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TOO MUCH OR LESS? MONEY SUPPLY IN JAPAN

Abstract. *The present study explores weather the effect of Japanese monetary policy is enough by quantitative easing. Thus, we have used the Generalized Supremum ADF test to detect the start and the close of potential excess liquidity in the Japanese financial for the time period of 1997 - 1999 and 2008 - 2009. It shows the effect of Asian financial crisis and Global financial crisis excess liquidity were high. From 2012, excessive monetary easing and increasing the money supply do not create the risk of the financial bubble by Abenomics. We provide evidence not supporting the money illusion hypothesis in Japan after 2009. This method is suited to practical implementation with time series and delivers a consistent date-stamping strategy for determining the origination and termination of multiple bubbles. Simulations show that the test significantly improves discriminatory power and leads to sharp power gains.*

Keywords: *The Quantity Theory of Money, Monetary Policy, Liquidity Bubble, Money Illusion, Generalized Supremum ADF.*

JEL Classification: C22, E44, E51, E52

1. Introduction

After Japan's bubble economy had burst at the start of the 1990s, the economic slump continued for more than two decades. The collapse of the real

DOI: 10.24818/18423264/52.3.18.02

estate bubble has shown a tendency contract with businesses, and also households could not increase their consumption. Especially after the global financial crisis in 2008, the United States and Europe started quantitative easing (QE) while Japan did not the growth of the monetary base in Japan became much smaller than those in the United States and Europe; as a simple monetary approach would suggest, this led to a rise in the yen. “Abenomics”, a term promoted by Shinzo Abe, Prime Minister of Japan for a second term that can be applied to fiscal motivation, and economic reforms in general, intended to resuscitate the Japanese economy including fiscal consolidation, more aggressive monetary easing by the national Bank of Japan (BOJ), and other basic reforms to help enhancing Japan’s economic growth and effectiveness. QE is the BOJ’s unprecedented asset purchase program and at the heart of Abenomics. The government and BOJ delivered a joint statement on overcoming deflation and achieving sustainable economic growth on 22 January 2013. The BOJ set the price stability target and the government expects the BOJ to implement aggressive monetary easing to achieve this goal. The BOJ main intention is to purchase long-term government bonds in order to help growing the monetary base, compared to the previous attempts focused on buying short-term government bonds. However, more than that, the results of Abenomics will determine what kind of country Japan is to be. Otherwise, critics argue that Abenomics bring significant risks. Some think monetary easing could spur hyperinflation while the opposite view holds that Abe's plan may be not reverse deflation. There is a high risk of a financial bubble due to a disproportionate assisted monetary policy and increase in the money supply, which cannot be seen by specialists neither as a good thing, nor as a bad one, taking into consideration all previsions. To sum up, it is important to achieve some balance wherein the economy and money supply have an absolute correlation. In the paper we will explore the effect from the bursting of the bubble could be moderated by QE of money supply in Japan.

Excess liquidity is an economic hazard that may lead to inflation pressure and asset price bubbles, and potentially bring huge financial risk. The reasonable judgment on the existence of excess liquidity has important significance for macroeconomic regulation in the long run and also for the corporate performance, considering those companies that had to change their financing activity in order to minimize financial risks (Moldovan et al, 2016).

Money is in a bubble when it trades well above its fundamental value. However, stocks and bonds maybe not in a bubble because they trade against money. In other words, a bubble on money can exist, given that a bubble is defined as the difference between the market price and the market fundamental. Wallace (1980) finds that monetary equilibriums (in which money is a pure bubble) exist if and only if the rate of population growth exceeds the coefficient of proportionality in the storage technology. At this point, just like those bubbles from centuries ago, when the current asset boom goes bust, the value of paper wealth will vaporize. It is because of this money bubble that people must come back to reality regarding what money is. Money is liquid, tangible assets being used in the economy in exchange for real goods and services. The money bubble also including the sovereign debt bubble or another currency bubble (all of these terms fit) has finally reached the point where no one operating within a historical or commonsensical framework can accept its validity, and to continue, a new lens is needed. Governments with printing presses can create as much currency as they want. The excess liquidity measures consider inflation to be a purely monetary phenomenon that can be held responsible for inducing a persistent rise in price levels. In this case, excess liquidity would have a direct inflationary effect on the spending habits of both households and business firms (Turk and Rubino, 2014).

When excess cash becomes a continuous phenomenon, the money market provides a continued excess currency supply compared to the total provision of the real economy: part of the money does not enter the real economy. Since the 1990s, Japan's real estate and stock market bubble burst and the economy went into a tailspin; it has suffered from sluggish economic growth. In February 1999, Japanese government implemented the zero interest rate policy (ZIRP) to eliminate deflationary and promote economic recovery. In the fall of 2000, the IT bubble burst in the United States; the economy suffered another negative shock; the BOJ adopted the quantitative easing policy (QEP) by creating excess reserves with

DOI: 10.24818/18423264/52.3.18.02

ample liquidity to maintain financial system stability. In the spring of 2006, the BOJ decided to terminate the QEP and keep interest rates at zero for the time being. After the global financial crisis, United States and Europe started QE and the growth of the monetary base in Japan became much smaller than those in the United States and Europe. The result was that yen was bought as a safe currency and led to appreciate. Given the deterioration in the economy, the BOJ adopted comprehensive monetary easing (CME) which it continued to April 2013. CME was similar to the ZIRP and QEP. Excess reserves were created, and commitment of policy duration was made. To solve deflation and obtain sustainable economic growth, the government and the BOJ implement an aggressive monetary policy to achieve the target.

The most commonly used detection methods have been developed using the present value model of the rational bubble assumption. In the case in which great investors are willing to offer more money than the normal standards impose, rational bubbles may arise, thus anticipating that the asset price will significantly exceed its core value in the future. Another method for detecting rational bubbles is the variance bounds test by Shiller (1981). The premise is that if a sound bubble exists, the variation of the asset price will surpass the margin required by the change of the fundamental value. However, it has been heavily criticized for not defining the bubble characteristics, and bubbles identified by the test can be ruled out by other reasonable factors. Extensive simulations conducted by Homm and Breitung (2012) indicate that the procedure of Phillips *et al.* (2011b) performs satisfactorily compared with other recursive methods for identifying structural breaks, and it is particularly useful as a real-time bubble detection algorithm. However, the method of Phillips *et al*. (2011a) can be applied to data at any frequency. Furthermore, the Phillips *et al*. (2011a) method is a formal statistical test of bubble existence, whereas other approaches rely on a subjective judgment of the deviations from the fundamentals or moderate states. Consequently, the Phillips *et al.* (2011a) method is a more objective tool for policy-makers to use for real-time bubble detection.

The previous studies on excess liquidity focus on the money supply and do not test for money bubbles using the recursive unit root tests approach (Lily *et al.*, 2012). Karras (1996) lends support to the idea of international asymmetry: negative money supply shocks have higher influence on the productivity than positive shocks (whose effect is often statistically insignificant). Okina *et al.* (2001) focus on the intensified bullish expectations that played a significant role in the large fluctuations in asset prices; the process of the emergence, expansion, and bursting of the bubble is examined about monetary policy in Japan since the latter half of the 1980s. Hunter *et al.* (2003) emphasizes the role of bank supervision policy rather than monetary policy to maintain financial stability. Schabert (2009) examines the implementation of money supplies as equilibrium sequences to satisfy forward-looking interest rate targets and further demonstrates that an interest rate target with positive inflation feedback corresponds to an accommodating money supply.

The previous methods of measuring excess liquidity either do not consider the equilibrium level itself or neglect the reasonable range of fluctuation about economic growth (Djigbenou-Kre and Park, 2016). In the present paper, we measure excess liquidity using the bubble approach. The findings of our study differ from previous results on testing Japan's monetary bubble. We use the ratio of the amount of money to the nominal GDP as a measure of the scale of liquidity; this ratio reflects the relationship between the supply and demand for currency and real economic activities. Our study's impact is as follows. First, we use the most recently developed bubble detection method (Phillips *et al.*, 2013), which can be applied to data of any frequency. It allows one to account for a nonlinear structure and break mechanisms while investigating the existence of multiple bubbles. Furthermore, the method of Phillips *et al.* (2013) is a formal statistical test of bubble life, whereas the other two approaches (the fundamental model approach and the cluster analysis approach) rely on the subjective judgment of deviations from the fundamentals or moderate states. To the best of our knowledge, the present study is the first to employ a right-tail unit root test to analyze the Japan monetary bubble. Second, unlike previous studies, we provide the starting and ending period for the bubbles using the M2/GDP index in Japan. The results can be

DOI: 10.24818/18423264/52.3.18.02

used to test the theory of money quantity and the money illusion hypothesis. We used the recursive unit root tests proposed by Phillips *et al.* (2013) to analyze excess liquidity through the lens of the money bubble. This method is better suited for showing the beginning and the end of multiple bubbles. Models indicate that the test considerably increases biased authority and initiates sharp power gains. Starting with the financial world crisis of 2008, and continuing with a catastrophic earthquake and tsunami that struck northeastern Japan, the Japanese government has implemented aggressive monetary and fiscal policy to escape from long-term sluggish economic growth. Moldovan et al (2014) highlights the importance of the quality of public decision-making processes in the political context. Our analysis will provide a reference and related financial decision-making for the Japanese government, to assist in judging the length of the bubble and analyzing its possible causes.

The remainder of this empirical study is organized as follows. Section 2 describes the theory of excess liquidity and the methodology for the recursive unit root tests. Section 3 presents the data used and discusses the empirical findings. Section 4 concludes.

2. The Quantity Theory of Money and Methodology

The quantity theory of money states that the rate of inflation is approximately equal to the growth rate of money more than the growth rate of real output. The most famous version of the quantity equation is doubtless the transactions version provided by Fisher (1911):

$$MV = PQ \tag{1}$$

If M represents the nominal money supply, and V stands for the velocity of the circulation of money; P is the price level, and Q is real output. In Equation (1), the primary event is a transaction: an exchange in which one economic player transfers goods, facilities or securities to another player and gets an allocation of money in ezchange. The equations'right side is the transfer of goods, services or securities; while the left side represents the matching transfers of money. Each transfer of goods, services or securities is regarded as the product of a price and quantity and includes the wage per week times the number of weeks, the price of a good times the number of units of the good, the dividend per share times the number of shares, the price per share times the number of shares, and so on. We transfer Equation (1) into the following form:

$$\frac{1}{V} = \frac{M}{PQ} = \lambda_t \tag{2}$$

In this paper, $\frac{M}{PQ}$ replaces $\frac{M2}{GDP}$, which is the key index when analyzing the relationship between money supply and output. This equation indicates that the relationship between currency stability and the economic development level is stationary and that there are no significant fluctuations under normal circumstances. Fisher (1928) also proposed the "money illusion" hypothesis, which refers to a tendency regarding nominal rather than real monetary values. The money illusion is observed in the presence of inflation when nominal accounting methods affect decisions. The illusion means that the cost of the money illusion is insignificant; however its effect on longer term development is evident albeit the amount of the money illusion is slight (Miao and Xie, 2013).

The first of these right-tailed unit root tests, the SADF test, was originally proposed by Phillips *et al.* (2011) and extended by Phillips *et al.* (2012, 2013) to account for the case of multiple collapsing bubble episodes. Homm and Breitung (2012) find that the tests is more appropriated in revealing multiple bubble episodes than any other tests. Phillips *et al.* (2013) worked on this issue by advancing a forward recursive test procedure.

For each time series λ_t, we apply the ADF test for a unit root against the alternative of an explosive root (the right-tailed). That is, we estimate the following autoregressive specification by least squares:

$$\lambda_t = \delta_t + \gamma\lambda_t + \sum_{i=1}^{N} \beta_N \Delta\lambda_{t-i} + e_{\lambda,t} \ , e_{\lambda,t} \sim NID(0, \sigma_\lambda^2) \tag{3}$$

Where λ_t represents the M2/GDP index, δ_λ is a constant and $e_{\lambda,t}$ is the error term. For some given value of the lag parameter *N*, *NID* denotes independent and normal distribution. In our empirical application, we use significance tests to

DOI: 10.24818/18423264/52.3.18.02

determine the lag order N. The unit root null hypothesis is H_0: $\delta = 1$ and the right-tailed alternative hypothesis is H_1: $\delta > 1$.

In forwarding recursive regressions, Equation (3) is repeatedly estimated, using subsets of the sample data incremented by one observation at each pass. If the first regression involves $\omega_0 = [ns_0]$ observations, for some fraction ω_0 of the total sample, [·] signifies the integer part of its argument; subsequent regressions employ this originating dataset supplemented by successive observations, giving a sample of size $\omega = [ns]$ for $s_0 \leq s \leq 1$. Denote the corresponding t-statistic by ADF_s and, hence, ADF_1 corresponds to the full sample. Under the null we have

$$ADF_s \Rightarrow \frac{\int_0^s PdP}{(\int_0^s P^2)^{1/2}} \tag{4}$$

$$\text{and} \quad \sup_{s\in[s_0,1]} ADF_s \Rightarrow \sup_{s\in[s_0,1]} \frac{\int_0^s PdP}{(\int_0^s P^2)^{1/2}}, \tag{5}$$

where P is the standard Brownian motion.

A comparison of $\sup_r ADF_r$ with the right-tailed critical values from $\sup_{s\in[s_0,1]} \frac{\int_0^s PdP}{(\int_0^s P^2)^{1/2}}$ makes it possible to test for a unit root against explosiveness. However, this testing procedure cannot date stamp the emergency or collapse of exuberance. To locate the origin and the conclusion of exuberance, one can match the time series of the recursive test statistic ADF_r with $s \in [s_0, 1]$ against the right-tailed critical values of the asymptotic distribution of the standard Dickey–Fuller t-statistic. This date-stamping procedure has some excellent properties and, in particular, enables the consistent estimation of the origination and collapse dates. In general, it indicates that the lower the actual p-value of the observed ADF_r, the stronger the empirical evidence for explosive behavior.

Phillips *et al.* (2013) propose an alternative approach named the generalized sup ADF (GSADF) test and extends the sample sequence by changing the sample over an available range of flexible windows (Phillips *et al.*, 2011b). Compared with the SADF test, the GSADF test extends the sample sequence to include more samples. Suppose the regression sample starts from the s_1 fraction of the total sample and ends at fraction s_2, where $s_2 = s_1 + s_w$ and s_w is the fraction of the sample size in the regression. In addition to expanding the sample window s_w, the GSADF test allows the sample be starting point s_1 to vary within its possible range, which is from 0 to $1-s_w$. The regression starts from the first observation when $s_1 = 0$, and $s_1 = 1 - s_w$; the regression sample covers observation. Particular ADF statistic is denoted by $ADF_{s_1}^{s_w}$. We defined the GSADF statistic to be the largest ADF statistic over the feasible ranges of s_w and s_1, and we denote this statistic by GSADF. That is,

$$GSADF = \sup_{s_w \in [s_0, s_1]} \left\{ \sup_{s_1 \in [0, 1-s_w]} ADF_{s_1}^{s_w} \right\} \tag{6}$$

Under the null hypothesis that the true process is a random walk without drift, the asymptotic distribution of the GSADF statistic is

$$\sup_{s_w \in [s_0, 1]} \sup_{\substack{s_1 \in [0, 1-s_w] \\ s_2 = s_1 + s_w}} \left\{ \frac{s_w [\int_{s_1}^{s_2} PdP - \frac{1}{2} s_w] - \int_{s_1}^{s_2} P(r)dr [P(s_2) - P(s_1)]}{s_w^{1/2} \left\{ s_w \int_{s_1}^{s_2} P^2 dr - [\int_{s_1}^{s_2} Pdr]^2 \right\}^{1/2}} \right\} \tag{7}$$

It is well known that the Wiener process has independent increments with distribution $P(s_2)\text{-}P(s_1) \sim N(0, s_w)$. Suppose the actual process is a random walk with drift, then both the SADF statistic and the GSADF converge to the standard normal distribution. Thus, the SADF and GSADF test statistics can be compared to the usual *t*-tables to perform an asymptotically valid test. To obtain the asymptotic critical values of the ADF statistic distributions under the null hypothesis that the actual process is a random walk, we resort to simulation. Suppose that $n_1, n_2, \ldots, n_N$ are equally spaced within a finite interval. At each point, we generate a Gaussian random variable with mean 0 and variance $1/N$. The value of $P(r)$ is the sum of first \`*s*\` increments. The right-tail critical values of the GSADF test are larger than those of the SADF test. Numerical simulations offer the asymptotic critical values

DOI: 10.24818/18423264/52.3.18.02

and the number of replications is 2000 (Phillips *et al.*, 2011b). To accomplish this, we use a bootstrap methodology to compute the finite sample distributions of the recently proposed tests. Monte-Carlo simulations indicate that the bootstrap method works well and allows us to identify explosive processes and collapsing bubbles. The method does not require the specification of the process followed by the fundamentals; it is not affected by a possible explosive root of the determinants of the asset price and provides a date-stamping strategy.

The primary connections between the theory and the methodologies are as follows. First, the methods test whether the money supply has exceeded the equilibrium level. The bubble detection method can determine the timing of bubbles, which helps policy-makers to deepen their understanding of how to combat speculative bubbles and how to reduce the chances of another excess liquidity crisis. Second, the quantity theory of money emphasizes the important role of the money supply, but to determine whether the money supply is greater than the equilibrium level and whether it remains stable for a long time, we need to use the bubble test to compare the existing money supply with the equilibrium level. Third, the test of the quantity theory of money and money illusion hypothesis by Phillips *et al.* (2013) is suited to practical implementation with time series and delivers. Hence, the empirical model for the quantity theory of money employs a bubble detection method that is simple but can identify the beginning and the end of potential excess liquidity in the Japanese financial market.

3. Data and Empirical Results

In this study, we use the ratio of broad money to GDP (M2/GDP) to analyze the monetary bubble in Japan. We use the quarterly M2/GDP ratio from 1994 to 2015 for our research. McKinnon (1973) proposes that the M2/GDP ratio is an important index for measuring the level of financial deepening and then analyzes the relationship between financial deepening and economic growth. The index represents a ratio expressing how much of the total national income is accounted for by a country’s use of currency trading accounts. In the early stages of modern financial development theory (1973–1990), the index was used by McKinnon and his followers as an index for the level of economic development. When using this index, the higher the value of the M2/GDP ratio, the higher the degree of financial deepening. The GDP data and broad money (M2) data are from the Bank of Japan, Economic and Financial Statistics and GDP has been seasonally adjusted.

We apply the SADF test and then implement the GSADF test developed by Phillips *et al.* (2013) to the M2/GDP to investigate whether the ratio display episodes of explosive behavior. Table 1 presents critical values for these two tests, which were obtained from Monte Carlo simulations with 2000 replications (sample size 85). In the ADF regressions and the calculation of the critical values, the smallest window was eight observations (i.e., the period when we switch from the front contract series to the next one)[1]. Several conclusions can be presented in Table 1. The SADF and GSADF statistics for the full data set are 1.836 and 5.697. Both of these statistics exceed their respective 1% right-tail critical values (i.e., 1.836 > 1.540 and 5.697 > 3.725), providing evidence that the M2/GDP has had explosive sub-periods. Based on both tests, we conclude that there is evidence of bubbles in the M2/GDP. Phillips *et al.* (2013) demonstrate that the moving sample GSADF (based on relatively modest sample sizes) outperforms the SADF test (based on an expanded sample size) in detecting explosive behavior in multiple bubble episodes. The GSADF tests allow us to highlight the possible presence of bubbles. The superior performance of the GSADF test is based on its ability to cover more subsamples of the data. All in all, we can thus settle that there is evidence of multiple bubbles in Japan’s monetary market.

Table 1. The SADF test and the GSADF test- M2/GDP

	SADF	**GSADF**
	1.836 ***	5.697***
	Finite sample critical values	
90%	1.034	2.315
95%	1.352	2.876
99%	1.540	3.725

[1] As a sensitivity analysis, we have applied several alternative windows include 10, 15, 25, 30. Detailed results are available on request. Our main qualitative findings hold under these alternative windows.

DOI: 10.24818/18423264/52.3.18.02

Notes: Critical values for both tests are obtained from a Monte Carlo simulation with 2000 replications (sample size 85: [1994.Q1–2015.Q1]). The smallest window has eight observations. *** denotes significance at the 1 percent level. GSADF, generalized sup augmented Dickey-Fuller; SADF, sup augmented Dickey-Fuller.

To locate specific bubble periods, we use the GSADF test to graph our estimate of the M2/GDP, with 95% confidence intervals, in Figure 1. The upper curve represents the ratio of M2/GDP. The bottom curve represents the GSADF statistic. The middle curve is 95% threshold of the GSADF statistic. Figure 1 displays the results for the date-stamping strategy over the period for each index in Japan. Focusing on the origin and collapse of bubbles, we find that there are two excess liquidity bubbles during the analyzed period.

The first bubble was during the period from the fourth quarter in 1997 to the last quarter in 1999, which lasts two years. This bubble is followed by the 1997 Asian financial crisis. The Asian financial crisis was a period of financial crisis that affected much of East Asia beginning in July 1997 and that raised fears of a worldwide economic meltdown because of financial contagion. Also, the BOJ simultaneously faced recession and banking crisis. Due to fragile financial conditions, the BOJ adopted the ZIRP in promoting economic recovery, and zero interest rate was achieved by creating reserves. In October 1998, half of bill’s $500 billion appropriations provided funds for recapitalizing distressed banks. The remaining $250 billion financed a blanket guarantee of bank deposits, and provided for the possible nationalization of failing institutions. The BOJ took some incremental steps to provide liquidity and implement more aggressive quantitative easing; the monetary base was expected to expand dramatically. In the other side, the government resorted to extremely expansionary fiscal policy and fundamental improvement in the financial segment. Originally, the government has constantly allotted economic sets for public areas (deficit spending from supplemental budgets) in order to stimulate the aggregated demand. Second, the government injected capital into the banks that accumulated bad debt. Because of continuous increase of the government spending, the government debt rose to 120% of the real GDP. The sudden interest of Japan in exercising the role of leadership on the Asian market as the one that establishes and empowers regional monetary cooperation, is due to the Asian financial crisis that took place between the years 1997-98 and has left many evidences in the political economy of Asia. Much of the fate of Japan's local financial leadership hinges on whether or not Japan succeeds in cultivating a constituency among Asian members.

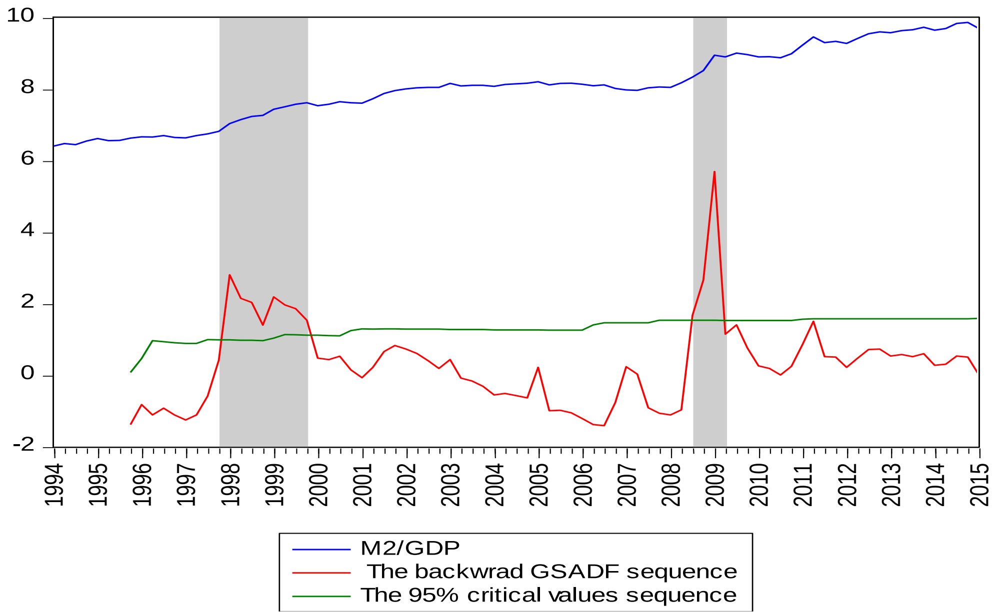
The 1997-1998 recession was severe, and the subsequent recovery was weak. The labor market has remained very depressed, and the ratio of job offers to applications sank below the 0.5 level from August 1998 to November 1999, the lowest ever recorded from 1959 onwards. One reason is that when the economy goes into recession, imports fall more than exports, and the yen-dollar exchange rate depends on whether net foreign investment expands more or less than net exports extends while NFI increased more than NX during this period.

The second bubble started in the third quarter in 2008 and collapsed in the second quarter in During this time, the subprime crisis erupted, and funds selectively flowed to assets in markets with lower perceived risk. The Bank of Japan (BOJ) had exited from QEJ in 2006 but has had to resort again to non-conventional measures in response to spillovers to Japan’s financial system and the economy of the world financial and economic crisis during 2007-09. Measures employed since 2008 have not involved QE. Most of them have been either QE1 or QE2. One of the first was the establishment of the yen/dollar swap scheme between the BOJ and the Fed and accompanying dollar supplying operations by the BOJ. This move was designed to ease the dollar shortage problem among non-U.S. financial institutions during the height of the international financial crisis of 2007-09 and its spillover to the domestic money market (Ueda, 2012). The result of the global financial crisis provides a case in point. The BOJ lowered its policy rate to zero and expanded the size of its balance sheet. However, as deflation intensified, the BOJ came under criticism for the limited scope of its asset purchase program and for lacking conviction that easing would yield tangible benefits (De Michelis and Iacoviello, 2016).

Due to the global economic slowdown, the yen rise and other negative factors on Japan's economy, the BOJ then launched quantitative easing monetary policy in

DOI: 10.24818/18423264/52.3.18.02

2010. Under the condition of zero interest rates, Japan's economy is in a liquidity trap, and market main body to monetary demand presents the tendency of infinity, which makes the incremental monetary precipitation in trap and free from the market operation. Even if issuing more currency, its effect is limited. On the other hand, from the monetary velocity, since the collapse of the bubble economy, Japan's monetary velocity has been in decline and the increment of the flow of money currency will form the foundation of liquidity at a lower speed which can't enter the efficient market operation. It suggests that the Bank of Japan should decide how much money issue, but can't decide how much money in the financial market circulation, therefore, also cannot necessarily ensure prices rise (Pang and Zhang, 2007).



Note: GSADF, generalized sup augmented Dickey-Fuller; SADF, sup augmented Dickey-Fuller. The periods of the first and second bubble are 1997Q4-1999Q4 and 2008Q3-2009Q2.

Figure 1: Date-stamping Bubble Periods in M2/GDP: The GSADF Test

QE policy, in essence, is actually under the zero rates, the central bank purchases asset and directly injects of money in the economy at the same time, improving credit market conditions, which expands spending and income level and ultimately drives the economy out of trouble to achieve policy objectives. The QE in Japan now effectively increases the amount and liquidity of the market, and it also reduces the high-risk premiums and liquidity premium brought by the crisis to the market, which is advantageous to the market recovery and real economy balances.

It shows that the potential excess liquidity in the Japanese commercial market during the periods from 1997 to 1999 and 2008 to 2009. From 2012, excessive monetary easing and increasing the money supply do not create the risk of the financial bubble by Abenomics. The Japanese economy had experienced prolonged deflation since the late 1990s. To reflate its economy, Abenomics implemented quantitative easing, fiscal policy through expanding government spending and provide economic growth strategies since the end of 2012. It is a set of policy measures meant to resolve Japan's macroeconomic problems, which is essentially by making inflation expectations, and stimulating consumption-investment in Japan's economy to pull the weak market. The BOJ is expected to apply a well determined monetary enabling so that it reaches its objective more rapidly. Long-term government bonds are being bought by the BOJ at the same time with a policy of growing its monetary base, however it does not attempt at an expansionary monetary policy focused on buying short-term government bonds (Yoshino and Taghizadeh-Hesary, 2014). Our results mean the Abenomics policies can be common issues in Japan, and there is no economic crisis possibility currently. Hausman and Wieland (2014) suggest that Abenomics also raised output growth by 0.9 to 1.8 percentage points in 2013. Abenomics continues to be stimulative for the medium and long term. Although we cannot be arbitrary say Abenomics has been a success, regarding the present stage, Abenomics did not spark inflation crisis and the inference on much currency issue is not revealed. Our results are not consistent with some researchers that are believing that Abe may lead to serious inflation risk (Xu, 2014; Yoshino and Taghizadeh-Hesary, 2014). We believe that the government will be able to continue to implement QE. Our research proves that there are too fewer money issues in Japan and still can continue to implement QE. It is found in the research that Japan's new round of

DOI: 10.24818/18423264/52.3.18.02

quantitative easing monetary policy is effective in overcoming deflation and stabilizing the price level. The results prove Japan is according to with the quantity theory of money except the periods between 1997 - 1999 and 2008 - 2009.

4. Conclusions

In this study, we use the recursive unit root tests proposed by Phillips *et al.* (2013) to identify the potential excess liquidity in financial market during the periods from 1997 to 1999 and 2008 to 2009. It shows that in 1997 and 2008, the effect of Asian financial crisis and Global financial crisis excess liquidity were high. From 2012, excessive monetary easing and increasing the money supply do not create the risk of the financial bubble by Abenomics. We provide evidence not supporting the money illusion hypothesis in Japan. This method by Phillips *et al.* (2013) is more appropriate to be implemented with time series and to provide a steady date-stamping strategy in order to establish the multiple bubbles. It means that in the long run, Japan can still increase economic stimulus plan and at present the issue of currency will not produce the risk of severe inflation. It means that there is no monetary bubble in Japan and still can increase the money supply to stimulate the economy.

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