MIZUHO RESEARCH PAPER

25

How serious are the risks of deflation in Japan?

A vicious cycle of prolonged price falls and wage decline

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Published by
Mizuho Research Institute
Tokyo, July 2010

Contents

	page
Summary	1
1. Consumer price declines are intensifying	1
(1) Renewed concerns regarding deflation	1
2. Discussions regarding the causes of deflation	3
(1) Deflation arises out of complex causes	3
(2) The increase of imported goods will lead to the continuous decline of goods prices	4
(3) Globalization of corporate activities are dampening the rise of goods prices around the world	6
(4) Note a significant decline of service prices in Japan	7
(5) Deregulation served to push down prices of food and services	8
(6) A recessionary gap (negative output gap) from the end of the 1990s	9
(7) The recessionary gap is larger than in the past	10
(8) The price gap in consideration of the supply–demand in the goods market and financial market is currently negative	11
3. The impact of deflation upon the real economy	13
(1) The rigidity of debts and nominal wages is serving as downward pressures upon the real economy	13
(2) A deflationary spiral was averted	15
(3) Debt deflation	15
(4) Nominal wages did not exhibit downward rigidity	17
(5) The flexibility of nominal wages curbed the rise of unemployment	19
(6) Mild deflation and fall of nominal wages will persist	21

4. Deflation viewed from the perspective of corporate behavior 23
(1) Price competition among corporate enterprises intensifies along with the fall of economic growth expectations 23
(2) Behavior among price leaders are inducing price cuts and cost cuts among followers 25

5. What are the desirable measures to stem deflation? 27
(1) The risks of debt deflation are remote 27
(2) The mild decline of prices and wages will persist again 27
(3) Specific growth strategies are necessary to push Japan out of deflation 29

Summary

1. Japan experienced a state of "deflation" – a condition of continuous price falls – from the end of the 1990s to mid–2000. Today, Japan is subject to renewed concerns regarding deflation amid the economic downturn accompanying the global financial crisis since the autumn of 2008.
2. Even though the Japanese economy fell into a state of "debt deflation" from the late 1990s, the rise of unemployment was limited due to the elasticity of nominal wages, hence enabling Japan to avoid a descent into a serious deflationary spiral.
3. The possibility of Japan falling once again into debt deflation is remote, given the progress of corporate debt adjustment up to the mid–2000. On the other hand, the breadth of the recessionary gap (negative output gap) is larger than in the previous deflationary phase, indicating that a vicious cycle of gradual price falls and wage decline will continue, hence extending the state of deflation over a prolonged period.
4. The vicious cycle above stems from the behavior among Japanese corporate entities which strive to remain profitable amid extremely low economic growth expectations. For Japan to emerge out of deflation, it is necessary to raise the expected rate of economic growth among corporations. In the medium to long–term context, measures for deflation are equivalent to economic growth strategies.

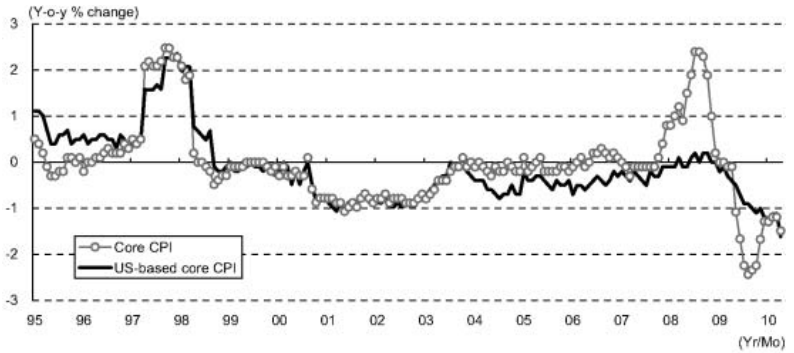
1. Consumer price declines are intensifying

(1) Renewed concerns regarding deflation

Consumer prices are continuing to fall. As of April 2010, the percentage change of consumer prices excluding fresh food (the

"core CPI") stood at –1.5% y–o–y (March –1.2% y–o–y) and consumer prices excluding energy prices and food (excluding alcohol) (the "US–based core CPI", referring to the core CPI calculated according to the same criteria as the US) stood at –1.6% y–o–y (March –1.1% y–o–y), both falling deeper into negative territory **(Chart 1)**. Even though the price fall in April stems largely from the government initiative to make senior high school tuitions essentially free (the core CPI and the US–based core CPI were dragged down by 0.5% and 0.7% respectively), the US–based core CPI is continuing to fall approximately 1% y–o–y even when excluding the impact of high school tuitions. Japan experienced a state of "deflation" (note 1) in which the core CPI fell for eight years from FY1998 to FY2005 (from FY1999 to FY2007 in terms of the US–based core CPI). Even though the price fall came to a halt toward the end of the previous expansion cycle, concerns are rising again that Japan might fall into deflation amid the slump accompanying the financial crisis from the autumn of 2008. In the *Monthly Economic Report of November 2009* (November 20, 2009) of the Cabinet Office, the government acknowledged that the Japanese economy is in a "mild deflationary phase". Subsequently, Governor Masaaki Shirakawa of the Bank of Japan (BOJ) decided to enhance the central bank's monetary easing measures at the extraordinary Monetary Policy Meeting held on December 1, 2009. In this paper, we shall discuss the extent to which deflation might progress in Japan at this juncture.

Chart 1: Consumer prices (the core CPI and the US–based core CPI)



Note: The core CPI refers to the general index excluding fresh food.
The US-based core CPI refers to the general index excluding energy and food (excluding alcohol).
Source: Ministry of Internal Affairs and Communications, *Consumer Price Index*.

2. Discussions regarding the causes of deflation

(1) Deflation arises out of complex causes

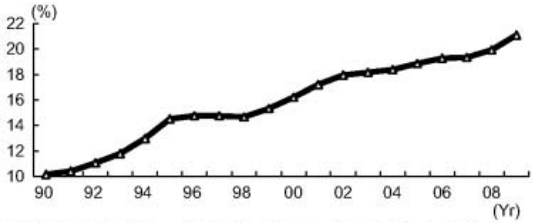
An examination of the previous deflationary phase would be beneficial in order to assess the magnitude of the deflationary risks Japan currently faces. Various theories regarding the causes of deflation were discussed during the previous deflationary phase (note 2) which started at the end of the 1990s. Theories on the causes of deflation may be categorized into three main views attributing deflation to the following causes: View ① which stresses the changes on the supply–side, View ② which stresses demand shortage, and View ③ which attributes the principal cause to monetary factors. View ① attributes supply–side factors as the major cause of price falls, for example the rise of imports from other Asian countries and deregulation against a backdrop of globalization, the

rationalization of distribution, and technological innovation. Since price falls stemming from such factors do not necessarily cause the fall of demand, and rather has the effect of stimulating demand, they are also referred to as "good price falls". View ② asserts that price falls are caused mainly by the expansion of the output gap along with the decline of demand, and that the decline of inflation expectations had extended the subsequent price falls. View ③ takes the position that monetary factors such as the decline of financial mediation functions and the shortage of money supply are the main causes of deflation.

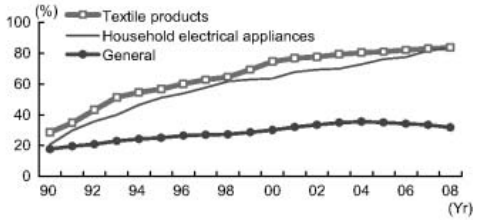
(2) The increase of imported goods will lead to the continuous decline of goods prices

Of the supply–side factors in ①, the increase of inexpensive imported goods from the countries of Asia is serving as continuous downward pressures upon domestic prices of goods. The percentage of imports in total domestic supply in the industrial sector (import penetration) has been rising continuously since the 1990s **(Chart 2)**. In particular, with respect to textile products and household electrical appliances, approximately 80% of the amount of imports consists of imports from the countries of Asia such as China, serving as strong downward pressures upon prices. Even though import prices of textiles rose during certain periods such as 2001 to 2002 and 2005 to 2007, the time span of price falls was longer, falling more than 10% in the late 1990s **(Chart 3)**. Import prices of electrical and electronic appliances have been following a more or less uninterrupted decline from the end of the 1990s. In both cases, the price fall is affected by the increase of reverse imports from overseas production sites where Japanese corporations are able to manufacture goods at low costs. Furthermore, in the case of electrical and electronic appliances, the progress of technological innovation mainly in the area of information technology is serving as a factor behind the price fall.

Chart 2: Import penetration and the share of Asian countries in imports

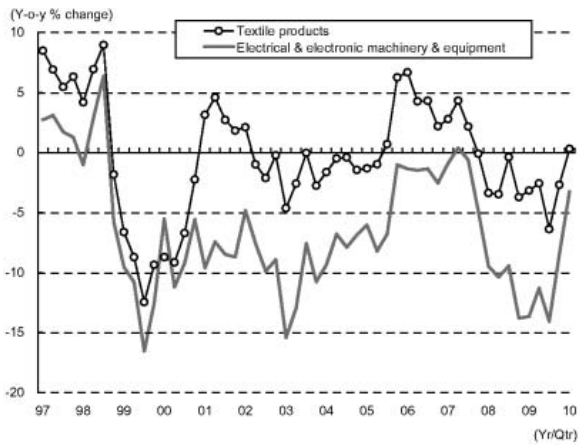


Note: Import penetration = imports / gross domestic supply
Source: Ministry of Economy, Trade and Industry, *Kokogyo sokyokyu shisu (total industrial supply index)*



Note: 1. Percentage of imports from Asia in total import value.
2. Imports from Asia = imports from China + imports from ASEAN.
Source: Ministry of Economy, Trade and Industry, *RIETI-TID2009.*

Chart 3: Import prices

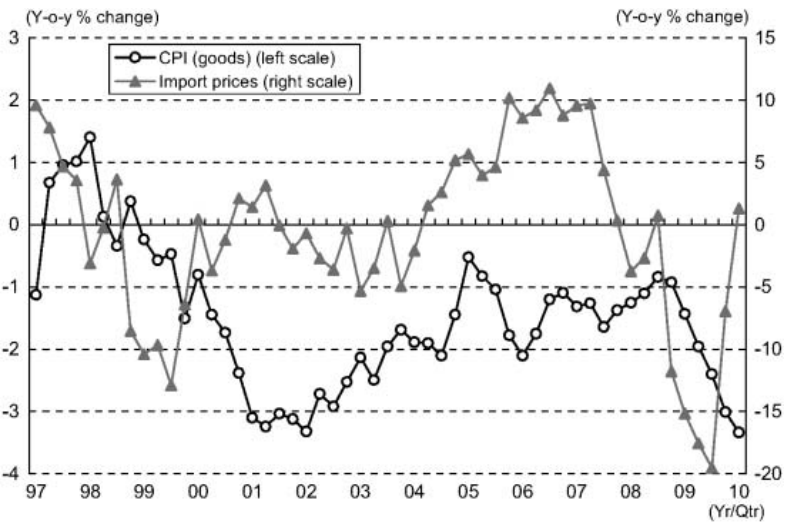


Source: Bank of Japan, *Corporate Goods Price Index.*

(3) Globalization of corporate activities are dampening the rise of goods prices around the world

A look at the goods CPI (ex good and energy) reveals an uninterrupted decline from the end of the 1990s **(Chart 4)**. Furthermore, **Chart 4** shows that the fall of the goods CPI tended to widen when import prices are falling. Undeniably, the influx of cheap imports led to the continuous decline of domestic prices of goods.

Chart 4: Japan's import prices and CPI (goods)

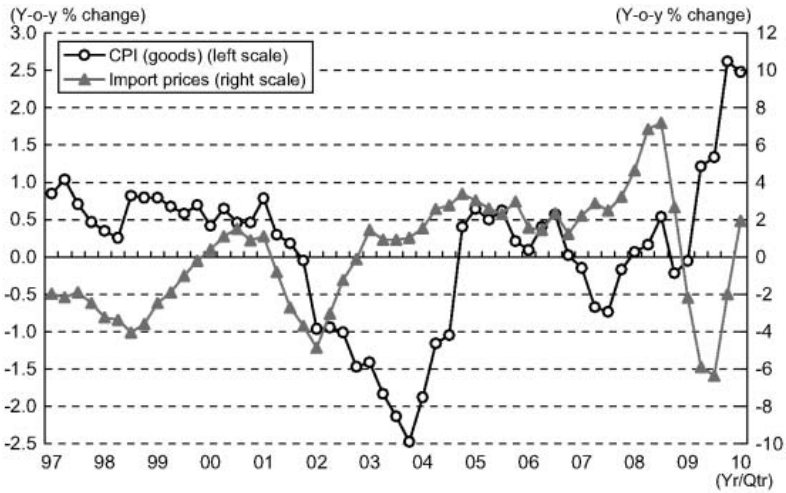


Note: Both the CPI (goods) and import prices exclude food and energy.
Sources: Bank of Japan, *Corporate Goods Price Index*, Ministry of Internal Affairs and Communications, *Consumer Price Index*.

That said, to a certain extent, the negative price pressures stemming from the inflow of imports are affecting developed countries other than Japan. Along with the globalization of corporate activities, there is a rising tendency among companies to locate their production sites in emerging countries where costs such as labor costs are relatively low. For example, the breadth of the fall of the goods CPI temporarily edged above 2% during the period around

2002 to 2003 when there were concerns that disinflation might progress in the US. The increase of cheap imports appears to have led to the fall of prices **(Chart 5)**. Given the weak upward pressures upon prices of industrial products around the world, price falls are not unique to Japan as far as prices of goods are concerned. Therefore, the primary cause of Japan's prolonged deflation lies elsewhere.

Chart 5: US import prices and CPI (goods)



Note: CPI (goods) exclude food and energy.
Import prices exclude petroleum products.
Source: Haver.

(4) Note a significant decline of service prices in Japan

The movement of service prices is what sets Japan apart from other countries. A comparison of trends in consumer prices (services) in the US, the Eurozone and Japan shows that service prices in Japan have hovered around zero during the past decade **(Chart 6)**. In contrast, prices of services in the US and the Eurozone have constantly moved within a band of +1% to +4%. Such a persistent rise of service prices may be a reason why deflationary

concerns do not rise as much as in Japan in the US and Europe. While deregulation and wage falls are said to be related strongly to the fall of service prices in Japan, this issue will be discussed later.

Chart 6: CPI (services)

Note: Core basis excluding energy-related prices.
Sources: Made by MHRI based upon US Department of Labor, Eurostat, Ministry of Internal Affairs and Communications, *Consumer Price Index*.

(5) Deregulation served to push down prices of food and services

A spate of deregulatory measures in the 1990s also served as a deflationary factor. In terms of goods, the deregulation of prices and distribution of rice, alcoholic beverages, cosmetics and pharmaceutical products led to the fall of prices **(Chart 7)**. Furthermore, the alleviation of market entry regulations in the transportation, communications and energy sectors also served to depress prices of services (note 3).

A look at the relationship between the percentage fall of prices of

deregulated items and the percentage rise of demand reveals that there were cases such as mobile telecommunications where price falls led to the stimulation of demand, as well as cases such as taxis where price falls were negligible and did not lead to a clear rise of demand. In the case of the taxi business sector, a large number of taxi companies fell into hardships due to fierce competition, resulting in an overall deterioration of labor conditions. Considering these examples where price falls triggered by deregulation did not lead to successful results, it would not be appropriate to label all price falls stemming from deregulation as “good deflation”.

Chart 7: Change in price and demand of items subject to regulatory reform

(%)

Sector		Rate of price fall	Rate of demand growth
Telecommunications	Mobile communications (1993⇒FY2005)	-60.6	1902.5
Transportation	Domestic air transportation (1992⇒FY2005)	-8.8	7.5
	Railway (JR) (1996⇒FY2005)	-6.0	1.0
	Taxi (automobile passenger transportation) (1996⇒FY2004)	-3.0	0.4
Energy	Electricity (1994⇒FY2005)	-39.1	18.6
Food and beverages	Rice (1994⇒FY2005)	-18.3	1.7
	Alcoholic beverages (beer, low-malt beer, "third" beer) (1991⇒FY2004)	-11.8	12.4
Products designated for resale	Cosmetics (1996⇒FY2005)	-10.2	4.8
	Pharmaceuticals (1996⇒FY2005)	-11.5	11.9

Note: The changes in price and demand are comparisons with the year before commencement of regulatory reform.
Sources: Cabinet Office, *Seisaku-koka bunseki report No. 22 kisei-kaikaku no keizaikoka (Analytical report on policy impacts Report No. 22 economic impact of regulatory reform)*

(6) A recessionary gap (negative output gap) from the end of the 1990s

As shown above, it appears certain that supply–side shocks such as the influx of cheap imports and deregulation served as a deflationary factor to some extent. Given the likelihood that

supply–side factors are still dragging down prices, the odds are high that deflationary pressures from import goods will intensify because of the strong yen. Even so, such factors only explain the fall of prices of a limited number of items and are insufficient as an explanation for the decline of prices of more than 80% of the items included in the consumer price index (584 items under the 2005 criteria).

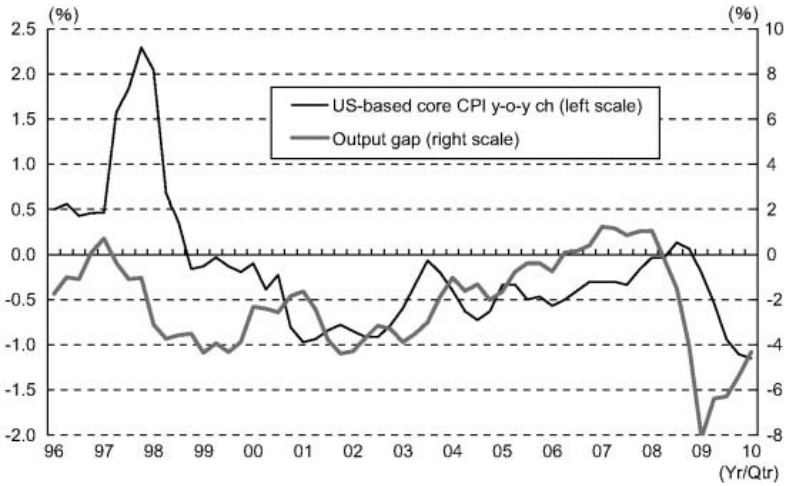
There is no doubt that the supply–demand slack of the entire economy is a factor behind the overall price falls. The second view (View ②), which attributes the main cause of deflation to the shortage of demand, places emphasis upon the trend of the supply–demand balance (the output gap) of the entire economy. The output gap is represented as the difference between actual GDP (actual demand) and potential GDP (supply capacity). While there are several estimation methods to gauge potential GDP, MHRI defines potential GDP as the level of GDP achieved under inflation–neutral labor and capital input. A look at the changes in the output gap since the end of the 1990s shows that the breadth of the output gap showing an excess of supply (referred to as a "recessionary gap") expanded to the mid–4% level during the period from the end of 1997 to 1999 when Japan was subject to financial turmoil **(Chart 8)**. Even though the recessionary gap narrowed to around 2% in 2000 due to the subsequent economic recovery, the breadth has widened again to the mid–4% level by 2001. Although the recessionary gap has contracted due to the economic recovery starting in January 2002, it has taken until 2006 for the recessionary gap to completely diminish. Price levels (US–based core CPI) fell from 1998, following closely the output gap, moving in negative territory most of the time until 2007.

(7) The recessionary gap is larger than in the past

In the recent financial crisis, the recessionary gap expanded to a gaping 8.1% as of the Jan–Mar quarter of 2009 due to a sharp slowdown of exports. While the recessionary gap narrowed slightly as the rate of real GDP growth turned positive from the Apr–Jun quarter, there is still a substantial recessionary gap of 4.3% as of the

Jan–Mar quarter of 2010. The breadth of the demand shortfall has finally narrowed to a level commensurate to the worst of the previous deflationary phase. In other words, in terms of the supply–demand balance alone, deflationary pressures are stronger than the previous phase.

Chart 8: The output gap and the US–based core CPI



Note: The output gap is expressed as a percentage of potential GDP.
Sources: Made by MHRI based upon Ministry of Internal Affairs and Communications, *Consumer Price Index,* Cabinet Office, *National Accounts*, and others.

(8) The price gap in consideration of the supply–demand in the goods market and financial market is currently negative

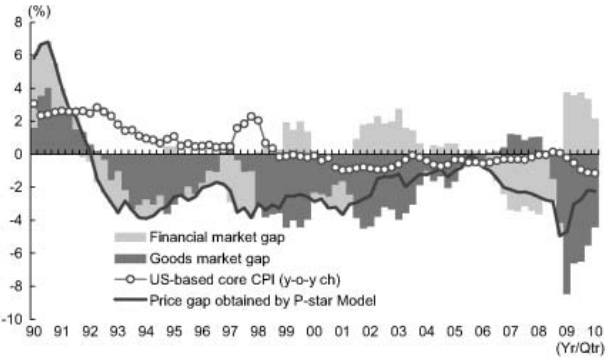
In contrast to views that deflation is caused primarily by changes in supply–side factors and the shortage of demand, View ③, which asserts that deflation is caused mainly by financial market factors, takes the position that price levels are determined by supply–demand in the financial market in addition to supply–demand in the goods market. In other words, even if the supply–demand gap in the goods market (the output gap) tips toward a recessionary gap,

price levels would not fall as long as the financial market is sufficiently accommodative. The P–star model (note 4) gauges the divergence (the price gap) of the equilibrium price level on the basis of supply–demand in both the goods market and the financial market from the actual price level. **Chart 9** shows the price gap calculated by this model. According to the results, the increase of money stock served to ease the deflationary pressures stemming from the weakness of the real economy during the period of deflation from the end of the 1990s to the first half of the 2000s. However, the price gap remained mostly in negative territory because the degree of easing was insufficient to offset the deflationary pressures from the real economy.

At the current juncture, various monetary easing measures are serving to push the financial market gap into positive territory and ease the deflationary pressures in the face of the rapid expansion of the recessionary gap since the autumn of 2008. Even though the negative price gap is starting to narrow after falling deep into negative territory in the Oct–Dec quarter of 2008 immediately after the global financial crisis, it remains negative as of the Jan–Mar quarter of 2010 since the monetary easing measures are still insufficient to offset the deflationary pressures from the real economy.

Thus, the view that deflation is monetary phenomenon would lead to the conclusion that the main cause of the fall of prices during the previous deflationary cycle was the consistent shortage of monetary easing. Moreover, it provides fodder for those who claim that the insufficient increase of money stock in comparison to the large size of the supply–demand gap in the goods market today is pushing prices downward and that further monetary easing is necessary to stop deflation. That said, as explained in more detail later on, it would be necessary to take note that the P–star model premised upon the quantity theory of money assumes that money velocity (nominal GDP/money stock) is constant and that monetary easing would not necessarily lead to the rise of prices in the event money velocity is slowing down.

Chart 9: Trends of the price gap



Sources: Made by MHRI based upon releases by the Cabinet Office, Bank of Japan and the Ministry of Internal Affairs and Communications.

3. The impact of deflation upon the real economy

(1) The rigidity of debts and nominal wages is serving as downward pressures upon the real economy

Next, let us look back at the channels through which deflation serves as a negative effect upon the economy. Theoretically, deflation has a negative impact upon the real economy as a result of debts and nominal wages being rigid over the short term.

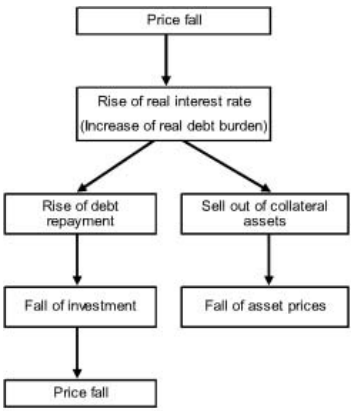
Turning first to debts, real interest rates rise when prices fall (meaning that real debt burdens increase) and prompt debtors – who face larger interest payment burdens – to pay down their debt. Since cash flows are channeled toward debt repayment, funds for other purposes such as capital investment would decline and lead to the stagnation of domestic demand during said period. The stagnation of domestic demand sends prices down further. In the meantime, asset prices fall because of the rise of sell–offs of real estate securing the loans along with debt repayments. As illustrated in **Chart 10**, a

condition arises where both price and asset value falls progress simultaneously. This process is referred to as “debt deflation”.

Meanwhile, the rigidity of nominal wages leads to the deterioration of the real economy through the following process. Keeping the quantity of sales unchanged, price falls would send downward pressures upon corporate earnings because the proceeds of sales among business firms would fall but would not push down nominal wages (real wages would rise). Under such conditions, firms would curb labor costs by reducing personnel and restrain capital investment to secure liquidity on hand. Since personal consumption would also decline due to the rise of unemployment, the fall of domestic demand would lead to further price declines **(Chart 11)**.

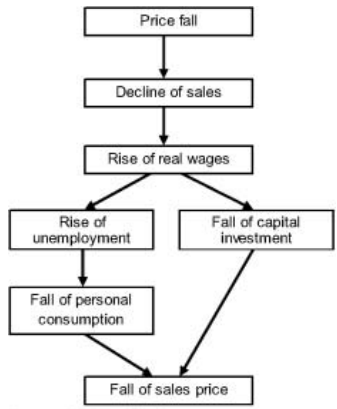
The fall of demand accompanying the rigidity of nominal debts and wages has the potential to lead to further price falls. A condition in which the fall of prices and decline of demand proceeds at the same time is referred to as a “deflationary spiral”. Would it be appropriate to describe the Japanese economy as falling into such a vicious cycle from the end of 1990s onward?

Chart 10: Debt deflation mechanism



Source: Made by MHRI.

Chart 11: Downward rigidity of nominal wages and its impact upon the real economy



Source: Made by MHRI.

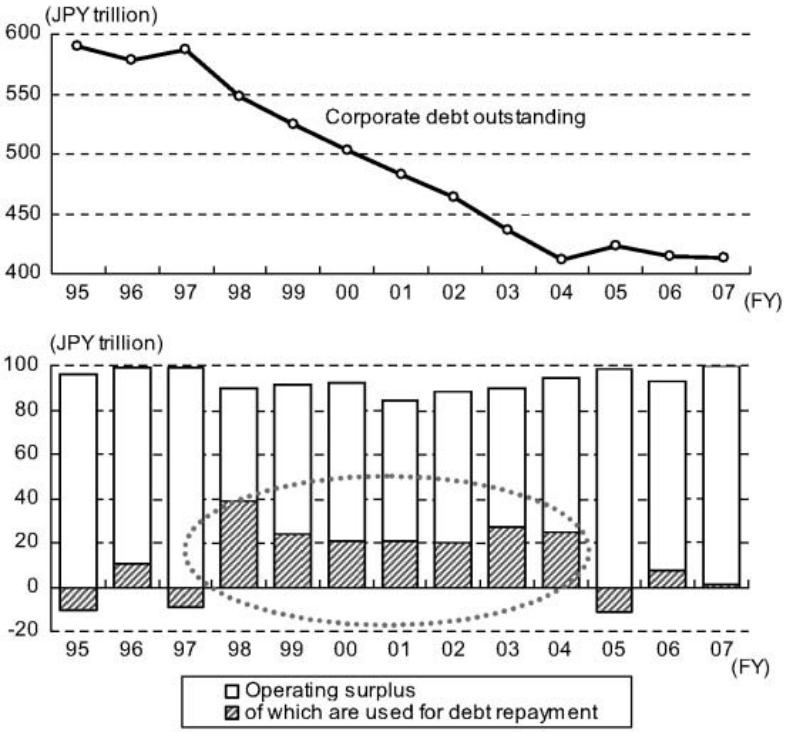
(2) A deflationary spiral was averted

Looking back at Japan's deflationary phase from 1998 to 2005, the economy did not necessarily contract during the entire period. In fact, the economy expanded from January 1999 to October 2000 and from January 2002 onward. This cannot be termed as a deflationary spiral where economic downturns and price falls occur at the same time. Even though Japan may have fallen temporarily into a deflationary spiral from the autumn of 1997 amid the severe destabilization of the financial system, the condition did not last for a long time.

(3) Debt deflation

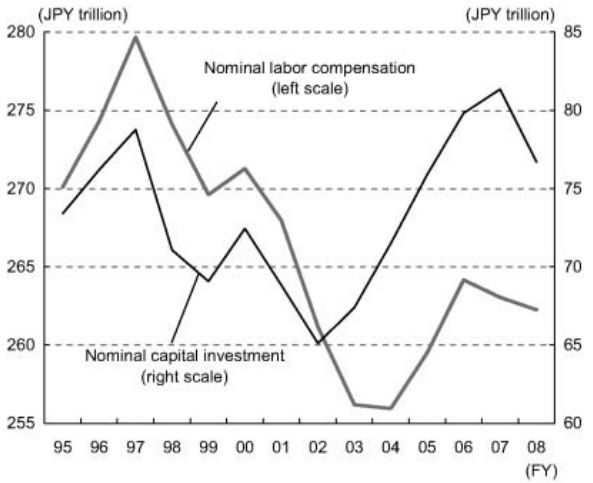
The debt reduction which progressed in the corporate sector during the previous deflationary cycle is presumed to be a factor behind the stagnation of domestic demand and fall of asset prices and thus served as deflationary pressures. Japanese corporate enterprises reduced their borrowings at a pace of JPY20–40 trillion per year (20–40% of operating surplus) from 1998 to 2004 **(Chart 12)**. As a result, outstanding loans of corporations were reduced as much as JPY176 trillion in seven years, from JPY587 trillion as of the end of FY1997 to JPY411 trillion as of the end of FY2004. Since a significant portion of cash flows was directed to debt repayment, capital investment and labor costs were held in check. Labor compensation fell by approximately JPY24 trillion from JPY280 trillion in FY1997 to JPY256 trillion in FY2004 and capital investment declined by approximately JPY14 trillion from JPY79 trillion in FY1997 to JPY65 trillion in FY2002 **(Chart 13)**. The fall of labor compensation most likely dragged down personal consumption, leading to a state of debt deflation where the stagnation of domestic demand (personal consumption and capital investment combined) serves as downward pressures upon prices.

Chart 12: Corporate debt burdens and status of repayment



Note: A negative debt repayment indicates the increase of borrowings.
Sources: Cabinet Office, *Annual Report on National Accounts*.

Chart 13: Labor compensation and capital investment



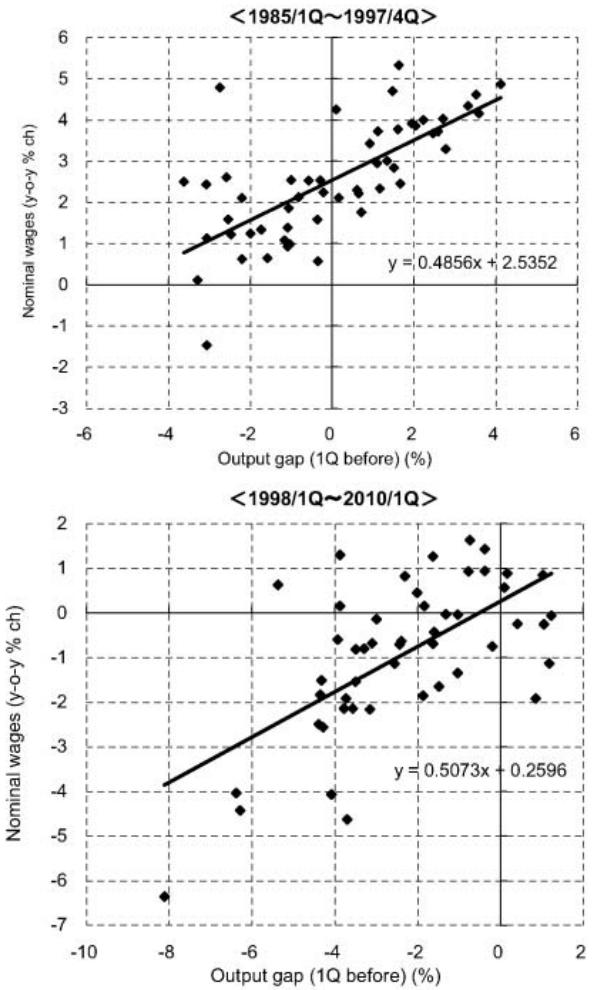
Source: Cabinet Office, *National Accounts*.

(4) Nominal wages did not exhibit downward rigidity

Let us turn to the downward rigidity of nominal wages – another factor of deflation which has a negative impact upon the real economy. **Chart 14** shows the relationship between the output gap and the percentage rise of nominal wages during the period up to 1997 and the period from 1998 onward when deflation took hold in Japan. During the period up to 1997, the percentage change of nominal wages remained more or less in positive territory even when the output gap was negative (excessive supply). In contrast, despite a higher tendency of nominal wages to decline from 1998 onward, the slope of the curve to the output gap (sensitivity) was more or less unchanged and even edged up slightly from 0.4856 to 0.5073. Even though the slope of the curve would moderate as the percentage change of nominal wages moves closer to zero if nominal wages exhibit downward rigidity, such a phenomenon was not observed. The flexibility of nominal wages during the period stems from restraints upon overall labor costs in the corporate sector by curbing regular worker labor costs through the introduction of

performance–based wages and the utilization of non–regular workers such as temporary workers with relatively lower wage levels.

Chart 14: Nominal wages and the output gap

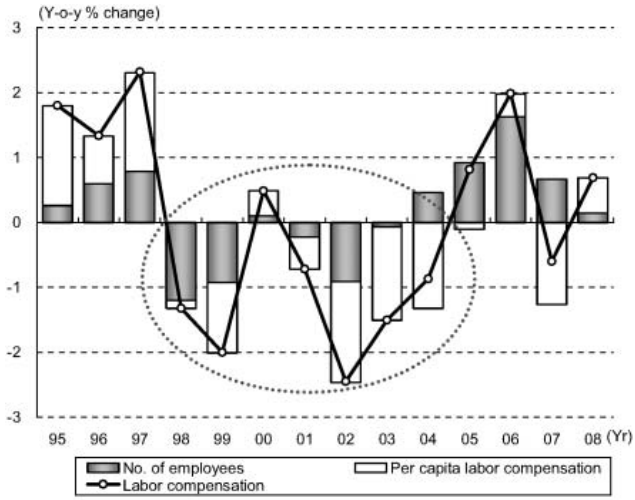


Note: Nominal wages pertain to business establishments with at least 30 workers on an all-industries basis.
Sources: Made by MHRI based upon Ministry of Health, Labor and Welfare, *Monthly Labor Survey,* Cabinet Office, *National Accounts,* and others.

(5) The flexibility of nominal wages curbed the rise of unemployment

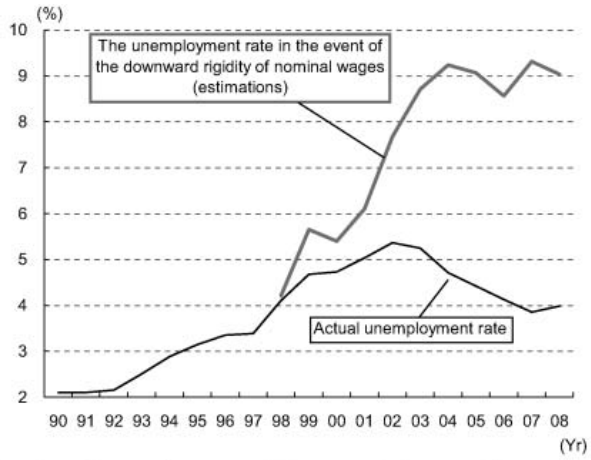
Given the flexibility of nominal wages, corporate enterprises were able to pare down their labor costs without having to resort to a significant reduction of personnel. A look at the movement of labor compensation during this period reveals that the decline in number of employed workers remained within 1% per annum and that the reduction of labor costs is progressing through the reduction of per capita labor compensation (≒ nominal wages) **(Chart 15)**. To achieve the reduction of the same level of labor costs without cutting per capita labor compensation from the level in 1997, the unemployment rate would rise above 9% by 2004 **(Chart 16)**. In reality, even though the unemployment rate did indeed rise from the 3%–level in 1997, it managed to stay at the 5%–level. Stated differently, it is quite plausible that the flexibility of nominal wages served to curb unemployment to some extent. In the event unemployment rises sharply while nominal wages exhibit downward rigidity, there is a high possibility of a sharp fall of personal consumption because the unemployed would lose their income (other than unemployment benefits) and concerns regarding unemployment would rise among employed workers who have not yet lost their jobs. The fact that a sharp fall of personal consumption did not occur because of the containment of unemployment as a result of the fall of nominal wages, is thought to be a factor which kept Japan from falling into a serious deflationary spiral during the previous deflationary cycle.

Chart 15: Trends in labor compensation



Source: Made by MHRI based upon Cabinet Office, *National Accounts.*

Chart 16: The unemployment in the event nominal wages do not fall (estimations)



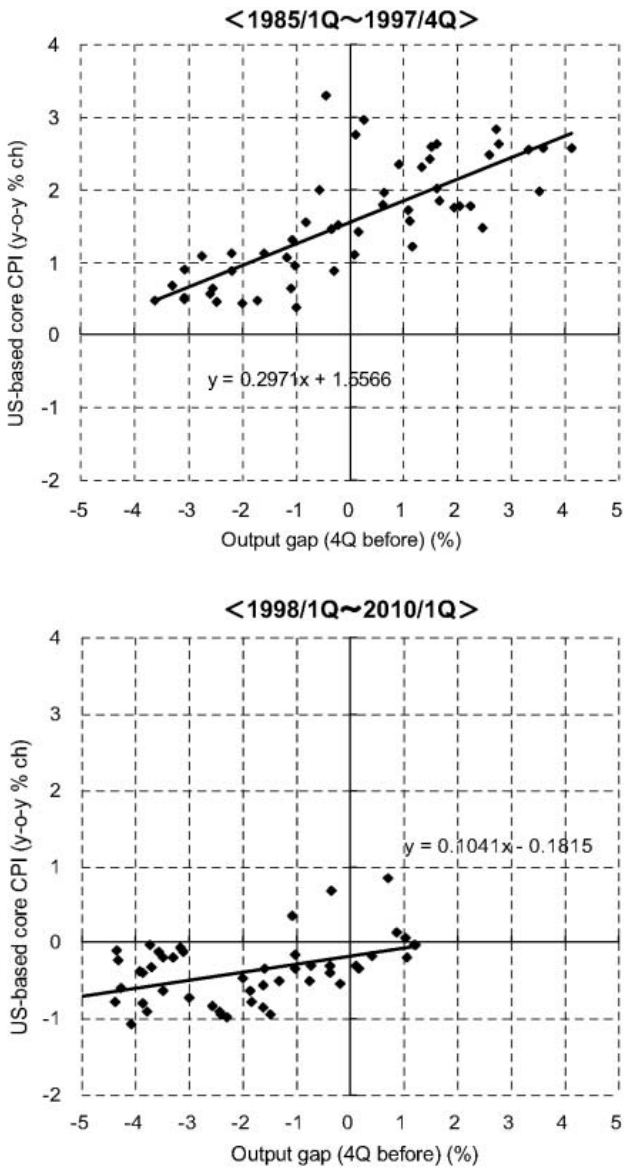
Note: Estimations of the unemployment rate in the event nominal wages exhibit downward rigidity are calculated by calculating the number of employee reduction (x) which would be necessary in the event per capita labor compensation is assumed to be flat from 1998 onward at the level as of 1997 upon fixing labor compensation at actual readings, and assuming that all (x) become unemployed.

Source: Cabinet Office, *National Accounts.*

(6) Mild deflation and fall of nominal wages will persist

A comparison of the correlation between the output gap and prices (US–based core CPI) during the period up to 1997 and the period from 1998 onward shows a sharp decline of the sensitivity of prices toward the output gap in contrast to the sensitivity of nominal wages, revealing that prices (rather than wages) exhibit downward rigidity **(Chart 17)**. This, we believe, happened because personal consumption did not fall so steeply since jobs were maintained to a certain degree even amid the decline of nominal wages, which in turn hampered the sharp fall of prices. Furthermore, the inclusion of items which are not correlated with supply–demand conditions and are reluctant to drop (such as cigarettes and various public utility charges) in the consumer price index is thought to be a factor. However, as prices fall – no matter how small the fall might be – companies would cut labor costs to remain profitable, resulting in a prolonged state of mild deflation and nominal wage decline. The prolonged period of "mild deflation" during the previous deflationary cycle stems most likely from the foregoing mechanism.

Chart 17: US–based core CPI and the output gap



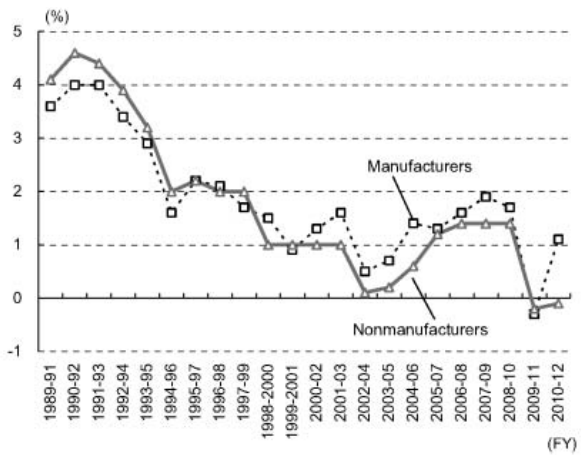
Sources: Made by MHRI based upon Ministry of Health, Labor and Welfare, *Monthly Labor Survey,* Cabinet Office, *National Accounts,* and others.

4. Deflation viewed from the perspective of corporate behavior

(1) Price competition among corporate enterprises intensifies along with the fall of economic growth expectations

Let us turn next to corporate pricing behavior under a deflationary setting. In the background to the intensification of price competition is the behavior among companies to remain profitable amid extremely low expectations toward the growth of demand (in particular, domestic demand). Growth expectations among corporate enterprises continued to fall throughout the 1990s and fell below 1% in the early 2000s **(Chart 18)**. Despite a slight improvement of expectations during the second half of the 2000s, it failed to reach 2% and fell sharply again under the recent financial crisis.

Chart 18: Expected rate of economic growth among corporate enterprises

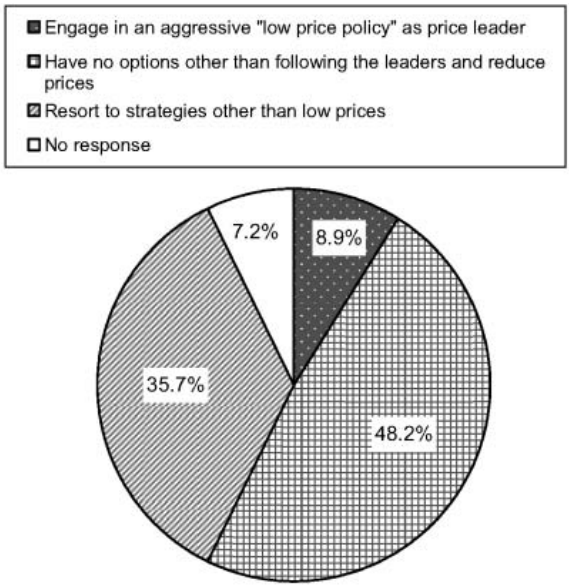


Note: Outlook on industrial sector demand in real terms over the next three years.
Sources: Cabinet Office, *Annual Survey of Corporate Behavior.*

As far as total demand is limited, a company would have to raise

its market share in order to increase its volume of sales. As a result, the escalation of price competition accelerates the fall of prices. A questionnaire survey conducted in 2002 by the Ministry of Economy, Trade and Industry on deflation revealed that price cuts among a small number of "price leaders" (companies which responded in the survey that they would "engage in an aggressive 'low price policy'") striving to expand their market shares are triggering price cuts among other companies (the "followers"), thus leading to overall price falls and wage declines accompanying the reduction of costs. Of the companies which responded to the survey, only 8.9% fell into the category of "price leaders" **(Chart 19)**. On the other hand, 48.2% fell into the category of "followers" which "have no options other than following the leaders and reduce prices". Incidentally, 35.7% of the respondents said that they would cope by resorting to strategies other than low prices.

Chart 19: Pricing behavior among corporate enterprises

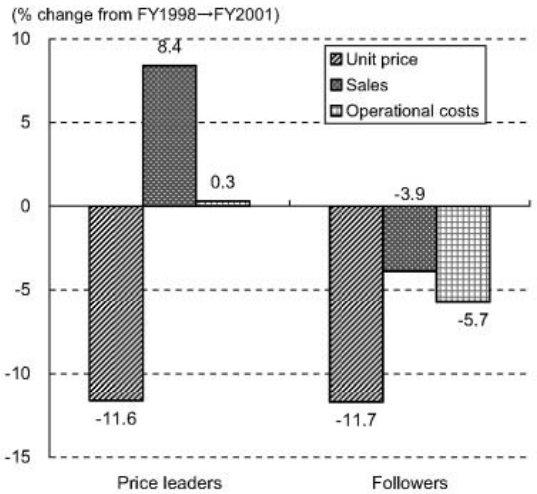


Source: Ministry of Economy, Trade and Industry, *Defure ni kansuru anketo-chosa (2002)(Questionnaire survey on deflation (2002))*.

(2) Behavior among price leaders are inducing price cuts and cost cuts among followers

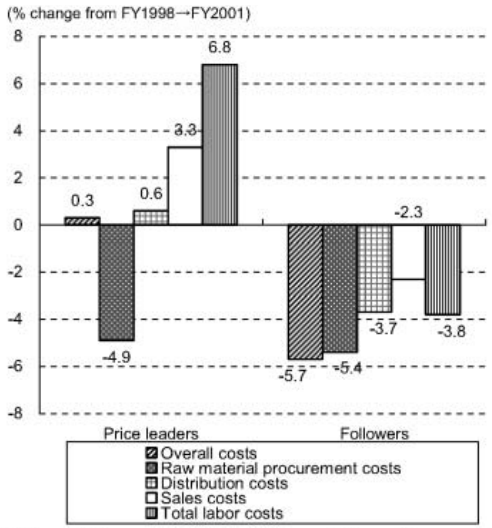
In general, price leaders possess corporate structures and systems enabling them to remain profitable even when cutting prices such as means to cut costs through overseas production or streamlining of production and sales. Such behavior among price leaders serves as a downside factor for domestic prices through the increase of low–priced imports. As far as price leaders are concerned, the launch of low–priced items would have the effect of expanding their market share and therefore enable them to remain profitable without further cost cuts. However, for the majority of followers who have no options other than following the behavior of price leaders, price cuts do not necessarily lead to profitability in many cases. A comparison of the business performance of price leaders and followers from FY1998 to FY2001 reveals that unit sales prices have fallen by the same degree. However, sales among price leaders increased by 8.4% in contrast to a sharp fall of sales (–3.9%) among followers **(Chart 20)**. As a result, followers would be compelled to cut costs. During the same period, operational costs increased 0.3% among price leaders in contrast to a 5.7% reduction among followers. The cost cuts among followers reach into all cost items such as distribution and sales costs and even labor costs (–3.8%) **(Chart 21)**. This is in sharp contrast to the rise of labor costs (+6.8%) among price leaders. Even if wages rise among workers employed by a price leader which is less than 10% of companies as a whole, average wages of workers as a whole would fall because wages would fall among workers employed by the followers which comprise close to half of the total.

Chart 20: Business performance (by pricing method)



Source: Ministry of Economy, Trade and Industry, *Defure ni kansuru anketo-chosa (2002)(Questionnaire Survey on Deflation (2002).*

Chart 21: Operational costs (by pricing method)



Source: Ministry of Economy, Trade and Industry, *Defure ni kansuru anketo-chosa (2002)(Questionnaire Survey on Deflation (2002)).*

As described above, the mild decline of prices and wages stems most likely from corporate behavior to secure market share and profits amid the lack of expectations toward the rise of overall demand. Such a vicious cycle tends to intensify in service sectors which rest mainly upon domestic demand and have a high proportion of labor costs in total costs. Presumably, this is the reason behind the significant fall of service prices in Japan in comparison with other countries of the world. Furthermore, the odds are high that such a negative spiral is progressing amid the sharp fall of economic growth expectations.

5. What are the desirable measures to stem deflation?

(1) The risks of debt deflation are remote

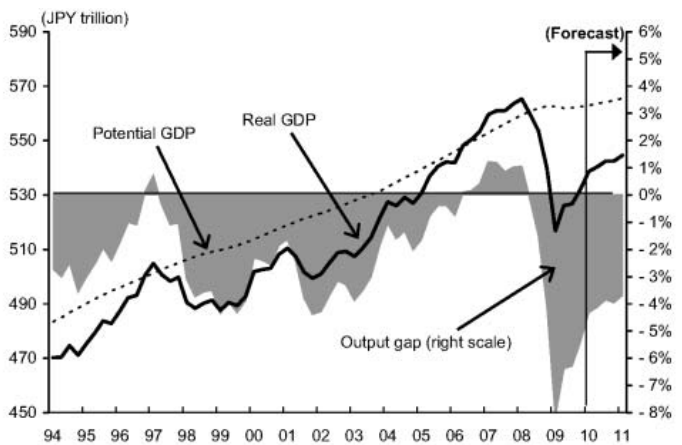
Keeping in mind the previous deflationary cycle, let us now turn to the risks stemming from the current deflationary phase. The debt overhang in the corporate sector which persisted from the early 1990s has been resolved as companies paid back their debts during the previous deflationary cycle. Therefore, it appears unlikely that the bulk of cash flows are being channeled toward debt repayment at the expense of labor compensation and capital investment.

(2) The mild decline of prices and wages will persist again

Meanwhile, the breadth of the recessionary gap (negative output gap) is larger than the previous deflationary phase. During the deflationary phase from 1998 to 2005, the recessionary gap was at most approximately 4.5%. This time, there is still an excessive supply of 4.3% as of the Jan–Mar quarter of 2010 after reaching 8.1% in the Jan–Mar quarter of 2009. According to forecasts by Mizuho Research Institute (MHRI), the recessionary gap is not expected to be closed anytime soon and that an excessive supply of

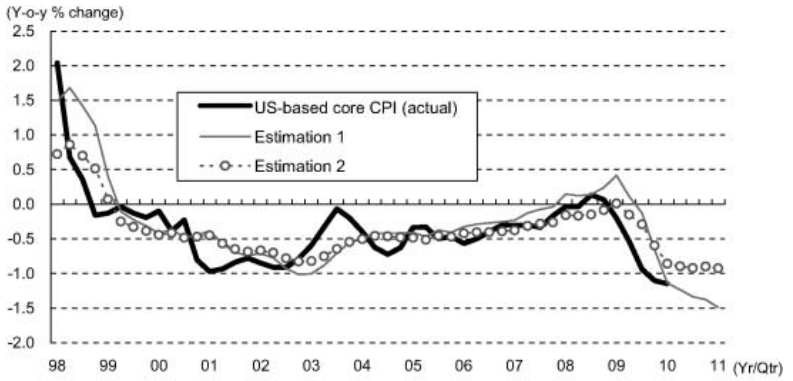
approximately 4% will persist even at the end of FY2010 **(Chart 22)**. Judging from the fact that the unemployment rate is already leveling off, corporate labor cost cuts will likely take the form of limitations upon wages in the future. Therefore, the chances are slim that a sharp rise of unemployment will lead to a serious deflationary spiral. However, as in the previous deflationary phase, the mild decline of prices and wages is expected to persist over a prolonged period of time. According to estimations based upon the output gap, the odds are high that the US–based core CPI will continue to fall at a pace of 1 to 1.5% even in 2010 **(Chart 23)**. An estimation of the time span from 1985 to the present reveals that the breadth of the fall of the US–based core CPI would expand to approximately 1.5%. Even if we limit the estimation period from 1998 onward in consideration of the fact that the sensitivity of prices to the output gap has been declining from 1998 onward, the results indicate that the US–based core CPI would continue to decline at a pace of 1% or so. Furthermore, mild price falls and wage declines are expected to persist from 2011 onward until the recessionary gap (negative output gap) is closed.

Chart 22: The output gap



Note: Estimates by MHRI.
Sources: Cabinet Office, Ministry of Economy, Trade and Industry, Ministry of Internal Affairs and Communications, and others.

Chart 23: The US–based core CPI (estimations)



Note: Estimation 1 (estimation period: 85/1Q～2009/3Q)

(US-based core CPI , y-o-y ch)＝0.1886＋0.7962＊(US-based core CPI , y-o-y ch)(average of 5～1Q before)
(1.78) (12.93)
＋0.1162＊output gap (4Q before)
(3.14)

Estimation 2 (estimation period: 98/1Q～2009/3Q)

(US-based core CPI , y-o-y ch)＝-0.1117＋0.5149＊(US-based core CPI , y-o-y ch)(average of 5～1Q before)
(1.29) (4.26)
＋0.0614＊output gap (4Q before)
(2.13)

Figures in ( ) are t-values

Sources: Made by MHRI based upon Ministry of Internal Affairs and Communications, *Consumer Price Index*, Cabinet Office, *National Accounts*, and others.

(3) Specific growth strategies are necessary to push Japan out of deflation

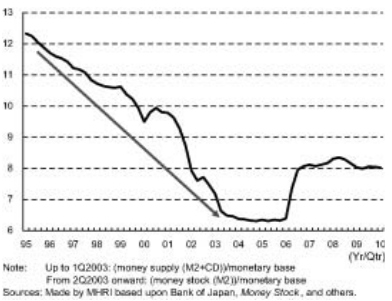
What financial and monetary policy measures are necessary in such a situation? Presuming that the quantity theory of money holds true, the negative price gap could be closed by increasing the supply of money through monetary easing and enable an exit out of deflation. However, during the previous deflationary phase, the Bank of Japan's (BOJ) expansion of the monetary base through quantitative easing did not lead to the expansion of money stock as a whole. This was due to the more or less uninterrupted decline of the money multiplier (money stock/monetary base) **(Chart 24)**. Furthermore, **Chart 25** shows that it was difficult for the expansion of money stock to lead to the recovery of the real economy due to the extremely slow velocity of money (nominal GDP/money stock). This was a state where expectations toward economic growth were

extremely low, where it was extremely difficult to increase borrowings and investment in the corporate sector and to raise inflationary expectations just by increasing the monetary base.

The same also applies to fiscal policy. Given Japan's critical fiscal conditions, temporary tax cuts and budget expansion will not serve as the key to Japan's emergence out of deflation. Since both tax cuts and budget expansion are clearly unsustainable, we cannot expect such measures to coax economic entities (corporate enterprises and households) to spend more because they expect that there will be tax hikes and budget cuts in the future.

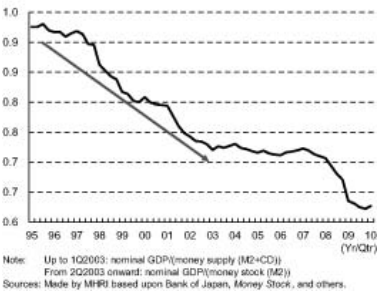
As examined in this paper, the reason for the persistence of the mild decline of prices and wages stems from the behavior among corporate enterprises to remain profitable amid low economic growth expectations. Therefore, it would be necessary to raise the expectations toward economic growth among corporate enterprises to emerge out of deflation. Within such context, measures to combat deflation on a medium to long–term perspective are the equivalent of growth strategies. The Japanese government unveiled the framework of its economic growth strategy at the end of last year. What is truly necessary for Japan's economy to emerge out of deflation is to build upon the specifics of this framework and to put them into action.

Chart 24: The money multiplier



Note: Up to 1Q2003: (money supply (M2+CD))/monetary base
From 2Q2003 onward: (money stock (M2))/monetary base
Sources: Made by MHRI based upon Bank of Japan, *Money Stock*, and others.

Chart 25: The velocity of money



Note: Up to 1Q2003: nominal GDP/(money supply (M2+CD))
From 2Q2003 onward: nominal GDP/(money stock (M2))
Sources: Made by MHRI based upon Bank of Japan, *Money Stock*, and others.

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Notes:

1 In the past, the term “deflation” was used to mean “the stagnation of the economy accompanied by the fall of prices”. However, in its *Monthly Economic Report* (March 2001), the Cabinet Office of Japan redefined deflation as the “sustained fall of prices”. This paper uses the definition of deflation by the Cabinet Office. On a global level, the norm is the fall of pries over a certain period of time. The IMF defines deflation as “a condition where prices fall continuously for at least two years”.

2 Even though it could be argued that Japan has been in a state of deflation up to the present since the end of the 1990s, the current deflationary phase is distinguished from the previous deflationary phase which is deemed to have ended around 2005 to 2006 when the recessionary gap (negative output gap) was eliminated and the core CPI stopped falling.

3 However, electricity charges are categorized statistically as nondurable consumer goods in consumer prices.

4 ＜Calculation of the price gap by the P–star model＞

Based upon the quantitative theory of money, the relationship between output, quantity of money and velocity of money circulation may be represented by the following equation.

$$MV = PQ \quad \cdots\cdots (1)$$

where M = money stock (M2 + CD), V = velocity of money circulation (nominal GDP/M), P = price level (GDP deflator), Q = output (real GDP)

Equation (1) can be rewritten:

$$M = KPQ \quad \cdots\cdots (2)$$

where K = Marshallian K (inverse of V)

Expressing equilibrium P, equilibrium Q and equilibrium K as P*, Q* and K* where money stock (M) is a given,

$$M = K^*P^*Q^* \quad \cdots\cdots (3)$$

Furthermore by dividing equation (2) by equation (3) and expressing the equation as a natural logarithm,

$$p^* - p = (q - q^*) + (k - k^*) \quad \cdots\cdots (4)$$

(lower case letters are logarithms)

Here, $(q - q^*)$ = output gap (GDP gap) in the goods market, $(k - k^*)$ = output gap in the financial market, $(p^* - p)$ = price gap reflecting both the goods market and the financial market

Equation (4) shows that the theoretical equilibrium price level turns out higher than the actual price level (the price gap widens) when the demand for goods is

larger than the equilibrium level or when the quantity of money supply (Marshallian K) corresponding to the real economy is higher than the equilibrium level. Therefore, the expansion of the price gap indicates the rise of potential inflationary pressures and reduction of deflationary pressures.

The long–term trend of Marshallian K which serves as the basis of calculation of the output gap in the financial market is obtained by the Hodrick–Prescott filter.

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