# Why did prices in Japan hardly decline during the 1997-98 recession?

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## 1. Introduction

Recently, the United States and European economies have been enjoying stable inflation together with continuously diminishing output gaps. Presumably, most of the participants in this meeting will discuss channels that suppress the rise in prices, such as the enhancement of productivity led by information technology, especially in the United States, or changes in wage-setting behaviour. Turning our eyes to Japan, however, we can find contrary developments in prices. The Japanese economy was on the brink of a deflationary spiral in 1998 as the output gap expanded rapidly and the risk of negative interaction between economic activity and financial stability mounted. But, in fact, prices did not fall as much as would have been suggested by classical estimates of the output gap. The main purpose of this paper is to try to find the factors behind these price developments in Japan.

Even if this puzzle is solved, there remains the question of whether information technology or other technological innovations have had any impact on prices in Japan. Looking at the Japanese economy recently, business fixed investment related to information technology has started to increase substantially. In addition, recent changes in the distribution sector are said to be having some effect on price developments in Japan. Taking these into consideration, we will examine how technological innovation and other supply side structural changes have influenced Japan's price developments in recent years and how these differ from experiences in other countries.

This paper tries to present hypothetical answers to the above questions by surveying price developments in Japan in the 1990s and by studying recent effects of structural economic changes on prices.[2]

## 2. Characteristics of price developments in the 1990s

In this section, we review price developments during the 1990s. As regards relationships between various price indices and economic developments in Japan during this period, prices basically moved along with the supply-demand gap until 1997 (Figures 1 and 2).

In detail, 1990 was when the overheating of the economy was in its last phase as asset prices skyrocketed. From 1991, the euphoria regarding future economic growth collapsed and capital stock adjustment began. Additionally, the balance sheets of firms deteriorated along with the drop in asset prices, and the Japanese economy faced a serious recession. At the beginning of this recession, the deceleration of inflation rates remained moderate as wage adjustments were relatively slow, reflecting a labour shortage among small to medium-sized companies. In these circumstances, consumer price increases peaked at over 3% on a year-to-year basis in 1991. But thereafter, the CPI inflation rate declined until 1993, and domestic wholesale prices dropped.

The economy then bottomed out at the end of 1993 and a moderate economic recovery continued until the beginning of 1997. The money stock increased gradually. Prices basically moved in accordance with the output gap, but there were some phases when prices moved in the opposite

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[2] The following discussions draw considerable material from a paper released by the Research and Statistics Department (2000-a), and may be understood as excerpts from it.

direction to developments in the gap. For instance, the rate of decline in domestic wholesale prices accelerated during the economic expansion in 1996, when the real GDP growth rate reached 5.1% and the yen depreciated significantly.

In fiscal 1997, Japan's economic growth turned to deceleration, reflecting efforts at fiscal consolidation such as a rise in the consumption tax rate. At the same time, the financial and economic turmoil in Asia started to have its negative effect on the Japanese economy through exports. Furthermore, the disturbance in the financial system triggered by the failure of major financial institutions, including Yamaichi Securities and Hokkaido Takushoku Bank in November 1997, induced a deterioration in corporate and household sentiment as well as a stringent lending stance on the part of financial institutions. The economy then underwent an unprecedented decline during 1998 as both private consumption and business fixed investment fell. Hence, the output gap expanded significantly and immense downward pressure was exerted on prices. Towards the end of 1998, the financial ratings of large firms were lowered frequently, reflecting shrinking corporate profits and worsening balance sheets in line with the economic slowdown. The lending stance of financial institutions became even more cautious. In these circumstances, downward pressure on prices became stronger as the negative link between the weakening of the real economy and the tightening of financial conditions intensified.

From the autumn of 1997 to end-1998, economic deterioration increased the credit risks of firms and a credit contraction occurred, as financial institutions became extremely restrictive about lending. This accelerated the contraction in the real economy. Thus, in 1998, the nominal GDP growth rate dropped to a record low since statistics were first compiled in 1955, and corporate profits were squeezed (Figure 3). Since wage adjustments were slow relative to the contraction in output and prices, corporate profits deteriorated further, and the burden created by the need to repay debts increased in the real term. This led to a further drop in demand. It is usually assumed that the rigidity of nominal wages will stop the fall in prices. In Japan, however, the decline in nominal wages started as a result of efforts by firms to reduce costs (Figure 1). Thus, Japan was at that stage on the brink of a vicious cycle between output and prices, the "deflationary spiral". Fortunately, the threat of a cumulative drop in wages and prices did not turn into reality. Meanwhile, growth in the money stock was relatively rapid, while nominal GDP declined substantially. It seems that further monetary easing and corporate finance policies implemented by the Bank of Japan and the credit guarantee system introduced by the government reduced the downward pressure on prices and kept the economy from a fully fledged deflationary spiral.

From 1999, the disturbance in the financial market observed during 1998 started to become stable. The implementation of the zero interest rate policy and the strong commitment to monetary easing by the Bank of Japan, and easing anxieties over the stability of the financial system resulting from injections of public funds into private banks, helped improve consumer and business sentiment and thereby triggered economic recovery. During this process, downward pressure on consumer prices also weakened. Growth in the money stock dropped slightly.

With respect to the price and economic developments described, the following three observations emerge as puzzles to be solved.

First, why did prices hardly decline from 1998 to the beginning of 1999 during the economic deterioration although the output gap was extremely large? Consumer prices, in particular, should have declined significantly if they were moving along with the Phillips curve that would be estimated by use of the output gap. Yet this relationship suddenly collapsed from 1998 (Figure 2). Even taking the downward rigidity of the consumer price index into consideration, it cannot be explained fully why prices did not decline.[3]

Second, the growth rate of the money stock since 1997 has been paradoxical (Figure 4). The money stock (M2+CDs) grew rapidly from the autumn of 1997 when the real economy underwent a serious recession. On the other hand, money growth recently became sluggish after the economy started to recover, suggesting a wild divergence between money and nominal GDP. Here, it is necessary to

[3] The consumer price index in Japan is expected to have some downward rigidity, particularly in public utilities charges and regulation charges. Kasuya (1999) examined the degree of downward rigidity in the CPI calculating the weights of items of which the change in the price decline is slower than that of the price rise out of the 580 items that constitute the consumer price index, and found that about 20% of items have downward rigidity.

examine the developments in the money stock, especially from 1998 to the start of 1999, in relation to the fact that the economy did not fall into a deflationary spiral.

Third, we need to consider reasons behind divergent developments in each of the price indices. For instance, why did the rate of decline in domestic wholesale prices quicken during the economic recovery in the mid-1990s? Moreover, it may be pointed out that the margin between CPI and WPI inflation rates has significantly narrowed since the mid-1990s[4] (Figure 5). Therefore, it is necessary to examine the relationship between prices and the supply side of the economy, such as technological innovation, increases in imported products, deregulation and the streamlining of distribution channels.

The three puzzles are addressed below.

## 3. Relationship between the output gap and prices

During the 1997-98 recession, many supply-demand indices showed a substantial output gap suggesting immense downward pressure on prices. But the decline in the consumer price index was extremely moderate in comparison with the suggested deflationary pressures. This is the first puzzle to be examined. There are two clues for this puzzle: first, stagnant domestic supply capacity in the face of economic structural changes, and second; the mismatch in the labour market.

### 3.1 Measurement of the output gap and potential growth

The output gap captures supply-demand conditions from a macroeconomic perspective by measuring the difference between potential GDP and real GDP. Although there are various estimation methods, we use the following approach. First, we explain Japanese GDP by using a production function that consists of three factors - labour, capital and total factor productivity (TFP). Then, we obtain the output gap from the rate of difference between real GDP and potential GDP, which is the maximum GDP obtained with labour and capital fully utilised.

$$Y_t = A_t \cdot (H_t \cdot L_t)^{1-\alpha} \cdot (Om_t \cdot Km_{t-1} + Oo_t \cdot Ko_{t-1})^{\alpha}$$

$Y_t$: real GDP, $A_t$: TFP, $H_t$: total working hours, $L_t$: number of workers, $\alpha$: capital share, $Om_t$: capacity utilisation rate in manufacturing industries, $Km_t$: capital stock of manufacturing industries, $Oo_t$: capacity utilisation rate in non-manufacturing industries, $Ko_t$: capital stock of non-manufacturing industries.

Recently, the potential growth rate of Japan has been generally considered to be around 2%, and thus, to diminish the output gap, economic growth should surpass this figure. Estimates of the output gap often use only the capacity utilisation rate in manufacturing industries as a demand factor, while ignoring rates in non-manufacturing industries. TFP, which explains the potential growth rate not explainable by the growth in capital and labour, is usually assumed to grow constantly, reflecting technological progress. Indeed, the output gap obtained by this method (thin solid line in Figure 6(1)) expanded in the first half of the 1990s and was temporarily reduced significantly from fiscal 1995 to fiscal 1996.[5] Thereafter, it continued to expand until the end of fiscal 1999. If the output gap followed such a trend, consumer prices should have declined until the end of 1999. Yet consumer prices did not actually decline from 1998. The output gap also contradicts the supply-demand gap indicators

[4] The composition item of consumer goods in the domestic wholesale price index differs from that of the consumer price index. Hence, it is inappropriate to see subtle differences between them. To see changes at the distribution stage, it is not enough to compare import prices at the consumer and wholesale stages. The CPI-related wholesale price index used here is rearranged to match the consumer price index.

[5] The output gap discussed in this paper is defined as a difference between actual GDP and potential GDP, which is obtained when capital and labour are fully utilised. It is necessary to keep in mind that this output gap is larger than those calculated by other methods, such as the output gap between actual GDP and the equilibrium level of GDP where the inflation rate is stable, and the output gap between actual GDP and the average level of GDP when capital and labour are operating at the average level calculated from past data. The level of the output gap differs depending on the calculation method.

based on firms' perceptions, such as the weighted average indicators (Supply and Demand Conditions for Products DI, Production Capacity DI, and Employment Conditions DI in the *Tankan-Short-term economic survey of enterprises in Japan*; Figure 6(2)) that have shown an upturn since the beginning of 1999.

However, it should be noted that when this particular estimation of the output gap is used, large measurement errors occur. In fact, if we estimate the production function by this method, the *Solow residual* obtained by subtracting contributions of capital and labour from GDP has been significantly reduced in recent years. As TFP is assumed to grow smoothly at a constant rate, residuals that cannot be explained by the time trend in the Solow residual are included in components of the output gap which are generated by demand fluctuations. This implies that estimated residuals are all supposed to arise from the fluctuations in the capacity utilisation rate (especially that of non-manufacturers), which cannot be captured statistically. Behind the expansion of the output gap obtained through this method, estimated errors fluctuate largely at random and have been extremely large recently. However, it is doubtful that the capacity utilisation rate of non-manufacturers fluctuates a great deal in the short term. In other words, these unrealistic movements of the output gap may be caused by the assumption that TFP follows a linear time trend and the capacity utilisation rate of non-manufacturing industries is obtained as a residual.

If so, the problem generated by the estimation of TFP trend can be solved by changing the calculation method of the output gap.[6] To do this, we have to estimate the capacity utilisation rate of non-manufacturing industries that has been assumed for convenience to be 100%. Also removing the assumption of the linear trend of TFP, we regard the Solow residual per se as the TFP (hereafter, we call this "the output gap adjusted by the capacity utilisation rate of non-manufacturers"). The functional form used for this is shown in Figure 7. As the capacity utilisation rate of non-manufacturers cannot be observed directly, the production capacity judgment BSI of non-manufacturers (*Business Outlook Survey* of the Ministry of Finance) and the unit of electric power for business use (ratio of electricity consumption for business use to electric power contracted for business use) are used to estimate the rate indirectly. Here, we assume that the BSI captures developments in the capacity utilisation rate in detail, while the unit of electric power for business use is employed to supplement the information at the operating level. More concretely, parameters are estimated by regressing the unit of electric power on the BSI and then the estimate obtained by substituting the BSI is considered to be the capacity utilisation rate of non-manufacturing industries (Figure 8).

TFP calculated in this way fluctuates randomly instead of increasing at a constant rate. Intrinsically, TFP is considered to be the mid- to long-run trend of technological progress and is affected by changes in the quality of capital and labour, efficiency of resource allocation, regulation and deregulation by the government, and social factors such as mobility of labour.[7]

The rate of change in this new output gap (the thick solid line in Figure 6(1)) from its peak in 1990 to the recent trough is smaller than that in the output gap calculated by the classical method. In addition, the new output gap started to close from the beginning of 1999. This indicates that it is moving in tandem with supply-demand indicators based on firms' perceptions (Figure 6(2)).

Next, to get a rough idea of the mechanism that determines prices in Japan, we estimate a Phillips curve based on this output gap. In the estimate, a dependent variable is the inflation rate of consumer

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[6] See Kamada and Masuda (2000) for further research on the idea.

[7] According to arguments in the United States, TFP includes (1) technological progress, which is intrinsically a quality change of labour but cannot be captured as labour, (2) technological progress which is a quality change of capital but cannot be captured as capital, (3) factors created in compiling data, and (4) other factors. Jorgenson and Griliches (1967) take the view that TFP basically does not move if all noise is removed. This is because if measurement of the input and output data becomes extremely accurate, then technological progress will be reflected in factors such as capital prices. This implies that if there is a problem in the accuracy of measurement, it will also affect TFP. On the other hand, Denison (1979) shows the following four factors as the factors of TFP decline in the United States after 1973: (1) declines in R&D and stock of knowledge; (2) regulation by the government to allocate capital, labour and land to activities other than production, or inefficiency of resource allocation by other regulations and the taxation system; (3) drop in willingness to work among the young generation, and declines of competitive pressure and quality of management; (4) errors caused when compiling data. Moreover, Kendrick and Grossman (1980) indicate the following seven factors as component elements of TFP: (1) accumulation of knowledge; (2) changes in quality of labour; (3) changes in quality of land; (4) the effects of resource reallocation among industries; (5) volume-related factors such as economies of scale; (6) government services; (7) other factors such as changes in legal, institutional and social environment.

prices, and explaining variables are the output gap in the current quarter, the expected inflation rate (proxied by the percentage changes in consumer prices in the previous quarter), and the supply shock (proxied by the percentage changes in import prices in the current quarter). The estimation result was essentially satisfactory (Figure 9) and the basic behaviour of the inflation rate can be explained by this relationship.

$$\pi_t = const + \beta \bullet \pi_{t-1} + \gamma \bullet GAP_t + \delta \bullet WPIIM_t$$

Estimation period: 1983 Q3-1999 Q4

$\pi_t$ : changes in the CPI (quarter-to-quarter trend cycle annualised, %)

$GAP_t$ : output gap

$WPIIM_t$ : changes in import prices (wholesale prices, yen basis, total average, quarter-to-quarter percentage change, annualised, %)

This new estimation shows that the reason that the output gap hit bottom, although the economic growth rate was low in fiscal 1999, was that TFP as a domestic supply factor reflects not only technological progress but also short-term fluctuations caused by various factors. During the 1990s in particular, the external environment changed, as is observed in the changes in industrial structure due to the globalisation of the economy and the recent introduction of information technology (IT). In these circumstances, it is likely that most of the capital stock, accumulated due to the vast business fixed investment until around 1990, has become obsolete, although it still exists.[8] Furthermore, in the process of these structural changes, an increasing number of firms require employees to obtain widely applicable and highly technical skills instead of skills specific to an individual company. When workers are not ready to satisfy this requirement, it is highly probable that labour productivity will decline. As the economic value of capital and labour decreases, TFP in Japan and in turn overall capacity growth seems to be lower than the potential growth rate calculated using the classical method, at least in the short run.[9,10] From this perspective, the contraction of the output gap despite low economic growth since 1999 can be explained.

As indicated, there are various problems surrounding the measurement and concept of the potential growth rate and output gap. The output gap should only be used when explaining price development trends and should not be expected to match short-term price fluctuations. Comparing the estimated values of consumer prices obtained from the Phillips curve and actual consumer prices, however, the estimated value dropped while the actual value increased somewhat at the end of 1998. Therefore, it seems that this factor is not enough to explain why prices did not fall during this recession period.

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[8] As regards evaluating the capital stock of private firms in terms of market value using second-hand prices, the growth rate of capital stock has been fairly low in recent years (for details, see Masuda (2000)). Furthermore, it may be that capital stock exists on firm's books but they no longer consider it to be valuable equipment. In this case, the value of capital stock decreases further and the growth rate declines even more. This is highly possible in the present environment, where structural adjustments are ongoing. The classical output gap based on the fixed capacity utilisation rate of the non-manufacturing industries is likely to be overestimated as a result of this factor. In the new output gap, TFP reflects problems surrounding the measurement of capital stock to some extent.

[9] The recent growth rate of the domestic supply capacity remains at around 1% when using this output gap. The figure is smaller than the potential growth rate (just below 2%) obtained when using the traditional production function approach. It should be kept in mind that these figures are subject to measurement errors.

[10] The following two aspects should be taken into consideration when examining the influence on potential growth of changes in the industrial structure symbolised by the IT revolution. First, in the mid to long run, if IT is to really take root in the Japanese economy, an increase in productivity may be expected as observed in the United States in recent years. Second, in this process, existing capital and human capital will, however, become obsolete and this is likely to reduce the capacity growth in the short run. In fact, even in the United States, the effects of the IT revolution did not appear immediately in the productivity statistics until the mid-1990s and this was regarded as one of the "puzzles". Thus, while existing capital and labour continue to deteriorate in the future, we must take into careful consideration that if IT becomes full-scale, the mid- to long-term potential growth of Japan will not decline significantly even though the prior or the present capacity growth is low.

### 3.2 Expansion of the mismatch in the labour market

Among the relationships between various supply-demand gap indicators and prices, the divergence between the unemployment rate and prices is the most conspicuous. This means that, especially in the labour market, supply-demand conditions that influence prices cannot be measured just by the unemployment rate. At present, the unemployment rate in Japan stands at 4.6% (as of August 2000), remaining around the highest level since statistics were first compiled. There is a negative relationship between the vacancy rate, which indicates insufficient employment, and the unemployment rate, which shows excess employment (Beveridge curve; Figure 10(1)). From the 1970s, however, the curve has repeatedly shifted to the right or right-upwards. Recently, the vacancy rate has increased slightly but the unemployment rate remains at the highest recorded level. The right shift or the right-upward shift of the relationship between the vacancy rate and the unemployment rate means that firms perceive that excess employment persists, while others feel there is insufficient employment. It is highly probable that some factors of a structural mismatch regarding labour supply and demand have strengthened. This contrasts with the United States experience, where the relationship between the two rates shifted left-downwards from the 1990s (Figure 10(2)). This growing mismatch in the labour market is likely to cause a decline in the equilibrium level of the output gap.[11] In line with the expansion of the output gap during 1998 to 1999, the equilibrium level declined. Thus, it is likely that deflationary pressures were not exerted on the economy, as shown in the gap expansion.

To distinguish the number of workers unemployed as a result of business cycles from those whose unemployment stems from structural factors, we have made four categories to explain unemployment:[12] (1) macroeconomic activity shocks due to business cycles; (2) mismatch in labour supply and demand reflecting age and sex among firms and industries (redistribution shock); (3) exogenous changes in the labour force due to the enlarged female participation rate (labour force shock); (4) hysteresis caused by the above factors and long-term changes in the labour force age composition (for instance, when unemployment occurs due to economic recession, it has irreversible effects on the economy, such as the loss of skills; deterministic trend). The result suggests that the effects triggered by the economic recession have finally weakened from their worst level (Figure 11).[13] On the other hand, the long-term increasing trend of unemployed workers continues, since it takes them a long time to find jobs due to lost labour skills, and the labour force age composition changes. Furthermore, structural adjustments of industries and changes in ways of thinking about employment among young generations seem to have increased the number of unemployed workers since 1995. Recently in particular, firms have been taking globalisation and IT into account. Under these conditions, firms have rapidly changed their stance towards their employees by requiring highly technical skills that are widely applicable for many purposes. In this sense, the factors that cause the stagnant capacity growth by deteriorating the value of the domestic labour force may simultaneously create a supply-demand mismatch in the labour market.

There seem to have been structural changes in recent years in the relationship between the unemployment rate and the change in wages (unit labour cost) (Figure 12(1)). The increase in the number of unemployed workers from 1998 was apparently not only due to economic deterioration, but also due to other structural factors. Hence, downward pressure on prices from 1998 to early 1999 was not as strong as indicated by the increase in the unemployment rate or the expansion in the output gap.[14]

We have presented two hypotheses which should explain why consumer prices did not decrease as much as predicted by the output gap from 1998 to early 1999. The argument is as follows: although

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[11] The "equilibrium level" of the output gap refers to the level of the output gap which is analogous to the level of the natural rate of unemployment in the labour market. This is expected to be lower than the level of potential GDP when the mismatch in the labour market is resolved and capital is fully used.

[12] See Nishizaki (2000) for details.

[13] To break down the number of unemployed workers, we estimate reduced form VAR by standardising the Beveridge curve. The impacts of the hysteresis are extracted. Furthermore, structural parameters are estimated on errors to identify the macroeconomic activities shock, redistribution shock and labour force shock. For detailed examples on the United States, see Blanchard and Diamond (1989).

[14] In fact, there exists a negative correlation between unit labour cost and the unemployment rate based on shocks from macroeconomic activities such as economic recovery and recession (Figure 12(2)).

the output gap was large in 1998, it was smaller than calculated based on the medium- to long-term potential growth rate usually imagined. Furthermore, downward pressure on prices moderated somewhat as the equilibrium level also declined. All these factors were confirmed to keep the Japanese economy from falling into a deflationary spiral.

## 4. Relationship between money stock and nominal GDP

To understand why the Japanese economy did not fall into a deflationary spiral from 1998 to 1999, we need to examine the impact not only on the real side of the economy, but also on the financial side. During this period, an unusual phenomenon seems to have occurred: the money stock continued to grow at a high rate in contrast to nominal GDP. In fact, the relationships among the money stock (M2+CDs), the economy (real GDP), and prices (GDP deflator) show that in 1998, the actual growth rates of the money stock always exceeded their forecast values (Figure 13). This implies that some missing variables that explained money demand played an important role in moving the money stock during this period. This is the second puzzle to be solved.

The fully fledged deterioration of the Japanese economy in 1997 was largely prompted by the disturbance in the financial system caused by the failures of large financial institutions in November 1997 (Sanyo Securities, Hokkaido Takushoku Bank, Yamaichi Securities, etc). As a result, concerns about corporate financing increased rapidly and many risk premiums were added to interest rates for fund-raising (Figure 14). This situation deteriorated further due to a drop in corporate profits from the second half of 1998.

In these circumstances, an increasing number of firms and households not only refrained from spending to secure liquidity, but also increased precautionary fund-raising.[15] It is highly likely that the latter caused the rise in the money. In fact, the money stock continued to grow and the *Marshallian k* (M2+CDs/nominal GDP) increased. Moreover, there was a possibility that if financial institutions could not supply sufficient liquidity, firms might have tried to obtain liquidity even by selling products and inventories, which was indeed seen in some Asian countries during the crisis period. In other words, although the relationship between money and the economy is normally loose, the interaction between lack of liquidity and price decline could become distinct when demand for liquidity increases drastically as seen during this period.

After all, a deflationary spiral did not materialise as various monetary measures or policies adopted by the Bank of Japan and the government wiped out corporate and household anxieties over liquidity during 1998 and 1999.[16] Since 1999, the growth of money stock has become rather slow as precautionary demand for liquidity by firms and households has decreased.

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[15] For details on the influence of the anxieties over the financial system on the Japanese economy, see Hayakawa and Maeda (2000).

[16] In autumn 1998, the Bank of Japan eased monetary policy further, lowering the target rate of the uncollateralised overnight call rate. Moreover, in response to the credit crunch felt by firms, the Bank expanded CP repo operations and established a temporary lending facility to support firms' financing activities. The Bank also started to consider the implementation of a new market operation scheme, which utilises corporate debt obligations as eligible collateral, and made loans directly or through the Deposit Insurance Corp for bankrupt financial institutions to continue business until final disposals were completed. In addition, the government implemented measures such as enhancing the credit guarantee system (Figure 15). These measures eased anxiety over liquidity, and the risk of further deflation created by selling goods was avoided.

From the beginning of 1999, liquidity risks reduced significantly and the economy started to pick up, due to the easing of financial anxiety which occurred as a result of the Bank of Japan's introduction of the zero interest rate policy and the government's injection of public funds into private banks.

## 5. Relationship between changes on the supply side of the economy and prices

The third issue to be addressed is how structural changes on the supply side such as technological innovation, increasing import penetration, deregulation and the streamlining of distribution channels affected prices throughout the 1990s. Here, it is interesting to observe that the relationship between real growth and inflation, especially in terms of the GDP deflator, looks rather tenuous, suggesting the importance of supply side developments (Figure 16).

### 5.1 Technological innovation

In the United States, there are discussions about the channel that suppresses the rise in prices due to the enhancement of productivity led by IT, and whether the United Kingdom follows this trend.[17] In Japan, however, stagnant business fixed investment throughout the 1990s led to a decrease in capacity growth, and as mentioned above, capacity growth recently seems to have been sluggish, at least in the short term. From these facts, it is thought that at present, the downward pressure on prices resulting from technological innovation is not accelerating.

However, the impact of the enhancement of productivity on the manufacturers' side, mainly in electronics equipment, is clearly seen in price indices. For instance, the domestic wholesale price index has been on a decreasing trend, even during the economic expansion phases of the 1980s and 1990s, except for the so-called bubble economy era in the second half of the 1980s. This is because electronics machinery-related technological innovation has exerted downward pressure on domestic wholesale prices through price declines in products such as semiconductors and personal computers. To capture the degree to which the technological innovation factor pushes down domestic wholesale prices, we calculate the contribution of items whose prices tend to be reduced with item-change, reflecting technological innovation. The results are shown in Figure 17. As a whole, technological innovation contributes to the decline in domestic wholesale prices or their final goods prices constantly and rather firmly.

### 5.2 Industrialisation in Asian countries and the increase in reverse imports

One of the factors that influenced import prices in the 1990s was the appreciation of the yen. From 1993 and also from 1998 (Figure 18), prices of intermediate goods in wholesale prices decreased in parallel with the appreciation of the yen, and after a while prices of final goods in wholesale prices started to decline. Consumer prices of imported/import competitive goods[18] also decreased slightly thereafter. Apart from intermediate goods, the pace of decline in final goods prices slowed, but prices did not increase even though the yen depreciated as from the second half of 1995.

This is not only because the appreciation of the yen pushes down prices of imported/import competitive goods, but also because a rapid expansion of inexpensive imported goods indirectly pushes down the prices of import competitive goods (Figure 19). Behind this essentially lies the price gap between Japan and Asian economies where personnel expenses and intermediate input costs are much lower than in Japan. In addition to the appreciation of the yen in the 1990s, the progress of industrialisation in Asian economies has significantly increased their supply capacity, resulting in a massive inflow of inexpensive final goods into Japan. It is also noted that a shift in production from Japan to Asia was a driving force for the industrialisation in Asian economies during the 1990s. Since 1993, the shift of production to Asia has become fully fledged. In the mid-1990s, an international division of labour between Japan and Asia was established, in which parts of IT-related equipment supplied by Japan were assembled in Asia to produce personal computers and audio equipment,

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[17] See Julius (1999), Vickers (2000), Wadhwani (2000) and Greenspan (2000a, b) for discussions of these aspects of prices.

[18] Composed of imported/import competitive items in the consumer price index. Specifically, items are aggregated that are regarded as import prices in wholesale prices, as well as those that are not included at the wholesaling stage, but obviously have a characteristic of imported/import competitive items. Since there is a high possibility that petroleum product prices move differently to other items, reflecting market conditions for crude oil, disturbance factors including petroleum products are excluded here.

which were then supplied globally. Inexpensive products were also reimported to Japan. The impact of this trend on prices can be confirmed by looking at the list of CPI items where the contribution rates of decline were the largest (top 50 items; Figure 20). The results show that the number of durable consumer goods, such as audio and other electrical appliances, increased rapidly from 1995 to 1996, and there were many items in apparel products in the first half of the 1990s.

### 5.3 Deregulation

Deregulation's downward pressure on prices has been observed from the beginning of the 1990s. For instance, in 1991 restrictions on beef imports were abolished, and large-scale retailers started to open new stores one after another with the deregulation of the Large-Scale Retail Store Law. Moreover, the Foodstuff Control Law and Provisional Measures Law on the Importation of Specific Petroleum Refined Products were abolished in 1995 and 1996 respectively. There appears to be a continuing impact as a result of these deregulations. Looking at the list of CPI items whose prices are declining fast (Figure 20), it is clear that petroleum products and rice have been constantly affected by deregulation. In addition, the decrease in corporate service prices is influenced by declines in communications fees and the damage insurance premium. In the immediate future, deregulation in electricity charges and communications fees is expected to affect prices.

### 5.4 Streamlining of distribution channels

Streamlining of distribution channels means the reduction of distribution margins by cutting excess profits or distribution costs, especially at the distribution stage. The streamlining of distribution channels is typically visible in the rapid rise of inexpensive imported apparel products made in China in the first half of the 1990s. The time when these Chinese products were imported rapidly roughly matches the time when discount stores and roadside chain stores started to increase. This boom then seemed to die down. However, since 1999 newly emerging retailing firms have improved both the quality of goods by guiding manufacturing skills in China and the import techniques for a large amount of inexpensive goods, aided by the appreciation of the yen. This movement has steadily taken root and an increasing number of volume sellers are beginning to cut prices to compete with inexpensive imported goods. These points are, once again, confirmed by looking at the list of CPI items whose prices declined fast (Figure 20). The number of items in apparel products in the top 50 has gradually increased since the end of 1998 after items such as suits and women's dresses obtained a majority in the early 1990s. Recent activities of newly emerging retailing firms seem to have encouraged a reorganisation in Japanese distribution industries, which have long been criticised for their inefficiency. In fact, the ratio of sales in wholesaling to sales in retailing, and the ratio of total sales in wholesaling to sales in wholesaling for retailing and final demand have continued to decrease from the beginning of the 1990s (Figure 21).

Among the four points cited as supply side factors, factors 2 to 4, which became prominent in the 1990s, can be understood as part of the price level adjustment process through revisions of high domestic prices and a narrowing of the price gap between Japan and abroad. It has been pointed out that in Japan, the cost of living is high due to relatively high services prices and distribution costs, while the prices of industrial products exposed to world competition are low. These corrections of high prices did not progress very much until the first half of the 1990s, but thereafter the price gap has been gradually reduced (Figure 22). This is because transactions aiming for arbitration of prices have expanded, triggered by an expansion of the price gap between Japan and abroad due to the appreciation of the yen, and by global business relationships in the world economy becoming widespread. In recent years, the introduction of globally used business models that provide inexpensive and high-quality products has exerted adjustment pressure on the price gap between Japan and abroad. Furthermore, intensified global business relationships expand the range of tradable goods and to some extent have arbitrage effects between Japan and abroad on services prices in the form of deregulation.

This "globalisation of prices" eventually enhances both the economic efficiency and the purchasing power of customers in the Japanese economy. Through this process, however, domestic demand partly leaks overseas and profits of specific industries may be squeezed due to the decline in competitive power and the narrowing of margins in existing conventional industries and wholesalers or retailers protected by regulations. The fact that this process has deflationary effects in the short term means that it must be carefully monitored.

## 6. Concluding remarks

The output gap derived from the classical method does not separate supply factors successfully from demand factors and thus fails to indicate actual supply-demand conditions. We tried to capture the demand side more accurately by estimating the capacity utilisation rate in non-manufacturing industries, and we re-estimated the output gap by measuring short-term capacity growth. We discovered that the rate of change in the gap from its peak in 1990 to the recent trough is smaller and the current output gap is closing gradually in line with the economic recovery that started in spring 1999, although it is still large, and its equilibrium level has been lowered.

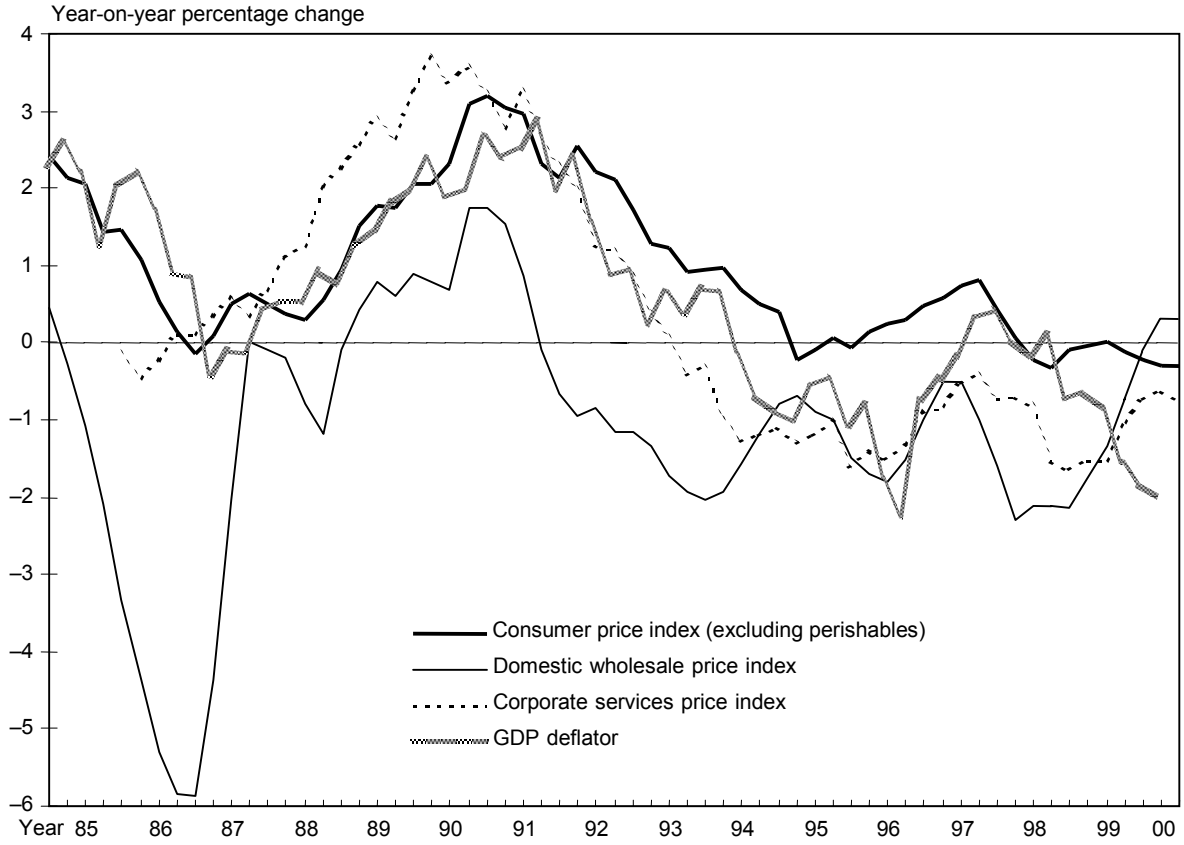
However, it is still hard to calculate "the real output gap" as large measurement errors may exist, especially in the current situation where there are structural changes in the Japanese economy. In these circumstances, we should also examine in detail the current movements of price indices to find the effects of supply side factors. Taking the output gap and the details of price indices into consideration, our conclusion is that downward pressure on prices stemming from weak demand seems to be declining significantly.

Needless to say, it is difficult to distinguish how much of the change in price levels comes from weak demand and how much from the supply side. Furthermore, price declines may have a negative impact on the economy in the short run, even though they do not come from weak demand, ie when they are induced by the closing of the gap between domestic and foreign prices. In this situation, one way to see whether the Japanese economy is under deflationary pressure is to examine the background of price behaviour from the distributive side. Currently, corporate profits are increasing without a decrease in the compensation of employees. This implies sustainability of the economic recovery under moderately declining prices.

Recently, investment in IT has started to become active in the Japanese economy. If this investment spreads throughout the economy and enhances total productivity, it will constrain price rises. Nevertheless, at present there is no clear evidence that IT is stimulating total productivity, except for enhancing productivity among IT manufacturers, especially that of the electronics machinery industry. It will also take some time before the mismatch in the labour market disappears, but when it does this too will enhance total efficiency in the economy. On the other hand, in the distribution sector, efforts to enhance productivity have started to bear fruit. This phenomenon affects prices at the consumer level, which means that consumer prices are likely to remain weak even amid economic recovery.

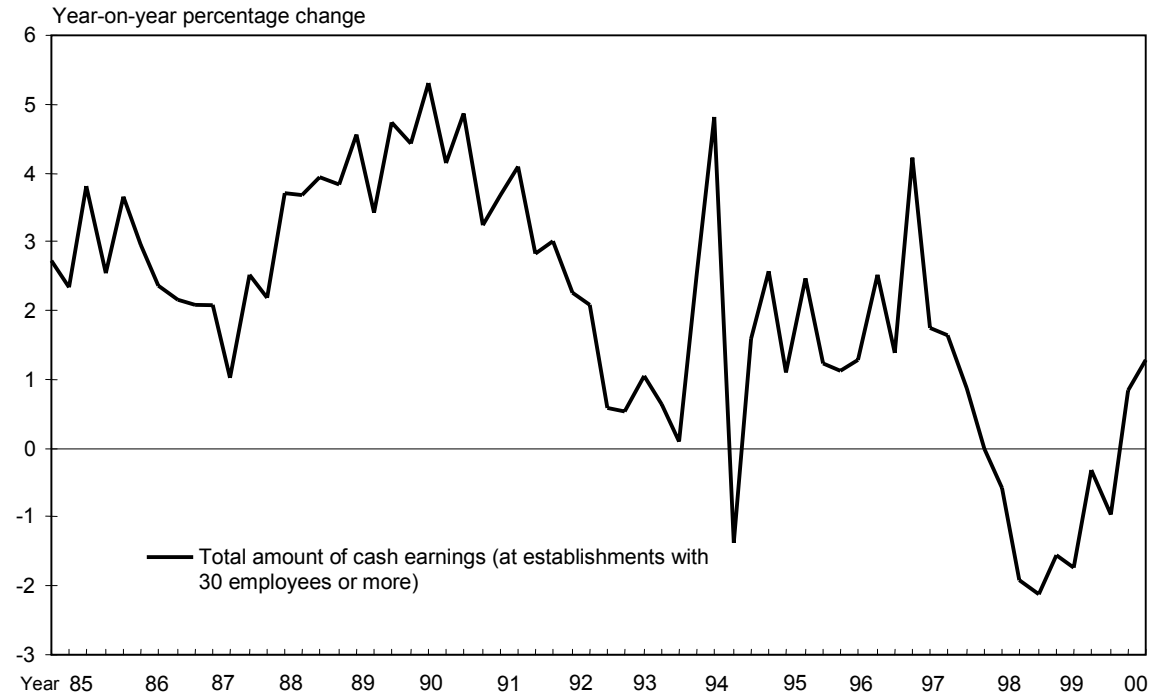
Figure 1

**Various price indices**




Notes: 1. Adjustments for the effects of the consumption tax of April 1989 are made using the level-shift dummy of X-12-ARIMA, while those for the effects of the consumption tax hike of April 1997 use the theoretical value on the assumption that prices of all taxable goods fully reflect the rise in the tax rate. (However, the GDP deflator is adjusted using the level-shift dummy for both April 1989 and April 1997.) 2. Data for 2000 Q3 CPI, Domestic WPI, and CSPI are from July.

**Reference: Nominal wages (total amount of cash earnings)**

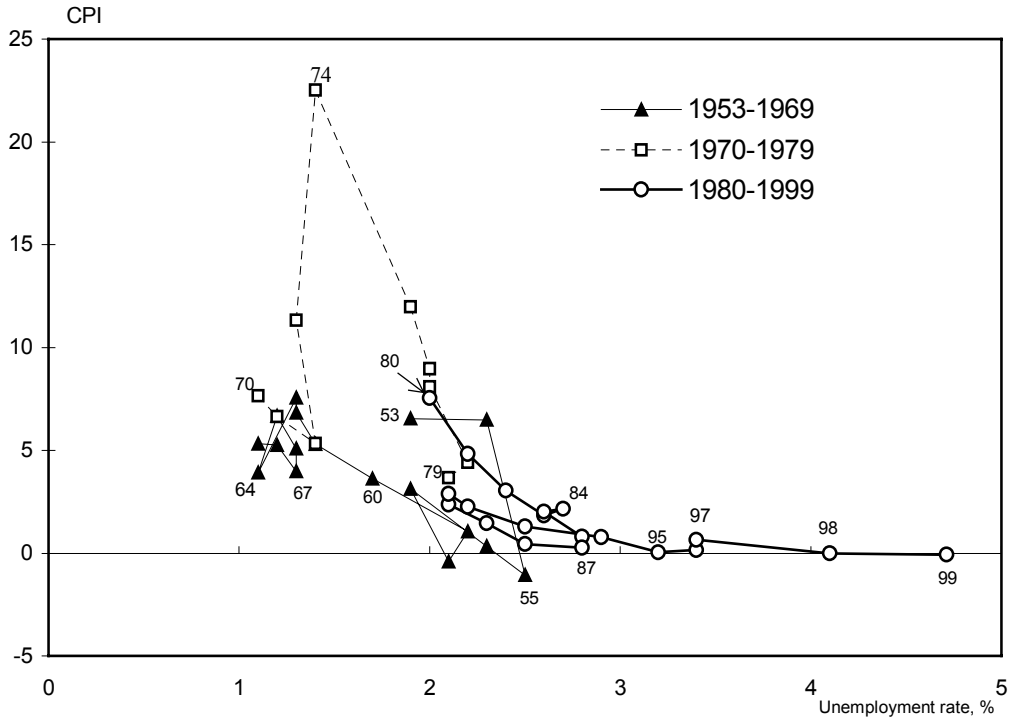



Sources: Management and Coordination Agency, *Consumer Price Index*; Bank of Japan, *Wholesale Price Indexes*; Economic Planning Agency, *National Income Statistics*; Ministry of Labour, *Monthly Labour Survey*.

Figure 2

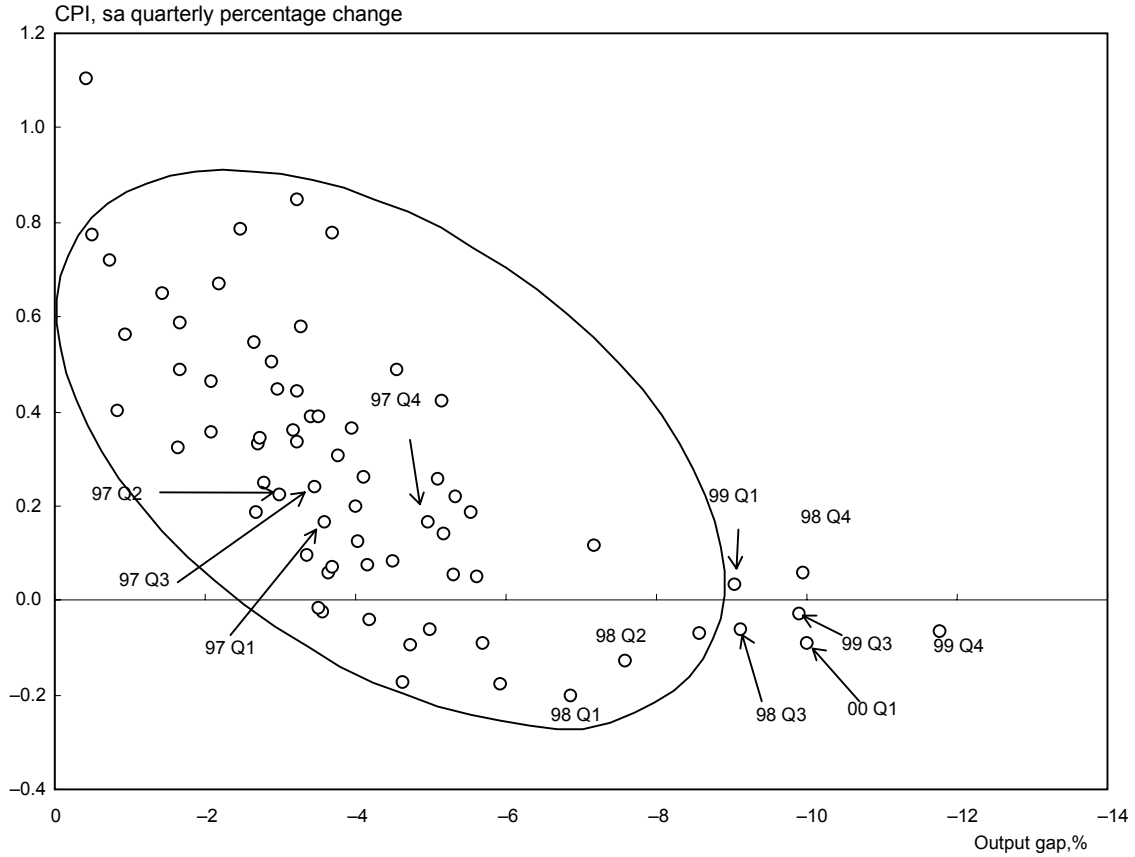
**Supply-demand gap and prices**

**1. Phillips curve of the labour market**




Note: General CPI 1953-70 = excluding inputed rent; 1971-99 = excluding perishables (adjusted for effects of comsumption tax).

**2. Output gap and inflation rate**



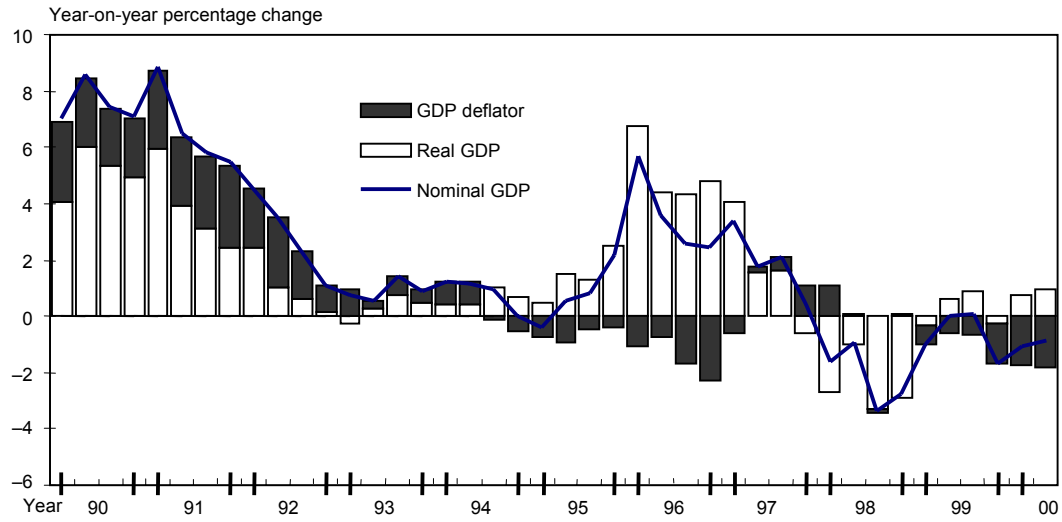

Notes: 1. Period: 1983 Q2-2000 Q1. 2. Output gap = classical output gap obtained by fixing the capacity utilisation rate of non-manufacturers (estimated by the Research and Statistics Department, Bank of Japan). CPI = General, excluding perishables (adjusted for effects of consumption tax).

Sources: Management and Coordination Agency, *Consumer Price Index, Labour Force Survey*.

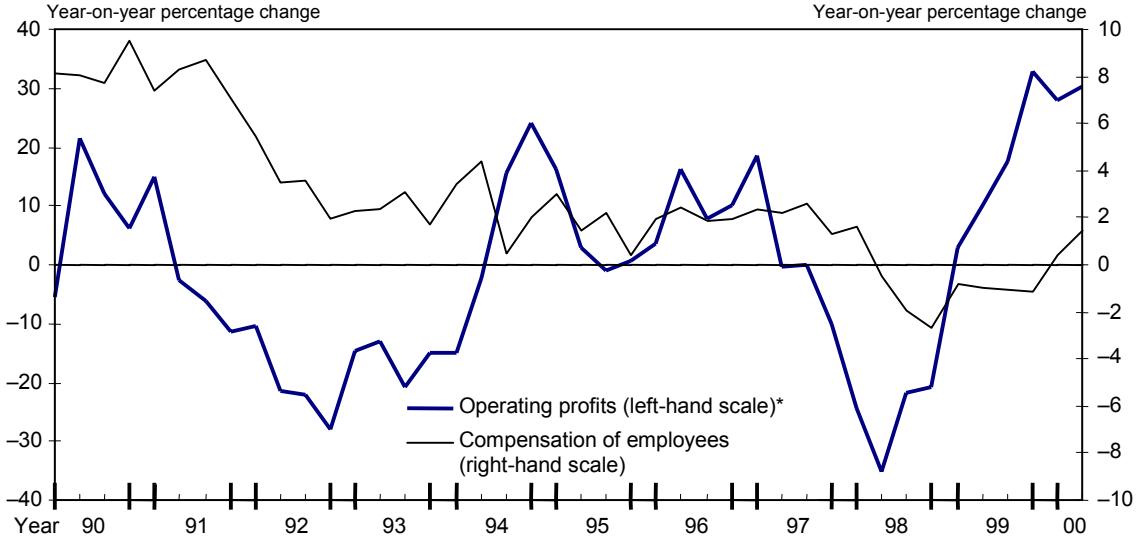
Figure 3

**Nominal GDP and profit/employment**

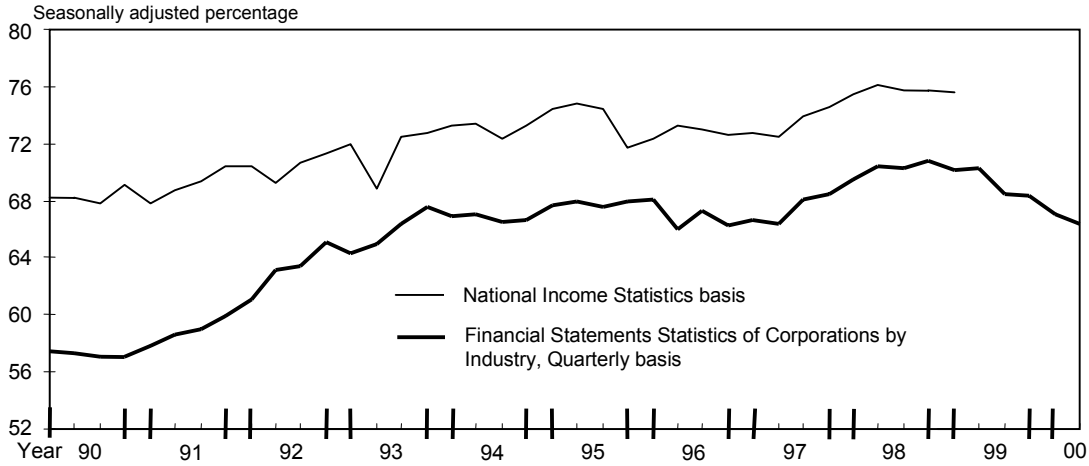
**1. Nominal GDP**




**2. Operating profits and compensation of employees**




**3. Labour share**



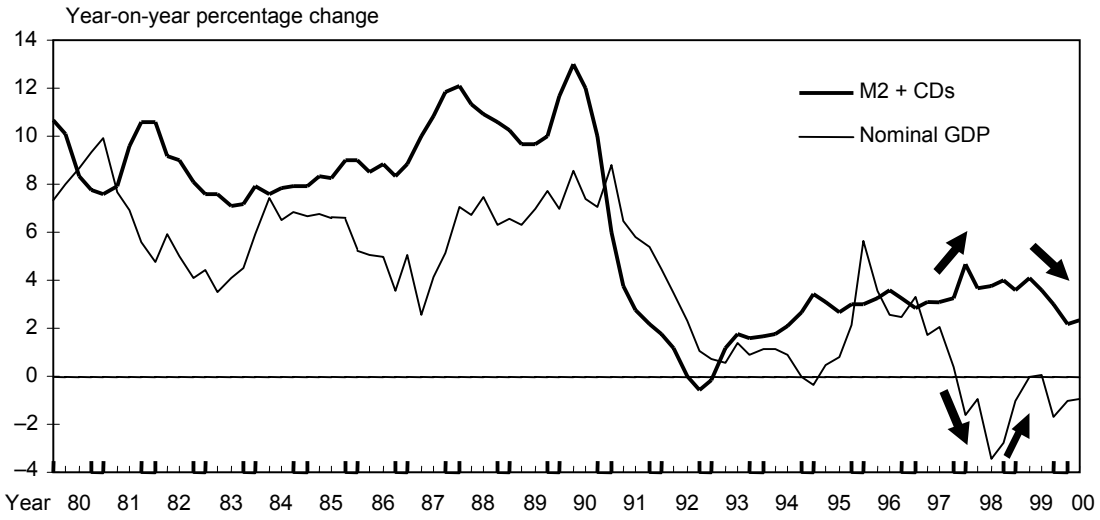

Notes: 1. Operating profits drawn from *Financial Statements Statistics of Corporations by Industry, Quarterly*. Figures of the *Financial Statements Statistics of Corporations by Industry, Quarterly* are based on all industries of all sizes (excluding large firms in medical and other services which include holding companies). Adjusted for discontinuity of data. 2. From 1999 Q1, data for compensation of employees are based on quarterly estimates. 3. Labour share (from *National Income Statistics*) = compensation of employees/ (compensation of employees + operating profits) × 100. 4. Labour share (from *Financial Statements Statistics of Corporations by Industry, Quarterly*) = personnel expenses / (personnel expenses + current profits + interest expense paid + depreciation) × 100.

Sources: Economic Planning Agency, *National Accounts*; Ministry of Finance, *Financial Statements Statistics of Corporations by Industry*, *Quarterly*.

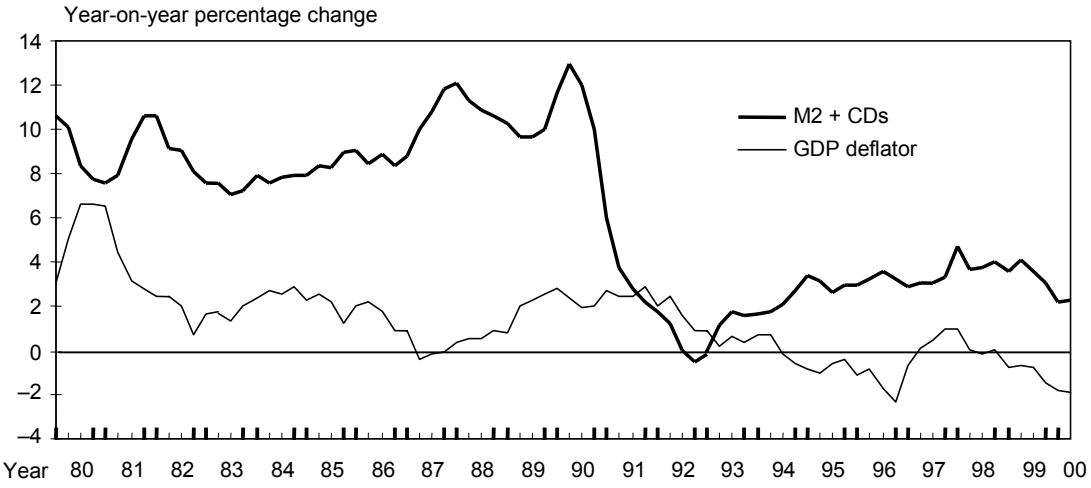
Figure 4

**Money stock, prices and GDP**

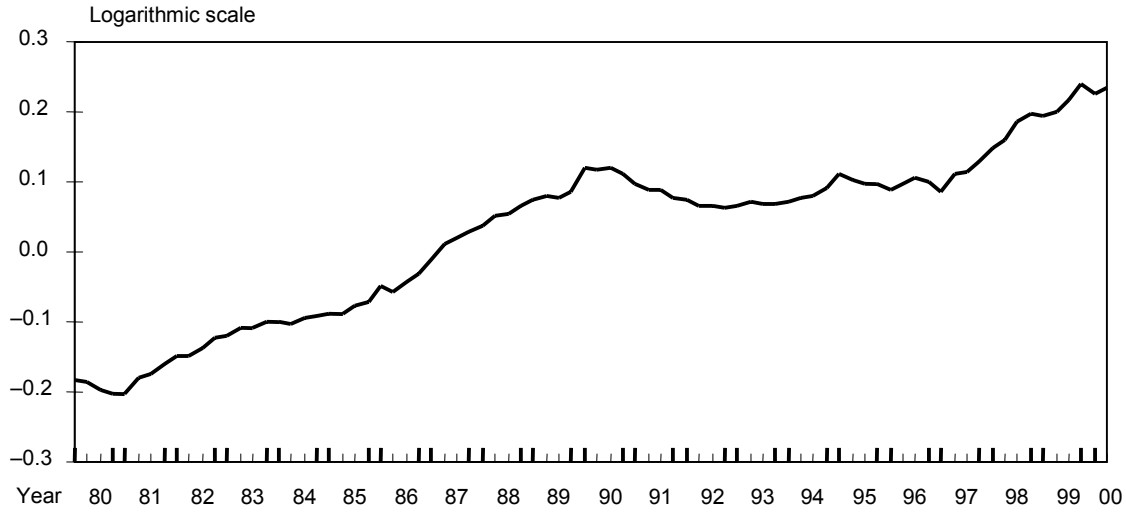
**1. M2 + CDs, nominal GDP**




**2. M2 + CD; GDP deflator**



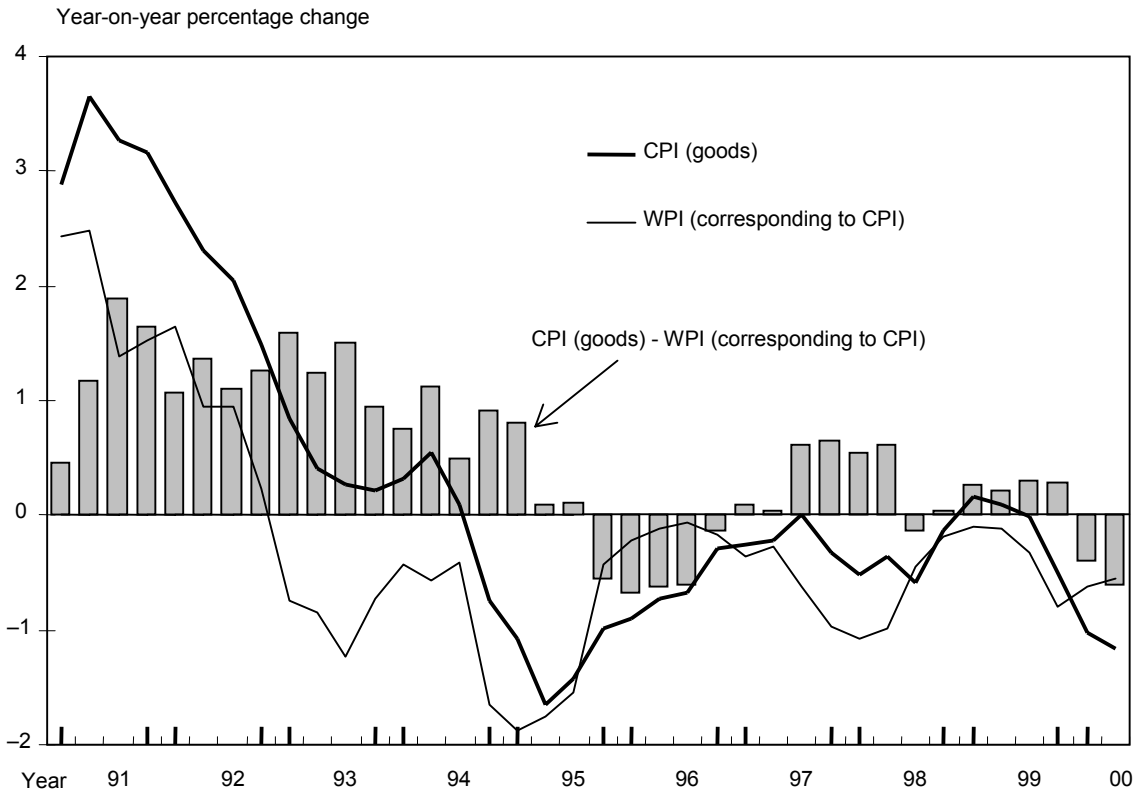

**3. Marshallian K (M2 + CDs/nominal GDP)**




Sources: Economic Planning Agency, *National Accounts*; Bank of Japan, *Financial and Economic Statistics Monthly*.

Figure 5

**CPI (goods) and WPI (corresponding to CPI)**



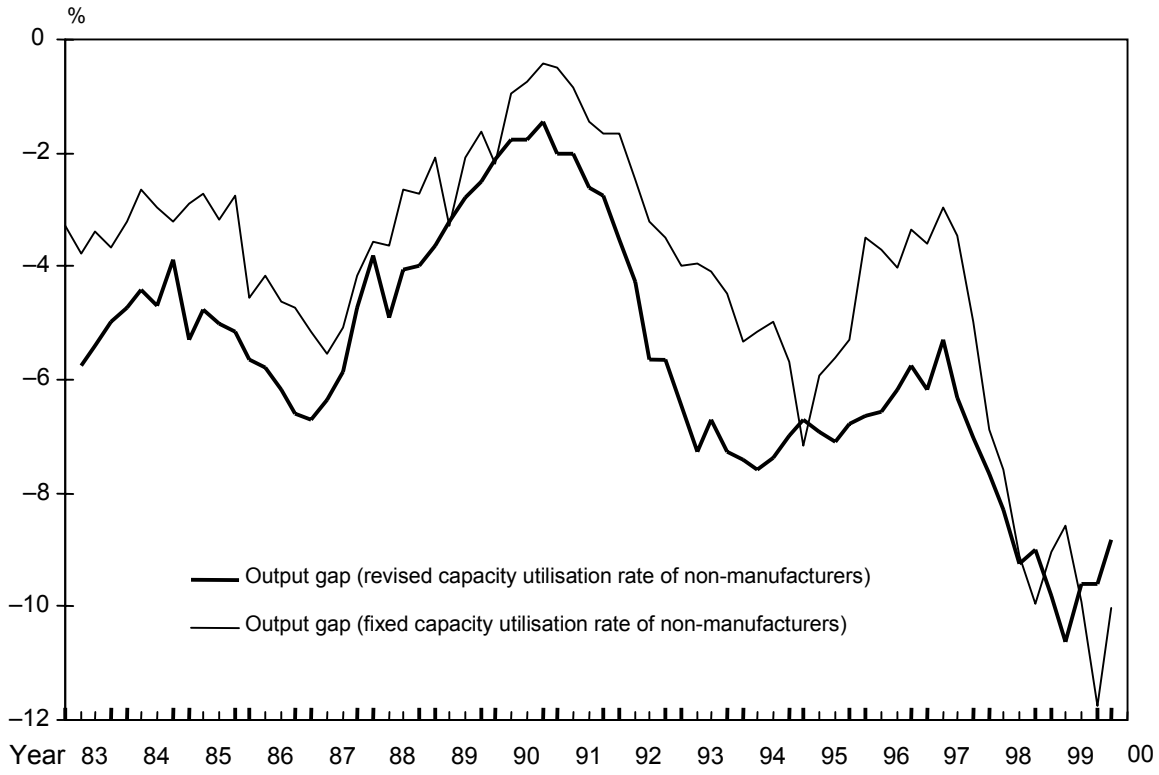

Notes: 1. WPI (corresponding to CPI) = items in the WPI that correspond to items included in CPI (goods) are weighted averages based on CPI weights. 2. Goods exclude perishables, electricity, gas and water charges and petroleum products. 3. Adjusted to exclude the effects of the consumption tax hike in April 1997.

Sources: Bank of Japan, *Wholesale Price Indexes;* Management and Coordination Agency, *Consumer Price Index*.

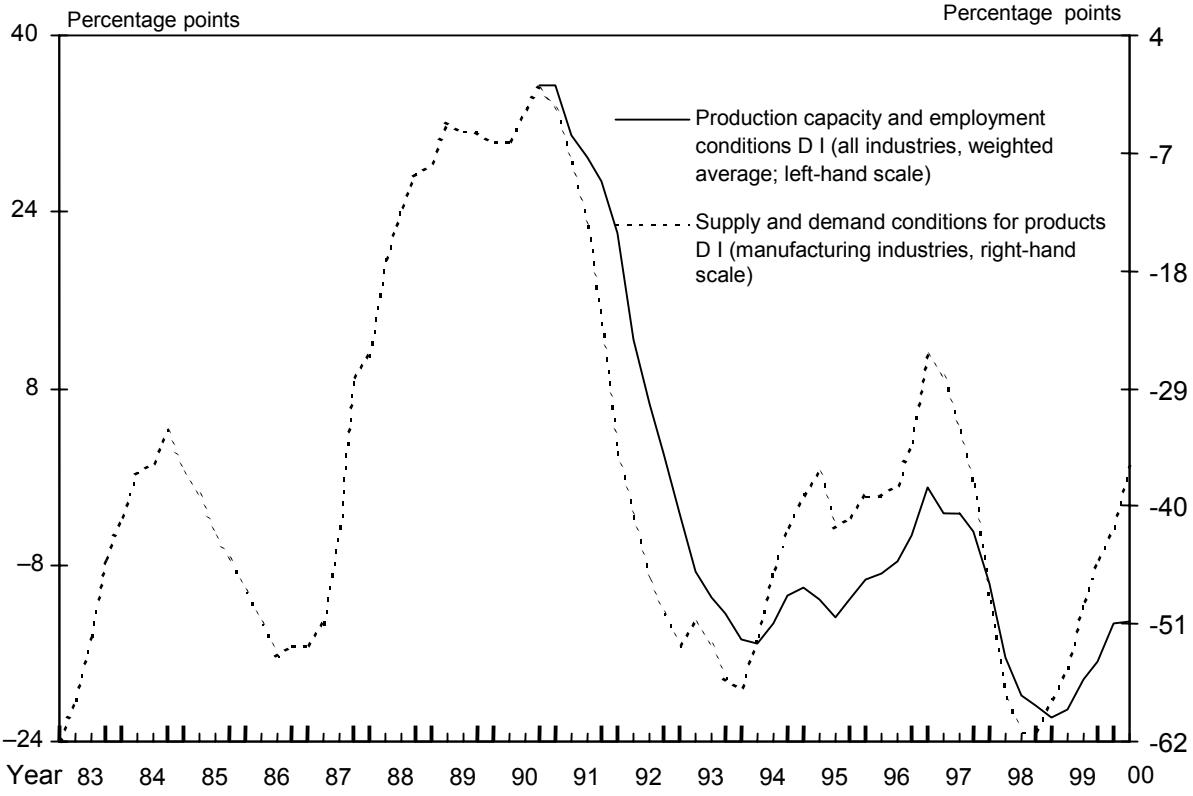
Figure 6

**Supply-demand gap**

**1. Output gap**




**2. Supply-demand gap indications (from S*hort-Term Economic Survey of All Enterprises in Japan*)**




Sources: Ministry of Finance, *Business Outlook Survey of the Ministry of Finance*; Economic Planning Agency, *National Accounts*, *Capital Stock of Private Enterprises*, *etc*; The Federation of Electric Power Companies Japan, *Electricity Demand*; Bank of Japan, *Short-Term Economic Survey of Enterprises in Japan*.

Figure 7

**Estimation method for output gap**

(Revised capacity utilisation rate of non-manufacturers)

1. Estimation of total factor productivity (TFP)

(1) Assume the Cobb-Douglas production function

$$Y_t = A_t \cdot (H_t \cdot L_t)^{1-\alpha} \cdot (Om_t \cdot Km_{t-1} + Oo_t \cdot Ko_{t-1})^{\alpha}$$

$Y_t$: real GDP, $A_t$: TFP, $H_t$: total hours worked, $L_t$: number of workers employed,

$\alpha$: capital share ratio, $Om_t$: capacity utilisation rate (manufacturing),

$Km_t$: capital stock (manufacturing), $Oo_t$: capacity utilisation rate (non-manufacturing),

$Ko_t$: capital stock (non-manufacturing)

(2) Calculation of TFP

Obtain TFP (A*t*) by taking the logarithm on both sides of the equation and then subtracting the contribution of capital and labour from GDP

$$\ln A_t = \ln Y_t - (1-\alpha) \cdot \ln(H_t \cdot L_t) - \alpha \cdot \ln(Om_t \cdot Km_{t-1} + Oo_t \cdot Ko_{t-1})$$

2. Calculation of potential GDP

Potential GDP = GDP produced using both maximised capital and labour. Then, substitute the maximum input amount of each production factor of capital and labour into the production function calculated in 1.

$$QN_t = A_t \cdot (H\,max_t \cdot L\,max_t)^{1-\alpha} \cdot (Om\,max_t \cdot Km_{t-1} + Oo\,max_t \cdot Ko_{t-1})^{\alpha}$$

$QN_t$: potential GDP, $A_t$: TFP, $Hmax_t$: maximum total hours worked,

$Lmax_t$: maximum number of workers employed, $\alpha$: capital share ratio,

$Ommax_t$: historical maximum value of capacity utilisation rate (manufacturing),

$Km_t$: capital stock (manufacturing),

$Oomax_t$: historical maximum value of capacity utilisation rate (non-manufacturing),

$Ko_t$: capital stock (non-manufacturing)

3. Calculation of the output gap

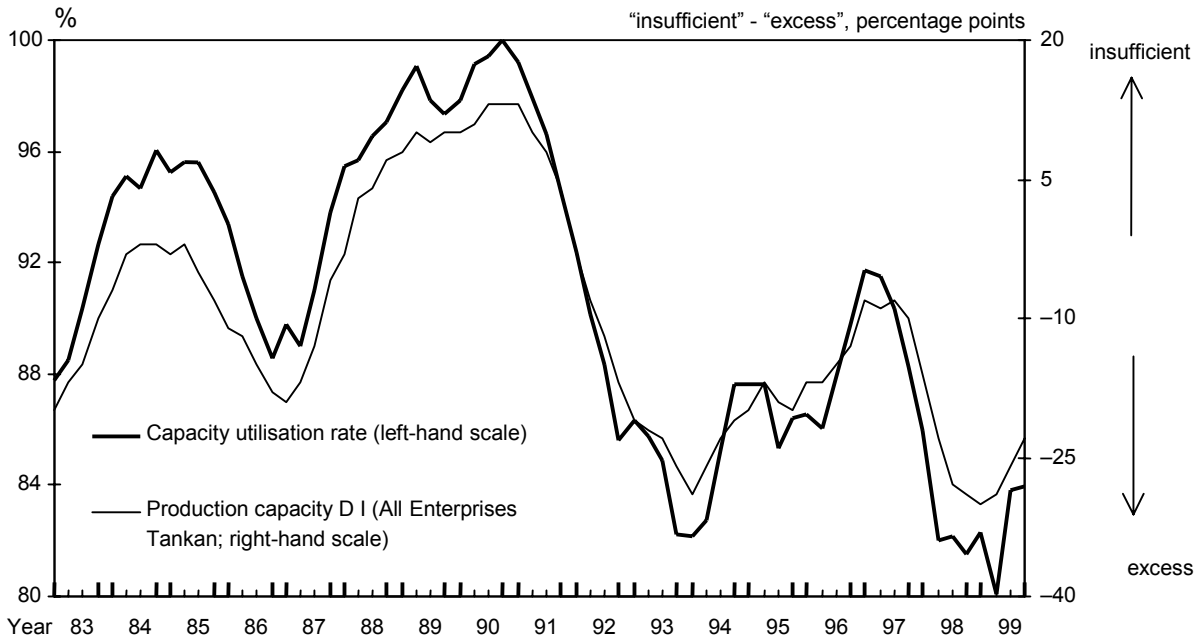
Calculate the output gap using the rate of divergence between GDP and potential GDP.

$$GAP_t = \frac{GDP_t}{QN_t} \cdot 100 - 100$$

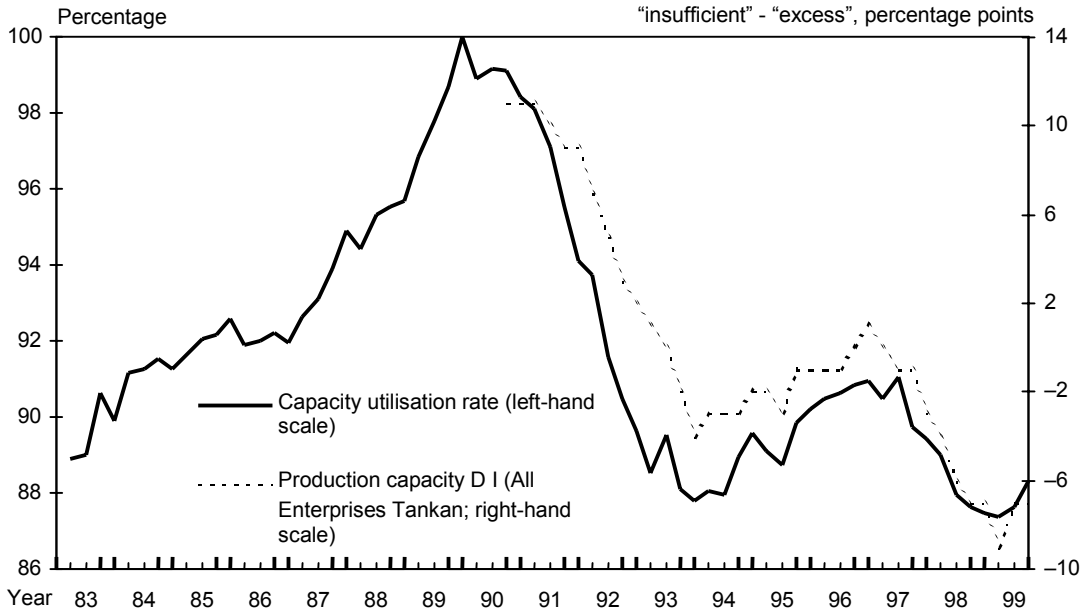
Figure 8

**Capacity utilisation rate (output gap estimation)**

**1. Capacity utilisation rate of manufacturers**




**2. Capacity utilisation rate of non-manufacturers**




Note: Capacity utilisation rate: historical maximum value = 100.

**Estimation method for capacity utilisation rate (non-manufacturing)**

1. Regress commercial power unit on BSI and make it level using the parameter.
(Estimation)

Commercial power unit = 487.3 + 2.10 × Trend + 4.72 × BSI + $\varepsilon$
(130.3) (24.7) (11.1)

Estimation period : 1983 Q2-1999 Q4, Adj-$R^2$: 0.90, D W ratio: 0.58

Unit of electric power for business use:
commercial unit = commercial electricity consumption/commercial power contracts.

Trend: linear trend during the estimation period.

2. From the estimation result, the capacity utilisation rate of non-manufacturers is obtained by:
capacity utilisation rate of non-manufacturers = (487.3 + 4.72 × BSI)/max (487.3 + 4.72 × BSI) × 100.

Figure 9

**Estimation of the Phillips curve using the output gap**

**Estimation**

$$\pi_t = \mu + \beta \cdot \pi_{t-1} + \lambda \cdot GAP_t + \delta \cdot WPIIM_t$$

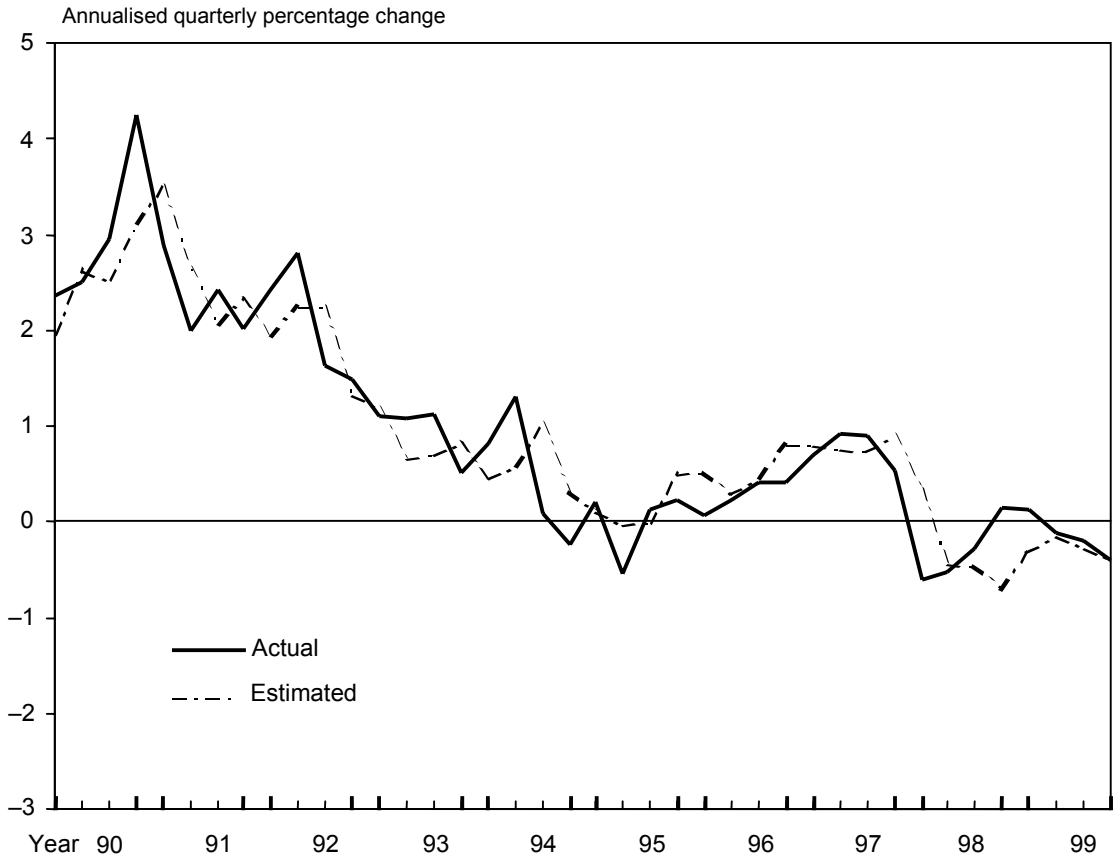
Estimation period: 1983 Q3-1999 Q4

| | |
|---|---|
| $\pi_t$: | quarter-to-quarter trend cycle of the CPI (annualised) |
| $GAP_t$: | output gap (revised version incorporating the capacity utilisation rate of non-manufacturers) |
| $WPIIM_t$: | import prices (wholesale prices, yen basis, total average);quarterly percentage change (annualised) |

**Estimation results**

| μ | β | λ | δ | Adj-$R^2$ | Durbin's h |
|---|---|---|---|---|---|
| 1.172 | 0.672 | 0.143 | 0.010 | 0.801 | 0.596 |
| (3.89) | (8.19) | (3.52) | (3.38) | | |

Note: figures in brackets are t-values.

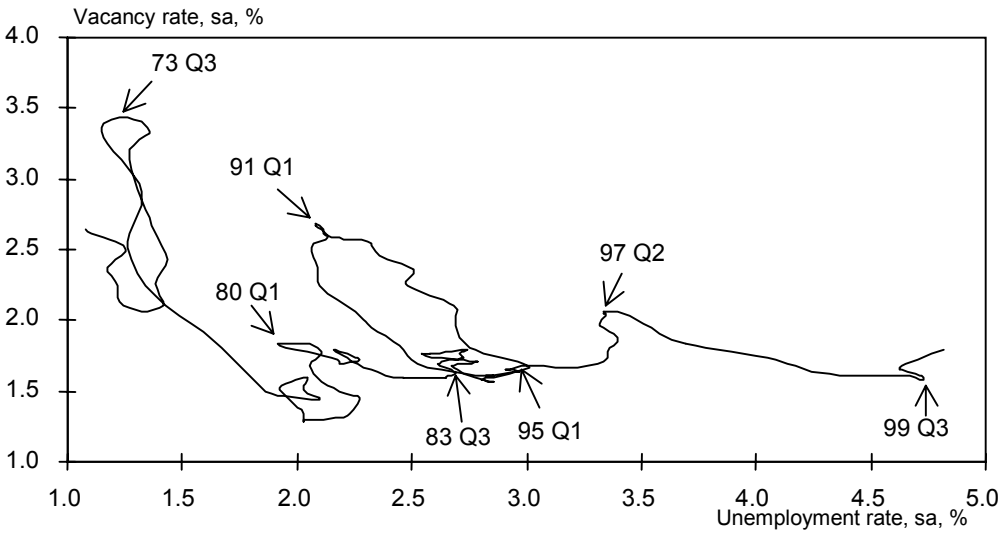



Sources: Economic Planning Agency, *National Accounts, Gross Capital Stock of Private Enterprises, etc;* Management and Coordination Agency, *Consumer Price Index*; Bank of Japan, *Wholesale Price Indexes*.

Figure 10

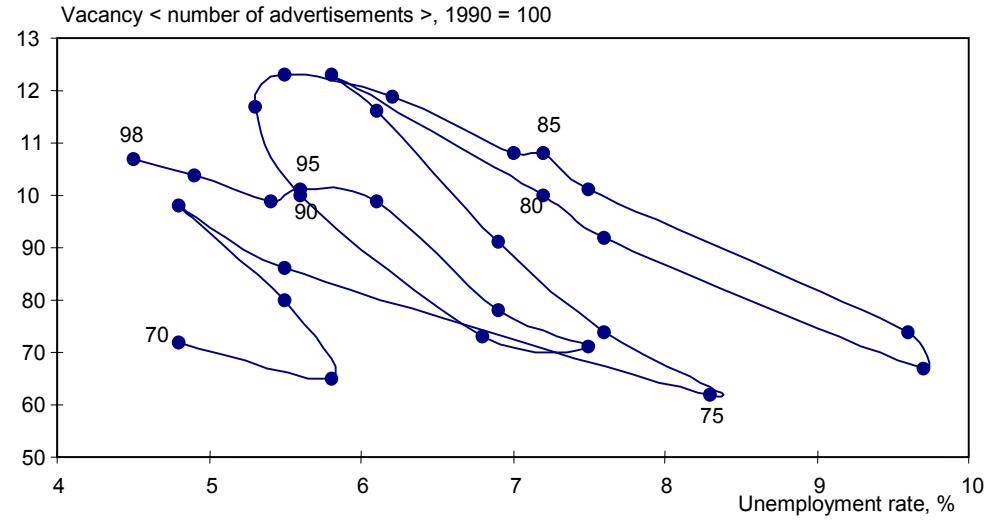
**Beveridge curve**

**1. Beveridge curve (Japan)**



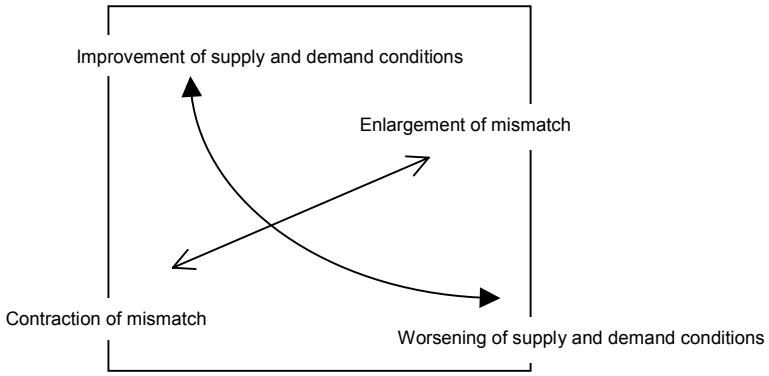

Notes: 1. Period: 1970 Q1-2000 Q1. 2. Vacancy rate = 100 × (number of job offers - number of placements)/(number of job offers - number of placements + number of workers employed).

**2. Beveridge curve (United States)**




Notes: 1. Period: CY1970-CY1998. 2. Unemployment rate is the "standardised unemployment rate" (compiled by the OECD).

**Reference: Beveridge curve**

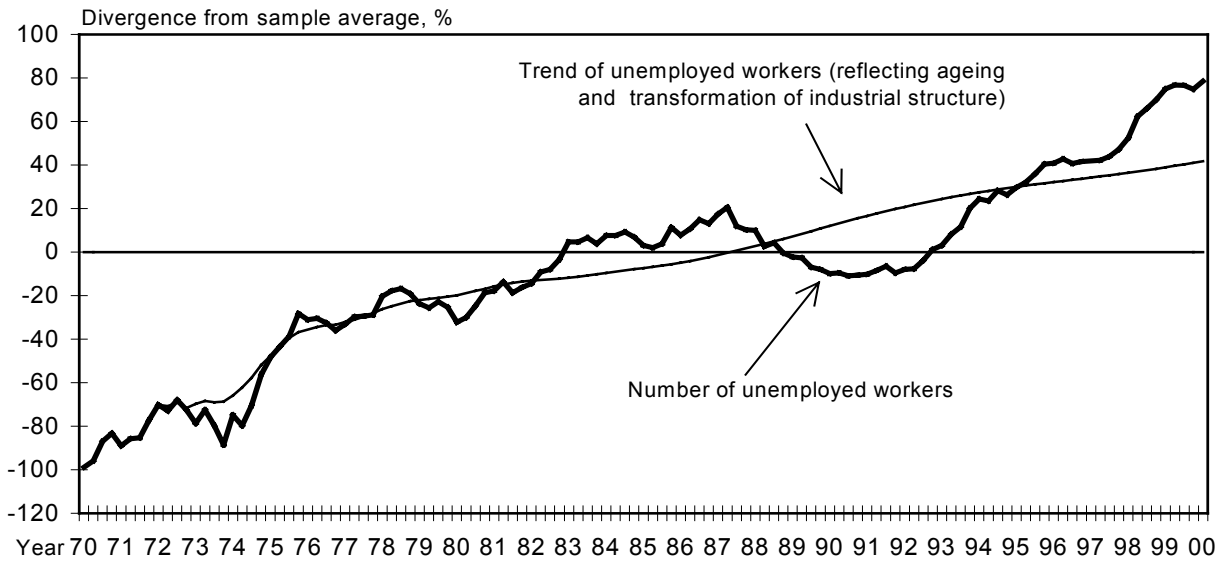



Sources: Management and Coordination Agency, *Labour Force Survey*; Ministry of Labour, *Report on Employment Service*, *White Paper on Labour 1999*.

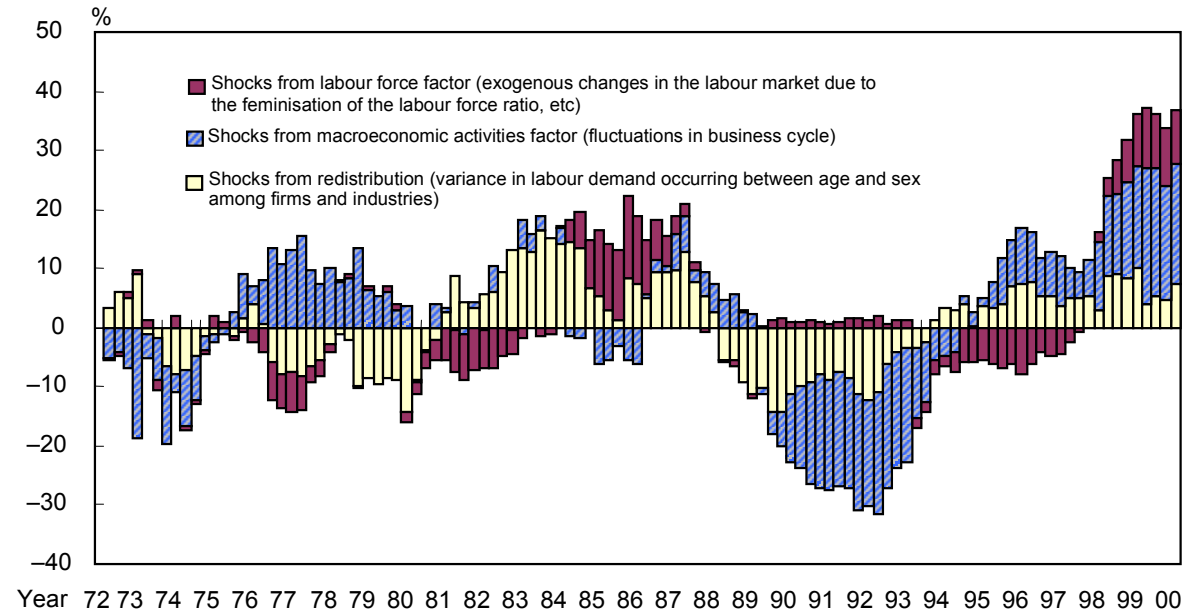
Figure 11

**Breakdown of changes in the number of unemployed workers**

**1. Standardised number of unemployed workers and the trend**




**2. Breakdown of divergence of unemployed workers from the trend**



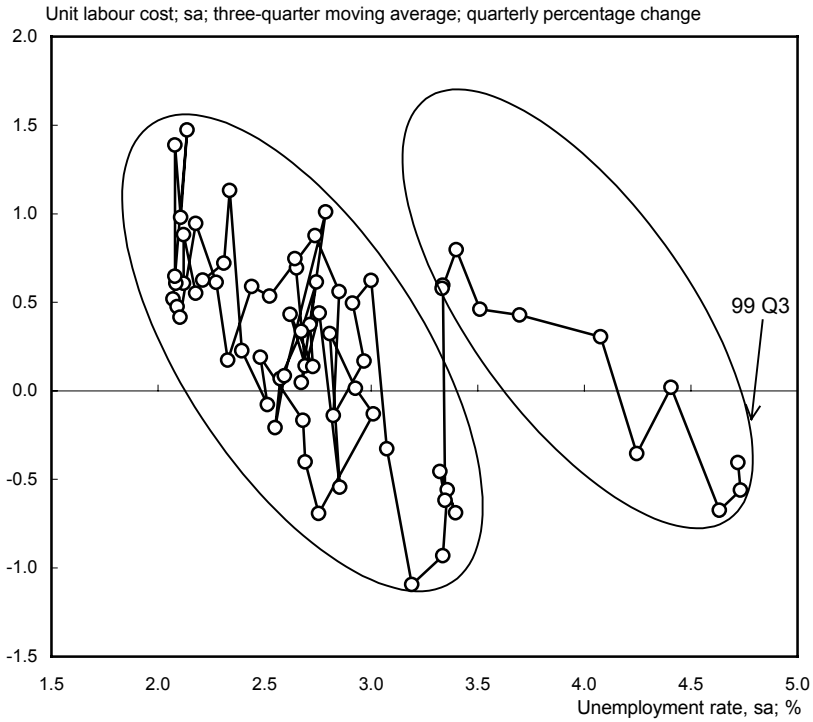

Notes: 1. In order to simplify the analysis, the numbers of unemployed workers, employed workers and vacancies are standardised by dividing them by the sample average and taking the natural logarithm. 2. The breakdown method is: (1) the reduced form VAR of the standardised numbers of unemployed workers, vacancies, and employed workers using the method in note 1 is estimated. The answer obtained is the deterministic trend (long-run hysteresis) reflecting ageing and the transformation of the industrial structure. (2) The random shock to the labour market is divided into three types: shocks from macroeconomic activities<negative correlation between the number of unemployed workers and the number of vacancies>; shocks from redistribution<positive correlation between the number of unemployed workers and the number of vacancies>; shocks from the labour force<number of unemployed workers changes but the number of vacancies is unchanged>. By using the divergence (residual) from the trend obtained in (1), the following two constraints are added: "each shock satisfies the characteristics in the square brackets and does not correlate with the others", and "the unemployment rate and the vacancy rate both move in the same direction as the redistribution shock for at least nine months". Then each shock is broken down. (3) Assume each shock is 0 and obtain the divergence between the actual value and the value calculated from the assumption. The divergence gap is the contribution to each shock.

Sources: Management and Coordination Agency, *Labor Force Survey*; Ministry of Labour, *Report on Employment Service*; Nishizaki (2000) "Waga kuni no bebarijji kyokusen ni tsuite (The Beveridge Curve in Japan)"; Research and Statistics Department, Bank of Japan, *Working Paper Series*, forthcoming.

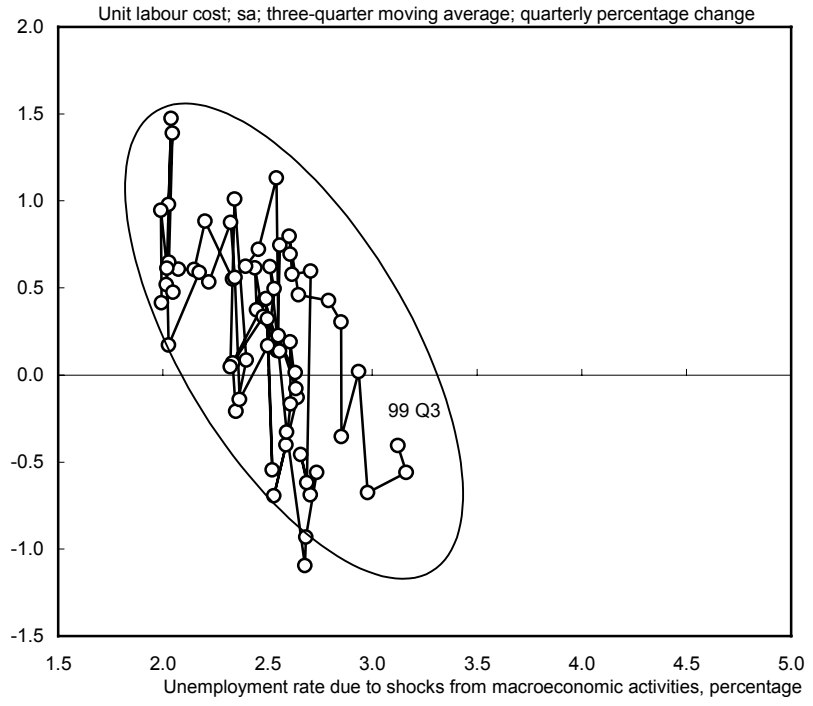
Figure 12

## Relationship between unemployment rate and wages (unit labour cost)

**1. Relationship between unemployment rate and unit labour cost**




**2. Relationship between unemployment rate and unit labour cost due to shocks from macroeconomic activities**

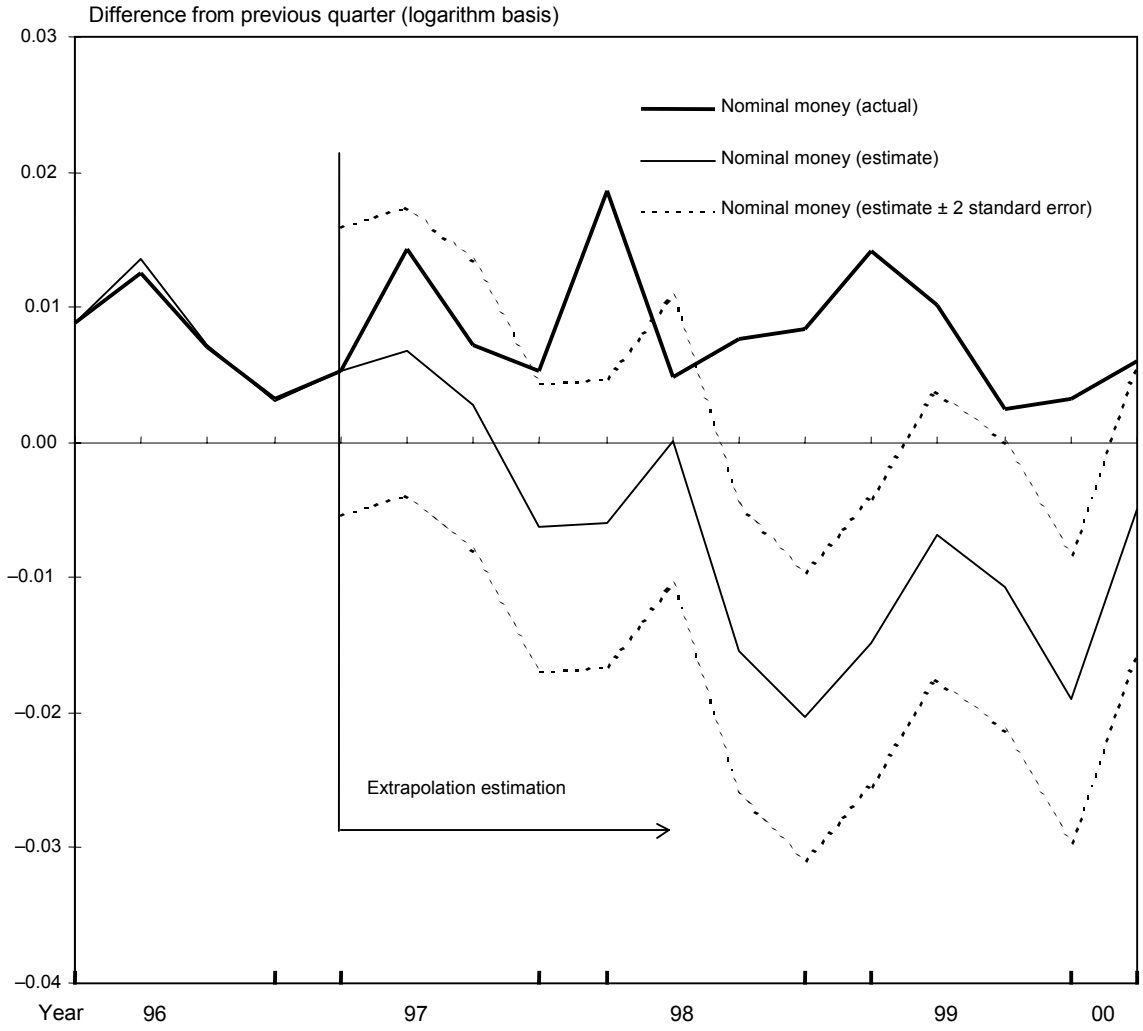



Notes: 1. Unit labour cost = compensation of employees/real GDP. 2. Unemployment rate due to shocks from macroeconomic activities = number of unemployed workers due to shocks from macroeconomic activities/number of employed workers due to shocks from macroeconomic activities. 3. The numbers of unemployed workers and employed workers due to shocks from macroeconomic activities are calculated by using the method in note 2 of Figure 11 and converting the contribution to macroeconomic activities into the number of people. 4. Period: 1983 Q1-1999 Q3.

Sources: Management and Coordination Agency, Labor Force Survey, Ministry of Labour, Report on Employment Service; Economic Planning Agency, National Income Statistics; Nishizaki (2000) "Waga kuni no bebarijji kyokusen ni tsuite (The Beveridge Curve in Japan), Research and Statistics Department, Bank of Japan, Working Paper Series, forthcoming.

Figure 13

**Projections on money using a five-variables VECM**

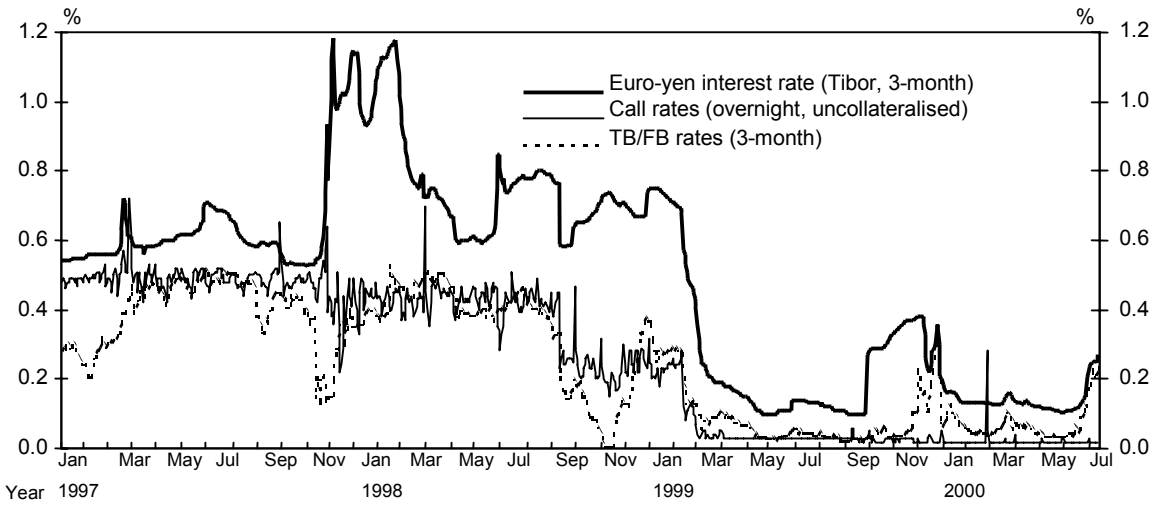



Note: the five variables are nominal money (M2 + CDs), real GDP, GDP deflator, real stock prices (deflate Tokyo Stock Price Index by GDP deflator), real long-term government bond yield (10-year). Using this five-variable VECM (sample period: 1972 Q1-1996 Q4), and results obtained from the extrapolation estimation (1997 Q1-2000 Q1), the changes in nominal money are plotted. Figures used are original series estimated using a seasonal dummy. (Number of lags is set as eight.)

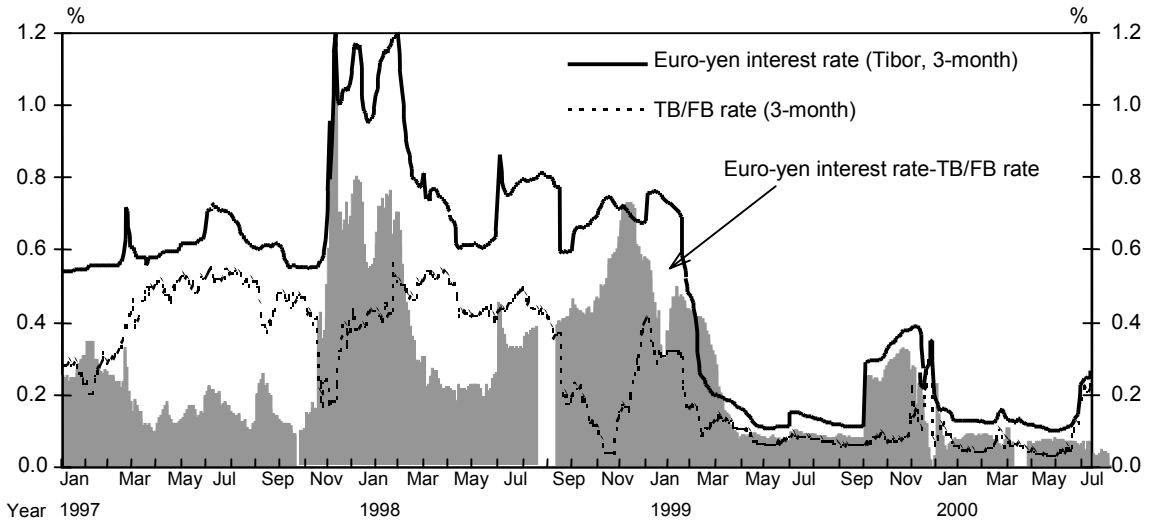
Figure 14

**Short-term money market and anxiety over fund management**

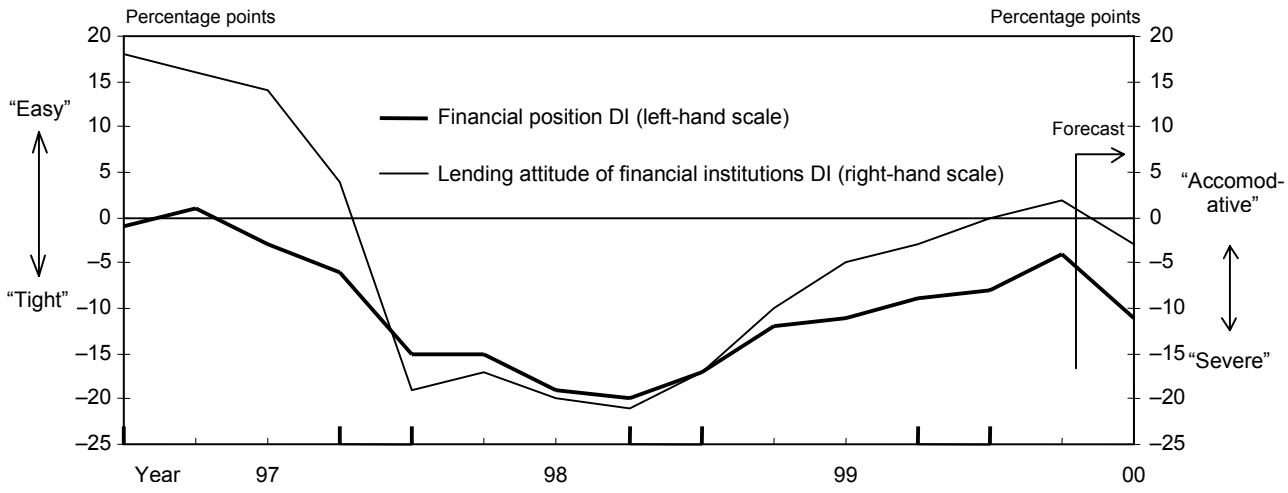
**1. Interest rate on term instruments**




**2. Spread of euro-yen interest rate and TB rate**




**3. Financial position D I and lending attitude of financial institutions D I (all firms, all industries)**

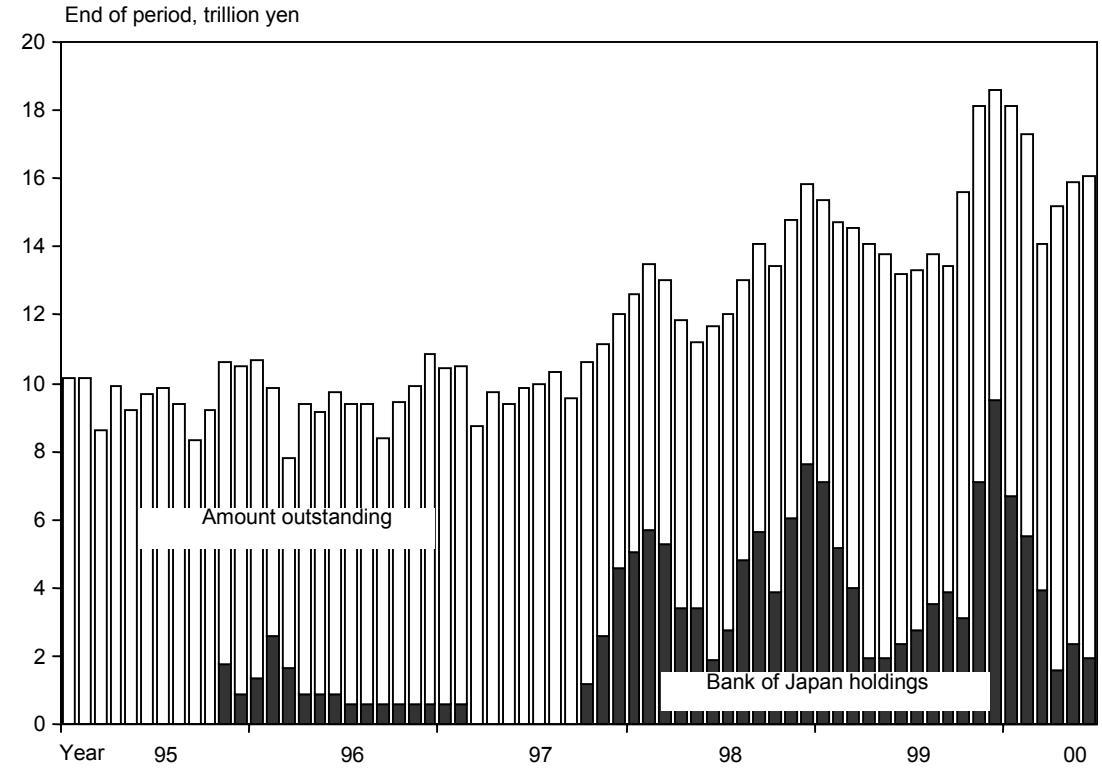



Sources: Bank of Japan, Tankan *Short-Term Economic Survey of Enterprises in Japan*; Japanese Bankers Association; Japan Bond Trading Co, Ltd.

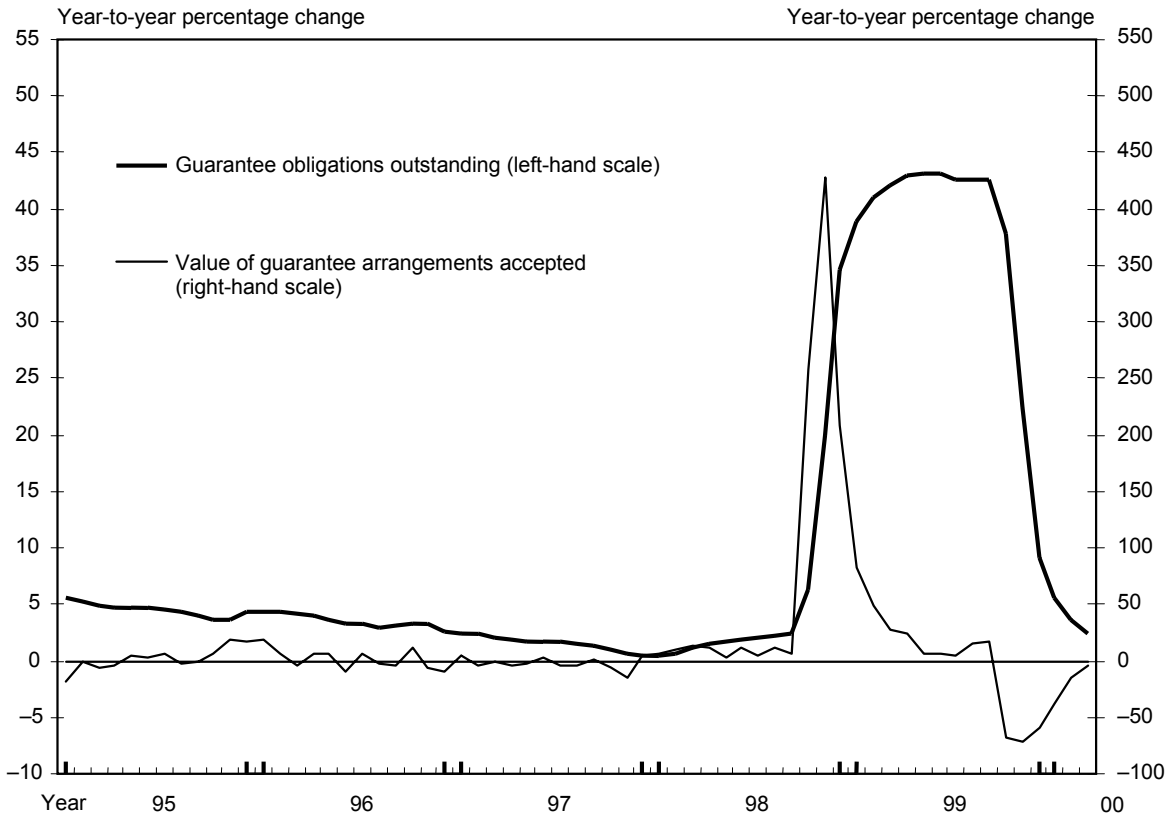
Figure 15

**CP operations and credit guarantees**

**1. Amount outstanding of commercial paper**




**2. Credit guarantees outstanding**




Note: Figures are those of client financial institutions of the Bank of Japan. Excludes those issued by banks.

Sources: National Federation of Credit Guarantee Corporations, *Activities of Credit Guarantee Corporations*; Bank of Japan, *Financial and Economic Statistics Monthly*.

Figure 16

**Economic growth rate and prices**

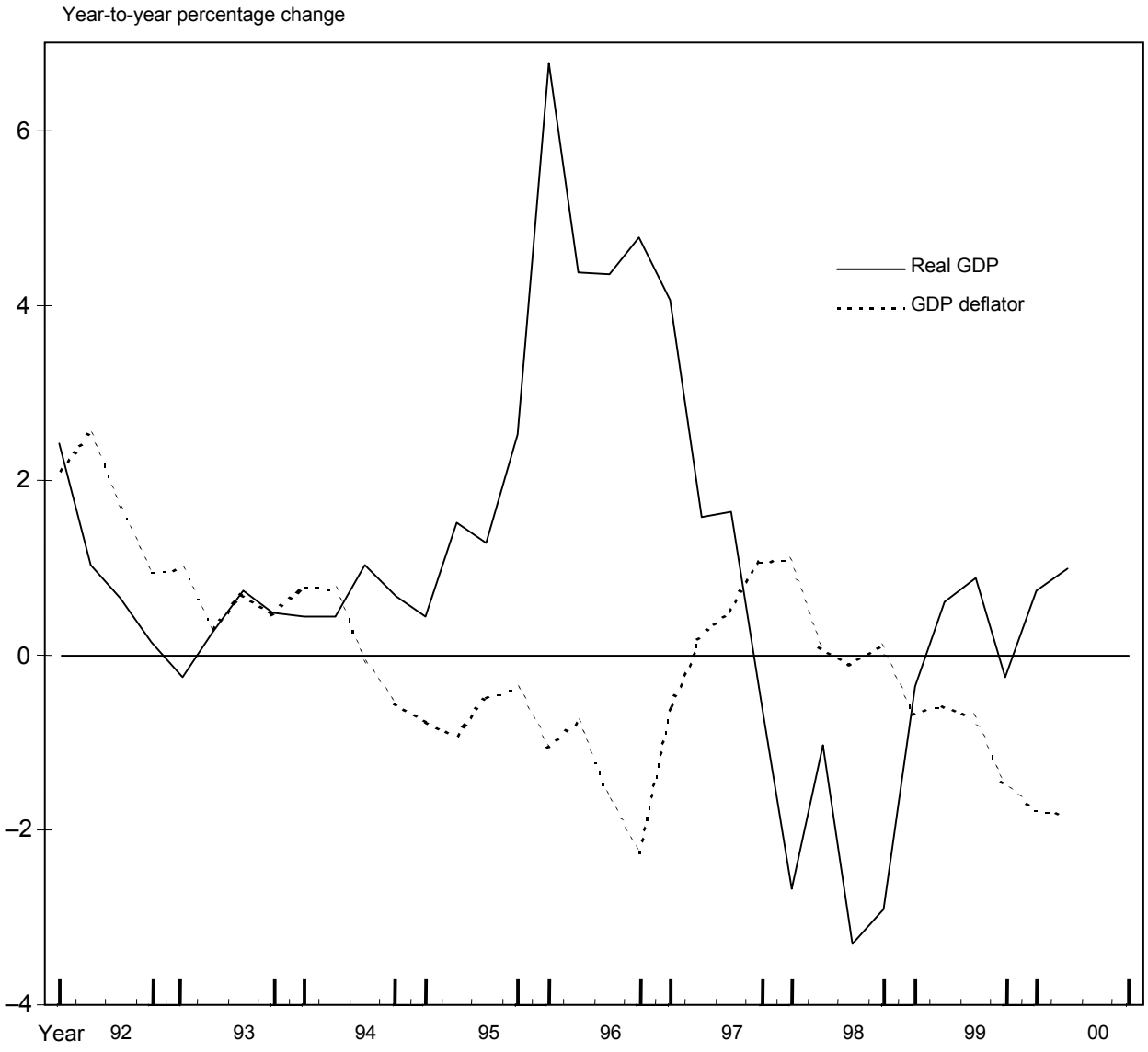
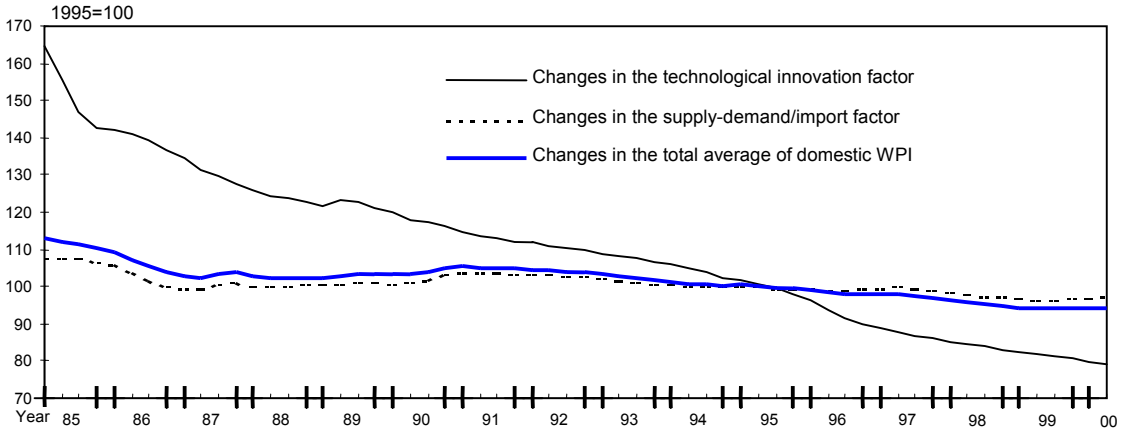


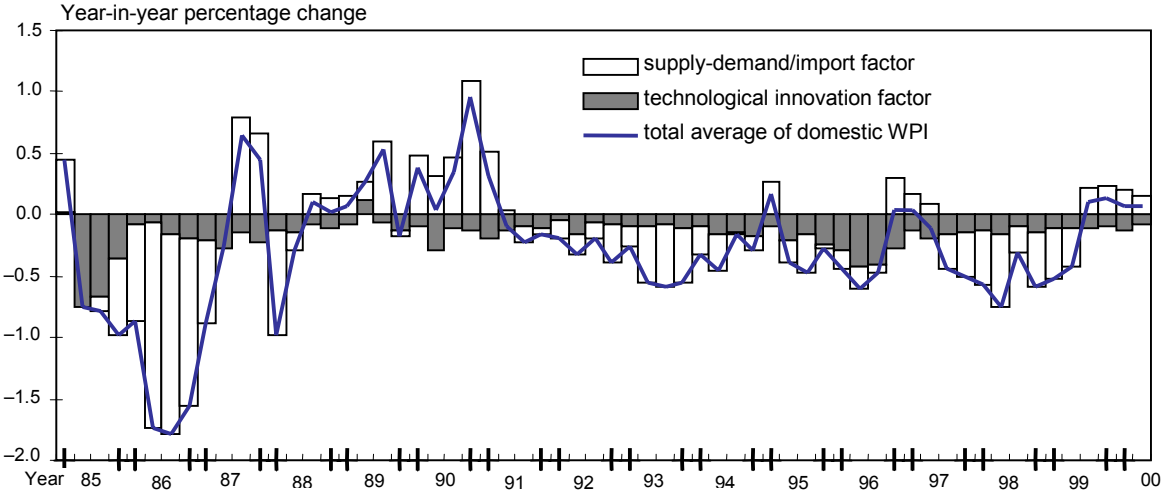
Figure 17

## Wholesale price index (technological innovation factor)

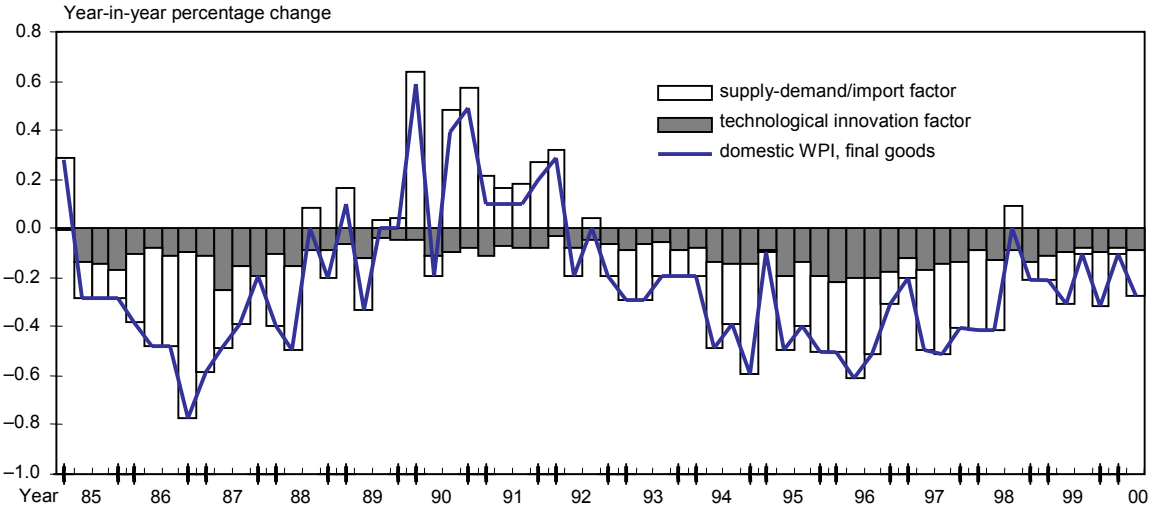
**1. Technological innovation and supply-demand factor**




**2. Breakdown of fluctuations in the wholesale price index**




**3. Breakdown of fluctuations in final goods of the wholesale price index**



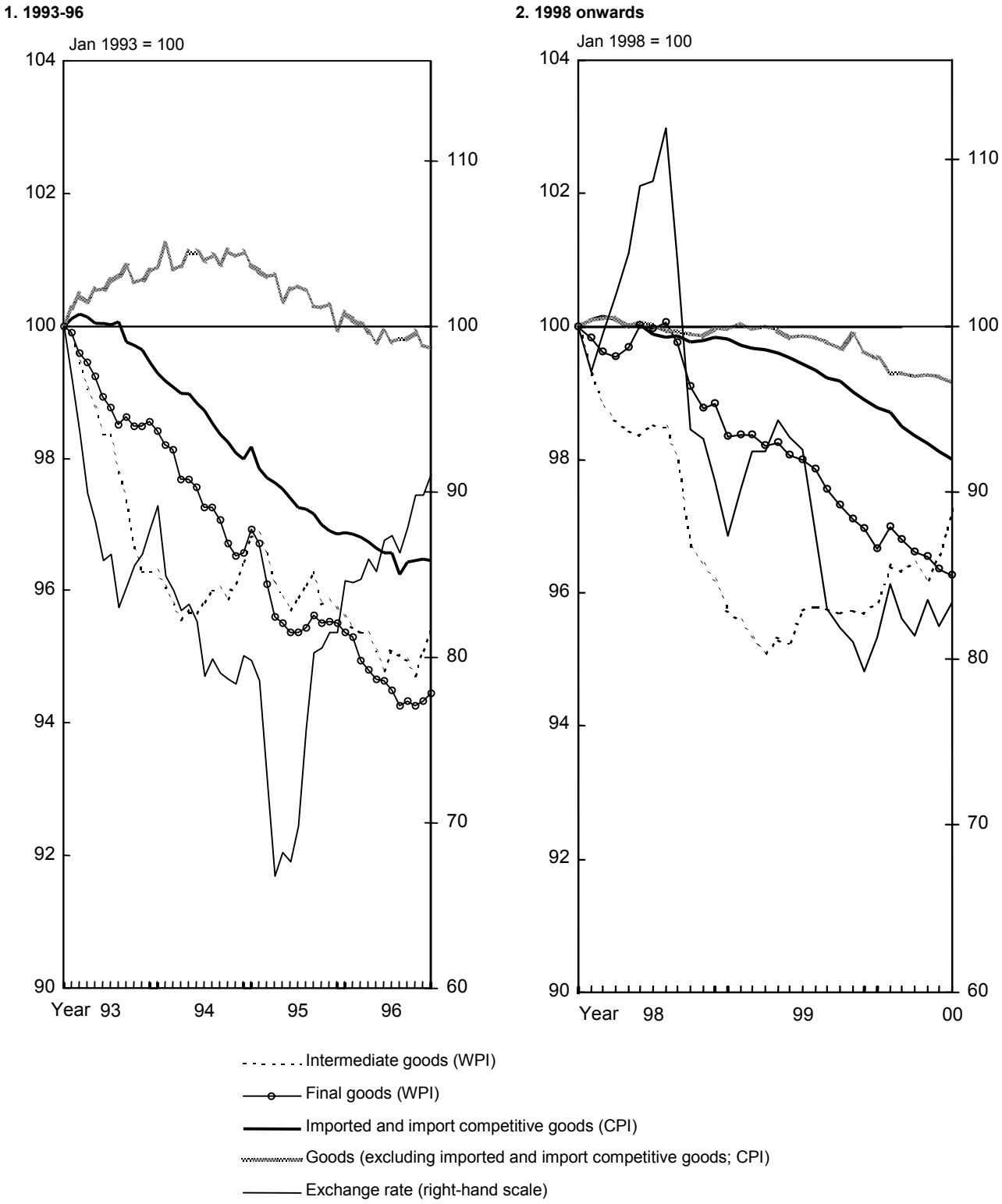

Calculation method: (1) From the domestic WPI, items are chosen of which price fluctuations are mainly due to adjustments reflecting the enhancement of the quality of the item at the time the item is changed (production cost method or hedonic regression approach). There are 72 items on the 1995 base and the weight is 164.3 (1/1000). Most of the items chosen are machinery-related items. For items prior to 1994 on the previous base, similar items are chosen from the 1995 base. (2) The overall fluctuation is calculated from the weighted average of the fluctuation in each chosen item. Then the figure converted into an index (1995=100) is defined as the technological innovation factor index. (3) Supply-demand/import factor index = domestic WPI - technological innovation factor index. (4) Final goods of domestic WPI (69 items, weight 126.3<1/1000>) are also calculated using the same method.

Note: Domestic WPI is based on the total average (excluding the effects of seasonal changes in electricity rates). Adjusted for effects of the consumption tax.

Source: Bank of Japan, *Wholesale Price Indexes*.

Figure 18

**Comparison of prices**

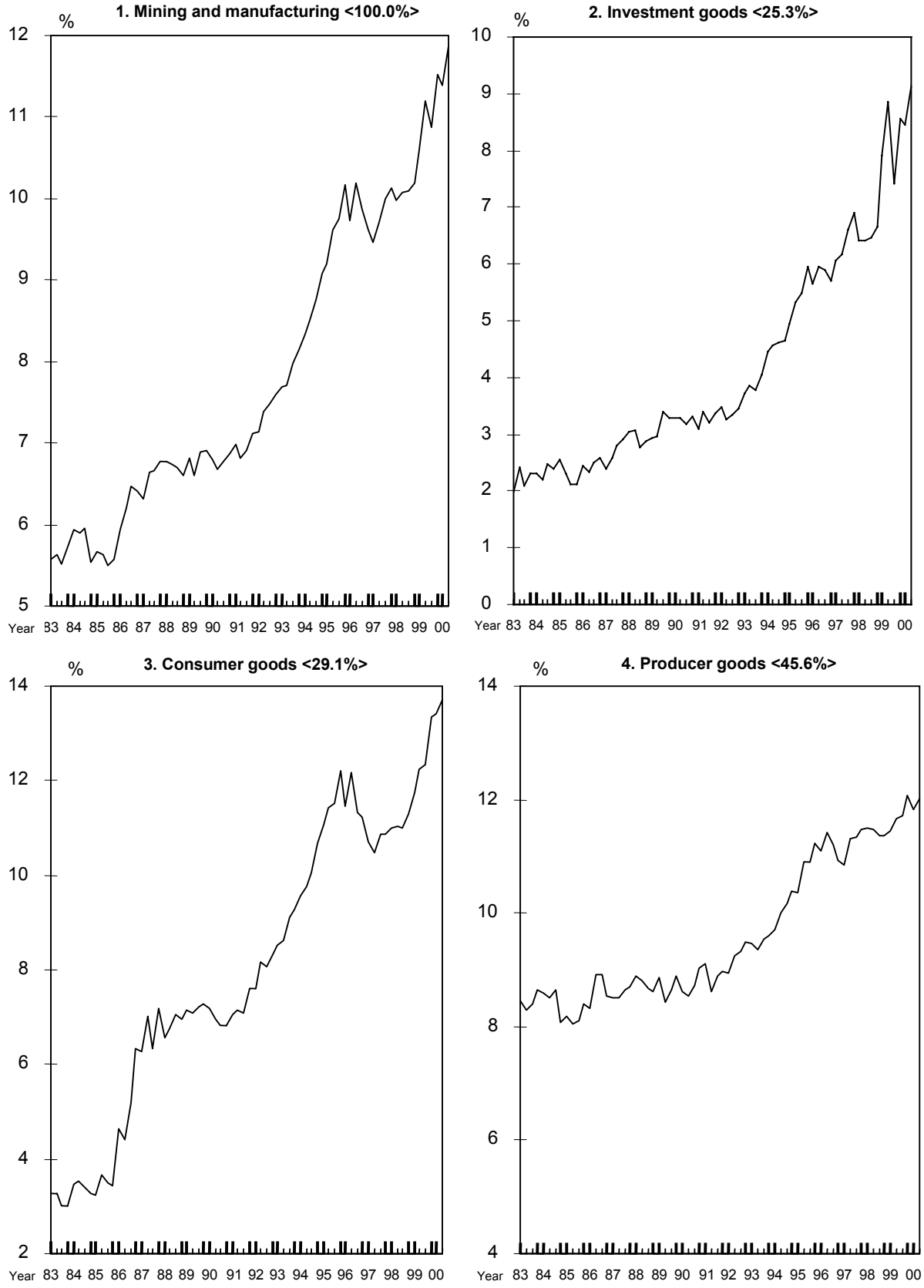



Notes: 1. The effects of the consumption tax are adjusted for both the WPI and the CPI. Data for the CPI are seasonally adjusted. 2. Imported and import competitive goods (CPI) are goods which are defined as "imports" by the Management and Coordination Agency, or are chosen by comparing them to items of imported goods (WPI) and by using microinformation. Perishables, electricity, gas, water charges and petroleum products are excluded. Adjustment has been made for the increase in the tobacco tax from December 1998. "Goods (excluding imported and import competitive goods; CPI)" are goods that are not included in the above definition. These definitions are also used in the analyses hereafter.

Sources : Management and Coordination Agency, *Consumer Price Index* ; Bank of Japan, *Wholesale Price Indexes*.

Figure 19

**Import penetration ratio**




Notes: 1. Import penetration ratio = imports/(shipments to the domestic market + imports). 2. Shares of each type of goods are shown in angle brackets.

Source: Ministry of International Trade and Industry, *Indices of Industrial Domestic Shipments and Imports*.

Figure 20
**CPI (declining rate of top items)**

**1. Breakdown of the top 50 items (declining rate)**


**2. Top 30 items (declining rate)**

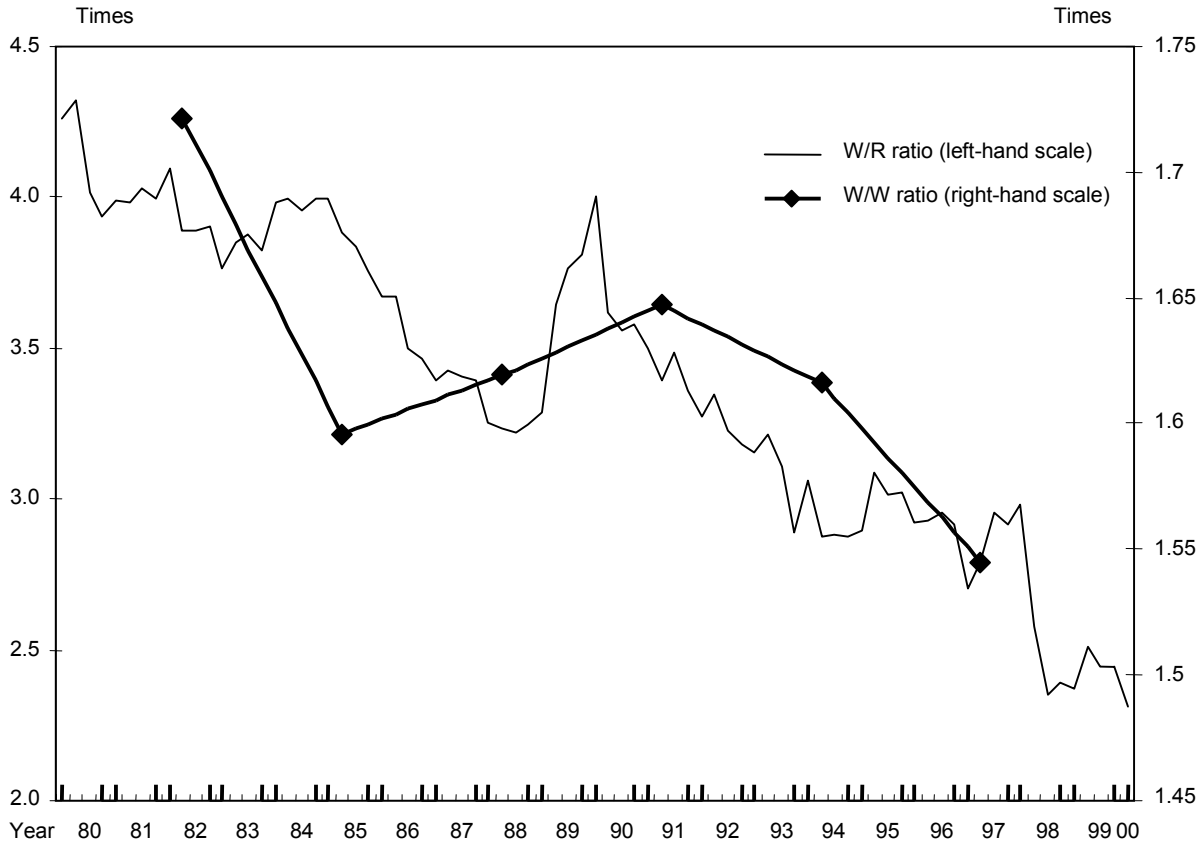
| Rank | CY93 | 94 | 95 | 96 | 97 | 98 | 99 |
|---|---|---|---|---|---|---|---|
| 1 | Monthly magazines, women's | Rice A (domestic) | *Gasoline (regular)* | *Gasoline (regular)* | *Gasoline (regular)* | *Gasoline (regular)* | Rice A (domestic) |
| 2 | *Beef (imported)* | ***TV sets*** | ***Word processors*** | ***TV sets*** | Rice A (domestic) | *Kerosene* | ***TV sets*** |
| 3 | *Gasoline (regular)* | *Gasoline (regular)* | ***TV sets*** | ***Word processors*** | ***Word processors*** | *Gasoline (premium)* | *Beef (imported)* |
| 4 | ***Room air conditioners*** | *Beef (imported)* | Rice A (domestic) | Computer games | Clean water equipment | *"Kabayaki", broiled eels* | *Women's overcoats* |
| 5 | Hen eggs | Standard rice | ***Video tape recorders*** | *Tyres* | *Gasoline (premium)* | ***Room air conditioners*** | Chrysanthemums |
| 6 | ***Word processors*** | *Room air conditioners* | *Car wax* | ***Room air conditioners*** | Rice B (domestic) | ***Word processors*** | *"Kabayaki", broiled eels* |
| 7 | *Women's overcoats* | Rice B (domestic) | *Kerosene* | *Gasoline (premium)* | ***Telephone set*** | *Women's overcoats* | ***Refrigerators*** |
| 8 | ***Refrigerators*** | ***Refrigerators*** | ***Refrigerators*** | ***Video tape recorders*** | Hen eggs | ***Refrigerators*** | *Handbags* |
| 9 | ***TV sets*** | *Men's suits (for winter)* | *Pants for exercise* | ***Refrigerators*** | *Kerosene* | Car wax | Carnations |
| 10 | *Kerosene* | ***Video tape recorders*** | Rice B (domestic) | Detergent, laundry | ***TV sets*** | ***Washing machines (full automatic type)*** | ***Electric rice-cookers*** |
| 11 | *Men's suits (for winter)* | *Kerosene* | Detergent, laundry | *Electric rice-cookers* | ***Video tape recorders*** | ***Bathtubs*** | Flowerpots |
| 12 | ***Video tape recorders*** | Glutinous rice | Salted salmon | *Instant coffee* | Detergent, laundry | *Women's suits (for winter)* | Computer games |
| 13 | Salted salmon | Bath preparation | *Women's suits (for spring & autumn)* | ***Telephone set*** | *Whisky A* | *Dog foods* | *Men's suits (for summer)* |
| 14 | *Women's slacks (for winter)* | *Men's suits (for summer)* | Chrysanthemums | Car wax | *Refrigerators* | *Sausages* | ***Video tape recorders*** |
| 15 | *Men's sweaters* | *Dog foods* | *Men's suits (for summer)* | *Pants for exercise* | *Potato chips* | Fresh milk (sold in stores) | *Women's suits (for summer)* |
| 16 | Bath preparation | ***Automobiles (1700cc-2000cc), imported*** | ***Room air conditioners*** | *Rice (imported)* | ***Kerosene stoves*** | *Women's blouses (short sleeves)* | Rice B (domestic) |
| 17 | *Women's sweaters (long sleeves)* | *Women's suits (for spring & autumn)* | ***Tape recorders*** | *Women's overcoats* | ***Washing machines (full automatic type)*** | Fried food | *Men's three-season coats* |
| 18 | *Quilts* | Blended rice (domestic) | *Handbags* | ***Tape recorders*** | Blended rice (domestic) | *Handbags* | *Coffee cups & saucers* |
| 19 | *Men's jackets* | Detergent, laundry | *Face cream* | ***Video cameras*** | Chrysanthemums | *Tyres* | *Beer* |
| 20 | *Sausages* | Salted cod roe | Yogurt | *Quilts* | ***Microwave ovens*** | ***Electric shavers*** | *Men's sweaters* |
| 21 | ***Tape recorders*** | ***Cameras*** | "Gyoza" | ***Washing machines (full automatic type)*** | Disposable diapers | Detergent, laundry | *One-piece dresses (for summer)* |
| 22 | *Men's suits (for summer)* | Salted salmon | Frozen croquettes | *Dolls* | Bath preparation | Disposable diapers | Beef (shoulder) |
| 23 | Cream puffs | ***Word processors*** | Mayonnaise | Salted cod roe | *Whisky C* | Fluorescent lamp fittings | *Women's sweaters (short sleeves)* |
| 24 | ***Bicycles*** | ***Tape recorders*** | *Ice cream* | Clean water equipment | ***Electric rice-cookers*** | *100% fruit drinks* | Clean water equipment |
| 25 | ***Carpets*** | ***Video cameras*** | ***Bathtubs*** | Fresh milk (sold in stores) | Facial tissue | *Rings* | Disposable diapers |
| 26 | Detergent, laundry | "Mochi", rice-cakes | *Quilts* | ***Carpets*** | Computer games | ***Tape recorders*** | Pickled chinese cabbage |
| 27 | Fresh milk (sold instores) | Rolled toilet paper | ***Kerosene stoves*** | ***Vacuum cleaners*** | *Whisky B* | Bean-jam buns | Fishes in soybean paste |
| 28 | Facial tissue | Fresh milk (sold in stores) | *Knitted suits* | ***Cameras*** | *Tyres* | ***Video tape recorders*** | *Quilts* |
| 29 | *Women's suits (for winter)* | *Men's sweaters* | ***Electric rice-cookers*** | Facial tissue | ***Video cameras*** | Salted cod roe | "Shirasu-boshi", dried young sardines |
| 30 | *Dog foods* | Facial tissue | ***Automobiles (661cc-1500cc)*** | Liquid detergent, kitchen | *Foundation* | ***Cameras*** | Pork (shoulder) |

Notes: 1. The year-to-year percentage change as of December each year (figures for March 2000 are compared to the previous March) in each item is calculated and the top 50 items with large negative contribution rates are chosen. The above Figure shows the number of items included in the top 50 items while the bottom Figure indicates the names of the top 30 declining items. 2. The following goods are indicated as: "clothes", shaded; "durable", bold, "imported/import competitive goods", italics. 3. Deregulation-related items are petroleum products (Provisional Measures Law on the Importation of Specific Petroleum Refined Products, abolished in April 1996) and rice (Staple Food Control Act, abolished in November 1995).

Source: Management and Coordination Agency, *Consumer Price Index*.

Figure 21

**Streamlining of distribution channels**




<Calculation method>

$\frac{W}{R}$ ratio = $\frac{\text{sales (wholesale industry)}}{\text{sales (retail industry)}}$

ratio of the retail industry to the wholesale industry

$\frac{W}{W}$ ratio = $\frac{\text{total amount of sales (wholesale industry) – inter-office transactions}}{\text{sales to retailers + sales to industries other than wholesale and retail + sales to overseas + sales to consumers}}$

= sales of wholesale industry/sales of wholesale industry to users

Presence of primary and secondary wholesalers within the wholesale industry.

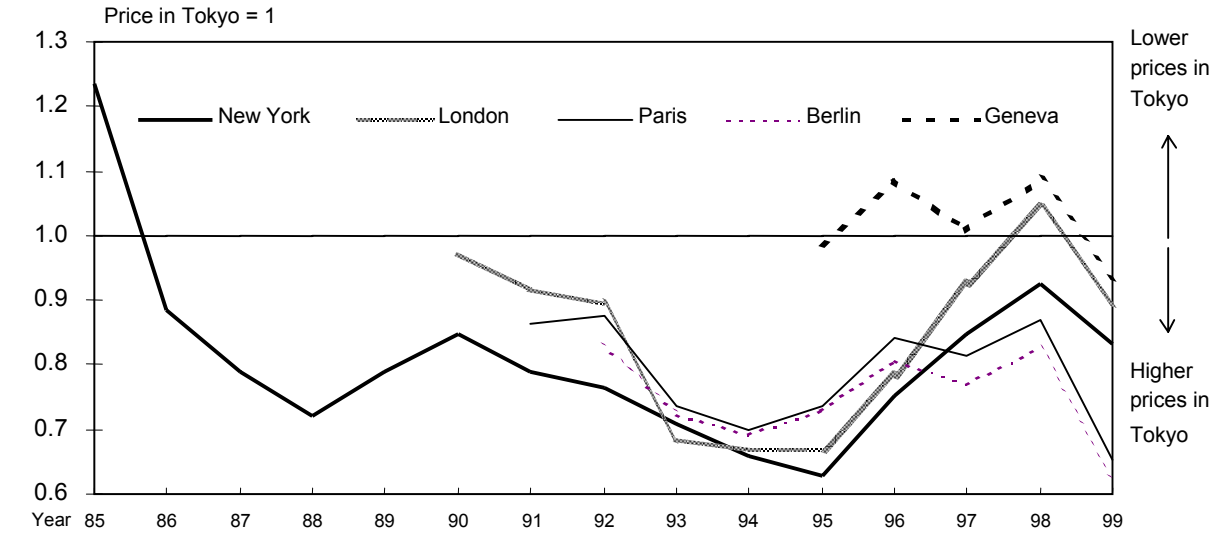
Notes: 1. Data for sales are seasonally adjusted. These figures have been adjusted for discontinuity of data based on firms of all scales in the *Financial Statements Statistics of Corporations by Industry, Quarterly*. 2. Total amount of sales (wholesale industry) based on data in the *Census of Commerce*.

Sources: Ministry of Finance, *Financial Statements Statistics of Corporations by Industry, Quarterly*; Ministry of International Trade and Industry, *Census of Commerce*.

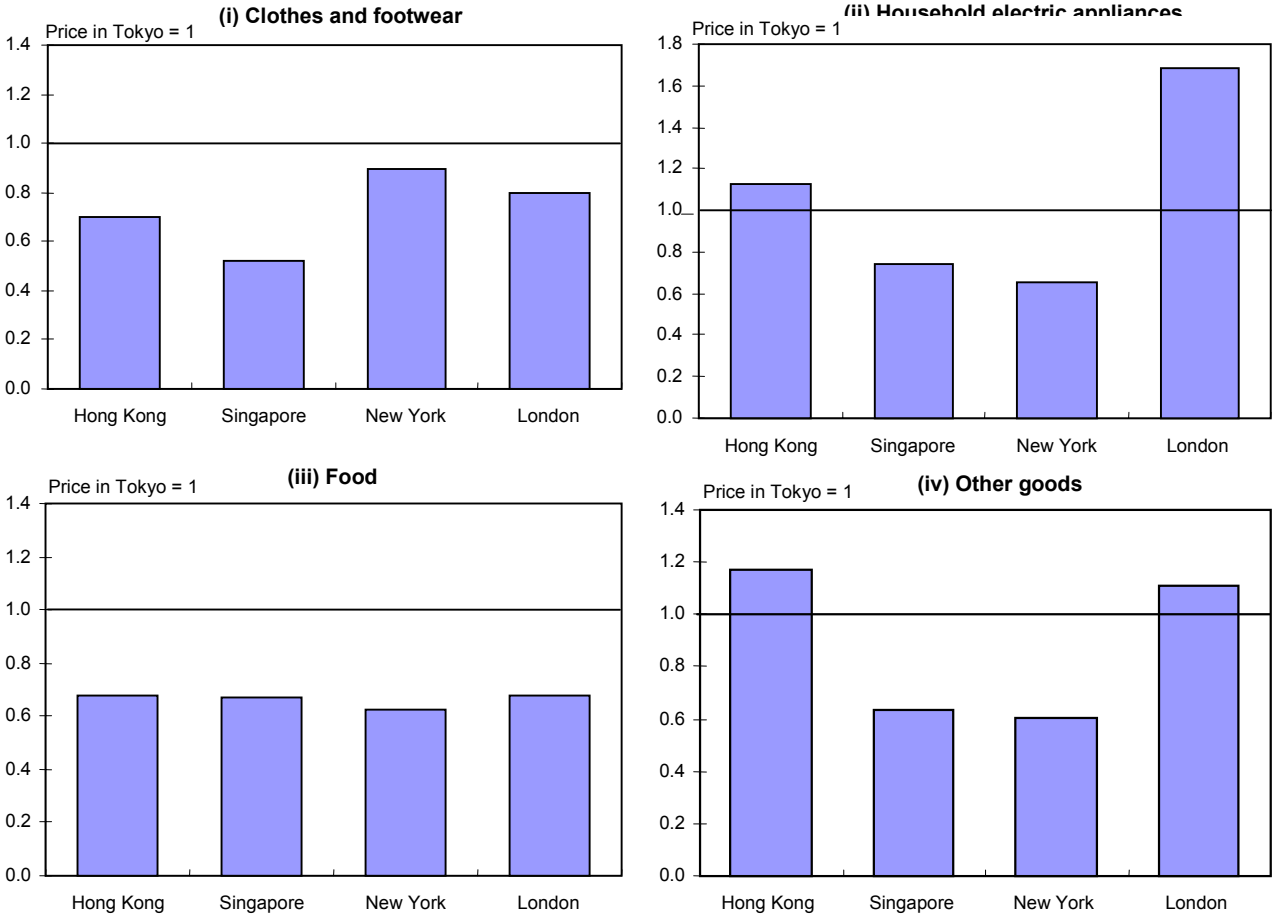
Figure 22

## Gap between domestic and foreign prices

**1. Changes in price gaps between Japan and overseas; living expenses**




**2. Price gaps between Japan and overseas (1999); final goods**




Note: Price gaps between Japan and overseas for final goods are based on the *Shuyona shohizai oyobi sabisu ni kakaru naigai kakakusa chousa kekka (1999 nen) ni tsuite* (Economic Planning Agency; see source). Each component is weighted by using the weight of the CPI of Japan (for "television", 1998 figures are used). The breakdown of each component is as follows: clothes and footwear: mens' suits (for winter), mens' slacks (for winter), skirts (for winter), mens' business shirts, mens' briefs, mens' shoes (leather). Foods: rice, white bread, spaghetti, salmon, fresh milk, hens' eggs, onions, oranges, bananas, sugar, black tea, cola drinks, beer. Household electric appliances: television, video tape recorders. Other goods: facial tissues, gasoline, films, magazines, newspapers, lipsticks, compact discs.

Source: Economic Planning Agency, *Shuyona shohizai oyobi sabisu ni kakaru naigai kakakusa chousa kekka (1999 nen) ni tsuite (Survey Results on the Price Gap of Major Consumer Goods and Services between Japan and Overseas <1999>)*, *Seikeihi chousa ni yoru koubairyoku heika oyobi naigaikakakusa no gaikyo (Summary Report on Purchasing Power Parity and Price Gaps between Japan and Overseas According to the Living Expense Survey)*; Management and Coordination Agency, *Consumer Price Index*.

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