Abenomics: Is Deflation Always Bad?

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Abstract

After the asset Bubble burst in the early 1990s, the Japanese economy has experienced a slow economic growth period called the 'Lost Two Decades.' The three arrows of Abenomics-massive monetary easing, fiscal stimulus and structural reforms-were promoted as the cure to deflation and economic revival. Abenomics aims to achieve: 1) 2% inflation, 2) eventual reduction in the fiscal deficit, and 3) improvement of the standard of living through economic growth. The average increase in the GDP deflator during the 2nd quarter of 2013 to the 2nd quarter of 2015 was 0.40 percent. On the other hand, the fiscal deficit increased by 65.6 trillion yen. Finally, there has been no improvement in living standards, as the level of real consumption expenditure remained stable during the period. To accomplish Abenomics, policy makers have to ensure that quantitative easing achieves the desired results as fast as possible. As time passes, the burden of the fiscal deficit will increase and when the balance exceeds the total amount of personal financial assets of 1,600 trillion yen, financial markets may experience significant turbulence. If prospects for achieving the inflation target of 2 percent continue to prove elusive, it will be necessary to revise present economic policy as fast as possible to limit damage to the Japanese economy.

Keywords: Abenomics, monetary policy, fiscal policy, growth strategy, deflation

1. Introduction

After the asset Bubble burst in the early 1990s, the Japanese economy has experienced a slow economic growth period called the 'Lost Two Decades.' The nominal average GDP growth rate during this time was about zero percent while the real GDP growth rate on average was about one percent. The inflation rate evaluated by the GDP deflator for the two decades from 1991 to 2011 is almost 0 percent while that from 2001 to 2011 is about -1 percent, meaning that the Japanese economy entered a deflationary phase.

Household consumption expenditure increased steadily during these two decades while the price deflator decreased monotonically. This means that the standard of living for Japanese

consumers increased during this period of deflation. Previously, in the high economic growth era in the 1960's and stable economic growth era in the 1980's, economic growth was accompanied by inflation, so the emergence of a deflationary trend was unexpected.

Why has the growth rate in Japan been so slow compared with that of other OECD countries and China, one of our neighboring countries? Some policy makers in Japan believe this is due to a deflationary spiral. Based on this assessment, they advocate aggressive measures to shock the economy out of the doldrums and cure deflation through bold measures. After the LDP (Liberal Democratic Party) won the December 2012 election, Shinzo Abe became prime minister for the second time, largely on the strength of Abenomics. The three arrows of Abenomics, namely massive monetary easing, fiscal stimulus and structural reforms, were promoted as the cure to deflation and economic revival.

Abenomics aims to achieve: 1) 2% inflation, 2) eventual reduction in the fiscal deficit (the public debt to GDP ratio is above 200%), and 3) improvement of the standard of living through economic growth.

Under Abe, policy makers seek to increase the GDP deflator in order to increase GDP. The hope is to stimulate household consumption expenditure and private investment by creating inflationary expectations and thus benefit producers. If this can be achieved, tax revenues would increase and lower the fiscal deficit.

This is the reason why the Bank of Japan (BOJ) set up an inflation target of 2 percent. As the first arrow, the BOJ expected to increase money supply (or money stock) through easing monetary policy, injecting almost 80 percent of a general budget of the government per annum into the monetary base by repurchasing government bonds through the market.

The difference and relationship between money supply and monetary base is explained in detail in section 3.1.

As the second arrow to jumpstart economic activity, the government also ramped up public spending on infrastructure for 2011 tsunami-related reconstruction, disaster prevention and support for areas suffering depopulation. In terms of structural reforms necessary to realize sustainable growth, policy makers enacted growth strategies and deregulation measures aimed at encouraging IT technology, tourism, agriculture and enhancement of women's labor force participation rate.

The third arrow of Abenomics seeks to create a growth environment as a means to facilitate structural reforms and is relying on aggressive government intervention to revive market forces and capitalist "animal spirits".

In 2013, Haruhiko Kuroda, the governor of the BOJ appointed by Abe, declared that within two years the inflation rate would reach 2 percent by aggressive monetary easing. But this goal has proved elusive.

This paper assesses the present state of the impact of Abenomics on the Japanese economy by examining economic statistics before and after the period of Abenomics reported by the Cabinet Office of the government, Ministry of Finance and the BOJ. After analyzing the available economic statistics in terms of macroeconomic theory, we evaluate Abenomics by posing the question: "Is deflation always bad?"

Section 2 describes the economic conditions of the Japanese economy in the period between

1980 and 2012. The period begins at the end of two oil price shocks in the 1970's until the enactment of Abenomics. This section also introduces the economic growth in China compared with that of the US, France and Japan. The trend of the Chinese economy has strongly affected the policy decisions of the Abe administration and Abenomics.

Section 3 explains the process of Abenomics after 2012, including the topics of monetary policy, fiscal policy and fiscal deficit, growth strategy, and an increase in the consumption tax.

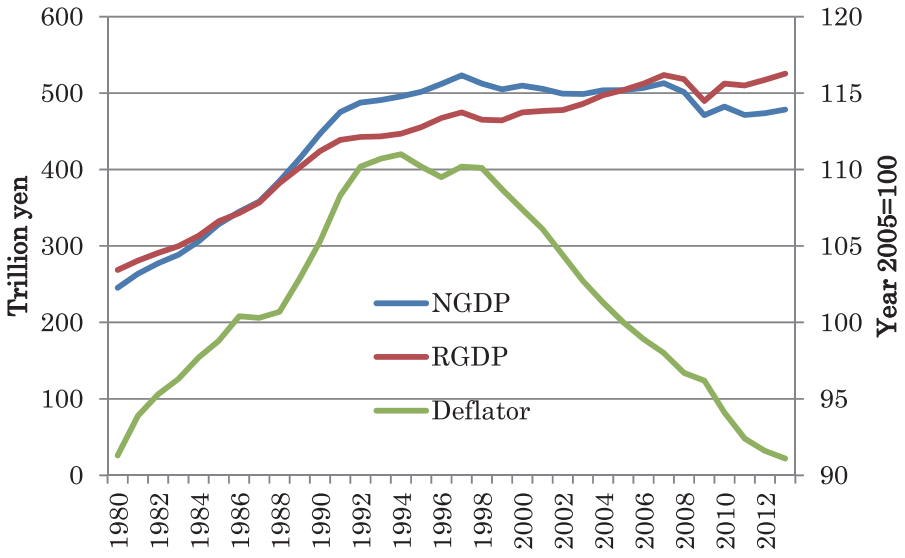
Section 4 will denote evaluation of Abenomics based on the fact findings. The evaluating points are the movement of GDP deflator, that of fiscal deficit and that of consumption expenditure before and after April 2013. we also introduce other interesting economic statistics. Finally section 5 concludes the present analysis and evaluates whether deflation is always bad.

Regarding an appendix, outline of macroeconomic theory used for the present analysis as a bench mark is prepared for the readers' convenience.

2. Economic conditions of the Japanese economy and the presence of China before implementing Abenomics

The movements of nominal GDP, real GDP, and GDP deflator from 1980 through to 2012 are indicated in Figure 1. Though nominal GDP has been stable, real GDP has increased steadily. And after 2000 the GDP deflator has decreased monotonically from the level of 110 to 90 during the most recent ten years.

Figure 2 shows that household consumption expenditure increased steadily during the period of the two decades while the price deflator decreased monotonically. This indicates that while the Japanese economy suffered a deflationary phase, living standards assessed in terms of real

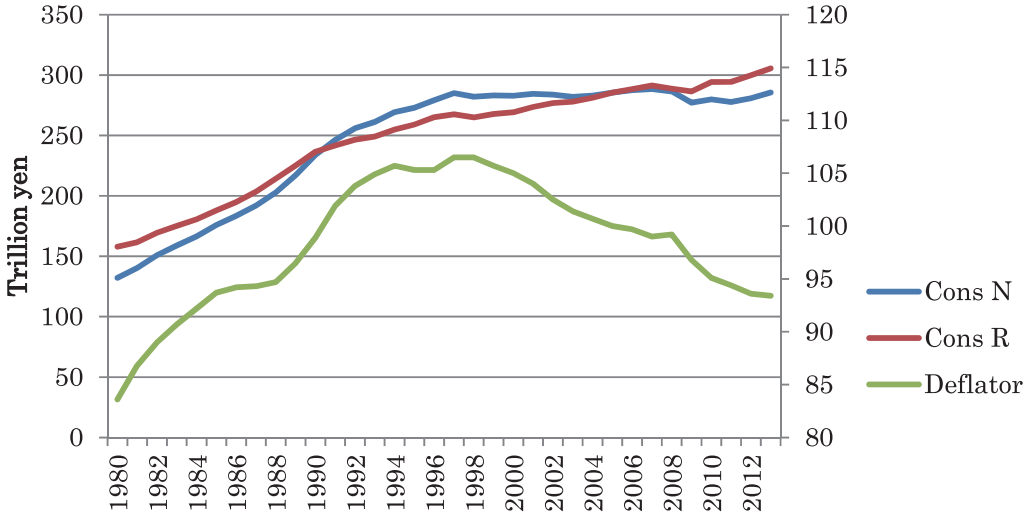


Source: Cabinet Office

Figure 1 Nominal GDP, real GDP, and GDP deflator

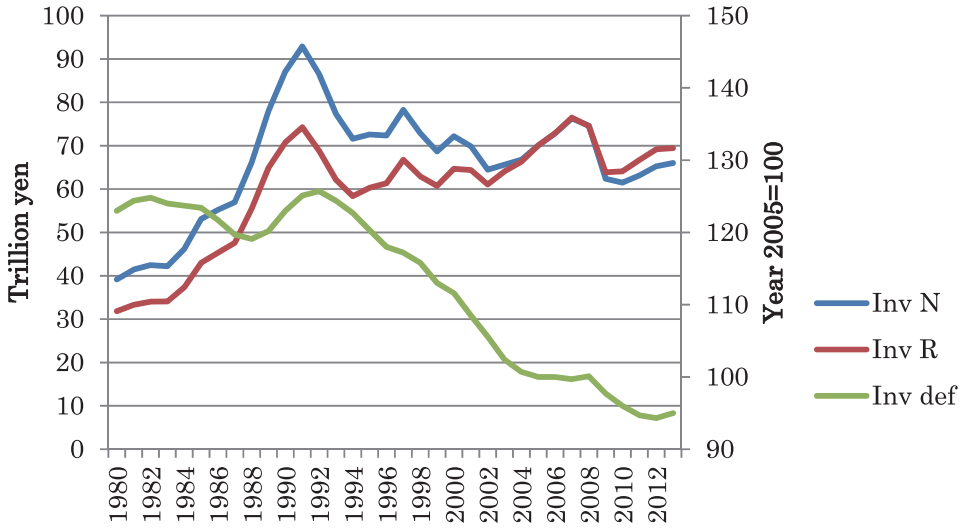
consumption expenditure increased. Private investment for firms was weak and fluctuated around 70 trillion yen, while the price deflator for private investment decreased monotonically as indicated in Figure 3.

The question facing policy makers in Japan is how to overcome the deflationary trend of the lost two decades. In order to determine a proper set of policies it is important to understand what triggered this deflation since the early 1990s. After two oil price shocks in the 1970's, policy emphasized restructuring the industrial system to promote energy saving and deregulation of the



Source: Cabinet Office

Figure 2　Household consumption expenditure



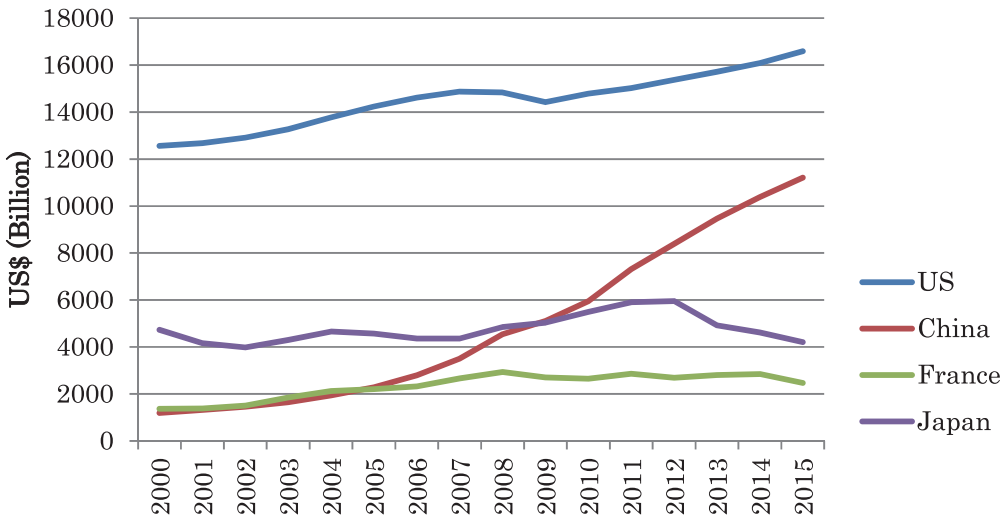
Source: Cabinet Office

Figure 3　Private Investment

wholesale and retail sectors in order to decrease consumer prices in the Japanese economy.[1)] The latter is called “price revolution” and “price destruction.” For the retail sector, the large-scale cheaper retail stores spread nationwide, driving many small-scale retail stores out of business. At the same time, imports of more cheaply priced consumer items from Asian nations increased, resulting in a shift of the aggregate supply (AS) curve rightwards. While prices declined, nominal expenditure was slightly increasing, meaning that the standard of living increased in the lost two decades. In this period the Japanese economy also enjoyed steady, but low GDP growth and overcame a major banking crisis. So even though the Chinese economy overtook Japan’s, the situation in Japan has been reasonably favorable. In this context, has the “cure” of Abenomics been appropriate to the “malaise” of contemporary Japan?

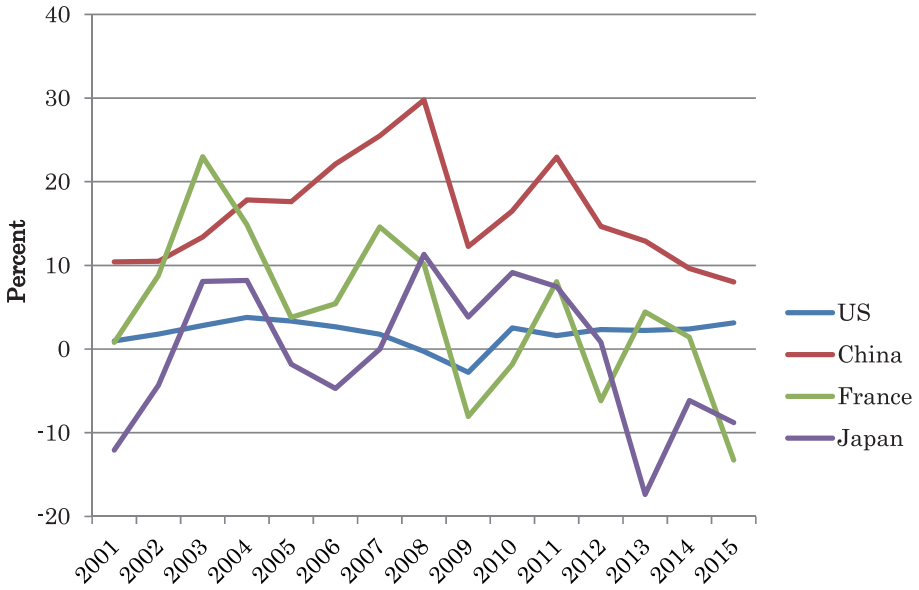
To confirm the present state of the Chinese economy, the trend of nominal GDP after 2000 in the US, China, France and Japan is shown in Figure 4 utilizing IMF economic statistics. The original currency unit of GDP is transformed into US dollars to facilitate comparison. China’s nominal GDP in 2005 exceeded that of France while China’s nominal GDP in 2009 exceeded that of Japan. At present, China is the second largest economy in terms of nominal GDP, followed by the US economy. The economic growth rate in China has been high compared with that of other countries, averaging 16.2 percent between 2001 and 2015, while the corresponding figure in the US was 1.9 percent, France was 4.4 percent and Japan was -0.4 percent as indicated in Figure 5. China’s rapid growth meant that it became a significant economic partner with most nations in Asia and other natural resource endowed countries around the globe

Regarding population, that of China is more than 10 times than that of Japan. The Japanese population reached 128 million, but has gradually decreased in the past five years as indicated in Figure 6. Japan became a stationary state regarding population, and thus policy makers have to consider this context when considering economic policy.



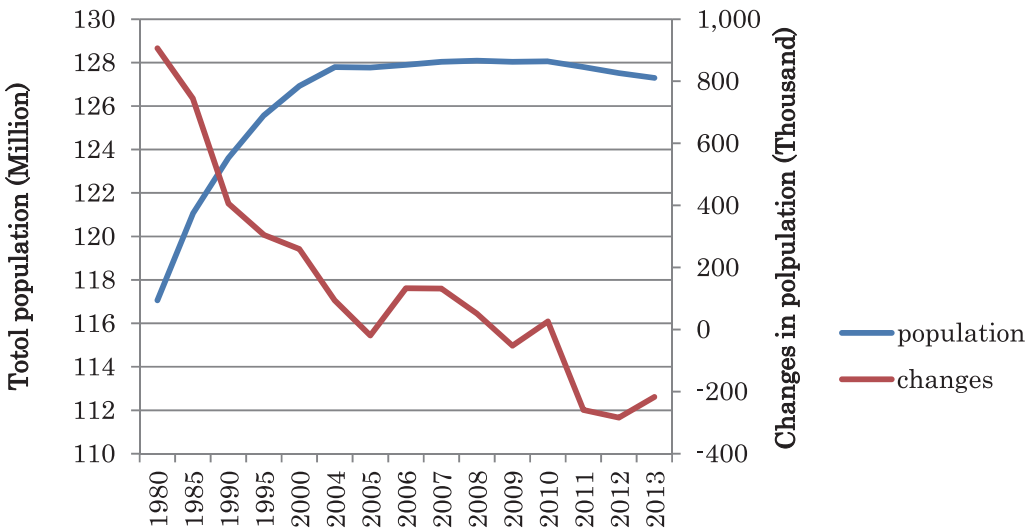
Source: IMF

Figure 4 Comparison of nominal GDP in the US, China, France and Japan



Source: IMF

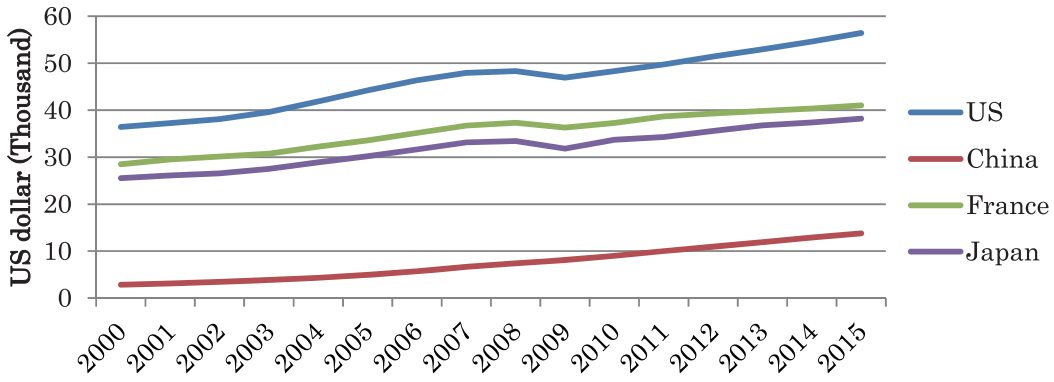
Figure 5　GDP growth rate in the US, China, France and Japan



Source: Statistics Bureau

Figure 6　Number of Population

When cross-national GDP is compared on a per capita basis, China is the laggard in the group. Per capita GDP adjusted by PPP (purchasing power parity) among four countries is $56,000 in the US, $41,000 in France, $38,000 in Japan and $13,000 in China,. The movement of per capita GDP adjusted by PPP is indicated in Figure 7.



Source: IMF

Figure 7 Per capita GDP adjusted by PPP

Though it is difficult to forecast the potential of the Chinese economy correctly, the Abe administration is sensitive to the presence of China for political reasons and seeks to increase Japan's nominal GDP to offset the ongoing regional power shift in China's favor.

3. Process of Abenomics after 2012

3.1 Conducting monetary policy

After the December 2012 election, Mr. Abe began to enact his three policy arrows. In February 2013 a large supplementary budget was enacted to stimulate growth and then in April 2013, the BOJ announced its quantitative easing program targeting an inflation rate of 2 percent, within 2 years by doubling the monetary base. This means that the BOJ will buy 60 to 70 trillion yen of bonds every year until it reaches its target. Even before the BOJ announcement, the stock market rose dramatically from late 2012, anticipating the impact of monetary "bazooka". Initially, Abenomics appeared to be working as rising consumer spending pushed first quarter economic growth to 3.5 percent on an annual basis.

When the BOJ wants to increase money supply, it purchases Japanese government bonds (JGBs) in the bond market. The market in JGBs is organized every month through a syndicate of private financial institutions. The government sells JGBs to private financial institutions that sell them to various clients. Under Abenomics, the BOJ also buys JGBs and the selling financial institutions deposit the proceeds from these JGB sales in a current account opened at the BOJ. By buying JGBs, the BOJ is engaged in what is called quantitative easing.

We should make a remark regarding the difference between monetary base (or high-powered money) and money supply. The definition of monetary base is the sum amount of issuing bank notes, circulating bank notes in the market and the BOJ current account held by private financial institutions. Monetary base is the BOJ's balance of payments. Money supply is the sum of financial instruments held by non-financial institutions, namely M3 as indicated in monetary statistics.

The relationship between monetary base and money supply is explained in the following manner. We have two equations regarding monetary base and money supply:

B = C + R

M = C + D

where B is monetary base, C is currency, R is reserves, M is money supply and D is demand deposits. We take the ratio between M and B as:

M/B = (C + D)/(C + R) = (C/D + 1)/(C/D + R/D) = (cr + 1)/(cr + rr)

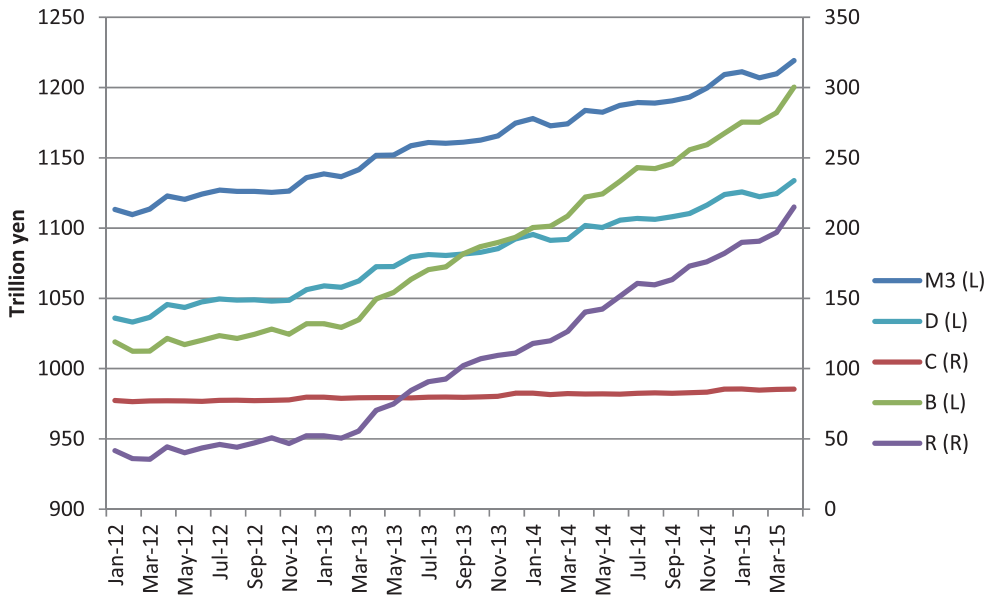
where cr is the ratio between currency and demand deposits, and rr is the ratio between reserves and demand deposits. Then the relationship between M and B is:

M = ((cr + 1)/(cr + rr))B

and (cr + 1)/(cr + rr) is called the money multiplier.

Because of monetary easing, the trend in the monetary base changed since April 2013 when the BOJ announced its policy of quantitative easing. However, the trend of money supply, M3, showed little change even after conducting monetary easing in April 2013. The enormous increase in monetary base did not connect to the increase in money supply. It was absorbed by increasing the current account of the BOJ, meaning that an increased monetary base was not distributed to the private sector through financial markets. The current account at the BOJ is its reserve money. After April 2013, the balance of the current account for reserves suddenly increased. Figure 8 indicates the movement of money supply and monetary base, and Figure 9 shows the trend of the reserve rate and cash rate to demand deposits.

The money multiplier is defined as the ratio between money supply and monetary base (high-powered money). The money multiplier declined from 10 to 4 during the three years from January 2012 to September 2015. This is also indicated by the increasing trend in the reserve rate defined as the ratio between reserves and demand deposits. This increased from 0.04 to 0.2 during the period.

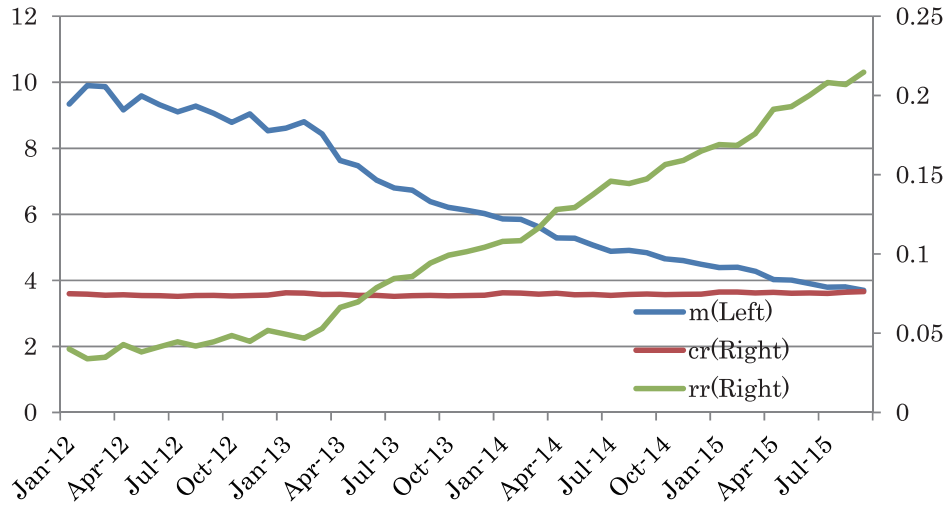


Source: Bank of Japan

Figure 8　Money supply and monetary base

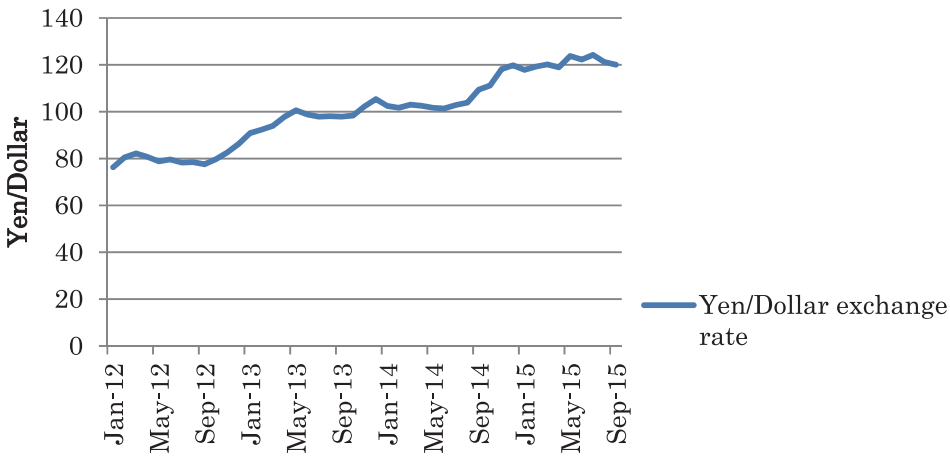
Though we usually assume the money multiplier as a constant in theory, it declined significantly in reality.

Monetary easing policy led to a dramatic weakening of the Japanese yen and a rise in the Nikkei stock index from January 2013. The value of the yen depreciated due to monetary easing from 97.7 yen/$1 in April 2013 to 120.0 yen/$1 in September 2015, a sharp 23 percent decline in two years. The movement of Yen/Dollar exchange rate is indicated in Figure 10.[2)] Because of the depreciation of the domestic currency, the stock market rose dramatically based on hopes that this would boost exports. The Nikkei stock index exceeded 20,000 yen in 2015 as indicated in Figure 11, just over one



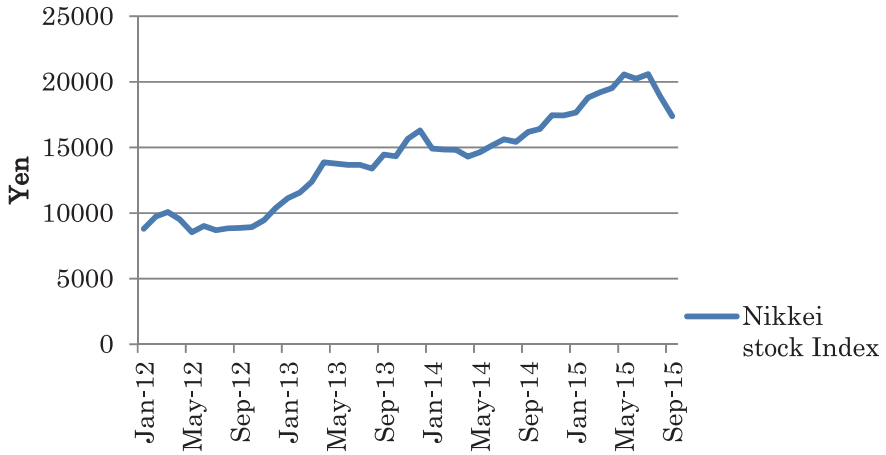
Source: Bank of Japan

Figure 9 Reserve rate and cash rate to demand deposits



Source: Bank of Japan

Figure 10 Yen/Dollar exchange rate



Source: Nikkei NEEDS

Figure 11　Nikkei stock index

half the all-time peak of nearly 39,000 yen at the end of 1989.

3.2　Fiscal policy and fiscal deficit

In Japan, the fiscal year begins on April 1st and continues until the end of the following March. The budget for the next fiscal year is decided by the Diet by the end of March. The budget includes a general budget and a supplementary budget. The latter is made when the general budget is deemed insufficient in light of prevailing economic conditions or in case of some emergency. For example, following the March 11, 2011 devastation caused by the earthquake, tsunami and flooding, the government proposed a supplementary budget to the Diet to fund relief, reconstruction and disaster countermeasures. The total amount of the 2013 supplementary budget was 13.1 trillion yen, above 10 percent of the total 2012 general budget.

One-third of the supplementary budget, namely 3.8 trillion yen, was for strengthening infrastructure for disaster prevention and reconstruction. Another one-third of the supplementary budget (3.1 trillion yen) was for spending designed to increase national wealth through growth. This involved: 1) strengthening growth due to introduction of private investment; 2) measures for increasing productivity and competitiveness for small- and medium-size firms in manufacturing and service sectors and restructuring the agricultural sector; 3) strengthening support for private firms to compete in world markets; and, 4) measures for increasing the quality of human resources and employment. The remaining one-third (3.1 trillion yen) was for supporting households and measures addressing problems in rural areas subject to depopulation.

Due to high and escalating costs of pensions and medical care in the context of an aging society where about one quarter of the population is over 65 years of age, the government faces significant fiscal constraints. Such social welfare spending claims about 33% of the general budget while an additional 25% is used to service the national debt. In this context the government enjoys limited flexibility in fiscal policy compared with monetary policy.

3.3 Growth strategy

Since April 2013, the Cabinet Office has issued and revised the Abe administration's growth strategies. One of his signature policies is aimed at enhancing women's labor force participation by increasing the capacity of nursery and a day-care centers, increasing the duration of maternity leave and supporting skills training programs aimed at helping women return to the labor force. A second is aimed at encouraging exports by small and medium size firms and the agricultural sector. The third supports restructuring of public sector enterprises by introducing PFI (private finance initiative) in the scheme of PPP (public private partnership).

The problem is that the growth strategy is not comprehensive and lacks concrete details regarding the period of realization, amount of budget, and other important considerations, thus it seems to be more of a vision than a plan.

Recently, some detail was presented in the *Financial Times* (June 23, 2015): "They call for a rise in the share of cheaper generic drug prescriptions to 80 per cent of the total by 2020, and another system of benchmarking to halve the gap between prefectures with the highest health spending and the lowest. There are also several additions to Mr. Abe's so-called third arrow. The biggest is a revamp of Japan's national universities aimed at making them more globally competitive, which will redirect funding to those that make the biggest reforms. The strategy also spells out whether Japan is willing to allow higher immigration-always controversial in its closed and homogeneous society. IT workers from India, students, ski instructors and hotel front-desk staff with language skills are singled out for a warmer welcome. A more relaxed visa policy has resulted in a boom in visitors from China this year, and Japan hopes to develop tourism as one of its main growth industries."

In terms of the structural reforms needed to boost growth, this list has done little to dispel disappointment that few bold measures have actually been enacted as the rhetoric of reform exceeds actual reforms.

3.4 Increase in consumption tax by 3 percent in April 2014

In April 2014, the consumption tax increased by 3 percent to 8 percent in order to increase government revenues and reduce the massive fiscal deficit. The government predicted a decrease in GDP in the second quarter in 2014 due to this tax increase, but the negative impact on consumption was greater than expected. As a result of the sharp downturn in the economy, in October 2014 the BOJ announced the expansion of its bond buying program, buying 80 trillion yen of bonds a year. In November 2014 the economy was technically in recession so Abe decided to postpone the planned second increase in the consumption tax to 10% and called a snap election, ostensibly to seek voter's approval of this measure. However, the consumption tax will have to increase by more 2 percent to 10 percent in order to reduce the financial deficit and restore fiscal discipline in the near future.

4. Evaluation of Abenomics

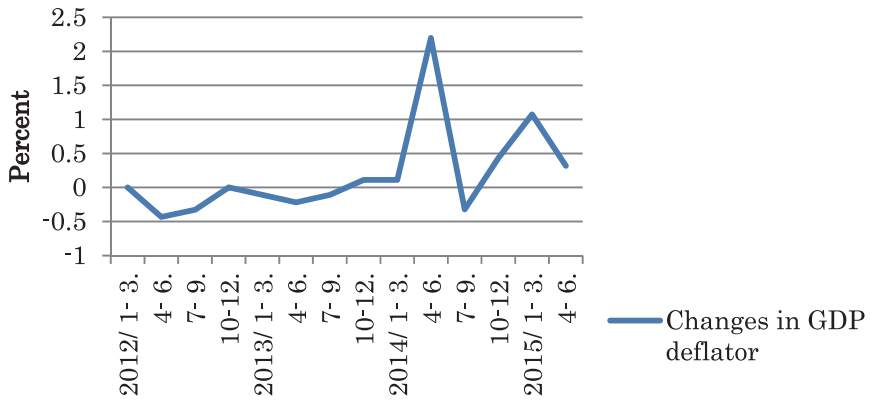
As I explained in section 1, Abenomics aims to achieve: 1) 2% inflation, 2) eventual reduction in the fiscal deficit (the public debt to GDP ratio is about 240%), and 3) improvement of the standard of living through economic growth.

4.1 Changes in GDP deflator and Real GDP

One of the objectives of Abenomics is to reverse the deflationary trend. Though the increase in the GDP deflator was 1.8 percent in the second quarter of 2014 as shown in Figure 12, this is mainly due to the 3 percent increase in the consumption tax. The increase in the GDP deflator in the fourth quarter in 2014 to the second quarter of 2015 is indicated in Figure 12.

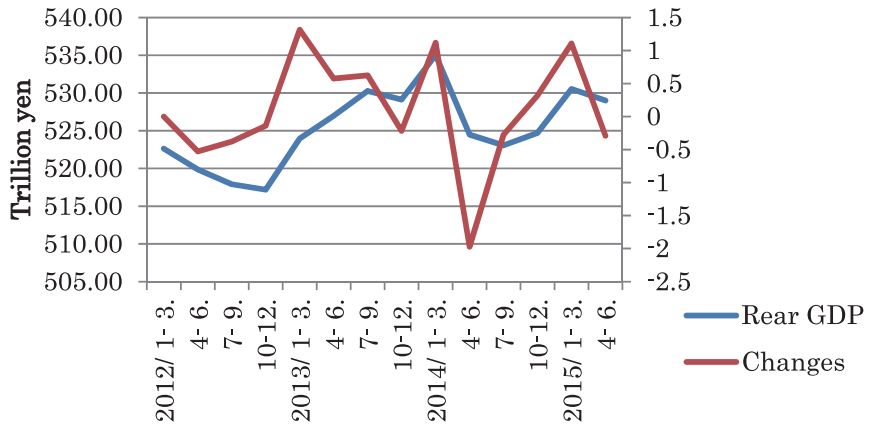
Abenomics has had mixed results in terms of GDP growth, rising for four successive quarters in 2013, and then declining after the introduction of the consumption tax in April 2014. In the second quarter of 2015, however, GDP growth has rebounded indicated in Figure 13.

In theory there exist two kinds of lags, namely inside lag and outside lag. The inside lag is the time between a shock to the economy and the policy action responding to that shock. The outside lag is the time between a policy action and its influence on the economy. This lag arises because policies do not immediately influence spending, income, and employment. (cf. Mankiw (2012), p. 521)



Source: Cabinet Office

Figure 12　Changes in GDP deflator



Source: Cabinet Office

Figure 13　GDP and GDP growth rate

However, it is difficult to identify the length of outside lags from empirical observation.

4.2 Reducing the fiscal deficit

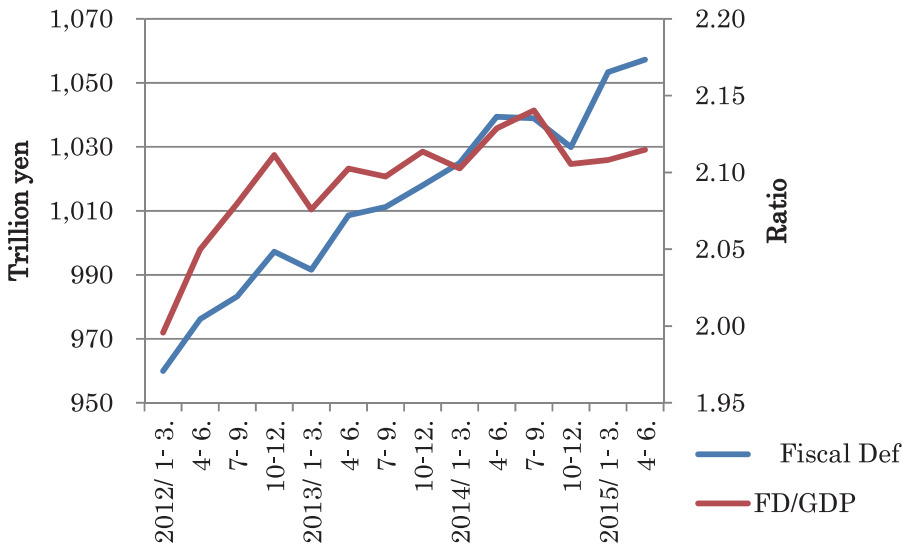
There is a trade-off between monetary policy and fiscal policy. Due to massive quantitative easing, the balance of JGB is increasing monotonically and the budget deficit is also increasing. We recognize that this tendency bears a trade-off between monetary policy by the BOJ and fiscal policy by the Ministry of Finance. For the government, the burden of JGB repayments will increase while spending for other items will have to decline. For the BOJ, in order to manage inflation it might have to sell bonds to shrink the money supply or recalibrate its current quantitative easing policies, possibly leading to significant losses on its portfolio and higher interest rates. In the context of a large public debt to GDP ratio, growing fiscal deficits and thus far mixed consequences of Abenomics, there is greater risk and uncertainty in the Japanese economy and about a quantitative easing exit strategy.

The balance of fiscal budget is indicated in Figure 14 and the movement of interest rates is depicted in Figure 15.

4.3 Increasing in the living standard for households

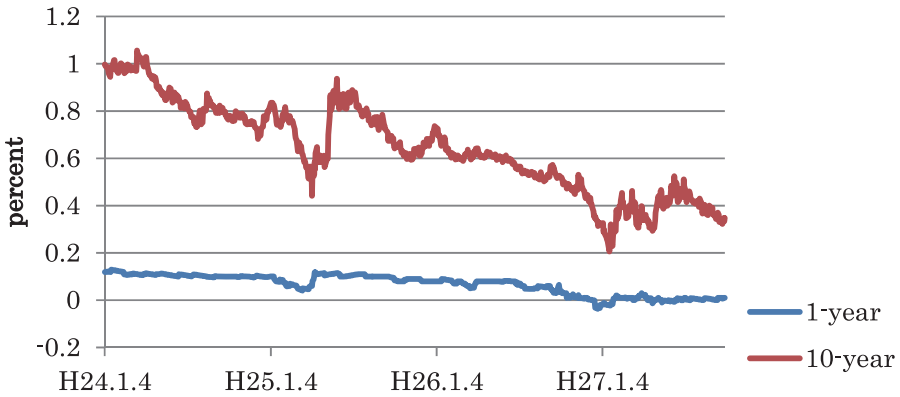
Regarding GDP, let us examine the movement of household consumption. Household consumption expenditure is a significant factor in GDP growth. The decline due to the introduction of new consumption tax was large as indicated in Figure 16. As shown in Figure 6 the population has been stable for the past 5 years and there is no difference between total and per capita household living standards.

In the next section we evaluate the impact of Abenomics on improving living standards.



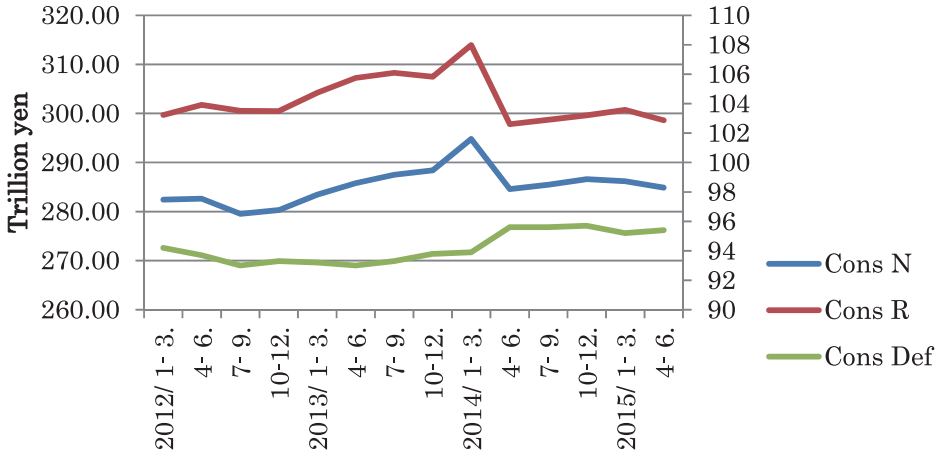
Source: Ministry of Finance

Figure 14 Fiscal deficit



Source: Bank of Japan

Figure 15　Movement of interest rates of long term and short term bonds



Source: Cabinet Office

Figure 16　Household consumption

4.4　Achievements of Abenomics

Abenomics aims to achieve: 1) 2% inflation, 2) eventual reduction in the fiscal deficit, and 3) improvement of the standard of living through economic growth. Table 1 presents relevant indicators regarding Abenomics since 2012.

Since December 2012, we observe three trends in key economic indicators. One is improving, another is unchanged and the other is deteriorating. First, the Nikkei stock index has doubled since the end of 2012, spreading windfall profits among investors, sparking an increase in consumption and investment. Moreover, the sharp depreciation of the yen boosted corporate profits for export-oriented companies such as automobiles because profits in foreign currencies translate into correspondingly higher yen earnings.

Second, regarding deflation, Abenomics has had little impact as the GDP deflator remained

Table 1 List of the records

	Period	Results	remarks
1) Inflation			
GDP deflator	2nd Q 2013		quarterly and
(Average increase)	to 2nd Q 2015	0.40%	seasonally adjusted
Real GDP	1st Q 2013	523.9 trillion yen	quarterly and
	2nd Q 2013		seasonally adjusted
(Average increase)	to 2nd Q 2015	528.1 trillion yen (0.7%)	
2) Reduction in the fiscal deficit			
Fiscal deficit	March 2013	991.6 trillion yen	
	June 2015	1057.2 trillion yen (6.2%)	
3) Improvement of living standard			
Real consumption	1st Q 2013	304.4 trillion yen	quarterly and
	2nd Q 2013		seasonally adjusted
(Average increase)	to 2nd Q 2015	303.6 trillion yen (-0.06%)	
Other economic indicators			
4) Stock price index			
Nikkei stock index	April 2013	13860 yen	
	September 2015	17388 yen (48.4%)	
5) Yen/Dollar rate			
Yen/Dollar	April 2013	97.7 yen	
	September 2015	120.0 yen (23.6%)	

below 2 percent and stable within the -0.5 percent and 1.5 percent range.

Third, regarding the fiscal deficit, there has been a marked deterioration, increasing from 991.6 trillion yen in March 2013 to 1057.2 trillion yen by June 2015. This is a consequence of easing monetary policy. The government and BOJ will have to reduce the amount of the monetary base in order to restore fiscal discipline.

As indicated in table 1, the average increase in the GDP deflator during the 2nd quarter of 2013 to the 2nd quarter of 2015 was 0.40 percent, far from the target of 2 percent. On the other hand, the fiscal deficit increased by 65.6 trillion yen. Finally, there has been no improvement in living standards, as the level of real consumption expenditure remained stable during the period.

It is difficult to evaluate Abenomics correctly, however, due to the possibility of a lag in capturing the impact. But if indeed Abenomics proves not to be effective, policy makers may have to revise the present policy. This leads us to raise the question of whether the original diagnosis and

prescription for Japan's economic malaise was correct.

5. In lieu of conclusion: Is deflation bad?

Is deflation bad? We have two different views on deflation. One is the US Federal Reserve (Fed) view and the other is the Bank of International Settlements (BIS) view. The Fed view on deflation is that it is always bad and it is essential to fight against deflation and unemployment. The Fed view on deflation is strongly related to the experience of the Great Depression. As a result, the Fed usually conducts monetary easing when the US economy shows symptoms of recession. On the other hand, European central banks are more concerned about inflation based on the post-war experiences of hyperinflation. The BIS makes a distinction between two types of deflation. Bad deflation is when prices of goods and services decrease while real GDP decreases. Good deflation is when prices of goods and services decrease while real GDP increases. (cf. 2014 BIS Report)

During the two lost decades in Japan, while prices decreased, real GDP increased steadily by 1 percent. The policy makers of Abenomics were influenced by the US way of thinking on macroeconomic theory and monetary policies and it looks as if they were relatively unfamiliar with European way of thinking.

A question critics of Abenomics are asking is whether the cost of changing the deflationary mindset of Japanese consumers to an inflationary mindset is worthwhile and beneficial. The balance of JGBs now exceeds 1,000 trillion yen due to massive monetary easing, but this means that the BOJ has abandoned financial discipline. The potential consequences are hard to foresee, but the benefits for households are not yet evident.

To accomplish Abenomics, policy makers have to ensure that quantitative easing achieves the desired results as fast as possible. As time passes, the burden of the fiscal deficit will increase and when the balance exceeds the total amount of personal financial assets of 1,600 trillion yen, financial markets may experience significant turbulence. If prospects for achieving the inflation target of 2 percent continue to prove elusive, it will be necessary to revise present economic policy to limit damage to the Japanese economy.

Appendix: Economic models

In the field of macroeconomic theory, we have dynamic models of aggregate demand and aggregate supply including dynamic stochastic general equilibrium (DSGE) models. Though these models are useful in policy simulation analysis, the results obtained from DSGE models are not so different from traditional Keynesian analysis. (cf. Argia, Tambalotti, Rao and Walsh (2010))

As the link between observations obtained from the real world and theory is easily connected by the traditional Keynesian model, we will use it in the present analysis. As the present objective is not to forecast economic behavior resulting from Abenomics, but rather to analyze observations, we will use the traditional Keynesian model.

The following is the structure of macroeconomic theory explained by Mankiw (2012). The basic factors in the macroeconomic model are the Keynesian cross, theory of liquidity preferences and the Mundell-Fleming model. The Keynesian cross provides the IS curve and the theory of liquidity

preference provides the LM curve. Combining the IS and LM curves with the Mundell-Fleming model, we construct an IS-LM model including not only domestic, but also international economic factors. We have two kinds of LS-LM models, namely: 1) a small open economy with perfect capital mobility and, 2) a large open economy.

In the small open economy, the interest rate is determined by global capital markets and is fixed for the domestic economy. In the large open economy, the interest rate is determined by the domestic market. In the short run, price is fixed and the short run aggregate supply curve is fixed at the level of price regardless of the level of output. In the long run, price is flexible and the long run aggregate supply curve is fixed at the natural level of output regardless of the level of price.

The aggregate demand curve is obtained by the IS-LM models that explain the equilibrium of both product and capital markets. And the aggregate supply curve is obtained by introducing the labor market. The AD-AS (aggregate demand and aggregate supply) analysis explains the equilibrium of product, capital and labor markets simultaneously.

In considering the characteristics of Abenomics, a possible model is the large open economy. As a preliminary step we will confirm the effects of fiscal expansion and monetary expansion to the variables of national income (Y), exchange rate (e) and net-export (NX) that is the gap between export and import under the floating exchange-rate regime in a small open economy. The following table shows the results obtained by the theory:

Effect of fiscal expansion and monetary expansion in the small open economy

	Impact on:		
Policy	Y	e	NX
Fiscal expansion	0	appreciation of domestic currency	decrease
Monetary expansion	increase	depreciation of domestic currency	increase

In the small open economy, monetary policy affects national income, but fiscal policy has no effect on national income. As policy makers of Abenomics assume the model of a large open economy, the conclusion regarding the effect of fiscal expansion on national income should be modified.

And we have to recall that when the LM curve shifts to the right in the short run in a small open economy, it lowers the real exchange rate and increases income. Because of the relationship of a downward sloping aggregate demand curve, increases in income result in decreases in the price level. This means that the increase in income does not necessarily result in inflation in the long run in a large open economy. The structure of a model of the large open economy includes six equations:

$$Y = C(Y - T) + I(r) + G + NX(\varepsilon)$$

$$M/P = L(i, Y)$$

$$NX(\varepsilon) = CF(r - r^*)$$

$$i = r + E\pi$$

$$\varepsilon = eP/P^*$$

$$Y = Y^n + \alpha(P - EP)$$

where CF is the net capital outflow. A set of endogenous variables are output Y, the real interest rate r , the nominal interest rate i, the real exchange rate ε, the nominal exchange rate e that is defined as $\varepsilon P^*/P$ and the price level P while exogenous variables are government purchase G, the money supply M, taxes T, the foreign price level P*, the natural level of output Y^n, the world interest rate r*, the expectation of future inflation $E\pi$ and the expectation of the current price level formed in the past EP.

A monetary expansion in a large open economy shifts the LM curve to the right. Income rises, and the interest rate falls. The decrease in the interest rate causes the net capital outflow to increase. The increase in the net capital outflow raises the net supply of domestic currency, which causes the exchange rate to fall.

The effect of fiscal expansion counteracts monetary expansion. Fiscal expansion shifts the IS curve to the right, income rises as does the interest rate. The increase in the interest rate causes the net capital outflow to fall, reducing the net supply of domestic currency, causing the exchange rate to rise.

Because of the relationship of a downward sloping aggregate demand curve, an increase in income results in a decrease in the price level. And when AS curve shifts rightward due to introduction of new technology, decreasing import price of commodities from other countries, and deregulation of wholesale and retail markets, a new equilibrium is realized where output is bigger and prices are lower than in the old equilibrium. This means that the increase in income does not necessarily have an inflationary impact in the long run large open economy.

Before constructing a sophisticated DSGE (dynamic stochastic general equilibrium)-like model including some expectations and shocks, it is necessary for us to gather observations in the real world, arrange such empirical findings, elucidate characteristics of Abenomics indicated in the observations, and evaluate the consistency between the results of policy implementation and those of macroeconomic theory.

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Notes

1) In those days the consumer prices in Japan were higher than in other OECD countries. Maki (1998) analyzed the price gap among the cities of Berlin, London, NYC, Paris and Tokyo and that among the countries of the France, Germany, Japan, the UK and the US based on the theory of consumer behavior. The author concludes that prices for commodities and services in Japan are 30 percent higher than in the US, the UK, France and Germany. To reduce the price gap between domestic and international markets, deregulation of the domestic market is necessary.
2) The yen depreciated by 48 percent from April 2012 to September 2015. One reason would be the effect of market jawboning by government ministers. Other reasons include stability of the Euro currency due to

relative political stability in the EU and the trend of Japan's trade deficit.

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