Labor Share Decline and Corporate Saving

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1. Introduction

Developed countries, including Japan, have experienced a secular decline in labor share. Economists did not consider the decline in labor share through the 2000s. Growing economic inequality and declining consumer purchasing power since the 2008 global financial crisis have raised concerns regarding the declining labor share. Previous studies on the secular decline in labor share, include Elsby et al. (2013), Karabarbounis and Neiman (2014), and Fukao and Perugini (2021). The explanation for the decline in labor share significantly focuses on the rise of low-labor share superstar firms, rising market power, globalization, and technological changes among others.

Meanwhile, corporate savings continues to increase. Fukuda (2017) shows that the increasing trend in corporate savings is not a problem unique to Japanese firms, but a challenge common to many countries. Faulkender et al. (2019) show that corporate savings of non-financial corporations in the United States have reached 4 trillion dollars. So far, the role of corporate savings on the declining labor share has not been analyzed.

This study aims to ascertain whether the increase in corporate savings can explain the decline in labor share. Against this background, this study ascertains whether firms have substituted employee compensation with corporate savings.

The remaining paper is structured as follows. Section 2 reviews existing studies on the decline of labor share. Section 3 describes data sources and variables. Section 4 presents the empirical model and findings. Section 5 concludes.

2. Related literature

According to Keynes (1939), “the stability of the production of the national dividend accruing to labor was one of the most surprising, yet best-established, facts in the whole range of economic statistics, both for Great Britain and for the United States.” This fact became one of the stylized facts of Kaldor (1957), which has become foundational for economic growth. However, the decline in labor share is a well-documented stylized fact in several developed economies. Elsby et al. (2013) found a 6% decline that began in the late 1980s, which has worsened since the early 2000s. Karabarbounis and Neiman (2014) also found a 5 % average decline in the labor share of global corporate gross value-added over the last 35 years, using data from 59 countries. Fukao and Perugini (2021) showed that compared to the share in the 1970s, the Japanese labor share decreased by approximately 10% in the

three subsequent decades.

A vast body of literature has identified varying causes for the decline in labor share. The first set of explanations involve technological progress. If technological progress makes capital cheaper and the elasticity of substitution between capital and labor is greater than 1, then labor share declines. Karabarbounis and Neiman (2014) estimate the elasticity of substitution between labor and capital to be approximately 1.25. They concluded that investment-specific technological progress caused a decline in labor share. Because the capital-to-output ratio increased and labor share decreased, Piketty and Zucman (2014) also concluded that the elasticity of substitution between labor and capital is greater than 1. Contrary to the above studies, Oberfield and Raval (2014) estimate that the elasticity of substitution between capital and labor is less than 1. They found that investment-specific technological changes cannot explain the declining labor share.

The second set of explanations involve the superstar firm hypothesis, which posits the rising market power of large firms. Autor et al. (2020) attribute the decline in labor share to the rise in low-labor share superstar firms, and emphasize the role of market concentration in driving down the labor share in several US sectors. De Locker and Eeckhout (2018) found that market power has been steadily increasing over time. They also noted the rise in market power worldwide but more clearly, in developed countries. De Locker et al. (2020) also concluded that the decline in US labor share can be attributed to the rising market power. This study also considers the firm's mark-up ratio as one of the determinants of labor share and includes it as an explanatory variable in the regression analysis.

The final set of explanations involve globalization. Elsby et al. (2013) found that offshoring the labor-intensive component of the US supply chain is a leading cause for the decline in US labor share. Reshef and Santoni (2019) also found that the accelerating decline in labor share is associated with an increased intensity of intermediate input exporting through global value chains (GVCs). This study includes export intensity, which is considered a globalization variable, as an explanatory variable in the regression analysis of labor share.

3. Data and Variables

For our analysis, I used the DBJ database, which contains unconsolidated financial data for listed firms. I construct variables such as firms' labor share using firm-level panel data spanning the period 1995 to 2018.

Labor share is defined as the ratio of total wages to nominal value-added. I obtain the nominal value-added by subtracting the nominal intermediate inputs from gross sales. Nominal intermediate inputs are calculated by subtracting the total wages and depreciation from the total cost of goods sold, selling, general, and administrative expenses. The corporate saving rate of interest is calculated by dividing net income after taxes minus dividends by total net worth.

Figure 1 shows the evolution of average labor share and corporate savings in listed firms over the period 1995 to 2018. The average labor share of listed firms in Japan decreases by 8% over the period. Interestingly, the average labor share experienced an increase in 2001 and 2008, when the IT bubble burst and the global financial crisis occurred. In contrast, despite the business cycle, the average corporate saving rate considerably increased by 5% over the period. I aim to examine how corporate savings rate affects the labor share.

Additionally, I use eight control variables. First, I use each firm's TFP (Total Factor Productivity) level relative to the average of the industry in which the firm operates, using the index number method employed by Good et al. (1997). The main advantage of the index number method is that it allows for heterogeneity in the production

Figure 1. Labor share and corporate saving rate

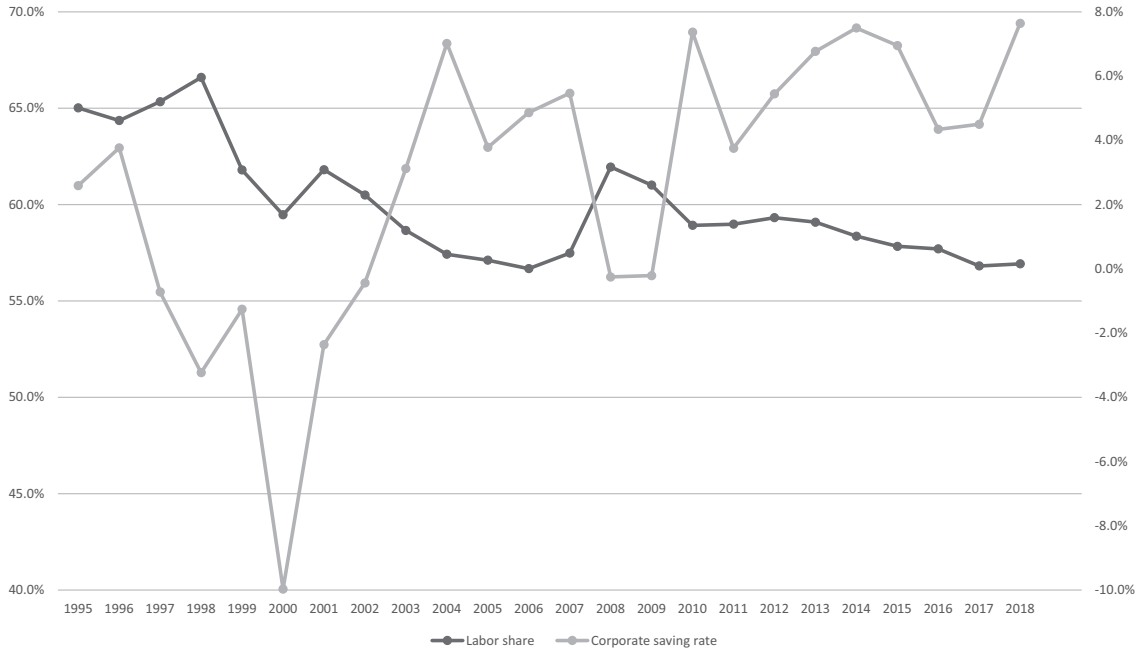

Table 1. Definition of Varibales

Variables	Variable Definition	Variable Description
Dependent Variable		
LS	Labor share	The ratio of total wage to gross value-added
Independent Variables		
CS	Corporate saving rate	(Earning after tax- dividends)/Total net worth
TFP	Total factor productivity	Each firm's TFP level
MUP	Mark-up ratio	Sales/(Labor cost + Capital cost + Intermediate cost)
AGE	Log of firm age	log(Number of years since the foudation of the firm)
EAGE	Log of averge age of employee	log(average age of employee)
LOGL	Log of employees	log(Total number of employees)
EXS	Export intensity	The ratio of export to total sales
FIO	Financial institutional ownership	The ratio of financial institutional ownership
FO	Foreign ownership	The ratio of foreign ownership

technologies of individual firms. Second, the markup ratio is the share of the total sales of the firm over the cost of input. Third, firm age is defined as the number of years since the firm's establishment. Fourth, I consider the average age of the employees. Fifth, firm size is measured according to the log number of employees. Sixth, the export intensity is the ratio of exports to total sales. Seventh, the ratio of financial institutional ownership is defined as the holdings in a stock by a financial institution as a percentage of the shares outstanding. Lastly, the ratio of foreign ownership is defined as the stock holdings by a foreign firm as a percentage of shares outstanding. Table 1

Table 2. Summary Statistics

Variables	Obs	Mean	Std.Dev.	Min	Max
LS	74297	0.60	0.21	0.00	1.00
CS	74294	0.03	1.25	-184.16	91.47
TFP	70677	-0.06	0.15	-1.66	1.52
MUP	74297	1.08	0.13	0.38	2.00
AGE	60681	3.76	0.65	0.00	4.92
EAGE	72071	3.65	0.12	1.39	5.97
LOGL	72214	6.16	1.35	0.00	12.13
EXS	74297	0.02	0.31	0.00	36.18
FIO	71876	19.05	13.76	0.00	74.88
FO	68495	8.09	10.96	0.00	97.61

summarizes the variables and measures used in the study.

Table 2 presents descriptive statistics for labor share, corporate savings rate, and firm characteristics for firms in full sample. I winsorize TFP, labor share, and corporate savings rate at the first and ninety-ninth percent level as they have skewed distribution.

4. Empirical analysis

This section provides estimates of the within-firm relationship between the corporate saving rate and labor share. I estimate the effect of the corporate saving rate on labor share at the firm level using the following equation:

$$LS_{f,t} = \alpha + \gamma CS_{f,t} + \beta X_{f,t} + firm\ dummies + Year\ Dummies + \epsilon_{f,,t}$$

where $LS_{f,t}$ represents labor share, f indexes firm, and t represents year; $CS_{f,t}$ represents the corporate saving rate; $X_{f,t}$ is a set of firm-level control variables, including TFP, Mark-up ratio, firm age, and firm size etc., and $\epsilon_{f,,t}$ is the residual.

Firm fixed effects are included in all the estimations of the equation. This means that the estimated coefficient of the corporate saving rate represents the effect of annual variations in the corporate saving rate on labor share after controlling for firm-level covariates.

Table 3 provides the estimation results on whether the corporate saving rate has any significant influence on the firm's labor share based on the fixed effect model. The coefficient of interest is γ, which represents the within-firm effect of the labor share at the firm level on the corporate saving rate, after controlling for firm-level covariates. I find that the coefficient of CS significantly negatively influences labor share in the full sample. This finding suggests that a large increase in corporate savings results in a decline in labor share. Column (1) of Table 3 indicates that a one standard deviation increase in the corporate saving rate reduces wages by 0.6% (= 0.0053 × 1.25). Table 3 also shows the results when the sample is divided into manufacturing and non-manufacturing. Increase in corporate savings negatively affect labor share, which remains the same in both sectors. However, the regression coefficient for the manufacturing sector is statistically insignificant.

Evidently, firm size and the average age of employees have a statistically significant positive relationship on labor share. Japan's employment system has traditionally been characterized by long-term employment and

Table 3. Effect of corporate saving on labor share, 1995-2018

Dependent variable: LS	Full sample				Manufacturing				Non-manufacturing			
	(1)		(2)		(3)		(4)		(5)		(6)	
CS	**-0.0053**	**-3.51*****	**-0.0044**	**-3.79*****	-0.0043	-1.39	-0.0039	-1.63	**-0.0055**	**-3.58*****	**-0.0047**	**-3.87*****
TFP	-0.4057	-41.52***			-0.4767	-39.53***			-0.4048	-27.70***		
MUP			-0.7625	-77.73***			-1.0198	-43.71***			-0.6404	-61.55***
AGE	-0.0404	-6.61***	-0.0402	-7.29***	-0.0104	-0.75	-0.0441	-3.03***	0.0008	0.11	-0.0120	-1.95*
EAGE	0.1970	11.40***	0.1534	10.70***	0.3114	8.62***	0.2010	8.46***	0.1873	7.34***	0.1563	6.82***
LOGL	0.0941	50.74***	0.0688	38.06***	0.1019	36.2***	0.0535	16.85***	0.0880	36.28***	0.0727	32.22***
EXS	-0.0059	-2.40**	-0.0062	-3.06***	-0.0507	-4.65***	-0.0397	-4.96***	-0.0055	-2.25**	-0.0050	-2.49**
FIO	-0.0031	-29.98***	-0.0021	-23.93***	-0.0033	-24.01***	-0.0022	-19.04***	-0.0026	-17.2***	-0.0019	-13.91***
FO	-0.0016	-14.72***	-0.0014	-16.08***	-0.0017	-12.59***	-0.0015	-13.69***	-0.0017	-10.28***	-0.0014	-10.13***
Constant	-0.4777	-7.93***	0.6623	12.77***	-1.0678	-8.60***	0.8572	9.30***	-0.5268	-5.92***	0.4214	5.17***
year dummies	Yes				Yes				Yes			
firm effects	Yes				Yes				Yes			
Number of observations	55,152		56,301		27,622		28,198		27,530		28,103	

Note: The t-statistics based on robust standard errors are reported right the coefficient estimates. ***p < 0.01. **p < 0.05. *p < 0.1

seniority-based wages. This finding suggests that labor share is higher for larger firms that maintain the Japanese employment system, and for firms with longer employee tenure.

In all three models in Table 3, I find that TFP and the mark-up ratio significantly negatively affect labor share. This is a surprising result, considering that, generally, firms with higher productivity and market dominance have higher wages. This negative effect is attributable to the fact that Japanese listed firms are likely to be cutting labor costs to achieve higher performance. Export intensity also has a statistically significant negative relationship. These empirical results suggest that firms with higher productivity, with higher mark-up ratio, and engaged in exports, experience stronger competitive pressure to restrain labor costs to survive and earn more profit in the global competitive market.

From the viewpoint of economic theory, I speculated that the labor share should decline in firms owned by financial institutional shareholders and foreign shareholders because shareholders' objectives are more likely to conflict with those of employees. As expected, I find that a higher share of financial institutions and foreign capital results in a decline in labor share.

Overall, I find that labor cost has been substituted by corporate savings.

A potential concern for our baseline results is that corporate savings and labor share are correlated with economic policy changes and the business cycle. To mitigate this concern, I focus on the sample period after the global financial crisis, 2009-2018, which includes the Abenomics period.

Table 4 presents estimation results for the subsample from 2009 to 2018. I confirm that the estimation results are significantly consistent with our baseline results in Table 3, except that the coefficient for export intensity is no longer statistically significant.

5. Concluding remarks

Using firm-level panel data from the DBJ Database from 1995 to 2018, I examine the relative importance of corporate saving as a factor responsible for the decline in labor share. I find that an increase in corporate savings results in a considerably lower labor share.

The potential issue of endogeneity is a significant concern. Aggregate demand and supply shocks simultaneously affect labor share and corporate savings, generating bias in the estimated coefficients of corporate saving. This endogeneity problem remains a potential issue for the future.

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Table 4. Effect of corporate saving on labor share,2009-2018

Dependent variable: LS	Full sample				Manufacturing				Non-manufacturing			
	(1)		(2)		(3)		(4)		(5)		(6)	
CS	**-0.0033**	**-2.92*****	**-0.0032**	**-3.05*****	-0.0007	-0.70	-0.0011	-1.14	**-0.0051**	**-3.52*****	**-0.0048**	**-3.60*****
TFP	-0.7220	-38.93***			-0.8649	-33.38***			-0.6494	-27.62***		
MUP			-0.7080	-46.58***			-0.9788	-25.18***			-0.5937	-37.60***
AGE	-0.0474	-4.28***	-0.0603	-5.59***	-0.0039	-0.15	-0.0478	-1.92**	-0.0250	-2.04**	-0.0338	-2.73***
EAGE	0.1807	7.25***	0.1096	4.43***	0.2107	4.90***	0.0960	2.23**	0.2265	7.46***	0.1721	5.79***
LOGL	0.0991	25.05***	0.0901	25.24***	0.0910	13.26***	0.0615	8.02***	0.1038	21.87***	0.1006	24.66***
EXS	-0.0042	-1.53	-0.0028	-0.94	0.0117	0.23	-0.0253	-0.59	-0.0041	-1.37	-0.0029	-0.88
FIO	-0.0036	-18.00***	-0.0035	-18.64***	-0.0041	-13.44***	-0.0038	-13.57***	-0.0029	-11.43***	-0.0029	-12.06***
FO	-0.0015	-7.62***	-0.0016	-9.14***	-0.0017	-6.56***	-0.0020	-9.07***	-0.0016	-5.17***	-0.0015	-5.52***
Constant	-0.4615	-4.59***	0.7107	7.04***	-0.6706	-3.49***	1.1887	6.50***	-0.7673	-6.33***	0.1843	1.52
year dummies	Yes				Yes				Yes			
firm effects	Yes				Yes				Yes			
Number of observations	26,588		27,018		12,336		12,534		14,252		14,484	

Note: The t-statistics based on robust standard errors are reported right the coefficient estimates. ***p < 0.01. **p < 0.05.

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