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The effect of pro-shareholder income distribution on capital accumulation : evidence from Japanese non-financial firms

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Abstract

Over the past decades, there has been a change in the pattern of capital accumulation, especially in developed countries. Although the profit rate and the profit share recovered after the 1980s and 1990s, the rate of capital accumulation remained stagnant in many developed countries in the same period. This phenomenon is called “investment-profit puzzle” because the movement of the rate of capital accumulation is thought to be mainly determined by that of the profit rate or the profit share. In this study, I examine the effect of financialization on the “investment-profit puzzle” in the Japanese economy. In the Japanese economy, the profit rate and the profit share began to recover from the mid-1990s, whereas the rate of capital accumulation did not recover during the same period. This study reveals that pro-shareholder income distribution, namely, the rise in profit share that is evoked by financialization is the main cause of the “investment-profit puzzle” in the Japanese economy. In the Japanese economy, the increasing profit share since the 1990s raised the profit rate in each industry, but its effect on capital accumulation has varied among different industries. While the rise in profit share has stimulated capital accumulation in manufacturing industries by increasing exports, it has depressed capital accumulation in non-manufacturing industries by decreasing domestic demand since the 1990s. Thus, the rise in profit share has caused the “investment-profit puzzle” in non-manufacturing industries, and the trend of non-manufacturing industries has determined the “investment-profit puzzle” in the Japanese economy since the 1990s because the scale of non-manufacturing industries is larger than that of manufacturing industries.

Key Words : Financialization, capital accumulation, income distribution,
investment function, demand regime

JEL Classification: B50, E12, G31

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1. Introduction

In the developed countries, there has been a change in the pattern of capital accumulation over the last decades. Although the profit rate and profit share recovered after the 1980s and 1990s, the rate of capital accumulation remained stagnant in many developed countries in the same period. This phenomenon is called “investment-profit puzzle” because the movement of the rate of capital accumulation is thought to be mainly determined by that of the profit rate or profit share (Stockhammer (2006), van Treeck (2008)). The reason why the recovery of these profit variables has not led to a rise in the rate of capital accumulation over the past several decades in developed countries has been one of the most important issues in the debate of capital accumulation regime.

Earlier studies often stated that financialization in non-financial corporations (NFCs) have made the separation between the profit variables and the rate of capital accumulation. They claim that with spread of new ideology of corporate governance, shareholder value orientation, NFCs in developed countries have engaged in financial activity than ever before, and this trend caused divergence between profit and investment. For example, Stockhammer (2004) and Clévenot et al (2010) emphasized the role of financial investment on capital accumulation, arguing that the spread of short-termism to satisfy shareholder value caused NFCs to increase financial investment to acquire short-term profit, thus depressing capital accumulation while maintaining profit. Therefore, the increase in financial investment raised corporate profits, but it depressed capital accumulation. This is an explanation of “investment-profit puzzle” in previous researches.

In this study, I also examine the effect of financialization on “investment-profit puzzle” in the Japanese economy. Japan is no exception to “investment-profit puzzle”. The profit rate and profit share in Japanese NFCs began to recover after the 1990s, whereas the rate of capital accumulation did not recover during the same period. Why did the recovery of the profit rate and profit share not lead to a rise in capital accumulation in the Japanese economy since the 1990s? To examine this problem, the present study applies different viewpoint from previous researches of financialization. This study mainly focuses on functional income distribution. This study considers that the pro-shareholder income distribution, that is, the rise in profit share since the 1990s at Japanese NFCs is the main cause of “investment-profit puzzle” in the Japanese economy.

As shown in this study, the effect of rising profit share on demand formation and capital accumulation after the 1990s is suppressive especially in Japanese non-manufacturing industries that depend mostly on domestic demand, though this is not the case for Japanese manufacturing industries that considerably depend on exports. Moreover, it is shown that a larger non-manufacturing industry compared to manufacturing industry affects the trend of “investment-profit puzzle” in all industries.

This study offers several contributions to the existing literature. Firstly, this study is the first attempt to explain the effect of financialization on capital accumulation from the viewpoint of functional income distribution. Although previous researches suggest

that financialization causes the rise in profit share (Hein and Schoder (2011), Duenhaupt (2012)), few attempts have been made to show how the rise in profit share brought by financialization affects the regime of capital accumulation. Secondly, this study explicitly considers the differing effect of financialization on capital accumulation in various industries, and shows that the influence of financialization in accumulation can vary significantly between manufacturing and non-manufacturing industries. Thirdly, the subject of this study is Japan that has been overlooked by literature of financialization. Previous studies of financialization mainly focus on the US and European countries such as Germany, France and the UK. This study illustrates that the influence of financialization on capital accumulation is not limited to those countries.

The remainder of this paper is organized as follows. Section 2 shows the actual state of financialization in Japanese NFCs. Section 3 provides the specification of the regression equations and regression results and explains how financialization affects capital accumulation in Japanese NFCs. Section 4 demonstrates how the rise in profit share in Japanese NFCs causes “investment-profit puzzle” from the viewpoint of the effect of functional income distribution on demand formation. Section 5 concludes.

2. Actual State of Japanese financialization

2.1. Aspects of financialization in Japanese NFCs

After the 1990s, a new ideology for corporate governance, “shareholder value orientation”, emerged in Japanese firms. The style of corporate governance in Japanese NFCs substantially shifted in this period following the changes in ownership structures such as the substantial increase in the shareholdings of foreign investors and the decline of cross-shareholding among corporations (Jackson and Miyajima (2007)). Thus, shareholder value orientation penetrated into Japanese NFCs. Japanese firms originally aimed for long-term growth (e.g. in sales). However, the short-term management goal to meet shareholder value such as share price and the dividend payout ratio became much more important in Japanese NFCs than before after the 1990s.

With the spread of shareholder value orientation, NFCs tend to engage in short-termism to meet shareholder value (Lazonick and O’Sullivan (2000)). This tendency brings important changes to NFCs. Previous researches reveal that in the process of spread of shareholder value orientation, NFCs show the following signs of financialization. Firstly, investment policies of NFCs change. Real investment for long-term growth decreases, while financial investment rises. And as stressed in Krippner (2005), profit-making occurs increasingly through financial channels rather than productive activities. In fact, financial investment and financial revenues have dramatically increased in the United States and other European countries since the 1980s (Stockhammer (2004), Epstein and Jayadev (2005), Krippner (2005)). Secondly, as shareholder claims become more powerful, the dividend policy in NFCs becomes more aggressive. Dividend payments and dividend payout ratio grow dramatically (Skott and Ryoo (2008), Orhangazi (2008 (a, b))). Thirdly, pro-shareholder income distribution appears. In other words, NFCs rise mark-up to cover dividend payments

and this leads to the rise in profit share (Boyer (2000), Hein and Schoder (2011)). NFCs secure profits and prepare for dividend payments by raising the profit share.

Among the signs of financialization, which characteristics does the Japanese economy show? At first, data of the amount of financial revenues and the ratio of financial revenues to gross profits verifies the change in investment policies in Japanese NFCs. Figure 1 shows the amount of financial revenues¹.

【Insert Figure 1】

From Figure1, it is apparent that financial revenues have dramatically increased, especially in large firms since the 2000s.

The cause of the rise of financial revenues in Japanese large NFCs is great increase of dividend incomes from equity in fixed assets (not equity in current assets)². Isobe (2013, 2014) indicate that Japanese large NFCs have greatly increased holdings of equity in fixed assets since the 2000s through substantial growth in equities in affiliated companies³. According to Isobe (2013, 2014), important reasons for the growth in holding of equities in affiliated companies are aggressive investment in overseas subsidiaries and increase of their mergers and acquisitions of foreign companies in Japanese large NFCs. Thus, Japanese large NFCs has increased equity in fixed assets through foreign direct investment and gained a significant amount of dividend income as returns on these investments.

The increase in financial investments changed the composition of asset side of balance sheet in Japanese large NFCs. Figure 2 shows the ratio of respective assets to total assets in Japanese large NFCs.

【Insert Figure 2】

From Figure 2, it is apparent that the ratio of total financial assets to total assets has greatly increased since the late 1990s, while the ratio of tangible fixed assets to total assets has apparently decreased in the same period in Japanese large NFCs. Financial assets have substituted for tangible fixed assets in Japanese NFCs since the late 1990s⁴. This substitution of financial assets for real assets is a remarkable characteristic of financialization (Clévenot et al (2010), Davis (2013)).

Next, I check the movement in the profit share of Japanese NFCs. Figure 3 shows the movement in the profit share from 1964Q1 to 2013Q4 of each scales of Japanese NFCs.

【Insert Figure 3】

Figure 3 shows that the profit share has apparently increased since the 2000s except during the depression from 2008 to 2009, especially in large firms. Boyer (2000) argues that firms raise the profit share to secure profit for financial payments under pressure

from shareholders. In fact, the rise in profit share in Japanese NFCs was accompanied by dramatic increase in dividend payments since the 2000s. The amount of dividend payments, the ratio of dividend payments to capital stock and the dividend payout ratio have greatly increased since the 2000s in Japanese NFCs because of the shift toward shareholder value orientation (Shimano (2015)). In other words, Japanese NFCs increased dividend payments at the expense of wage for employees. Figure 4 confirms this observation by showing the components of expenditures and saving as a share of value added in Japanese large NFCs.

【Insert Figure 4】

Figure 4 clarifies the pro-shareholder income distribution in Japanese large NFCs⁵. The decrease in wage and the increase of dividend payments is a basic trend of income distribution in Japanese NFCs in recent years. Figure 4 shows that with the spread of shareholder value orientation, shareholders gained dividend incomes from the fall in wage share in Japanese NFCs.

This pro-shareholder income distribution, the rise in profit share, reflects changes in the structure of stock ownership in Japanese NFCs. The ratio of cross-shareholding among firms declined from 15.3% in 1996 to 9.0 % in 2008, while the stock ownership ratio of foreign investors, individual investors, and institutional investors rose since the mid-1990s. Especially, stock ownership ratio of foreign investors increased from 5 % in 1990, to 25 % in 2009 (Shimano (2015)). Sasaki and Yonezawa (2000) revealed that foreign stock ownership ratio had a significant negative influence on the wage share in Japanese large firms. Noda and Abe (2010) estimated wage equations and found that the foreign stock ownership ratio had a significant negative impact on wages in Japanese large firms from 1997 to 2004⁶. Foreign investors' claim on profits to increase dividend payments depressed wages and increased profit share in Japanese firms.

After all, Japanese NFCs began showing all of the important characteristics of financialization after the 1990s. Under the rising influence of shareholder value orientation, Japanese NFCs have raised financial revenues from financial investment and increased the profit share to maintain sufficient dividends since the 1990s.

2.2. Change in the regime of capital accumulation in the Japanese economy

In the same period as the emergence of financialization in Japanese NFCs, a change in the regime of capital accumulation occurred in the Japanese economy. As shown in Figure 5, in all industries of Japanese NFCs, although the profit rate has apparently recovered since the 1990s, the rate of capital accumulation has remained stagnant in the same period.

【 Insert Figure 5 】

In all industries of Japanese NFCs, the rate of capital accumulation has no longer been determined by the profit rate since the 1990s. Coexistence of the rising trend of the profit rate and decreasing trend of the rate of capital accumulation (“investment-profit puzzle”) has appeared in all industries of Japanese NFCs. On the other hand, relationship between the profit rate and the rate of capital accumulation utterly differs between manufacturing and non-manufacturing industries. Figure 6 and 7 show the profit rate and the rate of capital accumulation in these industries.

【 Insert Figure 6 and 7 】

Figure 7 shows that in non-manufacturing industries, the decreasing trend of profit rate has increased since the 1990s as in all industries. However, this is not the case for manufacturing industries. As shown in Figure 6, the rate of capital accumulation has still been determined by the profit rate in manufacturing industries⁷.

In fact, when a simple investment function that includes only the profit rate as an explanatory variable is estimated from 1964Q1 to 1990Q4 (the first period) and from 1991Q1 to 2013Q4 (the second period), the profit rate is estimated positively and significantly in all categories of industries in the first period. However, in the second period, while the profit rate is estimated positively and significantly in manufacturing industries, the profit rate is not estimated significantly in all industries and non-manufacturing industries. Table 1 shows the regression result of the simple investment function (1).

$$\text{ACCUMU}_t = \alpha_0 + \alpha_1 \text{PR}_t \quad (1)$$

where ACCUMU is the rate of capital accumulation, and PR is the profit rate⁸.

【 Insert Table 1 】

3 Empirical analysis and results from the econometric tests

As has shown, the rate of capital accumulation in the Japanese economy (all industries of Japanese NFCs) has been stagnant since the 1990s, and the decreasing trend of capital accumulation has been accompanied by the rise in profit rate. This means that at least, the stagnant of capital accumulation in the Japanese economy since the 1990s cannot be explained by the movement of the profit rate. In addition, although the “investment-profit puzzle” since the 1990s in all industries also applies to

non-manufacturing industries, the trend of the profit rate and that of the rate of capital accumulation still correspond in manufacturing industries since the 1990s. What made the “investment-profit puzzle” in the Japanese economy and the difference in accumulation regime between manufacturing and non-manufacturing industries since the 1990s ?

Previous researches sometimes consider the cause of “investment-profit puzzle” as financialization. Especially, the increase of financial investment that is an aspect of financialization is regarded as the cause of “investment-profit puzzle (Stockhammer (2004), Clévenot et al (2010)). These studies consider that while the increase of financial investment increase profits in NFCs, it crowds out capital investment and causes “investment-profit puzzle”. On the other hand, how the rise in profit share that is another important aspect of financialization affects “investment-profit puzzle” has been hardly verified. However, it is possible that the rise in profit share affects “investment-profit puzzle” if it does not promote capital accumulation for some reason since it raises the profit rate.

For that reason, I confirm the effect of both the increase of financial investment and the rise in profit share on “investment-profit puzzle” in the Japanese economy. Has these aspects of financialization in Japanese NFCs influenced “investment-profit puzzle” in the Japanese economy ? To examine the possibility, I estimate the investment function of Japanese NFCs which includes the profit share and the ratio of fixed financial assets to total assets as explanatory variables. These variables are proxy variables for financialization in Japanese NFCs. The regression results of the coefficients and statistical significance of these variables in the investment functions are important for assessing effects of financialization on capital accumulation in Japan.

3.1. Data and investment function setting

The investment function includes both the profit share and the output-capital ratio. The profit share represents whether the regime of capital accumulation is wage-led or profit-led. If the profit share in the investment function is estimated positively, this means that the rising profit share stimulates capital accumulation and the regime of capital accumulation is profit-led. Contrarily, if the profit share is estimated negatively, capital accumulation regime is wage-led since the rising profit share depresses capital accumulation. The output-capital ratio represents the level of capacity utilization and expresses the demand effect on investment. If an accelerator effect arising from increasing demand is an important determinant for investment, the output-capital ratio is estimated positively and significantly.

Furthermore, the ratio of fixed financial assets to total assets is included in the investment function to confirm the effect of the increase of financial investment on capital accumulation. If firms use financial investment as a convenient tool of profit-making that replace capital expenditure, increasing financial investment depress capital accumulation, and the ratio of fixed financial assets to total assets is estimated negatively. However, if firms increase financial investment to increase financial revenues and firms’ cash flow and they use them as source for capital expenditure,

increasing financial investment may prompt capital accumulation. In this case, the ratio of fixed financial assets is estimated positively⁹.

All data for the variables in the investment function is drawn from *Corporation Statistics* published by the Ministry of Finance, Japan. The analysis uses quarterly data and all variables in the investment function are seasonally adjusted based on the Census X-12.

The investment functions are set as follows¹⁰.

$$\text{ACCUMU} = (\text{PS}, \text{GVA}, \text{FIX}) \quad (2)$$

where ACCUMU is the rate of capital accumulation, PS is the profit share, GVA is the ratio of output to capital stock (the output-capital ratio), and FIX is the ratio of fixed financial assets to total assets.

Since many of the variables used in the investment function have unit roots, an autoregressive distributed lag (ADL) model is used to estimate the investment function¹¹. The ADL model includes lagged dependent variables, level of independent variables and the first difference of independent variables. It has the advantage of preventing spurious regressions in the face of unit roots (Hamilton (1994)). Further, all independent variables in the investment function are lagged to avoid inverse causation. Independent variables are usually lagged by one unless the problem of serial correlation appears¹². Serial correlation is sometimes relaxed if the lag of independent variables is two. When the basic model has a serious problem of serial correlation, the estimation results of the investment function in which the lag is two are adopted. Basic setting of the investment function is as follows.

$$\begin{aligned} \text{ACCUMU}_t = & \beta_0 + \beta_1 \text{ACCUMU}_{t-1} + \beta_2 \text{ACCUMU}_{t-2} + \beta_3 \text{PS}_{t-1} + \beta_4 \Delta \text{PS}_{t-1} \\ & + \beta_5 \text{GVA}_{t-1} + \beta_6 \Delta \text{GVA}_{t-1} + \beta_7 \text{FIX}_{t-1} + \beta_8 \Delta \text{FIX}_{t-1} \end{aligned}$$

(Δ means the first difference of a variable)

The coefficients of level of independent variables are interpreted as showing long run stable relationships between a dependent variable and independent variables. The estimation period of the investment function is divided between 1964 Q1 to 1990 Q4 (the first period) and 1991 Q1 to 2013Q4 (the second period) to confirm the real effect of financialization on capital accumulation in Japanese NFCs. Separating the estimation period makes it possible to confirm whether the effect of the proxy variables of financialization on capital accumulation has changed since the 1990s. The estimation is performed not only for all industries, but also for manufacturing industries and non-manufacturing industries to verify the difference in the effect of financialization on capital accumulation among the industries. For each industry, the investment function is performed for all firms, large firms, and small and medium-sized firms.

3.2. Regression results

The regression results are represented in Tables 2 and 3. Regression period for Table 2 is from 1964Q1 to 1990Q4, and for Table 3 is from 1991Q1 to 2013Q4^{1 3}.

【 Insert Tables 2~3 】

Table 2 shows that GVA is estimated positively and significantly at the 5 % level in all firms and large firms of all industries, and in both manufacturing and non-manufacturing industries from 1964Q1 to 1990Q4. This confirms the importance of the demand effect on capital accumulation during this period. PS is also estimated positively and significantly at the 5 % level in all categories of industries, confirming the importance of rising profit share on capital accumulation in the first period. FIX is hardly estimated significantly. It is estimated significantly only in large firms of all industries and all firms of manufacturing industries, and their estimated coefficients are positive. There appears to be no substitution of financial investment with capital investment in the first period. Negative effects of financialization on capital accumulation did not appear in the first period in the Japanese economy.

However, results of all industries shown in Table 3 reveal that the effect of proxy variables of financialization on capital accumulation changed in the second period. Although GVA is still estimated positively and significantly in all firms and large firms in the second period, PS is estimated negatively in all firms and large firms. Especially in large firms, PS is estimated significantly. FIX is estimated negatively and significantly in each firm size. These results show that the rise in profit share no longer stimulated capital accumulation, and the increase in financial investment depressed capital accumulation in the second period^{1 4}. Thus, negative effects of financialization on capital accumulation appeared in all industries since the 1990s.

It is important to notice that the result of manufacturing industries differs from that of all industries in the second period. Table 3 shows that in manufacturing industries, although the coefficient of profit share is not significant in the estimation from 1991Q1 to 2013Q4 due to the abnormal value in the profit share during the Great Recession from 2008 to 2009, it has significant and positive sign in all firms and large firms in the estimation period from 1991Q1 to 2008Q1 that excludes the abnormal value^{1 5}. The rise in profit share still simulated capital accumulation in manufacturing industries in the second period. In the second period, FIX is estimated negatively and significantly in all firms and large firms in manufacturing industries.

Table 3 also shows the regression results of non-manufacturing industries in the second period. In non-manufacturing industries, PS is estimated negatively for all firms and large firms, and GVA is estimated positively and significantly at the 5 % level in each firm size. In non-manufacturing industries, FIX is estimated negatively and significantly at the 1 % level in each firm size. Unlike manufacturing industries, the rise in profit share did not stimulate accumulation in non-manufacturing industries in the second period. The result of profit share in non-manufacturing industries is the same as

all industries.

3.3. Financialization and “investment-profit puzzle” in the Japanese economy

Interestingly, the regression results of PS in the second period correspond to the relationship between the profit rate and the rate of capital accumulation in the different industries in the same period. As shown earlier, in all industries and non-manufacturing industries where the profit share is not estimated significantly in the second period, the rate of capital accumulation has no longer been determined by the profit rate and “investment-profit puzzle” has occurred since the 1990s. However, in manufacturing industries where the profit share is estimated positively and significantly in the second period, the rate of capital accumulation has been still determined by the profit rate since the 1990s. Since FIX, the ratio of fixed financial assets to total assets, is estimated negatively and significantly in all firms of each industry in the second period, the difference in regime of capital accumulation among the industries cannot be explained by the trend of FIX. Rather, the cause of the difference in accumulation regime among the industries in the second period should be attributed to the trend of profit share.

The difference in accumulation regime between the industries can be explained as follows. At first, the rise in profit share since the 1990s in Japanese NFCs raises the profit rate in the Japanese economy in the same period. The profit rate can be decomposed into the profit share (σ_{π}), the capacity utilization rate (u), and the capacity-capital ratio (k).

$$r = \frac{\pi}{K} = \frac{\pi}{Y} \cdot \frac{Y}{Y^*} \cdot \frac{Y^*}{K} = \sigma_{\pi} \cdot u \cdot k$$

where Π is the volume of profits, K is the capital stock, Y is the actual output, and Y^* is the potential output¹⁶.

Table 7 reports the results from decomposing of the profit rate from 1993 Q3 to 2007 Q4 in each industry of Japanese NFCs. The results show that the recovery in the profit rate in Japanese NFCs since the 1990s has been mainly lead by the rise in profit share¹⁷.

【Insert Table 4】

Namely, the rise in profit share raises the profit rate in each industry. Secondly, however, the effect of the rising profit share on capital accumulation since the 1990s in Japanese NFCs differs among the industries. As suggested by regression results of the profit share in the second period, the rise in profit share since the 1990s has depressed capital accumulation in all industries and non-manufacturing industries, but it has increased capital accumulation in manufacturing industries. This is why the trend of the

profit rate and that of the rate of capital accumulation since the 1990s have diverged in all industries and non-manufacturing industries and they have corresponded in manufacturing industries.

Then, what made the effect of the rise in profit share on capital accumulation differ among the industries? The key to solve the question is the effect of rising profit share on demand formation among different industries.

4. Effect of the rise in profit share on demand formation and capital accumulation after the 1990s in the Japanese economy.

It is well known that functional income distribution affects demand formation in a country. The trend of functional income distribution influences each component of aggregate demand. As for the profit share, the rise in profit share has a negative effect on consumption through income distribution from workers who have a high propensity to consume to capitalists and rentiers who have a low propensity to consume. However, the rise in profit share may increase investment if an increase in internal funds and improvement in the expectation of profitability stimulate capital expenditure of firms. Usually, the negative effect of the rise in profit share on consumption is larger than its positive effect on investment. Stockhammer and Stehrer (2011) reveal that most OECD countries become wage-led when they consider only private domestic demand^{1 8}.

However, rising profit share stimulates net exports since it decreases the cost effect of wages. The decline in wage share is the same meaning as a fall in unit labor cost, and it improves international competitiveness and increases export. Generally, the magnitude of the effect of the rise in profit share on exports determines whether an economy becomes wage-led or profit-led in total economy (Hein and Vogel (2008), Stockhammer et al (2009)). If the positive effect of the rise in profit share on net exports is larger than its negative effect on domestic demand, the demand regime in total economy will be profit-led since the rising profit share increase aggregate demand in this case.

An accelerator effect caused by growing demand is the prominent factor to stimulate investment (Chirinko (1993)). Therefore, the effect of the rise in profit share on capital accumulation depends on whether the rising profit share increase demand levels. In addition, the effect of the rise in profit share on capital accumulation may differ between manufacturing and non-manufacturing industries. In manufacturing industries, the rise in profit share usually has positive effect on capital accumulation because manufacturing industries have high export dependence and gain much export demand through the decline of unit labor costs. On the other hand, in non-manufacturing industries, there is a high possibility that the rise in profit share depress capital accumulation. This is because non-manufacturing industries have weak export dependence and mainly depend on domestic demand. The decline in consumption and domestic demand caused by the rise in profit share becomes important in non-manufacturing industries.

As shown in regression results of the investment function (2), in the Japanese

economy, the rise in profit share stimulated capital accumulation in manufacturing industries, but it depressed capital accumulation in non-manufacturing industries since the 1990s. Are the difference in the effect of the rising profit share on capital accumulation among these industries really caused by the factor the rising profit share have distinct effects on demand levels between the two industries as the theory above suggested ? To verify this possibility, I estimate the consumption function, investment function, and net exports function and determine demand regimes by estimating the following equations. The estimation period is from 1991 to 2013 and annual data is used. Each function is estimated in the first difference^{1 9}.

$$\text{Consumption function : } d(\log(C_t)) = c + d(\log(W_t)) + d(\log(P_t)) \quad (3)$$

$$\text{Investment function : } d(\log(I_t)) = c + d(\log(P_t)) + d(\log(Y_t)) \quad (4)$$

$$\text{Net export function : } d(\log(NX/Y_t)) = c + d(\log(PS_{t-1})) \quad (5)$$

where C is real consumption, W is real wages, and P is real profits. NX is real net exports, Y is real GDP, and PS is the profit share. (C, W, P, I, and Y are used in logarithmic form.)

Estimation results of these functions are shown in Table 5.

【 Insert Table 5 】

The result of consumption function in Table 5 show that the consumption elasticity for profits and wages have values of 0.129 and 0.362. From 1991 to 2013, the average value of $\frac{C}{\pi}$ and $\frac{C}{W}$ are 1.546 and 1.072. Multiply the elasticity by the average value, and the product is marginal propensities to consume for profits and wages^{2 0}. Therefore, the marginal propensities to consume for profits and wages are 0.199 and 0.388 respectively. Subtracting the value of the latter (0.388) from the value of the former (0.199) yields the effect of a change in the profit share on consumption.

Namely, $\frac{\partial C/Y}{\partial h} = 0.199 - 0.388 = -0.189$. (h means the profit share)

Moreover, since the real profits is not estimated significantly in the investment function (4), it is certain that a change in the profit share has no effect on investment in the estimation period. Thus, $\frac{\partial I/Y}{\partial h} = 0$.

From an estimated coefficient of the profit share in net exports function (5), it is clear that $\frac{\partial NX/Y}{\partial h} = 0.625$.

The results of each function derive the following formula.

$$\frac{\partial C/Y}{\partial h} + \frac{\partial I/Y}{\partial h} = -0.189 < 0.$$

$$\frac{\partial C/Y}{\partial h} + \frac{\partial I/Y}{\partial h} + \frac{\partial NX/Y}{\partial h} = -0.189 + 0.625 = 0.436 > 0.$$

The estimation results demonstrate that after the 1990s, the Japanese demand regime is wage-led in domestic demand, but it changes to profit-led in aggregate demand after adding net exports to domestic demand. The variation in demand regimes between domestic demand and aggregate demand can explain why the effect of the rise in profit share on capital accumulation varies among different industries in Japan after 1990s. The rising profit share since the 1990s has stimulated capital accumulation in manufacturing industries through the increase of exports and aggregate demand, but it has depressed capital accumulation in non-manufacturing industries through the decrease of domestic demand.

Moreover, the effect of functional income distribution on demand formation and capital accumulation in these industries from the 1990s illustrates the cause of difference in capital accumulation regime among the industries in Japan. In manufacturing industries, the rise in profit share increases both the profit rate and capital accumulation (profit-led), and the profit rate and the rate of capital accumulation correspond. Thus, the movement in rate of capital accumulation has still been determined by the rate of profit since the 1990s in manufacturing industries. However, in non-manufacturing industries, the rise in profit share has increased the profit rate, but it has depressed capital accumulation (wage-led), resulting in “investment-profit puzzle”. The capital accumulation regime in non-manufacturing industries influences “investment-profit puzzle” in all industries because scale of non-manufacturing industries is larger than that of manufacturing industries. The “investment-profit puzzle” in all industries of Japanese NFCs is affected by the trend of non-manufacturing industries.

5. Conclusion

This paper examined a cause of “investment-profit puzzle” in the Japanese economy after the 1990s focusing on the effect of financialization on capital accumulation from the viewpoint of a change in functional income distribution. Both increase of financial investment and pro-shareholder income distribution, the rise in profit share, emerged in Japanese NFCs after the 1990s in the process of financialization.

Empirical analysis in this paper showed that the rise in profit share was especially influential to produce divergence between the trend of the profit rate and the rate of capital accumulation in the Japanese economy from the 1990s. From the 1990s, while the rise in profit share has increased the profit rate in each industry, its effect on capital accumulation has been not uniform among the different industries. Although the rise in profit share has stimulated capital accumulation in manufacturing industries through its positive effect on exports, it has depressed capital accumulation in non-manufacturing

industries by suppressing domestic demand. For that reason, the coexistence of the rising profit rate and the decreasing rate of capital accumulation has emerged in Japanese non-manufacturing NFCs after the 1990s. The trend of non-manufacturing industries determined accumulation regime in all industries of Japanese NFCs. This is how the new regime of capital accumulation, “investment-profit puzzle”, appeared in the Japanese economy after the 1990s. The finding of this paper indicates that the trend of functional income distribution caused by financialization can have a significant influence on the regime of capital accumulation in a country through its impact on demand formation.

This paper considered the cause of slowdown of capital accumulation in the Japanese economy as the rise in profit share that is evoked by financialization. Thus far, on the other hand, there has been a view that financialization is not the cause of the decline in capital accumulation, and the real cause of the slump in capital accumulation is stagnation in the sphere of production that is represented by the fall in profit rate or the lowering demand levels. This view considers that a substantive factor rather than financialization have produced the decline in capital accumulation over the past decades. Kliman and Williams (2015) and Dögüs (2016) remark such a view.

Findings of this paper do not contradict the view that a real factor has produced the decline in capital accumulation in the developed countries over the past several decades. This paper showed that the fall in domestic demand caused the decline of capital accumulation in Japanese non-manufacturing industries and this lead to the stagnant of capital accumulation in the Japanese economy. The result coincides with an idea that a real factor such as the stagnation of demand has caused a slump in capital accumulation in the developed countries. What this paper showed was that at least in the Japanese economy, there has been a change in functional income distribution caused by financialization at the root of the stagnation of demand levels.

Notes

1. Throughout this paper, large firms mean firms that are capitalized over one billion yen, and small and medium-sized firms mean firms that are capitalized between ten million and one billion yen. All firms mean firms that are capitalized over ten million yen. Namely, all firms include both large firms and small and medium-sized firms.
2. According to Isobe (2013), the ratio of dividend incomes to total financial revenues was 64.2 % in manufacturing industries and 60.9 % in non-manufacturing industries in 2012.
3. The ratio of equity in fixed assets to total assets in Japanese large NFCs was only 5.1% in 1983 and 9.3% in 1998, but reached 25.0% in 2012 after great increase in the 2000s. Isobe (2014) pointed out that in listed Japanese large NFCs, the ratio of equity of affiliated firms to total assets was only 4% in 1983, but it began to increase especially in the 2000s and exceeded 20% in 2012. The results show that most of equity in fixed assets of Japanese large NFCs consist of equity of affiliated firms.
4. In Japanese large NFCs, the ratio of total financial assets to total assets rose from 40.3 percent in 1998 Q1 to 50.2 percent in 2013 Q1, but the ratio of tangible fixed assets to total assets decreased from 28.7 percent to 17.8 percent in the same period. Total financial assets consist of fixed financial assets and liquidity financial assets. The great increase in the ratio of total financial assets was caused by substantial increase of fixed financial assets, especially equity in fixed assets. The ratio of equity in fixed assets to total assets rose from 9.4 % in 1998 Q1 to 25.2% in 2013 Q1. The substitution of financial assets for real assets can also be seen in all firms of Japanese NFCs. From 1998Q1 to 2013 Q1, the ratio of total financial assets to total assets rose from 38.7 % to 46.1 %, but the ratio of tangible fixed assets to total assets decreased from 25.6 % to 17.5 % in all firms of Japanese NFCs.
5. The trend of income distribution in Japanese large NFCs is as follows. From 2001 to 2006, while wage share

- decreased from 63.9 % to 53.2 %, the dividend payments to value added rose from 3.7 % to 12.9 %. From 2009 to 2013, while wage share dropped from 64.8 % to 56.0%, the dividend payments to value added rose from 8.7 % to 11.7 %. The wage share is defined as the share of personal expenses in value added, where personal expenses are decomposed into wages for employees, compensation for officers, and welfare expenses. Among these, the decrease of wage for employees was most severe. The share of wage for employees in value added dropped by 7.0 % from 2001 to 2006, and it dropped by 6.2 % from 2009 to 2013. The increase of dividend payments and the decrease of wage share are remarkable in Japanese large NFCs, but they also can be found in all firms of Japanese NFCs. In all firms, wage share decreased from 75.3 % to 69.2 % whereas the ratio of dividend payments to value added increased from 1.8% to 5.6 % over the period from 2001 to 2006. From 2009 to 2013, wage share decreased from 74.4 % to 69.5 % whereas the ratio of dividend payments to value added increased from 4.7 % to 5.2%.
6. Interestingly, Noda and Abe (2010) also revealed that on the contrary, stock ownership ratio of financial institutions and business firms had a positive impact on wages in Japanese profitable large firms. This result is consistent with the finding of Sasaki and Yonezawa (2000) that stock ownership ratio of a main bank had a positive influence on the wage share in Japanese large firms. Namely, while wages are relatively low in firms in which foreign investors are the major stockholders, firms sustaining close ties with a main bank and business firms have relatively high wages. These results imply that the rise in foreign stock ownership ratio and the decline in stock cross-holdings from the mid-1990s increased the profit share in Japanese firms.
 7. Figure 5~7 show trends of the profit rate and the rate of capital accumulation in all firms of each industrial category. However, “investment-profit puzzle” since the 1990s in all industries and non-manufacturing industries is the same when firm size is divided into large firms and small and medium-sized firms. The correspondence between the profit rate and the rate of capital accumulation in all firms since the 1990s in manufacturing industries is also the same for large firms and small and medium-sized firms.
 8. See the appendix for a detailed definition of ACCUMU and PR.
 9. These opposite possibilities of effect of financial investment on capital accumulation are indicated by Orhangazi (2008 a, b).
 10. See the appendix for a detailed definition of variables in the investment function.
 11. PS and FIX in the estimation period from 1964Q1 to 1990Q4 and FIX in the estimation period from 1991Q1 to 2013Q4 are confirmed to have a unit root in all categories of industry, irrespective of firm sizes. Augment-Dickey Fuller test cannot reject null hypothesis that these variables have a unit root even at 10 % level. GVA in manufacturing and non-manufacturing industries in the first period and GVA in all industries and non-manufacturing industries in the second period are also confirmed to have a unit root by ADF test at 10 % level, irrespective of firm sizes.
 12. This specification of the investment function is similar to that in Stockhammer (2004).
 13. The regression results from 1991Q1 to 2008Q1 are also shown for manufacturing industries.
 14. As Kliman and Williams (2015) claims, the increase of financial investment does not crowd out capital investment if funds for financial investment are financed by borrowings. This applies to the US economy. On the other hand, Japanese NFCs have significantly reduced borrowings since the 1990s. In this case, the increase of financial investment can crowd out capital investment by reducing funds for capital expenditure.
 15. In all firms of manufacturing industries, the profit share declined to 8.5 % in 2008 Q4.
 16. The actual output is the same as value added. The potential output is estimated using the Hodrick-Prescott filter.
 17. 1993 Q3 is the bottom of the 11th business cycle in the post war period that includes the bubble and its collapse in the Japanese economy, which is also the starting point for the profit rate recovery in Japanese NFCs. 2007 Q4 is the peak of the 14th business cycle in the post war period preceding the Great Recession caused by the subprime crisis. The profit rate in Japanese NFCs reached nearly its highest value since the 1990s in the quarter.
 18. When the rise in wage share increases aggregate demand, the demand regime is called wage-led. If the rise in profit share increases aggregate demand, the demand regime is called profit-led (Bhaduri and Marglin (1990)).
 19. These data are taken from Annual Report on National Accounts. All variables are real. AR (1) is used to cure serial correlation when net export function is estimated. All variables used in the function (3), (4), and (5) are confirmed as stationary (I(0)) by Augmented Dickey-Fuller test at the 1 % level. In the net export function, PS is calculated as P (real profits)/ Y (real GDP).
 20. $\partial C / \partial \Pi = (\partial C / C) / (\partial \Pi / \Pi) \cdot \frac{C}{\Pi}$. $\partial C / \partial W = (\partial C / C) / (\partial W / W) \cdot \frac{C}{W}$.

References

- Bhaduri, A., and S. A. Marglin. 1990. “Unemployment and the Real Wage : the Economic Basis for Contesting Political Ideologies.” *Cambridge Journal of Economics* 14 (4): 375-393.
- Boyer, R. 2000. “Is a Finance-led Growth Regime a Viable Alternative to Fordism?: A Preliminary Analysis,” *Economy and Society* 29 (1): 111-145.

- Chirinko, R. S. 1993. "Business Fixed Investment Spending : Modeling Strategies, Empirical Results, and Policy Implications." *Journal of Economic Literature* 31 (4): 1875-1911.
- Clevenot, M., Guy, Y. and Mazier, J. 2010. "Investment and The Rate of Profit in a Financial Context." *International Review of Applied Economics* 24 (6): 693-714.
- Davis, L. 2013. "Financialization and the Nonfinancial Corporation : an Investigation of Firm-level Investment Behavior in the US., 1970-2011." University of Massachusetts Amherst Working Paper 2013-08.
- Dögüs, I. 2016. "A Minskian Criticism on the Shareholder Pressure Approach of Financialization." University of Hamburg Working Paper 53.
- Duenhaupt, P. 2012. "Financialization and the Rentier Income Share- Evidence from US and Germany." *International Review of Applied Economics* 26 (4): 465-487.
- Epstein, G., and A, Jayadev. 2005. "The Rise of Rentier Incomes in OECD Countries: Financialization, Central Bank Policy and Labor Solidarity." In *Financialization and the World Economy*, ed. G, Epstein. Cheltenham: Edward Elgar.
- Hamilton, J. 1994. *Time Series Analysis*. Princeton: Princeton University Press.
- Hein, E., and van Vogel, L. 2008. "Distribution and Growth Reconsidered : Empirical Results for Six OECD Countries." *Cambridge Journal of Economics* 32 (3): 479-511.
- Hein, E., and C, Schoder. 2011. "Interest Rates, Distribution and Capital Accumulation — A Post-Kaleckian Perspective on the US and Germany." *International Review of Applied Economics* 25 (6): 693-723.
- Isobe, S. 2013. "The Change of Financial Structure in Japanese Firms from 1980 to 2012." *Finance* 577: 63-71. (In Japanese)
- Isobe, S. 2014. "The Change of Financial Structure in Listed Firms and Unlisted Firms in Japan." *Finance* 583: 83-93 (In Japanese)
- Jackson, G., and H, Miyajima. 2007. "Introduction. The Diversity and Change of Corporate Governance in Japan." In *Corporate Governance in Japan —Institutional Change and Organizational Diversity*, ed. Aoki, M., G. Jackson, and H. Miyajima. Oxford: Oxford University Press.
- Kliman, A., and Williams, S. 2015. "Why 'financialization' hasn't Depressed US Productive Investment ?" *Cambridge Journal of Economics* 39 (3): 67-92.
- Krippner, G. 2005. "The Financialization of the American Economy", *Socio-Economic Review*, 2 (3): 173-208.
- Lazonick, W., and O'Sullivan, M. 2000. "Maximizing Shareholder-value:a New Ideology for Corporate Governance", *Economic and Society*, 29 (1): 13-35.
- Noda, T., and Abe, M. 2010. "The Wage Share and the Decline of Wages." In *Labor Market and Income Distribution*, ed. Higuti, Y. Tokyo: Keio Gijyuku Daigaku Syuppanlai (In Japanese).
- Orhangazi, O. 2008a. "Financialization and Capital Accumulation in the Non-financial Corporate Sector: A Theoretical and Empirical Investigation on the US Economy: 1973–2003." *Cambridge Journal of Economics* 32 (6): 863-886.
- Orhangazi, O. 2008b. *Financialization and the US economy*. Cheltenham:Edward Elgar.
- Sasaki, T., and Yonezawa, Y. 2000. "Corporate Governance and the FirmValue." *Security Analysts Journal* 38 (9): 28-46 (In Japanese).
- Shimano, N. 2015. "An Empirical Analysis of the Effect of Financialization on Capital Accumulation in Japan." *Political Economy Quarterly*. 51(4): 70-82. (In Japanese)
- Stockhammer, E. 2004. "Financializationand the Slowdown of Accumulation." *Cambridge Journal of Economics* 28 (5): 719-741.

- Stockhammer, E. 2006. "Shareholder Value Orientation and the Investment-Profit Puzzle." *Journal of Post Keynesian Economics* 28 (2): 193-215.
- Skott, P., and Ryoo, S. 2008. "Macroeconomic Implications of Financialization." *Cambridge Journal of Economics* 32 (6): 827-862.
- Stockhammer, E., Onaran, Ö. and Edere, S. 2009. "Functional Income Distribution and Aggregate Demand in the Euro Area." *Cambridge Journal of Economics* 33 (1): 139-159.
- Stockhammer, E., and Stehrer, R. 2011. "Goodwin or Kalecki in Demand ? Functional Income Distribution and Aggregate Demand in the Short Run." *Review of Radical Political Economics* 43 (4): 506-522.
- van Treeck, T. 2008. "Reconsidering the Investment-Profit Nexus in Finance-led Economies: An ARDL-based Approach." *Metroeconomica* 59 (3): 371-404.

Appendix : Definition of Variables in the investment function

ACCUMU (the rate of capital accumulation) is defined as the ratio of investment to capital stock. Capital stock is defined as the sum of tangible fixed assets except land and intangible fixed assets (the average of initial values and final values in a period is used). Investment is defined as the increase in capital stock plus depreciation in a period.

PR (the profit rate) is defined as the ratio of gross profit to capital stock. Gross profit is defined as the sum of operating profit and depreciation.

PS (the profit share) is defined as the share of gross profit in value added. Gross profit is defined as the sum of operating profit and depreciation. Value added is defined as the sum of gross profit and personal expenses.

GVA (the output - capital ratio) is defined as the ratio of value added to capital stock.

FIX is defined as the ratio of fixed financial assets to total assets. Fixed financial assets is the sum of equity in fixed assets, public bonds in fixed assets, other securities, and long-term loans.

【Figures and Tables】

Table 1 : Estimation Results of Equation (1) (Results of all firms)

	1964Q1~1990Q4	1991Q1~2013Q4
all industries	0.487*** (5.419)	0.061 (0.418)
manufacturing industries	0.336*** (4.451)	0.164** (2.504)
non-manufacturing industries	0.544*** (4.031)	0.002 (0.009)

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. *, **, and *** denote significance at 10, 5, 1 %, respectively. Estimated coefficients of the profit rate are reported.)

Table2 : Estimation Results of Investment Function (1) (First Period)

【 Results of all industries (1964Q1~1990Q4)】

	all firms	large firms		small and medium -sized firms
Constant	-0.061** (-2.246)	-0.100*** (-3.435)	Constant	-0.003 (-0.113)
ACCUMU(-1)	0.570*** (5.871)	0.625*** (6.401)	ACCUMU(-1)	0.618*** (5.499)
ACCUMU(-2)	-0.336*** (-3.224)	-0.237** (-2.441)	ACCUMU(-2)	-0.577*** (-5.321)
			ACCUMU(-3)	0.422*** (4.132)
			ACCUMU(-4)	-0.318 (-3.373)
PS(-2)	0.154*** (4.663)	0.142*** (4.544)	PS(-1)	0.145*** (3.170)
△PS(-2)	0.005 (0.047)	0.017 (0.176)	△PS(-1)	-0.161 (-1.432)
GVA(-2)	0.165*** (3.782)	0.240*** (3.669)	GVA(-1)	0.063* (1.740)
△GVA(-2)	-0.364* (-1.705)	-0.378 (-1.547)	△GVA(-1)	0.175 (0.328)
FIX(-2)	0.064 (0.440)	0.198* (1.944)	FIX(-1)	-0.242 (-1.135)
△FIX(-2)	0.290 (0.431)	0.699 (1.091)	△FIX(-1)	0.516 (0.706)
Adjusted R-squared	0.548	0.520	Adjusted R-squared	0.553
GB Obs. R ² squared	4.826	4.154	GB Obs. R ² squared	4.572

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R²-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

【 Results of manufacturing industries (1964Q1~1990Q4)】

	small and medium		
	all firms	large firms	-sized firms
Constant	-0.038*** (-2.760)	-0.044*** (-3.449)	-0.023 (-1.063)
ACCUMU(-1)	0.753*** (11.185)	0.718*** (7.505)	0.645*** (6.261)
ACCUMU(-2)		0.097 (1.000)	-0.132 (-1.338)
PS(-1)	0.061*** (3.131)	0.056*** (3.503)	0.105*** (2.814)
△PS(-1)	-0.228*** (-2.826)	-0.205*** (-3.147)	-0.219** (-2.216)
GVA(-1)	0.049** (2.126)	0.063** (2.316)	0.035 (1.367)
△GVA(-1)	0.266** (2.006)	0.305** (2.128)	0.354** (2.576)
FIX(-1)	0.161* (1.705)	0.121 (1.636)	0.105 (0.596)
△FIX(-1)	-0.550 (-0.964)	-0.380 (-0.892)	0.442 (0.945)
Adjusted R-squared	0.762	0.792	0.587
GB Obs. R ² squared	1.561	4.375	1.358

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R²-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

【 Results of non-manufacturing industries (1964Q1~1990Q4) 】

	all firms	large firms		small and medium -sized firms
Constant	-0.048 (-1.153)	-0.095* (-1.721)	Constant	0.007 (0.181)
ACCUMU(-1)	0.501*** (5.199)	0.545*** (5.518)	ACCUMU(-1)	0.662*** (5.916)
ACCUMU(-2)	-0.339*** (-3.302)	-0.285*** (-2.930)	ACCUMU(-2)	-0.633*** (-5.736)
			ACCUMU(-3)	0.494*** (4.589)
			ACCUMU(-4)	-0.349*** (-3.452)
PS(-2)	0.149*** (2.997)	0.145** (2.390)	PS(-1)	0.142** (2.383)
Δ PS(-2)	-0.060 (-0.510)	0.082 (0.705)	Δ PS(-1)	-0.129 (-0.993)
GVA(-2)	0.175** (2.579)	0.265** (2.001)	GVA(-1)	0.056 (1.083)
Δ GVA(-2)	-0.432 (-1.497)	-0.963** (-2.159)	Δ GVA(-1)	0.128 (0.625)
FIX(-2)	0.011 (0.054)	0.220 (1.213)	FIX(-1)	-0.321 (-1.232)
Δ FIX(-2)	-0.082 (-0.113)	0.133 (0.157)	Δ FIX(-1)	0.132 (0.194)
Adjusted R-squared	0.320	0.230	Adjusted R-squared	0.469
GB Obs. R-squared	3.881	3.842	GB Obs. R-squared	3.506

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

Table3 : Estimation Results of Investment Function (1) (Second Period)

【Results of all industries (1991Q1~2013Q4)】

	all firms	large firms	small and medium -sized firms
Constant	-0.033* (-1.979)	-0.012 (-1.195)	-0.019 (-0.839)
ACCUMU(-1)	0.429*** (3.750)	0.437*** (3.714)	0.499*** (4.268)
ACCUMU(-2)	-0.061 (-0.602)	-0.080 (-0.775)	-0.264** (-2.565)
ACCUMU(-3)			0.297*** (2.964)
ACCUMU(-4)			-0.492*** (-4.823)
ACCUMU(-5)			0.317*** (3.247)
PS(-1)	-0.036 (-0.596)	-0.078** (-2.586)	0.073 (0.691)
△PS(-1)	-0.018 (-0.137)	0.111 (1.107)	-0.215 (-1.184)
GVA(-1)	0.403*** (2.905)	0.547*** (4.152)	0.162 (1.316)
△GVA(-1)	-0.321 (-0.932)	-0.476 (-1.333)	-0.244 (-0.767)
FIX(-1)	-0.173*** (-3.765)	-0.056*** (-3.278)	-0.469** (-2.395)
△FIX(-1)	0.075 (0.293)	-0.153 (-1.009)	0.275 (0.895)
Adjusted R-square	0.466	0.599	0.435
GB Obs. R ² squared	0.801	2.200	2.406

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R²-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

【 Results of manufacturing industries (1991Q1~2008Q1)】

	small and medium		
	all firms	large firms	-sized firms
Constant	-0.028 (-1.259)	-0.030*** (-2.766)	-0.111** (-2.454)
ACCUMU(-1)	0.336*** (3.057)	0.407*** (3.470)	0.564*** (4.476)
ACCUMU(-2)		-0.240* (-1.768)	-0.178 (-1.486)
ACCUMU(-3)		0.440*** (4.345)	
PS(-1)	0.180** (2.246)	0.134** (2.246)	-0.022 (-0.245)
△PS(-1)	-0.322*** (-3.340)	-0.122** (-2.149)	-0.404*** (-2.734)
GVA(-1)	0.073 (0.494)	0.059 (0.465)	0.397** (2.243)
△GVA(-1)	0.264 (1.286)	-0.006 (-0.036)	0.158 (0.665)
FIX(-1)	-0.149*** (-2.970)	-0.094*** (-3.057)	0.190 (1.137)
△FIX(-1)	-0.231 (-1.012)	-0.039 (-0.336)	-0.657*** (-2.722)
Adjusted R-squared	0.695	0.850	0.465
GB Obs. R ² squared	1.647	8.251**	0.368

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R²-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

【 Results of manufacturing industries (1991Q1~2013Q4)】

	all firms	large firms	small and medium -sized firms
Constant	-0.005 (-0.360)	-0.018** (-2.614)	-0.058* (-1.707)
ACCUMU(-1)	0.582*** (7.255)	0.613*** (6.269)	0.571*** (5.501)
ACCUMU(-2)		-0.237** (-2.003)	-0.186* (-1.874)
ACCUMU(-3)		0.395 (4.375)	
PS(-1)	0.056 (1.180)	0.046* (1.670)	0.009 (0.121)
Δ PS(-1)	-0.191*** (-2.937)	-0.022 (-0.683)	-0.279** (-2.438)
GVA(-1)	0.038 (0.394)	0.065 (0.979)	0.228 (1.628)
Δ GVA(-1)	0.360** (2.083)	-0.017 (-0.138)	0.337* (1.722)
FIX(-1)	-0.040 (-1.429)	-0.021 (-1.609)	0.055 (0.383)
Δ FIX(-1)	-0.159 (-0.707)	-0.095 (-0.786)	-0.588** (-2.367)
Adjusted R-squared	0.575	0.813	0.349
GB Obs. R ² squared	3.324	4.695	1.725

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R²-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

【 Results of non-manufacturing industries (1991Q1~2013Q4)】

Constant	-0.053** (-2.238)	0.000 (0.015)	-0.036 (-1.182)
ACCUMU(-1)	0.351*** (2.886)	0.375*** (2.776)	0.269 (1.861)
ACCUMU(-2)	-0.053 (-0.515)	-0.048 (-0.451)	-0.085 (-0.803)
PS(-1)	-0.029 (-0.339)	-0.085** (-2.058)	0.128 (0.932)
Δ PS(-1)	0.063 (0.425)	0.005 (0.041)	-0.120 (-0.544)
GVA(-1)	0.593*** (3.107)	0.686*** (3.121)	0.268** (1.989)
Δ GVA(-1)	-0.658 (-1.329)	-0.374 (-0.625)	-0.632 (-1.323)
FIX(-1)	-0.302*** (-4.053)	-0.086*** (-3.099)	-0.783*** (-3.338)
Δ FIX(-1)	0.311 (1.343)	-0.362** (-2.383)	0.929*** (2.771)
Adjusted R-squared	0.396	0.479	0.288
GB Obs. R-squared	0.029	2.959	1.477

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. GB Obs. R-squared is the coefficient of determination in the Godfrey - Breusch test for autocorrelation.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

Table 4 : Rates of growth of basic variables in all firms of Japanese NFCs
(1993Q ~ 2007 Q4)

	r	σ_{π}	u	k
all industries	0.61%	0.32%	0.15%	0.14%
manufacturing	0.94%	0.67%	0.32%	-0.05%
non-manufacturing	0.43%	0.12%	0.06%	0.26%

Table 5 : Estimation Results of Equation (3), (4) and (5)

Equation (3)		Equation (4)		Equation (5)	
Constant	0.007*** (3.420)	Constant	-0.004 (-0.908)	Constant	0.002* (2.013)
d(log(profit))	0.129** (2.424)	d(log(profit))	0.066 (0.357)	d(profitshare _{t-1})	0.625** (2.734)
d(log(wage))	0.362*** (3.509)	d(log(output))	0.721** (2.308)	AR(1)	-0.427* (-1.882)
\bar{R}^2	0.525	\bar{R}^2	0.436	\bar{R}^2	0.234
DW stat.	1.871	DW stat.	1.519	DW stat.	1.949

(Estimates are obtained by Ordinary Least Squares (OLS). Parentheses below the coefficients are t value. DW stat is Durbin Watson ratio.

*, **, and *** denote significance at 10, 5, 1 %, respectively.)

Figure 1 : Financial Revenues in Japanese NFCs (all industries), 1964Q1~2013Q4

Source : Corporation Statistics, Ministry of Finance, Japan

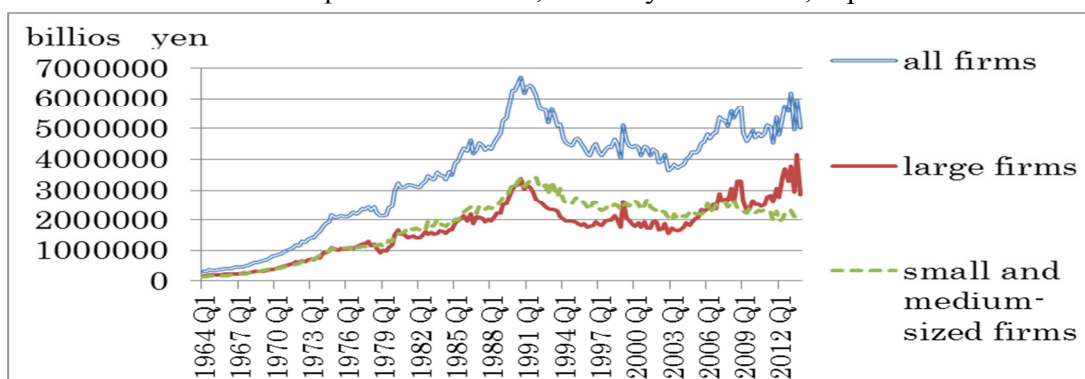


Figure 2 : Ratio of respective assets to total assets in Japanese large NFCs (all industries), 1964Q1~2013Q4

Source : Corporation Statistics, Ministry of Finance, Japan

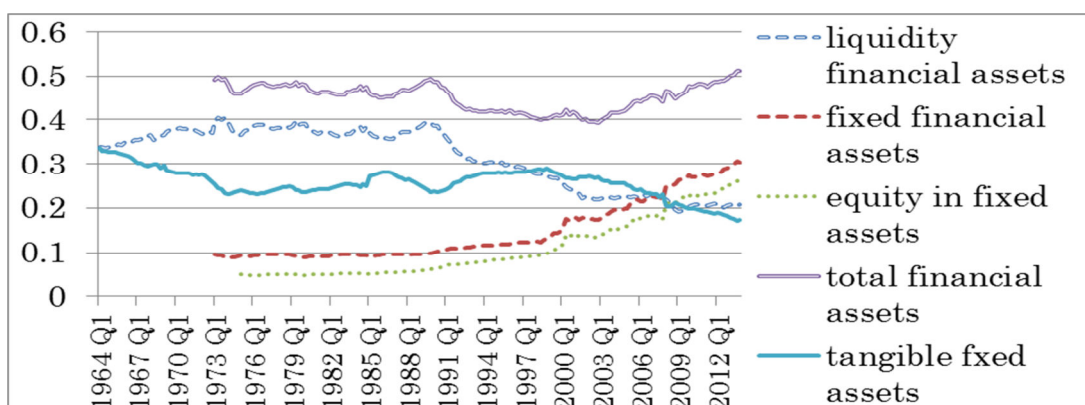


Figure 3 : The profit share in Japanese NFCs (all industries), 1964Q1~2013Q4

Source : Corporation Statistics, Ministry of Finance, Japan

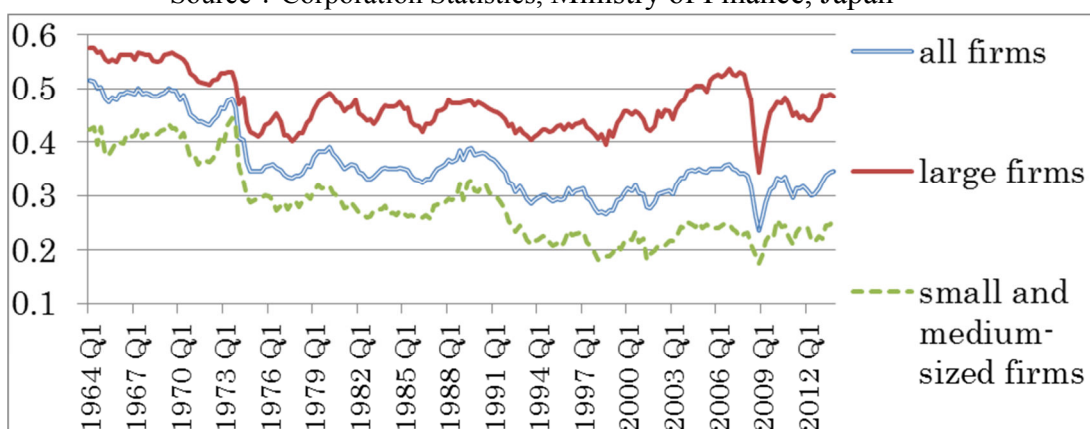


Figure4 : Components of Expenditures and Saving as a share of Value Added in Japanese Large NFCs (all industries), 1964~2013

Source : Corporation Statistics, Ministry of Finance, Japan

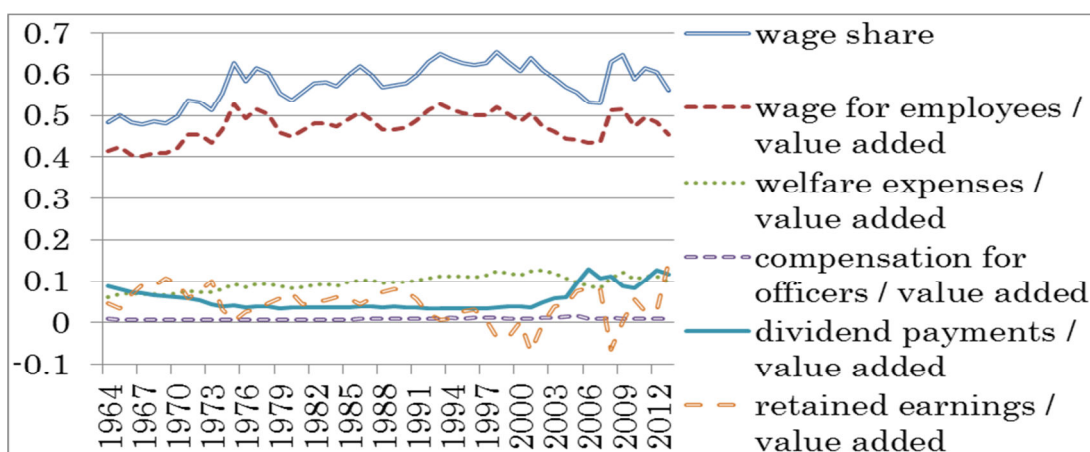


Figure 5 : The profit rate and the rate of capital accumulation in Japanese NFCs (all industries), 1964Q1~2013Q4

Source : Corporation Statistics, Ministry of Finance, Japan

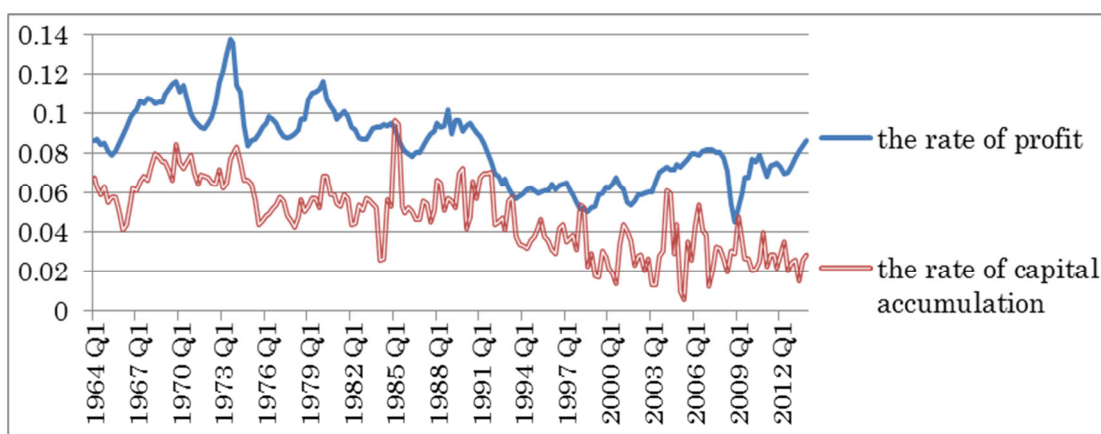


Figure 6 : The profit rate and the rate of capital accumulation in Japanese NFCs (manufacturing industries), 1964Q1~2013Q4
 Source : Corporation Statistics, Ministry of Finance, Japan

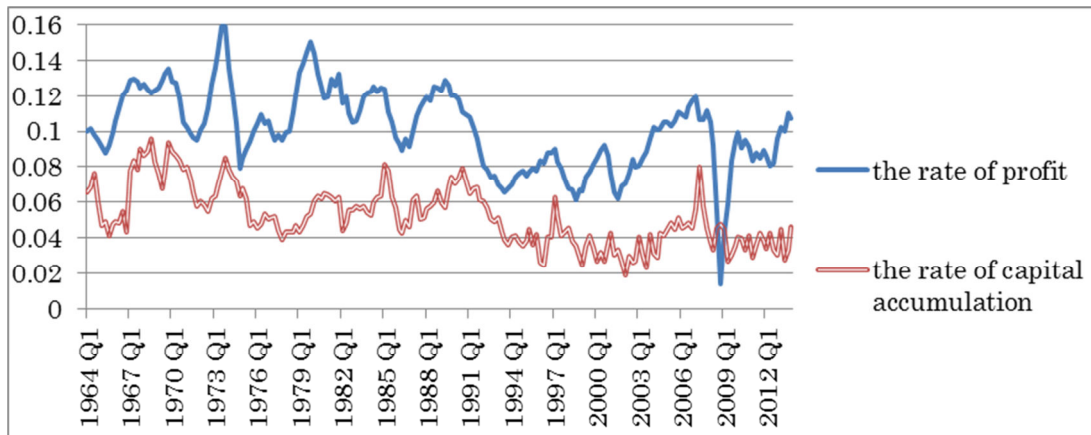


Figure 7 : The profit rate and the rate of capital accumulation in Japanese NFCs (non-manufacturing industries), 1964Q1~2013Q4
 Source : Corporation Statistics, Ministry of Finance, Japan

