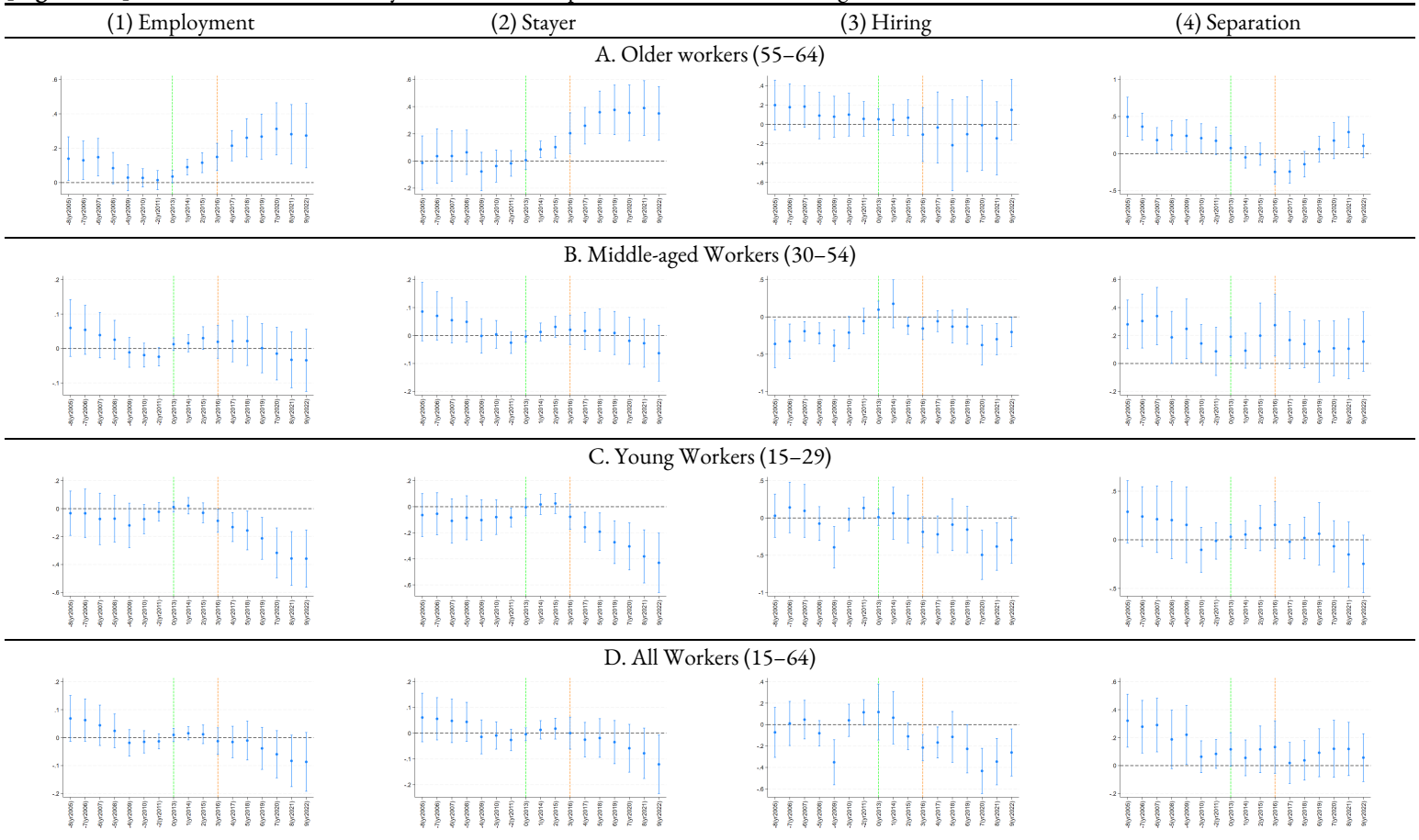
Source: Korea Employment Insurance

[Table A3] Employment of Workplaces by Year: Young Workers (15–29)

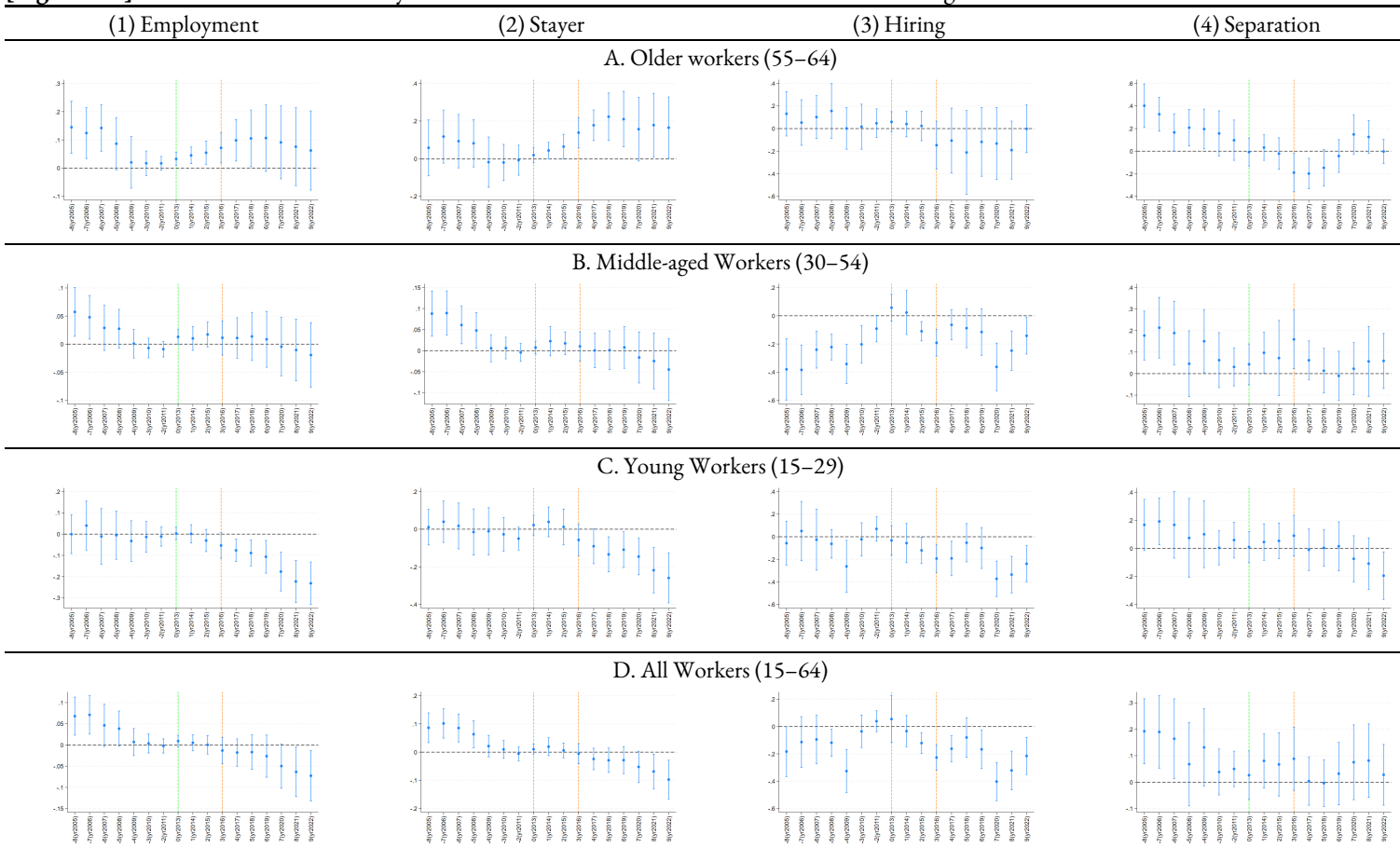
	Control (obs. 613)					Treat (obs. 3,150)				
Year	Employment	Stayer	Hiring	Separation	AgeEff. Outflow	Employment	Stayer	Hiring	Separation	AgeEff. Outflow
2005	43.3	26.6	16.7	11.1	5.1	78.1	51.2	26.8	18.0	8.6
2006	42.8	25.4	17.4	11.8	4.9	77.4	49.3	28.1	17.9	8.8
2007	42.7	25.9	16.8	11.5	4.9	77.0	48.8	28.2	17.8	9.2
2008	40.9	25.2	15.7	12.2	4.8	74.4	48.9	25.5	17.9	8.2
2009	38.5	23.9	14.6	11.1	5.5	69.1	46.6	22.4	16.7	9.4
2010	38.0	20.2	17.7	12.4	5.2	69.4	40.7	28.7	17.8	9.2
2011	36.4	20.0	16.4	12.2	5.2	68.7	39.5	29.2	18.5	9.6
2012	35.2	19.6	15.6	11.9	5.3	67.6	40.1	27.5	18.1	9.9
2013	34.0	20.1	13.9	10.5	4.9	65.7	40.7	25.0	18.2	9.3
2014	32.5	19.1	13.4	10.5	4.6	64.3	39.3	25.0	18.4	8.4
2015	33.0	18.7	14.3	9.8	4.1	61.9	37.9	24.0	18.1	8.3
2016	32.7	19.0	13.7	10.3	4.0	58.3	35.4	22.9	18.9	7.7
2017	33.0	19.0	14.1	10.1	4.1	55.8	33.5	22.2	18.3	7.3
2018	34.3	19.5	14.9	10.0	4.1	56.5	32.3	24.2	17.3	7.2
2019	34.2	20.6	13.7	9.8	4.4	55.6	33.4	22.1	16.8	7.1
2020	33.4	20.6	12.8	9.5	4.4	51.0	33.6	17.5	15.8	6.8
2021	33.7	18.8	15.0	10.7	4.4	51.2	29.9	21.3	15.1	6.8
2022	34.5	18.6	15.9	11.3	4.4	51.8	28.4	23.4	16.5	6.8

Source: Korea Employment Insurance

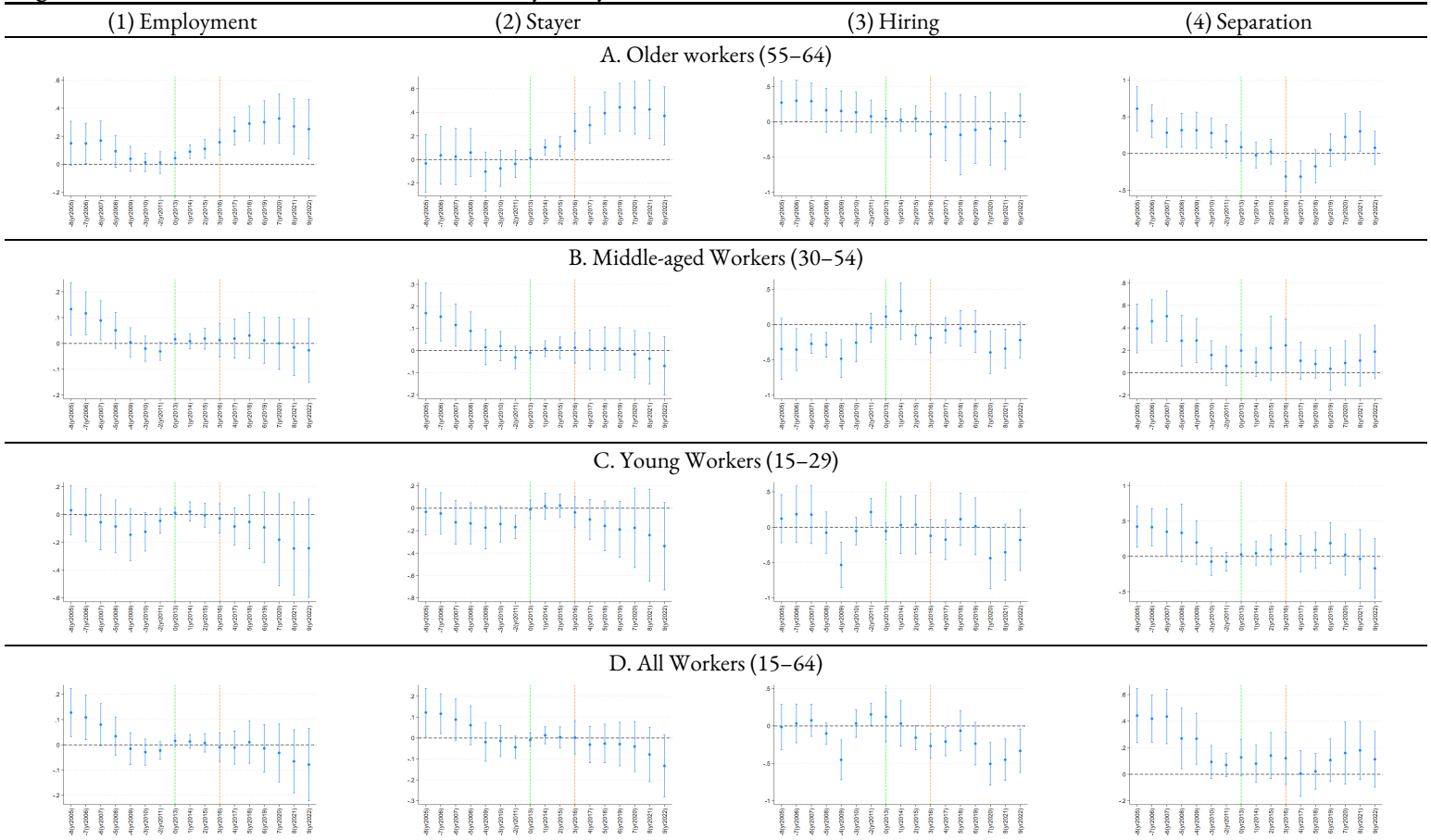
[Figure A1] Robustness Checks: Policy Effects on Workplaces Where Retirement Ages Are Identified



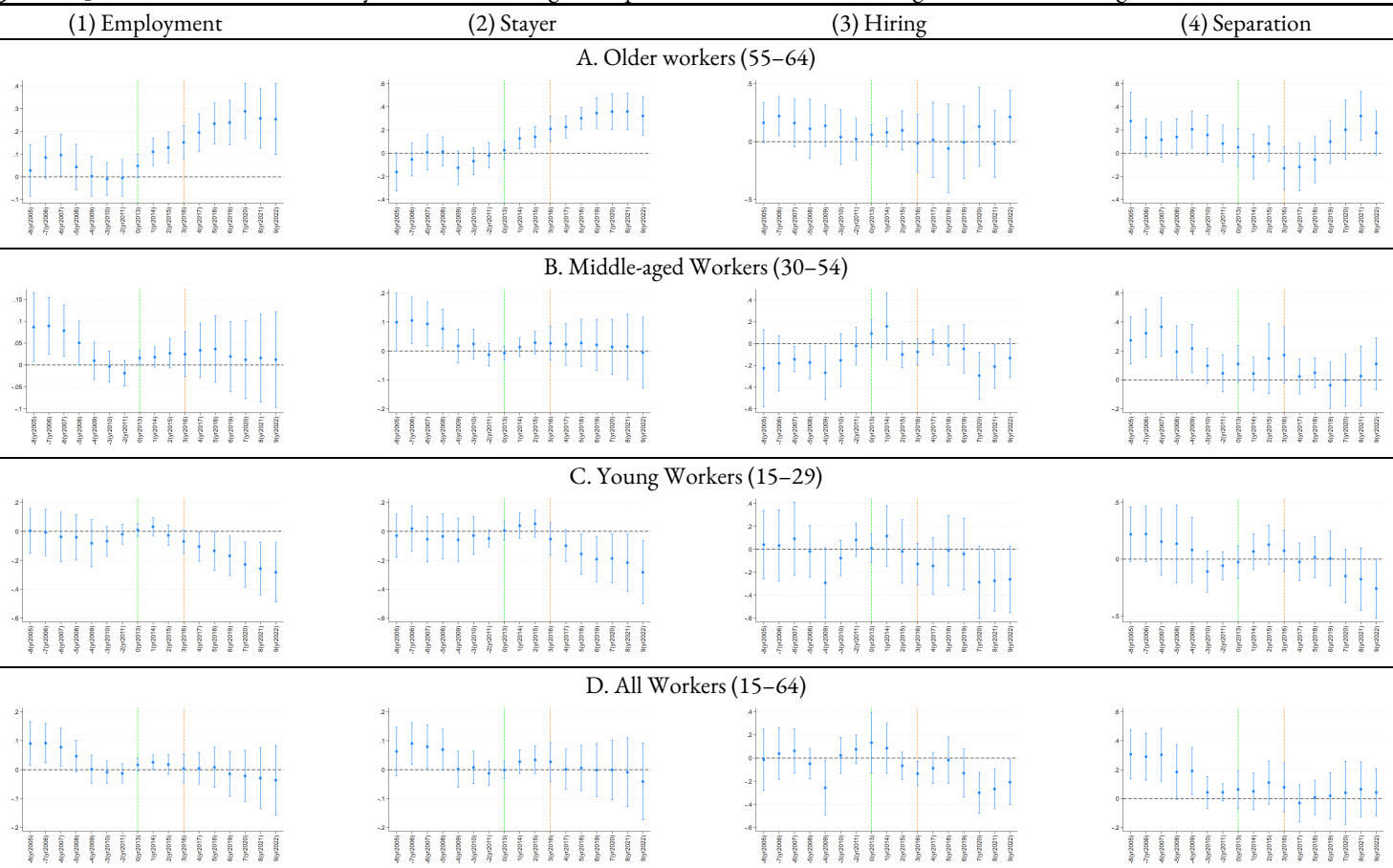
[Figure A2] Robustness Checks: Policy Effects under Alternative Definition of Retirement Age



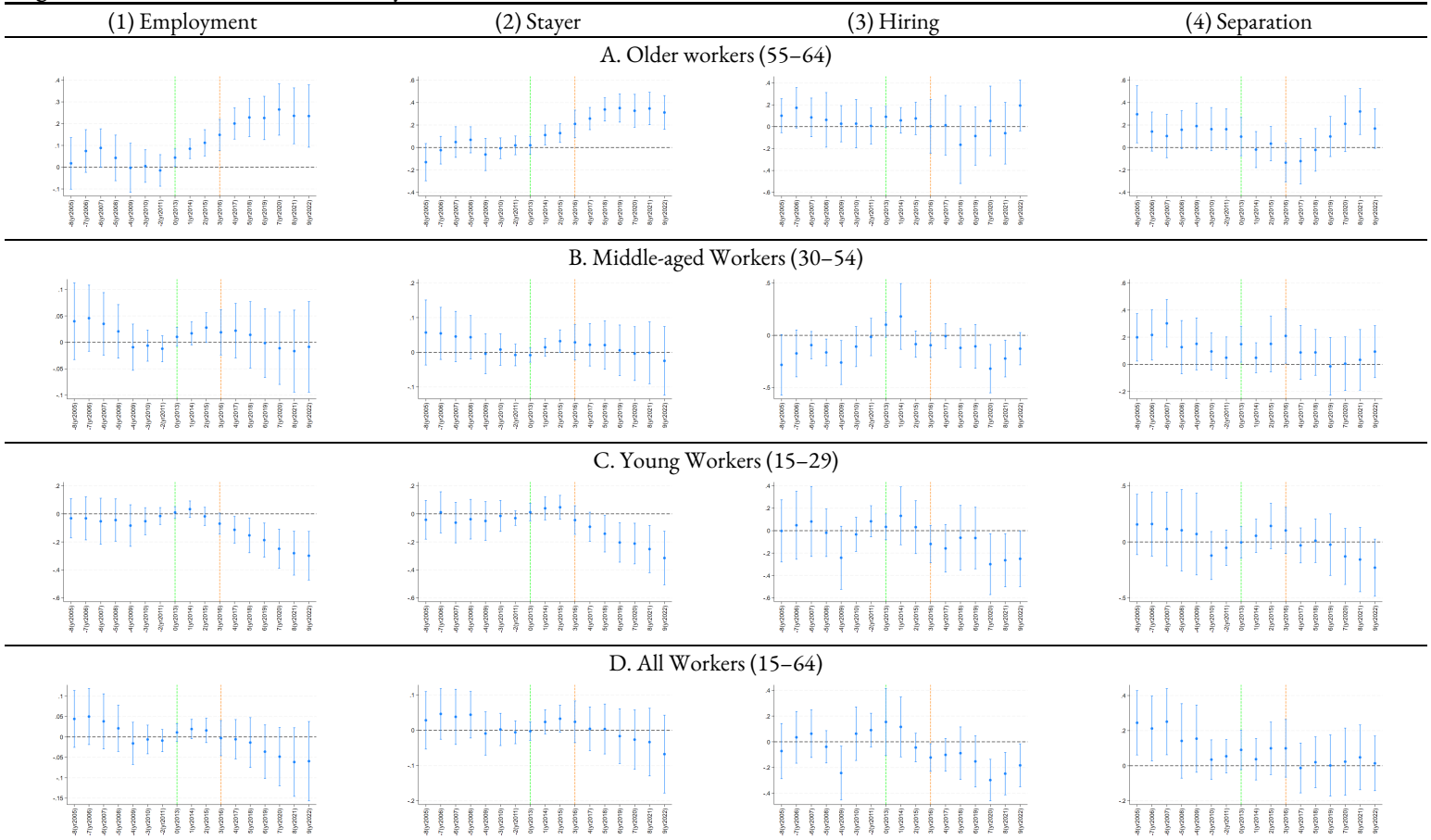
[Figure A3] Robustness Checks: Treatment Intensity Analysis



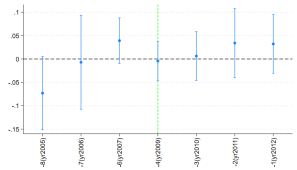
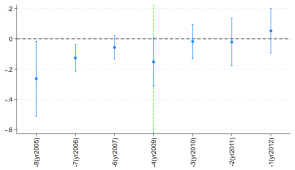
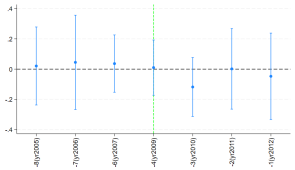
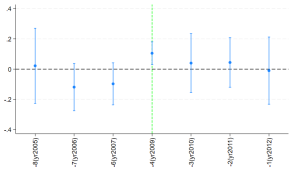
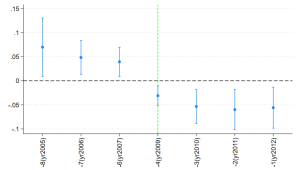
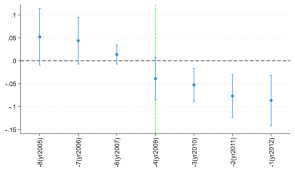
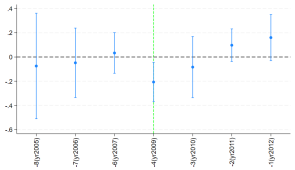
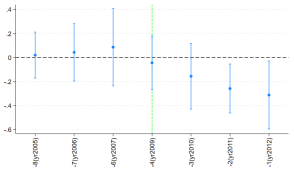
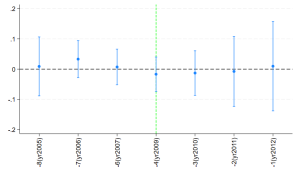
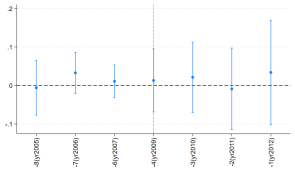
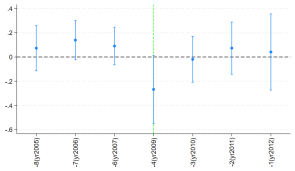
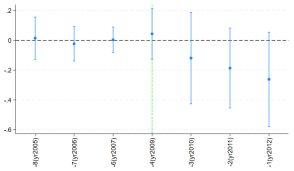
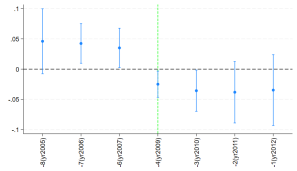
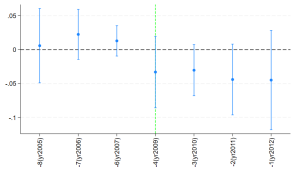
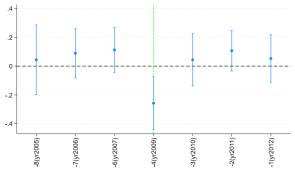
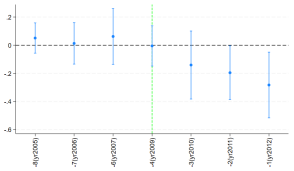
[Figure A4] Robustness Checks: Policy Effects Excluding Workplaces with Pre-Trend Changes in Retirement Age



[Figure A5] Robustness Checks: Policy Effects with Balanced Panel

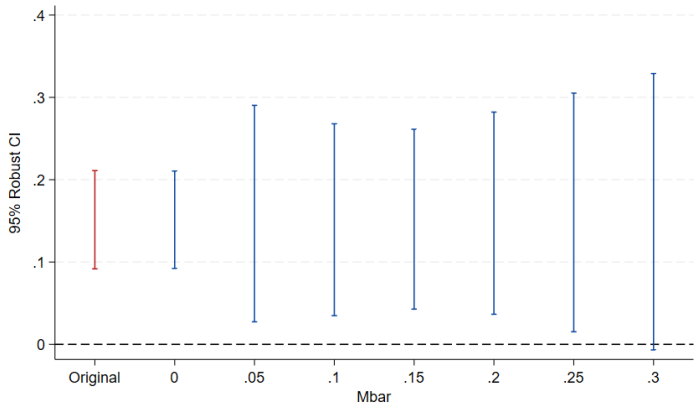


[Figure A6] Falsification Test

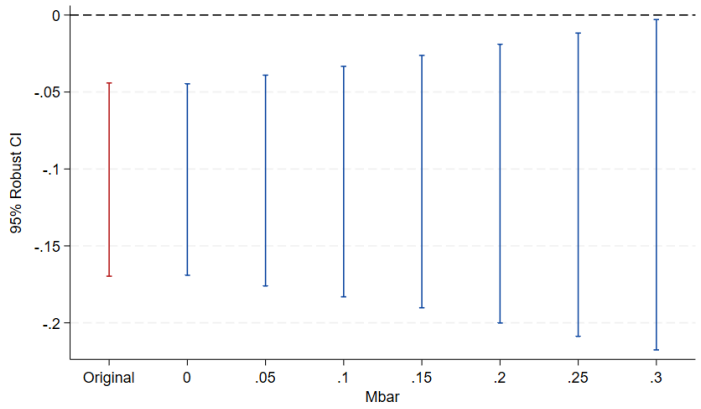
(1) Employment	(2) Stayer	(3) Hiring	(4) Separation
A. Older workers (55–64)			
			
B. Middle-aged Workers (30–54)			
			
C. Young Workers (15–29)			
			
D. All Workers (15–64)			
			

[Figure A7] Sensitivity Analysis

A. Older Workers

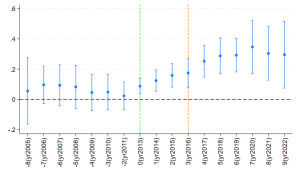
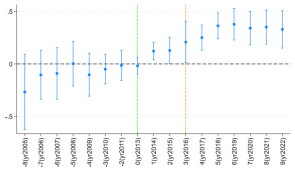
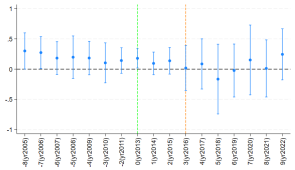
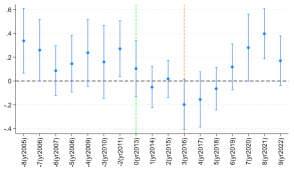
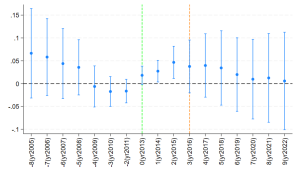
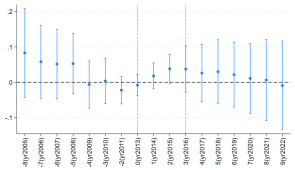
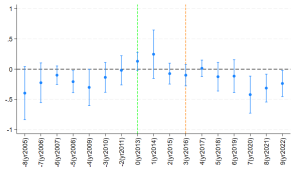
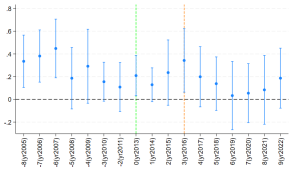
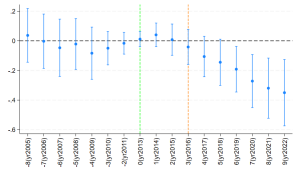
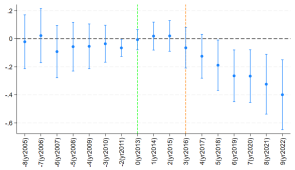
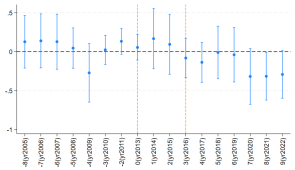
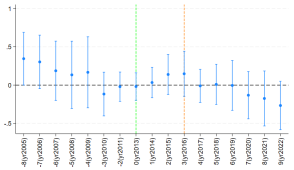
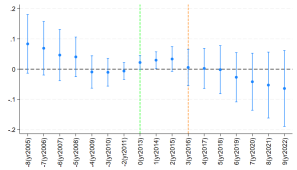
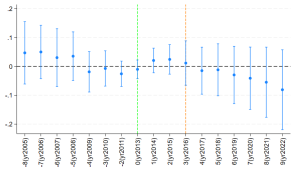
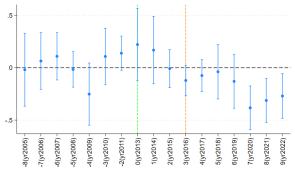
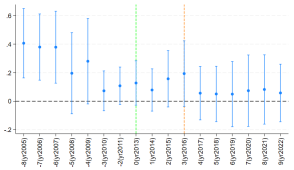


B. Young Workers

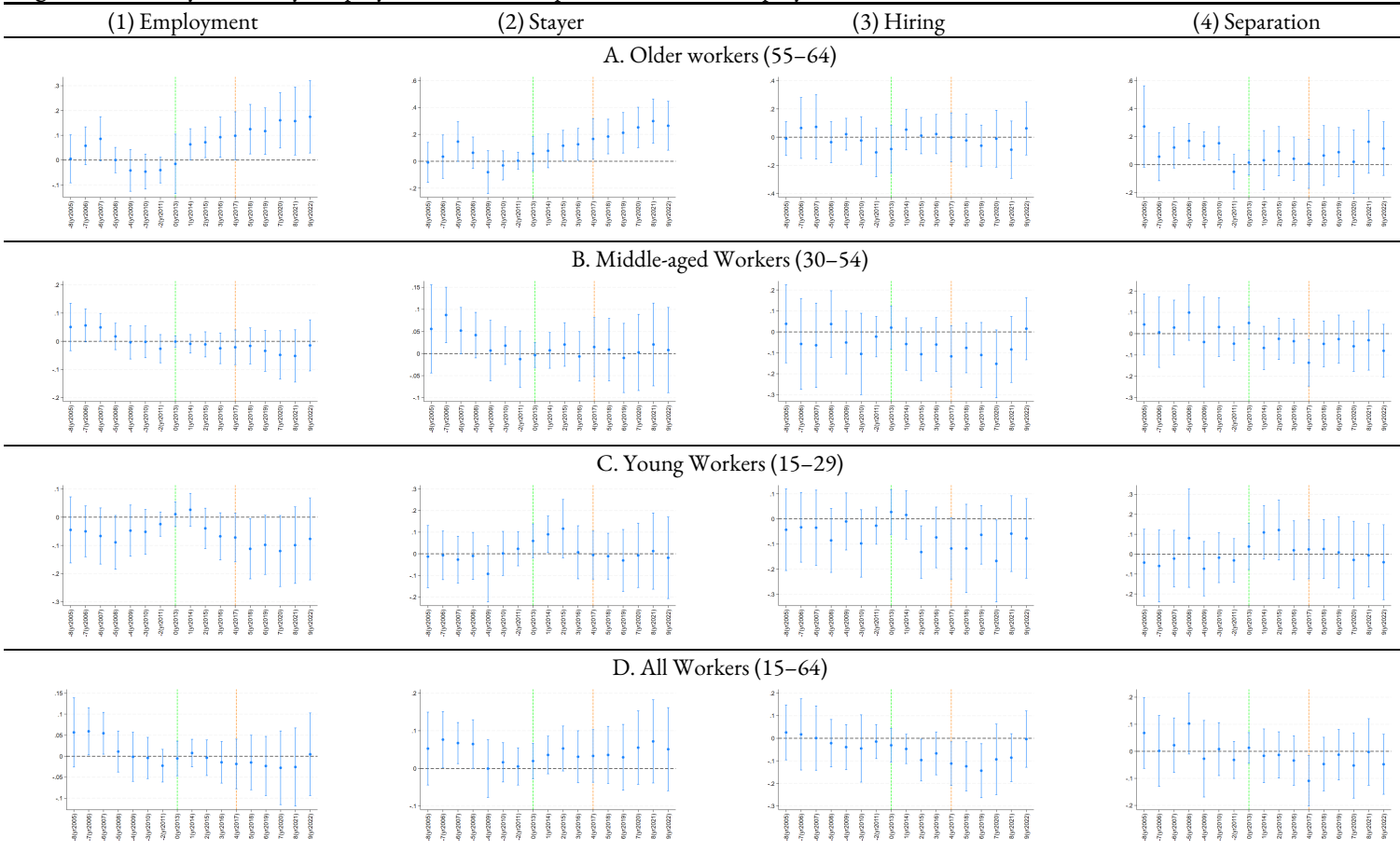


Note: The figures present the results of parallel trend sensitivity tests as suggested by Rambachan and Roth (2023).

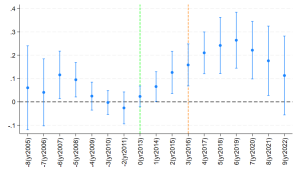
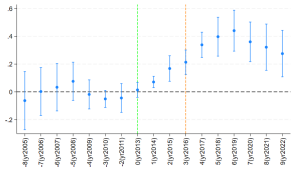
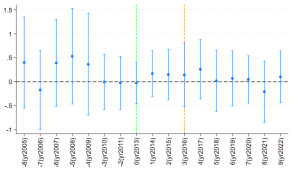
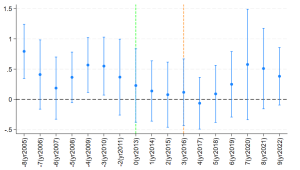
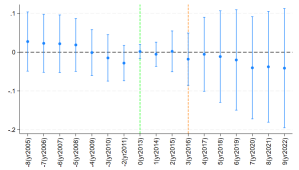
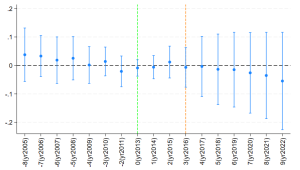
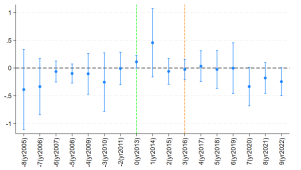
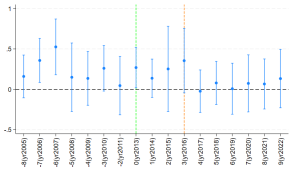
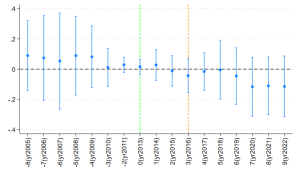
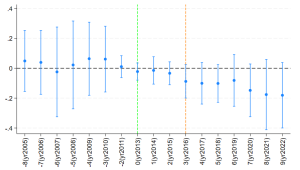
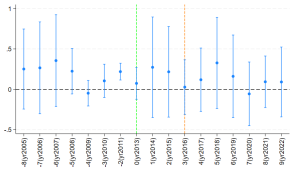
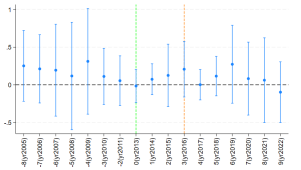
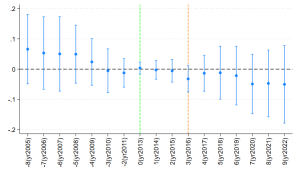
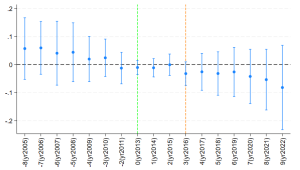
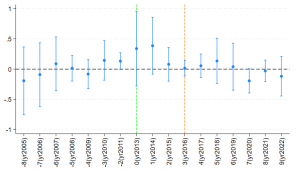
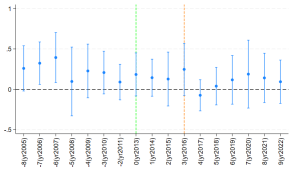
[Figure A8] Policy Effects by Employment Size: Workplaces over 300 Employees

(1) Employment	(2) Stayer	(3) Hiring	(4) Separation
A. Older workers (55–64)			
			
B. Middle-aged Workers (30–54)			
			
C. Young Workers (15–29)			
			
D. All Workers (15–64)			
			

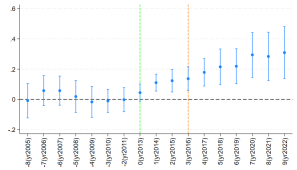
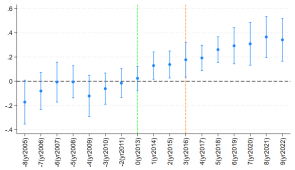
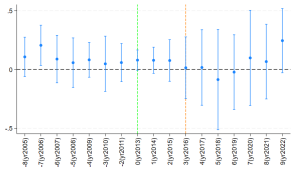
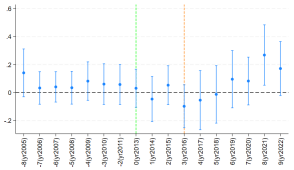
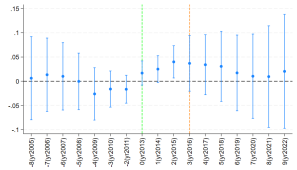
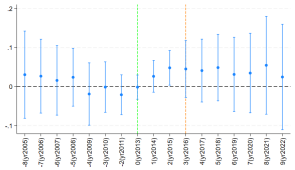
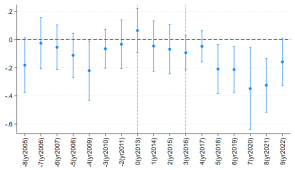
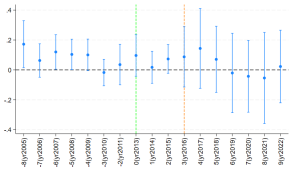
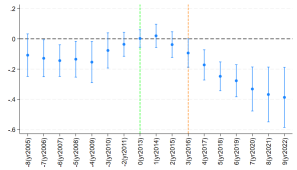
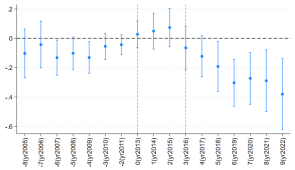
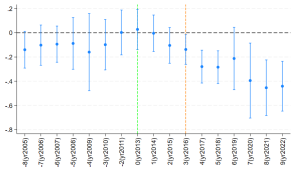
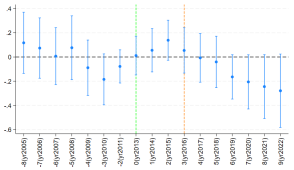
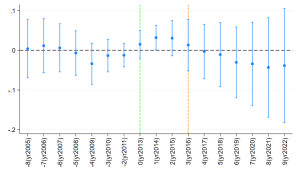
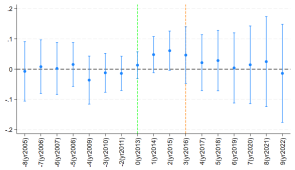
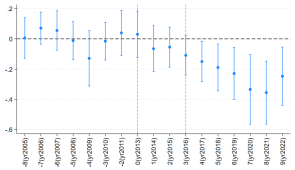
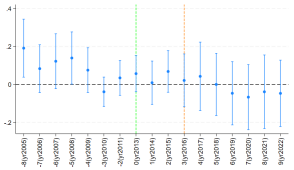
[Figure A9] Policy Effects by Employment Size: Workplaces under 300 Employees



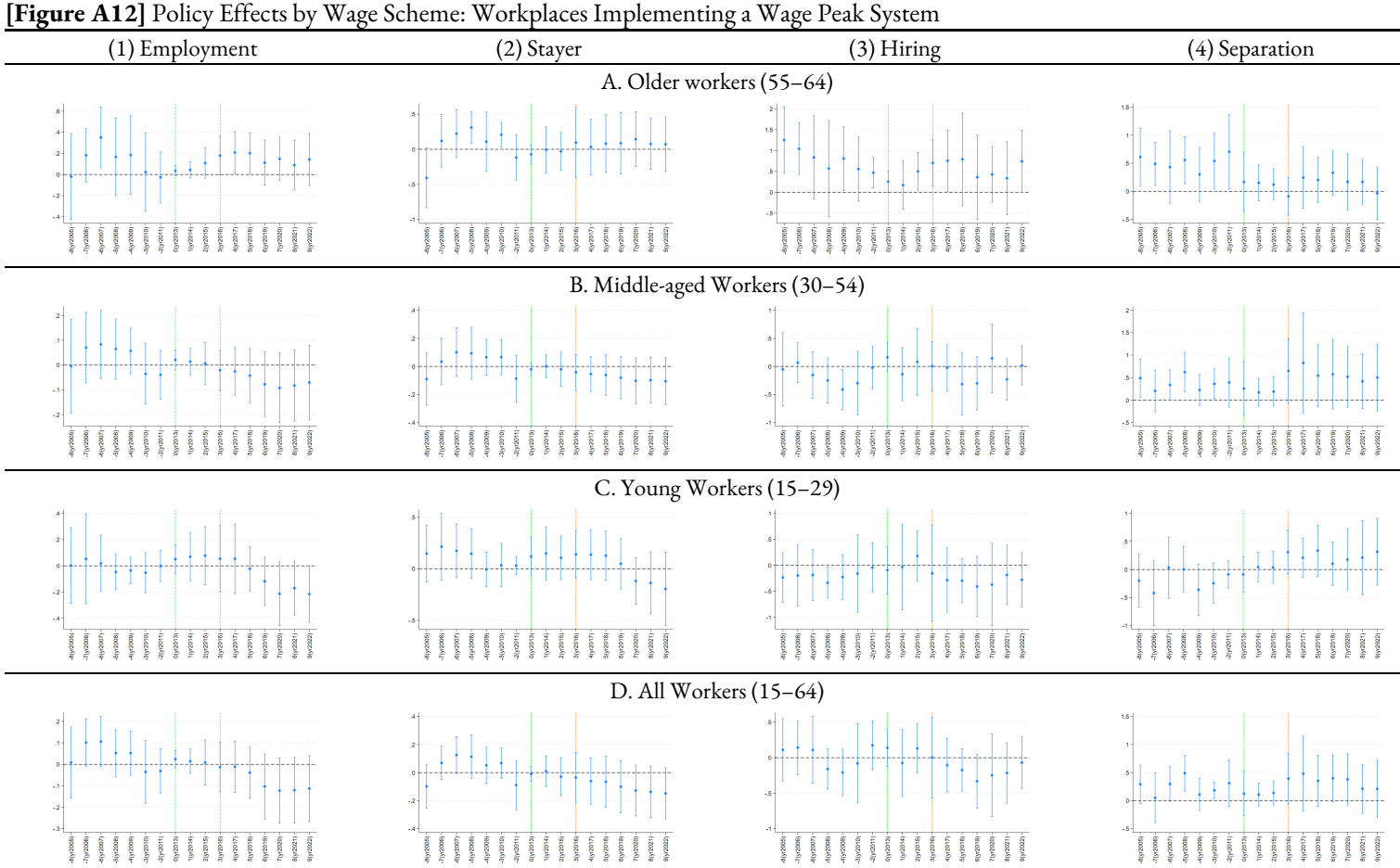
[Figure A10] Policy Effects by Industry: Manufacturing

(1) Employment	(2) Stayer	(3) Hiring	(4) Separation
A. Older workers (55–64)			
			
B. Middle-aged Workers (30–54)			
			
C. Young Workers (15–29)			
			
D. All Workers (15–64)			
			

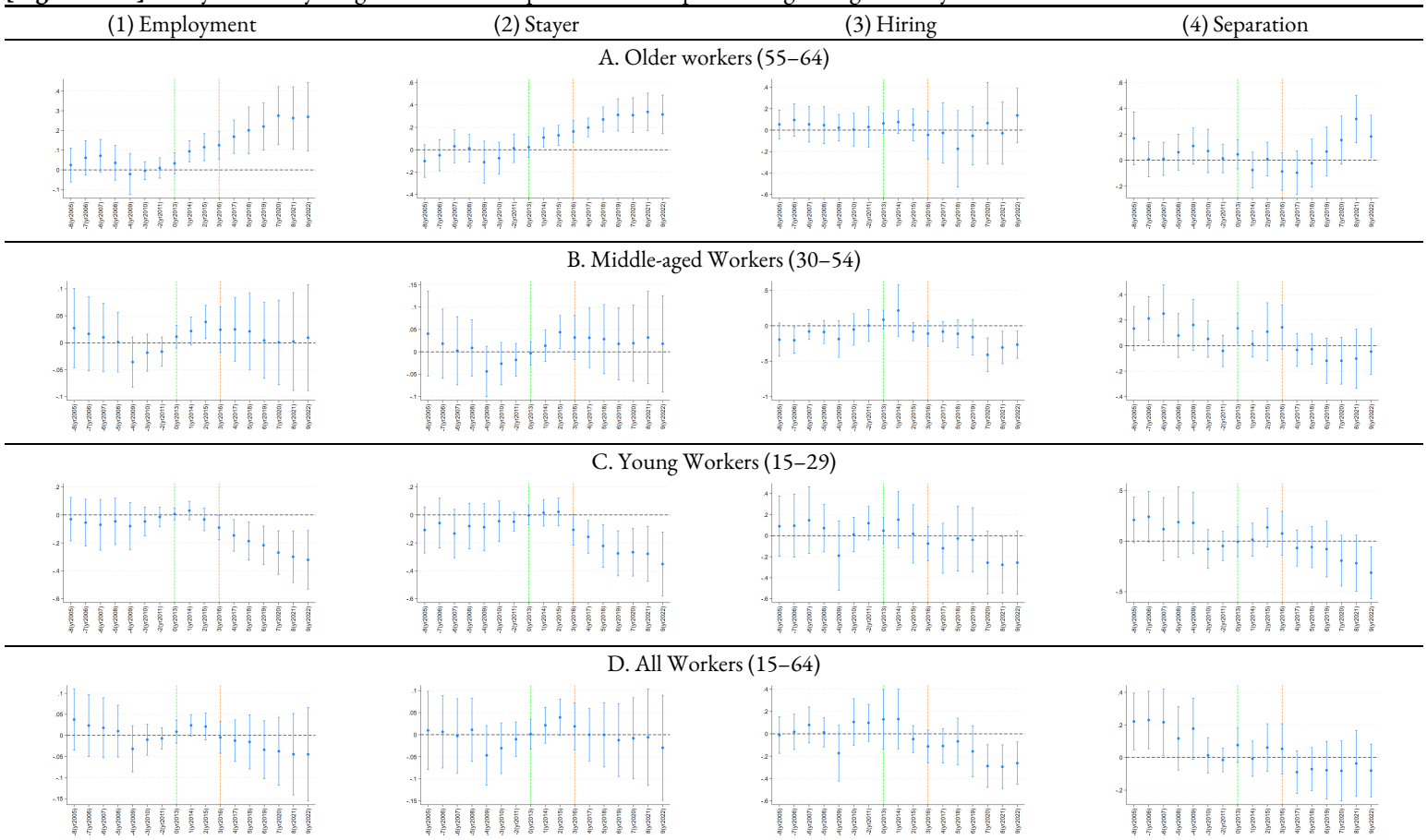
[Figure A11] Policy Effects by Industry: Service Sector

(1) Employment	(2) Stayer	(3) Hiring	(4) Separation
A. Older workers (55–64)			
			
B. Middle-aged Workers (30–54)			
			
C. Young Workers (15–29)			
			
D. All Workers (15–64)			
			

[Figure A12] Policy Effects by Wage Scheme: Workplaces Implementing a Wage Peak System



[Figure A13] Policy Effects by Wage Scheme: Workplaces NOT Implementing a Wage Peak System



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정년 의무화 정책의 세대별 고용효과*

정 종 우† · 이 철 희‡ · 진 성 진§

초 록 본 연구는 60세 이상 정년 의무화 정책의 고용효과를 분석하였다. 이를 위해 2005-2022년 사업체패널조사와 고용보험 기록을 결합한 자료에 사건분석 방법론을 적용하였다. 추정 결과에 따르면, 2013년 정년 의무화 정책이 공표된 이후 55-64세 고령 근로자의 고용이 증가한 반면, 300인 이상 또는 서비스업 사업체에서 15-29세 청년 근로자의 고용이 감소한 것으로 나타났다. 추가 분석 결과는 청년 근로자의 지속적인 신규 채용 감소로 인해 해당 연령대의 고용이 줄어들 가능성을 보여준다. 주목할 점은, 고령 근로자에 대한 임금 상한제인 임금피크제를 사전에 도입한 사업체에서는 정책의 공표 및 시행 이후에도 청년 근로자의 고용 감소가 나타나지 않았다는 것이다.

핵심 주제어: J26, J21, J14

경제학문헌목록 주제분류: 정년연장, 고령근로자, 청년고용, 노동수요, 사건분석

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