

13 March 2013 (No. of pages: 17)

Japanese report: 5 Feb 2013

Monetary Policy at a Turning Point, Effects of a Weaker Yen on Prices

Difficult to achieve inflation target on weaker yen alone

Economic Research Dept
Keiji Kanda

Summary

- The Bank of Japan (BOJ) has adopted a price stability target but this does not necessarily mean that it has changed its framework for monetary policy. Even so, the release of a joint statement with the government and the disappearance of “1% for the time being” as the goal for inflation do signal a turning point.
- Since the real economy and finance are two sides of the same coin, if the government foists the responsibility for deflation on monetary policy, there is no reason to think that expected inflation will steadily increase. The question is not establishment of an inflation target itself but what steps the government and the BOJ will take to achieve the target.
- Viewing from the perspective of unit labor cost to overcoming deflation, it will be important to strengthen the profit foundations of companies in the context of monetary easing and to build a safety net that smoothly promotes the rehabilitation of companies and the reemployment of workers.
- The yen depreciating 10% against the dollar would improve real GDP by around 0.2-0.4 percentage points from the second year. In light of past experience, yen depreciation over a year would have a limited impact on prices. However, if it extends over the long term, the resulting story would be different. Since inflationary pressure will accumulate through expansion of the economy, prices can be expected to trend gradually upward.
- If the yen depreciates over the long term, it would take considerable time before prices begin to rise. If the yen changes course sharply to appreciation, economic volatility would increase and the achievement of an inflation target would likely be delayed. What is needed for the sustained rise of prices is sustainable economic growth. This is why yen depreciation should be viewed as an opportunity for engaging in regulatory/institutional reform and for strengthening the economic structure. In other words, what should be emphasized is medium- to long-term growth capacity rather than the short-term growth rate.

Introduction

The Liberal Democratic Party achieved a major victory in the House of Representatives election held in December 2012, and political power shifted to a new administration after four years. In stock and foreign exchange markets, expectations for a political transition caused the yen to depreciate and stock prices to rise from mid-November, and the yen depreciated to the Y90 level against the dollar. In terms of economic fundamentals, the European crisis in remission and Japan's trade balance turning negative were developments favoring yen depreciation. It is possible to say that the Abe administration took advantage of these trends and that its call for bold monetary easing accelerated the yen's depreciation.

1. Inflation targeting and structural deflationary factors

Introduction of inflation targeting

At its Policy Board meeting of 21-22 January 2013, the Bank of Japan (BOJ) established a CPI growth rate of 2% as its inflation target and decided to engage in unlimited asset purchases starting in 2014 (until the end of 2013, asset purchases “shall be conducted up to the maximum outstanding amounts” specified in Principal Terms and Conditions for the Asset Purchase Program). Noteworthy is that the BOJ released a joint statement with the government that specified the objectives of overcoming deflation and achieving sustainable economic growth. A joint statement released in October 2012 merely bore the names of the BOJ Governor, the Minister of State for Economic and Fiscal Policy, and the Minister of Finance, and hence the joint statement of January 2013 clearly represents a stronger institutional commitment to policy coordination.

It does not appear, however, that the BOJ has actually changed its framework for implementing monetary policy following the Policy Board meeting. Strengthening the competitiveness and growth capacity of Japan's economy is regarded as a condition to be met in relation to overcoming deflation and increasing the inflation rate, and it would not necessarily be correct to say that the BOJ has changed its stance to overcoming deflation through its monetary policies. In *Background Note Regarding the Bank's Thinking on Price Stability* released by the BOJ on 23 January, the current monetary environment is considered to be extremely accommodative.

Question is what steps the government and the BOJ will take to achieve the target

While the BOJ has adopted 2% as its price stability target, this does not necessarily mean that the central bank has changed its framework for monetary policy since it has already been operating under a flexible inflation targeting policy. Even so, the release of a joint statement with the government and the disappearance of “1% for the time being” as the goal for inflation do signal a turning point. At the Council on Economic and Fiscal Policy, of which the BOJ Governor is also a member, monetary policy and price conditions are likely to be debated with greater intensity than before.

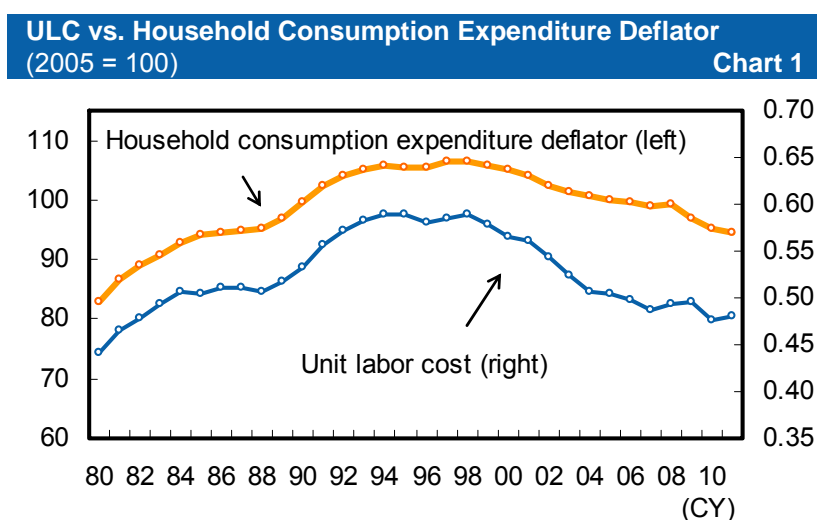
In the process of overcoming deflation, what will be desirable is the deepening of debate on how a price stability target should be understood with respect to such issues as the time lag of policy effects, the fostering of inflationary expectations, and the relationship between wages and prices—and this should be accompanied by a growing understanding among the public that monetary policy for ending deflation, although shadowed by certain issues, is slowly making progress. Moreover, there will be a need to clarify even more than before the roles and responsibilities of the government and the BOJ. To overcome deflation and achieve the inflation target, it will be important for the BOJ to strengthen its asset purchases under certain circumstances, but these are not objectives that can be met through monetary policy alone. As specified in the joint statement, the government should take steps that “include all possible decisive policy actions for reforming the economic structure, such as concentrating resources on innovative research and development, strengthening the foundation for

innovation, carrying out bold regulatory and institutional reforms and better utilizing the tax system.” Since the real economy and finance are two sides of the same coin, the government has the same level of responsibility for achieving these objectives. If the government foists the responsibility for deflation on monetary policy, there is no reason to think that expected inflation will steadily increase. The question is not establishment of an inflation target itself but what steps the government and the BOJ will take to achieve this target.

Backdrop to long-term deflation from the perspective of unit labor cost

How should deflationary factors be understood, and how should they be dealt with? If deflation consists of prices declining in the short term, this can be addressed through normal fiscal and monetary policies. This is because such deflation will have resulted from the easing of the macro supply-demand balance due to a worsening economy or from a financial shock like plunging asset prices. Deflation, however, has persisted in Japan for nearly 15 years. During this period, Japan experienced its longest postwar expansion, and successive administrations and the BOJ have implemented a multitude of policies to end deflation. Given this history, persistent deflation is clearly not a problem that can be solved through a single policy. Rather, it will need to be addressed in a comprehensive manner as a complex structural problem.

If deflation is understood to be a structural problem, investigating the background to unit labor cost (ULC) will prove to be effective, given that ULC determines the long-term trend of prices. ULC expresses labor cost per unit of production, and it is derived by dividing nominal employee compensation by real GDP.¹ Chart 1 presents the trend of the deflator for household consumption expenditures, corresponding to CPI on a GDP basis, and the trend of ULC. While these two indicators do not always move together in the short term, it should be evident from the chart that their long-term trends coincide.



Source: Cabinet Office; compiled by DIR.

Note: ULC (unit labor cost) = nominal employee compensation / real GDP.

1. If we posit a Cobb-Douglas production function for the first postulate of classical economics (marginal product of labor equals real wages), the marginal product of labor will be proportional to labor productivity, and the following substitution can be made:

$(w - p) = (y - l) \Leftrightarrow (w + l) - y = p$ (all are logarithmic expressions; labor's share excluded; w : nominal hourly wages; p : prices; y : real GDP; l : total hours worked).

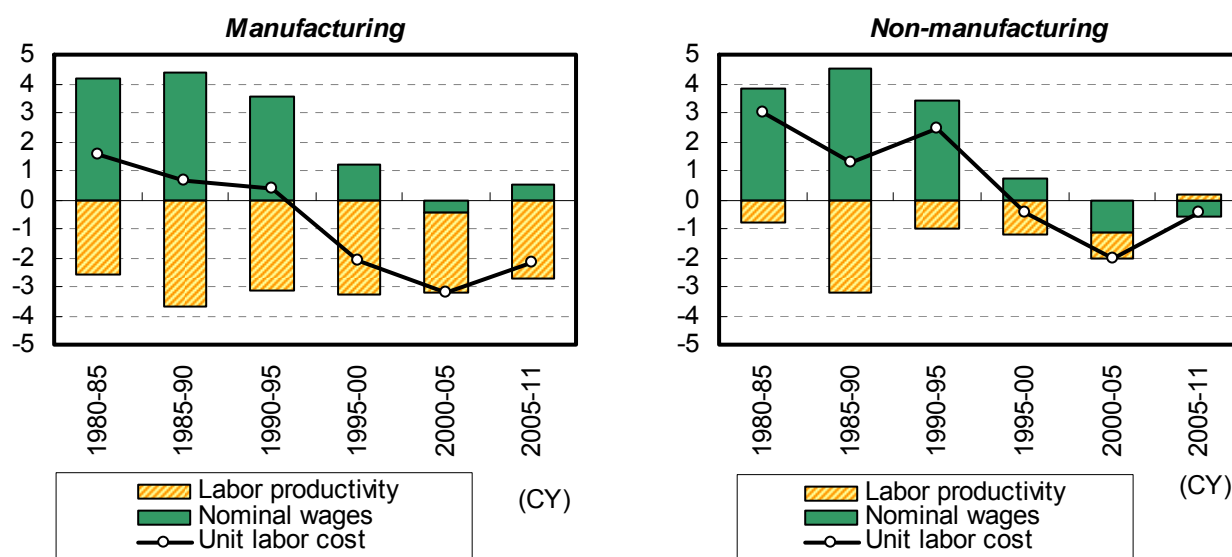
This means the growth of ULC and the growth of prices will equalize over the long term.

ULC is determined by nominal wages and labor productivity. That is to say, higher nominal wages will increase ULC, and higher productivity will reduce ULC. In relation to prices, higher nominal wages will increase prices, and higher labor productivity will reduce prices. Thus, to understand the trend of prices, it will be important to monitor the direction of nominal wages and labor productivity.

ULC: manufacturing vs non-manufacturing

Chart 2 portrays the results of dividing ULC shown in Chart 1 into that for manufacturers and non-manufacturers and comparing how these two ULCs change every five years from 1980 to 2011. To generalize, many manufacturing industries are capital intensive while many non-manufacturing industries are labor intensive. Thus, labor productivity tends to be higher in the former than in the latter. In fact, the labor productivity of manufacturing industries rose by an average 3% over the last 30 years, more than four times the 0.7% recorded by non-manufacturing industries when the asset bubble period is excluded. Compared to manufacturing industries, higher nominal wages easily results in a higher ULC for non-manufacturing industries to the extent that the growth rate of its productivity is low. Moreover, while the level of nominal wages may differ for manufacturers and non-manufacturers, since the domestic labor market is unified, they tend to change in the same direction as they influence each other. For example, when wages increase in manufacturing industries, non-manufacturing industries will also raise wages to secure labor. Since non-manufacturing industries will be unable to absorb increases in labor costs through higher productivity, it will transfer the increases to sales prices, causing CPI to rise. Services account for 50.7% of CPI (base year of 2010), underscoring that changes in non-manufacturing industries' ULC have a larger impact than those of manufacturing industries.

Breakdown of Unit Labor Cost of Manufacturing and Non-manufacturing Industries (y/y %) Chart 2



Source: Cabinet Office; compiled by DIR.
Note: Nominal wages=man-hour basis.

Productivity has been stable over the last 30 years, and nominal wages have tended to set the pace for ULC and prices. Before Japan's economy was overtaken by deflation (1980-95), nominal wages grew at an average rate of around 4% for both manufacturing and non-manufacturing industries. Since this was higher than the growth rate of productivity, ULC and prices rose. Once deflation took hold (1995 and beyond), however, the growth rate of nominal wages rapidly slowed, and it remained low without returning to its former level. As a result, ULC has continued to trend downward.² As this should

2. For Japan as a whole, nominal hourly wages increased an average 0.9% from 1995 to 2000 and then trended downward in the 2000s, declining an average 1.0% from 2000 to 2005 and then an average 0.4% from 2005 to 2011.

indicate, nominal wages represent an important key for analyzing structural problems of deflation. In the paragraphs to follow, we examine reasons why the growth of nominal wages has slowed compared to the years before deflation.

Background to nominal wage declines at manufacturers: manufacturers secured sales while terms of trade worsened

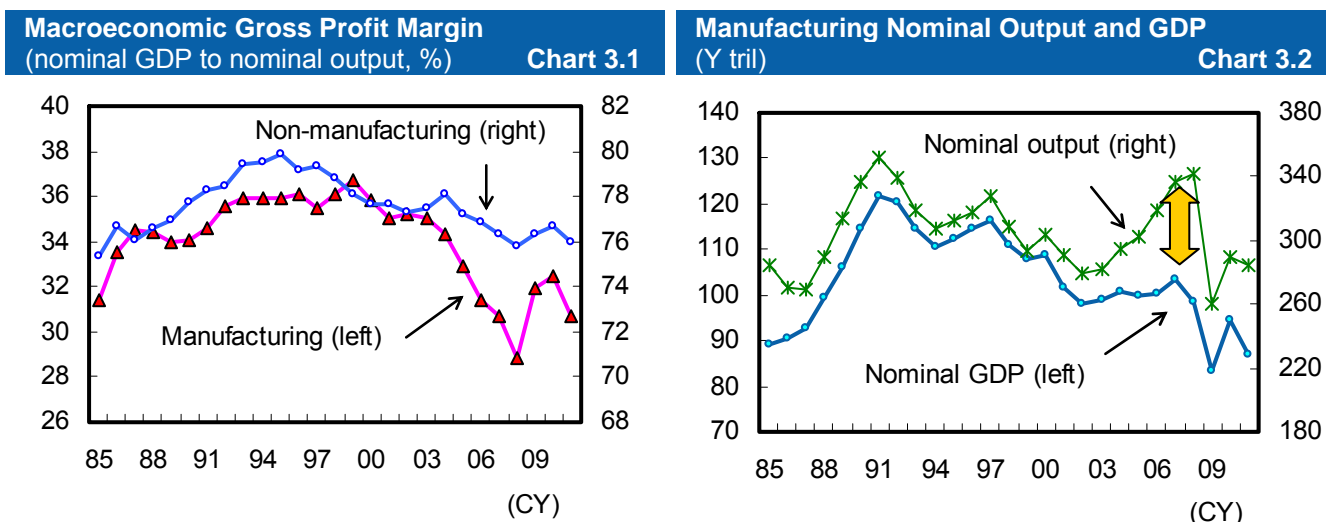
The ULC of manufacturers can be understood as an indicator of international competitiveness with respect to costs. The further ULC declines, the greater their export competitiveness will be.³ In the 1990s, the progress of globalization was accompanied by the growing presence of emerging economies, and this trend accelerated in the 2000s. Japan's export industries, in the context of high resource prices and the persistent shift to a stronger yen, maintained the competitiveness of Japanese products by refraining from transferring costs to selling prices. In short, they secured export volume by allowing the terms of trade (export prices / import prices) to worsen. Forgoing the passing through to selling prices the increase in raw material costs and/or the appreciation of the yen represents the effective reduction of prices, which companies sought to offset through labor costs. Naturally, costs can be absorbed if productivity rises, but since their productivity was increasing at a fixed pace, manufacturers reduced ULC by restraining the growth rate of nominal wages. While Japan's export volume grew at a certain rate during the longest postwar expansion that started in 2002, since wage increases were suppressed even when the yen depreciated, the wages paid by export industries did not grow as they did in the first half of the 1990s.⁴

Such behavior by manufacturers took clear form as declining profitability. Chart 3.1 illustrates the trend of nominal GDP divided by nominal output value,⁵ which can be understood as the macro gross profit margin. The gross profit margin of manufacturing industries fell rapidly once crude oil prices began to trend upward in 2004. It fell to 28.9% in 2008, the lowest for the 2000s and 8 percentage points below its peak since 1980 (36.7% in 1999). The nominal output value of manufacturing industries rose to Y342 trillion in 2008, a level only exceeded by the high reached in 1991 during the asset bubble period (Y352 trillion). Even so, nominal GDP in 2008 was Y23 trillion (about 20%) less than the corresponding figure for 1991 (Chart 3.2). Although Japan's economy experienced its longest postwar expansion from 2002 to 2007, the nominal GDP of manufacturing industries was largely flat during this period. Falling profitability is also applicable to non-manufacturing industries. As seen in Chart 3.1, the gross profit margin of non-manufacturing industries has undergone a secular decline after peaking in 1995. For nominal wages to rise, the profit environment of companies must improve. Since the second half of the 1990s, however, the profitability of both manufacturers and non-manufacturers has worsened, which is thought to be one of the factors constraining nominal wages.

3. Since raw materials and intermediate goods can be transferred internationally through trade, differences in manufacturing costs between nations are largely explained by differences in labor costs.

4. See *Rolling Back the Strong Yen under a Dollar Reserve Currency Regime*, Keiji Kanda and Hitoshi Suzuki, 30 December 2011.

5. GDP is expressed as production value minus intermediate input value. The latter corresponds to raw material costs of companies.



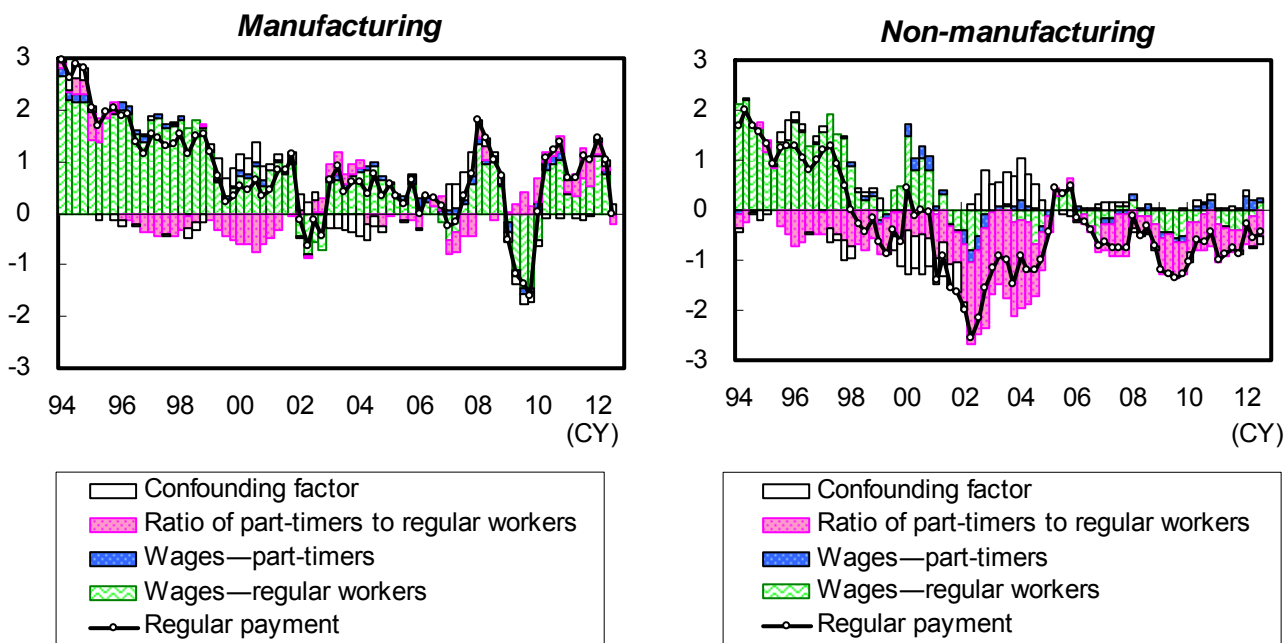
Source: Cabinet Office; compiled by DIR.

Background to nominal wage declines at non-manufacturers: non-manufacturers corrected domestic-foreign price gap by increasing ratio of non-regular employees

As depicted in Chart 2, nominal wages of manufacturers and non-manufacturers tend to change in the same direction. In the 2000s, however, the nominal wages of non-manufacturing industries have continued to trend downward, which is largely explained by increases in the proportion of non-regular employees. Chart 4 provides a factor analysis of per employee nominal regular wages. The chart reveals that non-manufacturers adjusted the average level of wages by increasing the proportion of part-time workers, whose wage level is about one third that of regular workers. Regular wages of regular workers also began to trend downward in the first half of the 2000s. These wage adjustments have been severe compared to manufacturing industries where the growth of wages was maintained for the most part even if at a low level. One of the factors behind these developments is thought to be pressure to correct the differential in domestic and foreign prices. At the start of the 1990s, an issue that came under discussion was Japan's high prices as well as the nation's high production and living costs. It was argued at that time that, since prices for the equivalent goods and services were higher in Japan than in foreign nations, the differential in domestic and foreign prices was a matter that needed addressing. What had been an industrial structure attained through high service prices and high wages where consumers shouldered a significant burden has now changed through globalization and deregulation to one where the price mechanism functions.

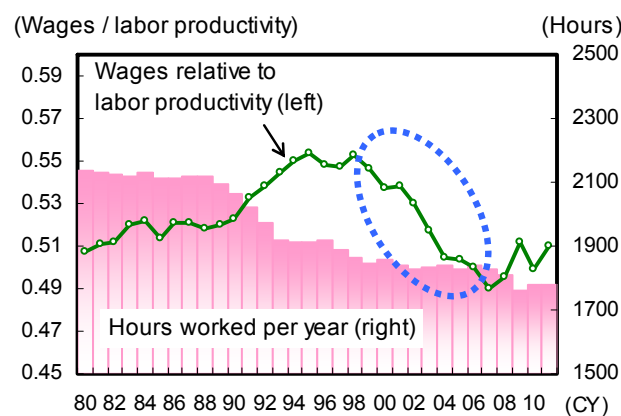
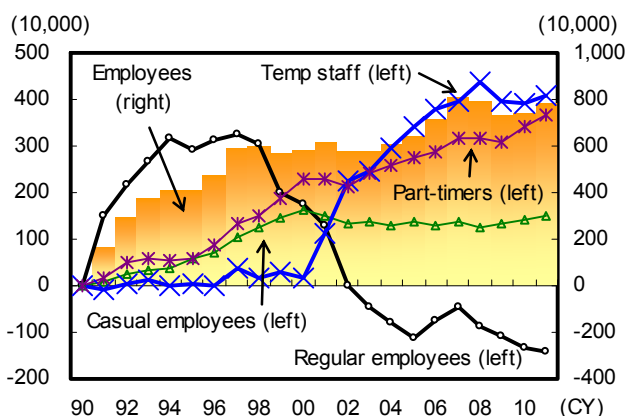
Wage adjustments carried out from around 1998 are reflected in the sharp decline in the growth rate of nominal wages from 1995 to 2000. As can be ascertained in Chart 5, despite Japan's economy worsening rapidly from the collapse of an asset bubble, companies continued to hire workers centering on regular employees in the 1990s. This, combined with the introduction of two-day weekends during the same period, led to a contraction in total actual hours worked per employee. However, real wages that should have trended at a certain level in proportion to labor productivity continued to rise to the mid-1990s owing to such factors as weak company earnings, excess employment, and the downward rigidity of nominal wages (Chart 6). Real wages remained high to about 1998. The worsening of corporate earnings stemming from the Asian currency crisis in the summer of 1997 and financial uncertainties in autumn 1998 then gave way to the adjustment of regular employees and massive wage adjustments from 1998 to 2004. As a result, the ratio of real wages to labor productivity fell back to its level in the first half of the 1980s. With respect to employment, as portrayed in Chart 4, the proportion of non-regular employees increased for such non-manufacturing industries as services and wholesaling/retailing, which contributed to the retreat of average wages.

Breakdown of Regular Payment by Industry (Y/y %) **Chart 4**



Source: Ministry of Health, Labour and Welfare; compiled by DIR.

No. of Employees (Change from 1990) **Chart 5** **Wages Relative to Hours Worked** **Chart 6**



Source: Ministry of Internal Affairs and Communications; compiled by DIR.

Source: Cabinet Office; compiled by DIR.
Note: Wages=man-hour basis; real terms.

- Notes: 1) Excl. executive officers.
2) Temp staff=full-time non-regular workers with direct contracts or those dispatched from staff agency.
3) Casual employees=ad hoc workers.

Overcoming deflation requires the government to display its capacity to act

Given the problems associated with the industrial structure and labor market rigidities described above, nominal hourly wages have trended downward from around the end of the 1990s, which gave rise to deflation. Also, as noted above, even if demand is stimulated in the short term, a sustained increase in nominal wages and prices is extremely difficult to achieve. For nominal wages to grow steadily, it will be important to strengthen the profit foundations of companies in the context of monetary easing and to build a safety net that smoothly promotes the rehabilitation of companies and the reemployment of workers.

A perspective of increasing and enhancing qualitatively supply capacity will be necessary in seeking to improve the profitability of companies. This does not mean expanding the supply of goods and

services that do not meet consumer needs. What will be needed is establishment of economic conditions where value-added is raised further through an unremitting process of company renewal and where new goods and services are created that improve living standards. To realize such an economy, the private sector will need to express a spirit of entrepreneurship and assume risk. For this reason, the Abe administration positioning growth strategies that encourage private-sector investments as a central pillar of its policies is clearly the right approach to take.

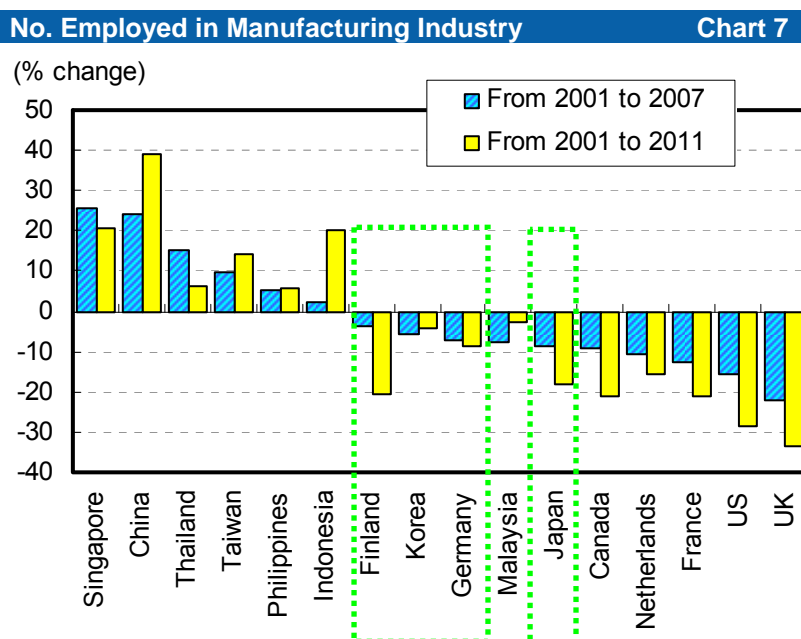
The Abe administration is also displaying enthusiasm for regulatory reform, which will be important in areas where demand is excessive. Whether demand exceeds supply is easy to judge by the number of people waiting in line, which is the case for day care centers, hospitals, and nursing care facilities. The number of children waiting for openings in day care centers indicates that the current supply capacity of such facilities does not match existing needs. Those sectors where consumers are at times willing to pay higher prices for medical care, nursing care, or child care are in markets that are highly regulated by the government. Carrying out regulatory reforms in such markets will strengthen the supply capacity of the economy and is certain to unleash potential demand.

Export companies have maintained earnings one way or another in the midst of worsening terms of trade. For such companies to regain their luster, the government should reduce the effective tax rate borne by corporations to a level corresponding to competitor nations and should expand foreign trade through free trade agreements and economic partnership agreements. As the expansion of the world economy progresses, a perspective of ascertaining demand on a global basis and meshing Japanese products and services with it will be indispensable. More broadly, the inbound investments of competitive foreign companies should be accepted to create jobs and to invigorate the domestic market.

In proceeding with deregulation and the liberalization of trade, the domestic industrial structure will need to smoothly change in response. In other words, it will be desirable for companies and workers in ebbing industries to smoothly transit to growth industries and for profitability and income levels to increase at both macro and micro levels.

Although some observers view the liberalization of trade negatively, since Japan engages in economic activities with other nations on a global basis, the domestic industrial structure is already changing under the influence of globalization. For example, as companies pursuing global opportunities transfer the assembly of products and other labor-intensive and low value-added work to emerging economies, related labor demand has contracted. In addition, the secular decline of employees in manufacturing industries has been observed in many advanced economies, and it is not a phenomenon that is unique to Japan. In fact, when the world economy grew strongly from 2002 to 2007, employment in manufacturing industries decreased not only in Japan and the US but also in such advanced industrial nations as Germany, Korea, and Finland (Chart 7).

Deregulation and the liberalization of trade will cause the industrial structure to change at an even more rapid pace. For this reason, it would not be realistic to assume that all companies and workers in ebbing industries will be able to smoothly transit to growth industries. In the short term, cases will arise where economic agents will encounter difficulties in the form of bankruptcies and frictional unemployment from their inability to adapt to changes in the economic structure. To swiftly eliminate such conditions, the government's role in providing a safety net will grow further. The purpose of a safety net is not to prevent bankruptcies and unemployment in industries in structural decline. Rather, it is to promote the launching of new businesses and the creation of jobs in growth industries. If the environment is in place for companies and people to accept challenges, companies taking risks would increase, creating value added and jobs.



Source: Haver Analytics, CEIC data, Cabinet Office; compiled by DIR.

Systemic reform toward the achievement of a highly flexible labor market will be a key issue in this process. As noted above, in the current labor market, regular employment is highly rigid. This situation is giving rise to such problems as non-regular employees bearing the brunt of unemployment risk, and young people being reluctantly employed in non-regular positions and finding themselves in lengthening periods of unemployment. If regulations are eased and trade liberalized without addressing these problems of the labor market, reemployment may not proceed smoothly and the unemployment rate may rise for structural reasons.

Hence, it will be important to create a system that lowers the barrier between regular and non-regular employment. What is needed is a process where the risk of unemployment is shared by society as a whole rather than having it fall exclusively on some segments of the population. How to balance a more flexible termination system for regular employees and improved compensation for non-regular employees will require a national debate. For example, the practice of downsizing employees by reducing non-regular employees should be ended so as to lessen the unemployment risk attaching to non-regular employees. Another possibility is to lower the corporate contribution to employee social insurance premiums, and, instead, to raise the tax burden to create a system where society as a whole supports the social security of workers. This would reduce the employment costs of companies, which can be expected to increase their interest in hiring regular employees.

Growth strategies are one of the three priority areas of the Abe administration. Much of what we have discussed above is reflected in these strategies of the new administration. The question is whether growth strategies will actually be implemented. The easing of regulations and liberalization of trade has both supporters and detractors, making political decisions difficult to reach. To overcome deflation that has lasted for nearly 15 years and to return to a vigorous Japanese economy with moderate inflation, the new administration will not only need to distribute policy benefits but will also need to steadily inculcate a willingness to persevere.

2. What effect will yen depreciation have on the economy/prices?

Adverse impact in the short term, positive impact as time passes

The adoption of an inflation target and other changes in monetary policy do not yet denote a major change in the framework for such policy. There is no question, however, that these changes have altered the sentiment of domestic and foreign investors, which is evidenced by the depreciation of the yen and the ascent of share prices. The yen has weakened from around Y80/\$ in mid-November to a level exceeding Y90/\$. Naturally, the reasons for yen depreciation are not limited to domestic factors. It is also the outcome of improvements in the external environment, such as the US and Chinese economies trending toward recovery and the headway being made in dealing with the European sovereign debt crisis. Given these developments, investors have pulled back from purchasing the yen as a safe-haven currency. In the midst of these changes, the dissolution of the House of Representatives on 16 November gave new plausibility to a change in administration, and expectations that deflation would be overcome intensified, particularly among foreign investors.

In this context, a matter of interest is how Japan's economy will be affected by yen depreciation. While the downsides of a strong yen have drawn attention to date, a weak yen also has its drawbacks. A typical example is the ascent of costs from higher import prices. About 50% of Japan's export value and about 70% of its import value is denominated in dollars. Hence, a simple calculation would indicate that the yen depreciating against the dollar would worsen the trade balance. This assumes, however, that all economic agents, whether domestic or foreign, would not change their behavior when the yen weakens. Thus, the statement that yen depreciation has an adverse impact on the economy applies only in the short term when the behavior of economic agents has not changed so much.

In reality, yen depreciation increases the international competitiveness of export industries, and export volume will grow with the passage of time. This in turn will expand production activity and increase hours worked, thereby inducing capex. It will also contribute to an improvement in corporate earnings and the employment and income environment for households. All these effects will need to be factored in to understand the actual impact of a weaker yen.

As one possible benchmark, Chart 8 presents an estimation of the effects of yen depreciation using our macroeconomic model.⁶ Specifically, we calculated how Japan's economy would be affected by the yen depreciating 10% against the dollar and this situation continuing for one year. Figures in the chart indicate deviation from the situation where the yen does not depreciate (base scenario). The yen depreciating 10% against the dollar would improve real GDP by around 0.2 to 0.4 percentage points from the second year forward. Deviation is the greatest in the fourth year when it reaches 0.41 points. In terms of demand components, the yen depreciating against the dollar would increase real exports with a lag, and this effect would spread primarily to capex. In addition, yen depreciation would increase import prices and reduce import demand, and real imports would decline compared to the standard scenario. While the improvement in the economy would cause the long-term interest rate to rise, the budget balance would improve as tax revenues increase from expansion of the economy.

6. For details, see *Japan's Medium-term Economic Outlook: February 2013*, Tomoya Kondo, Mikio Mizobata, and Keiji Kanda, 13 March 2013.

10% Depreciation of Yen against Dollar Continues for One Year

Chart 8

Deviation from absence of yen depreciation; %, %pt

	Real GDP							
		Private final consumption	Private housing investment	Private capital investment	Government final consumption	Public fixed capital formation	Exports	Imports
1st year	-0.06	0.00	0.00	-0.06	-0.10	0.10	0.00	0.17
2nd year	0.28	0.03	0.32	1.13	0.03	-0.49	2.29	1.16
3rd year	0.24	0.00	-0.34	0.19	0.03	-0.36	0.97	-0.13
4th year	0.41	0.06	-0.22	0.00	-0.01	-0.66	0.43	-1.95
5th year	0.18	0.09	-0.06	0.06	-0.10	-0.28	0.23	-0.48
	Y/\$	GDP gap	Unemployment rate	CPI	Short-term interest rate	Long-term interest rate	Current balance	Fiscal balance (central & local government)
							(% of nominal GDP)	
1st year	10.00	-0.04	0.01	0.04	0.01	0.00	-0.10	-0.03
2nd year	0.00	0.18	-0.03	-0.02	0.11	0.06	0.04	0.06
3rd year	0.00	0.13	-0.05	0.02	0.08	0.05	0.08	0.05
4th year	0.00	0.24	-0.06	0.05	0.23	0.13	0.33	0.11
5th year	0.00	0.10	-0.05	0.13	0.13	0.07	0.04	0.04

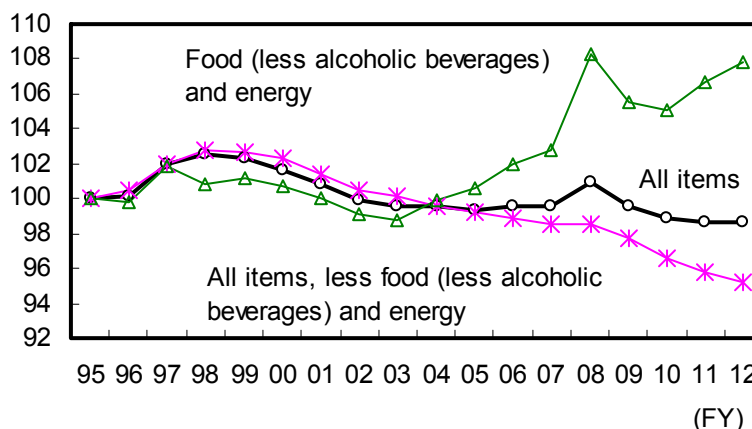
Source: Compiled by DIR based on DIR's medium-term macroeconomic model.

Impact of yen depreciation on CPI will be small

What deserves special attention in this chart is the impact of yen depreciation on CPI. It is natural to think that the expansion of the economy would tighten the macro supply-demand balance and give rise to inflationary pressure. However, our simulation with a macroeconomic model reflecting Japan's economic structure discloses that the impact on prices will be extremely small. CPI is a price index of 588 items adjusted by consumption value weightings for a given base year. Gasoline and other energy-related items that are readily influenced by exchange rates account for nearly 8% of CPI. A straightforward calculation indicates that, should the yen depreciate 10% against the dollar, energy prices would rise 5% and CPI would increase 0.4 percentage points if the prices of all other items are unchanged. In reality, since CPI components include a range of imported items like wheat and textile products, the impact of the yen depreciating against the dollar may be far higher than the results of our simulation might indicate.

An examination of past price trends, however, reveals that CPI does not necessarily increase in accordance with the increase calculated from the growth rates and weightings of its components. In other words, when the prices of daily staples and some other items rise, demand for other items will fall and their prices will decline. Hence, CPI as a whole has barely climbed.

Chart 9 presents the trends of CPI (all items), CPI excluding food (excl alcoholic beverages) and energy, and CPI for food (excl alcoholic beverages) and energy. Many of the items included in food and energy are strongly influenced by forex rates and commodity prices. Hence, a comparison of these three indices will enable us to infer how prices will change when the yen depreciates. The food and energy CPI, which accounts for about 30% of consumption value, has trended upward from around 2004 owing to the increase in commodity prices and depreciation of the yen. The correction of crude oil prices together with accelerating yen appreciation, however, temporarily stemmed the ascent of this index. Since 2011, the food and energy CPI has reverted to an upward trend. CPI excluding food and energy, with a 70% share of consumption value, has trended downward even in the period between 2005 and 2007. CPI (all items), a weighted average of the other two CPIs, has been on a gradual downward trend. As a result of reflecting these past price trends in our macroeconomic model, it is quite likely that the upside effect of yen depreciation on prices is understated in our estimation by a considerable degree.

Consumer Price Index (1995 = 100; 2010 weightings) Chart 9

Source: Ministry of Internal Affairs and Communications; compiled by DIR.

Should the yen trade at 90/\$ from January 2013 to the end of FY13, it would depreciate around 9% against the dollar compared to FY12, which would closely correspond to the assumption for our simulation portrayed in Chart 8. Thus, should the yen continue to trade at its current level for over a year, the upside impact on CPI will be quite small based on past economic trends. That said, should yen depreciation extend not for one year but over the long term, the resulting story will be quite different. Since inflationary pressure will accumulate through expansion of the economy, prices can be expected to trend gradually upward.

Two points at issue regarding exchange rates

Here we examine two points at issue regarding forex rates. They are (1) strong or weak forex rates and their impact on the economy and (2) the desirable level of forex rates. Following the transition to a floating exchange rate regime, Japan has achieved economic growth as a trading nation while at times being exposed to extremely volatile forex rates. This has made Japan a nation whose interest in forex rates is one of the highest in the world. Many people, such as market participants and individuals who deal with foreign currencies, have developed their own views and thinking regarding foreign exchange. For this reason, we will elucidate our perspective on foreign exchange and clarify the similarities and differences that exist with other viewpoints.

Point 1: Strong or weak exchange rates and their impact on the economy

The economic effects of a weak or strong yen are often debated in terms of a specific forex rate level. It is not appropriate, however, to debate economic effects only in such terms. When the forex rate between two nations is at a level that reflects economic fundamentals (i.e., the equilibrium exchange rate), the effect of this forex rate is neutral for both nations. When the yen's forex rate coincides with its equilibrium exchange rate, the Japanese currency cannot be called strong or weak whether its forex rate is Y50/\$ or Y200/\$. Since the equilibrium exchange rate is determined by the economic fundamentals of the two nations constituting the currency pair, its level is not rigid but changes gradually on a daily basis.

Forex rates have an economic impact when they deviate from equilibrium level. The size of this impact is determined by degree of deviation and rate of change. Companies generally manage production activities by considering the optimum input of people and goods in relation to economic fundamentals so as to generate as much value added as possible. Should the yen deviate from its equilibrium forex rate, they will be compelled to reallocate staff and goods and to alter contracts, and profits will be squeezed. Also, since companies will need some time to respond appropriately, should forex rates change at a faster pace than companies can respond, higher costs and other inefficiencies

will be experienced, and the economy will worsen from the decline in corporate earnings and household income.

These prospects will apply whether the yen strengthens or weakens. Yen depreciation will naturally bring upside pressure to bear on the economy, as we have noted above. In the long term, however, if the yen depreciates excessively, the forex rate will eventually converge on the equilibrium exchange rate, and the forex rate will turn to appreciate at some future moment (frequently overshooting the equilibrium level). As a result, the level of capital stock and employees deemed optimal by companies will become excessive, which will require massive adjustments and will worsen earnings. This is precisely what export industries experienced in the wake of the Lehman crisis. It is not the weakest forex rate that is the most desirable. Rather, what is desired is a forex rate that changes at a pace gradual enough so economic agents can respond in conformity with economic fundamentals.

Point 2: Desirable level of forex rates

The next issue concerns the question of what forex rate corresponds to an equilibrium exchange rate. Of the various approaches for calculating an equilibrium exchange rate, purchasing power parity (PPP) is highly practical and has empirical support.

PPP assumes that exchange rates are determined so that the purchasing power of nations equalizes to realize one price for identical products in the long term. Specifically, the growth rate of PPP corresponds to the difference in the inflation rates of trade goods between respective nations (strictly speaking, our discussion concerns relative PPP since it employs growth rates rather than price levels). Two problems, however, can be mentioned. First, no trade goods price index exists that matches the thinking behind PPP. Second, the equilibrium level will differ depending on the chosen estimation period and on the price index used as the proxy variable. Of the price indices that exist in Japan, the Domestic Corporate Goods Price Index is thought to be closest to the thinking behind PPP.

The PPP published by the OECD is sometimes used as an indicator of the desirable level of forex rates.⁷ The OECD PPP was Y103.9/\$ in 2012, more than Y10 weaker than the yen's recent forex rate. The OECD PPP was developed to measure the economic size (GDP) and average consumption level of nations, and it factors in relative prices between many nations for a broad range of goods and services constituting GDP. Since the OECD PPP does not express the relative price trends of trade goods, it is not a suitable indicator of whether forex rates are undervalued or overvalued.

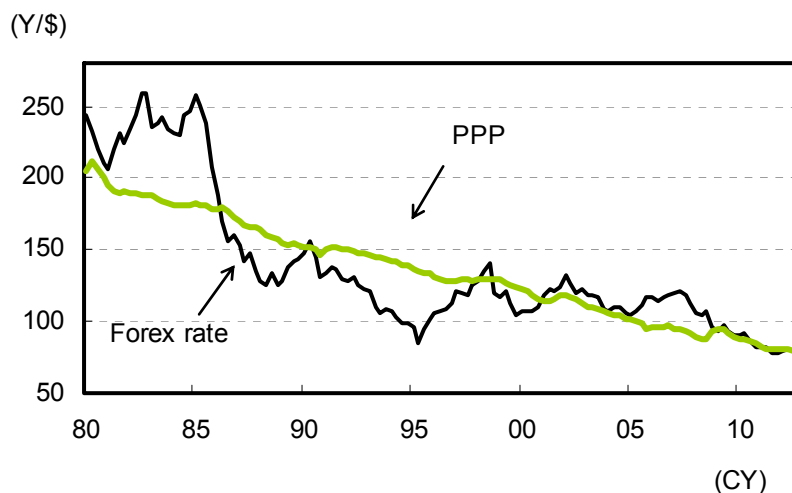
For our purposes, we selected the Domestic Corporate Goods Price Index of Japan and the Producer Price Index of the US as proxy variables for the prices of trade goods in calculating PPP.⁸ Chart 10 portrays this PPP and the trend of the forex rate. As discussed above, PPP calculations will need to be viewed with a certain degree of latitude. The specific level of the PPP we indicate is not that significant. The important point to note is that PPP does express the trend of forex and that theory proves to be applicable in the long term. PPP and forex rate rarely coincide, however, in the short term. For example, from the 1980s to the 1990s, the forex rate deviated from PPP significantly and over the long term. This divergence is precisely the strong or weak yen that affects the economy in a manner that cannot be explained by the basic factor of prices.

7. The IMF also publishes a PPP, but since it is based on the OECD PPP, it is essentially the same statistic (<http://www.imf.org/external/pubs/ft/weo/faq.htm#q4f>).

8. The PPP of the yen against the dollar is generally calculated by (1) selecting price indices for Japan and the US, (2) determining the period when yen-dollar PPP was equal to the forex rate (base year), and (3) extending the PPP forward from the base year according to the difference in inflation rates between Japan and the US. Rates of change, however, can differ between the price indices selected in (1) and the true prices of tradable goods, and the determination of (2) is somewhat arbitrary. In this report, we chose a regression equation to address these problems. With this method, nearly the same results are attained when CPI is used.

Y/\$: Forex Rate and PPP

Chart 10



Source: Bank of Japan, US Bureau of Labor Statistics; compiled by DIR.

Note: Purchasing power parity (PPP) estimated for the period from Jan-Mar 1980 to Oct-Dec 2012 based on the following equation:

$$\ln(Y/\$) = 5.07 + 0.99 \times \ln(\text{Japan's Domestic Corporate Goods Price Index} / \text{US Producer Price Index}).$$

When we focus on the rates of change in these two statistics, PPP is extremely stable compared to the forex rate. Factors thought to influence differences in the inflation rates of trade goods include the wage growth rate and production structure (labor input ratio, intermediate input ratio, and capital input ratio) in the trade goods industries as well as the rate of technological progress. Since these factors change only gradually at the macroeconomic level, the movement of relative prices is moderate. Forex rates, however, change in accordance with such indeterminate factors as the occasional news that sways forex markets, differences in nominal market interest rates, and the outlook for relative inflation rates. As a result, they can at times swing widely.

What is worth recalling at this juncture is the causal relationship between prices and exchange rates. PPP essentially determines exchange rates according to relative inflation rates. History discloses, however, that when forex rates deviate from PPP and undergo excessive shifts, such changes will alter PPP. That is to say, the relationship between PPP and forex rates goes both ways. When the yen forex rate diverges greatly from PPP and appreciates sharply as occurred after the 1985 Plaza Agreement or in 1995, the allocation of resources and income becomes distorted to the same degree, and PPP shifts. Chart 10 indicates that the recent forex rate is nearly the same as PPP. The crucial point here is that, if forex rate represents a strong yen, so too does PPP as a result of persistent deflation, and the divergence between the two appears to have been eliminated. In contrast, should the yen remain weaker than PPP, the expansion of the economy can be expected to shift PPP toward a weak yen.

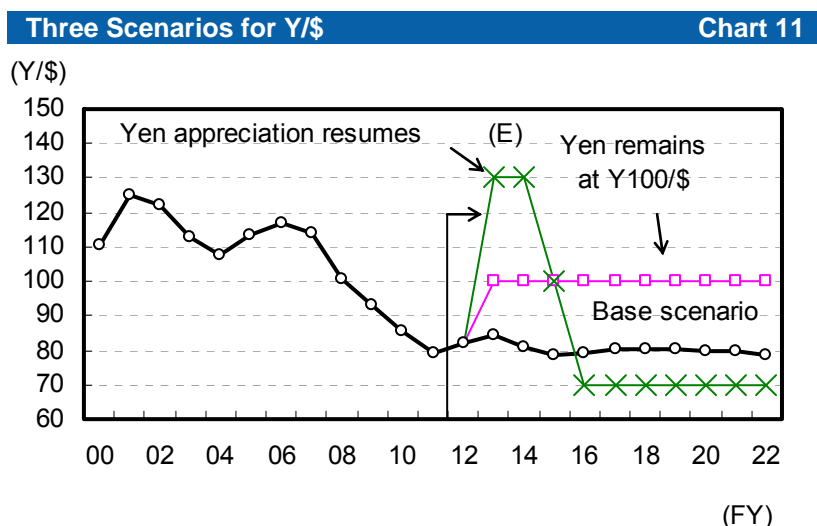
What will happen to the economy and prices if the yen remains weak over the long term?

Based on the above analysis, we performed a simulation with our macroeconomic model on how the economy and prices would be affected if the yen remains weak over the long term.

First, we present our assumptions for the yen-dollar forex rate. The forex rate in our base scenario in this report is the forecast value derived endogenously from our macroeconomic model. It is estimated based on forecast values with regard to the Japan-US difference in inflation rates and in interest rates (Chart 11). In other words, it can be understood as representing an economically neutral level derived from the economic fundamentals of Japan and the US. Besides the base scenario, we assumed two scenarios for the yen-dollar forex rate. In the first, “Yen remains at Y100/\$,” we assumed that the yen

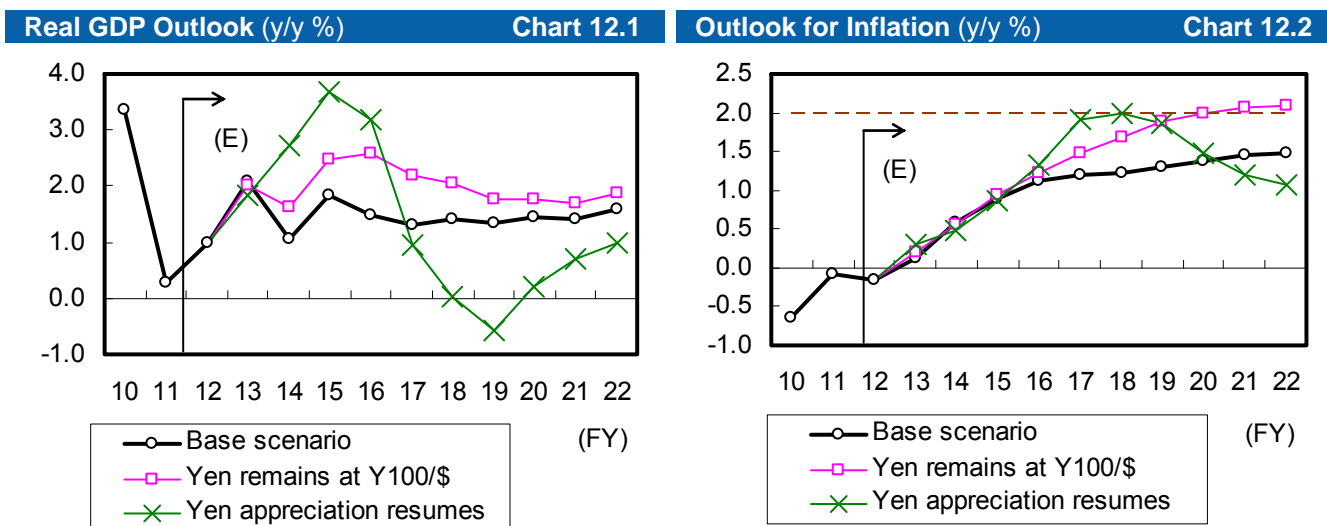
would depreciate Y20 from the base scenario starting in FY13 and would then remain at that level. In the second, “Yen appreciation resumes,” we assumed that the yen would trend at 130/\$ in FY13-14, would rapidly appreciate to 70/\$, and then remain at that level from FY16. In both of these scenarios, we assumed that the short-term interest rate would be 0% during the forecast period. Interest rates are not increased even if the economy overheats, which means an environment where prices will more readily rise in that degree.

In the “Yen remains at Y100/\$” scenario, the yen would be 20% to 30% weaker than the base scenario, which is the economically neutral level. This is similar to yen depreciation seen from end-2005 to the Lehman crisis. The forex rate at a stable Y100/\$ would still represent depreciation beyond the level suggested by economic fundamentals. As a result, the economy would be exposed to constant stimulation, and prices would experience sustained upside pressure. While the “Yen appreciation resumes” scenario is based on a somewhat extreme assumption, its purpose is to understand the impact on prices of the yen depreciating sharply and the impact on the economy when the yen then turns to appreciate.



Source: Bank of Japan; compiled by DIR.

Simulation results are as shown in charts 12.1 and 12.2. In the “Yen remains at Y100/\$,” scenario, the growth rate of real GDP increases in the context of a stable weaker yen, and it averages 0.5 percentage points more than the base scenario. Since the expansion of the economy tightens the macro supply-demand balance and places upside pressure on prices, the inflation rate gradually increases. In this scenario, inflation reaches 2% in FY20 and remains at a level above 2%. In contrast, in the “Yen appreciation resumes” scenario, the stimulative effect of a weaker yen plays out around FY16, and in subsequent years the economy experiences downward pressure from the yen’s appreciation. Economic growth is less than the base scenario in FY18 and beyond, and the yen value of real GDP is less than the base scenario in FY22. With respect to the inflation rate, since the stimulus effect of the initial depreciation of the yen spreads to prices with a lag, inflation is higher than the base scenario for some time. This difference gradually diminishes, and inflation is less than the base scenario in FY21 and beyond.



Source: Compiled by DIR based on DIR's medium-term macroeconomic model.

Note: In order to clearly see the impact of changes in the yen-dollar rate, the impact of probable consumption tax hikes from FY14 is excluded in Chart 12.2.

E: DIR estimates.

We can derive four conclusions from these results. First, prices will increase weakly. Our two scenarios assume that the yen would depreciate rapidly from FY13. In the “Yen appreciation resumes” scenario, the yen is assumed to depreciate by a considerable degree to Y130/\$. The growth rate of CPI to FY16, however, is not all that different than the base scenario. CPI does not approach 2% growth until FY17 at the earliest. The government and the BOJ are aiming to achieve an inflation target of 2% as soon as possible, but this will be difficult to achieve merely through yen depreciation.

Second, the “Yen remains at Y100/\$” scenario is not very realistic. In this scenario, an inflation rate of nearly 2% is achieved in FY20. Will a weaker yen, however, be sustained over such a long period in global financial markets where massive yen-dollar transactions of around \$570 billion⁹ occur on a daily basis? The longest postwar expansion Japan experienced in the 2000s was the result of the expansion of the world economy in the context of quantitative monetary easing and yen depreciation driven by the yen carry trade. The yen weakened at that time in a similar degree to our simulation. In other words, the “Yen remains at Y100/\$” scenario will only be achieved if the world economy gradually expands without relapsing and if the yen depreciates more than it did in the mid-2000s and sustains this magnitude of depreciation for nearly 10 years. It is safe to say that the probability of such a scenario materializing is low.

Our third conclusion concerns how prices would be affected if a weaker yen is unsustainable. Should the yen begin to appreciate sharply as in the “Yen appreciation resumes” scenario, economic volatility would increase and the achievement of the 2% inflation target would likely be delayed. As noted above, when exports expand accompanying yen depreciation and when companies respond by increasing capital stock and employee levels, earnings grow. Then, when the yen begins to appreciate, companies will be compelled to adjust capital stock and employee levels. These adjustment costs will increase the more sharply the yen depreciates, and more time will be needed to work through these adjustments at the macroeconomic level. Such adverse effects cannot be adequately mirrored in a macroeconomic model, and it is reasonable to think that the economy will worsen more than indicated by simulation results. What is needed for the sustained rise of prices is sustainable economic growth but not the yen depreciating clouded by future uncertainties.

9. Average value of daily transactions in April 2010. BIS (2010), *Triennial Central Bank Survey Report on global foreign exchange market activity in 2010*.

Fourth, this is precisely why yen depreciation should be viewed as an opportunity for engaging in regulatory and institutional reform and for strengthening the economic structure. Regulatory and institutional reform is highly likely to entail bankruptcies and frictional unemployment in the short term as the economic structure undergoes rapid changes. If the economic environment is a positive one at that time, cash flow management and reemployment will be easier to achieve than when that is not the case. Despite the temptation that arises during economic expansion to postpone unpopular reforms, reforms should be steadily implemented while market expectations are high. In this process, what should be emphasized is medium- to long-term growth capacity rather than the short-term growth rate.