Development Bank of Japan
Research Report
No. 27

Labor's Share and the Adjustment of Wages and Employment

June 2002

Economic and Industrial Research Department
Development Bank of Japan

Contents

Labor's Share and the Adjustment of Wages and Employment

Summary

1. The corporate profit rate declined entering the 1990s and this hindered long-term growth partly by discouraging investment. During the same period, labor's share showed a clear rising trend and has remained high until now. In this study, we examine the factors behind this increase in labor's share, then look closely at movements in wages and employment in response to other economic variables.

2. Labor's share rose during the two recessions in the 1990s and remains at a high level. This contrasts with the U.S., where labor's share has been surprisingly stable for many years. In Japan, short-term changes have been larger since both prices and unit labor cost move labor's share counter-cyclically (fall during expansions, rise during recessions). However, in addition to the deep and prolonged recessions in the 1990s, the stabilization and decline of prices have made it more difficult to lower labor's share even during expansions and resulted in a sustained increase.

By decomposing the unit labor cost into nominal wages and productivity, the rise of labor's share in this decade can be understood as a larger increase in wages than in productivity. In manufacturing, productivity fluctuates more in a pro-cyclical manner so the unit labor cost increases more during recessions. In the wholesale and retail industries, wages fluctuate in line with productivity, whereas wages increase without any improvement in productivity in the construction and service industries, accompanying the hike in the unit labor cost and labor's share.

Though the level of the share varies among industries, the rise in the 1990s occurred in a broader range of industries. Furthermore, as the rise in labor's share occurred during a recessionary period, it may have been caused by inadequate adjustment.

3. Taking the nominal hourly wage after adjustment in working hours, the premium on the inflation rate dropped rapidly after 1997 and the downward rigidity of wages had also been lost on average. However, this decrease has been realized by raising the ratio of part-time workers without lowering the wages of general workers.

Also, wages growth has been strongly related to inflation rate, hence real hourly wages have been increasing every year except 1998. In contrast, real wages in the U.S. continued to drop throughout the first half of the 1990s.

The increase of real wages affects labor's share by its difference from the growth in productivity. Comparing these two growth rates by industry, rates of wage increase are similar across industries in each decade. Across time, however, disparities have begun to widen along with stagnation in the growth rates. Also, disparities in the productivity growth rate between industries have narrowed and wage levels started to be more closely linked to individual performance.

4. This convergence of productivity growth across industries is thought to reflect ongoing adjustments of employment. Changes in labor input indicate an increase in employment during the first half of the 1990s in line with the reduction of working hours, which caused concerns over future labor shortages. Since 1998, however, there has been a steady decline in labor input and employment did not expand even when the economy was in recovery.

Estimations of the adjustment speed of employment indicate that, while employment adjustments accelerated during the latter half of the 1990s, they have slowed recently due in part to a drop in the required employment level. Still, a large proportion of companies think that they are overstaffed and pressure to adjust employment is increasing. Again in the U.S., the speed of employment adjustment has exceeded that of Japan throughout the estimation period and the estimates are also stable in the long term.

5. Adjustments of both employment and wages

are made gradually and, besides the concurrent economic environment, the future outlook and the insufficiency of past adjustments are important factors affecting these decisions. Though prospects for the economic growth rate are revised only moderately, the higher expected growth rate than ex post performance in the first half of the 1990s led to the expansion of labor costs. By estimating the target of labor's share, an increase in the share was "intentional" through 1996 but companies began to pursue a drop in the share (i.e., an improvement in the profit rate) in 1997 and 1998. However, with the growth rates lower than expected, the share increased unintendedly and this high level persisted through 2000.

6. The rise of labor's share during the early half of the 1990s was caused by the increase in wages and employment due to concerns regarding labor shortages, lower economic growth than expected, and disinflation. In the latter half of the 1990s, companies became more serious about lowering labor's share and tried to restrain nominal hourly wages and slim down employment due in part to rapid deterioration in economic conditions. However, an unexpected drop in economic growth resulted in a further rise in labor's share.

With the higher pressure to squeeze the labor costs, conventional wage and employment practices are likely to be restructured. While a safety net for the temporary negative shock to employment and wages must be prepared, productivity must also be urgently enhanced by fully utilizing existing human resource.

[Wataru Miyanaga (e-mail: wamiyan@dbj.go.jp)]

Introduction

It is widely recognized that labor's share is stable in the long run, and is at a similar level worldwide. Contrary to this rule of thumb observed primarily in the Western industrialized countries, in Japan, there has been a unique movement in labor's share in each period of development.

Labor's share in Japan rose significantly in the 1970s and again in the 1990s and currently remains at a high level. The drop in corporate profits is one factor in the prolonged slowdown in economic growth through a decline in the motivation to invest. Furthermore, if there is a mechanism in which low growth causes an increase in labor's share, then Japan may have now fallen into a vicious cycle of a rise in labor's share and low economic growth. In addition, of relevance to recent discussions that low-profitability sectors are preserved intact, we are interested in whether the increase of labor's share is biased toward specific industries.

In this study, we analyze variability in labor's share based on its relationship to the business cycle. This is the basic approach to understanding the current high level of labor's share and what changes in labor costs and production are foreseeable in future adjustments.

In Chapter I, we examine the background of the rise in labor's share in the 1990s based on a number of factor decompositions and consider the relationship between business cycles and labor's share movement. In particular, we pursue the impact of the drop in prices and other changes during the 1990s on cyclical movement and the relationship between their short-term and long-term trends. In addition, we also examine criteria for assessing the current high level of labor's share.

In Chapters II and III, we look at innovations in components of the numerator of labor's share: wages, employment and working hours, and make comparative examinations with the U.S. on the flexibility and other adjustment capabilities. We also examine industrial disparities in labor's share movement, with emphasis on whether any changes in wage and employment practices are emerging.

In Chapter IV, after surveying growth expectations in the 1990s regarding income (i.e. production), the denominator, we examine if the unanticipated economic performance had an impact on business attitudes, which herald signs of future adjustment. The final section summarizes the discussion.

I Factors in Labor's Share Variability and Assessment

1. Rising Labor's Share

Labor's share is defined as the ratio of payment for labor services to the value added.[1] Based on experience primarily in the Western industrialized countries, it has been pointed out that, besides being extremely stable in the long term,[2] labor's share is of virtually the same magnitude. In Japan, however, in addition to significant short-term variability due to cyclical factors, there exists an apparent trend in the medium to long term. Figure 1-1 (1) shows the movement in labor's share since 1955. Each decade saw a specific trend of the share: a decline in the latter half of the 1950s and an increase during the latter half of both the 1970s and 1990s, while the 1980s, when labor's share was relatively stable, can be seen as an exception. On the other hand, although labor's share in the U.S. (Figure 1-1(2)) rose about 5% during the latter half of the 1960s, it has enjoyed prolonged stability for many years and provides a good contrast.[3]

Table 1-1 confirms this difference between the U.S. and Japan from the statistics. Average levels in the two countries were similar both throughout the entire period and during the 1990s; however, the variability statistics in Japan rose to a level of 3-4 times that of the U.S. whether in terms of [maximum] – [minimum] or standard deviation. In addition, Figure 1-2 shows a comparison with other developed countries for more than the past ten years. A comparison of absolute levels is not easy mainly due to differences in definition. However, although variability is relatively large in the U.K., the consistent trend of increase in Japan is unique, even in Figure 1-2(2), in which the private com-

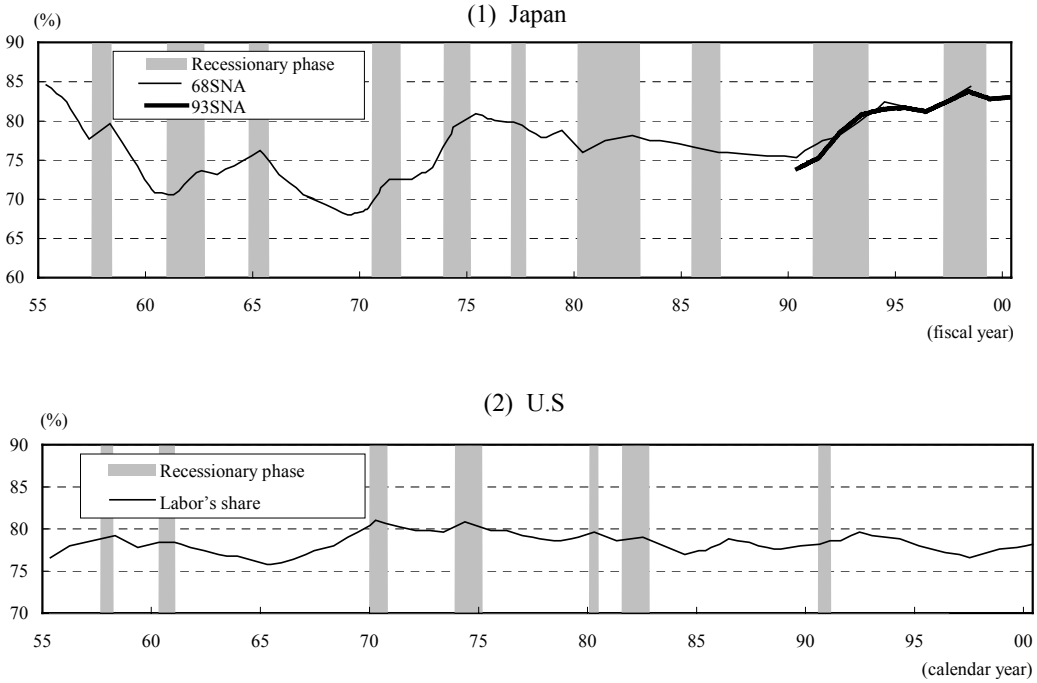


Figure 1-1. Labor's Share

Notes: 1. Labor's share = compensation of employees / (national income – personal entrepreneurial income).
2. Shaded areas are recessionary phases from peak to trough.
Source: "National Accounts," Cabinet Office; "Survey of Current Business," U.S. Department of Commerce.

[1] See Appendix I for a discussion of the specific calculation method.

[2] The Cobb-Douglas function, which is frequently used in macro-models, was introduced with the assumption of a constant labor's share.

[3] Solow (1958) and Kravis (1959) even cast doubt on the stability of labor's share (or the definition of stability) in the U.S.; it is obvious, however, that it was more stable than in Japan during the period of Figure 1-1.

pany ratio[4] and other differences in the economic structure are eliminated to a certain extent.

In this study, the rise in labor's share during the 1990s is the primary target of analysis, however, we briefly examine prior periods based on existing studies. Before the period of intense growth (prior to the period covered in Figure 1-1), the weight of the non-modernized small-scale self-employed sector, which is typical in agriculture, shopkeeping, cottage industries and so forth was high. While productivity was low in these sectors due to the existence of labor surplus, labor's share was at a high level because there was no drop in wages, which were already at the bare minimum subsistence level. As the economy subsequently expanded, especially in modernized sectors with relatively low labor's share, and, since the labor surplus in the non-modernized sectors was absorbed in that process into the modernized sectors, labor's share in the non-modernized sectors also dropped. Thus, labor's share of the economy overall was declining and it has been pointed out that the sudden drop in labor's share (from 85% to 70%[5]) in the period of rapid growth beginning in about 1955 was due to the steady decline in labor's share in the large corporate sector against the backdrop of rapid growth.[6] Thus, labor's share remained at a low level throughout the 1960s and it is thought that allocations to abundant capital supported the rapid growth through vigorous capital investments.

Entering the 1970s, labor's share began to increase. Besides an increase in the ratio of workers in management, R&D and other sectors not directly involved in production during this period, substantial increases were also apparent in expenses for worker benefits unrelated to cash earnings (Nishimura and Inoue, 1994). The tendency toward an increase in prices strengthened at about this time but, when this was restrained by the Oil Shock in 1973, wages began to rise, affecting a broad range of workers including blue collar through "inflation preempting" type springtime wage negotiations. Labor's share thus rose by 15 points between 1969 and 1975 while corporate profit in the midst of the recession dropped sharply in 1974 - 75. As a result of progressive belt-tightening in response to this especially in large-scale manufacturing industries, the unemployment rate rose to the 2% level and the employment of part-time workers became widespread. In addition, labor's share finally returned to a stable state during the latter half of the 1970s due in part to efforts to restrain the rate of wage increases through labor-management cooperation at the time of the second Oil Shock.

Thus, in the 1980s as the economy shifted to stable growth, labor's share remained stable in spite of the appreciation of the yen and other external shocks. The rise in labor's share during the 1970s was not adjusted, which is considered to indicate the realization of a level comparable with that of other industrialized countries. It was even asserted that labor's share should be increased in preparation for the consumption-oriented society when the expansion of domestic demand had become a new issue.

Entering the 1990s, labor's share rapidly surged from 73.9%, the lowest point, in 1990 to 81.5% in 1994, the pace of which is comparable to that in the 70s. As the share reached a record high, the debate turned to its appropriateness from an international perspective. There was strong anticipation of a recovery in the business climate at the time, however, and the possibility that this was a transitory phenomenon due to the recession premised on the advance of wage and employment adjustments has been pointed out (for example, by the Economic Planning Agency in 1994). To be sure, some of the decline was evident during the period of economic recovery through 1996. Subsequently, however, it again shifted to an increase, rising about 10% through

[4] See Appendix I.

[5] Values based on the definition of Figure 1-1; likewise below.

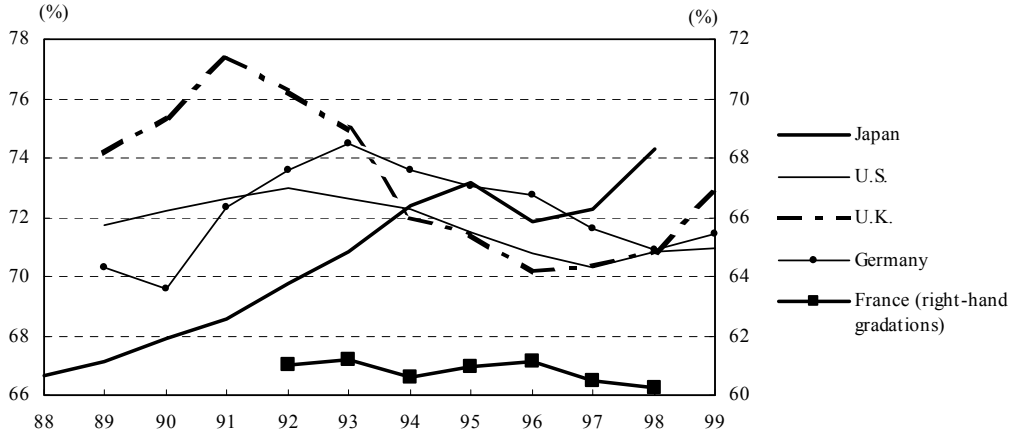
[6] The decline in labor's share during the period of rapid growth "corresponds to the spurt of capital and construction investments in the corporate sector; however, the rise in extrinsic effective demand promoted capital investments and economic growth while also increasing profits" (Ishikawa, 1994, p. 11).

Table 1-1. Statistics of Labor's Share in The U.S. and Japan

	1955-00		1990-00	
	Japan	U.S.	Japan	U.S.
Average	76.8	78.8	80.2	78.5
Maximum	84.8	81.5	83.7	79.9
	(FY '55)	(FY '70)	(FY '98)	(FY '92)
Minimum	68.1	76.2	73.9	77.0
	(FY '69)	(FY '65)	(FY '90)	(FY '97)
Max. – Min.	16.7	5.3	9.9	2.9
Standard deviation	4.1	1.2	3.1	0.9

Notes: 1. Computed from labor's share in Figure 1-1; fiscal year for Japan, calendar year for the U.S.
2. In Japan, based on 68SNA through 1989 and on 93SNA from 1990.

(1) Compensation of employees / distributed national income



(2) Compensation of employees / (distributed national income - personal entrepreneurial income)

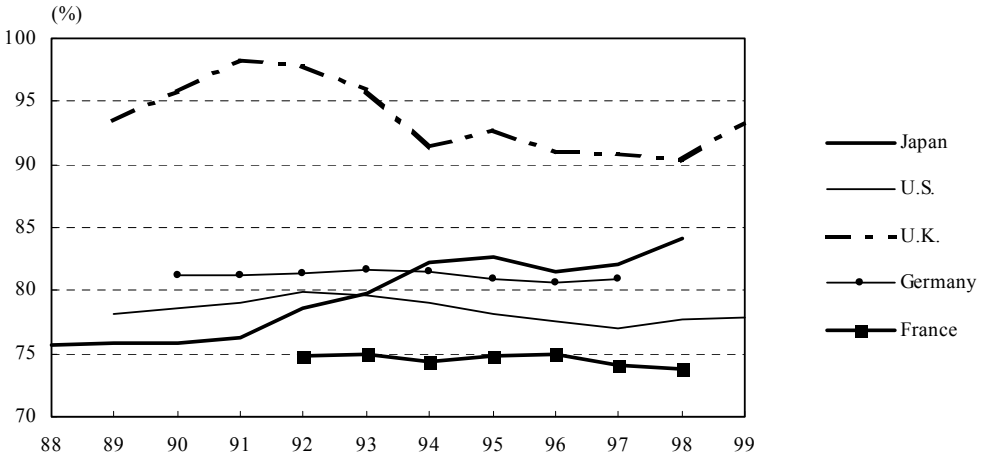


Figure 1-2. International Comparison of Labor's Share

Source: "2000 International comparison statistics," Bank of Japan.

out the 1990s to the present level of about 83%. Looking back to the 1990s, Japan experienced unprecedented low growth starting with the bursting of the bubble economy but it is hard to see that external shocks were of any particular consequence compared to the oil shocks and the upward reevaluation of the yen of the past. While the rise in labor's share during this time is constantly pointed out, it was a gradual increase. Inflation was furthermore one factor in labor's share during the 1970s and, in contrast, the progressive shift from price stability to deflation during the 1990s is a fundamental difference. In the following we will examine in particular this rise in labor's share during the 1990s.

2. Decomposition to Prices and Unit Labor Cost

Labor's share can be decomposed into factors in several ways. This section considers the decomposition to prices and unit labor costs (ULCs).

$$\text{Labor's share} = \frac{\text{nominal labor compensation}}{\text{nominal value added}}$$

$$= \frac{\text{nominal labor compensation}}{\text{real value added}} \times \frac{1}{\text{prices}} = \frac{\text{ULC}}{\text{prices}} \quad (1\text{-}1)$$

ULCs are the nominal labor costs required to produce one unit of real value added and Equation (1-1) indicates that labor's share is defined as the ratio of labor cost (numerator) to the value produced (denominator).[7]

In Figure 1-3, the difference in labor's share compared to the previous year (% points) is contribution decomposed based on Equation (1-1). During phases of rising labor's share, as the rate of price inflation remained at a high level during the latter half of the 1970s, it was outpaced by ULCs. During the latter half of the 1990s, however, while the inflation rate stabilized, ULCs continued to grow. In addition, referring to Figure 1-1, the relationship to business cycles shows that there is a tendency for labor's share to rise during periods of recession and to decline during periods of economic recovery. However, looking at the period of recovery during the 1990s, in spite of restrained ULC growth in 1993-97 and a sharp decline in 1999-2000, this is not linked to a decline in labor's share due to disinflation and deflation, which means deviation from the conventional cyclical movement.

In the Japanese economy, there have been considerable differences in productivity and profitability between industries and the need for reform in inefficient sectors has been an ongoing debate. In regard to variability in labor's share, let us look at whether or not it is possible to confirm if trends of some industries are strongly expressed in industry-specific labor's share in Figure 1-4. Here, due to data limitations, the method of calculating labor's share is different from that of Figure 1-1, which includes personal entrepreneurial income in the denominator.[8] In the diagram, besides the consistently low electricity, natural gas and water supply industries, industry-specific tendencies, such as the high level of transport and communications industries, are also evident. However, labor's share in the four industries (manufacturing, construction, wholesaler/retail and service) that account for 65.7% value added weighted (real domestic factor income in FY 1990) indicate similar tendencies in the long run.

Accordingly, Figure 1-5 shows a factor de-

[7] Since labor's share is a ratio, it is not important if production is one unit or the total volume. In addition, it is not appropriate to liken production to sales in company accounting practices since it is a value added concept. Refer to Appendix 1.

[8] Besides this, the calculation in Figure 1-1 also differs in the following points. (1) The values are calendar year values due to data limitations. (2) It is about 95% of total domestic factor income excluding agriculture, forestry, fisheries and aquaculture industries, producers of government services and producers of private non-profit services to households. (3) It is deflated by value added deflators by economic activity and, for the economy as a whole, a slight disparity occurs due to the difference in the coverage given in (2). When comparing labor's share for the economy overall, it is more than 10% lower than that of Figure 1-1 and it is due primarily to the inclusion of personal entrepreneurial income in the denominator. In addition, the reason for the smaller rise during the 1990s is due to the slight rise in the ratio of personal entrepreneurial income (including imputed rent). In addition, the imputed portion is large in the real estate and financial/insurance industries, hence they are omitted from the graph because of the difficulty of comparison.

composition of the difference in labor's share compared to the previous year. In Figure 1-5 (1), labor's share and weight overall are totaled, and the total is considered to be the share of the contribution of that industry. It can be seen that, while the rise in the 1970s was due to the contribution of a broad range of industries, the service, construction and wholesale/retail industries accounted for a considerable contribution to the

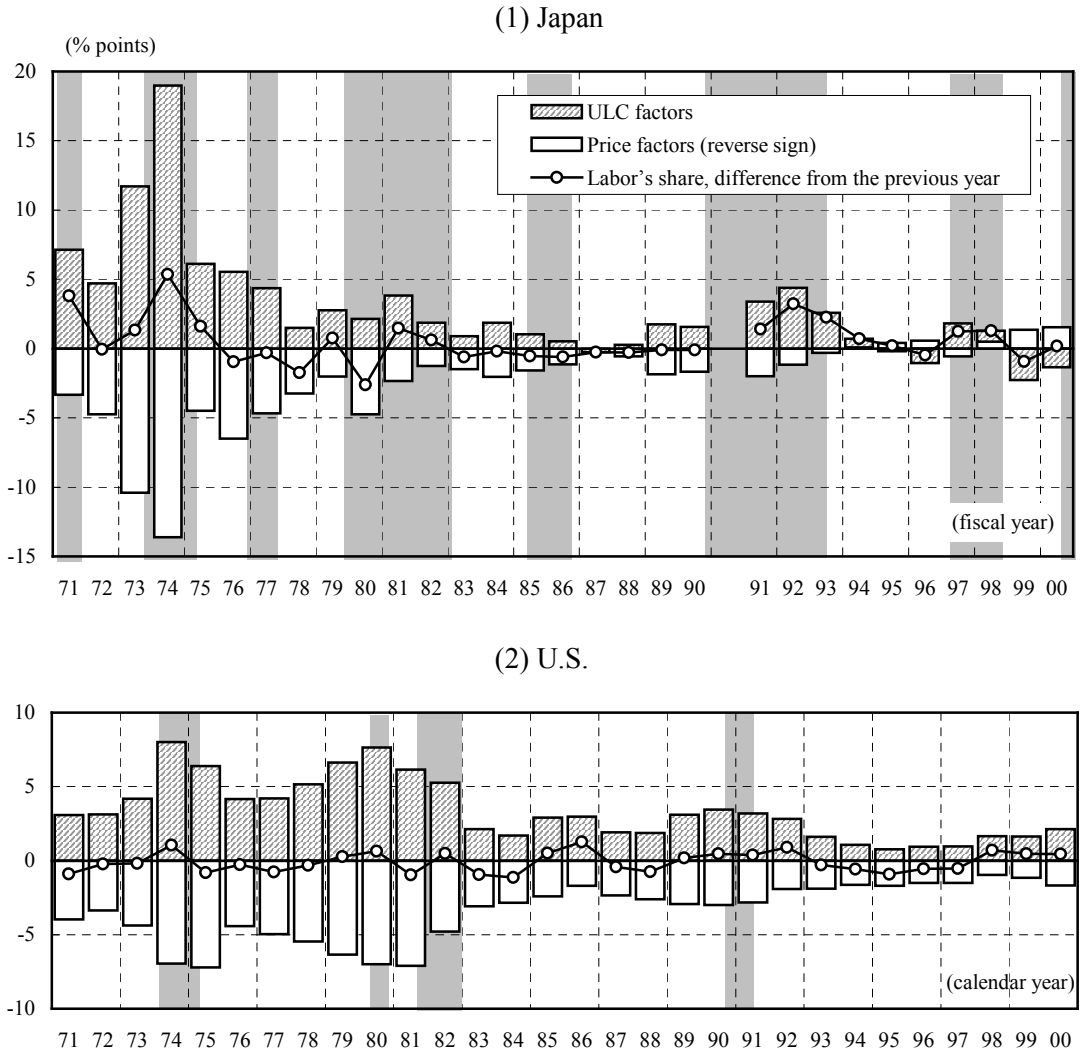


Figure 1-3. Factor decomposition of the Changes in Labor's Share

Notes: 1. Shaded areas are recessionary phases from peak to trough.
2. The following data was used for each variable:
Prices: GDP deflator
Nominal worker compensation: compensation of employees
Nominal value added: National income – personal entrepreneurial income
3. Japan based on 63SNA prior to 1990.

Source: "National Accounts," Cabinet Office; "Monthly Labor Statistics Survey," Ministry of Health, Labor and Welfare; "Survey of Current Business," U.S. Department of Commerce; "Monthly Labor Review," U.S. Department of Labor.

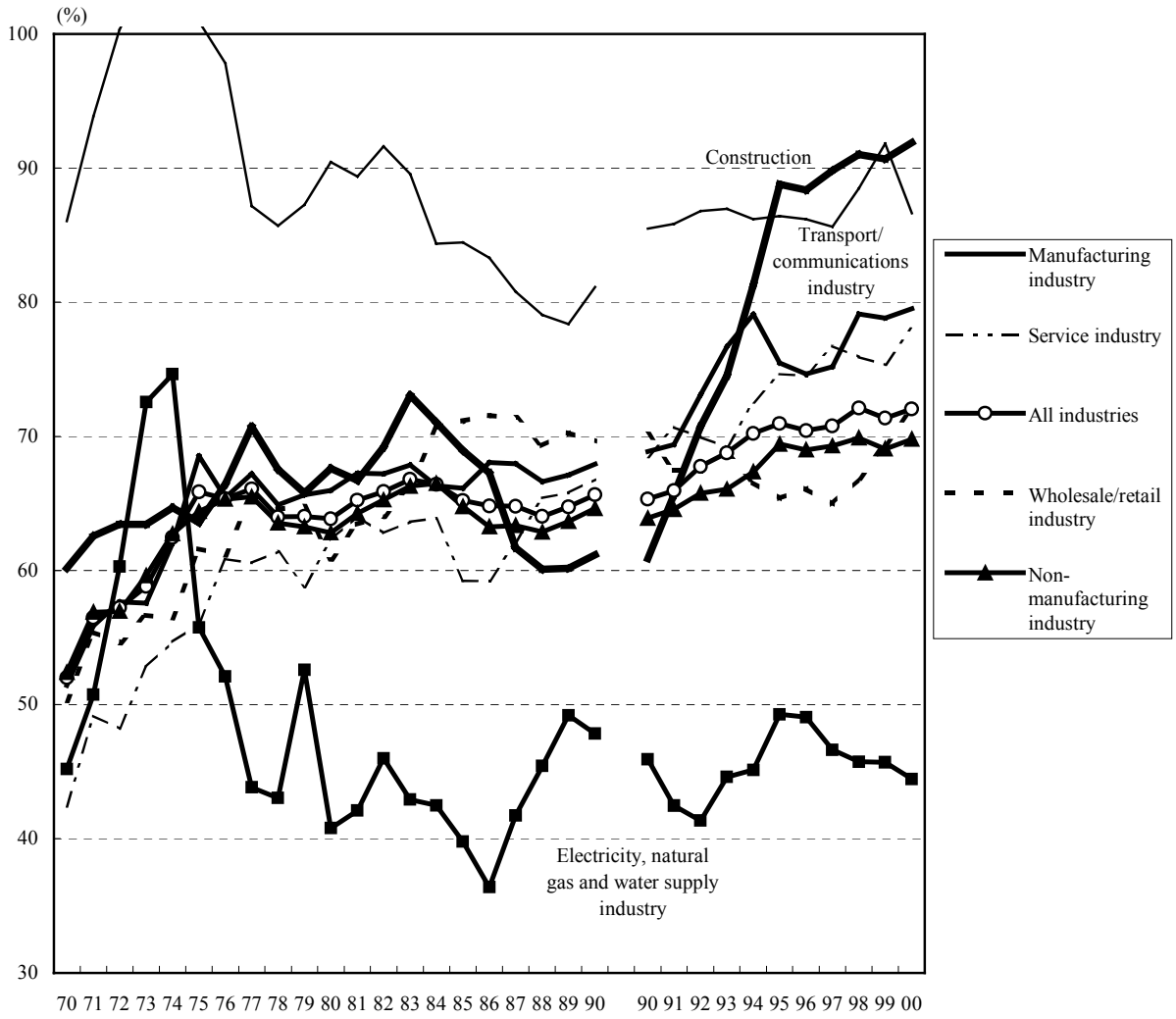


Figure 1-4. Labor's Share by Industry

Notes: 1. Calendar year. Data for 1970-90 based on 68SNA, data for 1990-99 based on 93SNA.
2. Labor's share = compensation of employees / domestic factor income.
3. Real estate, which is at a low level, mining, which has low value added weight, and the financial and insurance industries of which imputed interest accounts for the majority of SNA value added, are omitted.

Source:"National Accounts Annual Report," Cabinet Office.

rise in the 1990s. However, Figure 1-5 (2), in which weight changes are compiled separately, approaches the image of Figure 1-4 and, driven by the construction and manufacturing industries, the effect of the weight is considerably offset. Thus, both diagrams indicate a considerably different form of the factors in the rise and this difference was greater in the 1990s than in the 1970s. Overall, the construction industry undoubtedly contributed to the rise in the 1990s; however, it is difficult to attribute the rise in labor's share to specific industries and, while accompanied by a shift between industries, this can be considered a phenomenon that progressed simultaneously in a broad spectrum of industries.

Figure 1-6 shows the same decomposition as Figure 1-3 seen by industry. In the 1990s, in particular, the tendency toward deflation strengthened in the manufacturing and transport/ communications industries and the decline in the ULCs is not linked to a drop in labor's share. On the other hand, in the construction and service industries, while the usual deeply rooted tendency toward a rise in prices is lost, labor's share rises without an adequate drop in the ULCs. Labor's share thus varies due to the correlation between prices and ULCs; however, there are more notable differences between industries due to the ULCs. Let us look then at the variability factors in the ULCs in the next section.

3. Decomposition of Unit Labor Costs

If ULCs are decomposed in accordance with that definition, they can be expressed as indicated below:

$$\mathrm{ULC} = \frac{\text{nominal labor compensation}}{\text{value added amount}} = \frac{wLh}{Y} = w/\frac{Y}{Lh} \left(= \frac{\text{nominal hourly wage}}{\text{productivity}} \right) \quad (1\text{-}2)$$

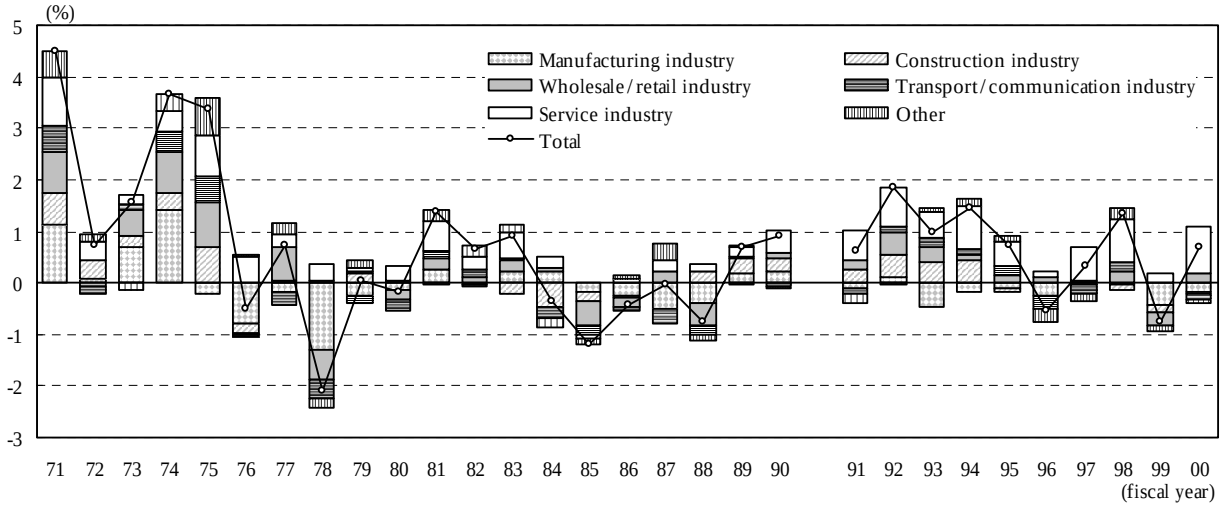
where, w = nominal hourly wage, the wage rate, L = number of workers, h = working hours per worker and Y = value added. Based on this analysis, ULCs increase when nominal hourly wages increase compared to productivity. In Figure 1-7, the ULC growth rate is factor decomposed based on this equation and expressed by industry.

When viewing all industries (private sector excluding agriculture, forestry and fisheries), it is possible to confirm that ULCs remained at a low level during the early 1990s because nominal hourly wages rose while the rise in productivity slowed. By industry, manufacturing industries reflect sizable cyclical fluctuations in the production level while productivity is high and moves pro-cyclically (rises during economic expansions and falls during recessions). However, the production level itself remained virtually flat (factor income deflated by the period 1990-2000 increased 2.2%) and it is possible to identify the cause of the medium- to long-term rise in labor's share in the increase in nominal hourly wages in the 1970s and in the relative drop in productivity during the 1990s.

In the wholesale/retail industries, fluctuations in productivity and wages were balanced and ULCs were stable from the 1980s to the mid-1990s, while the drop in productivity in recent years caused the ULCs to rise. Although employment in the wholesale/retail industries increased monotonously, the switch to a drop in real factor income beginning in 1998 brought about a decline in productivity.

In the construction and service industries, wages increased during the first half of the 1990s though no improvement was evident in productivity, causing an increase in ULCs. The construction industry, in particular, demonstrated a conspicuous decline in productivity, especially during the early half of the 1990s, and real factor income during this time dropped by more than 20% to 78.4 in 1995 and 72.0 in 2000 based on an index of 1990 = 100. Incidentally, a drop in real factor income during the 1990s was evident only in the construction and mining industries. Meanwhile, the transportation and communication industries achieved stable growth during the 1990s and, while there was a strengthening tendency toward a decline in ULCs due to improvements in productivity, it was not linked to a drop in labor's share within the context of falling prices, as seen above.

(1) Contribution decomposition by industry



(2) Contribution decomposition separate from changes in weight

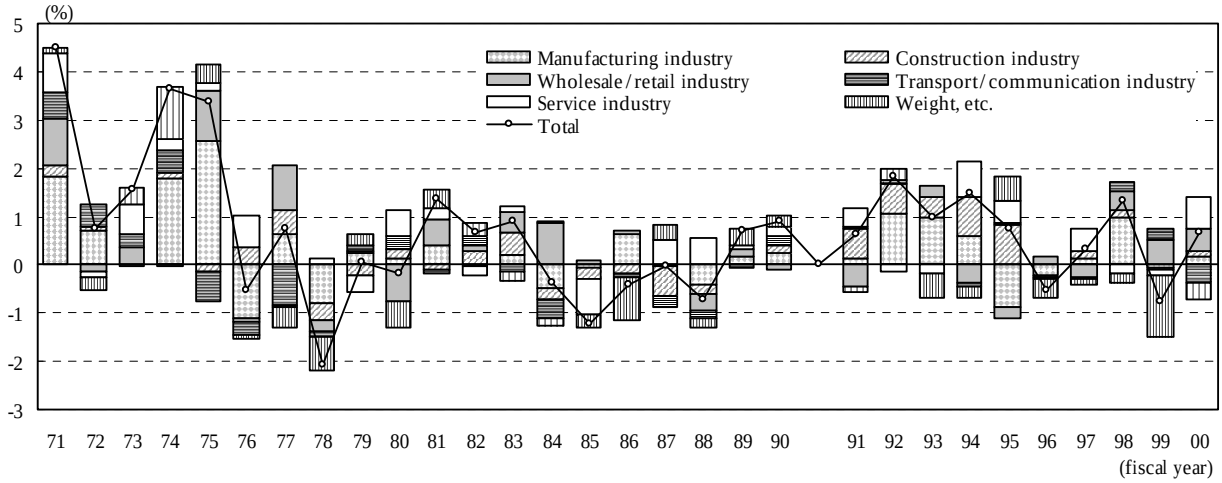


Figure 1-5. Contribution Decomposition by Industry of a Change in Labor's Share

Notes: 1. Calculated the same as in Figure 1-4.

2. Factor decomposition is based on the following formulation.
Suppose W is the compensation of employees (labor's share numerator) and Y is the denominator factor income, each of which is the sum of W_i and Y_i, variables for industry i. Then, labor's share can be decomposed as indicated below.

$$\frac{W}{Y}=\frac{\Sigma_i W_i}{\Sigma_i Y_i}=\sum_i \frac{W_i}{\Sigma_i Y_i}=\sum_i\left(\frac{W_i}{Y_i}\cdot\frac{Y_i}{\Sigma_i Y_i}\right)$$

Therefore, a change in overall labor's share is the weighted average of the changes in each industry. That is,

$$\Delta\left(\frac{W}{\mathrm{Y}}\right)=\sum_i\left(\Delta\left(\frac{W_i}{Y_i}\right)\cdot\frac{Y_i}{\Sigma_t Y_i}+\frac{W_i}{Y_i}\cdot\Delta\left(\frac{Y_i}{\Sigma_i Y_i}\right)\right)$$

Decomposition in Figure (1) is based on the changes by industry which is the bracket of the right-hand side of the above equation. In Figure (2), the first term in the bracket is extracted for major industries, and the effect of other industries and the entire influence of the weight change are unified under "Other."

Source: "National Accounts Annual Report," Cabinet Office.

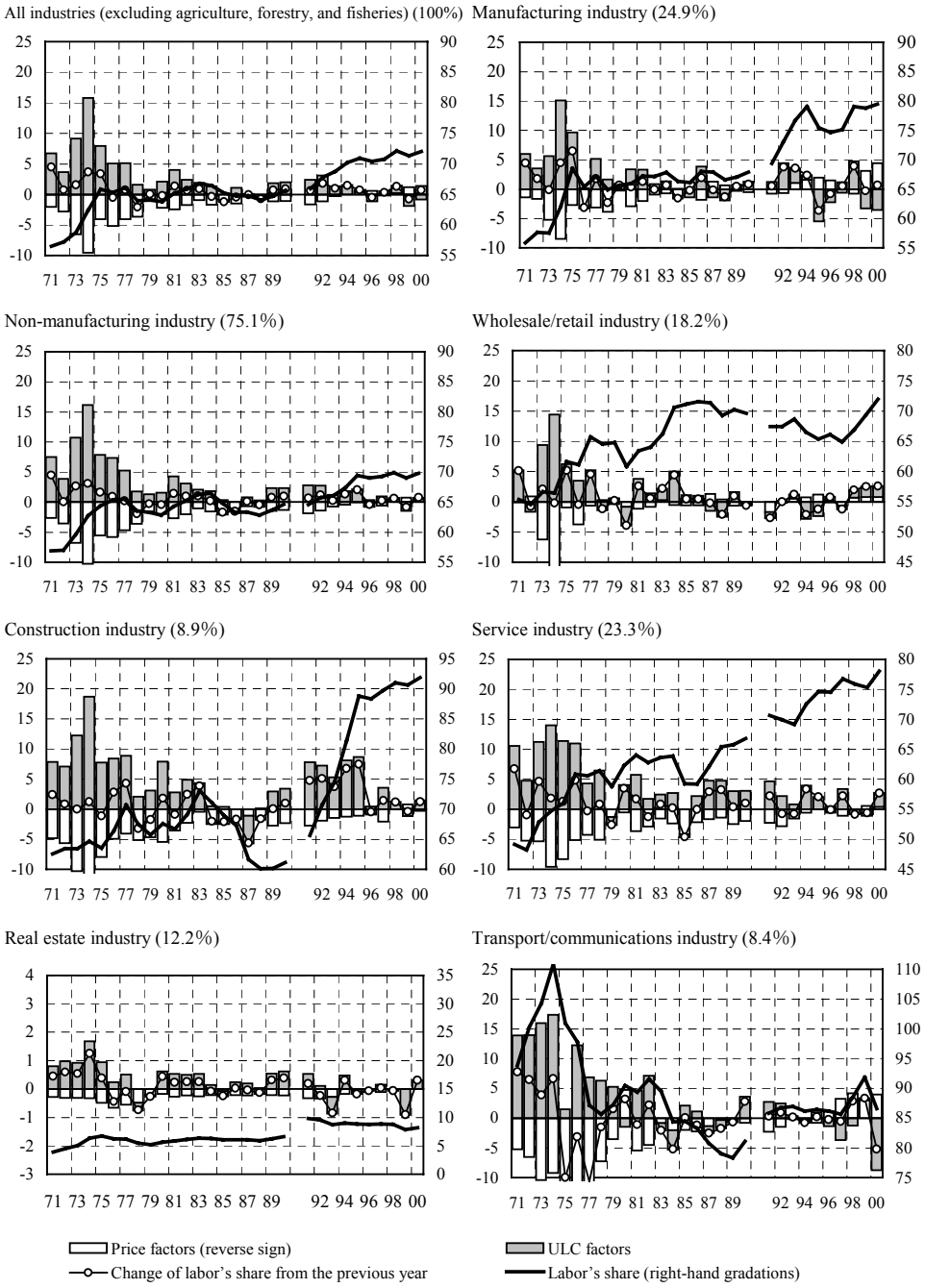


Figure 1-6. Factor Decomposition of Labor's Share Changes by Industry

Notes: 1. Based on calendar year. All units are %.

2. % change in labor's share from the previous fiscal year is factor decomposed based on the following.

$$\text{Labors share} = \frac{wLh}{YP} = \frac{wLh}{Y} \cdot \frac{1}{P} = \frac{\text{unit labor cost (ULC)}}{\text{prices}}$$

wLh is compensation to employees (domestic concept), *YP* is domestic factor income and *P* is product deflator by industry.

3. The share of factor income (real) compared to all industries (excluding agriculture, forestry, fisheries and aquaculture) in 2000 is shown in parentheses after the industry name.
4. *Electricity*, natural gas and water supply industries and the financial and insurance industries are omitted from the graphs.

Source: "National Accounts Annual Report," prepared based on Cabinet Office

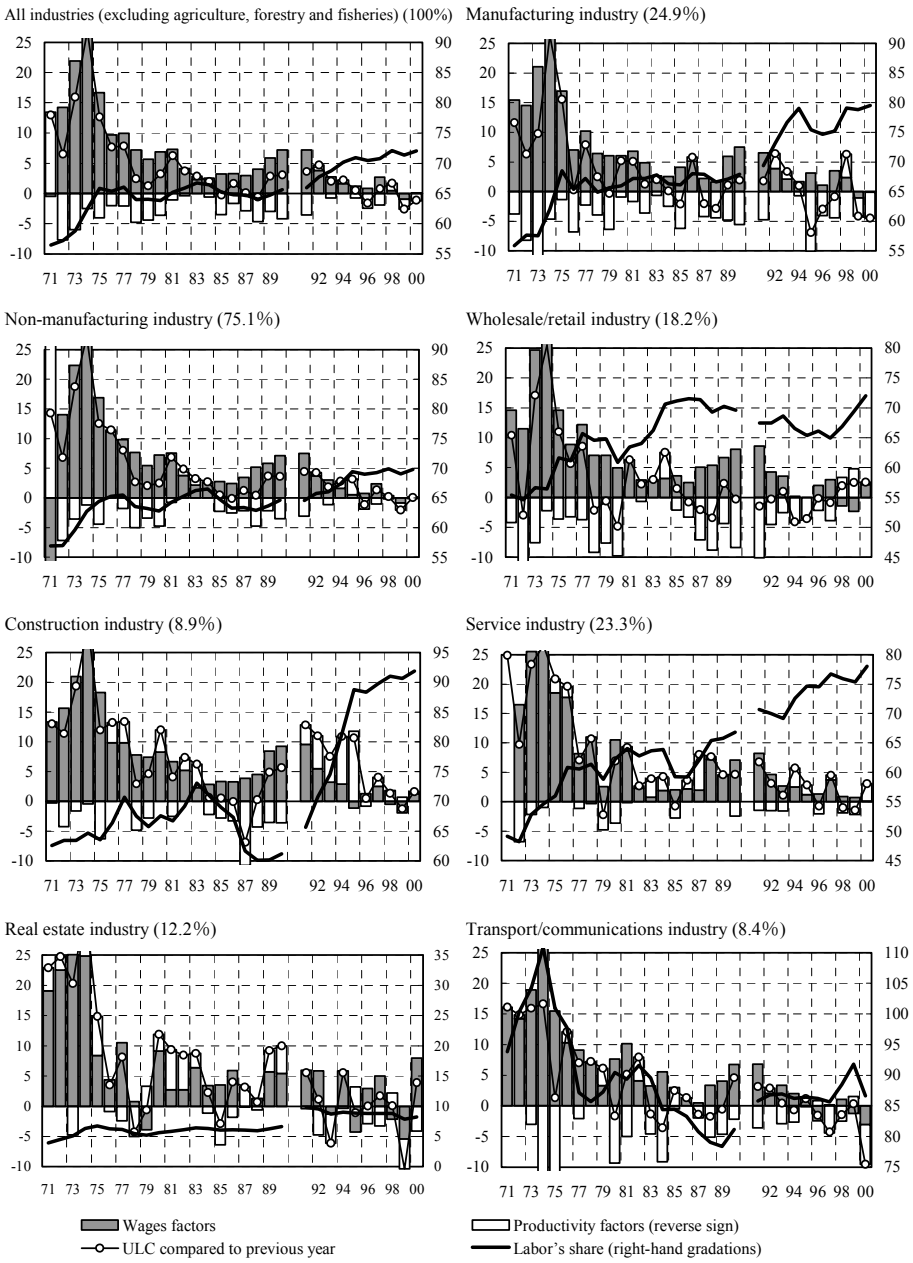


Figure 1-7. Factor Decomposition of the ULC Growth Rate

Notes: 1. Based on calendar year. All units are %.

2. % change of ULC from the previous fiscal year is factor decomposed based on the following equation.

$$\text{ULC} = \frac{wLh}{Y} = w/\frac{Y}{Lh} = \frac{\text{Nominal hourly wages}}{\text{Real productivity}}$$

wLh is compensation of employees (domestic concept), *Y* is domestic factor income deflated by product deflator by industry, *L* is the number of workers and *h* is working hours. Working hours until 1990 are based on Monthly Labor Statistical Surveys (businesses with 30 or more employees).

3. The share of factor income (real) compared to all industries (excluding agriculture, forestry and fisheries) in 2000 is shown in parentheses after the industry name.
4. Mining, electricity, natural gas and water supply industries and the financial and insurance industries are omitted from the graphs.

Source: "National Accounts Annual Report," prepared based on Cabinet Office; "Monthly Labor Statistical Surveys," Ministry of Health, Labor and Welfare.

Thus, in spite of the fact that a rise in labor's share is evident in a broad range of industries, definite disparities are seen between individual industries. This point is examined again in the following section.

4. Relationship between Cyclical Movement and Long-Term Rise

"Labor's share normally rises during recessionary periods and drops during periods of economic recovery" (Economic Planning Agency, 1966). This relationship between labor's share and the business cycles was recognized as early as in the 1966 edition of the Economic Survey of Japan. One still frequently encounters this claim regarding the counter-cyclical nature of labor's share and we would like here to attempt to stereotype the Japanese cycle of labor's share by examining prices and URLs based on the foregoing decompositions.

Figure 1-8 shows the transitions in the inflation rate by business cycle. With the exception of the broad surge in the inflation rate following the first Oil Shock, it can be seen that the movement was pro-cyclical, that is, the inflation rate moved together with economic recovery, until the early 1990s. Of course, the price level reflects a combination of non-cyclical factors, such as monetary policy, the exchange rate, and cyclical factors, thus making it difficult to verify a clearly-defined correlation,[9] however, the pro-cyclical movement indicated in Figure 1-8 (8) is established intuitively. Since the effect of prices on labor's share is counter-cyclical (refer to Equation 1-1), such observations indicate that cyclical price variability makes labor's share move counter-cyclically.

On the other hand, ULCs tend to move counter-cyclically, as illustrated in Figure 1.3. Greater fluctuation of labor's share in Japan can be accounted for by the fact that both prices and ULCs cause labor's share to vary counter-cyclically. Still, the similar cyclical pattern of price movement has also been pointed out in the U.S.[10] and differences can probably be sought in the movement of ULCs. Furthermore, since the pro-cyclical movement of productivity is virtually the same in both the U.S. and Japan, crucial differences can be found in nominal labor compensation. This point is examined from the following section.

The counter-cyclical movement of labor's share can also be confirmed in statistical precedence relationships between variables in the past. Estimating the relationship of production and labor related variables during the past twenty years or so using a simple VAR model (refer to Supplement 2) shows that, when an exogenous shock is provided on production, labor's share moves in the opposite direction to the initial shock to production. In addition, as time goes on, this innovation on labor's share is not eliminated and a level shift remains permanently. Therefore, if there is an alternating series of economic expansions and recessions, labor's share will remain stable in the long term while it will rise in the long term if negative shocks on production are relatively greater, as in the 1990s.

Furthermore, these short-term cycles of labor's share became asymmetric due to the drop in the inflation rate in the 1990s. Figure 1-8 shows that the inflation rate dropped after entering the 1990s due to the weakening of its relationship to business cycles and labor's share increased due both to the factors of prices and ULCs in recessionary periods. Meanwhile, though ULCs cause a drop in labor's share during periods of economic recovery, prices tend to cause an increase in labor's share, offsetting the drop in labor's share. It is thought that an asymmetrical correlation develops between labor's share and business cycles, boosting labor's share with a ratchet effect.

[9] Asako et al. (1991), who examined the issue with the exclusion of such non-cyclical factors, assert that there is an asymmetrical correlation between prices and nominal GNP, that is, inflation rate shows downward rigidity during recessionary periods. Similar results are reported in the U.S. that prices fluctuate pro-cyclically during growth periods and counter-cyclically during recessionary periods (Wolf, 1991). Furthermore, Ariga et al. (1992) deny the correlation itself between price level and the business climate.

[10] See footnote 9.

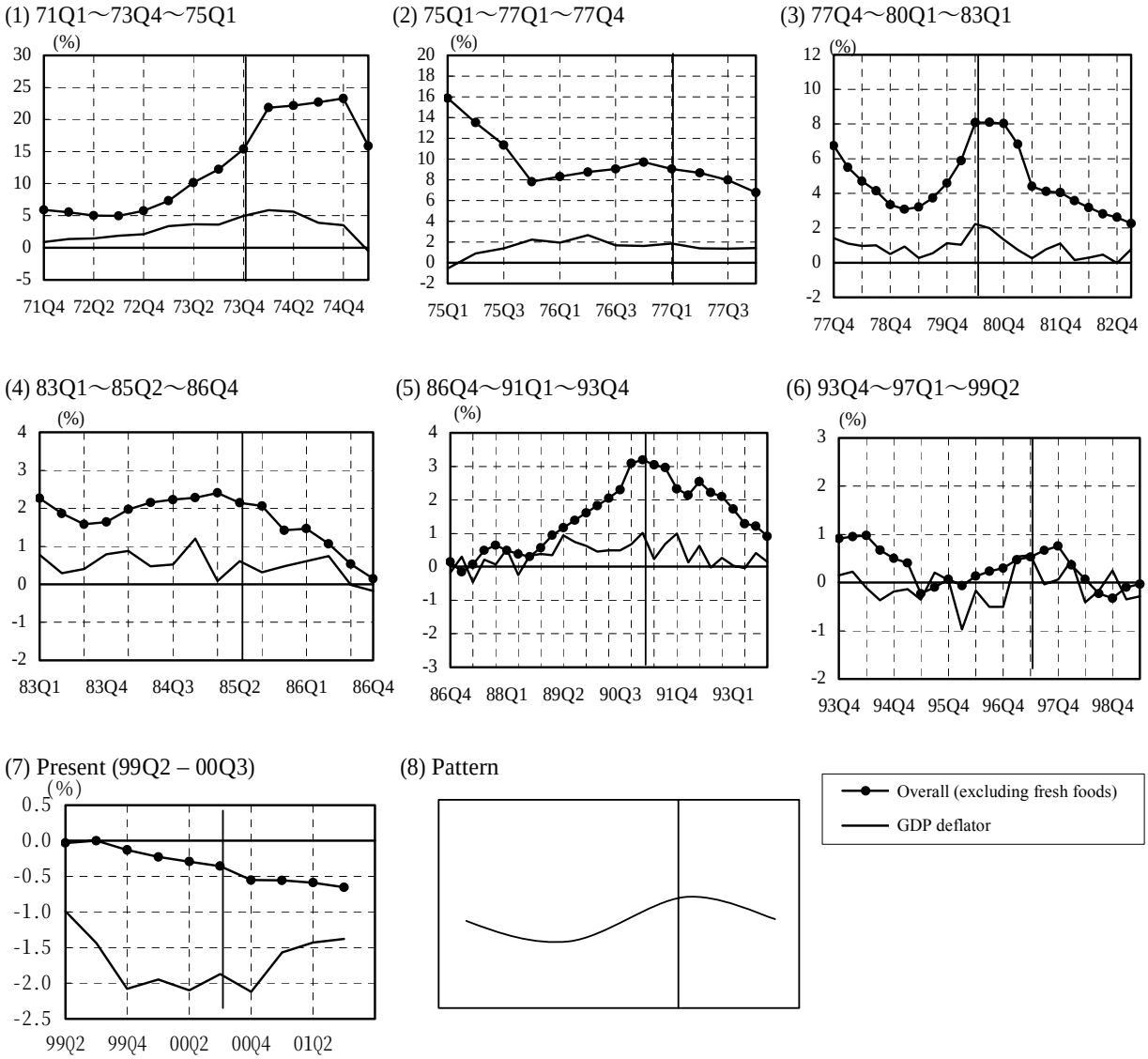


Figure 1-8. Price Movement in Business Cycles (trough - peak - trough) Compared to the Previous Year

Notes: 1. Consumer price index excluding fresh foods
2. Since the GDP deflator of cycle (7) only is based on 93SNA, it does not connect to (6).
3. Effect due to consumption tax is excluded; 89Q2 – 90Q1 are complemented linearly and a positive correction of 1.5% is applied to 97Q2 – 98Q1 based on the Economic Planning Agency (1997).

Source: "Monthly Consumer Price Index Report," Ministry of Public Management, Home Affairs, Posts and Telecommunications; "National Accounts Annual Report," Cabinet Office.

5. How Should the Current Labor's Share be Assessed?

We have examined the background of the rise in labor's share as indicated above; is it possible, though, to see a rise in labor's share as essentially vicious? Debates in the past have often focused on international comparisons, but we can discuss whether Japan's labor's share is at the optimum level in light of some sort of criteria.

In regard to the low level of labor's share during the period of intense growth and the gradual drop in labor's share during the 1980s, for example, there has been criticism that Japan's labor's share is low in international terms and that the workers are not gaining appropriate

benefits. In response to this, Koike (1999) states, "that does not mean that workers in Japan are gaining less than their share; labor's share drops in growing economies," citing Kaldor (1955-56) as an example. Aside from this, the possibility of a change in labor's share in a balanced growth track can be explained in terms of macro production functions. As pointed out by Hicks (1932),[11] Solow (1958) and recently by Nishizaki and Sugo (2001), even if the macro production function is constant returns, if based on the CES model, labor's share will rise together with the accumulation of capital when the elasticity of substitution of labor and capital is less than one. Based on this, it would be possible to accept a long-term rise of labor's share as a byproduct of economic growth.

If we take the factor decomposition of labor's share seen in this section into account, however, it would probably be difficult to support this approach for the following reasons. First of all, there were significant increases in labor's share primarily during two recessionary periods, not during periods of economic recovery when the pace of capital accumulation accelerated. Conversely, the fact that labor's share was stable during the latter half of the 1980s when there was an increase in the growth rate could be considered contradictory evidence of the same nature.[12] The Economic Planning Agency (1992), which conducted empirical analyses, Kamata and Masuda (2000) and others obtained results indicating that the elasticity of substitution, a condition for explanations by CES production functions, does not significantly differ from one.

We argue that, since the rise in labor's share happened not in an expansionary period, and because labor costs are inflexible, the required adjustment is hindered and so labor's share hovers at a high level. In such cases, the previously mentioned Kaldor, for example, pointed out using a Keynesian type of model the possibility that the rise of labor's share causes a drop in the economic growth rate in mature economies. In other words, when the company profit rate falls due to an increase in labor's share, mounting investor pessimism and risk occur along with lower investment, and the growth in demand does not attain the natural growth rate. It has been asserted, for example, that there has been a long-term decline in ROA in Japan.[13] The factors involved in fluctuations of the company profit rate (Figure 1-9) indicate that the impact of fluctuations on labor's share is more dominant than the value added ratio.[14] Though the Kaldor-type approach will require more specific studies to be undertaken, taking the existence of gaps in demand as one factor in the current deflation into account, we cannot exclude the possibility that high labor's share hinders growth due to a vicious cycle involving insufficient demand.

In addition, whether based on the above supply function or the possibility of disequilibrium due to inadequate adjustment, which is the perspective of this study, it is necessary to explain why labor's share increased consistently only in Japan during the 1990s unlike Western industrialized countries where capital accumulation advanced at a much higher pace. Below, we will examine each of the variables that make up labor costs and look at the characteristics of the Japanese adjustment process based on this perception.

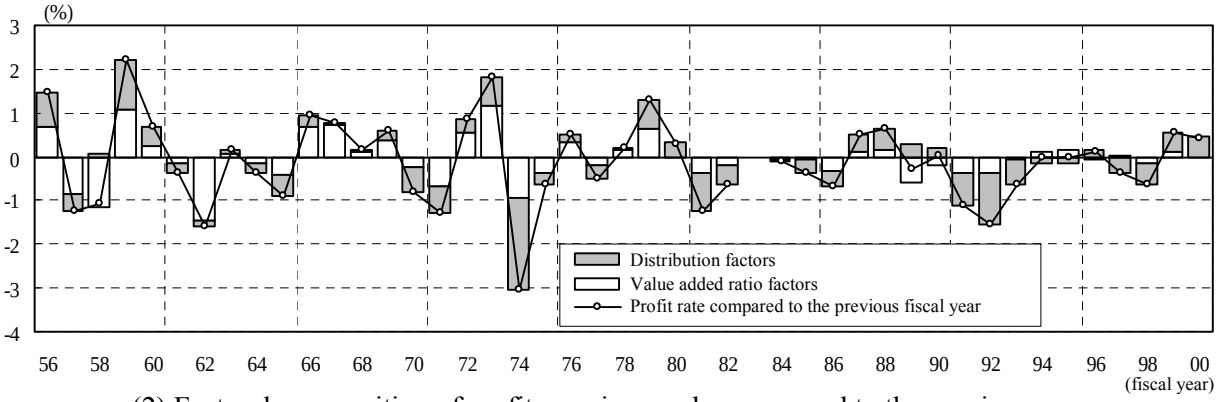
[11] See Yoshikawa (1994).

[12] Since the explanation based on CES model functions is based on a long-term model, it basically does not explain short-term fluctuations. However, this study adopts the approach that short-term factors survive to have a long term, a fundamentally different mechanism.

[13] Nakamura (2000) presents a detailed discussion of ROA decline and inter-company disparities using company micro-data.

[14] When labor's share factors and value added ratio factors indicate the same direction, we can say that company profits are more volatile since it is the residual after subtracting fixed labor compensation. Manufacturing and non-manufacturing industries show a tendency similar to that in Figure 1-9; however, the absolute variance is far greater in the case of manufacturing industries.

(1) Factor decomposition of the return on equity compared to the previous fiscal year



(2) Factor decomposition of profit margin on sales compared to the previous year

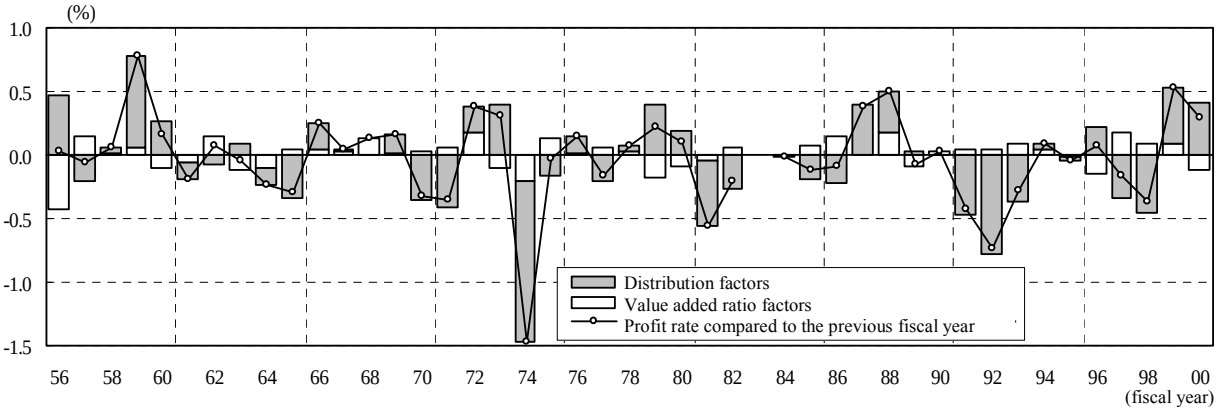


Figure 1-9. Impact of Labor's Share on the Profit Rate

Notes: 1. Covering companies with sales of ¥10 million or more excluding financial and insurance industries.

2. Factor decomposition is implemented with the figures defined as indicated below.

A : Total assets = beginning of term, end of term average (excluding land)
S : Sales
Y : Value added = ordinary profit + interest payment discount charge – interest dividends + labor cost
R : Company revenues = ordinary profit + interest payment discount charge – interest dividends
CS : Capital share = company revenues ÷ value added

Return on equity (ROE):

$$\mathrm{ROE} = \frac{R}{A} = \frac{Y \times CS}{A} = \frac{Y}{A} \times CS$$

Therefore, innovation in *Y/A* is value added factors and *CS* variability share factor. Profit margin on sales is decomposed in the same manner with *S* substituted for *A*.

3. Since interest dividends are posted beginning in FY1983, changes through that year are not obtainable.

Source: "Corporate Statistics Quarterly Reports," Ministry of Finance.

II Wage Adjustment

1. Nominal Wages and Its Flexibility

Labor costs consist of wages times number of workers or hourly wage (wage scale) times per capita working hours times number of workers. Of these, we will examine whether or not wages, in this chapter, and employment, in the next, have been at an appropriate level and whether or not there has been adequate flexibility.

It has been thought that, while employment remains stable in Japan, it has been characterized by comparative flexibility in working hours and wages. Among the comparative studies on this issue, Gordon (1982) gauged standard deviation and other measures of variability, and Sachs (1983) examined the speed of wage adjustments controlling changes in employment. However, Kurosaka (1988), who examined the literature including both of these, reached the conclusion that wages in Japan were not necessarily flexible. Taking subsequent circumstances into account, a Philips curve with the wage increase rate on the vertical axis clearly shifts from the former approximately vertical line to a flat curve, reflecting the one-sided increase in the unemployment rate and deflation in the 1990s. Even if it were possible to assess wages in Japan in the past as flexible to mitigate fluctuations in employment, we have to admit that this function has now weakened.

Here, we first confirm the downward rigidity of wages as a yardstick of wage flexibility in Japan. The downward rigidity of wages was originally advocated assuming the existence of labor unions and multi-year labor agreements, therefore we need to test the wages of individual workers in continuous service excluding the factors of industrial structure and changes in population composition.[15] In recent years in Japan, however, prices and productivity, important indices of springtime wage increases, are adding pressure to reduce wages and, even macro indices are indicating the robustness of downward rigidity.

The nominal wage index (total cash earnings) of the Monthly Labor Statistical Surveys fell by 1.6% in 1998 and by another 0.8% the following year, dropping below the previous year for the first time since 1953 when comparisons first became possible. By industry, nominal wages dropped early in the 1990s in transportation and communication, real estate and other industries. However, the fluctuations in the total amount include time adjustments in the construction and transportation industries, which commonly have daily and monthly wage or piece rate wage systems, as well as manufacturing with notable variability in overtime work. In addition, there is also more variability in the working hours in the case of part-time workers, who have been increasing in number in recent years, than general workers (Figure 2-1). Accordingly, Figure 2-2 shows the trends in hourly wages, the wage rate of total wage amount divided by working hours; however, in the process culminating in deflation, the growth of hourly wages has been restrained to near zero and, as may be expected, dropped in FY 1998 and 1999. From the perspective of the economy overall, downward rigidity in the sense of "not dropping below the previous year" is no longer an appropriate approach.[16]

2. Substance of Wage Reductions

Next, the factors involved in reducing wages by earnings category are shown in Figure 2-3. Here, we look at figures for businesses with five or more employees, a broader coverage, for the 1990s only. The total amounts show that the growth rate gradually dropped, decreasing in 1998, 1999 and then in 2001. In addition, with hourly wages on the right-hand side diagram, although scheduled persistent increases in the springtime wage offensive (refer to Figure 2-2), bonuses and other special earnings are the primary factor in the decline in hourly wages, as in the total amount in the left figure. Though it is said that wages in Japan have flexibility due to

[15] Other studies often employ panel data. Akerlof, Dickens and Perry (1966) showed downward rigidity including telephone interviews.

[16] Using industry-specific data, Kimura (1999) states that "there seem to be changes in the relationship between prices and wages bordering on a growth rate of zero". Here, too, when data for 1998 is added, it indicates that rigidity is statistically rejected.

Figure 2-1. Divergence in Wages and Hours between Part-Time Workers and General Workers

Note: The growth rate of general workers compared to the previous fiscal year is subtracted from the same growth rate for part-time workers and the central 3-month average is used.
Source: "Monthly Labor Statistics Survey," Ministry of Health, Labor and Welfare.

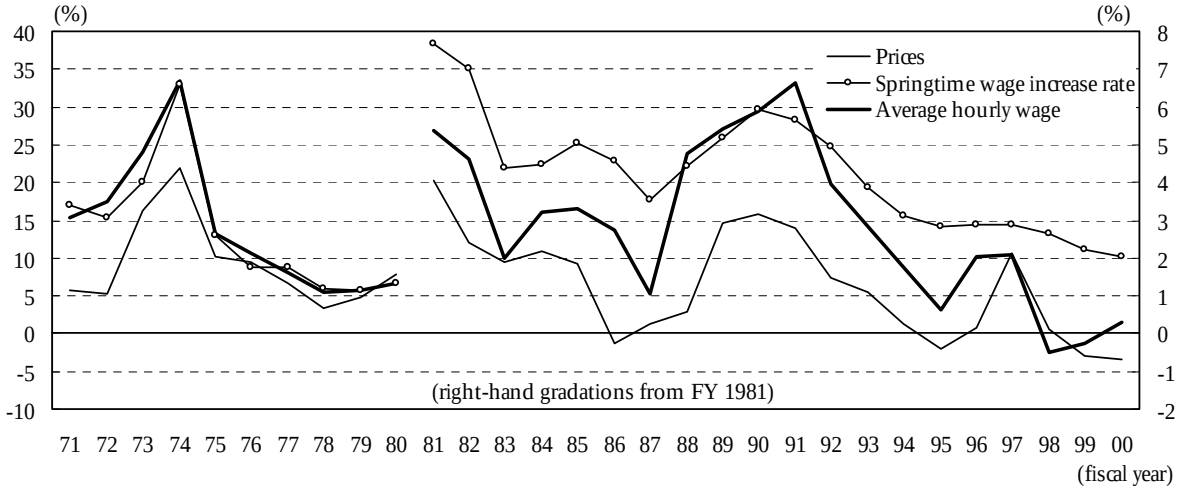
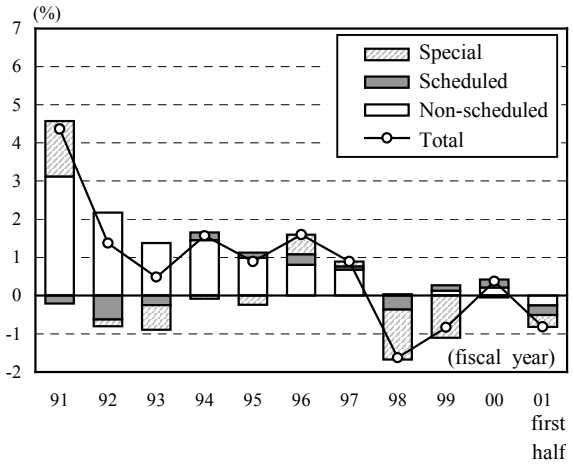


Figure 2-2. Changes in Nominal Hourly Wage and Price

Notes: 1. Average hourly wage is the growth rate of the wage index (total cash earnings) of the monthly labor statistics divided by the hour index.
2. Prices are the Consumer Price Index excluding imputed rent.
3. Data of businesses with 30 or more workers through 1990 and with 5 or more workers beginning in 1991 are used in the calculation of hourly wages.
Source: "Consumer Price Index," Ministry of Public Management, Home Affairs, Posts and Telecommunications; "Monthly Labor Statistical Surveys, Spring Wage Increase Rate Conditions," Ministry of Health, Labor and Welfare.

(1) Total



(2) Hourly wage conversion

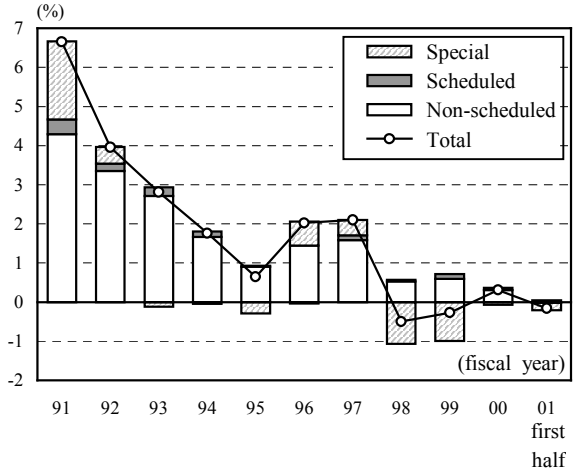


Figure 2-3. Breakdown of Earnings Growth

Note: Scheduled and non-scheduled hourly wages were prepared based on wage and earnings indices and special earnings were per total working hours. Factor decomposition was carried out based on the equation below and, since the contribution of changes in the distribution ratio of working hours (scheduled : non-scheduled) is trivial, it was not specified as a factor.

$$\frac{w}{h} = \frac{w_{sc}}{h_{sc}} \cdot \frac{h_{sc}}{h} + \frac{w_n}{h_n} \cdot \frac{h_n}{h} + \frac{w_{sp}}{h}$$

where w is nominal wage index, h is working hour index, and subscripts sc, n and sp indicate scheduled, non-scheduled and special, respectively. Those without a subscript are their total.

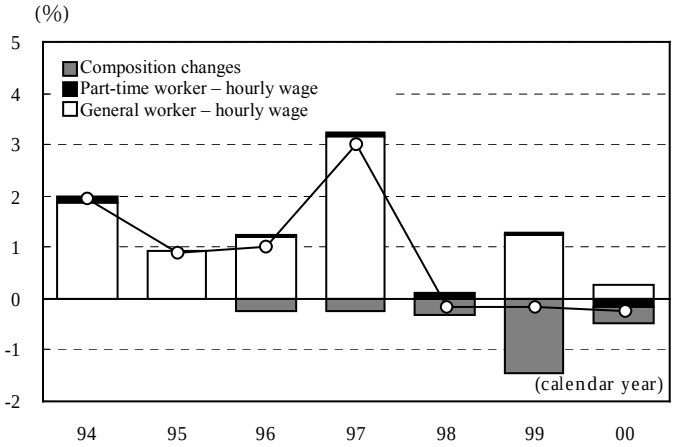
Source: "Monthly Statistical Reports (businesses with 5 or more workers)," Ministry of Health, Labor and Welfare.

overtime pay and bonuses, it has been confirmed that while scheduled earnings have downward rigidity, bonuses, in particular, fluctuate flexibly.

Wage adjustments centered on these bonuses do not affect all workers in the same manner. The factors in hourly wage variability by general and part-time workers in Figure 2-4 show that, though the growth in hourly wages of general workers decreased, it began to increase again after reaching zero in 1998 and the existence of downward rigidity cannot be denied. As the background, changes in the number of years of continuous employment in Figure 2-5 indicate that, employment practices may be changing, the average number of years of continuous employment is actually on the increase. In terms of age, the prolongation has reached the upper end particularly among younger workers, while the number of years of continuous employment among middle-aged and elderly workers aged 55-59 continues to increase. As the average age of the staff increases, it is not difficult to imagine that there is deeply rooted upward pressure on average wages due to the seniority wage system.[17]

Meanwhile, a major factor in the decline of hourly wages is the increase in the ratio of part-time workers (the ratio of part-time workers among all workers). The average hourly wage of part-time workers in 2000 was ¥979, less than 40% of the ¥2,495 of general workers, while the ratio of part-time workers is tending to increase, from 14.4% in 1994 to 20.2% in 2000. Since the wages of general workers are not subject to any sizable adjustment, there has been a tendency to promote the hiring of part-time workers and to cut labor costs. Considering this at the individual level where downward rigidity should basically be measured, there may be a decline in wages due to a conversion to part-time status since the absolute number of general workers began declining after reaching a peak in

[17] Tanaka (2000) points out that disparities between wage profiles by age are also expanding and that together with the employee composition by age, the burden of labor costs is increasing in the case of middle-aged and elderly workers.



Note: The decomposition is based on the equation below.

$$\frac{w}{h} = \frac{w_g(1-\theta)+w_p\theta}{h_g(1-\theta)+h_p\theta}$$

w : *Nominal wage index*
h : *Total working hour index*
θ : *Part-time* worker ratio

Subscript *g* indicates general worker and subscript p indicates part-time worker.

Source: "Monthly Labor Statistical Survey," Ministry of Health, Labor and Welfare.

Figure 2-4. Contribution of General and Part-Time Workers to the Wage Changes

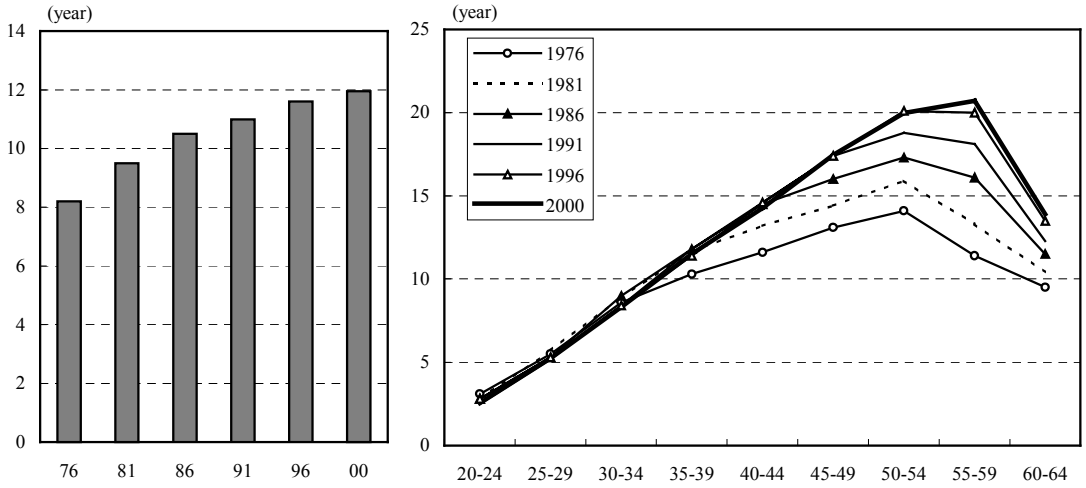


Figure 2-5. Years of Continuous employment

Source: "Basic Survey on Wage Structure," Ministry of Health, Labor and Welfare

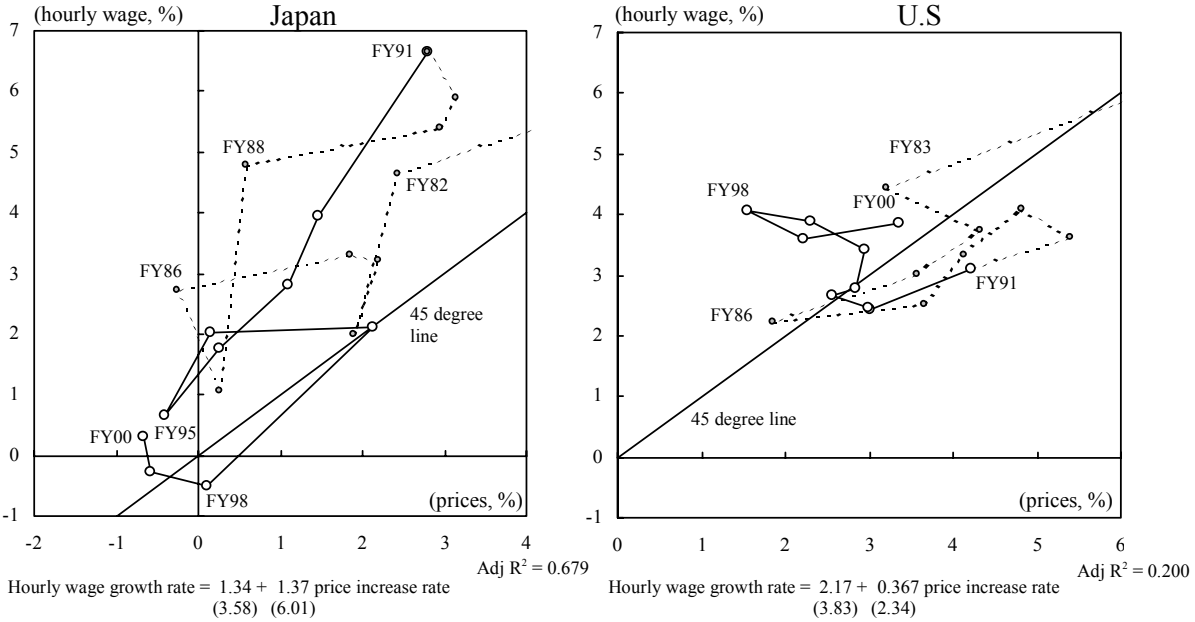
1997 (due to reemployment, etc.). It cannot be denied, however, that there is a downward rigidity in wages when work is continued.

3. How Should Real Wage Variability be Considered?

We saw above that the wage increase rate dropped along with the inflation rate. Figure 2-6 compares the rate of change of nominal wages and prices in the U.S. and Japan. Positioning on the left-hand side above the 45 degree line in the diagram means an increase in real hourly wages, and a decrease when on the lower right. Figure (1) was produced based on wage statistics. Wages in Japan tend to slide with prices and it was only in 1998 that there was a drop (on the right-hand side below the 45 degree line) in hourly wages in real terms, which was again reversed in 1999 and 2000. There is no particular difference in this tendency according to Figure (2) which is based on the National Accounts.

On the other hand, though there is a long-term correlation between hourly wages and prices in the U.S., there was a continuous decline in real hourly wages from the latter half of the 1980s through the early 1990s. In the National Accounts at the bottom, this tendency is gradual and, even if the slope of the trend lines is compared, it can be seen that the tendency toward a

(1) When using wage statistics



(2) When using the National Accounts

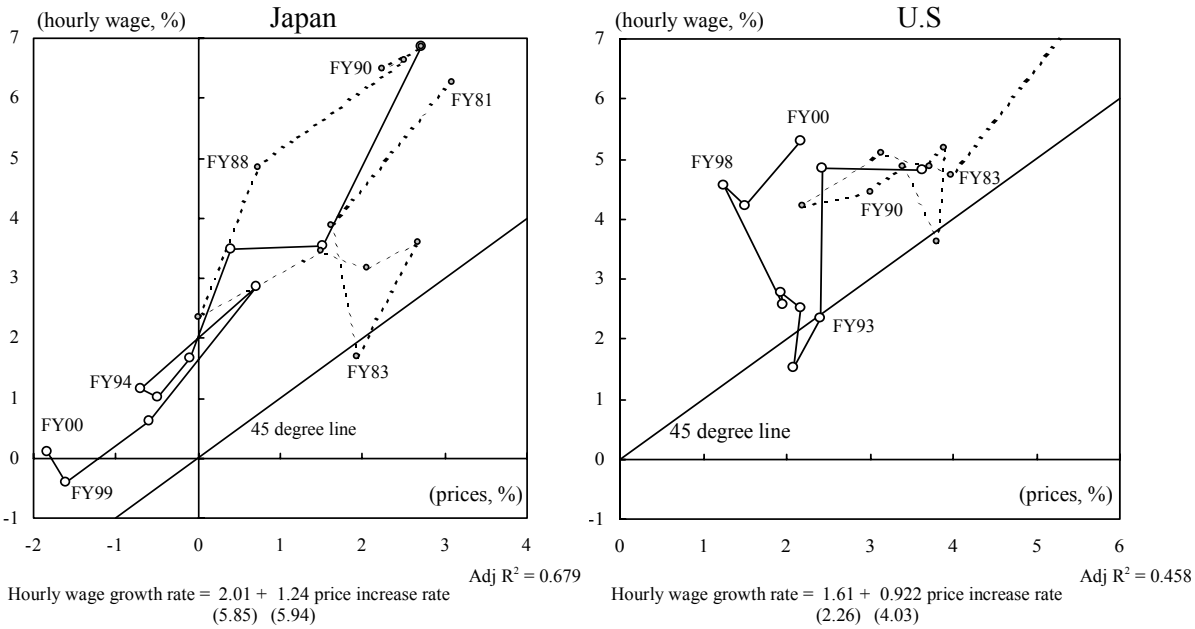


Figure 2-6. Percentage Change of Prices and Nominal Hourly Wages

Notes: 1. Data was prepared as indicated below.
1) Wages in Japan: businesses with 30 or more workers through 1990, businesses with 5 or more workers from 1991
Prices in Japan are based on the Consumer Price Index (excluding imputed rent).
2) Wages and prices (GDP deflator) in Japan are based on 68SNA through 1990 and 93SNA from 1991.
2. The trend line was measured for 1982 - 2000 after a broad drop in the inflation rate in the U.S. FY 1997, which was impacted by the increase in the consumption tax in Japan, is excluded. Values in parentheses are t values.

Source: "Monthly Labor Statistics," Ministry of Health, Labor and Welfare; "Consumer Price Index," Ministry of Public Management, Home Affairs, Posts and Telecommunications; "National Accounts Annual Report," Cabinet Office; "Survey of Current Business," U.S. Department of Commerce; "Monthly Labor Review," U.S. Department of Labor.

slide in prices is weaker in the U.S. than in 1991 and the stagnation in real hourly wages is interesting as a phenomenon occurring during an expansionary period.[18]

Thus, when nominal hourly wages are flexible in their relationship with prices, this suggests rigidity in real wages.[19] This in itself is not necessarily a problem; for example, when inflation and nominal currency unit fluctuations such as denominations do not have an effect on the real economy, we can interpret this real rigidity as natural neutrality.[20] However, if real wages are not able to respond appropriately to real shocks, it is also possible to judge it to be rigidity. Here, we consider how real hourly wages responded to (real) productivity again based on the decomposition of labor's share. When expressing labor's share using the same symbols as Equation 1-2 with P = price level,

$$\text{Labors share} = \frac{\text{nominal labor compensation}}{\text{nominal value added}} = \frac{wLh}{YP} = \frac{w}{p} / \frac{Y}{Lh} \left(= \frac{\text{real hourly wages}}{\text{productivity}} \right) \quad (2\text{-}1)$$

That is, labor's share does not change as long as real hourly wages vary proportionately with productivity. When comparing transitions in the growth rate both in the U.S. and Japan based on this relationship (Figure 2-7), the growth of both real hourly wages and productivity in the U.S. are similar to one another and span the 45 degree line. Meanwhile, in Japan, after dropping below the 45 degree line continuously during the latter half of the 1980s, real wages expanded greatly without regard to productivity during the early half of the 1990s.[21] Though the divergence between the two narrowed after 1996, the rate of increase of real hourly wages continued to outpace productivity.

Figure 2-8 illustrates the same relationship in Japan but for each industry, by each decade. Both the numerator and denominator are deflated by P in Equation 2-1, but for Figure (1), value added deflators for each industry are used as in Chapter I, and in Figure (2), GDP deflators (implicit deflator for a total of 9 industries) are used. The former can be thought of as one for producers and the latter is measured by purchasing power.

In both figures, there is a shift toward the origin in more recent years, reflecting stagnation in the growth of both hourly wages and productivity. However, in Figure (1) from the perspective of producers, there is dispersal along the 45 degree line; however, it is expressed in more concentrated groupings in each decade in graph (2). There is no change in either graph in the effect on labor's share measured by the distance from the 45 degree line, though considerable differences are evident.

Considering inter-industry disparities with the help of dispersion statistics, in Figure (1), disparities in the rate of increase in productivity were broader in the 1990s with the coefficient of variance; however, excluding the construction industry (-3.4, 0.7), productivity disparities are rather decreasing. This is also true in Figure (2); with the exception of the construction industry, disparities in productivity in the 1990s are not greater than in the 1980s.

Next for real hourly wages, in Figure (2),

[18] The coverage of the U.S. wage statistics that were used (average hourly earnings of production workers) is narrower than Japanese statistics in that they do not include executives or management or overtime pay, social insurance, etc., thus precluding a simple comparison. Bosworth and Perry (1994) point out that this index expresses the rate of increase of real wages lower than actual due to sampling problems. However, the same drop in real wages has also been verified using other indices (Employer Costs for Employee Compensation, for example) and there is undoubtedly a broad perception of this stagnation in real wages at present, which has, for example, been taken up in economics textbooks.

[19] In regard to fixed nominal wages originally indicated by Keynes, the counter-cyclical movement of real wages suggested together with the pro-cyclical movement of prices was denied by the examination of Dunlop and Tarshis. In the analyses of this study, upward rigidity is unrealistic in Japan where wages are revised annually and is not subject to the hypothesis.

[20] Of course, neutrality becomes a problem when we assume a policy effect on prices and the exchange rate through denominations or when money is expected to have a real effect on fiscal policies.

[21] Though pro-cyclical movement is evident in both the U.S. and Japan, it must be noted that this movement cannot be explained by a simple production function that assumes diminishing returns. While many explanations have been attempted, including labor hoarding and technology shock, it remains a major issue in macroeconomics.

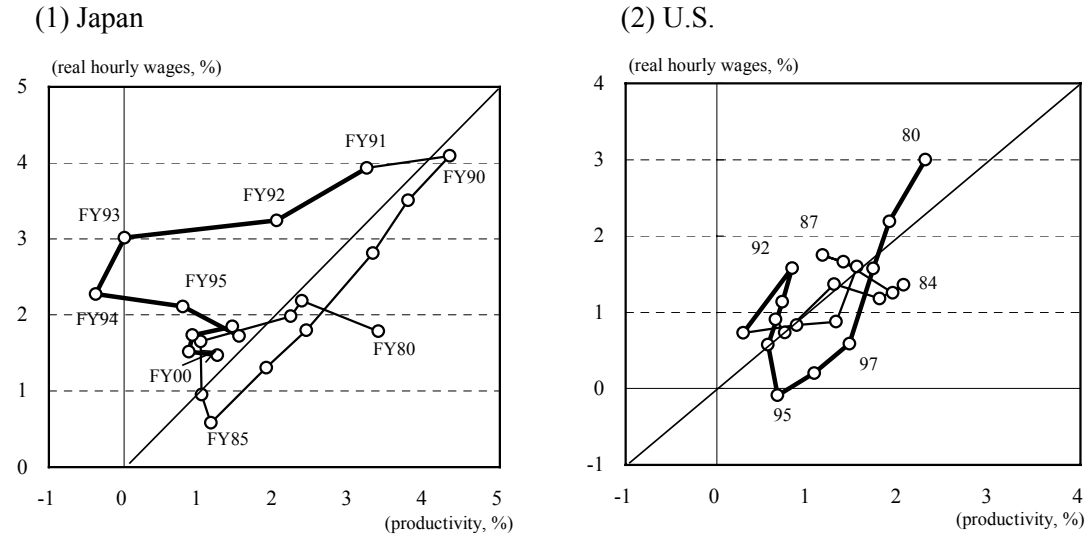


Figure 2-7. Real Wages and Productivity (three-year moving average)

Notes: 1. Here, labor's share of Figure 1-1 is decomposed into real hourly wages and productivity and the ratio for the previous fiscal year was calculated after determining the average movement during the past three quarters.
2. Due to data limitations and average movement, the figures for Japan are based on 68SNA through 1992 and on 93SNA beginning in 1993.

Source: "National Accounts Annual Report," Cabinet Office; "Survey of Current Business," U.S. Department of Commerce.

from the standpoint of the workers, there is a strong tendency toward uniformity between industries but disparities in real hourly wages expanded instead from the 1980s through the 1990s, a tendency which has strengthened further except in the construction industry. In addition, the coefficient of variance of Figure (1) indicates that, within the context of a decreasing growth rate, disparities in the wage rate are not smaller than in the 1980s.

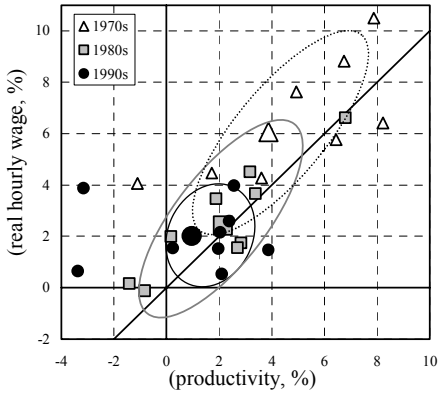
The two figures are based on different decompositions, and it would be inappropriate to extract the characteristics of different parts of these to draw an overall image. However, we can see the common features of the two figures: disparities in productivity decrease while disparities in real hourly wages gradually broaden in the vertical direction. This tendency becomes more evident in the 1990s, especially if the mining and construction industries, which have extreme values, are excluded.

4. Wage and Employment Conditions in the First Half of the 1990s

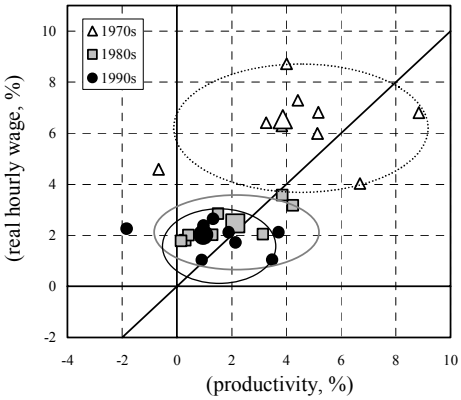
We shall now proceed to confirm the expansion in wage disparities using other materials. Viewing the conditions of dispersal of the springtime wage increases of large corporations (Figure 2-9) using the quartile dispersion coefficient, the coefficient conventionally usually rises in troughs. Entering the 1990s, as springtime wage increases recorded the lowest rate ever, the dispersion demonstrated a trend toward expansion.

As the background of this movement, Figure 2-10 shows the results of direct interviews with company managers regarding the factors involved in wage revisions. While the ratio of the "price" factor decreased in the mid-1980s, the "securing and establishment of the labor force" and "size of wage hikes at other companies" increased during the first half of the 1990s, reflecting, as seen in the next chapter, the strong concerns at the time of possible labor shortages. Meanwhile, the heightened importance of "company performance" can be pointed out as a change evident throughout the 1990s. Taken together with the previous Figure 2-9, the expansion of wage disparities between companies virtually coincides with the time when company performance was more reflected in the recessionary period and, rather than a factor of business cycles, changes are occurring structurally

(1) Deflating by industry-specific deflator



(2) Deflating by GDP deflator



Dispersion statistics

		Standard deviation	Coefficient of variance
Productivity	1970s	3.23	0.76
	1980s	1.90	0.78
	1990s	1.66	1.44
Real hourly wages	1970s	2.41	0.38
	1980s	1.87	0.68
	1990s	1.16	0.50

Dispersion statistics

		Standard deviation	Coefficient of variance
Productivity	1970s	2.92	0.73
	1980s	0.56	0.25
	1990s	1.29	1.26
Real hourly wages	1970s	0.91	0.13
	1980s	0.45	0.17
	1990s	0.48	0.21

Graph (1) data

		Mining	Manufacturing	Construction	Electricity, natural gas and water supply	Wholesale/ retail	Financial/insurance*	Real estate*	Transport/ communications	Service	9-industry average
Productivity	1970s	8.22	4.93	1.01	6.44	6.75	7.87	-1.11	3.60	1.72	3.87
	1980s	1.88	3.37	2.83	0.17	3.17	6.79	-1.42	2.70	-0.83	2.14
	1990s	-3.16	2.56	-3.37	1.97	2.38	3.87	2.10	2.04	0.24	0.96
Real hourly wages	1970s	6.42	7.63	2.16	5.77	8.82	10.50	4.06	4.27	4.47	6.07
	1980s	3.46	3.67	1.75	1.99	4.51	6.62	0.16	1.55	-0.12	2.42
	1990s	3.87	3.97	0.65	1.52	2.59	1.47	0.53	2.16	1.54	2.01

Graph (2) data

		Mining	Manufacturing	Construction	Electricity, natural gas and water supply	Wholesale/ retail	Financial/insurance*	Real estate*	Transport/ communications	Service	9-industry average
Productivity	1970s	6.69	3.27	5.17	8.84	3.84	4.42	-0.66	5.13	4.00	3.87
	1980s	0.30	2.18	4.23	0.42	1.50	3.85	0.15	3.14	1.29	2.14
	1990s	-4.28	0.97	-1.84	2.14	1.89	3.48	3.71	0.90	1.32	0.96
Real hourly wages	1970s	4.03	6.41	6.82	6.81	6.30	7.29	4.58	5.99	8.72	6.56
	1980s	1.81	2.53	3.17	2.01	2.85	3.57	1.79	2.04	2.02	2.46
	1990s	2.49	2.39	2.26	1.72	2.12	1.04	2.12	1.04	2.65	2.02

Figure 2-8. Real Hourly Wages and Productivity: Variance by Industry

Notes:
1. Calculated for 9 private-sector industries excluding agriculture, forestry and fisheries. 1990s based on 93SNA.
2. Productivity and hourly wages were calculated by dividing factor income and hourly wages by labor input (number of employees x working hours). Deflated by the industry-specific product deflator. The 10-year average growth rate was used after calculating based on calendar year.
3. The dispersion of the real hourly wage growth rate was obtained by weighting the values calculated above by labor input. The averages differ from the values in the table below due to the calculation.
4. The large symbols for the decades are averages of all industries.
5. It is not possible to compare the financial/insurance and real estate industries, the majority of the value added of which consists of the imputed portion, with other industries.

Source: "National Accounts," Cabinet Office; "Monthly Labor Statistical Surveys," Ministry of Health, Labor and Welfare.

in the factors involved in wage determination.

Even though there was a relatively large drop in productivity in the construction industry in the 1990s, the polarization in productivity is not confirmed. Rather, in a relatively long-term comparison by decade, there was an overall decrease in the disparities in labor's share variability by industry. These results are consistent with the across-the-industry rise in labor's share as seen in Chapter I. It can be said, however, that, in spite of the increased initiatives to reflect performance, the relatively uniform rise in labor's share suggests that the problems, if they exist, are common among the industries.

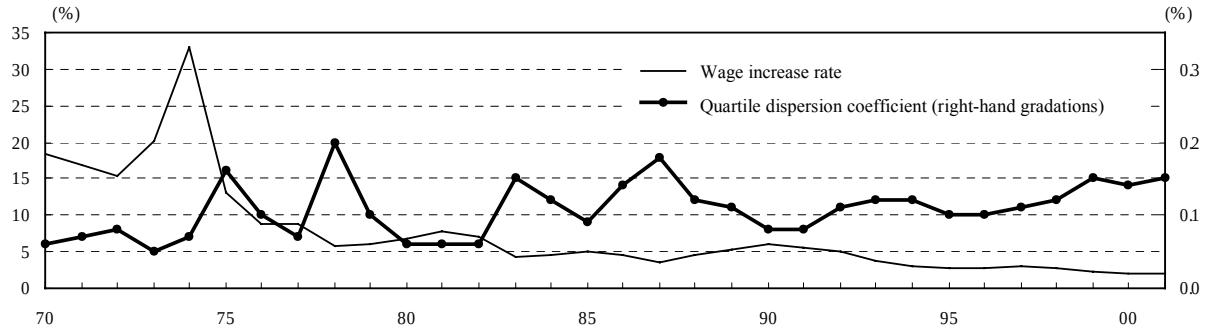


Figure 2-9. Gaps between Companies in Springtime Wage Increase Rates

Notes: 1. Targets were about 250 companies listed in the first section of the Tokyo and Osaka Stock Exchanges with capital of ¥2.0 billion or more and 1,000 or more employees (with a labor union).
2. The quartile dispersion coefficient is calculated according to the following equation on a company basis: (3rd quartile – 1st quartile) ÷ 2 ÷ median.

Source: Prepared based on "Conditions of Major Private-Sector Company Springtime Wage Hike Demands and Collective Bargaining Settlements," Ministry of Health, Labor and Welfare.

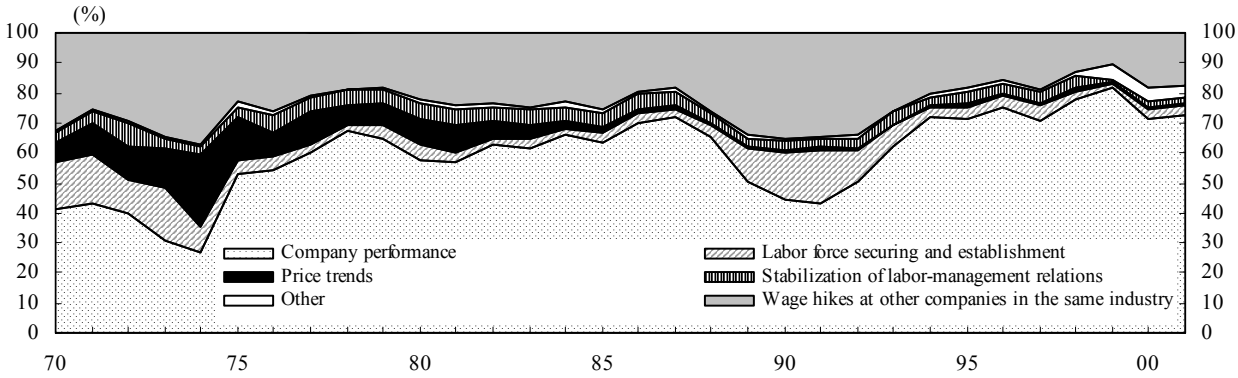


Figure 2-10. Factors with the Highest Priority in Wage Determination

Note: Targets were companies employing 100 or more regular workers. The service industry is based on criteria prior to expansion in 1998.

Source: "Survey of the Actual Situation of Wage Hikes," Ministry of Health, Labor and Welfare.

III Adjustment in Employment

1. From Labor Shortage to Labor Surplus

The increase in labor's share and the imbalance in productivity and hourly wages in the background are phenomena that are shared by a wide range of industries. Returning again to the all-industry basis, we will consider employment trends as one factor in the sluggish growth in productivity in the 1990s. First of all, the labor input calculated as the product of the number of workers and per capita working hours (Figure 3-1), remained virtually flat in the early 1990s when labor's share increased. That is because there was a considerable drop in both scheduled and overtime working hours even though employment increased about 2% through FY 1993. Historical changes in working hours in Figure 3-2 show that there was no great change in overtime hours, which serves as a short-term adjustor; however, there was a drop in scheduled working hours over a thirty-year period amounting to 15.3% (25.8 hours). One possible factor involved is the increase in part-time workers; however, the notable decline since the latter half of the 1980s is due to the adoption of the five-day work week and reduced working hours

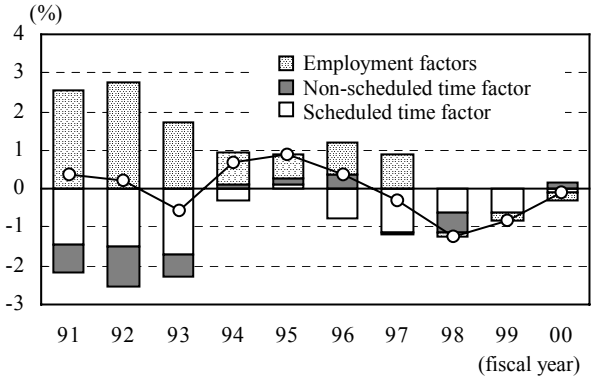


Figure 3-1. Percentage Change of Labor Input from the Previous Year

Note: Labor input is based on employment multiplied by time, man-hours.
Source: "Monthly Labor Statistical Survey (for businesses with 5 or more employees)," Ministry of Health, Labor and Welfare.

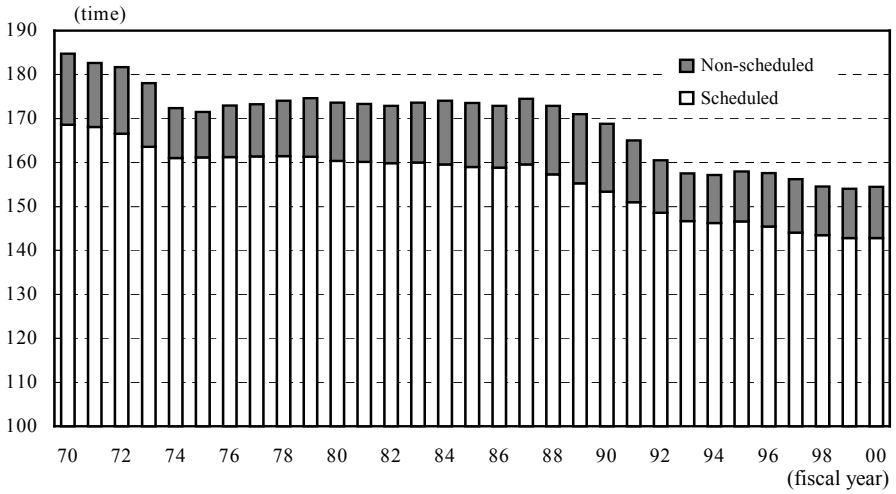


Figure 3-2. Transitions in Monthly Working Hours

Note: Retrogressing from the actual figures for 2000 using the hour index taking sample changes into account
Source: "Monthly Labor Statistical Survey (for businesses with 5 or more employees)," Ministry of Health, Labor and Welfare.

stipulated by the Labor Standards Act of 1993. This increased the concern about possible labor shortages, thus accelerating the attempt to secure employees by improving benefits.

Toward the end of the expansionary period in 1996, however, there was a complete change in the perception of employment from a shortage to a surplus. Again, according to Figure 3-1, it is possible to see that both employment and non-scheduled working hours began to decrease at this time and all means were employed to decrease labor input.

Indices relating to the labor market are summarized in Figure 3-3. As companies became more aware of overstaffing, the unemployment rate rose steadily. An increase in structural unemployment has been pointed out in recent years resulting from mismatches in geographical, occupational and other attributes as well as frictional factors. When calculated using the current popular method, the structural part can explain a large part of the increase in unemployment since 1992. However, if that portion excluded from the total unemployment rate is defined as the demand shortage unemployment rate, it also has increased in accordance with a "sense of overstaffing" in the company as well as a trend toward increase.[22]

This synchronous rise of the demand shortage unemployment rate and "sense of overstaffing" can be understood as follows.[23] When there is a stronger sense of overstaffing in a company, the unemployment rate, a surplus outside of the company, increases as the result of hiring restrictions, early retirement incentives, the reduction of contract workers and so forth. It is thought, however, that the company promotes employment adjustments in a way that maintains a balance between the pressure of the external labor market and the internal surplus without fully resolving the overstaffing. In addition to the fact that layoffs are in fact restricted,[24] one of the reasons why this adjustment is not complete is the possible effect of labor hoarding that is being implemented due to the costs involved in personnel adjustments. If employment fluctuates in line with fluctuations in the scale of production, in addition to personnel costs, there are also costs involved in having employees learn the company's unique expertise and experience. Rather, from a long-term perspective, implementing training, providing experience and securing a stable supply of skilled labor will ultimately be linked to the realization of high productivity (refer to Otaki (1994) for example). In addition, a stable employment system, along with a stable system of wages, also plays the role of insurance for workers which benefits both management and labor.

2. Is Employment Adjustment Picking Up Speed?

There are thus explanations for partial employment adjustments to be reasonable both for management and labor. Have there been any changes, though, in the pace of adjustment in recent years? That is, does the rising unemployment rate in the 1990s reflect a change in the conventional employment structure? Here, we estimate the speed of adjustment, which is a reaction of employment to economic activities (GDP) and other economic variables.

Denote L_t^* as the optimal employment level given production, wages and working hours at the present time (time t), and L_{t-1} as the previous employment volume, then $L_t^* - L_{t-1}$ is the optimal amount of adjustment. It is assumed that only $\gamma (0 \leqq \gamma \leqq 1)$ of this will actually be adjusted, where γ is the speed of employment adjustment.

Specifically, optimal employment volume is obtained by.[25]

[22] The structural unemployment rate does not extract purely structural factors. The actual unemployment rate was less than the structural unemployment rate during the first half of the 1990s and employment is realized during economic booms despite likely mismatches and other frictional factors. Conversely, during recessionary periods, structural factors emerge due to heightening selection and unemployment due to demand shortages may be underexpressed.

[23] The Bank of Japan's quarterly short-term economic survey DI (diffusion index) used here is based on the officially published one and no significant differences were found when the all-industry DI is weight-averaged by the number of employees by industry.

[24] The debate regarding the significance and effectiveness of the case law of abuse of right of dismissal, including the economic analyses of Nakauma (1998), is now popular, and there is also some relaxation in judicial interpretations.

[25] This formulation is obtained as a solution to the profit maximization problem for a given production level.

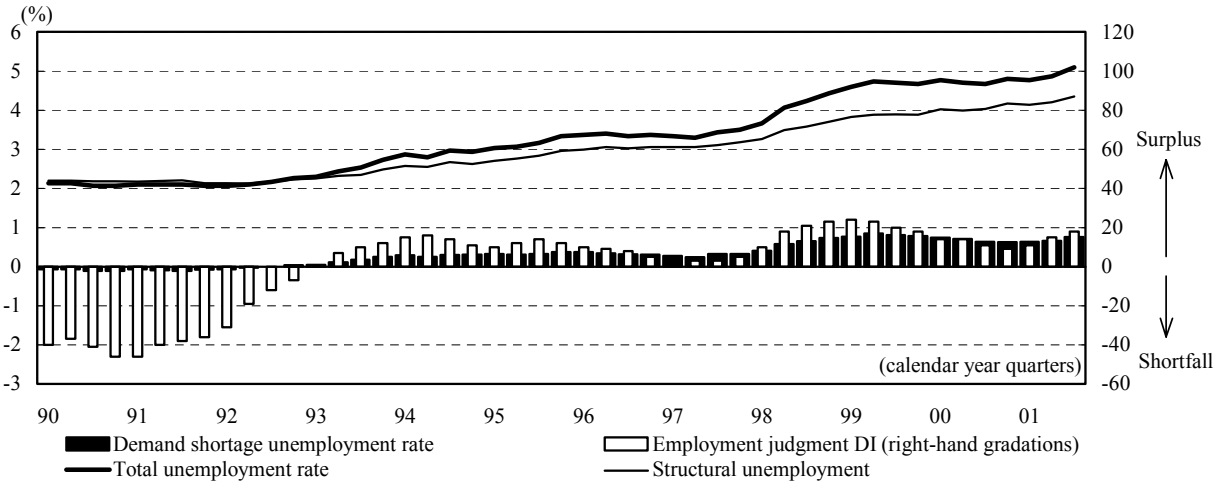


Figure 3-3. Demand Shortage Unemployment Rate and Overstaffing

Notes: 1. The structural unemployment rate was calculated based on a UV model. The demand shortage unemployment rate is the difference between the total employment rate and structural unemployment rate.
We generally see a downward shift toward the right (UV curve) between the unemployment rate (U) to vacancy rate (V). If the two are equal, labor demand is balanced in total and the unemployment rate at this point is due to structural factors. Below, after estimating the UV curve, the structural unemployment rate is given by the value at the point of intersection with the 45 degree line and this is considered to be structural unemployment with conversion based on all workers.
The variables are determined as below. All are seasonally adjusted values.

Ut : Unemployment rate (= total unemployment rate ÷ (total unemployed + employed workers))

Vt : Vacancy rate (= (effective labor demand – number of hirings) ÷ (numerator + number of employed workers))

At : Variable expressing structural change in the labor market (can be multiple)

The relationship of the downward slope to the right is modeled based on the following equation and estimated by the method of least squares:

$$\ln = U_t = \beta_0 + \beta_1 \ln V_t + \beta_2 A_t + \varepsilon_t$$

Structural unemployment $U^* = V^*$ at the point of intersection with the 45 degree line. Substituting this gives the following:

$$\ln U^* = \beta_0 + \beta_1 \ln U^* + \beta_2 A_t + \varepsilon_t$$

Taking the difference between the two, it becomes as indicated below and the structural unemployment rate is obtained (incidentally, the numerator of the right-hand member contains a residual):

$$\ln U^* = \frac{\ln U_t - \beta_1 \ln V_t}{1 - \beta_1}$$

Continuing, if the number of employed workers is EDt, the number of unemployed workers UEt is determined by:

$$\mathrm{UE}_t = \frac{U_t \cdot ED_t}{1 - U_t}$$

If the number of working persons is E_t, the total unemployment rate, which is based on working persons, is:

$$\frac{UE_t}{E_t + U_t}$$

The following estimate results were obtained using female worker ratio (A_t) and tertiary industry worker ratio (B_t) as variables expressing structural change.

$\ln U_t =$ $-6.643 - 0.217 \ln V_t - 0.0356 A_t + 0.1539 B_t$ adj.$R^2 = 0.981$

(8.873) (4.980) (0.929) (11.16) D.W ratio = 1.047

2. Employment judgment DI (diffusion index) is nationwide, all industries.

Source: "Labor Force Survey," Ministry of Health, Labor and Welfare, "National Accounts," Cabinet Office; "Quarterly Short-Term Economic Survey," Bank of Japan.

$$\ln L_t^* = \alpha_0 + \alpha_1 \ln GDP_t + \alpha_2 \ln \frac{w_t}{R_t} + \upsilon_t \quad (3\text{-}1)$$

where, GDP_t is real GDP, $\frac{w_t}{R_t}$ is earnings per worker deflated by prices, α is constant and υ is error term. Now, suppose the next partial adjustment:

$$\ln L_t - \ln L_{t-1} = \gamma(\ln L_t^* - \ln L_{t-1}) \quad (3\text{-}2)$$

The observed rate of increase on the left-hand side is γ times the optimal rate of increase. Based on both equations, we have,

$$\ln L_t = \gamma \alpha_0 + (1-\gamma)\ln L_{t-1} + \gamma \alpha_1 \ln GDP_t + \gamma \alpha_2 \ln \frac{w_t}{R_t} + \gamma \upsilon_t \quad (3\text{-}3)$$

Substituting the parameters for simplification, we have

$$\ln L_t = \beta_0 + \beta_1 \ln L_{t-1} + \beta_2 \ln GDP_t + \beta_3 \ln \frac{w_t}{R_t} + \varepsilon \upsilon_t \quad (3\text{-}3')$$

Sign conditions assuming general production functions are $\beta_0 > 0$, $\beta_1 > 0$, $\beta_2 > 0$ and $\beta_3 < 0$. Below, Equation (3-3') is estimated and the estimated value of the employment adjustment speed γ = 1 - β_1 is compared. In addition, an estimate based on labor input was also carried out in which the number of workers L_t is substituted by Lh_t, and real wages by real hourly wages.

The estimation period is based on year taking company's employment and wage decision units into consideration and, in order to capture changes in recent years while securing a certain sample size, the estimate was repeated by sliding the sample period of 15 years, by year. The employment adjustment speed obtained is shown in Figure 3-4 for both Japan and the U.S.

It has been reported in a similar estimate that the speed of employment adjustment accelerated after entering the 1990s[26] and an increase in the adjustment speed was also seen here in estimates terminating in 1997 and 1998. The acceleration of the adjustment speed is more conspicuous when based on labor input and, following a temporary drop at the end of the 1980s, rose rapidly through the latter half of the 1990s. However, whether based on the number of workers or labor input, the adjustment speed dropped again in periods including FY 1999 and 2000, hence we cannot confirm any evidence of a structural change around this period.

Meanwhile, in a comparison of the U.S. and Japan, the speed of adjustment is consistently higher in the U.S. than in Japan on a worker basis and there is also a tendency toward greater expansion of the gap. Based on labor input, the disparity between the U.S. and Japan is smaller, reflecting flexibility in the adjustment of working hours in Japan. In addition, the speed of the adjustment itself in Japan is also exhibiting considerable change and, based on labor input, it increased in excess of the U.S. until about 1998, which is thought to reflect the rapid decline in working hours.

The estimated value of parameters (Appendix Table) shows that, in the U.S., for both the number of workers and labor input, the labor volume of the previous term is not significant, though the real GDP coefficient is significant and, moreover, greater than the coefficient for Japan in all estimates. This enabled us to reconfirm that labor is more responsive to production in the U.S.

On the other hand, the coefficient on wage is significant and greater in Japan, showing that a negative relationship between wages and employment exists in Japan. If real wages rise excessively, the range of employment increase is restrained, while, if the reduction of labor costs is promoted, constraints on real wages probably have the effect of reducing employment cuts to a smaller scale. We will examine this tradeoff between employment and wages, including working hours and production, in Appendix 2.

[26] In recent similar analyses, the Economic Planning Agency (1992, 1994) showed that adjustment became slower in the period of stable growth since 1974, while the Economic Planning Agency (1999), the Ministry of Labor (1999), the Japan Center for Economic Research (2001) and Higuchi (2001) used more recent data to show that the speed accelerated beginning in the latter half of the 1980s.

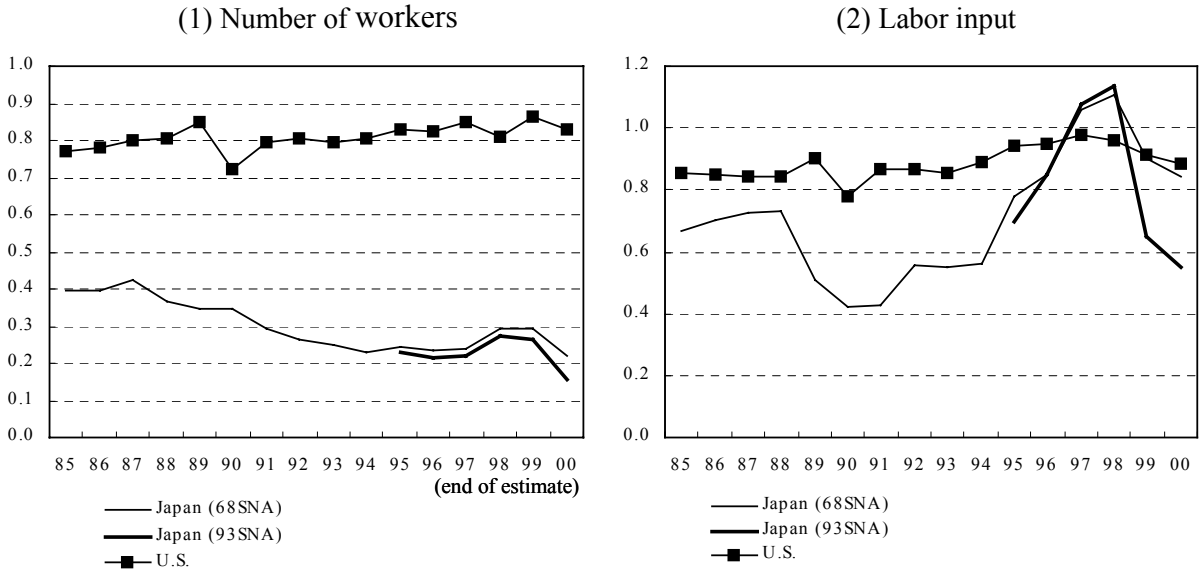


Figure 3-4. Employment Adjustment Speed

Notes: 1. Refer to the main text for the estimation equation.
2. Fiscal year for Japan and calendar year for the U.S. The graphs were produced by determining the employment adjustment speed starting from (fiscal) 1971 – 1985, staggered one year at a time to the estimation period (fiscal) 1986 - 2000.

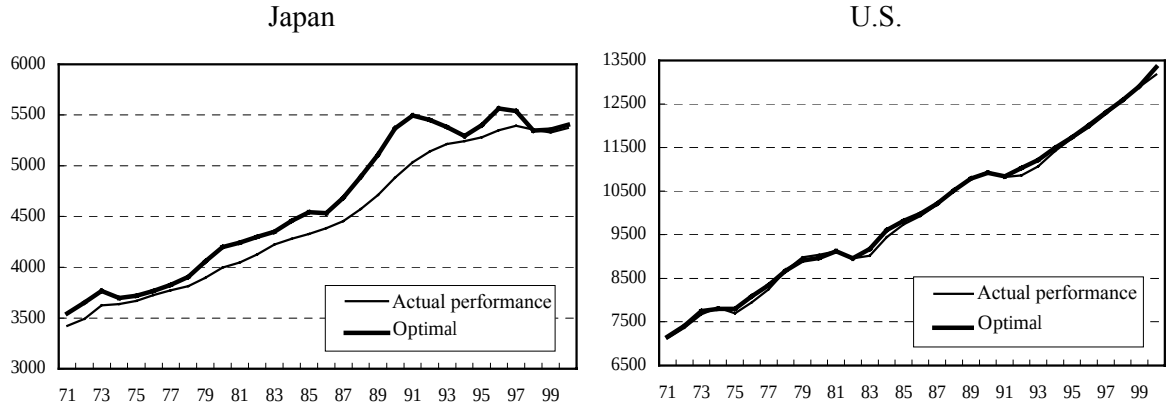
Source: "National Accounts Annual Report," Cabinet Office; "Monthly Labor Statistics Survey," Ministry of Health, Labor and Welfare; "Labor Force Survey," Ministry of Public Management, Home Affairs, Posts and Telecommunications; "Monthly Commodity Price Index," Bank of Japan; "Survey of Current Business," U.S. Department of Commerce; "Monthly Labor Review," U.S. Department of Labor.

Finally, we calculate optimal value L^* using the estimated values of Equation (3-3) to examine adjustment on a familiar scale (Figure 3-5). First, in Japan, there is a larger difference between the realized and the optimal number of workers, but on a man-hour basis, labor input is better adjusted to the optimal value reflecting the sizeable adjustment in working hours. In the U.S., the divergence between performance and the optimal value is small whether in terms of the number of workers or labor input, reflecting the faster adjustment speed.

Furthermore, in both the U.S. and Japan, the optimal labor volume in virtually all periods exceeds performance and the adjustment speed was measured in the direction of "increase;" however, in Japan during the 1990s, the optimal labor volume leveled off. When viewed by the number of workers which is more costly to adjust, the shortfall in optimal employment that had existed in Japan was lost and there was an increase in the pressure to adjust employment "downward." In the same manner as in the case of wages, it is possible that inadequate speed in the downward adjustment of employment is expressed as the recent decline in the speed of adjustment. Meantime, in the U.S., a decrease of about 5% was observed on at least three occasions in the past and one can see that adjustments are flexible also in the downward direction.[27] This result therefore confirms the general view that employment adjustment in the U.S. is more rapid.

[27] A tendency is apparent in the U.S. that the optimal level of employment demanded by production does not increase to any great extent immediately following economic recovery. While pointing this out, Gordon (1993) claimed that employment constraints during the early half of the 1990s do not indicate productivity-led growth and later moved the debate on to the issue of IT and productivity.

(1) Number of workers (10,000)



(2) Labor input (indexed, 1971 = 100)

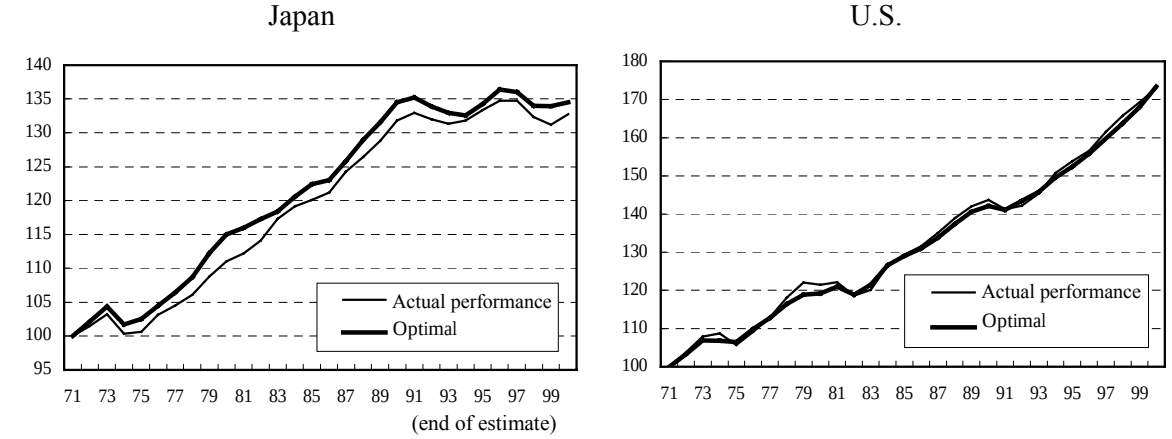


Figure 3-5. Optimal Employment Volume and Performance Values

Notes: 1. Coefficients of (3-1) were calculated based on the estimated value of Equation (3-3') and, from there, the averages of the values obtained for each period were set as the optimal values.
2. Fiscal year for Japan and calendar year for the U.S.

IV Growth Expectations and Downward Pressure on Labor's Share

1. Corporate Growth Prospects and Labor's Share Targets

Among the institutional factors behind the gradual adjustment of wages and employment is that an approximate level has to be decided before the relevant fiscal year begins, through the springtime wage negotiations and hiring activities. Here, prospects for production activities may be important in deciding the labor input and expenses in advance. Figure 4-1 compares the outlook for economic growth based on company surveys with realized performance. Expected growth rates are modest compared to the realized growth, i.e. less volatile, and there tends to be a delay in revising the business climate. Particularly, through 1994, the expected growth rates were higher than the actual growth rates, in expectation of recovery. This drop in production below the higher expectation is another reason for the hike of labor's share, in addition to an increase in labor costs in the midst of concerns about a possible labor shortfall. Such divergence between forecasts and actual performance led to inadequate adjustments of the employment level, and the trend of decline in the economic growth rate throughout the 1990s eliminated the chance to correct labor's share with the rise in the production level.

In order to ascertain the effect of this divergence between expectations and performance in labor's share, we estimated a simple target value for labor's share. While labor costs are adjusted throughout the fiscal year due to bonuses and overtime work, we assume here that the numerator of labor's share is determined in advance. This is because the general framework of company employment and wage levels is determined by the blanket hiring of new graduates, determination of wage increases in springtime wage negotiations and other factors. For the denominator, national income (excluding personal entrepreneurial income) (denominator) is assumed to be expected to rise to the same extent as in the growth rate. This hypothesized ex ante target value of labor's share is then compared with actual performance.

Figure 4-2 (1) shows that the target labor's share values themselves exceeded those of the previous year from 1990 to 1995, which is being accelerated by the decline in the growth rate. Hence we can consider the rise in labor's share

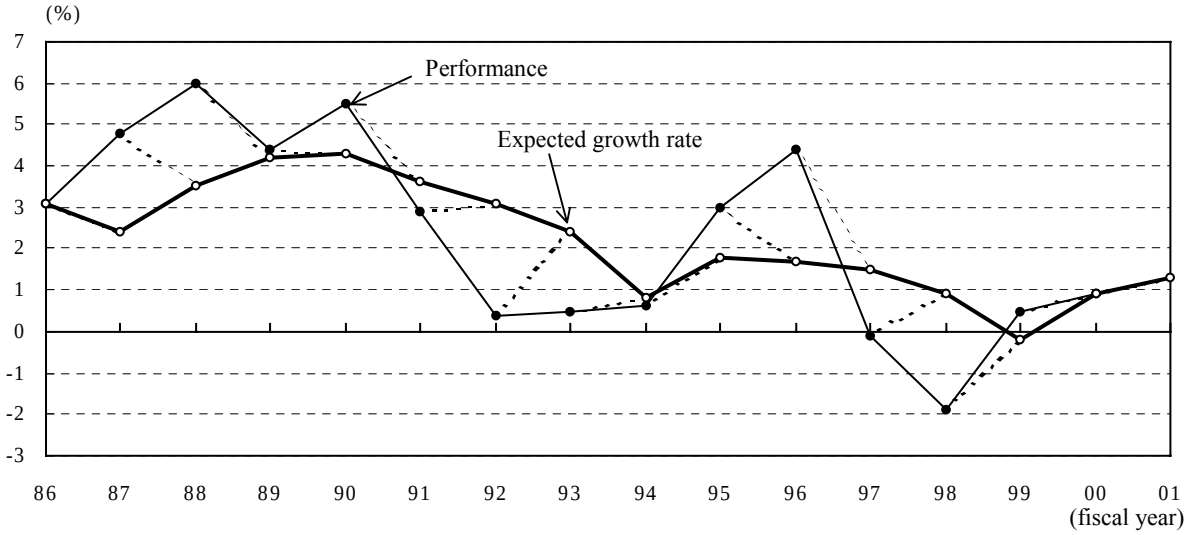
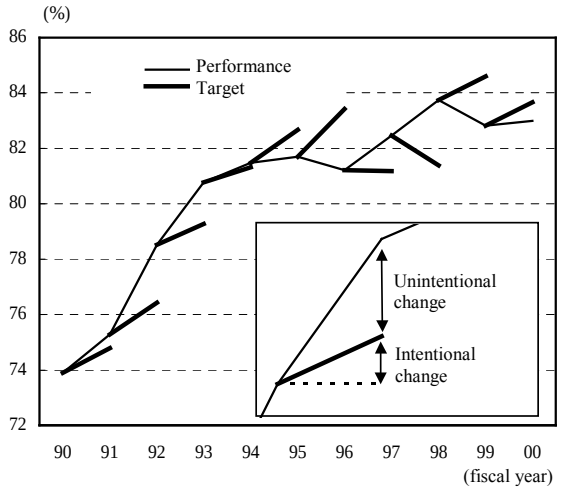


Figure 4-1. Corporate Expected Economic Growth Rate

Notes: 1. Real 68SNA basis was used for the performance growth rate. Besides corrections after the end of the fiscal year, GDP actually differs somewhat from the growth rate at the time of the forecast.
2. The dotted lines connect the current fiscal year to the following fiscal year being forecast. The growth rate for the year is not ascertained precisely at the time of the forecast.

Source: "National Accounts, Survey of Corporate Behavior," Cabinet Office.

(1) Labor's share target and performance values



(2) Decomposition of labor's share compared to the previous fiscal year

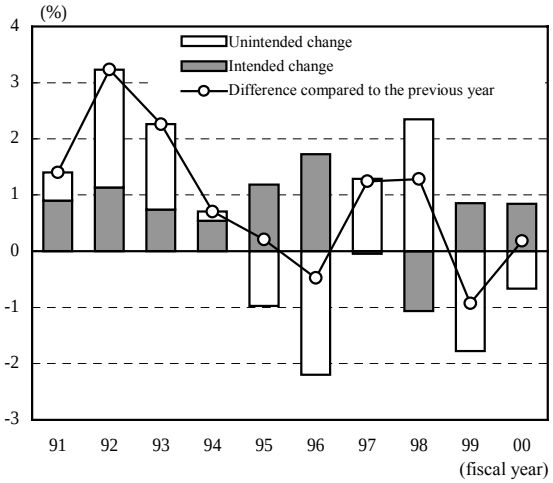


Figure 4-2. Labor's Share Target and Performance Values

Notes: 1. It is hypothesized that companies forecast the economic growth rate at the beginning of the fiscal year and set up yearly plans for wages and employment and that actual worker compensation performance reflects that. Forecast national income was used as the denominator with the addition of the post facto divergence of the real GDP forecast.

2. Specifically, based on the equation below. National income (previous fiscal year) excludes personal entrepreneurial income. The rise portion of expectations based on 68SNA was used for "economic growth rate (expected) – same (actual performance)."

$$\text{Labors share target value} = \frac{\text{worker compensation (current fiscal year)}}{\text{national income (previous FY)} \times (1 + \text{performance growth rate} + \text{economic growth rate (expected)} \text{ same (actual)}}$$

Source: "National Accounts, Survey of Corporate Behavior," Cabinet Office.

by dividing it into the "intentional rise" portion of the target value, and the "unintentional rise," the rest being the unanticipated result of production level. In Figure 4-2 (2), the difference in labor's share compared to the previous fiscal year is decomposed into these two factors. In FY 1991-94, labor's share increased due to both of these two factors and, in spite of the fact that this rise in labor's share was already treated as an important issue in labor-management negotiations, labor cost constraints were not adequately promoted. However, since FY 1994, labor's share stopped changing in one direction since two factors worked to offset each other. Furthermore, a decline in labor's share was targeted in FY 1997-98, the next recessionary period, showing a stronger awareness of labor's share corrections. However, since production once again dropped below the forecast, labor's share increased further and the rise in the first half of the 1990s was thus not corrected. In addition, progress in the adjustment pointed out in 1998 also became obscured when the short recovery beginning in 1999 arrived, which corresponds to the wage and employment analyses above, which hardly indicate the occurrence of structural changes at this time.

2. Conclusion and Outlook for the Future

The one-sided rise of labor's share during the 1990s and its current high level are indicative of the unique nature of labor's share in Japan compared to other industrialized countries. The increase during the early half of the 1990s was especially rapid, due primarily to a slowdown in

economic growth that exceeded expectations, coupled with firm growth in wages and employment with an underlying sense of a labor shortage and heightened growth expectations during the latter half of the 1980s. The inflation rate dropped throughout the 1990s, culminating in deflation; however, this trend in prices also exacerbated the increase in labor's share, weakening the effect of the wage and employment adjustments seen in the latter half of the 1990s.

The relationship between variables in the past indicates that shocks to production have a sustained effect on labor's share. Though labor's share is not affected in the medium to long term when economic recoveries and recessions occur alternately, one-sided increases do occur in labor's share in phases of persistent economic stagnation as in the 1990s. Furthermore, the drop in prices weakens the downward swing of labor's share previously seen in periods of economic recovery and a medium- to long-term effect readily persists in labor's share even when subjected to alternating business cycle shocks.

When looking at the contribution by industry to the rise of labor's share in the 1990s, the construction industry had a larger influence, and the increase in the weight of the service industry was another important factor. However, the rise was observed in a broad range of industries and is not necessarily attributable only to specific industries. In the long run, inter-industry disparities in productivity are narrowing and there is a tendency for company performance to be also reflected in wages decisions. The economy-wide rise in labor's share in this situation is, hence, considered a problem underlying the entire economy.

In the meantime, the plunge of the economy through 1998 triggered some serious changes, including a drop in nominal wages and constraints on the number of employees. However, besides the downward rigidity that continued to be seen in the wages of general workers, the move toward adjustment has weakened in the phase of economic recovery through 2000. It thus cannot be said that structural wage and employment adjustments observed around 1998 are progressing.

The business climate again entered a recessionary phase, which peaked in October 2000. The pressure to adjust wages and employment continues and is intensifying during this recessionary phase due to the heightened sense of company overstaffing and an increase in company bankruptcies. If the inadequate adjustments of the past accumulate, there will be a need for more far-reaching adjustments.

The hiring of part-time workers to hold down labor costs is increasing and the ratio of part-time workers in Japan has already reached a high level by international comparison.[28] In addition, the reduction of bonuses and overtime working hours is also progressing rapidly and there is limited room for adjustment in conventional fringe benefits. When resolving deflation, there are hopes for an improvement in real wage adjustment capabilities; however, there is no guarantee that such improvements in the environment will be realized in the near term. In addition, the time is also approaching for a reexamination of the wage disparities of part-time workers and, in future adjustments, the need will probably arise for a fundamental review of employment practices.

When reducing labor costs, it is necessary to reduce one or more of the factors of hourly wages, number of workers and working hours. The debate surrounding the issue of work-sharing, a reduction in working hours rather than the number of workers, has become more intense lately. It is also possible to see the prolonged reduction in working hours in the past as work-sharing. The fundamental difference now, however, is that the reduction of the absolute labor input is being called into question. It is not possible to explore the effect of work sharing only by experience in the past[29] and it is probably necessary to look further for a structural mechanism in which the various adjustments exert an effect on production. Taking into account the fact that skills and motivation increase as workers gain experience, earn more and are accorded

[28] See the part-time rate of the OECD (2001) Employment Outlook (Statistical Annex, p. 225).

[29] In Appendix II, we look at the precedent relationships in the past between production and labor-related variables. Labor-related variables have a strong tendency to lag behind production, rendering the difficulty of comprehending the effects on production when manipulating labor-related variables.

higher social status, the mere redistribution of jobs does not solve the real issue, and a competitive environment is needed to enhance production.

There is also an imperative need for the development of a safety net in response to the growing pressure for adjustment. However, in addition to the redistribution of income, we need to pursue sources of future growth. Reducing labor costs in the short term may halt the vicious cycle of low growth and rising labor's share through the improvement of company profits, but more important is the creation of a labor environment that is linked to the growth process through the utilization of human resources in the future. Thus, there is a need for a means to optimize labor's share in the long term while minimizing labor compensation sacrifices.

Appendix I Definition of Labor's Share

National income generated through production activities is distributed entirely as compensation to production factors in one form or another. This includes compensation to capital that results in dividends, interest, rental income and other payments, while it is embodied in corporate value in the form of internal reserves.[30] Meanwhile, labor's share is that portion which is distributed to workers through wages and earnings.

A number of different calculation methods are used depending on the purpose or the ability to acquire statistical data. The advantages and disadvantages of each have been already pointed out[31] and we will look over some points that relate to this study. First of all, the following definition for labor's share of an entire economy using the National Accounts is in wide use and it was calculated to be 73.6% in FY 2000:

Labor's share =
worker compensation ÷ national income. (A1-1)

It differs from GDP in three points: a) the denominator, national income, is a national concept, b) fixed capital depletion is deducted (net concept) and c) taxes and subsidies are excluded. Meanwhile, in terms of domestic industries, the following is calculated using figures based on the domestic concept of Supporting Table 2, By Economic Activities, of the National Accounts:

Labor's share =compensation of employees (excluding net income earned overseas) ÷ domestic factor income (A1-2)

Net worker compensation earned overseas is small enough to be neglected, but the numerator of (A1-2) becomes smaller, around 2%. As a result, labor's share was 74.9% in FY 2000, more than 1% greater than in the calculation based on (A1-1).

The treatment of self-employed businesses and other private companies is a more important problem. In the two definitions above, labor's share is under-expressed because labor compensation of private companies is not included in the worker compensation used as the numerators while personal entrepreneurial income (including imputed home rent) is included in the denominators. To avoid this issue, labor's share limited to corporate sector workers (including officers' salaries) excluding personal entrepreneurial income is defined as indicated below and was calculated as 83.0% in 2000:

Labor's share = compensation of employees ÷ (domestic factor income - personal entrepreneurial income) (A1-3)

In international comparisons, however, there is also the possibility that Equation (A1-3) would give rise to new bias since the acquisition of corporate status by private companies depends on institutional factors. In this regard, the ratio of personal entrepreneurial income in national income (Fig. A1-1) was stable after dropping through about 1980 and the disparity with the U.S. is narrowing. There is probably no particular problem with comparing the values of recent years based on the definition of Equation (A1-3).

Labor's share calculated by the National Accounts indicated above has the disadvantage of the inability to acquire data for the most recent term. In addition, industry-specific calculations must also be in accordance with Equation (A1-2). Multiple definitions are also used in this case:

Labor's share = labor costs ÷ (labor costs + ordinary profit + net interest payments) (A1-4)

and

Labor's share = labor costs ÷ (labor costs + operating profit + depreciation expenses) (A1-5)

Labor costs here are the sum total of offi-

[30] Though land can be another distinctive production factor because it does not depreciate, we included it in capital assets here.

[31] See Yoshikawa (1994), for example.

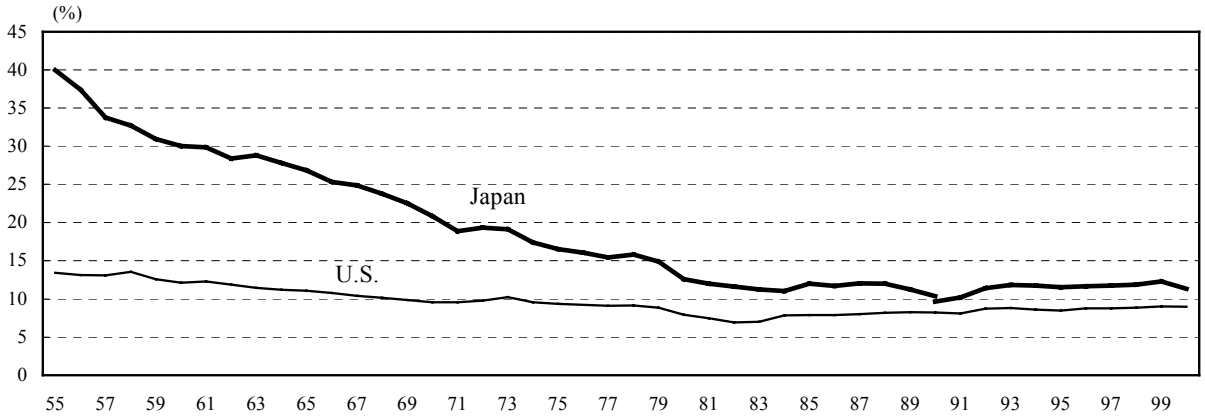


Figure A1-1. Ratio of Personal Entrepreneurial Income to National Income

Note: Fiscal year for Japan and calendar year for the U.S. Based on 68SNA in Japan until 1990.
Source: "National Accounts," Cabinet Office; "Survey of Current Business," U.S. Department of Commerce.

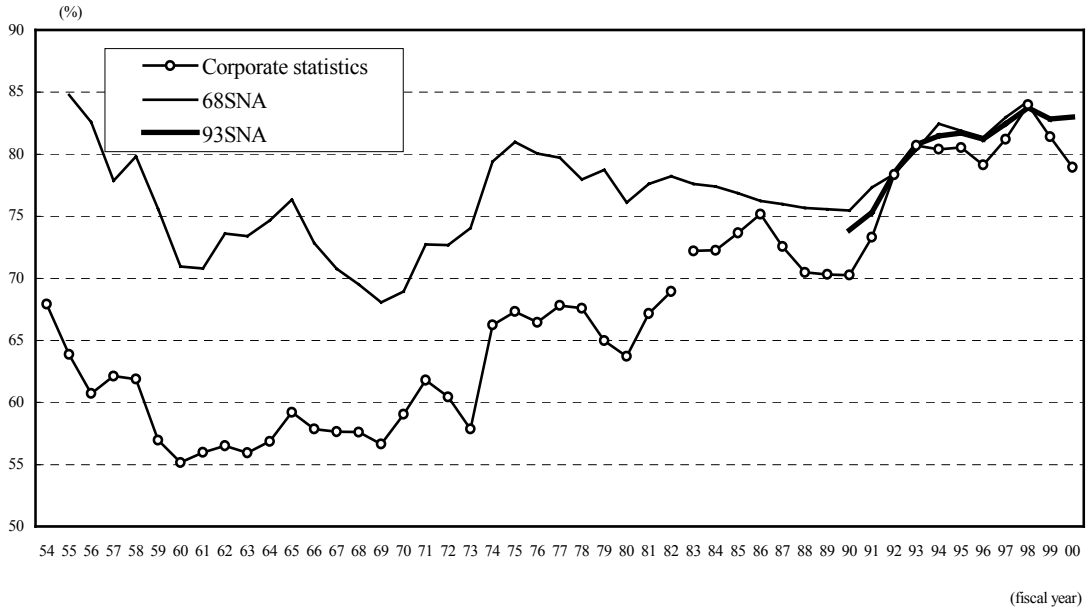


Figure A1-2. Labor's Share Based on Corporate Statistics

Notes: 1. SNA basis is the same as Figure 1-1.
2. The corporate statistics basis includes corporations with ¥10 million or more in capital excluding the financial and insurance industries. The calculation is based on Equation (Supplement - 4).
However, since interest received was added beginning in 1983, there is no connection between 1982 and earlier years.
Source: "Corporate Statistics Quarterly Reports," Ministry of Finance

cers' and employees' salaries and benefit costs.[32]

Nishizaki and Sugou (2001) use Equation (A1-5) including depreciation for the reason that depreciation expenses are applied to new investments as free cash flow.

Labor's share obtained from these two indices differs in the following manner. First, (a) Corporate Statistical Survey annual reports target all profit corporations while the quarterly reports, which require figures for the most recent term,

[32] The Annual Report of Corporate Statistics calculates value added combining labor and other costs and labor's share derived as the percentage of this going to labor costs indicates similar movement. However, rent on movable property and real estate, which is an interim payment to the real estate industry, is included in value added and the level of labor's share is also expressed somewhat low.

do not include companies with less than ¥10 million in capital or the financial and insurance industries. (b) General government and private sector (share 100%, 9% of the national factor income) are included in the National Accounts. (c) Worker compensation and national income are expressed as factor prices in the National Accounts which are a "net" concept excluding fixed asset depletion, and indirect taxes as well. It is also possible to include depreciation when using the Corporate Statistical Surveys. In addition, statistics such as these are not common overseas and unsuitability for international comparisons is a disadvantage.

Values that are somewhat small are derived when calculating labor's share using Corporate Statistics Annual Reports primarily due to factors (a) and (b). Fig. A1-2 was prepared based on the Corporate Statistics Annual Reports in accordance with Equation (A1-4); however, the level in the 1960s and '70s is low compared to coefficients based on the National Accounts the same as Fig. 1-1, followed subsequently by a broad increase. It can be seen, though, that it is not greatly different in the 1990s, the main focus of this study.

In this study, Equation (A1-3) is considered to be the primary index of labor's share and it is used in Figure 1-1 and elsewhere. Calculations are also based on the same criteria in international comparisons unless noted otherwise. On the other hand, Equation (A1-2) is used in industry-specific analyses due to data limitations and it should be noted that simple comparisons of the two are not possible. In addition, though fiscal year has priority in Japan as the unit of corporate activities, it should also be noted that calendar year figures are used in industry-specific calculations using Equation (A1-2) due to data limitations.

Appendix II Relationship of Production and the Adjustment of Hourly Wages, Employment and Working Hours

In Chapter I, we extracted a tendency for labor's share to move counter-cyclically based on factor decomposition. Is it possible to comprehend this quantitatively? Moreover, if wage and employment adjustments are promoted hereafter, we would expect long-term growth through the correction of labor's share and increased capital investments. But at the same time, it is also possible that the slowdown in consumption, boost in social insurance and other fiscal costs would have a negative impact on growth. When we need to choose which of the labor cost components from wages, employment, and working hours are actually modified, more specific analysis on the interconnection with production is essential, and we are interested in the effect on labor's share in that process.

Here, in order to quantitatively explore the statistical relationship with macro indices in the past, we measured the long-term precedence relationship with production (GDP), employment, wages and working hours using a VAR model. Then, we simulated the repercussions when each of the variables was subjected to a shock by means of an impulse response function. Fig. A2 (1) shows the effect with a 1% drop in production. As long as there are no new shocks, production gradually recovers over a period of about two years and, during that time, working hours initially shift to a decline and a sustained decline in real wages continues after six quarters. Meanwhile, employment tends to increase in the second to third year due in part to the decrease in working hours. Fig. A2 (5) illustrates the effect on labor's share as a cumulative rate of change from the initial level. The effect, however, was sustained, with an initial 1% increase which accumulated up to 6% in the tenth quarter and, even after 20 quarters, it is still higher than the initial level by almost 4%. Though it would difficult, given the current circumstances, to consider a scenario in which employment begins increasing due to a decline in production or hours, trends during the first half of the 1990s are illustrated comparatively well.

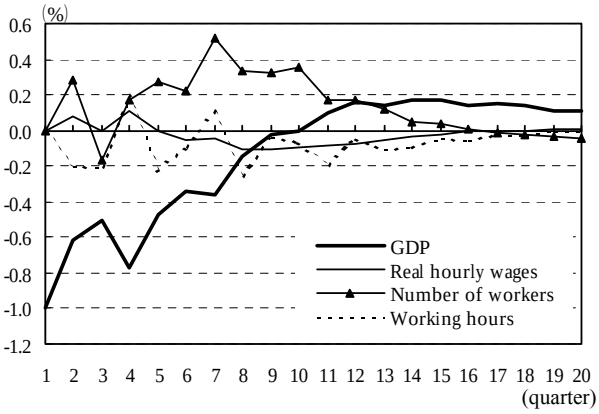
Thus, even if the shocks to GDP have a permanent effect on labor's share, there is the possibility of prolonged stability in labor's share while moving with high frequency variability if there are alternating positive and negative shocks. However, if negative shocks were exerted continuously during the 1990s, that would naturally result in a one-sided increase in labor's share. Analyses based on VAR would lead to a symmetrical outcome with either a positive or a negative shock. But if the real effect of shocks on labor's share is asymmetrical within the context of deflation as seen in Section 4 of Chapter I, the trend of an increase in labor's share may be stronger.

We next calculate the three variables that determine labor compensation, with each reduced by 1% assuming that labor costs will decline in the future. The decrease in real hourly wages and in employment both cause a maximum reduction in the GDP of 0.3%; however, the decline in the GDP by a short-term reduction would be no more than about 0.1% with a shift to positive growth after five quarters. If the effect on labor's share were due to a reduction in hourly wages and employment, labor's share would ultimately begin to increase; however, if working hours were curtailed, this would ultimately bring about a decline in labor's share of almost 5%. Though labor compensation (numerator) would also ultimately drop at the same time about 2% below the initial level, an increase in interest income would also be expected which may compensate overall household income. A reduction in labor cost through a cut in working hours would appear to be the most desirable scenario here.

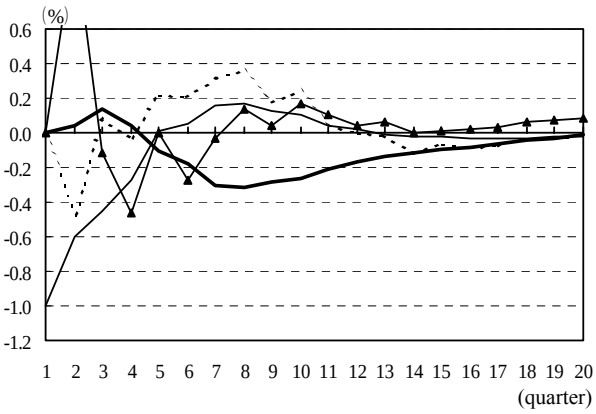
However, besides the dependence of the results of this calculation on the relationship between past variables, there is also a need to be aware of whether this precedence relationship actually existed. An examination of the Granger causality (test for determining whether lagged explanatory variables have the ability to explain significantly; lower table of Fig. A2) between these variables shows that it is not possible to significantly detect the effect of working hours on other variables. Results were obtained in this test showing that the three labor-related variables lag behind production, and the outcome of the

simulation above of reducing labor costs was obtained by using a precedence relationship that can only be recognized weakly in the past. When choosing an actual method, we need to examine more structured causality between variables. Especially, the effect on production that explains the majority of the movement in labor's share in the calculations above will be an important issue.

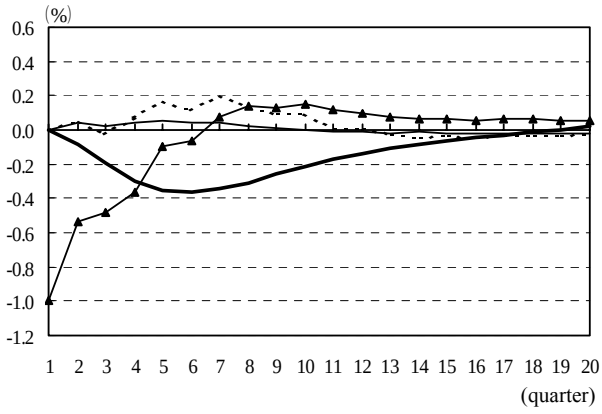
(1) Shocks to GDP



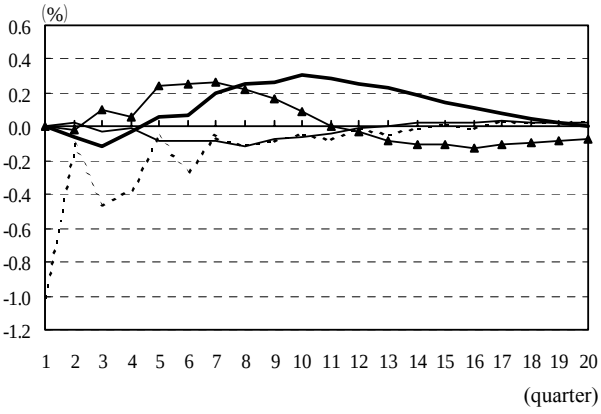
(2) Shocks to real hourly wages



(3) Shocks to number of workers



(4) Shocks to working hours



(5) Impact of each shock on labor's share

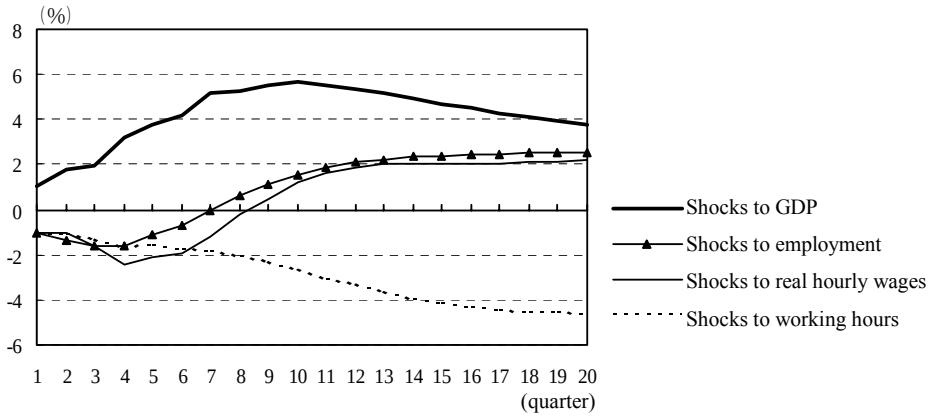


Figure A2. Effect of Adjustment Shocks

Granger causality test between variables

		Explanatory variables			
		GDP	Real hourly wages	Number of workers	Working hours
Independent variables	GDP	—	1.012	1.935	1.659
	Real hourly wages	0.851	—	4.005	0.885
	Number of workers	3.646	0.093	—	0.431
	Working hours	2.949	0.264	2.888	—

Significance levels: 1% level 5% level 20% level

Notes: 1. The VAR model with a lag of 4 periods is estimated with constants and time trend. and used the impulse response function when each variable was subjected to a 1% negative shock. The estimate period was the first quarter of 1982 through the third quarter of 2001.
GDP: GDP based on 93SNA
Real hourly wages: Total cash earnings index / total working hours index deflated by the domestic wholesale price index
Number of workers: Number of workers
Working hours: Total working hours
2. The vertical axis is the growth rate compared to the previous year. The impact on labor's share is the rate of change with respect to the initial labor's share.

Source: "National Accounts Annual Report," Cabinet Office; "Monthly Labor Statistics Survey," Ministry of Health, Labor and Welfare; "Monthly Commodity Price Index," Bank of Japan; "Labor Force Survey," Ministry of Public Management, Home Affairs, Posts and Telecommunications.

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