ADBI Working Paper Series

Japan's Lost Decade: Lessons for Other Economies

Naoyuki Yoshino and
Farhad Taghizadeh-Hesary

No. 521
April 2015

Asian Development Bank Institute

Naoyuki Yoshino is Dean and CEO of the Asian Development Bank Institute.

Farhad Taghizadeh-Hesary is Assistant Professor of Economics at Keio University, Tokyo. He is also a visiting scholar at the Credit Risk Database (CRD) Association of Japan and Research Assistant to the Dean of ADBI.

Suggested citation:

Yoshino, Y., and F. Taghizadeh-Hesary. 2015. Japan's Lost Decade: Lessons for Other Economies. ADBI Working Paper 521. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/working-paper/2015/04/08/6590.japan.lost.decade.economies/

Please contact the authors for information about this paper.

Email: farhadth@gmail.com; nyoshino@adbi.org

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

Japan has suffered from sluggish economic growth and recession since the 1990s, a phenomenon dubbed “Japan’s Lost Decade.” The People’s Republic of China, many countries in the eurozone, and the United States may face similar problems in future and they have been concerned by Japan’s long-term recession. This paper will address why Japan’s economy has stagnated since the bursting of its economic bubble. Our empirical analysis challenges the beliefs of some western economists, such as Paul Krugman, that the Japanese economy is in a liquidity trap. We argue that Japan’s economic stagnation stems from a vertical IS curve rather than a liquidity trap. The impact of fiscal policy has declined drastically, and the Japanese economy faces structural problems rather than a temporary downturn. These structural problems have many causes: an aging demographic (a problem that is frequently overlooked), an over-reliance by local governments on transfers from the central government, and Basel capital requirements that have made Japanese banks reluctant to lend money to startup businesses and small and medium-sized enterprises. This latter issue has discouraged Japanese innovation and technological progress. The paper will address all these issues empirically and theoretically and will provide some remedies for Japan’s long-lasting recession.

JEL Classification: E12, E62

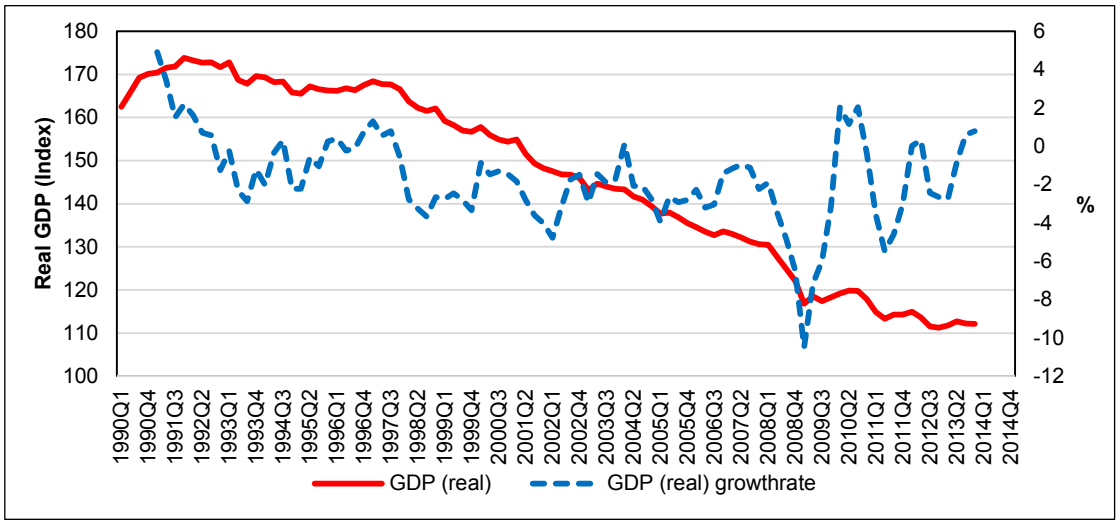
Contents

1. INTRODUCTION

In the early 1990s, Japan's real estate and stock market bubble burst and the economy went into a tailspin. Since then, Japan has suffered sluggish economic growth and recessions (known as "Japan's Lost Decade"). Japan's growth rate during this period has been among the lowest of the major developed countries of the world. During 1995–2002, for example, the annualized growth rate of Japan's real gross domestic product (GDP) averaged only 1.2%. This was lower than the eurozone average of 2.7%, and was less than the other Group of 7 countries: Canada (3.4%), France (2.3%), Germany (1.4%), Italy (1.8%), the United Kingdom (2.7%), and the United States (US) (3.2%). Japan's performance was also poor in comparison to the 2.7% average of the Organisation for Economic Co-operation and Development (OECD), and was significantly less than that of the larger OECD countries: Australia (3.8%), the Republic of Korea (5.3%), Mexico (2.6%) the Netherlands (2.9%), and Spain (3.3%) (Horioka 2006).

Figure 1 shows the trend of Japan's real GDP and the real GDP growth rate during 1990–2013. After Japan's economic bubble burst in the early 1990s Japanese real GDP started to decline sharply. This long-term recession lasted almost 25 years.

Figure 1: Japanese Gross Domestic Product Trends, 1990–2014



GDP = gross domestic product.

Note: Japan's GDP deflator was used to calculate Japan's real GDP. Real GDP is seasonally adjusted using the X-12 quarterly seasonal adjustment method.

Source: Nikkei Economic Electronic Database System (NEEDS) (2014).

It is crucial for the People's Republic of China (PRC), countries in Europe, and the US to study the causes of, and remedies for, Japan's long-term recession and low growth rates to prevent it happening to them. Economists, such as Paul Krugman, have argued that Japan's recession has happened because the country is in a liquidity trap, where monetary policy is ineffective in lowering interest rates. However, analysis in this paper indicates that the problems of the Japanese economy stem from other sources. Theoretical and empirical results shows that stagnation of the Japanese economy comes from a vertical IS curve rather than a liquidity trap. This means problems stem from structural issues rather than a temporary downturn.

There are several reasons for this long-term stagnation. The main, greatly underestimated, reason is Japan's aging population. Japan has the highest life expectancy in the world, but the mandatory

retirement age is still 65 years old.[1] The number of elderly and retired people in Japan is rising, while the number of people in younger generations is shrinking. This results in a diminishing working population. Since elderly people tend to consume less than younger people this also shrinks the domestic consumer market, creating additional problems. Further issues stem from the way the government of Japan allocates transfers to local governments, and Basel capital requirements have also made Japanese banks more reluctant to lend money to startup businesses and small and medium-sized enterprises (SMEs). This has discouraged Japanese innovation and technological progress.

In the following section we will discuss the causes of the long-term Japanese recession and will provide a comparative study of Greece's economic collapse in Section 3. Section 4 is an empirical analysis of the Japanese economic crisis, and the ineffectiveness of the fiscal policies in stimulating the GDP growth after the bubble burst. It provides proof of our hypothesis that Japan's problems have been caused the vertical IS curve and not by a liquidity crisis. Section 5 provides remedies for pulling the Japanese economy out of recession and boosting its economic growth. The final section presents the concluding remarks.

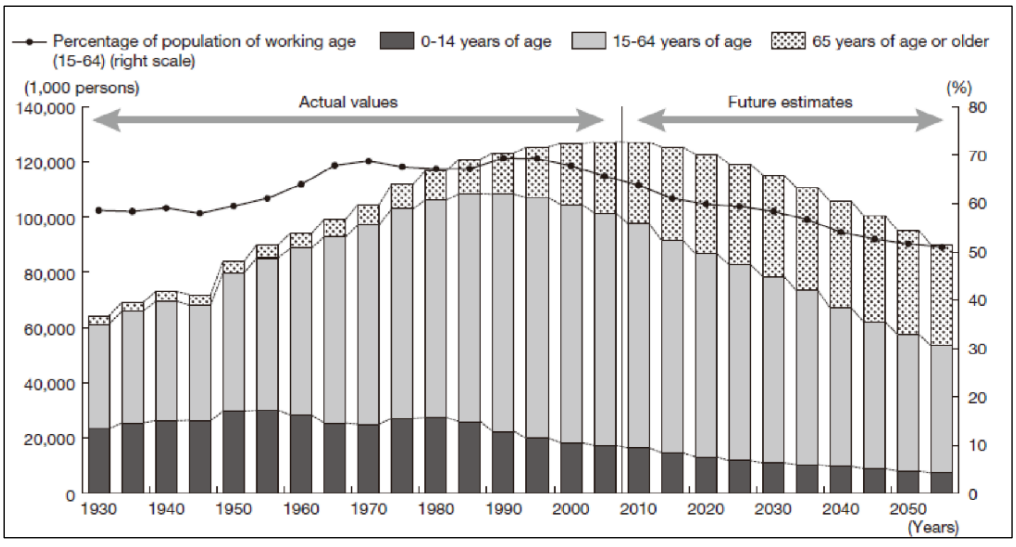
2. CAUSES OF THE LONG-TERM RECESSION IN JAPAN

2.1 Aging Population

Japan has achieved the highest life expectancy in the world, but its retirement age is still 65 years of age. Figure 2 shows that the working population (i.e., those aged between 15 and 64) is diminishing drastically while the elderly population (those aged 65 and older) is growing rapidly. The aging population and the diminishing workforce is one of the biggest causes of long-term recession in Japan.

On the other hand, Japan's method for calculating wages is based on seniority. Seniority-based wage systems make it difficult for companies to hire elderly people. They are often forced to retire, even though many of them would like to continue working. Because of the aging population, social welfare costs have started to increase and currently one-third of government spending is allocated to this, while the government budget deficit is rising every year.

Figure 2: Demographics of Japan



Source: Yoshino (2013).

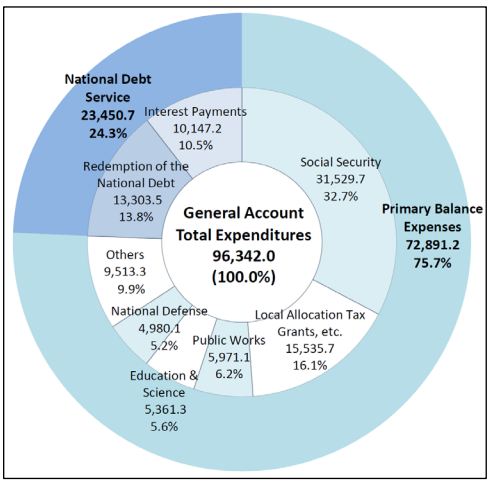
[1] http://www.wsj.com/articles/SB10000872396390443687504577564800240852924

2.2 Monetary Transfers from Central to Local Governments

Figure 3 shows expenditure from the general account budget of the Government of Japan in 2015. About 16% of total government spending is allocated to local governments, making it the second largest government expense after social security. Local governments rely too heavily on central government transfers and do not make efforts to revitalize regional economies. In addition, a rigid distribution system within agriculture cooperatives has put farmers in a weak position, and they are unable to make innovations in agricultural production.

Figure 3: General Account Expenditure Budget, 2015

(¥ billions)

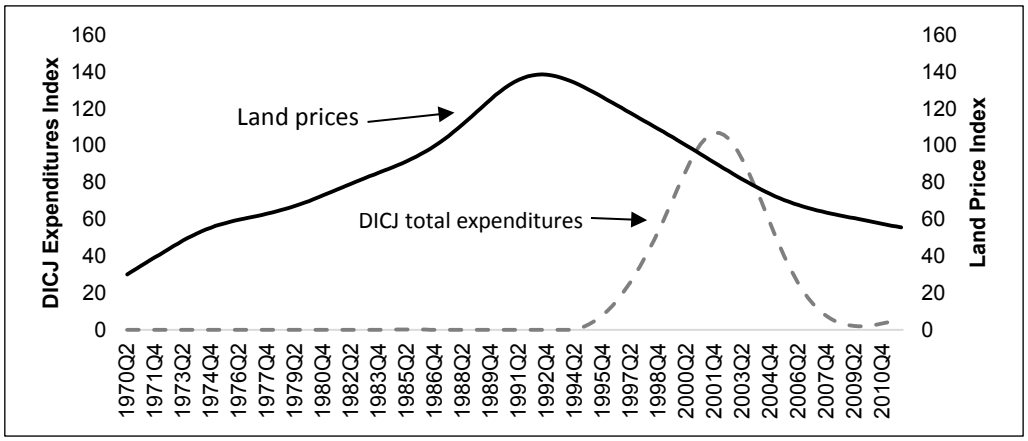


Source: Government of Japan, Ministry of Finance (2015).

2.3 Banking Behavior

In the 1980s, Japanese banks issued loans based on collateral. From 1991 onwards, land prices started to decline and banks began to accumulate bad loan assets. The number of banking failures started to increase immediately after the financial bubble burst, reaching a peak almost one decade later.

Figure 4: Land Price and Deposit Insurance Corporation of Japan's Financial Assistance for Banking Failure



DICJ = Deposit Insurance Corporation of Japan.

Source: Yoshino, Taghizadeh-Hesary, and Nili (2013).

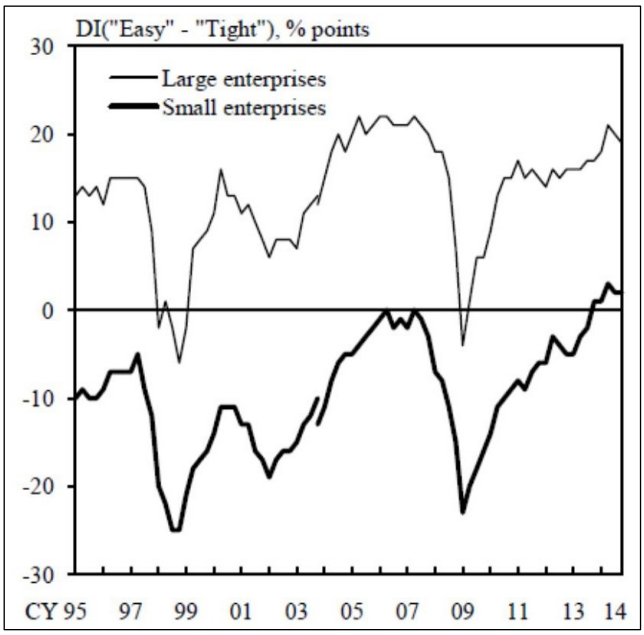
Figure 4 shows that before the bubble burst, there was no banking failure and assistance from the Deposit Insurance Corporation of Japan (DICJ), the financial system's insuring organization, was almost at zero. When banks began to fail after the bubble burst, the DICJ began to raise financial assistance to help the failed banks. This assistance also peaked a decade after the bursting of the bubble.

Another obstacle in the banking system is the Basel capital requirements. Basel I regulations forced banks to hold 8% capital, regardless of economic conditions. Japanese banks started to reduce their loans to avoid a shortage of capital, which created a credit crunch, and it became difficult for SMEs and startup businesses to borrow money from banks.

Figure 5 shows the results of a survey conducted by the Bank of Japan investigating the difficulty for large firms and small and medium-sized enterprises to raise money from banks or from the capital markets. Data points below zero signify difficulty for companies in raising money. The figure shows that smaller enterprises find it harder to raise money than larger firms.

Figure 5: Access to Finance by Large and Small Enterprises in Japan

(percentage points)



CY= commercial year; DI = diffusion index; SME = small and medium-sized enterprise.

Source: Yoshino and Taghizadeh-Hesary (forthcoming, a).

2.4 Excessive Contractionary Monetary Policy

Japanese monetary policy in the late 1980s was too easy and contributed to the development of an economic bubble. After the bubble burst, Japan's monetary policy was over tightened, drastically reducing the lending capacity of Japanese banks. Revankar and Yoshino (2008) estimate Japan's loan supply function for the periods 1982–1989 and 1990–1995. The results are summarized in Table 1.

Table 1: Estimated Loan Supply Function

Dependent Variable (bank loan)	Period I (1982–1989)		Period II (1990–1995)
Bank deposit		0.658 (19.69)	
Market share		0.426 (1.48)	
Loan rate–call rate	16.298 (2.611)		21.351 (3.028)
Call rate	8.564 (2.568)		6.755 (2.904)
BIS-ratio		8.658 (2.353)	
Rival bank's previous period loan	0.066 (3.675)		0.038 (2.333)
Land price	0.123 (2.564)		-1.760 (-1.449)
Constant		-36.302 (-0.874)	
Adjusted R^2 0.892, Hausman Statistic, CHI-SQUARE=0.923, P-Value=0.820			

BIS = Bank for International Settlements.

Note: Figures in parentheses are t-values.

Source: Revankar and Yoshino (2008).

Findings from Revankar and Yoshino (2008) show that:

(i) The interest rate policy was less effective from 1990 to 1995 than it had been from 1982 to 1989.

(ii) The capital requirement rule of the Bank for International Settlements discouraged Japanese banks from lending money to SMEs, startup businesses, and risky sectors.

(iii) During the period of economic boom, the increasing land prices pushed bank loans upward. Japanese banks were using land as collateral and the high land prices pushed up the value of the collateral, making the banks more willing to lend large quantities of money.

(iv) Japanese banks decided how to allocate their loans by looking at the behavior of other banks. Sumitomo Bank, for example, started to increase its loans during the economic bubble and many other banks followed suit. This is reflected in Table 1, "Rival bank's previous period loans."

2.5 Reduced Effectiveness of Fiscal Policy

Kiichi Miyazawa, Prime Minister of Japan from 1991 to 1993, implemented fiscal policy when the Japanese economy was slow to recover in the 1990s. He followed a Keynesian policy, hoping for a high growth period in Japan in which public investment would help boost the Japanese economy. However, major highways and bridges had already been completed and investment in new infrastructure did not help the economy due to a decline in the multiplier for public investment. Public investment in Japan has tended to produce low stimulative effects on gross national product because of ineffective distribution. The bulk of public investment has been concentrated in the countryside, and research shows that such investment has a much smaller impact on rural areas than on urban areas and that public investment in the agriculture sector has been much less

effective than public investment in the industrial and service sectors (Yoshino and Sakakibara 2002). The result of this increasing rural and agricultural bias in the allocation of public investment is that the multiplier of public investment declined sharply from about 2.5 to as low as 1 (Yoshino, Kaji, and Kameda 1998). This shows that such public investment only increases budget deficits; it cannot bring about a recovery of the Japanese economy.

The results of this misallocation are seen in declining returns from public and private investment, as reported by Yoshino and Nakahigashi (1999, 2000) in Table 2. The marginal productivity of public capital was high during the high-growth period (1955–1969) but declined from 1970 onward. It is likely that the misallocation of public capital also contributed to a lower rate of return from private capital, since public investments did not remove the "infrastructure bottlenecks" that lower the rate of return from private investment.

Table 2: Marginal Productivity of Private Capital and Public Capital

Time Period	Private Capital	Public Capital
1955–1959	0.8346	0.2468
1960–1964	0.8685	0.3216
1965–1969	0.8204	0.3610
1970–1974	0.4740	0.1802
1975–1979	0.3144	0.0944
1980–1984	0.2813	0.0722
1985–1989	0.2416	0.0621
1990–1993	0.2410	0.0592

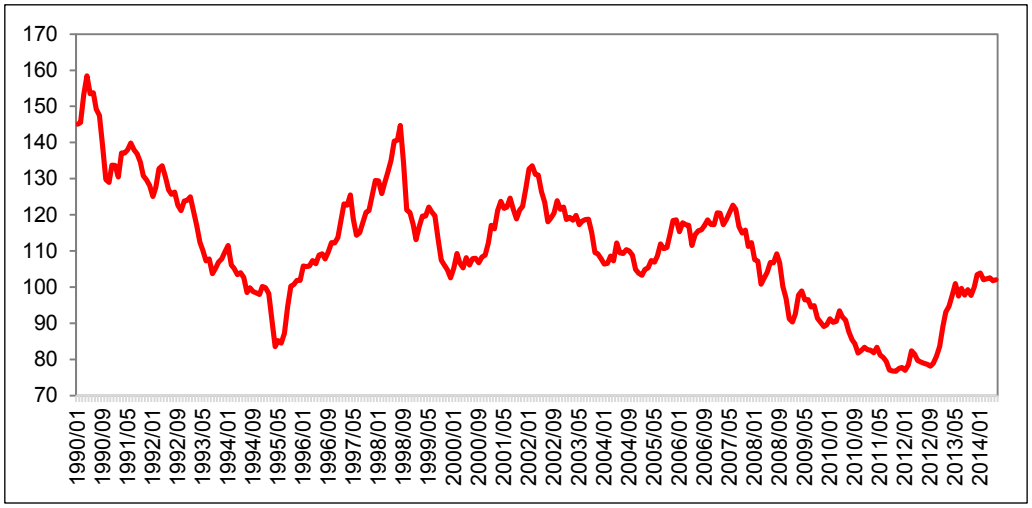
Source: Yoshino and Nakahigashi (1999, 2000).

2.6 High Appreciation of the Yen in the Mid-1990s

Figure 6 shows fluctuations in the dollar–yen exchange rate during 1990–2014. Appreciation of the yen in the mid–1990s caused Japanese manufacturing companies to relocate from Japan to other Asian countries. Wage increases also pushed Japanese companies abroad. As a result, domestic production started to diminish. Figure 7 shows Japanese outward foreign direct investment to other Asian economies including the PRC; Hong Kong, China; India; and Indonesia from 1989 to 2004.

Figure 6: Exchange Rate, 1990–2014

(dollar–yen rate)

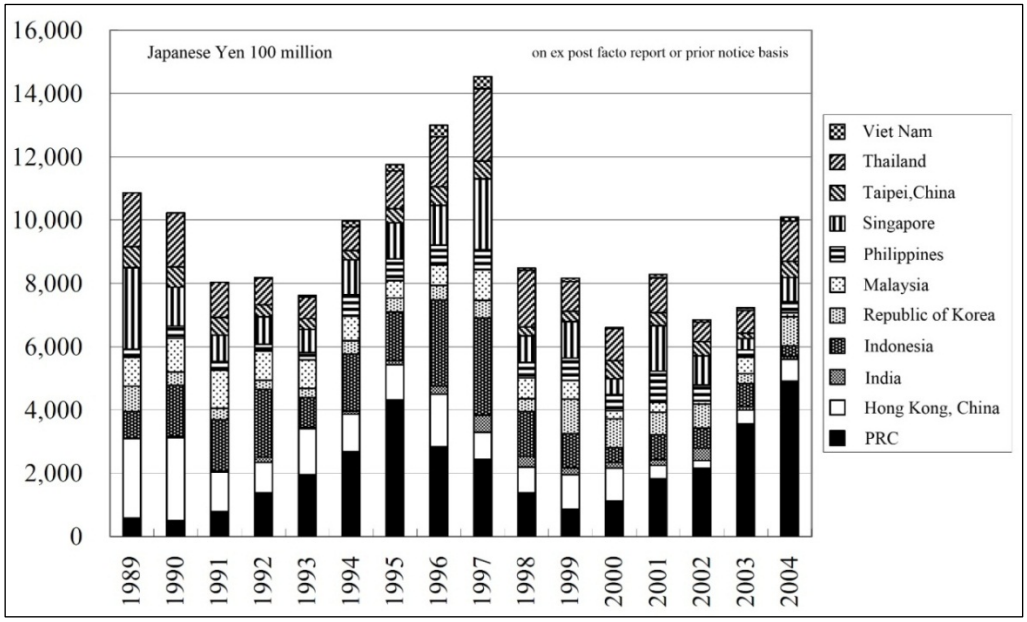


Note: Dollar–yen spot rate at 5 p.m. Japan Standard Time, monthly average, Tokyo market.

Source: Bank of Japan foreign exchange rate, time series database.

Figure 7: Japanese Outward Foreign Direct Investment to Asia

(¥100 million)



PRC = People's Republic of China.

Source: Alvstam, Ström, and Yoshino (2009).

2.7 Banking Crisis of 1998

Japanese banks were in turmoil in the late 1990s. In total, 181 banks went bankrupt. Most banks that failed were small, or were credit cooperatives. The main reasons for failure were:

(i) too much concentration on lending to specific sectors (such as the construction and real estate sectors);

(ii) increased stress placed on the lending of regional banks due to regional recessions;

(iii) mismanagement and fraudulent lending; and

(iv) failure in securities investment and a lack of investment knowledge.

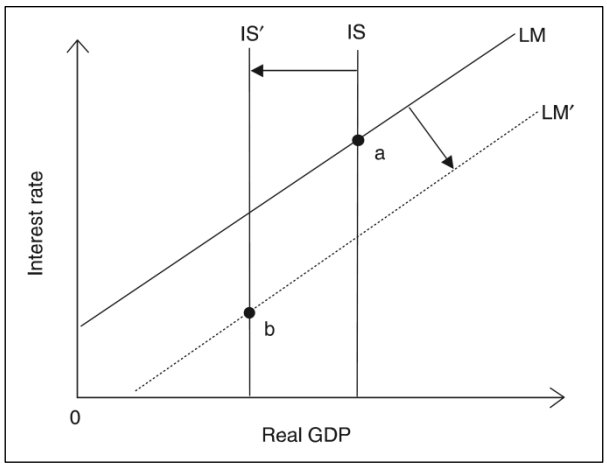
The injection of capital into problem banks was regarded as a moral hazard in the 1990s. Many manufacturing companies opposed capital injections for banks since manufacturing industries were never rescued by the government. Capital injections were implemented in the 2000s, however, when Prime Minister Koizumi was in power.

2.8 Japan's Ineffective Monetary Policy

Japan's long-term recession is often explained as a liquidity trap. Much attention has been focused on monetary policy rather than structural issues, but the problem of the Japanese economy was in its vertical IS curve (Figure 8). Private investment did not grow despite very low interest rates. Expected future rates of return were low and so hardly any new technological progress was made in Japan. Even though the central bank's short-term interest rate was set to zero, depressed investment in Japan meant that the economy was not able to recover.

Because so much criticism was aimed at monetary policy instead of accelerating corporate restructuring, attempts to reduce idle capacity and start new investment through such restructuring was not pursued.

Figure 8: Japan's Ineffective Monetary Policy



GDP = gross domestic product; IS = investment/savings; LM = liquidity preference/money supply equilibrium.

Source: Yoshino and Sakakibara (2002).

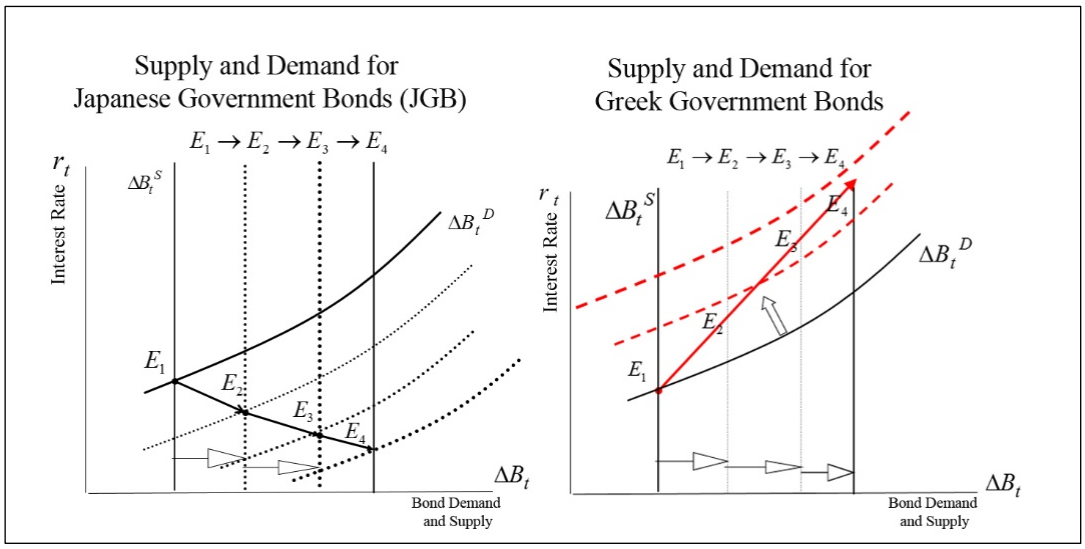
3. COMPARISON OF THE ECONOMIC COLLAPSE IN JAPAN AND GREECE

Although both Greece and Japan have high levels of net debt, it is helpful to understand why Japanese debt is still sustainable while Greece was declared bankrupt.

Japan's government debt is much higher than that of Greece, but it is sustainable because more than 90% of the Government of Japan's debt is held by domestic investors in banks, postal savings, life insurance, and pension funds. The Japanese government issues various kinds of bonds based on demand by differing sectors, and the government bond market has been quite stable in Japan. Japanese investors continue to hold government bonds since Basel capital requirements set the risk of government bonds at zero. On the other hand, more than 70% of investors in Greece's bond market are foreign and they have been quick to move out of the market at times of risk.

Figure 9 depicts the supply of government bonds and the demand for government debt in Japan and Greece. The vertical line shows the supply of government bonds in the primary market since no matter what the rate of interest is, the government has to finance its budget deficits. The demand for government bonds increases when the interest rate rises. Thus the demand curve for government bonds is denoted by an upward sloping demand curve in the figure.

Figure 9: Government Bond Markets of Japan and Greece



Source: Yoshino and Taghizadeh-Hesary (2015).

Both Japan and Greece have increased their sales of government bonds, meaning that the supply curve of government bonds has shifted to the right in the primary market. Demand for Japanese government bonds by banks, insurance companies, and pension funds is increasing as the sluggish economy has reduced demand for corporate loans (Figure 9). Monetary easing has increased bank deposits and these funds have often been invested in government bonds. Japanese interest rates, therefore, remain low.

The behavior of holders of Japanese and Greek debt is distinctive (Table 3). Overseas investors, who hold 70% of government bonds in Greece, are very quick to sell them if they feel that risk is increasing. As demand for Greek bonds has diminished, the demand curve of the bonds has shifted to the left, (Figure 9, right-hand graph), which has progressively raised the interest rate on Greek bonds. The Greek interest rate increased to more than 20%, while the Japanese interest rate has remained at about 1% or less (Yoshino and Mizoguchi 2013). Since only 5% of the total bonds issued by the Japanese government are held by overseas investors, there is much less likelihood of capital flight, since domestic holders tend to retain their investments.

Table 3: Holders of Japanese and Greek Government Bonds, 2011

Holders of Japanese Government Bonds	% of Total	Holders of Greek Government Bonds	% of Total
Bank and postal savings	45	Overseas investors	33
Life and non-life insurance	20	Domestic investors	21
Public pension funds	10	European Central Bank	18
Private pension funds	4	Bilateral loans	14
Bank of Japan	8	Social pension funds	6
Overseas investors	5	International Monetary Fund	5
Households	5	Greek domestic funds	3
Others	3		

Note: In Greece, 70% of debt is held by overseas investors, compared with 5% for Japan.

Source: Yoshino and Taghizadeh-Hesary (2015).

4. EMPIRICAL ANALYSIS

4.1 Empirical Model

To provide evidence for our assertion that the problem of the Japanese economy stems from the vertical IS curve, we have developed an IS–LM model and will run our empirical analysis based on it.

The IS–LM model, has played a central role in the macroeconomic theory of the Keynesian model. A basic version of that model remains the core of many introductory textbooks (e.g., Hall and Taylor [1988]) that use it to analyze the effects of changes in some exogenous macroeconomic variables and, in particular, the impact of alternative monetary and fiscal policies. The augmented IS–LM model is also the backbone of many of the large-scale, highly disaggregated, macroeconometric models used by governments and commercial firms for the purposes of policy evaluation and economic forecasting. More generally, the IS–LM model has a significant influence on how policy makers and market participants view the workings of the economy. This is clearly reflected in the popular business press (Gali 1992).

Below are two equations that constitute the simplest version of our IS–LM model. They will be used simultaneously in order to run our empirical analysis. The first equation is the IS equation. It represents the equilibrium where total private investment equals total saving. Each point on the curve represents the balance between savings and investments. The second part of the simultaneous equation model is the LM equation. It shows the combination of interest rates and levels of real income for which the money market is in equilibrium. The LM function is the set of equilibrium points between the liquidity preference (or demand for money) function and the money supply function. The right money demand consists of the transactional demand, which is a function of real GDP, and the speculative demand, which is a function of the interest rate.

$$y = \alpha - \sigma(i - p) + u_{is} \quad \text{(IS equation)}$$

$$m - p = \beta + \phi y - \lambda i + u_{lm} \quad \text{(LM equation)}$$

In these equations, y denotes the log of real GDP, i is the nominal long-term interest rate, and p and m are the logs of the price level and the money supply, respectively. u_{is} and u_{lm} are the stochastic processes describing money supply and money demand (LM) and spending (IS) driving forces. In order to run our empirical analysis for GDP we used the Japanese real GDP, deflated by the GDP deflator (2009 = 100), seasonally adjusted using the X-12 quarterly seasonal adjustment method. For the interest rate we used a 10-year government bond yield, which is a long-term, safe asset interest rate. For the price level we used the general consumer price index of Japan. For the money supply we used Japanese M1, adjusted using the X-12 quarterly seasonal adjustment method.

We used data from Q2 1990 to Q4 2013. All variables except the interest rate were used in logarithmic form. The data is sourced from Nikkei NEEDS and the Bank of Japan database.

4.2 Unit Root Test

In order to evaluate the stationarity of all series, we performed the unit root test on all variables at levels and first differences initially with the intercept, and then also with the intercept and trend. The test used was the Augmented Dickey-Fuller test and the results are summarized in Table 4.

Table 4: Unit Root Test

Variable	Definition	Intercept				Trend and Intercept			
		Levels (t-statistic)	AIC	First differences (t-statistic)	AIC	Levels (t-statistic)	AIC	First differences (t-statistic)	AIC
$(i-p)_t$	Real interest rate	-2.40	1.77	-9.64**	1.817	-2.19	1.78	-9.80**	1.816
i_t	Nominal interest rate	-2.06	0.33	-9.59**	0.37	-1.73	0.34	-7.65**	0.29
y_t	Real GDP	1.24	17.42	-8.20**	17.32	-4.77**	17.18	-8.36**	17.33
$(m-p)_t$	Real money supply	-0.58	62.21	-2.85*	62.20	-2.13	62.19	-2.82	62.18

AIC = Akaike Information Criterion; GDP = gross domestic product.

Note: * indicates rejection of the null hypothesis for the presence of unit root at 5%. ** indicates rejection of the null hypothesis for the presence of unit root at 1%. The optimal lag lengths for the Augmented Dickey-Fuller test were found using the Akaike Information Criterion.

Source: Authors' calculations.

The results imply that almost all variables are non-stationary in levels. The variables include real interest rate, nominal interest rate, real GDP (in logarithmic form), and real money supply (in logarithmic form).[2] However, the first differences of all variables show stationary results. These results suggest that the real interest rate, nominal interest rate, real GDP (in logarithmic form) and the real money supply (in logarithmic form) each contain a unit root. Once the unit root test was performed and it was discovered that the variables are non-stationary in level and stationary in first differences, they were integrated of order one or I(1). Hence they will appear in our empirical model in first differences.

4.3 Empirical Results

Both the IS and the LM equations are simultaneously estimated by the iterative seemingly unrelated regression. This method uses information about contemporaneous correlation among error terms across equations in an attempt to improve the efficiency of parameter estimates. The results of the regression are summarized in Table 5.

[2] Real GDP was stationary with "intercept and trend," but because the value of the Akaike Information Criterion (AIC) with "intercept" was higher compared to "intercept and trend," we consider the "intercept" result. Hence, this means the variable was also non-stationary in level and stationary in first difference, i.e., I(1).

Table 5: Empirical Results

(Sample: Q2 1990–Q4 2013)

Equation	Dependent variable	Explanatory variable	Coefficient	Std. error	t-Statistic	Prob.
IS	y_t	α	-0.16	0.08	-1.98*	0.049
		$(i-p)_t$	-0.0002	0.0004	-0.53	0.60
		y_{t-1}	1.01	0.007	147.63**	0.00
R-squared = 0.99, adjusted R-squared = 0.99, Durbin-Watson Stat. = 1.70, Std. error of regression = 0.01						
LM	$(m-p)_t$	β	0.02	0.19	0.11	0.91
		y_t	0.70	0.26	2.67**	0.008
		i_t	-0.025	0.009	-2.72**	0.007
		$(m-p)_{t-1}$	0.99	0.006	171.06**	0.00
R-squared = 0.99, adjusted R-squared = 0.99, Durbin-Watson Stat. = 1.93, Std. error of regression = 0.03						

Std. error = standard error; Prob. = probability.

Note: Estimation Method: Iterative Seemingly Unrelated Regression.

Source: Authors' calculations.

The upper part of Table 5, with the results for the IS equation, shows the relationship between the real GDP and the real long-term interest rate. Research suggests that when the real interest rate goes down, investment should go up, so the sign of the interest rate in the empirical findings should be negative. Indeed, the sign of the real interest rate in Japan's IS equation from Q2 1990 to Q4 2013 was negative, but not significant. This means that when the interest rates were lower, investment did not accelerate. This is evidence of the vertical IS curve that can be seen in Figure 8 and is in accordance with Yoshino and Taghizadeh-Hesary (forthcoming b) who did not find significant association between the long-term real interest rate and the real GDP of Japan during Q2 2002–Q2 2014. The lagged GDP gap had a significant impact on the current value of GDP.

The lower part of Table 5, with the empirical results for the LM equation, shows the combination of interest rates i_t and levels of real income y_t for which the money market is in equilibrium. The LM function is the set of equilibrium points between the liquidity preference (or demand for money) function and the money supply $(m-p)_t$. The Y axis of the LM curve is the interest rate and the X axis is the real GDP (y_t). Usually, the LM curve is upward sloping and our empirical results for Q2 1990–Q4 2013 of Japan are in accordance with an upward-sloping LM curve. Money demand consist of two parts; transactional demand (which is a function of the real income) and speculative demand (which is a function of the interest rate). Our results are in accordance with economic theory, which suggests that transactional demand is a positive function of the real income, and speculative demand is a negative function of the interest rate. Moreover, both coefficients show statistically significant values. These findings contradict Paul Krugman's assertions about the Japanese economy.[3] He has argued that Japan is currently in a liquidity trap, which would equate to a horizontal LM curve. However, our empirical analysis indicates that the Japanese LM curve has an upward slope, so the problems of the Japanese economy must stem from other sources.

Since we argue that the problem of the Japanese economy in the "Lost Decade" did not arise from monetary policy, because the results show the Japanese economy is not in a liquidity trap, we suggest that the problems arise from other issues such as banking behavior, diminished

[3] http://www.brookings.edu/~/media/projects/bpea/1998%202/1998b_bpea_krugman_dominquez_rogoff.pdf

effectiveness of fiscal policy, high appreciation of the yen in the mid–1990s, an aging population, and transfers from central to local governments.

5. REMEDIES FOR STIMULATING GROWTH IN JAPAN

We suggest 10 remedies for stimulating Japanese economic growth that could also be crucial for preventing other Asian economies from falling into long-term recession.

5.1 Reforms to Combat the Issues of an Aging Population

An aging population and early retirement age are some of the key contributing factors to Japan's slow economic activity. Wage rates should be based on productivity rather than seniority. It is much easier for companies to hire elderly people if their wage rates are set according to productivity. Healthy, elderly people should be able to find jobs based on their experience. The retirement age should be increased to boost the diminishing working population. Moreover, the government needs to encourage greater female participation in the labor force through measures such as improving childcare facilities.

5.2 Reduction of Transfers from Central to Local Governments

Government spending between central and local governments must be clearly defined. An incentives mechanism should be created to enable local governments to reduce transfers from the central government. At present, local governments are eager to receive transfers from the central government rather than raise private funds, however, only limited transfers should be provided by the central government to encourage local governments to raise most of the funding from the private sector. Public–private partnerships and Hometown Investment Trust (HIT) funds must also be promoted. The allocation of taxes and expenditure between the central government and local governments must also be determined.

5.3 Reform of the Agriculture Sector

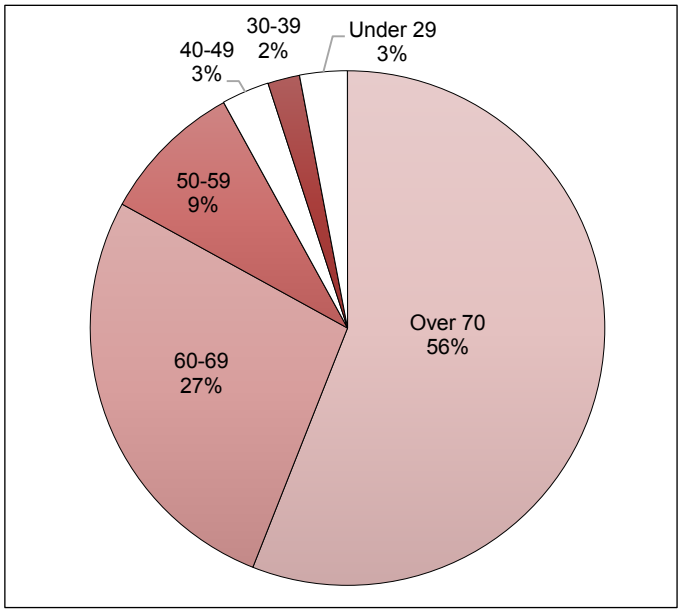
Although Japan's agriculture sector is small, it is one of the major topics of discussion concerning the country's participation in comprehensive international trade agreements. The 2011 *Basic Policy and Action Plan for the Revitalization of Japan's Food, Agriculture, Forestry and Fisheries* aims to bolster the competitiveness of farmers in the five years following its publication, to create an agriculture sector compatible with high-level Economic Partnership Agreements. In March 2013, the government decided to take part in negotiations for the Trans-Pacific Partnership, while promising to defend the interests of Japanese agriculture. Agriculture in Japan faces a number of challenges:

- During the past 50 years, agriculture's share of GDP dropped from 9% to 1%, while its share of the labor force shrank from 28% to 4%. Meanwhile, the area of land under cultivation in Japan has fallen by a quarter, while part-time farming has become the norm. Food self-sufficiency, a key objective for the government, fell from 79% in 1960 to 39% in 2010, in terms of numbers of calories.
- Productivity in land-intensive agriculture is low, reflecting the small size of Japanese farms, which average only 2 hectares, compared to farms in the European Union (14 hectares) and the US (170 hectares) (Government of Japan, MAFF 2012). Farms tend to be small in Japan, because of land reforms following World War II, Japan's mountainous terrain, the production adjustment program that allocates output of rice to specific farmers, and subsidies that make small-scale farming profitable.
- High levels of commodity-specific support on certain products impose heavy burdens on

consumers and taxpayers. The overall level of assistance in Japan, as measured by the Producer Support Estimate, was 51% in 2009–2011, about double the average of the OECD. Higher prices boosted consumer spending on agriculture products to 1.8 times more than it would have been without government policies.

- Border measures, including a 2012 tariff of ¥341 per kilogram of rice, which amounted to a 780% rate, isolated farmers from international competition and complicated Japan's participation in comprehensive regional and bilateral trade agreements. Still, some parts of the agriculture sector are thriving. In particular, vegetable production increased its share of agriculture output from 9% in 1960 to 28% in 2010, exceeding the share of rice. Vegetables are a labor-intensive sector with business-oriented farms that receive relatively little government support and are not necessarily large scale. A more open and competitive environment is essential to secure the growth and competitiveness of agriculture and promote Japan's integration in the world economy. Demographic factors create an opportunity for farm consolidation and other reforms to boost productivity. Indeed, in 2010, the average age of farmers was 66, and 56% of rice farmers were over 70, while a further 36% were aged between 50 and 70 (Figure 10). Only 8% were under the age of 50 (OECD 2013).

Figure 10: Age Distribution of Rice Farmers in Japan, 2010



Source: Ministry of Agriculture, Forestry, and Fisheries (2010).

In addition to the reforms of agriculture cooperatives undertaken by Shinzō Abe, there are other ways to revitalize rural areas in Japan:

- The production adjustment program should be phased out over a fixed and relatively short time period, thereby increasing the share of rice produced using efficient methods and reducing its production costs. The impact of lower rice prices should be mitigated by transitory income payments to large farmers (OECD 2013).
- Liberalizing border tariffs on agricultural goods, when done in conjunction with domestic reforms, will facilitate Japan's participation in comprehensive regional and bilateral trade agreements, including the Trans-Pacific Partnership
- There should be more progress in farm consolidation. The prohibition on non-agriculture corporations owning farmland should be abolished to attract labor, capital, and technology into agriculture, while ensuring that land-use regulations limit the shift of farmland to other uses. At the same time, taxation ought to be reformed, to discourage the holding of idle agricultural land near urban areas (OECD 2013).

- There should be new methods of financing, not only by banks, but also Hometown Investment Trust (HIT) funds and crowdfunding that can provide finance to rural SMEs and farmers.[4]

One reform that the government of Japan has launched under the Abe administration is to enable elderly people who own farmland to lease it to younger people. Formerly this was not allowed. In combination with the HIT, this means that many more people can build an agriculture business.

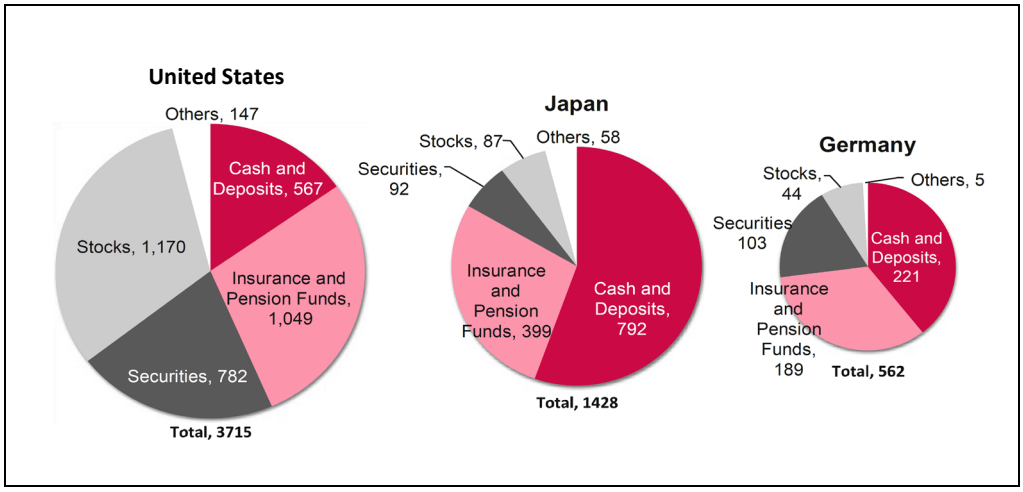
5.4 Diversification of Households' Asset Allocation

The government of Japan needs to provide enough incentives to enable households to diversify their financial assets. At present, cash and deposits form the bulk of financial assets in Japanese households and shares of stocks and securities are low. Government incentives are needed to raise the share of stocks and securities in household portfolios and to reduce the share of cash and deposits.

Figure 11 shows how individuals in Germany, Japan, and the US distribute their financial assets, with the size of each pie chart representing the total amount of personal financial assets. Assets in the US amount to ¥3,715 trillion; more than double the amount in Japan.

Figure 11: Financial Asset Allocations of the United States, Japan, and Germany

(¥ trillion)



Source: Yoshino (2013).

In the US, cash and savings comprise around 15% of total financial assets. More than half of these deposits or loans have been securitized and many of them have been sold to other countries. That is why the cumulative debt of the US is much smaller than that of Japan. In Japan, cash and savings make up the majority of total assets (55%), followed by pension funds and insurance. The number of marketable securities and shares is extremely small and, if this falls further, could create issues over who will provide money for corporations and environmental projects in regions with possibilities for growth but which carry risk. If not handled properly, opportunities for growth could be overlooked, with the flow of funds through Japan's financial institutions going only to safe borrowers.

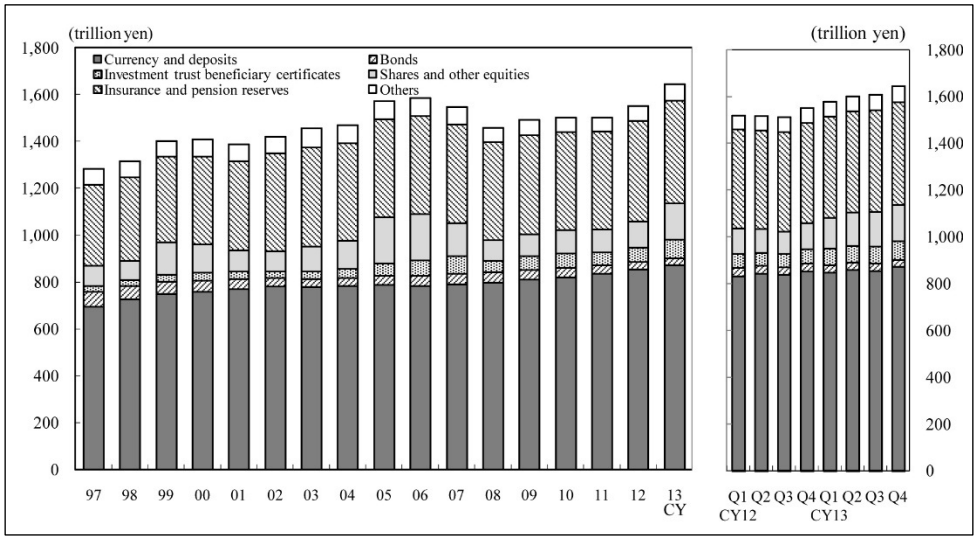
[4] Hometown Investment Trust (HIT) funds are a new form of financial intermediation that has been adopted as a national strategy in Japan. The name reflects the goal of the fund: to connect fund providers and their hometowns. Naoyuki Yoshino, coauthor of this paper, was one earliest proponents of the funds.

In contrast, individuals in the US are much less risk-averse. In the US, for example, over half of all household assets are held in shares and marketable securities, and it appears that private individuals are motivated to take risks in the hope of high returns.

In this regard, Germany used to resemble Japan. However, with the emergence of investment trusts and the profitable sell-off of shares for privatization in Japan, there has been a shift to shares and investments (Yoshino and Mizoguchi 2013). In the case of privatization of companies such as Nippon Telegraph and Telephone Corporation and Japan Tobacco, shares were sold, but their prices fell. Ultimately, investors were not able to channel their investments profitably into equities (Yoshino 2013).

Figure 12 shows how households in Japan allocate their financial assets. After cash and deposits, insurance policies form the second-largest share of households' assets. In Japan, insurance is regarded as a long-term saving scheme. Deposits are usually held for 1 or 2 years, but insurance policies are for 10, 20, or 30 years. Many people in Japan prefer to keep their financial assets as deposits initially and then to take out insurance.

Figure 12: Financial Assets Held by Households in Japan



CY = calendar year.

Source: Bank of Japan (2014a).

When considering the distribution of assets across the population in Japan, Table 6 shows that older people have the greatest number of assets and young people have the least. Older people prefer to hold deposits, insurance, and government bonds, which are perceived as safe, rather than assets that they regard as risky. This is another reason why the share of cash and savings is so high in Japanese households, and also why this share is greater than in many other countries.

Table 6: Financial Assets of Japanese People by Age

(¥10,000)

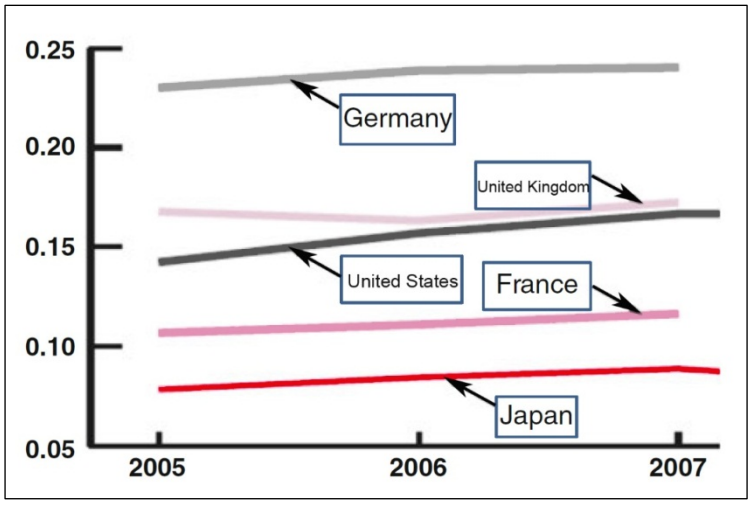
Age	Deposits	Insurance	Securities	Others	Total
Average	635	303	179	52	**1,169**
20 years	266	26	40	10	**342**
30 years	298	122	77	40	**537**
40 years	355	241	85	62	**743**
50 years	533	344	126	65	**1,068**
60 years	811	409	276	43	**1,539**
70 years	1,035	333	287	52	**1,707**

Source: Yoshino and Taghizadeh-Hesary (2015).

Figure 13 shows a country comparison of income from interest and dividends, divided by income. Germany has the highest share while Japan has the lowest. France and Germany were major supporters of the creation of the euro, making it simple for Germany to invest in the 18 countries in the eurozone, whenever it feels this will be profitable. That is why German dividends and interest payments are very high. Japan's low rate of return is due to 20 years of slow growth, and the high value of the yen, which means that Japanese investments overseas have a low rate of return in terms of yen.

Figure 13: Revenue Share of Financial Assets in France, Germany, Japan, the United Kingdom, and the United States.

(income from interest and dividends divided by income)



Source: Yoshino (2013).

Judging from Figure 12, one consequence of Abenomics has been to diversify households' asset allocations from an overconcentration of deposits to much wider asset holdings.[5] The government

[5] When Shinzō Abe was elected to his second term as prime minister in December 2012 he introduced a reform program called Abenomics. It aimed to revive the sluggish economy with "three arrows": fiscal consolidation, more aggressive

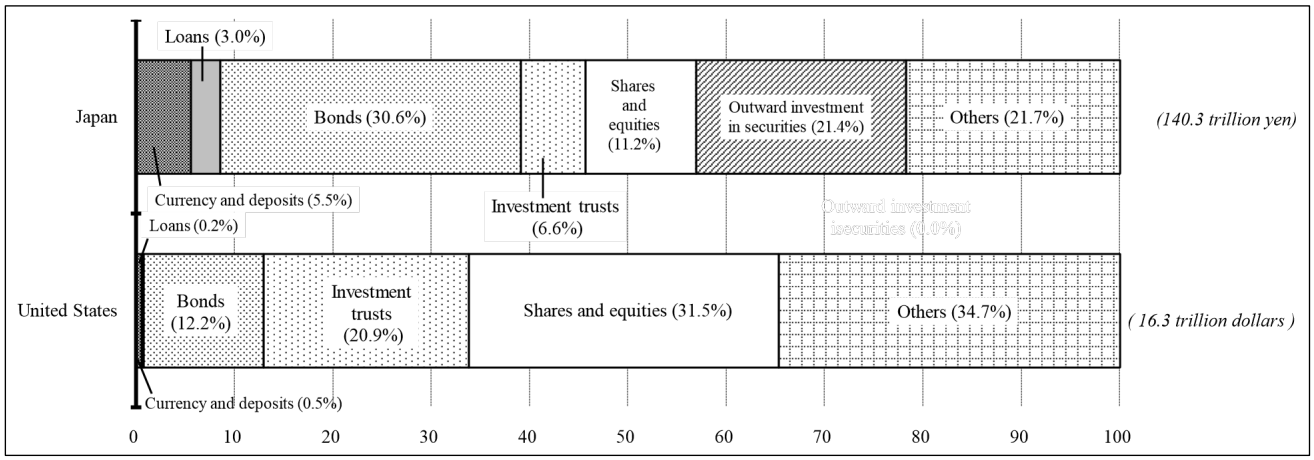
has introduced a new investment savings account—Nippon Individual Saving Account—which it hopes will widen the share of stocks and bonds in the financial assets of Japanese householders (Yoshino and Taghizadeh-Hesary 2015). There is a need for more policies such as this, which will accelerate the diversification of households' financial assets. This will give them an incentive to enter the stock market in order to raise the share of stocks and bonds in their portfolio and to reduce the share of cash and deposits.

5.5 Switching Asset Allocation Pension Funds and Insurance Companies from Pay-As-You-Go to 401(k)-Style

Figure 14 shows the financial assets held by pension funds in Japan and the US. Unlike the US, pension funds and insurance companies in Japan mainly invest in government bonds and are very cautious about investing in stocks. The main reason for this is that Japanese pension funds are pay-as-you-go style and pension contributors cannot control how their funds should be invested. Investors let the government decide how to allocate their funds to various financial products. In contrast, most US pensions are 401(k)-style and pension contributors decide what percentage can be invested in risky and safe assets, which means self-responsibility for pension management. In this case, with the contributor deciding what proportion of pension funds to be allocated to risky assets and what proportion to safe assets, the job of the asset management company is very easy. If all the funds are aggregated, x% will be invested in risky assets and 1–x% will be allocated to safe assets. In Japan, there is complete reliance on the decisions of asset managers. There is no self-responsibility with regard to pension funds and insurance companies. Hence, asset managers want to invest in government bonds, which are the safest asset. If Japan's pension system changes to 401(k)-style and asset allocation relies on individuals' portfolio allocations, then stock market investment and overseas investment in stocks will become much easier because they will be based on individuals' decisions (Yoshino and Taghizadeh-Hesary 2015).

Figure 14: Financial Assets Held by Pension Funds in Japan and the United States

(% ratio of total financial assets)



Note: "Others" is the residual amount that remains after deducting currency and deposits, loans, bonds, investment trusts, shares and equities, and (for Japan) outward investment in securities, from total financial assets. The US flow of funds data includes both outward and domestic investment in securities.

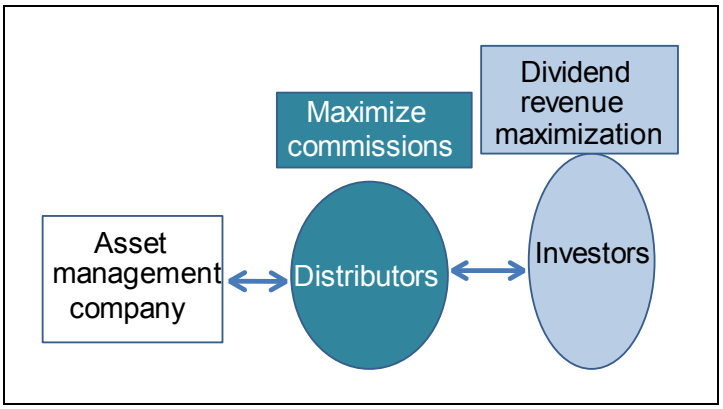
Source: Bank of Japan (2014b).

monetary easing from the Bank of Japan, and structural reforms to boost Japan's competitiveness and economic growth.

5.6 Review of Asset Management Fees

The sales commissions of asset management companies need to be reviewed. The discussion here refers to sales commissions for financial instruments.

Figure 15: Sales of Financial Products



Source: Yoshino and Taghizadeh-Hesary (forthcoming a).

In Figure 15, households ("investors" in the figure) want to maximize their rates of return through dividends or interest payments. But in the middle, distributors, such as banks or securities companies who sell financial products to individual investors, are looking for trust fees and commissions rather than rates of return. In many countries, including Japan, trust fees and commissions are based on principles + dividends. So, even if the dividends are negative, distributors always receive commissions and fees. That is one reason why Japanese investors have tended to lose money in recent years. In order to change this system, distributors' fees and commissions need to be based only on dividends so that investors and distributors are driven by the same maximization goals. Japan needs to change its fees and commission structure so banks and securities companies share objectives with individual investors.

5.7 Use of Home Town Investment Trust Funds to Finance Riskier Businesses

After the housing bubble burst in the early 1990s, Japan's unique system of financial intermediation—the "collateral principle"—was blamed. Its lending criteria were based on the amount of collateral, rather than the viability of the project. It subsequently became a national objective in Japan to adopt Anglo-American ways of finance. Two decades later, the Lehman crisis devastated the world economy and Anglo-American financial methods were discredited. Then, in March 2011, the Great East Japan Earthquake and tsunami struck Japan. During the long and painful recovery process that followed the earthquake many Japanese people had a strong desire to contribute to the recovery. They were often looking for opportunities to contribute, rather than to benefit from high returns. They also realized that local SMEs and many startup companies needed financing. There was a clear need for a meeting place for these borrowers and lenders. Furthermore, the country's budget deficit-to-GDP ratio breached 200% in 2010, casting doubt on the efficiency and effectiveness of public investment. There was a need for private financing with transparent performance monitoring.

It was in this period that a new form of financing—the HIT fund—was proposed to connect fund providers and their hometowns, and a committee at the Cabinet Office was created to study the proposal. There are three advantages to HIT funds. Firstly, they are able to reinforce financial stability by reducing information asymmetry and sharing risk. The downfall of the pre-Lehman "originate and distribute" model was that borrower IOUs were hidden deep within complicated

financial instruments. This made risk difficult to calculate and track. Once markets had lost faith in the ability of borrowers to repay, nobody knew where the risks were and credit markets froze. Far from "distributing" risk to achieve financial stability, information ended up being as asymmetric as it could possibly have been. In contrast to this model, the HIT method encourages stability by reducing information asymmetry as much as possible. This is because households—and firms, if they want to invest in other companies—are keen to obtain information on the borrowing firms, mainly SMEs. The lenders are from the same "hometown" as the borrowers, or they may share a similar interest. There is also a low degree of scale and concentration, with both the lenders and borrowers being relatively small and dispersed. Accordingly, this form of financial intermediation allows risk to be distributed, but does not make it invisible in the process.

Secondly, HIT funds become a new source of much needed risk capital. Financial regulations, notably the capital adequacy ratio requirements of the Bank for International Settlements, are becoming more stringent as banks and other financial institutions are seen as possible sources of instability. In a macroprudential sense, this may help to reduce risk, but it is detrimental to the supply of risk capital. Firms with little or no collateral are particularly affected by this change, so the provision of a new and stable source of risk capital can be especially beneficial.

Thirdly, HIT funds are project driven. Unlike other arrangements, such as the Grameen Bank, where investment destinations are determined later, HIT investors are able to choose their investment from a pool of projects. Investors are not necessarily seeking high returns. Instead, they are motivated to help a project they feel strongly about. This may be because the project is based in their hometown, or they may see significance in the investment's potential to reduce poverty, address environmental concerns, or assist in disaster recovery. In this way, investors may feel a level of personal satisfaction in their choice, and have the added benefit of actually being able to "see" the results. This is not possible with ordinary mutual funds, where investors are not able to track the destinations of their investments.

The drawbacks of these regional trust funds, however, are that they are not guaranteed by the DICJ and risks are borne by the investors. Steps must be taken to increase investor confidence to enable the HIT market to grow. This could be done by ensuring that the terms of the fund are explained in detail to the investors and to make sure that this includes information about the associated risks and where the funds will be invested.

Examples of regional funds in Japan are those covering wind power generation, startup businesses, and agriculture businesses. There are around 20 wind-power generators in Japan that were constructed through private–public partnerships. For these projects, local residents invested between $1,000 and $5,000, and in return they received annual dividends from the sales of electricity generated.

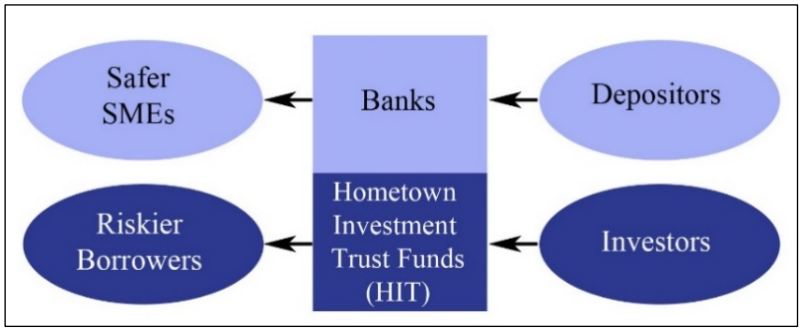
Project evaluations play an important role in the creation of regional funds, as some funds that have been invested in risky ventures have failed to perform well. Globally, banks are becoming increasingly concerned about their risks following the implementation of Basel III (Yoshino and Hirano 2011). Since Asia is dominated by bank loans, and capital markets are generally not well developed, this makes it even harder to raise venture capital and finance riskier projects. Consequently, project assessors must identify potential nonperforming investments that could lose money for investors. It should be noted, though, that some of Japan's regional funds are regarded as charities and offer an opportunity for investors to contribute to their region and support venture businesses.

Banks are often not able to finance projects that carry high risks, even if the expected rates of return are high. If, however, these projects are financed through regional funds, rather than by deposits transformed into bank loans, banks are able to receive money though the sales of regional funds by their branch offices. They do not have to worry about the creation of nonperforming loans. Investors must be made fully aware of the risks when making their investments, but they may also receive a high rate of return, and this could increase investments into riskier projects that would otherwise not have been funded.

The success of its regional funds may help a bank to attract more investors. Conversely, if funds do not perform well, banks may lose future investors. In this way, through competition on the basis of the performance of the regional funds, the quality of projects and the risk-adjusted returns for investors can be improved (Yoshino 2012).

Figure 16 illustrates bank-based SME financing and regional financing to riskier borrowers. Bank loans go to relatively safe borrowers. HITs finance riskier projects.

Figure 16: Bank-Based Financing of Small and Medium-Sized Enterprise and Regional Financing to Riskier Borrowers



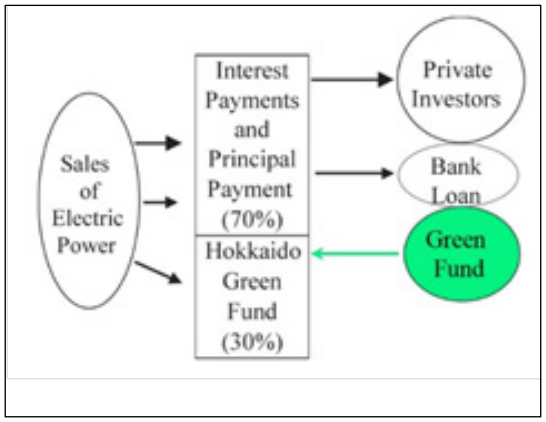
Source: Yoshino and Taghizadeh-Hesary (2015).

With ordinary investment trusts, an outlay is made by a group of investors who provide funds to a range of borrowers, with the investors receiving dividends but not knowing what their investment will be used for. The main feature of HITs is that the investor knows the identity of the borrower and the destination of the investment. Investors can choose to support their local region and borrowers and, by doing so, to use the fund both as a form of investment and donation.

5.8 Optimal Mix of Public and Private Funds

Figure 17 shows the forms in which private and public funds may be collected to invest in wind power. It would be ideal if all the funding came from the private sector.

Figure 17: Wind Power Trust Fund of Japan

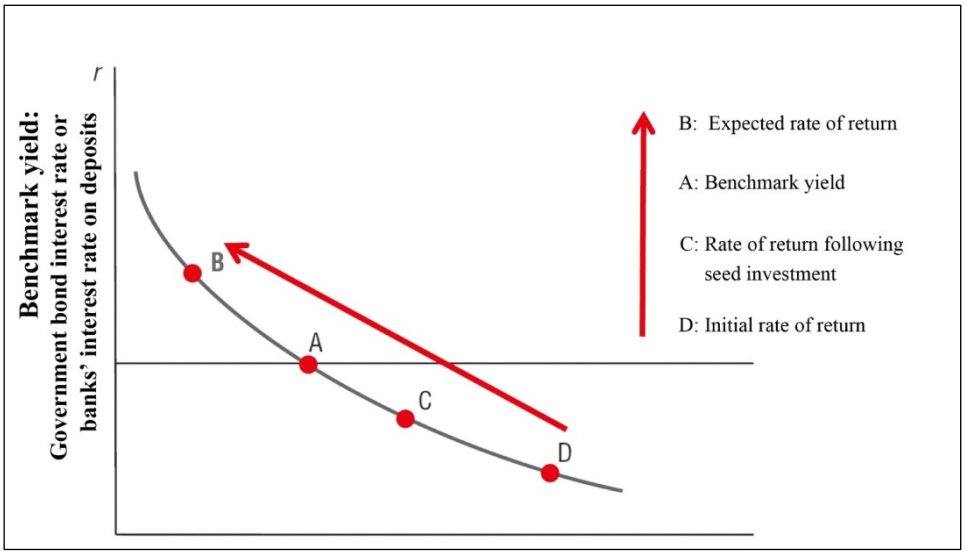


Source: Yoshino (2013).

However, in the case of enterprises that represent a public good, such as solar panels, it is conceivable that public funds (from national or local governments) could be introduced in the form of matching funds or grants that would be combined with funds from private sector investors. In Figure 17, private sector funds represent 70% and public-sector funds 30% of

the total. If we suppose that all the proceeds (the returns) from the project go to the private sector investors, and that, even though the profitability for the private sector investors will not be high, it will increase if dividends do not have to be paid to the originators of the national government funds, this will make the investment attractive to private sector investors because it will offer an anticipated rate of return that is higher than the benchmark profitability shown by the horizontal line in Figure 18.

Figure 18: Calculated Rate of Return



Source: Yoshino and Taghizadeh-Hesary (2015).

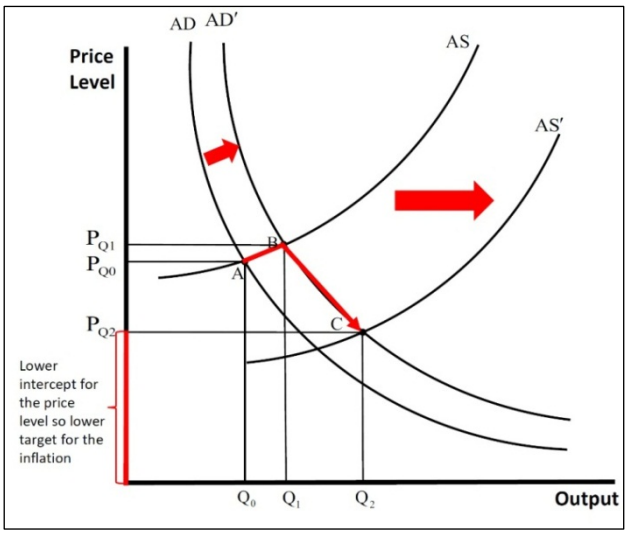
If private and public sector funds are combined as described above, there may be a leveraging effect because investors can be told that the project has official government support. They can also be told that, even if the rate of return is low, since interest and dividends need not be paid to the public investors, there will be an increased rate of return for private-sector investors. A further reason for combining private and public funds is that the introduction of private-sector funds will enhance project efficiency. Lengthy, low-quality construction work will be avoided as projects funded solely by the private sector would usually only concentrate on generating profits as quickly as possible (Yoshino 2010).

5.9 Review of Monetary Policy Goals

Monetary policy has to set goals for inflation and economic growth. A rigid exchange rate system will increase the central bank's foreign reserves and will therefore greatly increase the monetary base. Gradual adjustment of the exchange rate from a current basket to desired weights for the basket will be desirable. In between four and four-and-a-half years, optimal weights for the basket currency system will be better established.

In 2013 the Bank of Japan set a price stability target of 2% (year-on-year rate of change in the consumer price index). It is implementing aggressive monetary easing to achieve this target. We believe, however, that this target needs to be reviewed and reduced because of the recent drop in oil prices. After nearly 5 years of stability, oil prices began to drop rapidly in 2014 and more than halved in the 5 months following September 2014. In Europe, the price of a barrel of Brent crude oil fell from $117.15 on 6 September 2014, to $45.13 on 14 January 2015.

Figure 19: The Effect of Lower Oil Prices on the Price Level Intercept



AD = aggregate demand; AS = aggregate supply; Q = quantity.

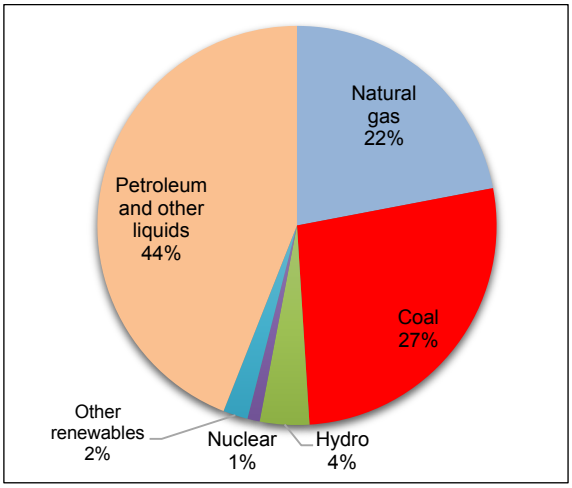
Source: Authors' calculations.

Oil is considered to be one of the most important production inputs. Figure 19 shows that in periods with cheaper oil, the aggregate demand (AD) curve shifts to the right because of higher consumption. In the supply side of the economy the aggregate supply (AS) curve also shifts to the right because of cheaper production costs, which raise the output (Q_2). So the intercept of the price level becomes lower (P_{Q2}), and the inflation target needs to be reviewed. Because oil price is exogenously given for Japanese monetary policy, the target rate of inflation should be lower than 2% during the current period of cheap oil prices.

5.10 Diversification of the Energy Basket

Japan is the world's largest liquefied natural gas importer, the second largest coal importer, and the third largest net oil importer after the US and the PRC. Japan has limited domestic energy resources, meeting less than 15% of its own total primary energy use from domestic sources (EIA 2015). Figure 20 shows the share of each energy carrier in Japan's total energy consumption.

Figure 20: Japan's Energy Consumption, 2013



Source: British Petroleum (2014).

Oil demand in Japan has declined by nearly 15% since 2000. This decline stems from structural factors, such as fuel substitution, a declining population, and government-mandated energy efficiency targets. In addition to the industrial sector's shift to natural gas, fuel substitution is occurring in the residential sector as high prices have led to decreased demand for kerosene for home heating. Japan consumes most of its oil in the transportation and industrial sectors, and it is also highly dependent on naphtha and low-sulfur fuel oil imports. Demand for naphtha has fallen as ethylene production is gradually being displaced by petrochemical production in other Asian countries (Yoshino and Taghizadeh-Hesary 2014b).

The 9.0 magnitude Great East Japan Earthquake and tsunami that hit Japan on 11 March 2011 resulted in an immediate shutdown of about 10 gigawatts of nuclear electric generating capacity. In the 14 months following the Fukushima disaster, Japan lost all of its nuclear capacity as a result of scheduled maintenance and lack of government approvals to return to operation. Japan replaced this significant loss of nuclear power with generation from imported natural gas, low-sulfur crude oil, fuel oil, and coal. This caused the price of electricity to rise and led to inflation. Increases in the cost of fuel imports in the 2 years since the disaster resulted in Japan's top 10 utilities losing over $30 billion. In 2012, Japan spent $250 billion on total fuel imports—a third of the country's total import value—and consumed over 4.7 million barrels of oil per day (Yoshino and Taghizadeh-Hesary [forthcoming b]). The increased cost of imported energy had a significant, negative impact on the Japanese economy.[6]

Because of increased imports of fossil fuels after the Fukushima disaster, the trade balance reversed from a 30-year trade surplus of $65 billion in 2010 to a deficit of $112 billion in 2013. The recent drop in oil prices in the latter part of 2014 is likely to ease the trade deficit and provide some relief to Japanese utilities.

Japan needs to diversify its energy basket away from fossil fuels to non-fossil fuels (renewable and nuclear) to reduce energy costs. This will reduce production costs for Japanese manufacturers, stimulate the economy, and raise the self-dependency of energy, in order to protect the economy from further shocks.

Like Japan's current government, we believe that Japan needs to use nuclear energy as a base load power source, with necessary safety measures. This will help ease current energy supply strains and reduce the high energy prices faced by Japan's industries and end users.

The government's 2014 energy policy emphasizes energy security, economic efficiency, and emissions reduction. Key goals and plans to balance the country's fuel portfolio include strengthening the share of renewable and alternative energy sources. These efforts occur in the context of the government's goals to reverse two decades of economic stagnation in Japan and to provide economic revitalization through public infrastructure spending, monetary easing, labor market reform, and business investment (Government of the United States, EIA 2015).

6. CONCLUDING REMARKS

The empirical analysis of this paper shows that stagnation of the Japanese economy comes from a vertical IS curve. The impact of fiscal policy drastically declined from the 1990s and the Japanese economy faced structural problems rather than a temporary downturn. Our empirical findings also reject the idea proposed by some western economists that the Japanese economy is in a liquidity trap.

Structural problems have arisen mainly from the aging population, ineffective fiscal policy, and the allocation of transfers from the central government to local governments that make up about 18% of

[6] For more information on the impact of higher energy prices on the economy see Taghizadeh-Hesary et al. (2013); Taghizadeh-Hesary and Yoshino (2014); and Yoshino and Taghizadeh-Hesary (2014b, 2014c).

total government spending. This high spending rate has kept some sectors, such as agriculture, weak. Further structural problems have arisen from the Basel capital requirements that made Japanese banks reluctant to lend money to startup businesses and SMEs, thus discouraging Japanese innovation and technological progress. Economic growth was further slowed by the high appreciation of the yen in the mid-1990s, which caused Japanese manufacturing companies to move from Japan to other Asian countries. Finally, wage increases also pushed Japanese companies abroad, resulting in diminished domestic production.

The remedies for stimulating economic growth in Japan are:

(i) reform to combat the aging population;

(ii) reduction in the transfers from central to local governments;

(iii) diversification of households' asset allocation;

(iv) reform of the agriculture sector;

(v) switching the asset allocation pension funds and insurance companies from pay-as-you-go to 401(k)-style;

(vi) a review of asset management fees;

(vii) use of HIT funds to finance riskier businesses;

(viii) optimal mix of public and private funds;

(ix) a review of monetary policy goals; and

(x) diversification of Japan's energy basket.

The experience of Japan after the "Lost Decade" should be a lesson for other countries, including the PRC, the countries of the eurozone, and the US, to prevent them falling into long-term recession and to encourage their economic growth.

REFERENCES*

Alvstam, C. G., P. Ström, and N. Yoshino. 2009. On the Economic Interdependence Between China and Japan: Challenges and Possibilities. *Asia Pacific Viewpoint* 50 (2): 198–214.

Bank of Japan. Foreign Exchange Rates. Time series database.

Bank of Japan. 2014a. Basic Figures of the Flow of Funds—Third Quarter of 2014. 24 December. Research and Statistics Department: Tokyo.

Bank of Japan. 2014b. Flow of Funds—Overview of Japan, US, and the Euro area. 24 December 24. Research and Statistics Department: Tokyo.

British Petroleum. 2014. *BP Statistical Review of World Energy 2014*. London: BP.

Galí, J. 1992. How Well Does the IS-LM Model Fit Postwar U.S. Data? *The Quarterly Journal of Economics* 107 (2): 709–738.

Government of Japan, Ministry of Agriculture, Forestry and Fisheries (MAFF). 2010 Census of Agriculture and Forestry. Tokyo.

Government of Japan, Ministry of Agriculture, Forestry and Fisheries (MAFF). 2012. *FY2011 Annual Report on Food, Agriculture and Rural Areas in Japan*. Tokyo.Government of Japan, Ministry of Finance. 2015. *Highlights of the Draft Budget for FY2015*. Tokyo.

Government of the United States, Energy Information Administration (EIA). 2015. *Analysis: Japan.* 30 January. Washington, DC.

Hall, R. E. and J. B. Taylor. 1988. *Macroeconomics: Theory Performance and Policy*. 2nd edition. New York: Norton & Co.

Horioka, C. Y. 2006. The Causes of Japan's 'Lost Decade': The Role of Household Consumption. National Bureau of Economic Research Working Paper 12142. Cambridge, MA: NBER.

NEEDS. 2014. Nikkei Economic Electronic Database System.

Organisation for Economic Co-operation and Development (OECD). 2013. *Economic Survey of Japan*. April. Paris: OECD.

Revankar, N., and N. Yoshino. 2008. An Empirical Analysis of Japanese Banking Behavior in a Period of Financial Instability. *Keio Economic Studies* 45: 1–15.

Taghizadeh-Hesary, F., and N. Yoshino. 2014. Monetary Policies and Oil Price Determination: An Empirical Analysis. *Organization of the Petroleum Exporting Countries Energy Review* 38(1): 1–20.

Taghizadeh-Hesary, F., N. Yoshino, G. Abdoli, and A. Farzinvash. 2013. An Estimation of the Impact of Oil Shocks on Crude Oil Exporting Economies and Their Trade Partners. *Frontiers of Economics in China* 8 (4): 571–591.

Yoshino, N. 2010. Financing Transport Infrastructure Development. In *Southeast Asian Economic Outlook 2010.* Paris: OECD.

Yoshino, N. 2012. Global Imbalance and the Development of Capital Flows among Asian Countries. *OECD Journal: Financial Market Trends* 1: 81–112.

Yoshino, N. 2013. The Background of Hometown Investment Trust Funds. In *Hometown Investment Trust Funds: A Stable Way to Supply Risk Capital*, edited by N. Yoshino and S. Kaji. Tokyo: Springer.

* ADB recognizes China as the People's Republic of China.

Yoshino, N., and T. Hirano. 2011. Pro-cyclicality of the Basel Capital Requirement Ratio and its Impact on Banks. *Asian Economic Papers* 10 (2): 22–36.

Yoshino, N., and T. Mizoguchi. 2013. Change in the Flow of Funds and the Fiscal Rules Needed for Fiscal Stabilization. *Public Policy Review* 9(1).

Yoshino, N., and M. Nakahigashi. 1999. Economic Effect of Public Investment (in Japanese). In *Nihon Hyo-ron Sha*, edited by N. Yoshino and T. Nakajima.

Yoshino, N., and M. Nakahigashi. 2000. Economic Effects of Infrastructure–Japan's Experience after World War II. *Japan Bank for International Cooperation Review* 3: 3–19.

Yoshino, N., and E. Sakakibara. 2002. The Current State of the Japanese Economy and Remedies. *Asian Economic Papers* 1: 110–126.

Yoshino, N., and F. Taghizadeh-Hesary. 2014a. Three Arrows of "Abenomics" and the Structural Reform of Japan: Inflation Targeting Policy of the Central Bank, Fiscal Consolidation, and Growth Strategy. ADBI Working Paper 492. Tokyo: Asian Development Bank Institute.

Yoshino, N., and F. Taghizadeh-Hesary. 2014b. Economic Impacts of Oil Price Fluctuations in Developed and Emerging Economies. *Institute of Energy Economics of Japan* 9: 58–75.

Yoshino, N., and F. Taghizadeh-Hesary. 2014c. Monetary Policy and Oil Price Fluctuations Following the Subprime Mortgage Crisis. *International Journal of Monetary Economics and Finance* 7(3): 157–174.

Yoshino, N., and F. Taghizadeh-Hesary. 2015. An Analysis of Challenges Faced by Japan's Economy and Abenomics. *The Japanese Political Economy* 40(3): 1–26.

Yoshino, N., and F. Taghizadeh-Hesary. Forthcoming a. Analytical Framework on Credit Risks for Financing SMEs in Asia. *Asia-Pacific Development Journal.* United Nations Economic and Social Commission for Asia and the Pacific.

Yoshino, N., and F. Taghizadeh-Hesary. Forthcoming b. Effectiveness of the Easing of Monetary Policy in the Japanese Economy, Incorporating Energy Prices. *Journal of Comparative Asian Development* 14(2).

Yoshino, N., F. Taghizadeh-Hesary, and F. Nili. 2013. Optimal Premiums for the Deposit Insurance System: An Empirical Work on the Deposit Insurance System of Japan. *Keio Economic Society Discussion Paper* 13–1. Tokyo: Keio University.