

The Impact of Employment Protection on the Quality of Job Match

: Evidence from Job Duration Data in South Korea

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I. 2007 Reform in Korean Labor Market:

Primary change introduced in the 2007 reform: restrict the length of fixed-term employment with one employer to maximum of 2 years

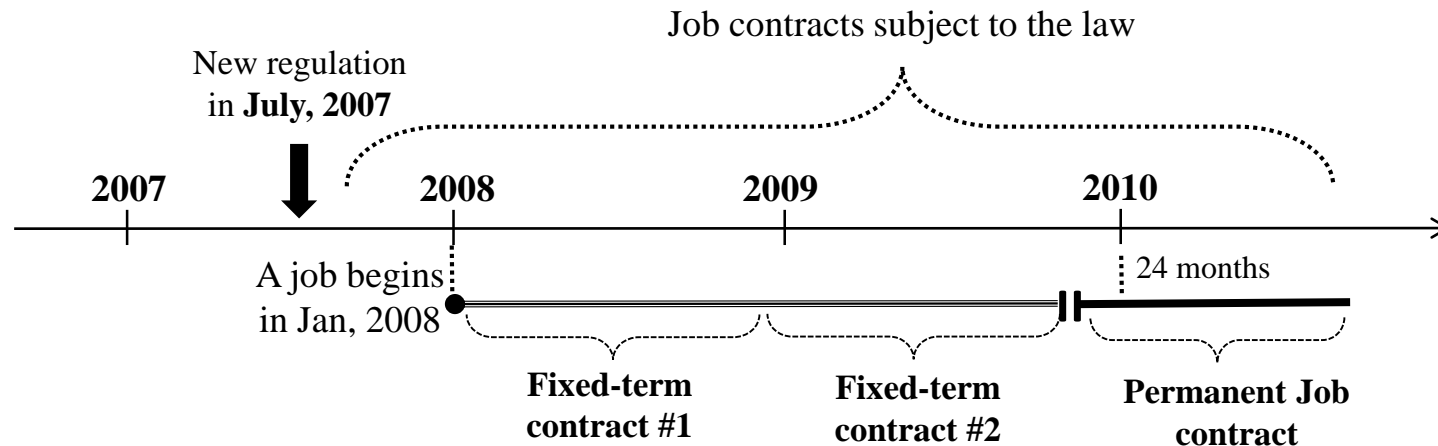
✓ 2007 regulation requires employers to convert temporary worker to permanent after 2 years

❖ Fixed-term employment contract

: Employment contract that terminates at specific future date,

or when particular task is completed

❖ Example of Fixed-Term Contracts after Reform



❖ **Exceptions of reform:**

- Workers aged 55 or older
- Firms with fewer than 5 employees in private sector
- Workers who work less than 15 hours per week
- Workers holding doctoral degrees or highly technical and professional qualifications
- Workers subject to other special laws, etc

1. Previous Studies on the Effect of 2007 Labor Market Reform

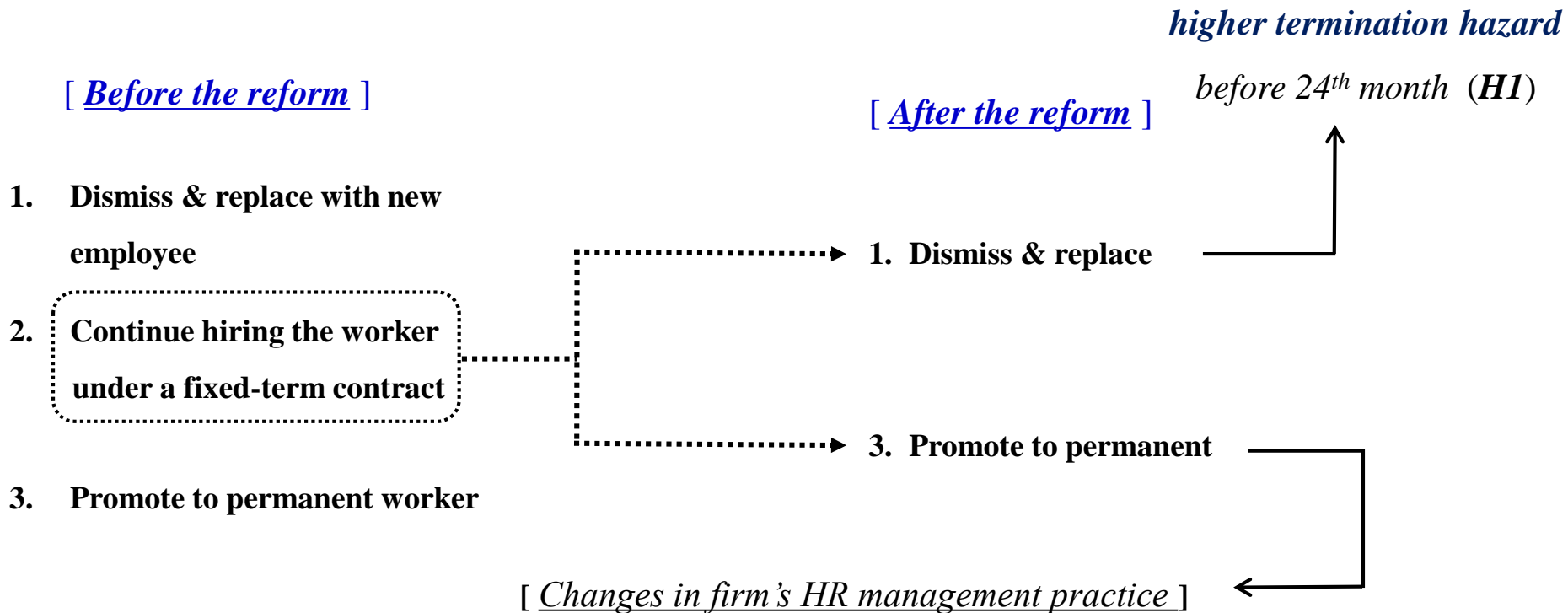
- ❑ The previous studies have focused on whether the reform influenced total employment.
 - Nam and Park (2010), Yoo and Kang (2012), Lee (2009, 2011)

Limited long-term effect of the regulation:

- ✓ Decreases in fixed-term and total employment right after the reform (in the short run)
 - ✓ The negative effects faded away by two years after the reform.
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- ❑ This study relates the change in protection for temporary employment to job sorting mechanism.

 - ❑ We focus on a firm's screening process using duration analysis.
 - Boockmann and Hegen (2008), Marinescu (2009)

2. Change in Firms' Options after Reform and its Possible Effects



- (a) Better recruitment practice:
- *lower termination hazard for workers with low tenure (H2)*
- (b) Higher monitoring effort & rigorous evaluation:
- *higher termination hazard for workers with low tenure (H3)*

3. Possible Effects of Reform on Employment Termination

(1) Firm's Perspective

- (H1) Replacement channel : Replace worker with new temporary worker
 - ➔ **Higher termination hazard** right before the 24th month
- (H2) Recruitment channel : Better recruitment practice
 - ➔ **Lower termination hazard** for workers with low tenure
- (H3) Monitoring channel : Higher monitoring on the job & rigorous evaluation
 - ➔ **Higher termination hazard** for workers with low tenure

(2) Workers' Perspective

- (H4) Higher effort on the job
 - ➔ **Lower termination hazard** throughout the period of temporary contract

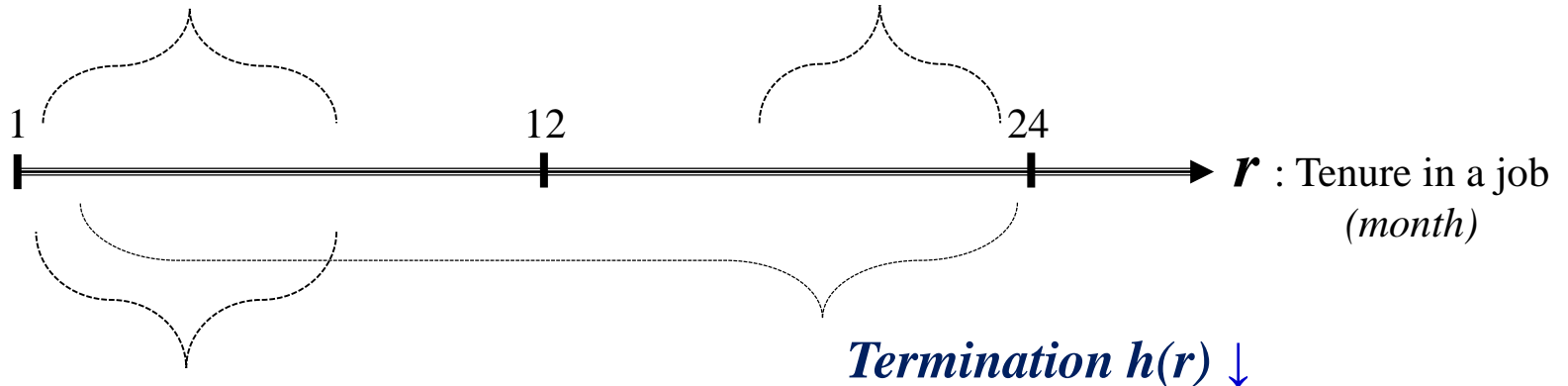
❖ Possible Effects of Reform on Employment Termination

(H2) Recruitment channel

(H1) Replacement channel

Termination $h(r)$ ↓

Termination $h(r)$ ↑



Termination $h(r)$ ↑

Termination $h(r)$ ↓
(H4) Workers' Higher Effort

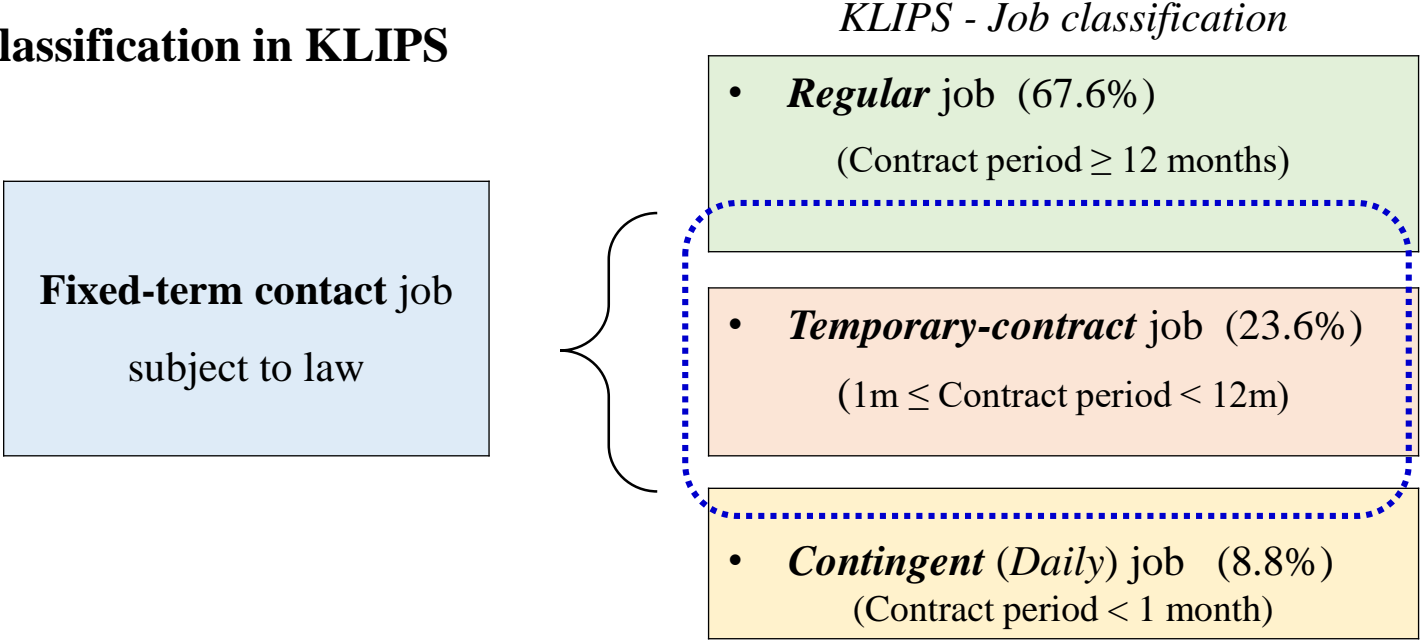
(H3) Monitoring channel

II. Analysis I : Firm's Behavioral Change after Reform

1. Data : Job History Data of KLIPS (Korea Labor & Income Panel Study)

- Sample: temporary contract jobs between Jan 2001 and Aug 2016
- Temporary-contract jobs: 1 month \leq the period of an employment contract < 1 year , or
Current employment is expected to end within a year

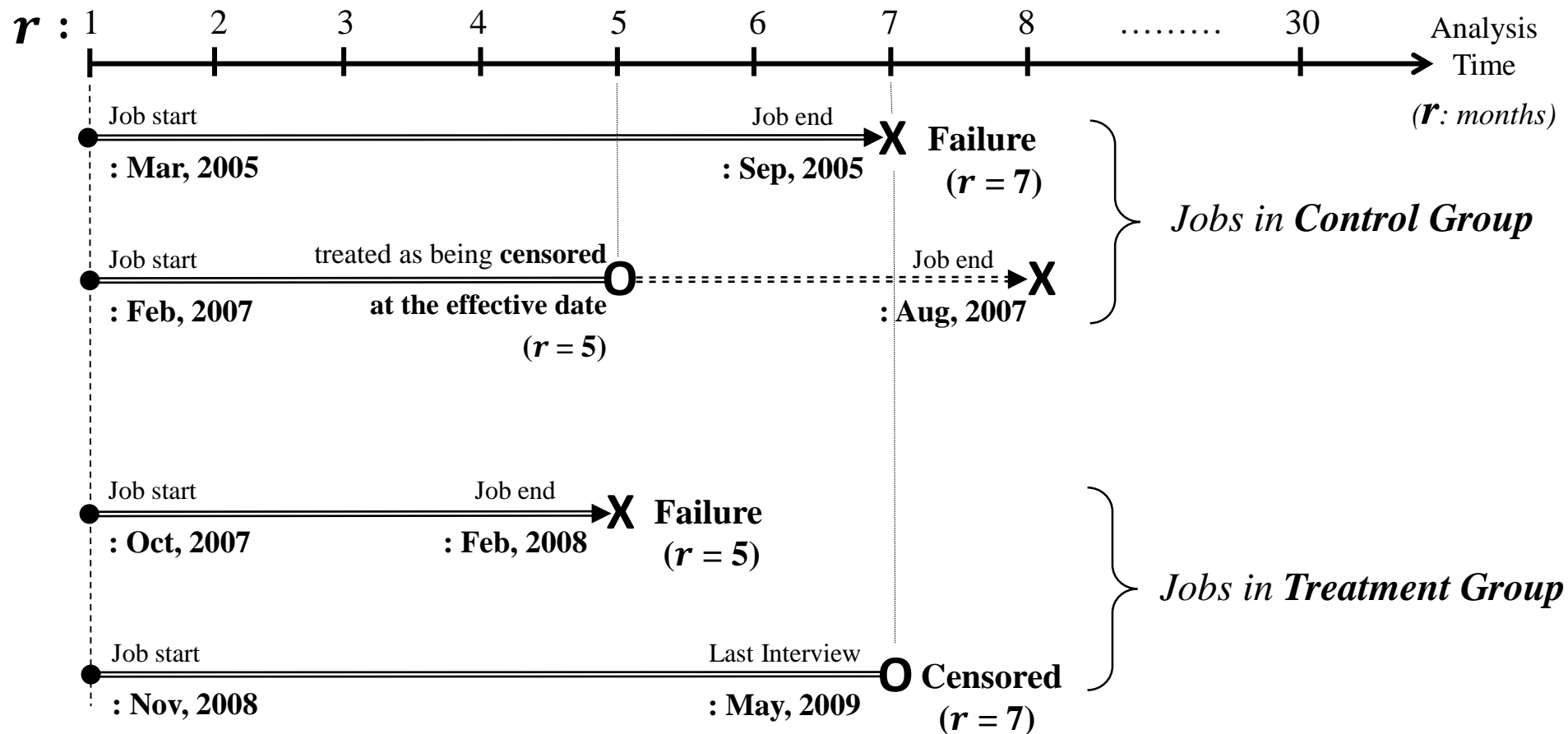
❖ Job Classification in KLIPS



※ Fixed-term employment contract: Employment contract that terminates at specific future date

❖ Control and Treatment Group

- Analysis time (r) : Tenure of a worker in a job (months)
- Failure: Termination of a job ($r = \text{Job end date} - \text{Job start date}$)
- Censored : unobservable since the last interview ($r = \text{The last interview date} - \text{Job start date}$)



2. Control and Treatment Group: Basic Statistics

Jobs under <i>temporary-contracts</i>	The number of jobs	The number of failures	The number of censored cases	Median value of job tenure	
				Full sample	Sub-sample : using only uncensored cases
Control group (Jan. 2001 – Jun. 2007)	2,236	1,596 (71.4%)	640 (28.6%)	9 months	9 months
Treatment group (Jul. 2007 – Aug. 2016)	3,454	2,282 (66.1%)	1,172 (33.9%)	13 months	12 months
Total	5,690	3,878 (68.2%)	1,812 (31.8%)	11 months	10 months

3. Kaplan-Meier Nonparametric Estimates for Job Termination Hazard

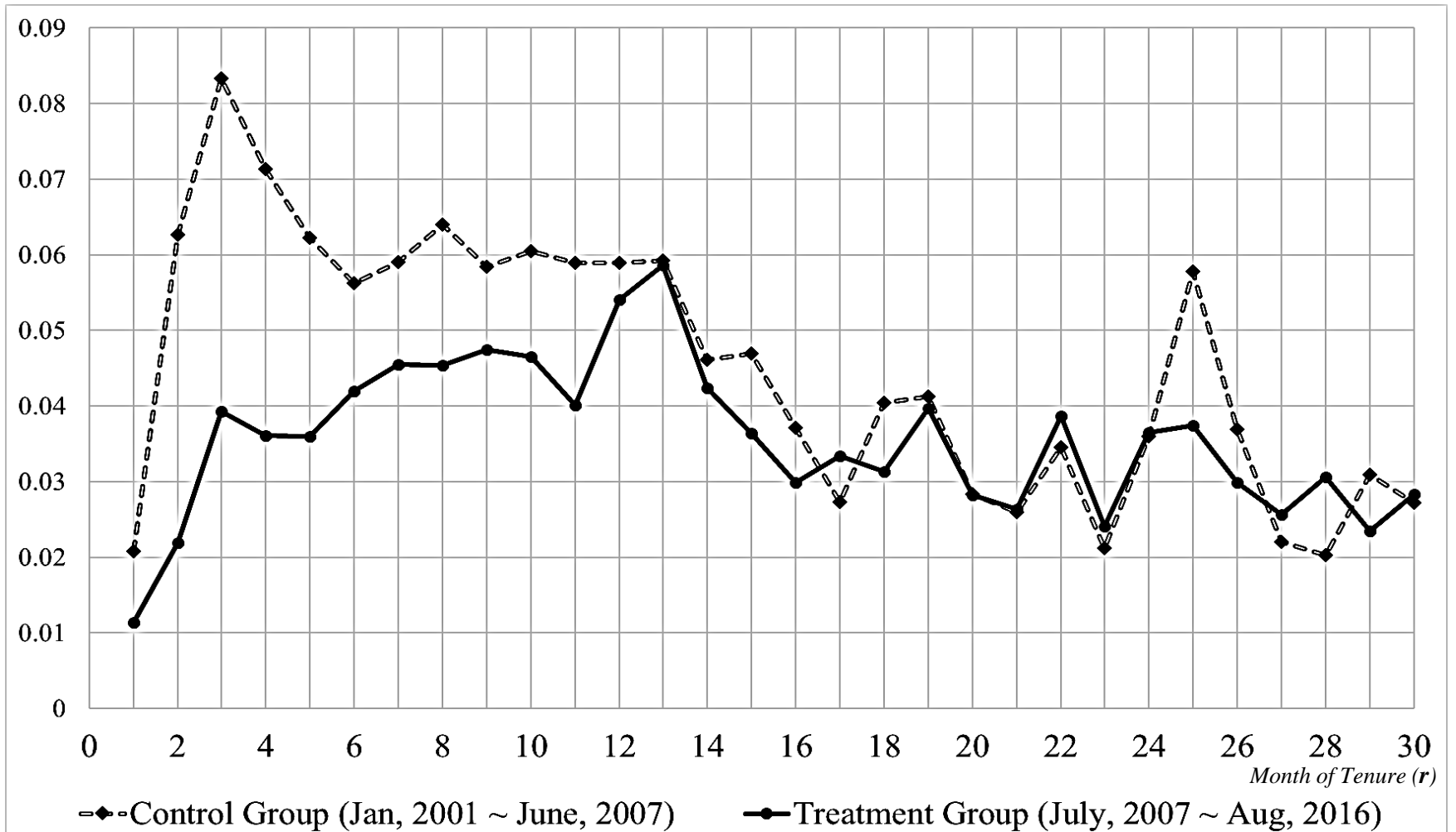
$$h(r) = \lim_{\Delta r \rightarrow 0} \frac{\Pr(r < R < r + \Delta r \mid R > r)}{\Delta r}$$

$$\hat{h}(r) = \frac{f_r}{n_r} \quad \left(\begin{array}{l} \bullet \ f_r : \text{the number of jobs terminated at } r \\ \bullet \ n_r : \text{the number of jobs at risk of termination at } r \end{array} \right.$$

3. Kaplan-Meier Nonparametric Estimates for Hazard Function $h(r)$

$$\hat{h}(r) = \frac{f_r}{n_r} \quad \begin{array}{l} \bullet \quad f_r : \text{the number of jobs terminated at } r \\ \bullet \quad n_r : \text{the number of jobs at risk at } r \end{array}$$

[Kaplan-Meier hazard estimates for the workers on *temporary-contracts*]



4. Effect of Reform on Hazard of Employment Termination

[Probit Model]

- Unobserved latent variable, Y_{it}^* , for a job i lasting at least t

$$Y_{it}^* = X_{it}\Pi + \sum_{r=2}^{30} \beta_r D_{rit} + \sum_{r=1}^{30} \delta_r (D_{rit} \cdot Post-job_i) + \varepsilon_{it}$$

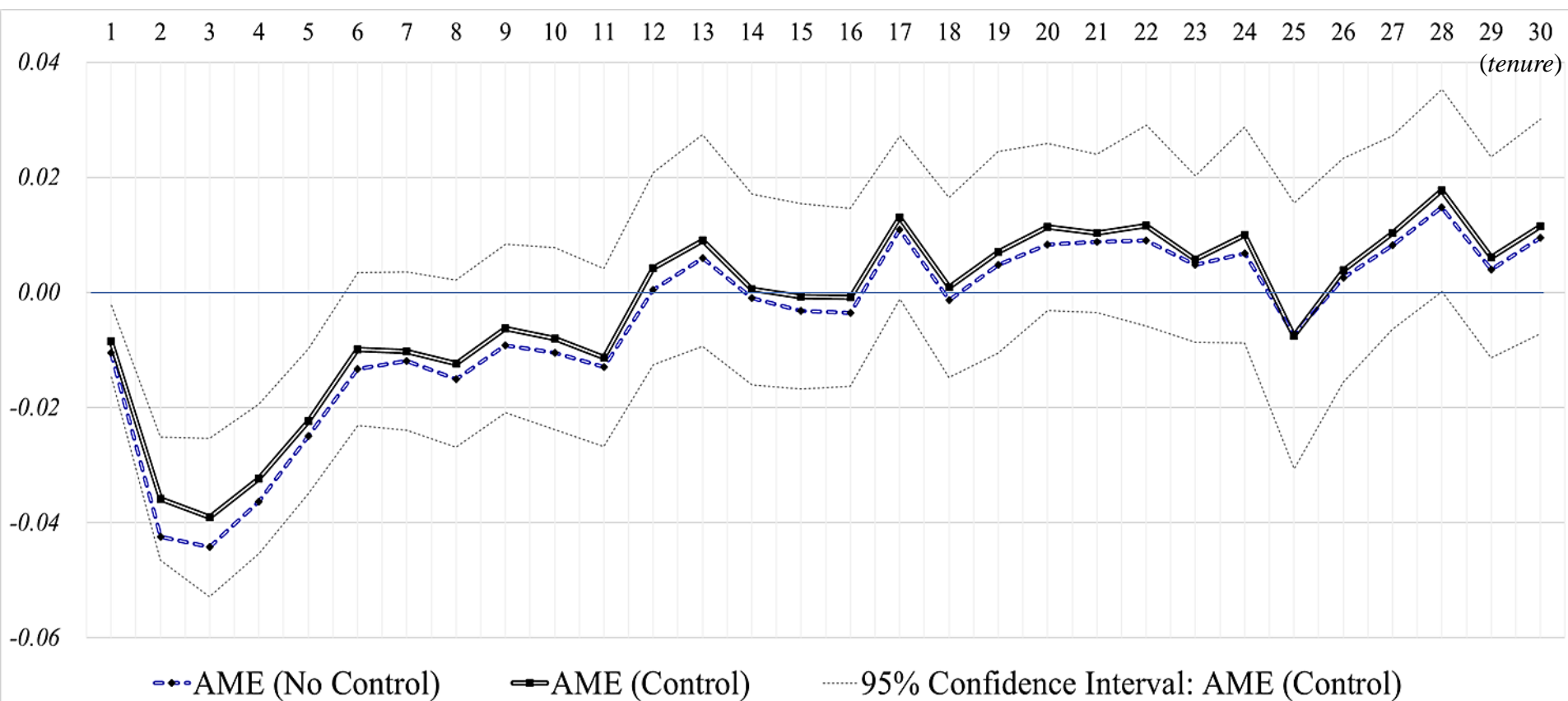
- The observed variable, $Y_{it} = 1\{Y_{it}^* \geq 0\}$
 - : Dummy variable indicating whether a job i terminated at t .
- ***Post-job_i*** : Treatment effect that has a value of one when a job began after the reform
- ***D_{rit}*** is a dummy identifying month of tenure (r) for a job.
 - **δ_r** : Effect of reform on hazard of employment termination at tenure r
- ***X_{it}*** is set of controls including
 - Worker characteristics (gender, marital status, education level, and age)
 - Job characteristics (firm size, occupation, and industry)
 - Macroeconomic conditions (the average unemployment rate)

4. Effect of Reform on Hazard of Employment Termination

- The observed variable, $Y_{it} = 1\{Y_{it}^* \geq 0\}$

$$Y_{it}^* = X_{it}\Pi + \sum_{r=2}^{30} \beta_r D_{rit} + \sum_{r=1}^{30} \delta_r (D_{rit} \cdot \text{Post-job}_i) + \varepsilon_{it}$$

[Average Marginal Effects]



4-1. Sensitivity test: Probit analysis with various sample periods

Sample period		2001 - 2016	2001 - 2013	2004 - 2010
		(Full sample)		
	Before	Jan. 2001 – Jun. 2007	Jan. 2001 – Jun. 2007	Jan. 2004 – Jun. 2007
	After	July. 2007 – Dec. 2016	July. 2007 – Dec. 2013	July. 2007 – Dec. 2010
δ_r : The coefficient of $[D_{rit} \cdot Post-job_i]$	D_1 * Post-job	-0.247***	-0.211**	-0.232*
	D_2 * Post-job	-0.474***	-0.449***	-0.374***
	D_3 * Post-job	-0.363***	-0.311***	-0.285***
	D_4 * Post-job	-0.319***	-0.296***	-0.222**
	D_5 * Post-job	-0.240***	-0.222***	-0.215**
	D_6 * Post-job	-0.104	-0.059	-0.087
	D_7 * Post-job	-0.103	-0.049	0.021
	D_8 * Post-job	-0.122*	-0.081	0.066
	D_9 * Post-job	-0.0619	-0.087	0.102
	D_{10} * Post-job	-0.078	-0.135	-0.106
	D_{11} * Post-job	-0.119	-0.117	-0.081
	D_{12} * Post-job	0.039	0.013	0.143

Sample size		85,530	74,874	40,933

4-2. Placebo test: Probit analysis with false reforms

		Placebo test I: False reforms on temporary-contract workers		Placebo test II: A false reform on selected regular worker groups	
		<i>A false reform in Jan. 2004</i>	<i>A false reform in Jan. 2013</i>	Regular workers covered by social insurance ¹	excluding exceptions of the regulation ²
Sample period		2001 - 2006	2010 - 2015	2001 - 2013	
	Before	Jan. 2001 – Dec. 2003	Jan. 2010 – Dec. 2012	Jan. 2001 – Jun. 2007	
	Reform	<i>A reform in Jan. 2004</i>	<i>A reform in Jan. 2013</i>	<i>A reform in July 2007</i>	
	After	Jan. 2004 – Dec. 2006	Jan. 2013 – Dec. 2015	Jul. 2007 – Dec. 2013	
δ_r : The coefficient of $[D_{rit} \cdot Post-job_i]$	D_1 * Post-job	0.095	-0.028	-0.105	-0.010
	D_2 * Post-job	0.092	0.120	0.032	-0.021
	D_3 * Post-job	0.143	-0.139	-0.255*	-0.205
	D_4 * Post-job	-0.027	-0.035	0.013	0.042
	D_5 * Post-job	0.039	-0.231**	-0.181	-0.219
	D_6 * Post-job	0.162	-0.192*	-0.039	-0.054
	D_7 * Post-job	-0.019	-0.069	-0.147	-0.137
	D_8 * Post-job	-0.163	-0.208*	-0.061	-0.126
	D_9 * Post-job	-0.245**	0.201*	0.056	0.039
	D_{10} * Post-job	0.093	0.243**	-0.056	-0.058
	D_{11} * Post-job	-0.041	0.166	0.006	-0.043
	D_{12} * Post-job	-0.080	0.124	0.001	0.016
	
Sample size		27,813	37,701	145,713	131,429

Note) 1. Social insurance programs in Korea include Unemployment insurance, National pension, National health insurance, and Industrial accident compensation insurance.

❖ Effects of Reform on Employment Termination

Firm's Perspective

- (H1) Replacement channel : replace the worker with new temporary worker
 - ➔ **Higher termination hazard** before the 24th month **(NOT CONFIRMED)**
- (H2) Recruitment channel : better recruitment practice → higher job matching quality
 - ➔ **Lower termination hazard** for workers with low tenure **(CONFIRMED)**
- (H3) Monitoring channel : higher monitoring effort & rigorous evaluation
 - ➔ **Higher termination hazard** for workers with low tenure **(NOT CONFIRMED)**

III. Analysis II : Effects of Reform on Workers' Effort

(H4) Temporary worker's strategic behavioral change : **Higher effort on the job**
→ **Lower termination hazard** throughout the period of fixed-term contract

Booth et al. (2002) and Engellandt and Riphahn (2005) use unpaid overtime work as a proxy for a workers' effort

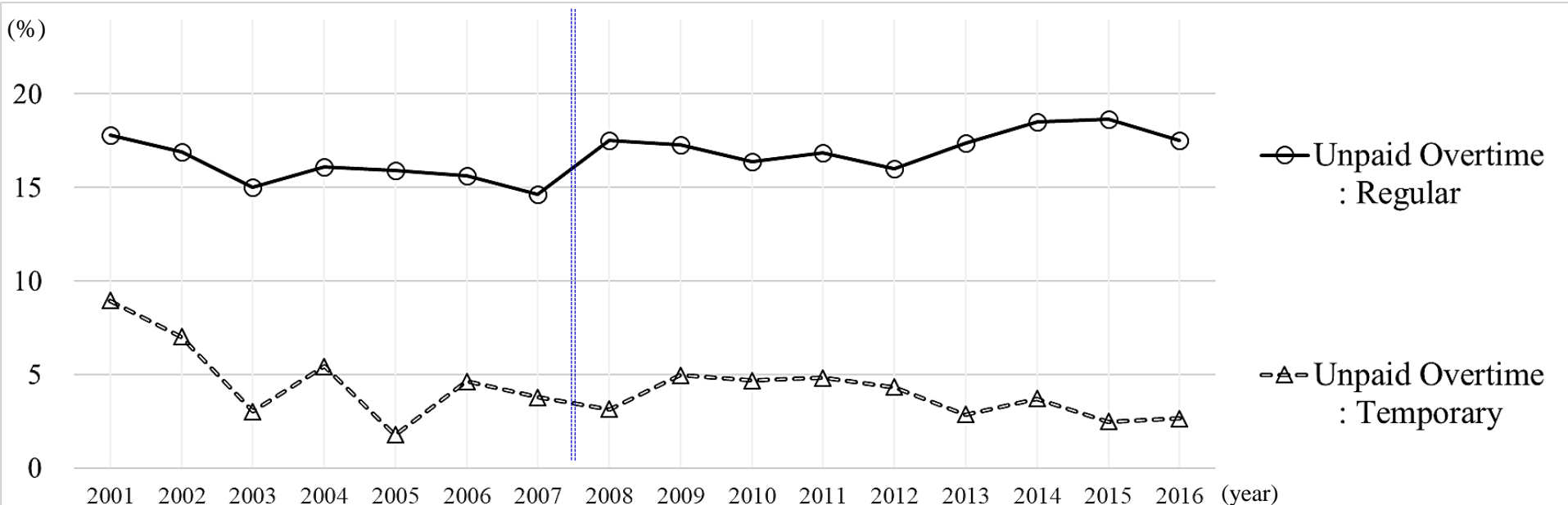
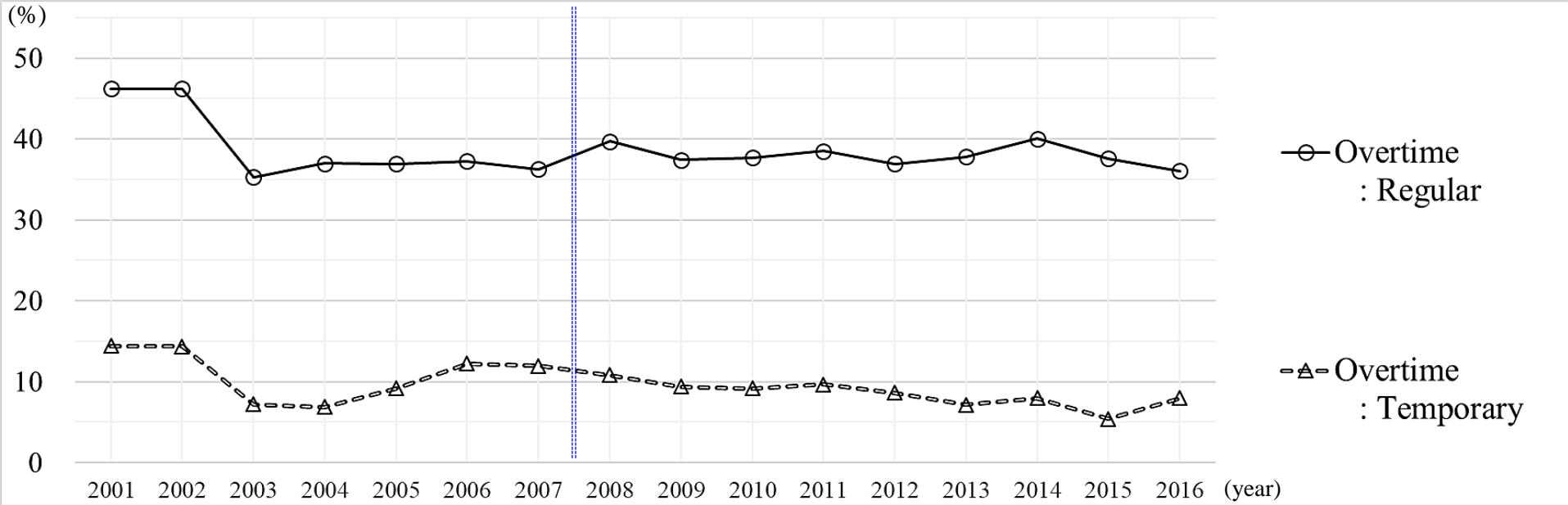
1. Dependent Variables as a Proxy for Workers' Effort

Continuous variables (<i>censored at zero</i>)	(1)	HR_{it} = Average weekly overtime hours (paid and unpaid)
	(2)	UHR_{it} = Average weekly unpaid overtime hours

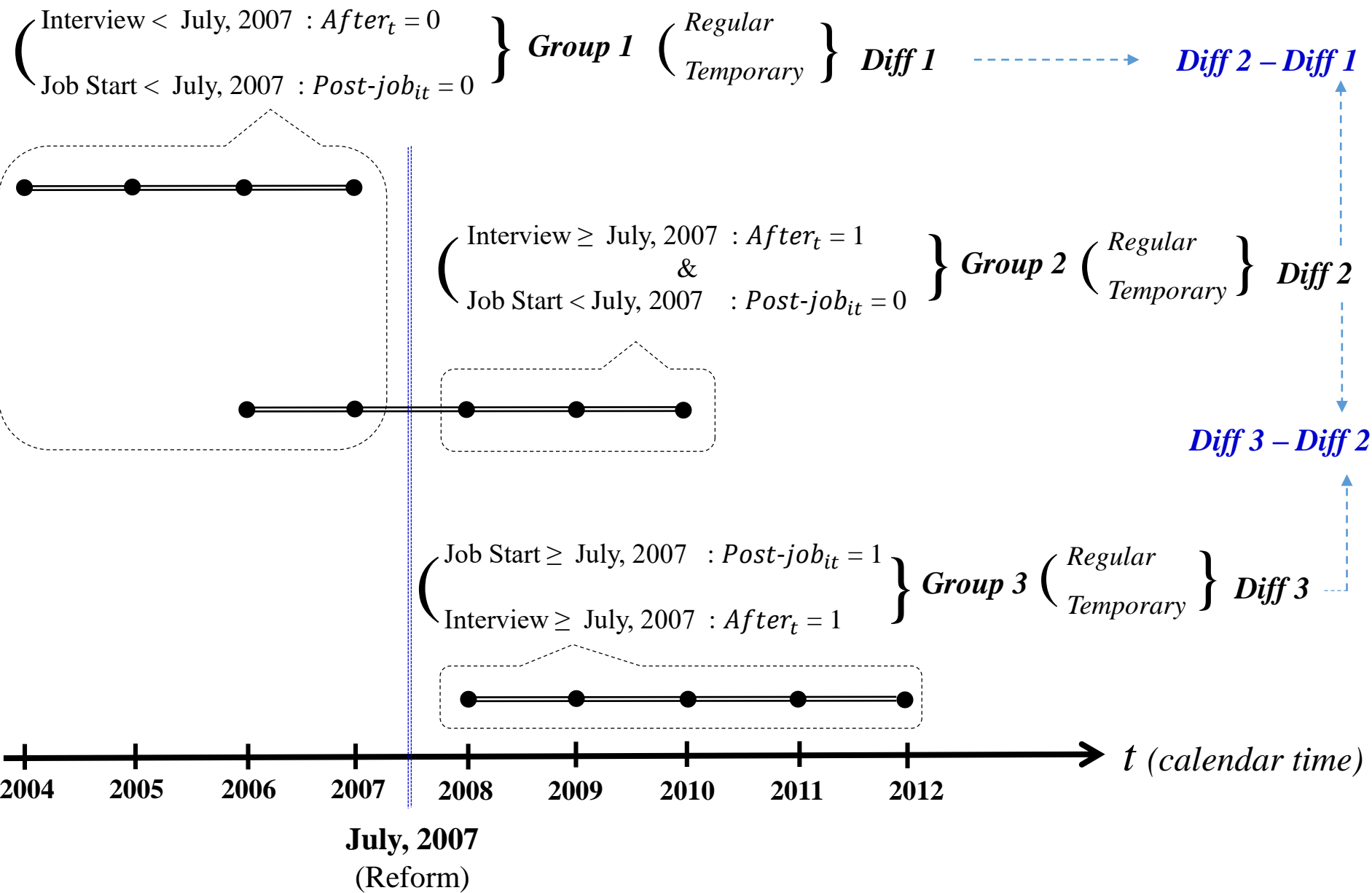
2. Data : KLIPS Data for Individuals

- Sample: *Temporary-contract* workers and selected *Regular* workers;
Panel structure – 16 waves surveyed between 2001 and 2016
- ※ Selected *Regular* workers : Employment contract periods are not pre-specified

3. Proportion of Workers Providing Overtime Hours



❖ Three Groups of Observations and Two Types of Treatment Effects



4. Effect of Reform on Workers' Overtime

$$Y_{it}^* = X_{it}\Pi + \beta_1 Temp_{it} + \beta_2 After_t + \beta_3 Post-job_{it}$$

$$+ \beta_4 [Temp_{it} \cdot After_t] + \beta_5 [Temp_{it} \cdot Post-job_{it}] + \varepsilon_{it}, \quad \text{where } Y_{it}^* = HR_{it}^* \text{ or } UHR_{it}^*$$

	(1) <i>HR_i</i> = average weekly overtime hours (paid & unpaid)	(2) <i>UHR_i</i> = average weekly hours of unpaid overtime
Variables	Tobit model	
Temp : β_1 (Temporary-contract)	-4.768*** (0.620)	-3.152*** (0.934)
After : β_2 (After=1, if surveyed after July, 2007)	1.484*** (0.389)	0.755 (0.596)
Post-job : β_3 (Post-job=1, if job began after July, 2007)	0.451 (0.403)	0.544 (0.573)
Temp x After : β_4	0.201 (1.107)	-0.186 (1.602)
Temp x Post-job : β_5	-1.097 (1.105)	-1.570 (1.553)
The Number of Observations	37,835 (The number of individuals: 8,497)	

(H4) Temporary worker's behavioral change : Higher effort on the job

➔ Lower termination hazard throughout the period of fixed-term contract

(NOT CONFIRMED)

IV. Conclusion

- ❑ Increased protection for temporary workers induces employers to improve recruitment process, which results in better-matched jobs.

- ❑ Temporary workers do not consider that reform help them be promoted to permanent employment.