

Labor Share and Firm Performance*

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Abstract

This study analyzes the relationship between firms' distribution of value added, particularly labor share, and their yearly performance, using panel data (for 1994-2013) from the Financial Statements Statistics of Corporations by Industry in Japan. In all samples, while a decline in labor share accompanies sales growth in the same year, rises in the share are observed two years later, indicating the possibility of average firms having adjusted profit changes with the intertemporal distribution.

An analysis in which firms are broken down by industry and average sales growth found that sales changes at manufacturing firms have significantly negative effects on labor share in the same year, irrespective of the extent of sales growth rates. This might be because fixed costs' share of total labor costs are higher at manufacturing firms; even if value added increases in line with sales growth, total labor costs are adjusted only slightly, resulting in a decline in labor share. At rapidly growing non-manufacturing firms, however, sales growth does not accompany labor share's decline. This means that the distribution of profits to workers increases as much as value added growth at these firms. Apparently, these firms distribute value added to labor costs, dividend and retained earnings in line with value added growth, keeping profit shares for these items stable.

Key words: labor share, value added, rent sharing

JEL Classification: J30, D22, G31

I. Introduction

Over the past 20 years, the average salary of Japanese employees has been declining. It is certain that the rise in the ratio of part-time workers with low wages has worked to depress average salaries. However, the salaries of full timers has also hardly risen during this period. Even during the economic expansion period called Izanami Boom that lasted about five years since 2002, wages were not raised, and workers could not feel the economic recovery. Such long-term stagnation in wages is often pointed out as one of the major factors of sluggish

* This study utilizes microdata from the Financial Statements Statistics of Corporations by Industry which are collected by the Ministry of Finance (MOF). The author is grateful for helpful comments and suggestions by Kazumi Asako (Rissho University), Masami Orihara (Waseda University), Konari Uchida (Kyushu University), and Mariko Nakamura (Deloitte Touche Tohmatsu Limited).

personal consumption growth.

Meanwhile, firms have amassed substantial retained earnings during this period. Looking at the aggregate data of the Financial Statements Statistics of Corporations by Industry by the Ministry of Finance, total stock-based retained earnings have doubled from 142.8 trillion yen in 1997 to 304.5 trillion yen in 2012. According to the disposal of profits on profit-making corporations from the Corporation Sample Survey by National Tax Agency, the proportions of both flow-based retained earnings and dividends have been greatly increased since the 1990s. This trend in distribution ratios is also consistent with the Business Outlook Survey by the Ministry of Finance. In the FY2015 survey, profit distributions to which large firms placed most emphasis were “equipment investment”, “return to shareholders”, “internal reserve”. “Return to employees” is not included among them¹.

In other words, since the latter half of the 1990s, Japanese large firms have tended to suppress allocation of value added to wages and, at the same time, to encourage distribution to retained earnings and dividends. Due to the simultaneous nature of these phenomenon, it seems that discussions on the stagnation of wages became popular as a criticism toward firms’ attitudes, which emphasize returning profits to shareholders and themselves rather than employees.

This criticism has led to arguments that firms should not transfer each year’s value added to retained earnings, but instead allocate it to salaries and bonuses to raise labor share. The Annual Report on the Japanese Economy and Public Finance 2008 says that in response to the situation where high-level corporate profits have not led to wage increases, many people are thinking that the labor share should be increased based on appropriate profit distribution. On the other hand, many business owners believe that the rise in labor share means a decrease in profit, which in turn may lead to a decrease in return on capital, a decline in investment, slowing of economic growth, and a weaker job market² (Nishimura and Inoue 1994).

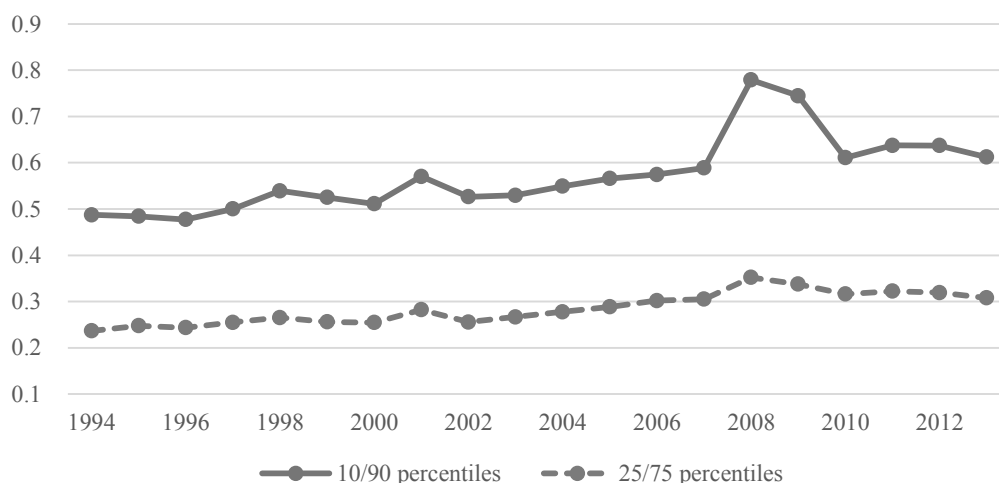
In this paper, we analyze the panel data created from micro data of the Financial Statements Statistics of Corporations by Industry, and examine the relationship between corporate performance and value added allocation from the 1990s to the 2000s, paying special attention to the labor share³. Yoshikawa (1994) and many other studies show that the labor share indicated by the aggregate data decreases during the boom period and rises during the recession period in the short-term economic cycle, while it is stable in the long-term. However, as the number of firms that distribute value added differently from such average

¹ For small and medium-sized firms, “return to employees” is in the second and third place respectively. This rank order has not changed since the 2006 survey for both large firms and small and medium-sized firms. Since the survey timing has been changed from October–December to January–March since 2012, however, careful attention is required for time series comparison.

² Under incomplete contracts, the “hold-up problem” that workers’ rent sharing causes a firm’s underinvestment is known (Groux 1984). However, Card et al. (2014) shows that there is no evidence that workers’ rent sharing weakens an incentive for a firm to make an investment using matching data of Italian firms and workers.

³ Harada and Hino (2002) focuses on value added distribution of firms as we do in this paper, but use industry aggregate data by year and capital size instead of corporate microdata.

Figure 1. Expansion of Labor Share Gap



trends increases in recent years, that is, if corporate profit distribution behavior is diversified, there is the possibility, for example, that the stability of the average value of labor share can be observed as a result of offsetting diversified characteristics of firms (i.e. fallacy of composition). Looking at the trends in gap of labor share of sample firms between 25 and 75 percentiles, and between 10 and 90 percentiles in each year, it can in fact be found that the volatility of labor share has gradually expanded over the past 20 years (Figure 1). This is a key reason for adopting the micro approach based on individual firms' data in this paper rather than the macro approach to grasp the overall characteristics from the aggregate data.

Among the value added allocations, what we are particularly interested in is allocation to employees, or labor share. On the other hand, it makes sense that firms do not determine wage allocation to employees in advance or independently, but rather determine the value added distribution in each period, taking into account the balance with dividends to shareholders and retained earnings. Therefore, covering dividends and retained earnings, we also analyze the relationship between allocation to each stakeholder and change in corporate performance. In addition to the analysis using the whole sample firms, we also develop analyses classifying corporations by industry and average growth rate of sales. The relationship between sales and value added allocation and the differences in this relationship between industry and sales growth rate may have implications for discourse on firms' tendency to suppress labor share and to retain retained earnings.

Issues on labor share and retained earnings have been examined since the 1960s, such as Shinno (1960), Takazawa (1964), Yoshino (1967), Ono (1973, 1985), but it was after the 1990s, when wages stagnated under the low-growth economy, that they drew more attention. For example, Yoshikawa (1994) and Nishimura and Inoue (1994) consider the change in labor share and its corresponding causes since the end of the war both theoretically and empirically. Wakita (2005) also shows that the high labor share of the 1990s reflected huge

capital depreciation costs. Nevertheless, it seems that the appropriate level and direction of change of labor share in the order have yet to be assessed. One reason is that many of the previous studies have adopted a macro-level approach using aggregate data, in which the relationship between performance and value added distribution (wages, dividends and retained earnings) at the firm level cannot be made sufficiently clear. Therefore, research which evaluates a firm's value added distribution by analyzing financial data of the individual firm has been increasing in recent years.

Ibaraki et al. (2007) analyzes the financial data of listed firms on the First Section of the Tokyo Stock Exchange by using NEEDS Financial QUEST and finds how their internal factors (profit-turnover ratio and change in the number of employees), external factors (average wage in the industry and unemployment rate) and special factors (part-time ratio in the whole economy and introduction of performance-based wage) impact their labor costs. In addition, Noda and Abe (2010) analyzes panel data of listed companies created from the Nikkei NEEDS database and Labor Administration Report (*Rouseijihou*), and reveals that the form of corporate governance and financing affected the wage level of employees. Kawamoto and Shinozaki (2009), using the Corporate Finance Data Bank of the Development Bank of Japan, examines whether the increase in uncertainty, weakening financial markets and the strengthened governance by shareholders were reasonable reasons for the suppression of personnel expenses⁴. Ogawa (2007) is a study using panel data constructed from individual data of the Financial Statements Statistics of Corporations by Industry. Covering data on unlisted small- and medium-sized firms, it analyzes the impact of excessive debt in firms on each firm's employment in the 1990s, finding out that the debt ratio had a significant negative influence on employment for small- and medium-sized firms⁵.

II. Labor Share, Dividend and Retained Earnings

In this chapter, we deal with the characteristics of labor share, dividend and retained earnings and introduce the definitions of indicators used in the empirical analysis of Chapter III.

Discussions on the relationship between corporate profits and retained earnings or wage levels are based on the premise that the labor market is not perfectly competitive. In theory, since firms in the perfectly competitive labor market accept the wages decided by the market as given, profit does not affect the wage level. However, the actual labor market is imperfectly competitive and firms have some discretion in wage determination. As a result, firms can obtain excess profit as a rent and share it with employees and shareholders (i.e. rent-sharing). The difference in rent size and distribution explains parts of wage differences across firms

⁴ Ito, Dejima and Kinoshita (2015) uses data from the Basic Survey of Japanese Business Structure and Activities, which is conducted by the Ministry of Economy, Trade and Industry.

⁵ Based on recent trends that firms raise funds through internal procurement such as retained earnings rather than external procurement including bonds and borrowings, we focus on retained earnings, unlike Ogawa (2007) which focused on the external procurement.

and workers (Abowd and Lemieux 1993, Blanchflower et al. 1996, Hildreth and Oswald 1997).

Accordingly, for the Japanese labor market, we assume that employees, shareholders, and firms will share the value added and excess profit under the imperfect competition. In other words, employees, shareholders, and firms have an incentive to obtain higher salaries, dividends and retained earnings respectively, and top management decide on the allocation to each stakeholder in every year.

II-1. Labor Share

Labor share is the part of value added allocated to employees, which is often calculated using the System of National Accounts (SNA) or the Financial Statements Statistics of Corporations by Industry⁶. In this paper, we use the index of the Annual Financial Statements Statistics of Corporations by Industry, which divides total labor costs by total value added. The value added in the denominator is defined as the sum of personnel expenses, operating net profit, interest expense, tax and property rent⁷. Total labor costs in the numerator are the sum of salary and bonus of board members and employees, and welfare benefit expenses. Also, sampling methods and survey items of the finance and insurance industry are different from those of other industries, so we exclude sample in those two industries from our analysis.

As referred above, the labor share tends to decline during the boom period and rise in the recession period. In fact, during the economic expansion period from 2001 to 2007, the labor share declined from 75.1% to 69.4% and increased to 74.4% at the time of the 2009 financial crisis. From 2010 onwards, it begins to decrease again reflecting the economic recovery, and the labor share of 2014 is 68.8%⁸. In this way, the labor share has some variations with business cycle, but about 70% of value added is allocated to personnel expenses on average. Setting and adjusting the wage and bonus level is very significant for firms because they are

⁶ SNA-based labor share is calculated by dividing the total amount of employee compensation by national income. Value added (excluding depreciation of fixed capital) created by domestic production activities is distributed to employees as employee compensation and to firms as an operating profit after excluding taxes on production and imports (Annual Report on the Japanese Economy and Public Finance 2010). The labor shares based on SNA and the Financial Statements Statistics of Corporations by Industry show almost the same change through time series. Until 1980s, the level of labor share in the Financial Statements Statistics of Corporations by Industry had been higher by several points than that in SNA. However, since the 1990s, the difference between those indicators has almost disappeared.

⁷ The Financial Statements Statistics of Corporations by Industry consists of an annual survey to examine the final settling of accounts over the year and quarterly surveys to examine the provisional settling of accounts for each quarter. In the analysis of corporate earnings, quarterly surveys are often used due to their promptness. However, as they are provisional, special profit and loss, corporate tax and net income (final profit and loss) etc. are investigated only in the annual survey which investigates final settlements (Arai 2006). See Arai (2006) about more detail on the definition of value added when using quarterly surveys and the difference in labor share between the annual and quarterly surveys.

⁸ Until the 1990s, a significant rise in labor share is observed in the middle and long-term low growth period (Yoshikawa 1994). Nishimura and Inoue (1994) reveals that the rise in the labor share of large firms from 1960s to 1990s can be attributed to an increase in fixed labor costs.

the largest expenses.

In prior research, Abowd and Lemieux (1993), Van Reenen (1996) and Blanchflower et al. (1996), focusing on the relationship between profits *per person* and wage rates, verify the rent sharing model in Canadian collective agreement firms, UK manufacturing companies and American manufacturing industry respectively. This paper also shares a common interest with these studies. However, considering that part-time workers are converted into full-time workers and indirect employment workers are not included in the number of employees in the Financial Statements Statistics of Corporations by Industry⁹, I focus on the relationship between *total* sales and labor share rather than between profit per capita and wage rate¹⁰.

The labor share can be interpreted as a relationship between wages and labor productivity, which is obtained by dividing real wage by labor productivity, $((w/p)/(V/L))$, where the labor cost is wage, w times number of employees, L and the value added is real value added, V times price, p (Arai 2006). “Analysis of the Labor Economy 2015” outlines Japan’s situation where the real wage has not kept pace with the continuing rise in real labor productivity and describes that the rise in labor productivity should lead to wage increase. In other words, labor share should not merely be raised by the rise in the share of value added to workers through the wage increase, but also be decided in view of the balance between labor productivity and wages.

II-2. Dividend and Retained Earnings

For shareholders, dividends are paid out from the final profit, or net income, which is value added minus expenses such as employees’ salary. Dividends account for 40 to 60% of net income (2011-2015). Strictly speaking, firms do not pay dividends only from the net income for each period, but also pay from retained earnings, including those carried forward from prior years. Looking at each firm’s dividend and net income information from the Financial Statements Statistics of Corporations by Industry, we can find many firms in which the total dividend for each period exceeds net income, and dividends are not necessarily capped at the amount of net income for each period.

As indicators showing the degree of return of profits to shareholders, “dividend payout ratio,” the ratio of dividends to *net income*, is often used. However, in this paper, we are

⁹ The number of employees reported in the Financial Statements Statistics of Corporations by Industry does not show the breakdown between regular employees and other employees including temporary and part-time workers, and the latter is converted into the number of regular employees based on regular worker’s average working hours. For this reason, the per capita salary calculated by dividing the total salary by the number of employees is interpreted as the average salary in case that all employees are considered as regular employees. In Japan, hourly wage differences for the same job differ widely by employment status. Thus, the per capita wage calculated by the definition of the Financial Statements Statistics of Corporations by Industry may not reflect actual average wages of employees especially for firms with a high percentage of non-regular employees.

¹⁰ Kan (2009) provides more detail on the characteristics of salary per employee in the Financial Statements Statistics of Corporations by Industry.

interested in allocation of value added, so we define the ratio of dividends to *value added* as the “dividend distribution ratio” and use it as an indicator of allocation to shareholders, instead of using the common dividend payout ratio¹¹.

Among net income, “residuals” that are not paid as dividends are retained within the firm (flow of retained earnings). Then, the cumulative retained earnings for each period are recorded as *rieki joyokin* (stock of retained earnings), which is a part of own equity of the firm. Although in the Financial Statements Statistics of Corporations by Industry the use of retained earnings cannot be identified, Iwase and Sato (2014) analyzes the contribution ratio of assets, liabilities and net assets and estimate that retained earnings are highly likely to be not only held as cash and deposits but also invested in long-held securities¹².

On the other hand, retained earnings can be viewed as a strategic indicator of financing, rather than a residual of value added. According to the Financial Statements Statistics of Corporations by Industry from 2010 to 2014, firms have been relying more on internal finance such as retained earnings rather than external finance such as corporate bond issuance and financial institution borrowing in recent years. If this action is interpreted as the intention of a firm that wishes to raise its capital adequacy ratio by compressing debt and increasing retained earnings (Development Bank of Japan 2005), it is safe to assume that firms decide distribution to personnel expenses and dividends with the aim of retaining some degree of retained earnings. Therefore, as well as labor share and dividend distribution ratio, we define “retained earnings distribution ratio” by dividing the flow of retained earnings by value added, and regard it as an index of allocation to the firm itself.

In 2015, according to the Financial Statements Statistics of Corporations by Industry, out of the total value added of all industries except the finance and insurance industries (294 trillion yen), personnel expenses accounted for 67.5% and operating income accounted for 16.9%. From operating income, non-operating profit (or loss), extraordinary profit (or loss) and corporate tax etc. are adjusted to be net income, then from net income dividends to shareholders are paid out. Finally, the remainder is defined as retained earnings. However, as mentioned above, firms that aim to strengthen their financial standings are likely to restrict allocation to personnel expenses and dividends in order to secure retained earnings. Although which elements are actually preferred or subordinated depends on strategy of each firm, there is no doubt that the value added generated by production activities is the source of personnel expenses, dividends and retained earnings and that the allocation to each factors is an

¹¹ Yamada, Toda and Murakami (2009) also conducts analysis using the ratio of dividends to the value added.

¹² Investment securities include stocks of domestic and overseas subsidiary and affiliated firm recorded at acquisition cost, and its volume has increased in recent years. Given the increase in overseas affiliated firms and unwillingness to make equipment investments after the financial crisis, it is inferred that the rise of investment securities is mainly caused by the increase in investment to overseas firms by overseas subsidiaries (Iwase and Sato 2014). Harada and Hino (2002) speculates that retained earnings were mainly used as working capital for firms until the 1990s.

important matter for firms, directly linked to their investment and employment strategies¹³.

Based on the above discussion, in the next chapter, we examine the relationship between labor share, dividend distribution ratio, and retained earnings distribution ratio and sales, and clarify the effect of change in corporate performance on value added distribution.

III. Data and Estimation Model

In the empirical analysis, we use the panel data created from microdata of the Annual Financial Statements Statistics of Corporations by Industry from 1994 to 2013, which are merged with the firm identification number and address. The statistics are a large-scale sample survey conducted by Ministry of Finance and in 2015 about 29,000 firms responded. The sampling method differs depending on capital level. Because firms with capital less than 1 billion yen are stratified random sample by industry, it is difficult to continuously obtain settlement information of the same firm. Therefore, in this paper, we limit analysis targets to firms with capital of 1 billion yen or over, of which all are included¹⁴.

The number of responding firms with capital of 1 billion yen or more in 2013 survey is 5,471, accounting for 19.4% of the total number of 28,263 responding. Considering the fact that the smaller the capital stock is, the higher the labor share tends to be (Harada and Hino 2002, Yamada et al. 2009), the characteristics of value added allocation are likely to differ by capital stock size. Therefore, it should be noted that the results in this paper, which focus on big firms, do not show the trends of all Japanese corporations or the Financial Statements Statistics of Corporations by Industry as a whole.

In addition, several important points must be sorted out concerning the process of combining each year's survey into panel data. The first is how to deal with firms that converted from an operating firm into a holding firm. There are a certain percentage of firms that became pure holding firms during the sample period. These firms changed their category of business into "pure holding firm" and financial results of those holding companies are reported since then¹⁵, although the same corporate code is attached. Looking at the survey results before and after becoming a holding firm, for example, the number of employees has decreased sharply after the holding firm has been put in place. Thus, there is no continuity between the holding firm and the operating firm. In addition, the holding firm obtains dividends from group subsidiaries as sales, but because there is no other operating division in the holding firm, its sales, liquid assets and fixed assets are too small to be recorded. Therefore, from the non-consolidated settlement of a pure holding firm, it is difficult to grasp

¹³ The allocation to expenses for interest, premises and equipment rental fee and tax other than personnel expenses and operating net income makes up only about 15%. Besides, allocation to each expense item is stable in time series. Interest, rent and tax are distributed to creditors, landlords and the government or municipalities respectively.

¹⁴ Since the survey in 2009, all firms with capital of 500 million yen or more have been included.

¹⁵ The pure holding firm was classified as "other service industry" before 2008. The operating holding firm is classified as the industry with the largest sales.

the relevance between the operating profit and shareholder dividend. For these reasons, for firms that have become a pure holding firm, we decided not to include samples after becoming a holding firm in the analysis.

The second is change of industry. In the Financial Statements Statistics of Corporations by Industry the industry is determined by the business with the largest sales. For some firms, the reporting industry may change through diversification or concentration of business. In this paper, we allocate a unique industry code to each firm, so for a firm that changed the reporting industry during the sample period, the industry with the longest reporting period is regarded as the industry of the firm. In the case of a firm with the same period of two industries, the industry of the recent year is used. The sample period is from 1994 to 2013, but firms that have not responded to the 2013 survey¹⁶, firms with a panel period of less than 4 periods, firms with fewer than 30 employees in average and firms with minimum zero employees during the sample period are excluded. As a result, 3,749 firms are used in the analysis. The Financial Statements Statistics of Corporations by Industry is an inventory survey for firms with capital of 1 billion yen or more, but the response rate in each fiscal year is about 90%, which means not every firm responds every year. Furthermore, because there are dropout samples due to becoming a holding firm, the created data is an unbalanced panel.

Labor share, dividend distribution ratio, and retained earnings distribution ratio are used as explained variables. They are defined as a percentage of personnel expenses, dividends and retained earnings in value added respectively. In particular, retained earnings, deducting dividends from net income, are often negative especially during periods of deteriorating business performance. Indeed, those of about 24.8% of the samples have negative values. This means that the dividends in each period exceed the net income, and the firm devotes its stock of retained earnings to dividends. Therefore, for samples whose retained earnings are zero or less, we think that there were no retained earnings in the *current* fiscal year and that the retained earnings distribution ratio is zero. The main explanatory variable is the logarithmic value of sales and it is regarded as the performance indicator of each year¹⁷. Considering the tendency that the labor share is higher as the firm size is smaller, the logarithm of number of employees is also added to the explanatory variable in order to control for the effect of the firm size¹⁸.

¹⁶ As Shinozaki (2008) states, if the progress of globalization promoted the elimination of firms that paid relatively higher wages in comparison with labor productivity to cause a decline in the average labor share ratio, it is possible that the average labor share of sample firms which survived as of 2013 could be lower than the announced average labor share which includes firms that went bankrupt or merged after the survey year.

¹⁷ Hildreth and Oswald (1997) also uses total sales considering the problem of measurement error on the number of employees.

¹⁸ In literature, either capital or number of employees is often used as a classification criterion for firm size. In the analysis of this paper, since we use difference estimation, the effect of the capital amount is absorbed by the fixed effect for firms whose capital amount does not change during the sample period. Therefore, we use the logarithm of number of employees, which is time-variant, as a control variable for the firm size.

Also, taking into consideration the possibility of autocorrelation of an explanatory variable, such as past labor distribution rate influencing the current level, we adopt a dynamic model that includes lag terms of explained variables as explanatory variables, following the previous study such as Van Reenen (1996). Furthermore, regarding the sales used as an explanatory variable, it is highly likely that the time to extend its influence over allocation of value added varies from firm to firm. In this case, since past sales are predetermined variables not reflecting current value-added distribution, we use lag terms of sales as an exogenous explanatory variable.

In addition, the fixed effect to grasp unobservable time-invariant factors is added to the estimation. In the Financial Statements Statistics of Corporations by Industry, information on human capital such as an employee's educational background and average age are not investigated. Some of the difficulties, however, can be reduced by using the panel data to separate out unobservable fixed effects (Hildreth and Oswald 1997).

Each distribution ratio is, in the short term, also considered to depend on the change in effective demand and the degree of competition in the market (Nishimura and Inoue 1994). In fact, in previous studies, market factors that may affect value added and profit distribution such as the import penetration rate of industry, the labor union organization rate (Van Reenen 1996), the average wage of the industry and the unemployment rate of the area (Abowd and Lemieux 1993), are added into explanatory variables. On the other hand, Nickell and Wadhawani (1990) and Nickell et al. (1994) emphasize that internal factors of firms play an important role in firm's wage decisions and control market factors by including year dummy, assuming the change in the market all firms commonly experience simultaneously as exogenous. We follow the latter approach.

Based on the above discussion, the estimation equation is

$$\begin{aligned} labor\ share_{it} = & \theta_1 labor\ share_{i,t-1} + \theta_2 s_{it} + \theta_3 s_{i,t-1} + \theta_4 s_{i,t-2} + \theta_5 s_{i,t-3} + \theta_6 emp_{it} \\ & + y_t + f_i + u_{it} \end{aligned}$$

where $labor\ share_{it}$ is the labor share of firm i in fiscal year t , s_{it} is the logarithm of sales, emp_{it} is the logarithm of the number of employees. Also, y_t is a year dummy and f_i represents a firm fixed effect. This formula expresses the relationship between labor share and sales, and we can apply it to the analysis of dividend distribution ratio and retained earnings distribution ratio. The fundamental statistics are shown in Table 1.

Table 1. Summary Statistics

Variables		Mean	sd	Min	Max	Obs.
Labor share	overall	0.75	3.15	0.004	465.80	N = 61024
	between		1.70	0.02	76.15	n = 3747
	within		2.94	-73.74	423.56	
Dividend distribution ratio	overall	0.08	5.55	0.00	1346.94	N = 61066
	between		1.36	0.00	79.38	n = 3749
	within		5.37	-79.30	1267.64	
Retained earnings distribution ratio	overall	0.11	0.73	0.00	96.47	N = 61073
	between		0.34	0.00	11.00	n = 3749
	within		0.68	-10.89	85.71	
Welfare benefit distribution ratio	overall	0.12	0.40	0.00	82.60	N = 60859
	between		0.16	0.00	7.63	n = 3747
	within		0.38	-7.45	75.08	
Log of sales	overall	10.49	1.49	3.40	16.58	N = 61054
	between		1.48	4.16	16.17	n = 3748
	within		0.31	2.98	16.46	
Log of employees	overall	6.49	1.33	0.00	12.85	N = 61016
	between		1.31	3.29	12.20	n = 3748
	within		0.31	-0.15	11.15	

Notes: The upper row (N) of obs. is the sample size, and the lower row (n) is the number of firms.

IV. Estimation Result

IV-1. Analysis Using All Samples

First, we analyze the relationship between changes in labor share and changes in sales using all samples. In Table 2, model (1) regresses the labor share on the same year's sales and its number of employees, model (2) adds one-year lag of labor share to model (1), and model (3) adds to three-year lags of sales to model (2). Those three models take the difference of variables and estimate by OLS. The coefficients of sales are significant negative at 1% level in any model. For example, in model (3), a negative relationship between labor share and sales in the same year is confirmed; labor share would drop by 0.01 if sales in the same year increase by 1%.

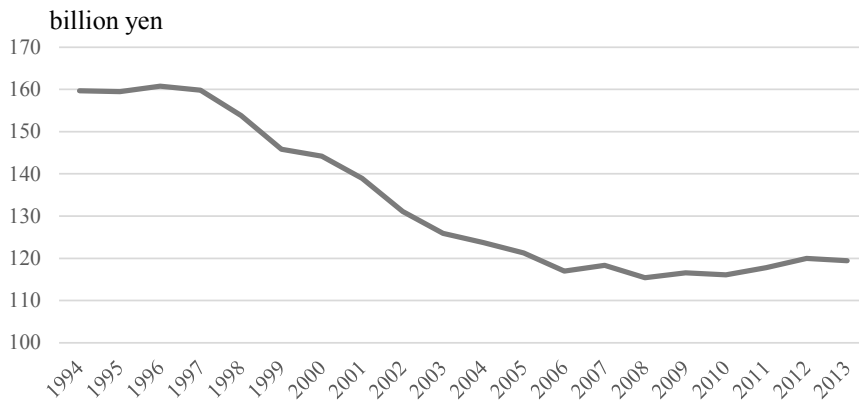
At first glance, one might interpret that firms suppress distribution to employees at the time of good financial performance, but we should interpret these results more carefully for the following two reasons. Firstly, it is only the number of *directly* employed workers and their employment cost that the Financial Statements Statistics of Corporations by Industry reports. In other words, the number of *indirectly* employed workers including temporary workers and contract-based workers is unreported and their employment costs are not included in personnel expenses. According to Figure 2, the average of the total personnel expenses of the sample firms consistently decreases from 1997 to 2006 and remains flat afterward. In the latter half of the 1990s and the middle of the 2000s when personnel expenses

Table 2. Sales and Labor Share

Dependent variable: labor share	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) GMM
Log of sales t	-0.888 *** [0.241]	-0.952 *** [0.277]	-1.001 *** [0.321]	-0.984 *** [0.316]	-1.036 *** [0.331]
Log of sales $t-1$			-0.149 [0.117]	-0.069 [0.156]	-0.082 [0.176]
Log of sales $t-2$			0.340 *** [0.110]	0.214 ** [0.087]	0.281 *** [0.095]
Log of sales $t-3$			0.015 [0.096]	-0.048 [0.092]	-0.100 [0.112]
Lagged labor share		-0.375 *** [0.076]	-0.382 *** [0.079]	-0.011 [0.015]	-0.014 [0.013]
log of employees	0.188 ** [0.081]	0.221 ** [0.088]	0.178 * [0.096]	0.171 * [0.084]	0.191 * [0.108]
Year dummies	yes	yes	yes	yes	yes
R-squared	0.0023	0.0866	0.1064		
Number of observations	56,359	52,782	45,562	45,562	43,885

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Figure 2. Trend of Total Personnel Expenses



declined, temporary workers prevailed in the workplace of many large firms. Unfortunately, we cannot tell to what extent the sample corporations switch from direct employment to indirect employment based on the Financial Statements Statistics of Corporations by Industry. Considering the increase in indirectly employed workers in the Japanese labor market as a whole, however, it is highly likely that the decline in the total personnel expenses in the Financial Statements Statistics of Corporations by Industry reflects the effect of the increase in indirect employment¹⁹. In other words, the decline in the total amount of personnel

¹⁹ Kawamoto and Shinozaki (2009) and Noda and Abe (2010) point out the importance of the effect of the increase in non-regular workers on the decline in wage level. However, they do not analyze the influence of non-regular workers explicitly because wage information of the number of non-regular workers at firm level is not available.

Table 3. Sales and Dividend Distribution Ratio

Dependent variable: dividend distribution ratio	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) GMM
Log of sales t	-1.061 [0.982]	-1.145 [1.103]	-1.351 [1.311]	-1.377 [1.327]	-1.885 [1.838]
Log of sales $t-1$			0.572 [0.572]	0.581 [0.574]	1.192 [1.170]
Log of sales $t-2$			0.506 [0.497]	0.493 [0.507]	0.732 [0.723]
Log of sales $t-3$			0.978 [0.991]	0.996 [0.998]	0.599 [0.595]
Lagged dividend distribution ratio		-0.009 [0.012]	-0.008 [0.011]	0.012 [0.014]	0.012 [0.014]
log of employees	0.184 [0.260]	0.225 [0.273]	0.141 [0.199]	0.139 [0.202]	0.028 [0.138]
Year dummies	yes	yes	yes	yes	yes
R-squared	0.0015	0.0016	0.0032		
Number of observations	56,347	52,782	45,554	45,554	43,872

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

expenses and labor share in the Financial Statements Statistics of Corporations by Industry should not be viewed simply as a reduction of the employment cost of *direct* employment workers; it is not necessarily clear whether the significant negative effect of the same year sales is maintained when considering the employment costs of both directly and indirectly employed workers.

Secondly, it is possible that the negative relationship between labor share change and sales change in the same year just reflects the delay in wage adjustment. About 80% of value added distributed to workers is regular salary deducting special bonus from cash salary total. From the analysis of Monthly Labor Survey (*maitsuki kinro tokei chosa*), regular salary is found to be lagging against the bottom of the recession²⁰. If sales of the firm fluctuate in line with the economic trend²¹, it is likely that the negative effect of the same year's sales reflects the situation where wage adjustments (numerator in labor share) is not catching up with changes in value added (its denominator) resulting from change in sales. Looking at the result of model (3) with one to three year lags of sales, the two-year lag has a significant positive effect at the 1% level, which means the firm raises the labor share two years after its sales have increased. It is inferred that the firm gave back the revenue growth with intertemporal distribution.

Table 3 shows estimation results using the dividend distribution ratio as the explained variable. Explanatory variables and estimated models are the same as estimates on labor share.

Coefficients of sales including lags are not statistically significant in any of model (1) to

²⁰ Cabinet Office, Government of Japan (2014).

²¹ The sales of small and medium-sized firms in manufacturing industries is classified as a consistent index among diffusion index.

Table 4. Sales and Retained Earnings Distribution Ratio

Dependent variable: retained earnings distribution ratio	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) GMM
Log of sales t	0.058 *	0.045	0.087 ***	0.074 **	0.084 **
	[0.035]	[0.040]	[0.031]	[0.036]	[0.038]
Log of sales $t-1$			-0.069	-0.073	-0.085
			[0.047]	[0.049]	[0.053]
Log of sales $t-2$			-0.090	-0.085	-0.104
			[0.060]	[0.061]	[0.070]
Log of sales $t-3$			-0.035	-0.042	-0.021
			[0.035]	[0.034]	[0.033]
Lagged retained earnings distribution ratio		-0.198 **	-0.370 ***	0.024 *	0.000
		[0.096]	[0.082]	[0.013]	[0.015]
log of employees	-0.080 ***	-0.075 ***	-0.061 ***	-0.057 ***	-0.078 ***
	[0.025]	[0.025]	[0.021]	[0.022]	[0.026]
Year dummies	yes	yes	yes	yes	yes
R-squared	0.0012	0.0375	0.0823		
Number of observations	56,361	52,802	45,574	45,574	43,892

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

model (3), and which means dividend distribution ratio is hardly affected by the change in sales. In other words, it is presumed that dividend is adjusted in conjunction with the increase and decrease of the value added, and that the dividend distribution ratio has been stable. This result is not consistent with Ueno and Baba (2005) which shows a stable amount of total dividend and a fluctuating payout ratio from the aggregate data of the Financial Statements Statistics of Corporations by Industry from 1990 to 2003. However, in Japan many firms have recently been establishing numerical targets for returning profits to shareholders, such as payout ratio (Life Insurance Association 2014). The estimation result seems to reflect the fact that many of the sample firms adjusted the total amount of dividends according to performance and stabilized the dividend distribution ratio.

Table 4 shows the results of estimation using retained earnings distribution ratio as an explained variable. The coefficients of the same year sales in models (1) to (3) are all positive, especially in model (3) with sales lags, significant at the 1% level. The parameters of lags of the sales in model (3) are all negative, but not significant. Therefore, with respect to retained earnings, the adjustment trend through intertemporal allocation as seen in the labor share cannot be clearly found. It seems that retained earnings fluctuated in the same direction as sales in the same year when the sales in each period changes and that its magnitude of change was more than a magnitude of value added.

However, the above estimations by OLS remains problematic in that it cannot deal sufficiently with the bias caused by simultaneous determination of sales and explained variables such as labor share²². Furthermore, since lags of the explained variables correlate

²² Namely, we cannot identify whether the financial situation of a firm affects the labor share or whether the labor share of a firm affects its financial situation.

with the error terms, estimated values do not have consistency. In order to deal with these problems, we use two kinds of instrumental variables (IV) in model (4) and model (5). Following Van Reenen (1997), model (4) uses two-year lag of the explained variable like $labor\ share_{it-2}$ as an IV of the lagged dependent variable²³. Model (5) is the result of GMM estimation by Arellano and Bond (1991) using two-year and further lags of the explained variable as IV²⁴.

In these estimations, it is expected that coefficients are larger than those in OLS as the endogenous problem causing underestimation of the coefficients is corrected. However, as far as the results of model (4) and model (5) about the labor share in Table 2 are concerned, although the coefficients of the same year's sales are still negative and significant, the magnitude of the coefficients is not so different from that of OLS. As for lags, the coefficient of two-year-lag of sales is positive and significant, which is consistent with the result of the OLS.

Also, when the Sargan test of the over-identifying restrictions is investigated in the result of model (5) of labor share, the null hypothesis is strongly rejected; IVs used in this model are not likely to be valid. On the other hand, in model (4), since the null hypothesis about one-year lag of labor share as exogenous is rejected, this variable can be treated as endogenous. Therefore, in the subsequent analysis, we adopt the model (4) using two-year lag of the explained variable as IV.

Results of IV estimators on dividend distribution ratio and retained earnings distribution ratio are almost the same as those of OLS respectively. However, considering the results that both Sargan's over-identifying test for model (5) and exogeneity test on one-year lag of the explained variable to model (4) are rejected, we are based on model (4) in the analysis of next section.

IV-2. Analysis by Industry and Sales Growth Rate

Iwase and Sato (2014) examines that using aggregate data of the Financial Statements Statistics of Corporations by Industry, there are differences in the dividend payout ratio between manufacturing and non-manufacturing industries. In the manufacturing industry, dividend payout ratio is higher and returning to shareholders has been given priority, while in the non-manufacturing industry, the priority of profit distribution is higher for retained earnings than returns for shareholders. Also, Takada (2015) shows that there are differences between manufacturers and non-manufacturing firms in terms of growth rate of personnel expenses and labor share. Therefore, in this section, considering the possibility that firm's distribution policy to wages, dividends and retained earnings differs depending on the industry, we analyze firms' distribution to them separating the manufacturing industry from

²³ It is confirmed that there is no series correlation between the difference in labor share and its two-year lagged term, so two-year lagged labor share satisfies the condition of instrumental variables.

²⁴ Nickell and Wadhvani (1990), Nickell et al. (1994), Hildreth and Oswald (1997), Ogawa (2007), Ibaraki et al. (2007) and Noda and Abe (2010) analyze the relationship between employment or wages and the firm's financial condition by using GMM.

Table 5. Sales and Labor Share by Sales Growth Rate and Industry (2SLS)

Dependent variable: labor share	low (1) manufac- turing industry	low (2) non- manufac- turing industry	middle (3) manufac- turing industry	middle (4) non- manufac- turing industry	high (5) manufac- turing industry	high (6) non- manufac- turing industry
Log of sales t	-0.908 *** [0.316]	-1.061 *** [0.782]	-1.629 *** [0.566]	-0.508 *** [0.184]	-1.253 * [0.728]	0.354 [0.279]
Log of sales $t-1$	-0.577 ** [0.273]	0.629 [0.553]	-0.205 [0.192]	0.039 [0.049]	0.308 [0.409]	0.290 * [0.171]
Log of sales $t-2$	-0.007 [0.218]	1.175 * [0.684]	0.269 [0.255]	0.063 [0.067]	0.076 [0.150]	0.216 [0.192]
Log of sales $t-3$	-0.023 [0.223]	-0.040 [0.245]	-0.431 [0.408]	0.168 [0.138]	0.107 [0.138]	-0.241 [0.232]
Lagged labor share	0.001 [0.032]	-0.043 *** [0.011]	0.007 [0.018]	-0.111 [0.084]	-0.011 [0.008]	0.007 [0.014]
log of employees	0.407 [0.292]	0.194 [0.192]	0.168 [0.095]	0.079 ** [0.032]	0.100 [0.550]	-0.117 [0.149]
Year dummies	yes	yes	yes	yes	yes	yes
Number of observations	5,002	5,655	13,737	11,126	4,143	5,899

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

the non-manufacturing industry. Furthermore, in light of the possibility that value added distribution could differ depending on performance growth, we calculate the average sales growth rate over the previous year during the sample period and classify firms into three groups by their rates: low growth group (lower 25%), middle growth group (25-75%), high growth group (top 25%). Specifically, firms with an average sales growth rate of less than -1.8% are in the low growth group, firms with a growth rate of -1.8% to 3.3% are in the medium growth group, and firms with a growth rate of higher than 3.3% are in the high growth group. Then, 2SLS estimation is performed for each of the six groups.

Table 5 shows estimation results of labor share by sales growth rate and industry. Changes in same year's sales for manufacturing firms have a significant negative effect on labor share regardless of sales growth rate. In the middle-growth group of the manufacturing industry (3) with the greatest effect, the 1% increase in same year's sales reduces the labor share by 0.016. Since the value added usually increases with an increase in sales, the decline in labor share means that the total personnel expenses which is numerator of the labor share changes little or decreases. Conversely, if the coefficient of labor share is not significant, the labor share does not change much. It can be interpreted that the firm increases personnel expenses to the same extent as the increase in value added. Thus, the result that the coefficients of same year's sales of the non-manufacturing industry's low-growth firms (2) and the high-growth firms (6) are not significant suggests that personnel expenses were adjusted along with the change in value added.

With regard to the result of labor share, there is something else to note. Only in the high growth group of the non-manufacturing industry (6), a significant positive effect is observed in the coefficient of the one-year lag. It is inferred that only firms in this group do not restrain the labor share at the time of increasing sales, and raise salaries and bonuses to share the increased revenue with workers, which is so-called rent sharing. However, firms in other

industries and groups do not appear to raise the labor share even with a delay after the same year's labor share declining.

Total personnel expenses include salary and bonus of employees and board members and welfare benefit expenses, among which employee salary and welfare benefit expenses are regarded as fixed expenses that are not readily adjustable even if the economy or the firm's performance fluctuates. The ratio of employee salary and welfare expenses to total personnel expenses by three sales growth groups is 90.14% for the low growth group, 89.31% for the middle growth group and 87.93% for the high growth group respectively. By industry, the ratio is 89.68% in the manufacturing industry and 88.71% in the non-manufacturing industry. In other words, it is difficult for firms in the low growth rate group and the manufacturing industry to adjust personnel expenses flexibly. Due to these limitations, it is likely that in these firms, even if sales and value added increase, the fluctuation of total personnel expenses remains marginal, decreasing the labor share in the current period. On the contrary, non-manufacturing firms with high growth rates and a relatively small proportion of fixed costs to personnel expenses can flexibly adjust personnel expenses according to performance and value added fluctuations. It seems likely that firms in this group raise personnel expenses to the same extent as an increase in value added at the time of good performance and labor share does not change so much as a result.

As mentioned earlier, the Financial Statements Statistics of Corporations by Industry reports the total personnel expenses of directly employed workers. Although directly employed workers consist of regular, part-time and temporary workers, the breakdown by employment status is not available, because the number of part-time and temporary employees is converted into the number of regular employees based on the working hours. However, since wages of part-time employees are usually lower than those of regular employees, even if the number of employees reported is almost the same, it is highly likely that the total personnel expenses of firms would be lower when the proportion of part-time employees increases. And if the ratio of regular employees to part-time employees actually changes in many firms, the result of the estimation on labor share above might also reflect changes in its composition. However, because it is impossible to directly control the number or proportion of non-regular employees in the Financial Statements Statistics of Corporations by Industry, here we focus on the benefits welfare expenses as an alternative variable of wage fluctuation of regular employees. Benefits welfare expenses that include "what is deemed to be labor costs other than salary and bonus" are primarily proportionate to the wages of regular full-time employees, such as statutory welfare expenses (welfare pension insurance premiums, health insurance premiums, and employment insurance premiums etc.) and retirement allowance reserves. Therefore, we define the ratio of welfare benefit expenses to the value added as "welfare benefit distribution ratio", and estimate by growth rate and industry using it as an explained variable. The result is almost the same as the above result of labor share (table omitted). As a result, it is confirmed that the result in Table 5 is not due to the influence of changes in employee composition, that is, it indicates the relationship between labor share of regular employees and sales.

Table 6. Sales and Dividend Distribution Ratio by Sales Growth Rate and Industry (2SLS)

Dependent variable: dividend distribution ratio	low (1) manufactu- ring industry	low (2) non- manufac- turing industry	middle (3) manufactu- ring industry	middle (4) non- manufac- turing industry	high (5) manufactu- ring industry	high (6) non- manufac- turing industry
Log of sales t	-7.862 [7.187]	-0.111 [0.072]	-0.184 * [0.1104]	0.053 [0.082]	-0.076 [0.048]	0.018 [0.024]
Log of sales $t-1$	5.804 [5.592]	0.052 [0.092]	-0.067 [0.123]	0.069 [0.054]	0.042 [0.037]	-0.017 * [0.010]
Log of sales $t-2$	5.217 [4.865]	-0.031 [0.023]	0.020 [0.063]	0.032 [0.070]	-0.010 [0.017]	-0.016 [0.027]
Log of sales $t-3$	10.982 [10.406]	-0.029 [0.054]	-0.016 [0.022]	0.017 [0.041]	-0.014 [0.017]	-0.010 [0.018]
Lagged dividend distribution ratio	0.005 [0.005]	0.975 *** [0.012]	0.960 *** [0.024]	-0.432 * [0.241]	-0.020 [0.024]	-0.005 [0.004]
log of employees	1.223 [1.184]	0.029 [0.027]	-0.043 [0.084]	-0.188 [0.228]	0.018 [0.025]	0.007 [0.026]
Year dummies	yes	yes	yes	yes	yes	yes
Number of observations	4,994	5,654	13,739	11,122	4,145	5,900

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 7. Sales and Retained Earnings Distribution Ratio by Sales Growth Rate and Industry (2SLS)

Dependent variable: retained earnings distribution ratio	low (1) manufacturing industry	low (2) non- manufacturing industry	middle (3) manufacturing industry	middle (4) non- manufacturing industry	high (5) manufacturing industry	high (6) non- manufacturing industry
Log of sales t	0.164 ** [0.065]	-0.076 [0.151]	0.127 *** [0.027]	0.115 *** [0.033]	0.132 *** [0.037]	0.078 [0.096]
Log of sales $t-1$	-0.126 * [0.074]	-0.190 [0.227]	-0.039 [0.034]	0.024 [0.041]	-0.111 *** [0.023]	0.020 [0.064]
Log of sales $t-2$	-0.012 [0.053]	-0.328 [0.328]	-0.067 *** [0.026]	0.013 [0.034]	-0.007 [0.016]	-0.049 [0.050]
Log of sales $t-3$	-0.046 [0.048]	-0.371 ** [0.181]	0.043 [0.026]	0.057 [0.047]	0.002 [0.018]	0.058 [0.043]
Lagged retained earnings distribution ratio	0.021 [0.041]	0.015 [0.020]	0.042 [0.028]	0.001 [0.007]	0.259 *** [0.063]	0.054 *** [0.010]
log of employees	-0.102 ** [0.044]	-0.112 [0.122]	-0.065 * [0.036]	-0.034 * [0.019]	-0.097 *** [0.028]	0.001 [0.018]
Year dummies	yes	yes	yes	yes	yes	yes
Number of observations	5,003	5,657	13,739	11,128	4,145	5,902

Notes: All variables are in first differences. Standard errors in brackets clustered at firm level. *** Significant at 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 6 shows the results for the dividend distribution ratio. The change in sales has almost no significant effect on the dividend distribution ratio by both growth rate and industry. Firms with high growth rate do not tend to raise returns to shareholders at the time of good performance.

Table 7 shows the estimation of retained earnings distribution ratio. Contrary to the result of labor share, the coefficients of same year's sales are generally positive, especially larger in the manufacturing industry than in the non-manufacturing industry. In manufacturing firms, regardless of the growth rate, we observe that the distribution to retained earnings is raised

when the sales increases. Looking at the results of lags, it is difficult to find a consistent trend, though there are some groups in which the distribution rate decreases from the following year. In the non-manufacturing industry, the coefficients of low-growth firms and high-growth firms are rarely significant. It seems that in these firms the retained earnings distribution ratio is stable.

Looking at these results comprehensively, the characteristics of each group become more clear. First, in the analysis of the dividend distribution ratio, the coefficient of sales for any group is almost non-significant. This result implies that as with analysis using all samples, firms do not maintain a fixed amount of dividends as their performance fluctuates, but adjust the dividend along with increases and decreases of value added and keep a stable dividend distribution ratio as a result. And this trend is observed regardless of industry or sales growth group.

Next, when comparing estimation results of labor share and retained earnings distribution ratio (Tables 5 and 7), the effect of the same year's sales on each distribution ratio provides a stark contrast. In the industries and sales growth groups in which labor share decreases significantly, the same year's retained earnings distribution ratio is significantly raised. However, it is difficult to distinguish whether the firm lowers the labor share with the intention of increasing retained earnings, or whether the delay in wage adjustment appears as a decline in labor share and an increase in retained earnings distribution ratio. Looking at the lagged terms, some coefficients are estimated positively in the labor share analysis and negatively in the retained earnings distribution ratio analysis, but many are not significant and we cannot find any evidence of intertemporal distributions.

And in the low growth group and the high growth group of the non-manufacturing industry, the coefficients of sales are almost insignificant, both in the analysis of labor share and retained earnings distribution ratio. However, the underlying reasons for this result seem to be different in the two groups. For low-growth firms, the average change in sales and value added during the sample period is negative, and the average retained earnings is the smallest in non-manufacturing firms with low growth (Table 8). Therefore, it is likely that low-growth firms in the non-manufacturing industry have no choice but to cut down fixed wages under circumstances where sales and value added growth are stagnating, and that retained earnings are also suppressed. In other words, in the face of a difficult business situation, the value added, wages and retained earnings have all fallen, and as a result labor share and retained earnings distribution ratio hardly change, leading to no significant relationship between changes in sales and both distribution ratios.

For high-growth non-manufacturing firms, as we discussed above, it is likely that the total personnel expenses of directly employed workers are also increased according to the increase of the value added to the extent that the labor share does not change. As Table 8 shows, firms in this group also have higher average retained earnings. That is, in high-growth non-manufacturing firms, it is likely that, each distribution ratio has been kept stable by allocating personnel expenses, dividends and retained earnings in accordance with an increase in value added when sales increases.

Table 8. Average Amount of Internally Retained Flow

	Manufacturing industry			Non-manufacturing industry		
	Low	Middle	High	Low	Middle	High
10%	68.8	124.0	137.9	44.4	89.7	119.9
25%	141.8	244.1	325.5	128.6	182.1	305.7
50% (median)	363.8	573.5	770.8	306.5	435.8	737.0
75%	1013.0	1455.4	2042.2	742.2	1044.4	1900.8
90%	2929.4	3983.6	5475.3	2275.6	2745.7	5185.0

Note: Unit is one million yen.

V. Conclusions

In this paper, we examine the relationship between distribution of value added, in particular the labor share, and the firm's performance, using panel data of firms with capital of 1 billion yen or more from the Financial Statements Statistics of Corporations by Industry. In all samples, the labor share declines with the increase in same year's sales, but it rises two years later. It is likely that firms adjust the impact of changes in performance by intertemporal distribution.

In the analysis by industry and growth rate, the change in same year's sales of manufacturing firms has a significant negative effect on labor share regardless of growth rate. Meanwhile, in non-manufacturing high-growth firms, the labor share does not decline despite the increase in sales. This is because the allocation to personnel expenses is increased to the same extent as the increase in value added.

Regarding dividends, it is observed that firms are willing to stabilize the dividend distribution ratio by adjusting the dividend in accordance with the change of the sales and the value added. As for the retained earnings distribution ratio, it is significantly higher in industries and groups with a declining labor share in the same year, which contrasts with the estimated result of the labor share.

The first problem to be solved is improving the estimation model. In order to cope with the simultaneity of the relationship between profit distribution and corporate performance, it is necessary to use appropriate instrumental variables, in particular external instrumental variables instead of lagged terms (Branchflower et al. 1996). In this paper, we cannot find appropriate instrumental variables that satisfy the condition, so there is a possibility that

results may not be estimated consistently.

The second challenge is to consider the influence of changes in production efficiency, such as rise in labor productivity due to technological progress, on value added distribution. It is said that skill-biased technical change (SBTC) since the 1990s has changed the quality of workers demanded by firms and has expanded the productivity gap among firms. There is also a possibility that such changes have influenced the value added distribution. Although the target is limited to large firms with capital of 1 billion yen or more due to the use of panel data in this paper, studies trying to clarify factors that change firm's value added distribution are urgently required by expanding their sample target to small and medium firms with bigger technology and productivity gap.

References

- Abowd, J. A., and Lemieux, T. (1993) The Effects of Product Market Competition on Collective Bargaining Agreements: The Case of Foreign Competition in Canada. *The Quarterly Journal of Economics*, 108(4), 983 - 1014.
- Arai, Haruhito. (2006) Recent Corporate Earnings and Labor Share. *Reference*, No.665. (in Japanese)
- Arellano, M., and Bond, S. (1991) Some Tests of Specification for Panel data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277 - 297.
- Blanchflower, D., Oswald, A. J., and Sanfey, P. (1996) Wages, Profits, and Rent-sharing. *The Quarterly Journal of Economics*, 111(1), 227 - 251.
- Cabinet Office, Government of Japan. (2014) *Improvement of Economic Trend Index (Interim Report)*. <http://www.esri.cao.go.jp/jp/stat/di/140530siryou3-2.pdf>
- Card, D., Devicienti, F., and Maida, A. (2014) Rent-sharing, Holdup, and Wages: Evidence from Matched Panel Data. *The Review of Economic Studies*, 81(1), 84 - 111.
- Development Bank of Japan. (2005) Change in Corporate Fund Surplus and its Use. *Chosa (research)*, No.86. (in Japanese)
- Grout, P.A. (1984) Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach. *Econometrica*, 52, 449 - 460.
- Harada, Yutaka, and Naomichi Hino. (2002) Distribution of Value: Added to Labor and Capital, Profit and Loss Appropriation. *Financial Review*, No.62. (in Japanese)
- Hildreth, A. K., and Oswald, A. J. (1997) Rent-sharing and Wages: Evidence from Firm and Establishment Panels. *Journal of Labor Economics*, 15(2), 318 - 337.
- Ibaragi, Hideyuki, Yusuke Inoue, Motoyuki Arima, and Takahiro Nakano. (2007) Changes in Corporate Wage Determination Behavior and its Background. *The Japanese Journal of Labour Studies*, No.560. (in Japanese)
- Ito, Shinsuke, Takahisa Dejima, and Kazuhiro Kinoshita. (2015) Quantitative Analysis between Corporate Performance and Financial Content, and Wages and Employment: Using Micro Data from the Basic Survey of Japanese Business Structure and Activities.

- Institute of Economic Research Hitotsubashi University Discussion Paper Series A*, No. 623. (in Japanese)
- Iwase, Tadaatsu, and Masaki Sato. (2014) Internal Retained Earnings and Profit Distribution of Japanese Firms Seen through the Financial Statements Statistics of Corporations by Industry. *The Finance*, No.584. (in Japanese)
- Kawamoto, Takuji, and Kimiaki Shinozaki. (2009) Why did not Wage Get Better? A Consideration on Suppression of Large Firms' Personnel Costs in the 2002 - 07 Economic Expansion Period. *Bank of Japan Working Paper Series*, No. 09-J-5. (in Japanese)
- Life Insurance Association. (2014) *Questionnaire on Efforts to Improve Shareholder Value*.
- Nickell, S., Vainiomaki, J., and Wadhvani, S. (1994) Wages and Product Market Power. *Economica*, 61(244), 457-473.
- Nickell, S., and Wadhvani, S. (1990) Insider Forces and Wage Determination. *The Economic Journal*, 100(401), 496-509.
- Niino, Kojiro. (1960) Determinants of Industrial Structure. *Kobe University Economic Review*, 101(2): 17-31. (in Japanese)
- Nishimura, Kiyohiko, and Atsushi Inoue. (1994) Labor share of Japanese Manufacturing Industry since the High-Growth period. In *Japanese Income and Distribution of Wealth*, ed. Tsuneo Ishikawa. University of Tokyo Press. (in Japanese)
- Noda, Tomohiko, and Masahiro Abe (2010) Labor Share and Wage Decrease. In *Labor Market and Income Distribution* ed. Yoshio Higuchi. Keio University Press. (in Japanese)
- Ogawa, Kazuo. (2007) Financial Crisis and Employment Adjustment: Japan's Experience in the 1990s. In *Financial dysfunction*, ed. Fumio Hayashi, Keiso Shobo. (in Japanese)
- Ono, Akira. (1973) *Wage Determination in Postwar Japan*, Toyokeizai Shinposya. (in Japanese)
- Ono, Akira. (1985) Distribution of Labor Income and Economic Growth Rate. *The Japanese Journal of Labour Studies*, 27(12). (in Japanese)
- Shinozaki, Kimiaki. (2008) Globalization, Corporate Distribution, Labor Share: Redistribution Mechanism through Firm Heterogeneity. *Bank of Japan Working Paper Series*, No. 08-J-12. (in Japanese)
- Suga, Mikio. (2009) Measurement Methodology of Disparity Ratio between Executive Officer's Average Payroll and Worker's Average Payroll by Using the Financial Statements Statistics of Corporations by Industry. *Proceedings of the Institute of Statistical Mathematics*, 57(2), 393-411. (in Japanese)
- Takasawa, Toshio. (1964) Labor Issues of Small and Medium Firms. *Journal of the Brewing Society of Japan*, 59(12). (in Japanese)
- Takata, Kiyoshi. (2015) Japan Economy with Further Improved Corporate Profit Ratio: From the FY2014 Financial Statements Statistics of Corporations by Industry. *The Finance*, No.601. (in Japanese)
- Ueno Yoichi, and Baohiko Baba. (2005) Determinants of Shareholder Return Policies by Japanese Firms: Empirical Analysis on Incentives for Dividend and Share Repurchase.

- Bank of Japan Working Paper Series*, No. 05-J-6. (in Japanese)
- Van Reenen, J. (1996) The Creation and Capture of Rents: Wages and Innovation in a Panel of UK Companies. *The Quarterly Journal of Economics*, 111(1), 195-226.
- Wakita, Shigeru. (2005) The Lost Decade in the Japanese Labor Market: Labor's share and Okun's Law, *Financial Review*, No.78. (in Japanese)
- Yamada, Ryo, Akihito Toda, and Takaaki Murakami. (2009) Why was Wage Suppressed? Focusing on the Comparison between the Previous Economic Recovery Period and the Bubble Period. *New ESRI Working Paper Series*, No. 12. (in Japanese)
- Yoshikawa, Hiroshi. (1994) Labor Share and Growth and Circulation of the Japanese Economy. In *Japanese Income and Distribution of Wealth*, ed. Tsuneo Ishikawa. University of Tokyo Press. (in Japanese)
- Yoshino, Takeo. (1967) Retained Earnings and Dividend Policy. *The Waseda Commercial Review*, No.192: 83-98. (in Japanese)

