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Do Growing Companies Pay Higher Wages?

An Empirical Analysis Using Employer-Employee Matched Data in Japan

Slight modifications were made after the presentation.

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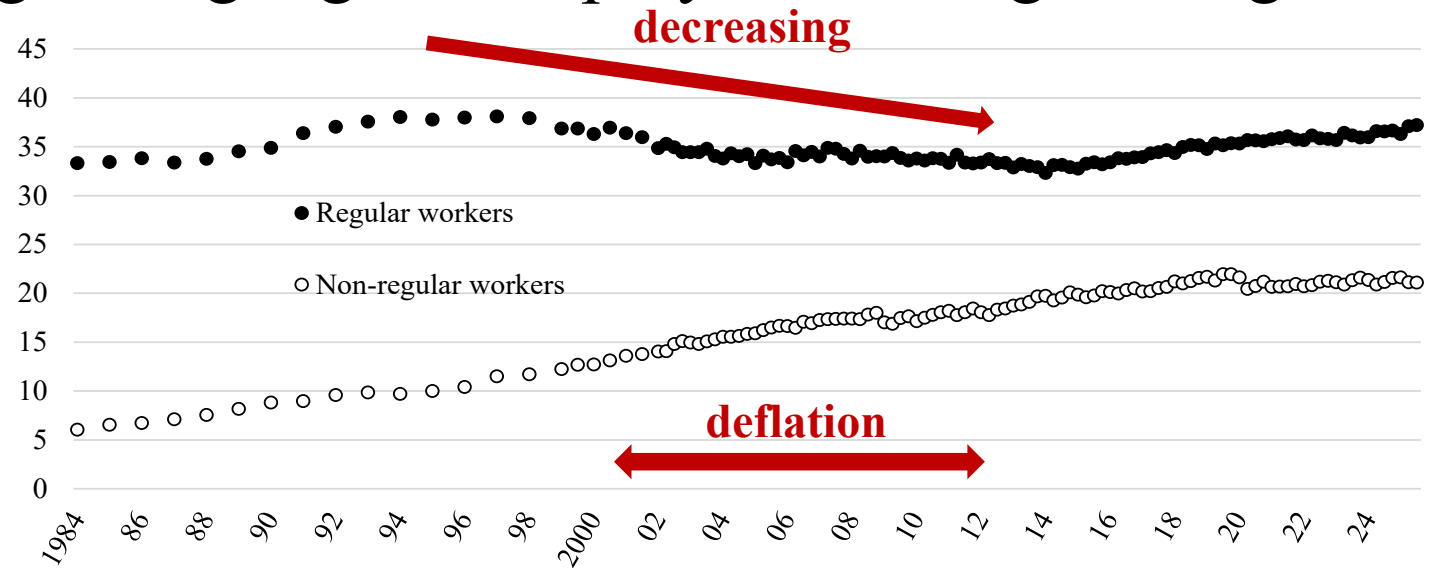
1. Introduction

- In Japan, the number of regular workers started to increase in 2015, after having decreased for more than a decade accompanied by a serious deflation (**Figure 1**).
- However, an important question is whether the quality—in particular, wage levels—of the growing regular employment is high enough.



Source: Ministry of Internal Affairs and Communications, *Labour Force Survey* (Detailed Tabulation).

Figure 1. Number of workers in Japan (million people)

- Generally, balancing employment growth and job quality is one of the most important policy agendas, and a large body of macro-level and industry-level analyses and policy prescriptions has been published (e.g., OECD 2018).

- At the same time, given Japan's decentralized wage determination system, clarifying the relationship between employment growth and wage levels at the company level is also essential.

- More specifically, wage levels differ not only by industry and occupation, but also by the productivity and HR policies of each company in Japan. This is why we need to examine the relationship between employment growth and wage levels at the company level.

- In this regard, Hara (2005) showed that companies with enterprise unions hired fewer new graduates in 2004, suggesting a negative relationship between wage levels and employment growth.
- There is also influential literature warning that low-wage companies pursuing cost-reduction strategies have become increasingly prevalent in the labor market (e.g., Konno 2012).

- Nevertheless, these studies do not directly address the issue of whether growing companies pay higher wages. Moreover, their conclusions may be specific to a deflationary period in which the number of regular workers was declining in the labor market as shown in **Figure 1**.
- This presentation aims to examine the relationship between employment growth and wage levels at the company level more directly and comprehensively.

2. Research Questions (Exploratory)

RQ1: Do growing companies pay higher wages, on average?

RQ2: Do growing companies have particular characteristics in terms of workers' and employers' attributes?

RQ3: Do growing companies pay higher wages (a wage premium) after controlling for workers' and employers' attributes?

RQ4: Are there particular mechanisms linking the average wage level and the wage premium of growing companies?

RQ5: Do the answers to the above questions differ by economic conditions?

3. Data and Variables

- Data: Japan's **establishment–worker matched survey***, *General Survey on Diversified Types of Employment*, conducted by the Ministry of Health, Labour and Welfare in 2014 and 2019.

  *Although the title of this presentation includes the term "company," the unit of analysis is the individual worker and the establishment.

- Dataset: A worker-level dataset, in which establishment-level information reported by HR managers was merged with individual workers' responses.

- Dependent variable: The logarithm of **the hourly wage (JPY) of individual regular workers**.

- Key independent variable: **A "growing" dummy**, indicating whether the HR manager reported that **the number of regular workers at the establishment had increased during the past three years**.

- Control variables: Gender, age, education, occupation, and job tenure (reported by individual workers); industry of establishments, firm size*, and type of establishments (reported by HR managers).

  * Although reported by HR managers at establishments, this variable refers to firm-level information.

- Number of observations: 7,239 workers in 2014; 4,661 workers in 2019.

- **Table 1** presents the descriptive statistics. It shows that:
  - In 2014, 32.3% of regular workers were employed in growing establishments, and the figure increased to 38.9% in 2019, probably reflecting the overall trend of the labor market.
  - From 2014 to 2019, the male ratio of regular workers declined, and they became older, consistent with the overall trend of the labor market.

Table 1. Descriptive statistics (continued)

	2014					2019				
	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Dependent variable										
Ln (hourly wage) (JPY)	7239	7.416	0.37	6.215	8.923	4661	7.449	0.36	6.272	8.923
Independen variable										
Growing	7239	0.323	0.47	0	1	4661	0.389	0.49	0	1
Control variables (individual worker)										
Male	7239	0.686	0.46	0	1	4661	0.660	0.47	0	1
Age	7239	40.438	10.09	17.5	57.5	4661	41.858	10.05	17.5	57.5
Education										
Junior high school	7239	0.011	0.10	0	1	4661	0.010	0.10	0	1
High school	7239	0.316	0.46	0	1	4661	0.303	0.46	0	1
Specialized Training College	7239	0.126	0.33	0	1	4661	0.112	0.32	0	1
Junior college and technical college	7239	0.093	0.29	0	1	4661	0.105	0.31	0	1
University	7239	0.427	0.49	0	1	4661	0.440	0.50	0	1
Graduate School	7239	0.027	0.16	0	1	4661	0.031	0.17	0	1
Occupation										
Administrative and managerial	7239	0.176	0.38	0	1	4661	0.205	0.40	0	1
Professional and engineering	7239	0.166	0.37	0	1	4661	0.187	0.39	0	1
Clerical	7239	0.403	0.49	0	1	4661	0.371	0.48	0	1
Sales	7239	0.080	0.27	0	1	4661	0.072	0.26	0	1
Service	7239	0.056	0.23	0	1	4661	0.051	0.22	0	1
Security	7239	0.004	0.07	0	1	4661	0.004	0.06	0	1
Manufacturing process	7239	0.060	0.24	0	1	4661	0.052	0.22	0	1
Transport and machine operation	7239	0.020	0.14	0	1	4661	0.024	0.15	0	1
Construction and mining	7239	0.020	0.14	0	1	4661	0.015	0.12	0	1
Carrying, cleaning, packaging and related	7239	0.014	0.12	0	1	4661	0.019	0.14	0	1
Other	7239	0.002	0.04	0	1	4661	0.001	0.03	0	1
Job tenure (years)	7239	12.694	8.48	0.125	25.000	4661	12.521	8.69	0.125	25.000

The ratio of regular workers employed in growing establishments increased.

the ratio of male regular workers dropped, and regular workers become older

Table 1 (continued)

	2014					2019				
	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Control variables (establishment)										
Industry										
Mining	7239	0.001	0.03	0	1	4661	0.000	0.02	0	1
Construction	7239	0.083	0.28	0	1	4661	0.077	0.27	0	1
Manufacturing	7239	0.227	0.42	0	1	4661	0.214	0.41	0	1
Electricity, gas, heat supply and water	7239	0.007	0.08	0	1	4661	0.004	0.07	0	1
Information and communications	7239	0.044	0.21	0	1	4661	0.044	0.21	0	1
Transport and postal services	7239	0.076	0.26	0	1	4661	0.073	0.26	0	1
Wholesale trade	7239	0.090	0.29	0	1	4661	0.089	0.29	0	1
Retail trade	7239	0.074	0.26	0	1	4661	0.077	0.27	0	1
Finance and Insurance	7239	0.042	0.20	0	1	4661	0.039	0.19	0	1
Real estate and goods rental and leasing	7239	0.018	0.13	0	1	4661	0.017	0.13	0	1
Scientific research, professional and technical services	7239	0.034	0.18	0	1	4661	0.035	0.18	0	1
Accomodation, eating and drinking services	7239	0.049	0.22	0	1	4661	0.046	0.21	0	1
Living-related and personal serivices and amusement services	7239	0.032	0.17	0	1	4661	0.028	0.17	0	1
Education and learning support	7239	0.025	0.16	0	1	4661	0.033	0.18	0	1
Medical, health and welfare	7239	0.139	0.35	0	1	4661	0.147	0.35	0	1
Compound services	7239	0.010	0.10	0	1	4661	0.011	0.11	0	1
Other services	7239	0.051	0.22	0	1	4661	0.063	0.24	0	1
Firm size										
1,000 employees or more	7239	0.331	0.47	0	1	4661	0.316	0.46	0	1
500–999 employees	7239	0.092	0.29	0	1	4661	0.094	0.29	0	1
300–499 employees	7239	0.071	0.26	0	1	4661	0.087	0.28	0	1
100–299 employees	7239	0.160	0.37	0	1	4661	0.149	0.36	0	1
50–99 employees	7239	0.089	0.28	0	1	4661	0.089	0.29	0	1
30–49 employees	7239	0.062	0.24	0	1	4661	0.067	0.25	0	1
5–29 employees	7239	0.195	0.40	0	1	4661	0.199	0.40	0	1
Type of establishment										
Office	7239	0.326	0.47	0	1	4661	0.298	0.46	0	1
Factory	7239	0.236	0.42	0	1	4661	0.240	0.43	0	1
Research laboratory	7239	0.013	0.11	0	1	4661	0.014	0.12	0	1
Sales office	7239	0.115	0.32	0	1	4661	0.137	0.34	0	1
Store	7239	0.110	0.31	0	1	4661	0.122	0.33	0	1
Other	7239	0.200	0.40	0	1	4661	0.190	0.39	0	1

4. Results (1): Basic Wage Determinants

- **Table 2** presents the results of ordinary least squares (OLS) regressions of wages on all control variables.
- It shows that the estimated wage determinants are consistent with previous findings in the literature (e.g., Tachibanaki 1996; Takahashi 2018), suggesting that the wage information in these datasets is reliable.
- For example:
  - Men earn more than women
  - Age and job tenure affect wages positively
  - Tertiary education, managerial and professional jobs, and being employed in larger firms affect wages positively

Table 2. Determinants of wages (OLS)

Dependent variable = Ln (hourly wage)	2014 B	2014 S.E.		2019 B	2019 S.E.	
Male	0.172	0.009	***	0.145	0.010	***
Age	0.010	0.000	***	0.006	0.001	***
Education (High school)						
Junior high school	-0.084	0.032	**	0.019	0.042	
Specialized Training College	0.058	0.011	***	0.016	0.015	
Junior college and technical college	0.002	0.013		-0.021	0.016	
University	0.092	0.009	***	0.101	0.011	***
Graduate School	0.163	0.022	***	0.136	0.026	***
Occupation (Clerical)						
Administrative and managerial	0.090	0.010	***	0.148	0.012	***
Professional and engineering	0.046	0.010	***	0.050	0.013	***
Sales	-0.010	0.015		-0.067	0.018	***
Service	-0.073	0.016	***	-0.034	0.021	
Security	-0.129	0.052	*	-0.256	0.069	***
Manufacturing process	-0.030	0.016		-0.076	0.021	***
Transport and machine operation	-0.028	0.025		0.019	0.031	
Construction and mining	0.121	0.027	***	0.097	0.037	**
Carrying, cleaning, packaging and related	-0.042	0.029		-0.147	0.032	***
Other	-0.097	0.079		0.072	0.141	
Job tenure	0.010	0.001	***	0.013	0.001	***
Industry (Manufacturing)						
Mining	-0.028	0.124		0.021	0.219	
Construction	-0.003	0.017		0.021	0.023	
Electricity, gas, heat supply and water	0.180	0.042	***	0.168	0.064	**
Information and communications	0.082	0.020	***	0.023	0.026	
Transport and postal services	0.010	0.018		-0.066	0.024	**
Wholesale trade	0.038	0.017	*	0.080	0.022	***
Retail trade	-0.089	0.020	***	-0.049	0.027	
Finance and Insurance	0.049	0.021	*	-0.011	0.028	
Real estate and goods rental and leasing	0.046	0.027		0.012	0.036	
Scientific, professional and technical services	0.032	0.022		0.064	0.029	*
Accomodation, eating and drinking services	-0.109	0.020	***	-0.153	0.028	***
Living-related, personal and amusement services	0.002	0.023		-0.082	0.031	**
Education and learning support	0.021	0.027		-0.085	0.030	**
Medical, health and welfare	-0.006	0.019		-0.074	0.024	**
Compound services	-0.114	0.035	**	-0.100	0.043	*
Other services	-0.071	0.018	***	0.012	0.023	
Firm size (1,000 employees or more)						
500–999 employees	-0.068	0.012	***	-0.051	0.015	**
300–499 employees	-0.071	0.014	***	-0.082	0.016	***
100–299 employees	-0.124	0.010	***	-0.055	0.013	***
50–99 employees	-0.118	0.013	***	-0.124	0.016	***
30–49 employees	-0.110	0.015	***	-0.126	0.018	***
5–29 employees	-0.145	0.011	***	-0.143	0.013	***
Type of establishment (Office)						
Factory	-0.048	0.013	***	-0.016	0.018	
Research laboratory	0.036	0.031		0.007	0.040	
Sales office	-0.073	0.012	***	0.003	0.014	
Store	-0.038	0.015	**	-0.030	0.018	
Other	-0.028	0.013	*	0.015	0.016	
Constant	6.821	0.021	***	6.972	0.029	***
N		7239			4661	
F-statistic		121.085	***		76.312	***
Adjusted R^2		0.427			0.421	

Note: *** p<0.001, ** p<0.01, * p<0.05.

4. Results (2): Workers' and Employers' Attributes

- **Table 3** compares the workers' and employers' attributes of "growing" and "not growing" establishments.
- Workers in growing establishments are paid lower on average in 2014 ($p < 0.01$), but slightly higher in 2019 (n.s.).
- In both 2014 and 2019, workers in growing establishments are younger, more educated, more likely to be women, more likely to be in professional and engineering occupations, and more likely to have shorter job tenure.
- In both 2014 and 2019, growing establishments are more likely to be in the medical, health, and welfare industry, more likely to belong to large firms, and less likely to be sales offices or stores.

Table 3. Comparison of "growing" and "not growing" establishments (continued)

	2014			2019		
	Not growing		Growing	Not growing		Growing
N	4,903		2,336	2,846		1,815
Hourly wage (average: JPY)	1676.8		1633.1	1704.9		1739.0
Male	71.3%		62.8%	67.0%		64.5%
Female	28.7%	<	37.2%	33.0%	<	35.5%
Age (average)	41.0	>	39.2	42.6	>	40.8
Junior high school	1.0%		1.4%	1.0%		1.1%
High school	33.8%	>	26.9%	33.4%	>	25.3%
Specialized Training College	12.2%		13.4%	11.0%		11.5%
Junior college and technical college	9.1%		9.6%	11.2%		9.4%
University	41.1%	<	46.1%	41.1%	<	48.5%
Graduate School	2.8%		2.6%	2.4%		4.2%
Administrative and managerial	18.1%		16.4%	20.5%		20.6%
Professional and engineering	14.7%	<	20.7%	17.6%	<	20.5%
Clerical	39.0%	>	42.9%	37.6%		36.1%
Sales	9.3%	>	5.1%	7.7%		6.2%
Service	6.0%		4.7%	4.7%		5.7%
Security	0.4%		0.4%	0.3%		0.4%
Manufacturing process	6.5%		4.9%	5.6%		4.8%
Transport and machine operation	2.5%		1.1%	2.6%		2.1%
Construction and mining	1.8%		2.4%	1.4%		1.6%
Carrying, cleaning, packaging and related	1.4%		1.3%	1.8%		1.9%
Other	0.2%		0.0%	0.1%		0.0%
Job tenure (average: years)	13.5	>	11.0	13.2	>	11.5

Workers in growing establishments are:

- Paid lower on average in 2014, but slightly higher in 2019
- More likely to be women
- Younger
- More educated
- More likely to be in professional and engineering occupations, and less likely to be in clerical and sales occupations
- More likely to have shorter job tenure

Table 3 (continued)

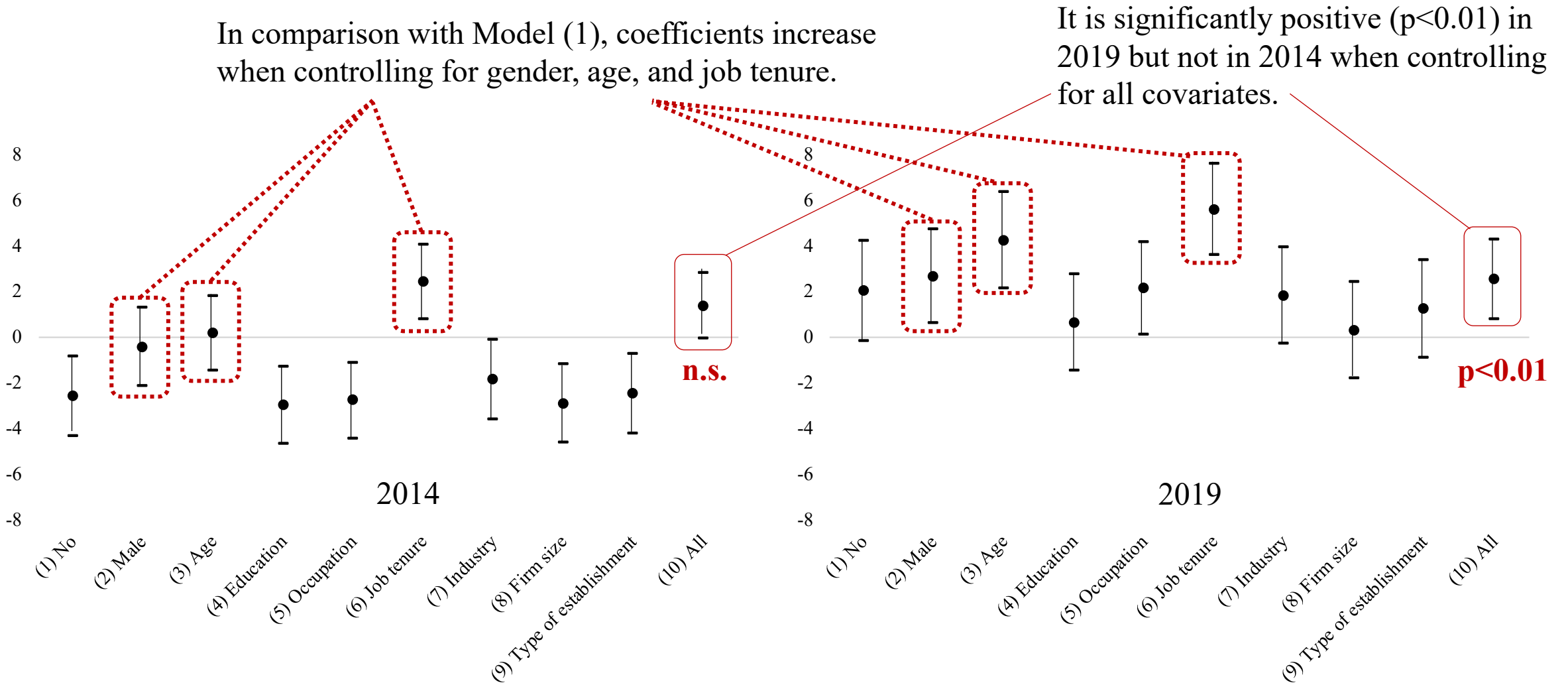
	2014		2019	
	Not growing	Growing	Not growing	Growing
Mining	0.1%	0.1%	0.0%	0.0%
Construction	8.6%	7.8%	8.2%	6.9%
Manufacturing	23.6%	20.8%	20.1%	23.5%
Electricity, gas, heat supply and water	0.8%	0.4%	0.6%	0.2%
Information and communications	4.3%	4.7%	3.5%	6.0%
Transport and postal services	8.3%	6.0%	7.4%	7.1%
Wholesale trade	9.3%	8.3%	9.5%	8.0%
Retail trade	8.7%	> 4.7%	8.2%	7.0%
Finance and Insurance	4.4%	3.7%	4.7%	2.7%
Real estate and goods rental and leasing	1.5%	2.3%	1.4%	2.3%
Scientific, professional and technical services	3.3%	3.5%	3.5%	3.5%
Accomodation, eating and drinking services	5.2%	4.4%	6.2%	> 2.1%
Living-related, personal and amusement services	3.7%	2.0%	3.4%	2.0%
Education and learning support	2.2%	3.0%	3.6%	2.9%
Medical, health and welfare	9.9%	< 22.2%	12.5%	< 18.1%
Compound services	1.3%	0.4%	1.5%	0.6%
Other services	4.8%	5.9%	5.7%	7.2%
1,000 employees or more	33.2%	32.9%	29.1%	< 35.5%
500–999 employees	8.2%	< 11.2%	7.6%	< 12.1%
300–499 employees	6.6%	8.2%	9.0%	8.4%
100–299 employees	15.7%	16.6%	14.6%	15.3%
50–99 employees	8.4%	10.1%	9.0%	8.8%
30–49 employees	6.8%	4.8%	7.3%	5.6%
5–29 employees	21.1%	> 16.3%	23.4%	> 14.3%
Office	32.6%	32.7%	29.1%	30.9%
Factory	24.4%	22.0%	23.2%	25.3%
Research laboratory	1.4%	1.1%	1.2%	1.7%
Sales office	12.6%	> 9.0%	13.7%	13.5%
Store	13.0%	> 6.8%	14.8%	> 8.0%
Other	16.0%	< 28.4%	18.0%	< 20.5%

Growing establishments are:

- More likely to be in the medical, health, and welfare industry, and less likely to be in retail trade and accommodation, eating and drinking services
- More likely to belong to large firms
- Less likely to be sales offices or stores

4. Results (3): Changes in the Coefficients of "Growing" Dummy When Controlling for Covariates

- **Figure 2** presents OLS coefficients of the "growing" dummy controlling for covariates, expressed as percentage differences.
- Both in 2014 and 2019, the coefficients become more positive when controlling for gender, age, and job tenure.
- The coefficient is significantly positive ($p<0.01$) in 2019 but not in 2014 when controlling for all covariates.



Note: Vertical bars indicate 95% confidence intervals.

Figure 2. OLS coefficients of the "growing" dummy controlling for covariates (1)–(10) (expressed as percentage differences)

5. Conclusion and Future Research

- On average, growing companies (establishments) paid lower in 2014, but slightly higher in 2019 (RQ1); a wage premium was found in 2019, but not in 2014 (RQ3).
- Reflecting employment practices in Japan, growing companies employed a higher proportion of women and young workers and had shorter average job tenure, regardless of the survey year (RQ2).
- These compositional characteristics help explain why the average wage of growing companies was not significantly higher in 2019 and was even lower in 2014 (RQ4).
- The absence of a wage premium in growing companies in 2014 may reflect cost-reduction strategies adopted by these companies under Japan's deflationary conditions between 2001 and 2012 (RQ5).

- This conclusion needs to be confirmed and updated using more recent data. In particular, the *General Survey on Diversified Types of Employment* was conducted in 2024, and its data will become available in 2026.
- The business and HR strategies of growing companies across different periods also need to be examined empirically.
- The causal relationship between company growth and the wage premium also needs to be examined.
- Finally, this presentation analyzed only the relationship between increases in the number of regular workers and the wages of individual regular workers. Future research should employ data and models that account for both regular and non-regular workers.

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Thank you for your attention.