Declining Labor Share and Increasing Retained Earnings in Japan

Naohiko Ijiri

1. Introduction

Empirical analyses in the early twentieth century suggested the long-term stability of labor share, also known as Bowley's Law. Keynes (1939) described this stability in the UK and the US as "one of the most surprising, yet best-established, facts in the whole range of economic statistics." Given such stability, the research on labor share had attracted little attention from researchers and policymakers. However, since the late-twentieth century, empirical evidence began suggesting a moderate downward trend in labor shares. Consequently, it has attracted the concerned attention of researchers because household incomes may not increase with declining labor share in case of improved macroeconomic performance (Atkinson 2009).

The World Inequality Database (WID), hosted by the World Inequality Lab, shows that over time—and across countries—a higher capital share is associated with higher inequality in the distribution of household income. Additionally, a declining labor share can have political consequences if it erodes support for market-oriented economic policies or for globalization, more broadly. Significantly, trends in labor share negatively affect the main macroeconomic indicators, namely household consumption, private sector investment, net exports, and government consumption (Wolf 2014).

Recently, labor share in Japan has been declining, whereas retained earnings have been increasing (Abe and Diamond 2017, Haneda et al. 2021). As a result of increased internal reserves, it appears that Japanese companies they have the leeway to raise wages. This study attempts to clarify the reasons for Japan's stagnant labor share.

This article is structured as follows. First, we summarize the main research results in previous studies, such as the effects of globalization and innovation on labor share and income inequality. Second, we focus on the empirical analysis of globalization in the two large, advanced economies: Germany and Japan, based on the new measurement method of the degree of offshoring, using trade data.

2. Labor Share and Income Inequality

2.1 Income Inequality

In the twentieth century, economists generally considered labor share to remain stable at a certain level in developed countries; however, recent studies have indicated declining labor share in many developed economies (Hobijn and Sahin 2013, Karabarbounis and Neiman 2013, Piketty 2014, Dao et al. 2017). For example, Autor et al. (2020) report that since 1970, labor share has been on a downward trend in 10 of the 12 Organisation for Economic

— 81 —

Figure 1: The national income shares of the top 10% in selected countries
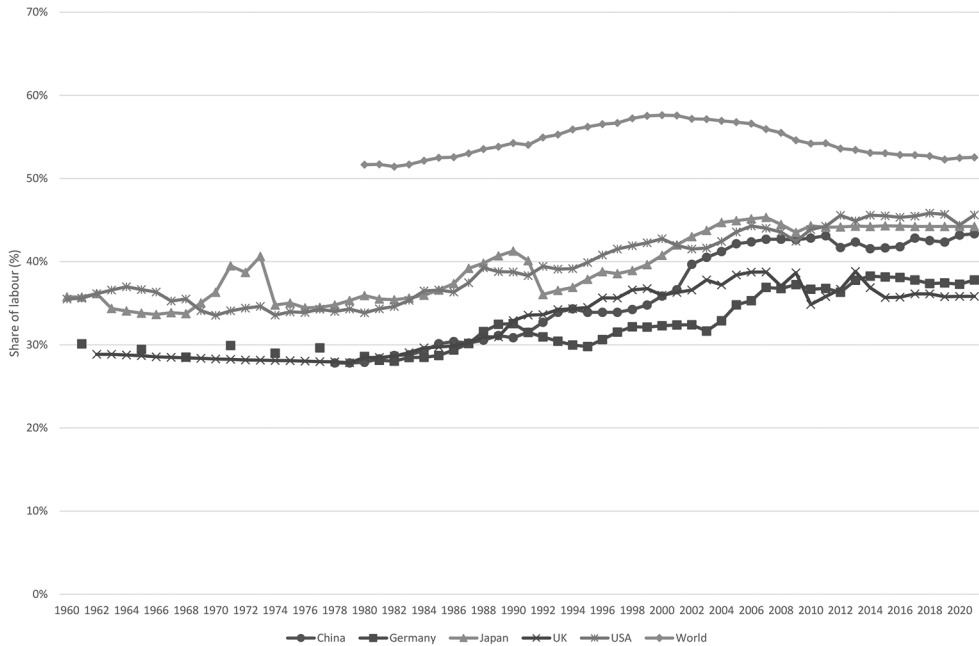
Source: The World Inequality Database (WID)

Co-operation and Development (OECD) countries, excluding the UK and Sweden. This labor share decline likely indicates a worsening—not improving—treatment of workers, which constitutes a significant issue for economic policy. As the number of people earning income from capital is generally considered to be smaller than the number of workers, labor share decline implies increasing income inequality.

According to the WID, the share in the total domestic income of the top 10% income level group in G5 countries and China has increased since 1980 (Figure 1); the share of the bottom 50% income level group has decreased (Figure 2). In other words, the wealthy are becoming wealthier, the poor are becoming poorer, and the gap between them is widening—a trend particularly noticeable in the top 1% group in the US.

2.2　Empirical Findings in Previous Studies

Figure 3 shows the 1995-2015 changes in labor shares[1] in Japan based on the SNA data and JIP 2018 database, according to Haneda et al. (2021). The results indicate a declining trend for labor share in Japan during this period, as in other developed economies.

The results of previous research are summarized below for each factor considered to negatively affect the labor share. Recently, globalization and technological changes have been extensively discussed as factors responsible for this decline.

（1）The Globalization Hypothesis

Globalization and the introduction of Artificial Intelligence (AI) and industrial robots—the latter two significantly impacting technological changes in the current world economy—have attracted substantial academic
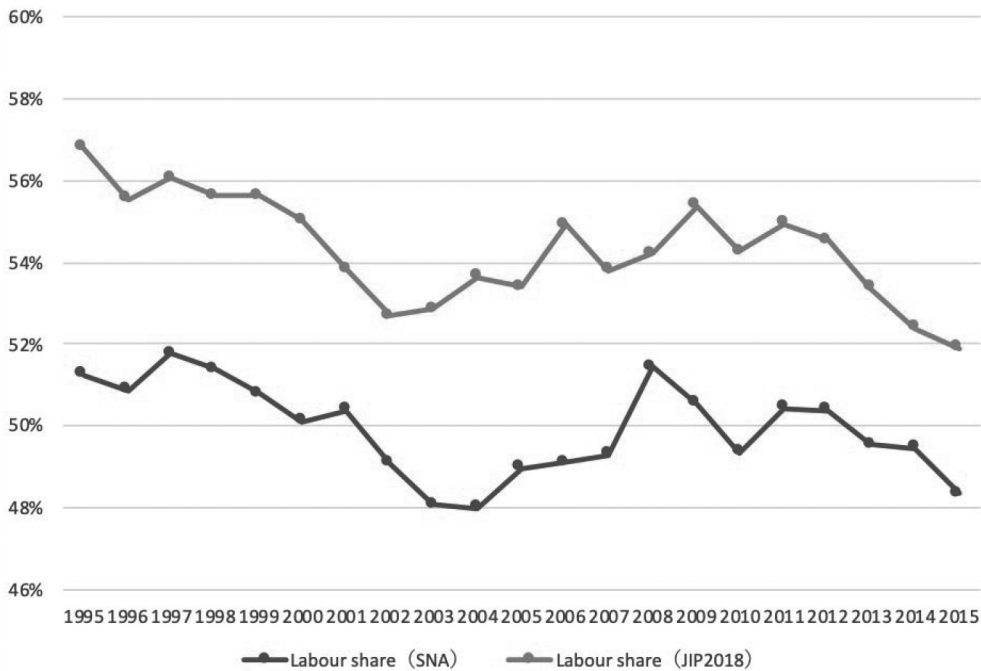
Figure 2: The national income shares of the bottom 50% in selected countries
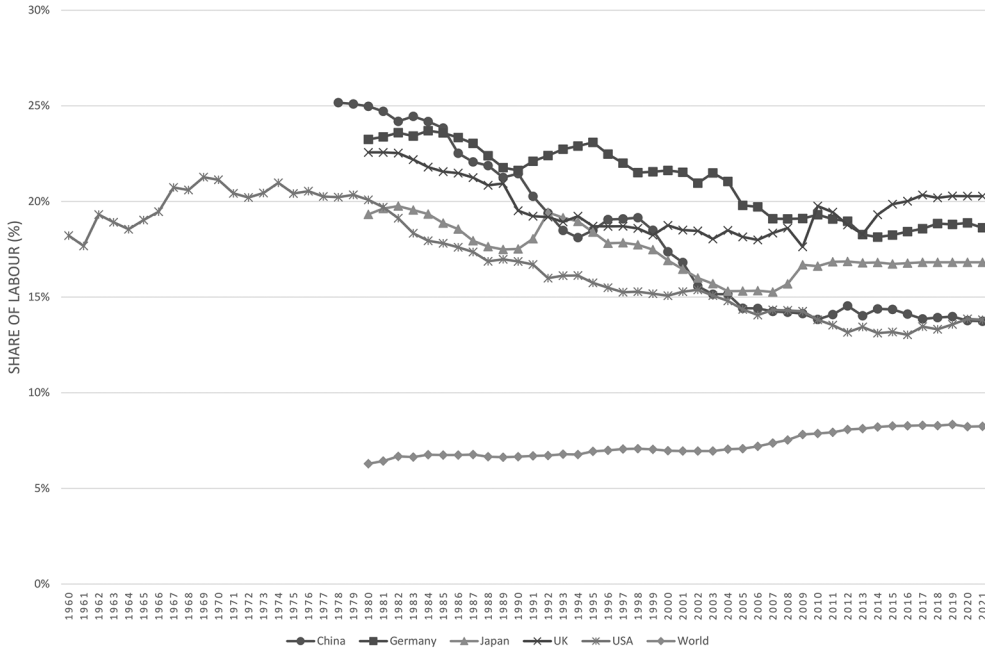
Source: The World Inequality Database (WID)

Figure 3: Changes in labor share in Japan, 1995-2015

Source: Haneda et al. (2021)

attention as factors responsible for the declining labor share.

Globalization occurs via two routes. The first is offshoring to developing countries where labor costs are relatively cheap compared to the home country, which leads to a decline in labor share, especially in labor-intensive industries (Elsby et al. 2013). In other words, a labor share decline occurs when domestic workers experience a substitutive relationship with imported goods.

The second is the competition between domestic and imported products in the domestic market. When domestic products compete with cheaper imports, it lowers the labor share. However, regarding this effect, it is necessary to consider the capital-labor ratio of the industry and the discussion of comparative advantage—depending on the industry, the labor share may increase or decrease. As in the case of offshoring, it is also indicated in this case that labor share decline occurs in labor-intensive industries (Bassanini and Manfredi 2012).

Additionally, previous studies have highlighted that a decline in the price of capital goods raises the share of intermediate inputs, and thus, lowers the labor share. Alternatively, if capital-labor substitution elasticity exceeds 1, it implies that the increase in capital mainly due to the introduction of AI and robots is a substitute for labor. However, the elasticity of substitution differs among previous studies, and no clear consensus has yet been reached (Karabarbounis and Neiman 2014, Hubmer 2018).

（2）The Innovation Hypothesis

We summarize previous research findings that introduction of new technology impacts labor share decline. Owing to data limitation, few studies have empirically analyzed the impact of introduction of AI and robots on the decline in labor share.

Acemoglu and Restrepo (2019) indicate that the introduction of industrial robots reduced both employment and wages in the US. In this case, as labor and capital are substitutes, labor share will likely decline. Additionally, regarding information and communication technology (ICT), Tanaka et al. (2018) have highlighted that in the future, there will be technologies that will be complementary to labor productivity, as well as those that will be alternatives to labor—this makes it difficult to interpret how technology will actually impact labor share in the future.

3. Empirical Analysis

3.1 Offshoring and Income Inequality

A simple theoretical explanation of offshoring is provided below. We assume two countries: Home and Foreign, and two production processes: assembly and parts and components production, which are high-skilled labor intensive and low-skilled labor intensive, respectively. We also assume Home is high-skilled labor abundant, whereas Foreign is low-skilled labor abundant. Home offshores the assembly to Foreign because it is a low-skilled intensive production process. As a result of this offshoring, the relative demand for high-skilled labor compared to low-skilled labor at Home increases. It is called skill-biased labor demand.

This will increase Home's relative wage rates (high-skilled labor wage rates / low-skilled labor wage rates), and, in turn, widen Home's wage gap between high-skilled and low-skilled workers. Consequently, income inequality will increase in Home because of offshoring. Most offshoring of low-skilled jobs generally occurs from developed economies to developing economies.

3.2　Degree of Globalization: Offshoring Indicators

As discussed above, offshoring may increase income inequality in developed economies—the more the offshoring, the larger the income inequality. To estimate the effect of offshoring on home countries' income inequality, it is significant to assess the degree of offshoring in these countries. For this reason, we introduce a new measurement method of the degree of offshoring for an industry or an economy using disaggregate international trade data.

A new export transaction refers to an entrance to a certain foreign country by export from a home country. Similarly, a new import good is an entrance to a home county by import from a foreign country. The definition of entrance is crucial because trade transactions between countries tend to be extremely intermittent. A country i has a positive export value of good x to country j in year t. However, this export value becomes zero in year t + 1. Thereafter, it becomes positive in year t + 2. In this case, it is difficult to identify whether the entrance occurred in year t or t + 2.

Therefore, Ijiri (2014) introduced a measurement method for the entrance and exit of international trade between countries. According to his study, the entrance is a consecutive positive trade transaction for three years from year t and zero trade value in year t-1. Considering global value chains (GVCs) activities, it would be rare to see an intermittent transaction if it is attributed to GVCs activities. Hence, the entrance should be considered as a consecutive positive trade transaction for certain years.

This consecutive transaction criterion can also apply to the exit of international trade. It is called a "lost trade transaction" in contrast to new trade transaction, and is related to the trade margins analysis.

Previous studies have estimated the trade margins of a country as follows. They calculated the total number of products exported from the home country to a foreign country in years t and t + 1, and thereafter, assessed the difference between the total numbers in each year. The difference constituted the export margin for the home and foreign countries.

This method focuses on the change in the number of export products, not on the change in the components of export products, as in the study by Hummels and Klenow (2005). Ijiri's method can identify the difference in the components of export products between trading partners. We can identify which product enters or exits into/from trade with the foreign partner country.

3.2.1　Japan and Germany: Two Large Economies in GVCs

Chaney (2008) decomposes changes in trade volume into two directions: the intensive and extensive margins. The former is a quantitative expansion of goods already traded. For example, in 2001, digital cameras from Japan were already exported to China. If this export volume increased in 2002, it would be defined as an intensive margin. The extensive margin implies that Japan did not export digital cameras to China in 2001, but this export occurred in 2002. It is an increase in exports due to the new expansion of exported goods and export destinations. Hummels and Klenow's (2005) method of measuring the intensive and extensive margins reveals the extent to which the total number of exported goods and export destinations have changed compared to the previous year. However, this method cannot accurately grasp newly created export goods and export destinations. Specifically, as there may be lost export goods and export destinations, there is a risk that the extensive margin will be biased if only the difference in the total number of traded products between the current and the previous year is measured. Therefore,

in this section, we clarify Japan's trade fluctuations by measuring the new and lost trade transactions, as discussed above.

3.2.2　Offshoring Indicators: Difference in the Degree of Offshoring in Japan and Germany

We attempt to measure the impact of offshoring of manufactured goods production on trade using the following new offshoring indicators suggested by Ijiri (2022).

（1）Offshoring Indicator 1

This indicator shows that when the production of consumer goods, which is the downstream part of the production process, is offshored from the home country to a foreign country, the export of consumer goods from the home country to the foreign country decreases, and instead, intermediate goods are exported to the offshore destination. Assume the export of capital goods (other than consumer goods) and import of consumer goods.

Offshoring Indicator 1 = number of new export transactions (non-consumer goods) + number of lost export transactions (consumer goods) + number of new import transactions (consumer goods) / (total number of export transactions + total number of import transactions).

（2）Offshoring Indicator 2

This indicator considers the possibility that import of capital and intermediate goods will decrease because of offshoring of production bases for consumer goods from the home country. These figures are obtained for each year using the following formulas. Note that the lag is taken into consideration here, and the denominator, the total number of trade transactions (the sum of the total number of export transactions and the total number of import transactions), is the value for the previous year.

Offshoring Indicator 2 = number of new export transactions (non-consumer goods) + number of lost export transactions (consumer goods) + number of new import transactions (consumer goods) + number of lost import transactions (non-consumer goods) / (the total number of export transactions + the total number of import transactions).

（3）Offshoring Indicator 3

The above two indicators assume that the production of consumer goods is offshored. The final goods assembly process is generally considered to be the most labor-intensive. It is assumed that labor-intensive production processes such as assembly processes will be offshored from capital-rich developed countries. Additionally, the production of intermediate goods (not including capital goods) may also be offshored. Therefore, Offshoring Indicator 3 is calculated using the following formula, considering the fluctuations in the trade of intermediate goods. Note that lag is considered here as well, as for Offshoring Indicators 1 and 2.

Offshoring Indicator 3 = number of new export transactions (other than consumer goods) + number of lost export transactions (consumer goods + intermediate goods) + number of new import transactions (consumer goods +

intermediate goods) / (total number of export transactions + total number of import transactions).

### 3.2.3 Results of Offshoring Indicators: Number of Transactions

The three types of offshoring indicators mentioned above are measured for the period 2008-2017 using disaggregate trade data for Japan and Germany. The results are shown in Figure 4.

First, according to Offshoring Indicator 1 in Figure 4, both Japan and Germany have been on a gradual downward trend since 2001. Their comparison reveals that the degree of Offshoring Index 1 was always higher in Japan than in Germany during the study period.

Next, in Offshoring Indicator 2 as well in Figure 4, the degree of offshoring is higher in Japan; however, the difference is not as significant as in Offshoring Index 1. It can be said that both countries were on a gradual downward trend during the analysis period. In the results of Offshoring Indicator 3, which assumes that offshoring has also occurred in the production of intermediate goods, the degree of offshoring is higher in Japan. Additionally, both countries were on a gradual downward trend during the investigation period. In 2017, Japan was on an upward trend, while Germany was on a downward trend.

3.2.4 Results of Offshoring Indicators: Amount

As discussed above, the three indicators of offshoring measured by the number of transactions show that Japan has a higher degree of offshoring than Germany. Figure 5 shows Offshoring Indicators 4, 5, and 6, measured using the formulas for Offshoring Indicators 1-3, based on the amount of trade instead of number of transactions.

Figure 4: Offshoring Indicators 1, 2, and 3: Number of transactions
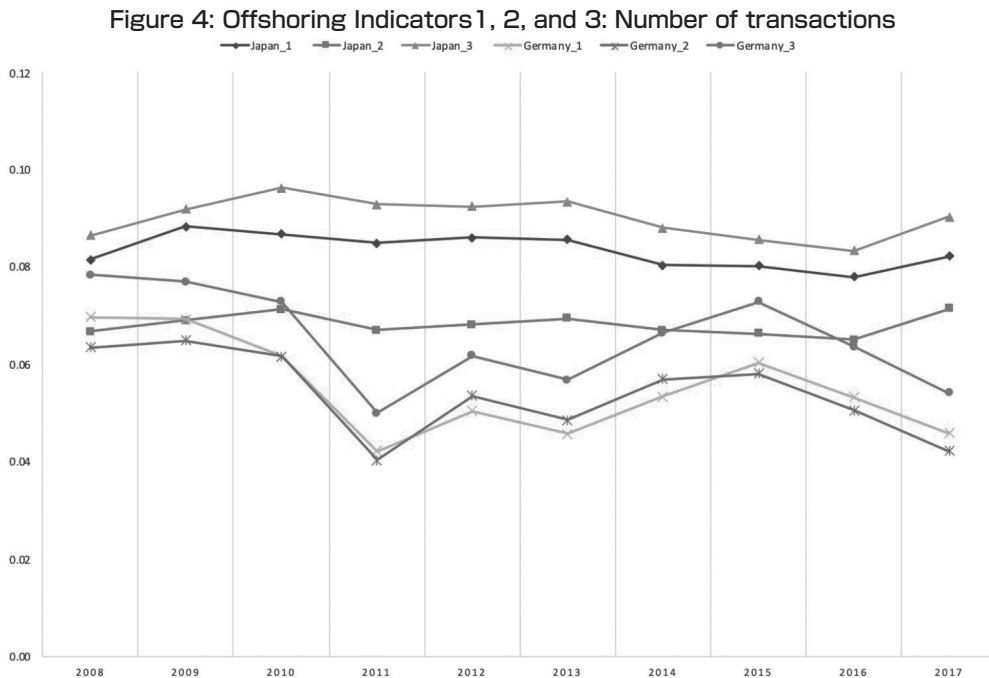
Source: Author's calculation using the UN COMTRADE Database

Figure 5: Offshoring Indicators 4, 5, and 6: Value of transactions
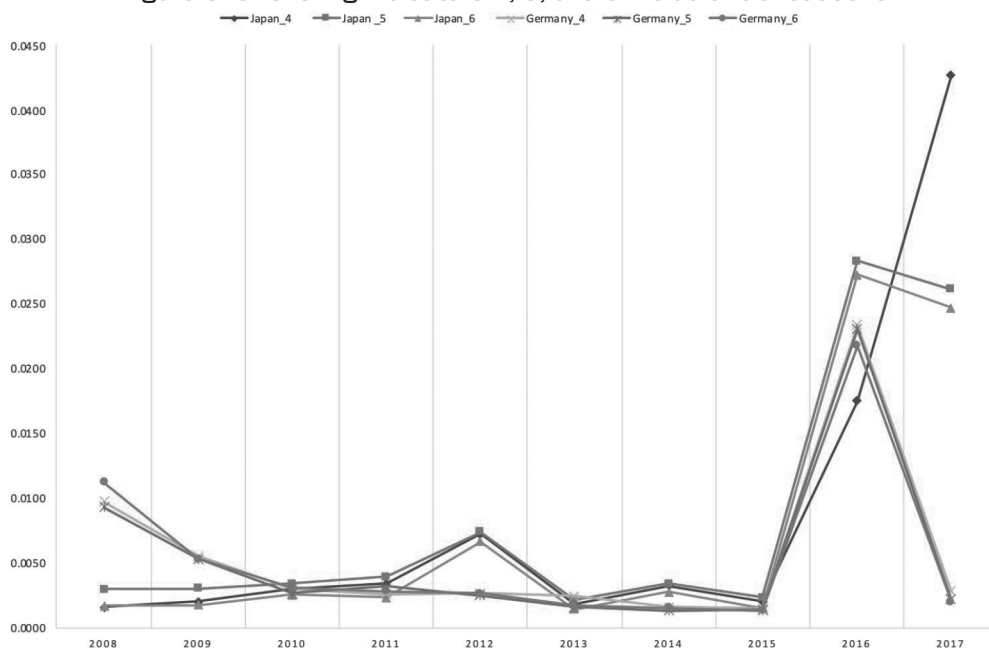
Source: Author's calculation using the UN COMTRADE Database

（1）Offshoring Indicator 4

Offshoring Indicator 4 = value of new export transactions (non-consumer goods) + value of lost export transactions (consumer goods) + value of new import transactions (consumer goods) / (total export value + total import value)

Similarly, Indicators 5 and 6 are calculated by replacing the number of transactions by amount of trade.

According to Offshoring Indicator 4 (amount) shown in Figure 5, the degree of offshoring is generally higher in Japan than in Germany. However, when compared with Indicator 1, which is based on the number of transactions, there are certain years in which Germany's figures are higher than Japan's; therefore, it is surmised that there is little difference between the two countries. The figures for both Japan and Germany rose sharply in 2016, indicating a shock to the international economy related to offshoring.

Next, regarding Offshoring Indicator 5 (Figure 5), there is not much difference in the level of offshoring between Japan and Germany. In this indicator, the gap between the two countries in 2008—quite pronounced in Indicator 4—had narrowed, and the figures for both countries increased in 2016. Furthermore, in offshoring Indicator 6 (Figure 5), even when considering the offshoring of intermediate goods production, there is little significant difference between the two countries.

When evaluated in terms of monetary value, before 2011, the scale of trade fluctuations due to offshoring was larger in Germany than in Japan. However, when evaluated by the number of transactions, Japan always exceeded Germany. These results imply that the impact of offshoring on trade in both countries is identical in scale, but the range of affected goods and partners is greater in Japan.

Japan's trade is, evidently, not growing in comparison to major developed countries such as the US and
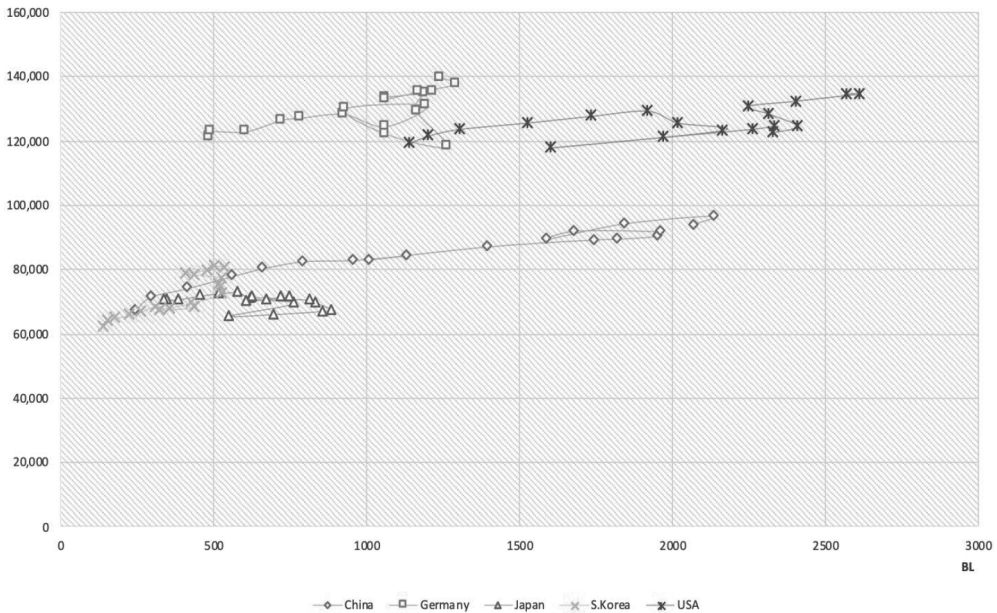
Results of value and number of trade transactions in selected 5 GVC countries
Figure 6: Plot diagram of export values and export transactions
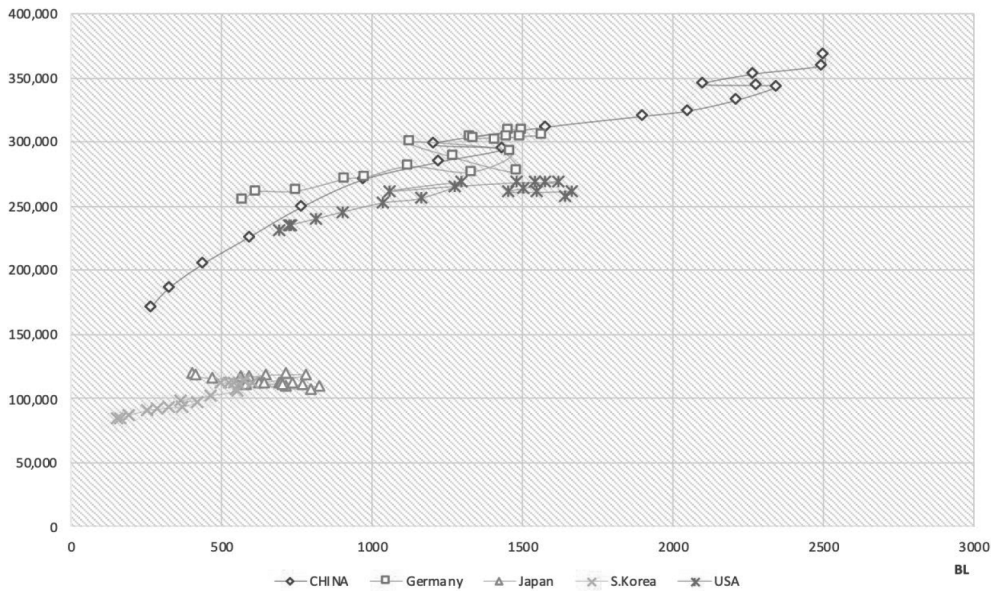
Source: Ijiri (2022), Figures 2-8, p. 49.

Figure 7: Plot diagram of import values and transactions

Source: Ijiri (2022), Figures 2-7, p. 48.

Germany, or to its East Asian neighbours such as China and South Korea, as seen in Figures 6 and 7.[2] The total number of trade transactions in Japan, especially the number of export transactions, is declining. The number of import transactions has slightly increased, but the number of export transactions has decreased. China is

demonstrating high growth, whereas Japan's growth has stagnated. Additionally, Germany has more trade transactions than Japan in both imports and exports. Indicators such as the total number of trade transactions and trade value are also on the rise. Japan's exports have moderately increased in terms of value, but in terms of the number of export transactions, its exports have stagnated compared to other countries.

4. Risk Management of Japanese Companies

A clear definition of the term *internal reserves* does not exist, but it generally refers to the profit accumulated in a company, that is, the retained earnings, which is an item of net assets on the balance sheet.

First, net income refers to income after deducting the cost of sales and selling, general and administrative expenses related to sales, adding or subtracting non-operating profit and loss and extraordinary profit and loss, and deducting corporate taxes. A portion of this is returned to shareholders in the form of dividends, and the remainder is added to retained earnings—a net asset line item on the balance sheet.

Thus, retained earnings accumulated within a company without being distributed to shareholders as company's profit is generally called internal reserves.[3]

Figure 8 indicates a continuous increase in the retained earnings of Japanese companies, reaching 585 trillion Japanese yen as of FY2021, according to the Ministry of Finance's Surveys for the Financial Statements Statistics of Corporations by Industry in Japan. Given their size of retained earnings, Japanese companies are often criticized for accumulating too much profit and not paying adequate wages to workers in Japan. However, retained earnings tend to increase if the company is profitable, except when the entire profit is returned to shareholders. Therefore, it is evident that retained earnings have increased; however, the concern is this: whether retained earnings have increased "too much."

Figure 8: Retained earnings in Japan, FY2008-2021
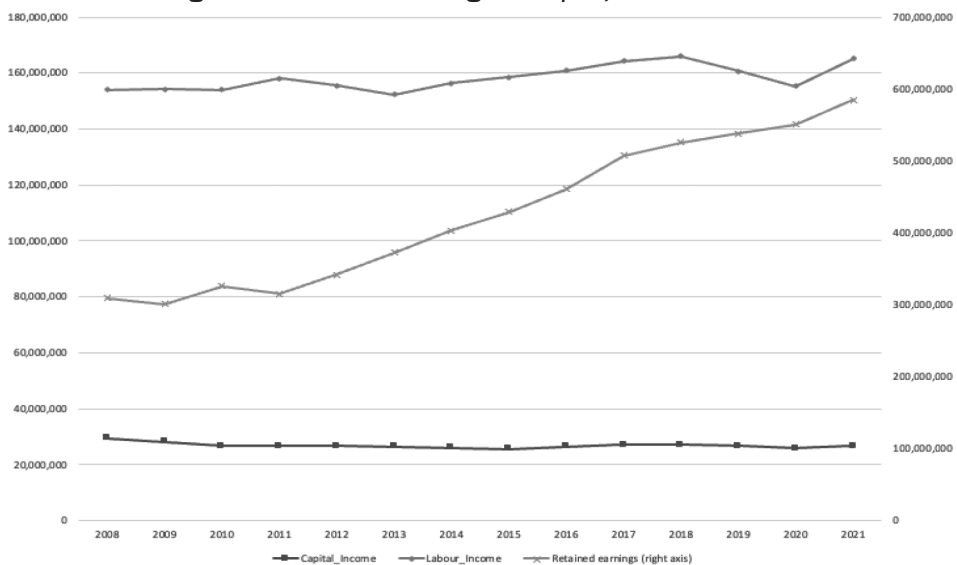
Source: Author's calculation using "Surveys for the Financial Statements Statistics of Corporations by Industry 2022," Ministry of Finance, Japan.

To ascertain this, Table 1 indicates the growth rates of labor and capital incomes and retained earnings in Japan from 2009 to 2021. The average growth rate of retained earnings is approximately 5%, whereas that of labor income is a mere 0.6%. Retained earnings have grown approximately 10-times faster than labor income in Japan. Additionally, the growth rate of capital income is negative. The incomes of workers and capital owners has not improved much in Japan, whereas Japanese companies have significantly improved their internal reserves.

In the economic recovery phase under "Abenomics," the "internal reserves" of Japanese companies had been a topic of frequent discussion. High internal reserves of Japanese companies have been generally positively evaluated in the context of the economic downturn triggered by the COVID-19 pandemic. Conversely, it must be considered that Japanese companies did not accumulate such massive internal reserves to prepare for the pandemic-induced economic shocks.

We propose the following hypothesises to explain this behavior of Japanese companies. First, in the context of Japan's declining population, Japanese companies are projecting low economic growth for the future. Second, the possibility of outsourcing increases Japanese companies' direct investment in foreign countries—except when they use arm's length transactions with foreign enterprises—and thus, Japanese companies face the risks associated with foreign direct investment. Japanese companies have been actively investing overseas[4] since the mid-1980s because of limited domestic growth opportunities due to a rapidly declining birth rate and an aging population. Although such outsourcing has facilitated the globalization of Japanese companies, the number of Japan's trade transactions has continuously declined, as shown in Figures 6 and 7, raising concerns that the positive effects of globalization on the Japanese economy are lacking.

As discussed above, the possible reasons why Japanese companies have increased their internal reserves over the last two decades are slower growth in the Japanese market and risks associated with offshoring.

Table 1: Growth rates of incomes and retained earnings in Japan
Growth rate

	Capital_Income	Labour_Income	Retained earnings
2009	-4.68%	0.23%	-2.74%
2010	-5.53%	-0.18%	8.29%
2011	0.21%	2.68%	-3.11%
2012	0.46%	-1.63%	8.38%
2013	-1.22%	-2.05%	8.95%
2014	-1.78%	2.55%	8.20%
2015	-1.11%	1.48%	6.45%
2016	3.01%	1.44%	7.31%
2017	2.83%	2.06%	10.17%
2018	-0.12%	1.16%	3.66%
2019	-1.88%	-3.23%	2.39%
2020	-3.11%	-3.44%	2.25%
2021	3.54%	6.39%	6.23%
average	-0.72%	0.57%	5.11%

Source: Author's calculation using the "Surveys for the Financial Statements Statistics of Corporations by Industry 2022," Ministry of Finance, Japan.

5. Conclusion

While Japan's labor share continues to decline, its companies' retained earnings have continuously increased over the last decade. Based on our results of offshoring indicators newly proposed in Ijiri (2022), Japan is more affected by offshoring for a wider range of goods than Germany. Trade fluctuations associated with offshoring are similar in terms of trade value in both countries, but Japan has a wider range of goods than Germany, and therefore, a higher level of offshoring. This suggests that Japan's trade fluctuations are largely attributable to its participation in GVCs. Offshoring may decrease the relative wages of low-skilled labor because of skill-biased labor demand, and thus, increase income inequality.

The significant economic concerns attributed to the Japanese economy include decrease in the number of trade transactions and decline in population. We suggest that these concerns make Japanese companies overestimate the risks of globalization. Therefore, they accumulate retained earnings as a countermeasure against such risks.

Notes

1） Labor share is generally difficult to measure, as a few studies have indicated. For example, Krueger (1999) indicates the following problems. First, it is vague who should be included under the category of labor. For example, the remuneration received by an owner and head of a company and a self-employed worker should be considered as the income of their own capital or not? Second, it is not clear what should be included in the income of labor. For example, there is ambiguity whether stock options for employees is income to labor, or whether welfare expenses for employees constitute a distribution to labor.

2） Figures 6 and 7 take the total number of transactions as the vertical axis and total trade values as horizontal axis, for exports and imports.

3） In contrast to retained earnings, which is the concept of stock, the portion of the flow that is added to retained earnings is sometimes called internal reserves.

4） The criticism that Japan's economy will not grow because companies do not invest in their facilities could be rather the opposite of the causal relationship.

References

Abe, M. and Diamond, J. (2017), "Declining Labor Share and Corporate Finance (Roudoubunpairitsu no Teika to kigyouzaimu)", Economic Analysis, Vol. 195, pp9-33, Economic and Social Research Institute, Cabinet Office.

Acemoglu, D. (2002). "Directed Technical Change", *Review of Economic Studies,* Vol. 69, pp. 781-810.

Acemoglu, D. (2011). "When Does Labour Scarcity Encourage Innovation?", *Journal of Political Economy*, Vol. 118, No. 6, pp. 1037-1078.

Arthur, W.B. (2011). "The Second Economy", McKinsey Quarterly, October.

Acemoglu, D. and Restrepo, P. (2019). "Automation and New Tasks: How Technology Displaces and Reinstates Labour", *Journal of Economic Perspectives*, 33, pp.3-30.

Adachi, D. and Saito, Y. U. (2020). Multinational Production and Labour Share. *RIETI Discussion Paper Series*, 20-E-012, pp.1-85.

Atkinson, A. (2009). "Factor Shares: The Principal Problem of Political Economy?", *Oxford Review of Economic*

Policy, Vol. 25, No. 1, pp. 3-16.

Atkinson, A.B, Piketty, T. and Saez, E. (2011). "Top Incomes in the Long Run of History", *Journal of Economic Literature*, Vol. 49, No. 1, pp. 3-71.

Autor, D., Dorn, D. and Hanson, G. (2013). "The China Syndrome: Local Labour Market Effects of Import Competition in the United States", *American Economic Review*, Vol. 103, No. 6, pp. 2121-2168.

Autor, D., Dorn, D., Katz, L. F., Patterson, D. and Reenen, J. V. (2017). "Concentrating on the Fall of the Labour Share", *American Economic Review*, Vol. 107, No. 5, pp.180-185.

Autor, D., Dorn, D., Katz, L. F., Patterson, D. and Reenen, J. V. (2020). "The Fall of the Labor Share and the Rise of Superstar Firms", *The Quarterly Journal of Economics*, Vol. 135, No. 2, pp. 645-709.

Bassanini, A. and Manfredi, T. (2012). "Capital's Grabbing Hand? A Cross-Country/Cross-Industry Analysis of the Decline of the Labour Share", *OECD Social, Employment and Migration Working Papers*, No.133.

Dao, M., Mitali D., Zsoka K. and Weicheng L. (2017). "Why Is Labour Receiving a Smaller Share of Global Income? Theory and Empirical Evidence", *Technical Report*, International Monetary Fund.

Elsby, M. W.L., Hobijn, B. and Sahin, A. (2013). "The Decline of the US Labour Share", *Brookings Papers on Economic Activity*, 2013 (2), pp.1-63.

Fukao, K. and Perugini, C. (2018). "The Long-run Dynamics of the Labour Share in Japan". *Discussion Paper Series*, 672, Institute of Economic Research, Hitotsubashi University.

Fukao, K., Ito, K. and Perugini, C. (2019). "A Microeconometric Analysis of the Declining Labor Share in Japan", *ADBI Working Paper Series*, No. 925.

Haneda, S., Kwon, H. and Ijiri, N. (2021). "Determinants of Labour Shares in Japan (Nihon niokeru Roudoubunnpairitsu no Ketteiyouinn)", *RIETI Discussion Paper Series* 21-J-006

Hubmer, J. (2018). "The Race between Preferences and Technology", Technical Report, MIMEO, Yale University.

International Labour Office. (2008). Global Wage Report 2008/09: Minimum wages and collective bargaining―Towards policy coherence (Geneva).

―. 2010. Global Wage Report 2010/11: Wage policies in times of crisis (Geneva).

Ijiri, N. (2022). *Trade Fluctuations and Non-Tariff Barriers in Japan (Nihon no Boueki Henndou to Hikanzeishouheki)*, Bunshindou.

Karabarbounis, L. and Neiman, B. (2014). "The Global Decline of the Labour Share", *Quarterly Journal of Economics*, Vol. 129, No. 1, pp.61-103.

Krueger, A. (1999). "Measuring Labour's Share", *American Economic Review*, Vol. 89, No. 2, pp. 45-51.

Muck, J., McAdam, P. and Growiec, J. (2018). "Will the 'True' Labour Share Stand Up? An Applied Survey on Labour Share Measures", *Journal of Economic Surveys*, Vol. 32, No. 4, pp. 961-984.

Piketty, T. (2014). "Capital in the Twenty-First Century", Harvard University Press, Cambridge MA.

Siegenthaler, M. and Stucki, T. (2014). "Dividing the Pie: The Determinants of Labour's Share of Income on the Firm Level", KOF Working Papers, No. 352.

Tanaka, G., Kikuchi, Y. and Ueno, Y. (2018), "Determinant analysis on the declining labor share in recent years (Kinnen no Roudoubunpairitsuteika no Youinbunseki)" Keizai *Zaisei Bunseki Discussion Paper*, DP/18-4,pp1-56, Economic Research Bureau, Cabinet Office.

Wolf, M. (2014). *The Shifts and the Shocks: What We've Learned—and Have Still to Learn—from the Financial Crisis*,

Penguin, London.