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Why Wages Have Not Been Raised Even Facing a Labor Shortage?^{*1} – Analysis Based on Business Outlook Survey and Financial Statements Statistics of Corporations by Industry –

Policy Research Institute
MASUI Tsubasa^{*2}, OKU Ai^{*3}

Abstract

Real wage growth has been stagnant even during a labor shortage in Japan. We analyze how firm managers that face a labor shortage try to respond to their situation, and what types of firms try to raise wages as a solution for a labor shortage. We find that the firms facing a labor shortage are more willing to raise wages than the firms with adequate employees. Furthermore, we also find that the firms whose managers chose to raise wages to deal with the labor shortage are characterized by (1) a small size (in terms of capital stock), (2) relatively low wage levels, and (3) industries such as accommodation, eating and drinking services, and miscellaneous services.

1. Introduction

The population in Japan is expected to continue declining. There is no vaccine for stopping a declining population. Even though the economy will recover from the COVID-19 shock, the trend of a labor shortage will continue. Based on economic theory, a labor shortage causes a rise in wages in the labor market. However, real wage growth has been stagnant even during a labor shortage in Japan. Many labor economists and specialists have tried to analyze this phenomenon, and issued the book titled “*Hitodebusoku nanoni naze chingin ga agara nai no ka* (in Japanese)” (Genda ed., 2017).¹ In this paper, we try to explore how the firms facing a labor shortage manage their operations.

First, we look into government survey results regarding firms’ labor shortage conditions and their operational responses. According to *Annual Report on the Japanese Economy and Public Finance*

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^{*2} Policy Research Institute, Econometric Analysis Officer

^{*3} Policy Research Institute, Chief Economist

¹ The authors of this paper tentatively translated the book title to English as “Why Wages Have Not Been Raised Even Under a Labor Shortage”.

2019 (Cabinet Office, 2019),² the most frequent answer was “increase new recruits and mid-career employment.” In addition, according to *White Paper on the Labour Economy 2019* (Ministry of Health, Labour and Welfare, 2019),³ the most frequent answer from the firms struggling with a labor shortage was “raising wages at the time of recruitment.” Among the firms in the surveys, especially focusing on the firms facing a labor shortage, the answers were “expanding the employment targets such as relaxing the application requirements, etc.” and “strengthening employment of new graduates.”

According to *Business Outlook Survey July-September 2019*, the most frequent answer from the large and medium-sized firms (based on capital stock) was “strengthening the human resources development.” In the case of the small-sized firms, the most frequent answer was “raising wages (including starting wages).” Focusing on the large-sized firms, the most frequent answer from manufacturing firms were “strengthening the human resources development” and “raising wages (including starting wages),” while those from non-manufacturing firms were “strengthening the human resources development” and “reviewing business processes.”

Hashimoto (2020) points to the result of the survey that the small-sized firms consider improving the treatment of employees to be more important compared to the large and medium-sized firms. She also mentions that manufacturing firms consider having skilled employees to be more important, while non-manufacturing firms consider improving operational efficiency to be more important.

In this paper, we will clarify how firm managers that who face a labor shortage try to respond to their situation, and what types of firms try to raise wages as a solution for a labor shortage. We use microdata from *Business Outlook Survey* to make more detailed analysis than Hashimoto (2020). This paper is composed of four sections. In Section 2, we show the data we use. In Section 3, we explain the results of the analyses. Section 4 is a summary.

2. Data

The data used in this paper is the microdata from *Business Outlook Survey July-September 2019*⁴ and *Financial Statements Statistics of Corporations by Industry FY 2018*.⁵ The total number of responses of *Business Outlook Survey July-September 2019* was 11,667 (82.4% response rate), and that of *Financial Statements Statistics of Corporations by Industry FY 2018* was 28,107 (76.2% response rate).

² This survey was based on *Survey on Corporate Awareness of Diversified Workforce* which was conducted from February 4th to 22nd in 2019, and obtained 2,147 valid responses (26.8% response rate). All choices of the questionnaires are on Figure 1-3-6 of *Annual Report on the Japanese Economy and Public Finance 2019* (Cabinet Office, 2019).

³ This survey was based on *Survey on Current Status of Labour Shortage and Work styles, etc. (Company Questionnaire)* (The Japan Institute for Labour Policy and Training, 2019), and the survey was conducted on firms with 20 or more employees and on full-time employees from March 1st to 20th in 2019, and obtained 4,599 valid responses (23.0% response rate). All choices of the questionnaire are on Figure 2-(1)-13 of *White Paper on the Labour Economy 2019* (Ministry of Health, Labour and Welfare, 2019).

⁴ The reference day of the survey was August 15, 2019.

⁵ It was conducted during the fiscal period from April 2018 to March 2019 (FY 2018).

2.1 Data from *Business Outlook Survey*

The reason we use the data from *Business Outlook Survey* is to analyze firm managers' minds. The survey asked managers of each firm about their employees' excess/shortage level and their operational responses.⁶ We use microdata from the survey, which was not used in Hashimoto (2020), to analyze more detailed points. Each questionnaire that we use in this paper is as follows.

2.1.1 Managers' judgement on employees' shortage level

Business Outlook Survey asks managers about their judgement on employees' excess/shortage level. Managers chose the answer among "insufficient," "adequate," "excessive," or "unknown." We use the results of this questionnaire to judge employees' shortage level of each firm.

2.1.2 Managers' operational responses based on their employees' shortage level

Business Outlook Survey July-September 2019 asked managers "How does your firm try to keep your employees?"⁷ This questionnaire was only conducted in that period. Managers chose up to three choices based on the level of importance out of ten choices (Table 1).⁸

Table 1: Answers to "How does your firm try to keep your employees?"

1. Raising wages (including starting wages)
2. Enhancing employees' welfare
3. Strengthening human resources development
4. Relaxing application requirements
5. Converting from a temporary to permanent hiring contract, utilization of various regular employees' programs
6. Introducing telework/flextime
7. Reviewing business processes
8. Rehiring retirees or extending retirement age
9. Hiring foreign workers
10. Others

(Source) *Business Outlook Survey* July-September 2019.

⁶ In *Business Outlook Survey*, the questionnaire of employees' excess/shortage level is conducted each year, while the questionnaire of managers' responses was only conducted in the July-September 2019 survey.

⁷ Both permanent and temporary employees are included.

⁸ There is a note, "If it is difficult to choose three, please choose two or one," on the questionnaire.

2.2 Firms' Financial Statements

We use the financial statement data from *Financial Statements Statistics of Corporations by Industry* FY 2018 to analyze the financial condition of each firm. We assume that managers' decisions might be affected by their firm's financial condition of the previous year.

2.3 Data connection

We connected the data from *Business Outlook Survey* and the data from *Financial Statements Statistics of Corporations by Industry* (excluding finance and insurance).⁹ The connected data is classified by categories in Table 2.¹⁰ The firms of *Business Outlook Survey* are selected from among the firms in *Financial Statements Statistics of Corporations by Industry*. The firms' capital, contributions, or funds are 10 million yen or more (unconsolidated basis), and their head offices are located in Japan.¹¹

Table 2: Classification by categories

Industries		Firm sizes	
Manufacturing	1,831	Under 10 employees	220
Construction	247	10-100	967
Real estate	286	100-500	1,528
Wholesale trade	464	500-1,000	712
Retail trade	236	1,000-5,000	862
Information and communication	334	5,000-10,000	139
Transport and postal services	256	10,000 employees or over	87
Other services	724	Total	4,515
Other non-manufacturing	137		
Total	4,515		

(Source) *Business Outlook Survey* July-September 2019 and *Financial Statements Statistics of Corporations by Industry* FY 2018.

⁹ When connecting the data, we usually use the same firm number of both surveys if both data are in the same fiscal year. The firm data we use in this paper are not in the same fiscal year (there is a possibility to assign the firm's number to another firm, especially in the small-medium size firms), so we select the firms based on region, capital, and industry to confirm whether the firm of both surveys are the same firm. We used the data of the firms that answered the question "How does your firm try to keep your employees?" and excluded the firms with no employees.

¹⁰ We combined several industries into one category; "Other services" includes accommodations, eating and drinking services, goods rental, services for amusement and hobbies, research, professional and technical services and miscellaneous services. "Other non-manufacturing" includes agriculture, forestry and fisheries, mining and quarrying of stone and gravel, and electricity, gas and water supply.

¹¹ The annual survey of *Financial Statements Statistics of Corporations by Industry* covers all commercial firms in Japan.

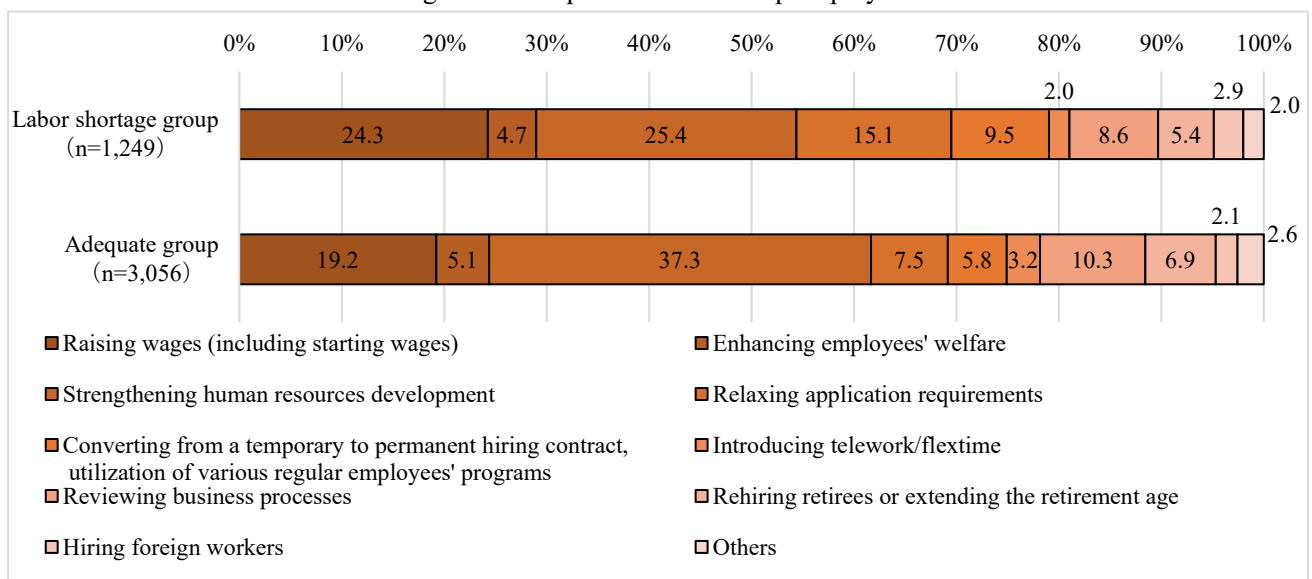
3. Analysis and Results

3.1 How firms deal with a labor shortage

First, we divide the firms’ data into two groups based on the managers’ judgements regarding employees’ excess/shortage level from *Business Outlook Survey* (2.1.1 above). The group in which managers chose the answer of “insufficient” is called the “labor shortage group,” and the group in which managers chose “adequate” is called the “adequate group.”

Next, we use the answers of the “How does your firm try to keep your employees?” questionnaire (2.1.2 above) of each group to analyze what kinds of action will be taken to keep employees. The purpose of this analysis is to investigate whether managers have some tendency when they decide their solutions depending on their employees’ shortage level. We analyzed the microdata from *Business Outlook Survey* to explore whether there is any difference between these groups. The results are shown in Figure 1.

Figure 1: Groups’ methods to keep employees



(Note) We exclude the firms that chose “excessive,” “unknown,” or no answer.

(Source) *Business Outlook Survey* July-September 2019.

Figure 1 shows that the most frequent answer is “strengthening human resources development” in both groups, and the adequate group (37.3%) has a higher percentage than the labor shortage group (25.4%). The answer which was chosen second in both groups is “raising wages,” and the labor shortage group (24.3%) has a higher percentage than the adequate group (19.2%).¹²

¹² This paper only counts the first choice in order to analyze which measure is considered the most important to firm managers.

3.2 Types of the firms highly motivated to raise wages in the labor shortage group

Next, we try to analyze the financial types of the firms that are highly motivated to raise wages to deal with a labor shortage. Especially, we focus on financial conditions of the firms that chose to raise wages as the most important answer for the solution among the labor shortage group in Figure 1.

In our analysis, we divided the labor shortage group into two groups (“the raising wages group” and “the other group”) to examine the significant differences regarding financial indicators or industry characteristics. The raising wages group is the firms choosing to raise wages as the most important solution. The other group is all the others.

We use the following financial indicators for comparison. Each indicator’s formula is in Table 3.

- Wages per employee - managers’ motivation to raise wages might be based on current wage levels.
- Cash flow - firms might need surplus funds to raise wages.
- Sales - firms’ output might affect the number of employees.
- The number of employees and the amount of capital stock - the size of the firms might affect the solutions (the results of *Business Outlook Survey* imply that the small-sized firms have more tendency to choose to raise wages).
- Interest-bearing debt ratio - firms with excess debt might choose the way not to spend too much for dealing with their labor shortage.
- Labor equipment ratio - labor shortage firms might have a motivation to replace labor to capital.
- Labor productivity - firms’ productivity might affect management policy decisions.

Table 3: Formula of the indicators used in this paper

Indicator	Formula
Wages per employee	(employees’ salaries + employees’ bonus + welfare expenses) / number of employees
Cash flow ¹³	((net profits for the period + depreciation expenses + special depreciation expenses – (special profits – special losses) – difference of beginning of year and end of year net operating capital) – (difference of beginning of year and end of year tangible fixed assets and difference of beginning of year and end of year intangible fixed assets + depreciation expenses)) / total assets
Sales	Natural logarithm
Number of employees	Natural logarithm
Capital stock	Natural logarithm
Interest-bearing debt ratio	(short-term borrowings + long-term borrowings + bonds) ¹⁴ / net worth
Labor equipment ratio	(land + other tangible fixed assets (excluding construction in process)) / number of employees and directors ¹⁵

¹³ Refer to Nakamura (2017).

¹⁴ Refer to Shima (2017).

¹⁵ Small-sized firms do not usually distinguish duties between employees and directors, so we included both the numbers in “capital equipment ratio” and “labor productivity” in the above formula.

Labor productivity	added value ¹⁶ / number of employees and directors
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We obtained the following results (Table 4).¹⁷ First, “the raising wages group” tends to have lower wages levels per employee and lower capital stock compared with “the other group”. On the other hand, there are no statistically significant differences regarding cash flow, sales, the number of employees, interest-bearing debt ratio, labor equipment ratio, and labor productivity.

Secondly, we confirm that the industries which have statistically significant results of our analysis are manufacturing, information and communication, and “other services”. Judging from the results in Figure 4, we find that the proportion of the industries choosing to raise wages is smaller among manufacturing and information and communication industries. However, it is larger among “other services” industries. This “other services” herein mainly includes accommodation, eating and drinking services, and miscellaneous services. Since Hashimoto (2020) uses the aggregated data, it is difficult to distinguish each industry which composes the non-manufacturing industries as a category. Therefore, we use the microdata to divide the non-manufacturing industries into each industry.

As a result, we find that the firms of the information and communication industry tend not to choose to raise wages as the most important solution to deal with their labor shortage. On the other hand, the firms of “other services” relatively tend to choose to raise wages for their solution to deal with their labor shortage. These industries are usually included in the same category as the non-manufacturing industry, but the firms’ solution for a labor shortage is very different between “other services” and the information and communication industry, even these are included in the non-manufacturing industries.

In summary, we find that the firm types in which managers are motivated to raise wages on facing a labor shortage are as follows: (1) small-sized firms (in terms of capital stock), (2) relatively low wage levels, and (3) industries such as accommodation, eating and drinking services, and miscellaneous services.

¹⁶ As defined in *Financial Statements Statistics of Corporations by Industry*, we calculated “added value” as net operating income (operating profits - interest expenses, etc.) + personnel expenses (directors’ remuneration, directors’ bonus, employees’ salaries, employees’ bonus, welfare expenses) + interest expenses + rental or leasing expenses for fixed and liquid assets + taxes and public charges.

¹⁷ There are positive correlations between sales and the number of employees (correlation coefficient 0.825), sales and capital stock (0.607), the number of employees and capital stock (0.518), and wages per employee and labor productivity (0.505). In other words, it is difficult to distinguish which of these variables is related to the other, as these variables are affected similarly across firms.

Table 4: Comparisons between “the raising wages group” and “the other group”

(Ten thousand yen, person)

Variables	Mean		t	P(T<=t) two-sided
	The raising wages group (n=303)	The other group (n=946)		
Wages per employees	5.78	6.44	-2.65	0.0080
Cash flow	-0.02	-0.01	-0.61	0.5412
Sales (natural logarithm)	9.30	9.50	-1.43	0.1518
Number of employees (natural logarithm)	5.62	5.71	-0.76	0.4486
Capital stock (natural logarithm)	6.81	7.07	-2.19	0.0289
Interest-bearing debt ratio	0.75	0.82	-0.25	0.8049
Labor equipment ratio	51.55	51.16	0.01	0.9900
Labor productivity	11.95	22.12	-1.43	0.1540
Manufacturing	0.25	0.31	-2.07	0.0388
Information and communication	0.06	0.10	-2.26	0.0241
Other services	0.24	0.18	2.27	0.0236

(Note 1) Only the firms choosing “insufficient” with regards to managers’ judgement on the labor shortage level are included.

(Note 2) In the variables of industries, the proportion of the composition of the industries and its significance level are shown. Only the industries that have a significant difference with a 10% significance level are shown.

(Source) *Business Outlook Survey* July-September 2019 and *Financial Statements Statistics of Corporations by Industry* FY 2018.

4. Summary

We analyze how managers facing a labor shortage react to their situation. We try to find the types of the firms which have strong motivation to raise wages for dealing with a shortage of their employees based on the microdata from *Business Outlook Survey* and *Financial Statements Statistics of Corporations by Industry*.

We find that the firms facing a labor shortage are more willing to raise wages than the firms with adequate employees. Furthermore, we also find that the firms whose managers chose to raise wages to deal with the labor shortage are characterized by (1) a small size (in terms of capital stock), (2) relatively low wage levels, and (3) industries such as accommodation, eating and drinking services, and miscellaneous services. In addition, we find that manufacturing industry and information and communication industry firms take another solution to solve their shortage of employees rather than by raising wages.

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Note: * shows that the authors of this paper tentatively translated the Japanese title to English.

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<Supplementary discussion>

We made a group with firms which chose to raise wages not only as their first choice but also second and third choices. Then, we compare this group with the group not choosing to raise wages. We find that the group which raised wages has financial characteristics such as a relatively low wage level and relatively low labor productivity than the other group. Furthermore, we also find that the proportion of the industries for the group choosing to raise wages is larger in the construction industry, but smaller in the information and communication industry.

Policy Research Institute, Ministry of Finance
100–8940 Kasumigaseki3-1-1, Chiyoda
TEL 03–3581–4111 (ext. 5487,5222)