

THE STUDY ON THE LIQUIDITY TRAP IN CHINA'S MONEY MARKET

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ABSTRACT

This study aims to identify the liquidity trap and indicate the factors that affect money liquidity in China. A liquidity trap is an economical issue which is faced by lots of developed countries when their economy has achieved a certain stage of development, such as Japan, America and Europe. However, China as the fastest-growing developing country, some scholars suggested that its economy has also being trapped in a liquidity trap. Thus, to verify this opinion, monthly data of several important economic indexes were selected through a series of econometric process to indicate two major findings. First, the economy of China has not fallen into a liquidity trap. Besides, the interest rate and real estate price had a negative impact on the liquidity of money in China while the development of the financial industry had a positive contribution.

INTRODUCTION

Liquidity refers to the term used to describe how easy to convert assets into liquid assets, which mostly refers to cash because it can always be used easily and immediately. There are many indicators for the level of liquidity in a country. Liquidity of money in China can be explained by the speed of cash circulating in the market. In this study, the M1 currency over M2 currency was used to represent the liquidity of money. Based on this concept, the liquidity trap was in an extreme situation

in which the current interest rates were low and savings rates were high. The interest rate cannot effectively adjust the money demand, rendering monetary policy ineffective which was the assumption that was first proposed by Keynes.

An economy which has fallen into a liquidity trap would have several characteristics;

1. The general economic condition fell into a recession, serious shortage in consumer demand, high unemployment rate, the market cannot effectively adjust itself.
2. The interest rate has reached the lowest level, and the nominal interest rate has dropped significantly, even to zero or negative interest rate. Under the extremely low-interest rate, investors have a poor expectation of economic prospects and consumers have a pessimistic attitude towards the future, which makes the leverage effect of interest rate to stimulate investment and consumption ineffective. The reduction of the nominal interest rate by the monetary policy cannot start the economic recovery, the economic development can only rely on the loose fiscal policy and cutting taxes.
3. The interest rate elasticity of money demand tends to be infinite.

In a liquidity trap, the liquid assets or cash does not circulate in the market, the demand for money does not increase. This is because the decline in interest rate makes consumers choose to avoid bonds or any risky asset and keep their funds in savings because of the prevailing belief that interest rates will soon rise. Because bonds have an inverse relationship to interest rates, many consumers do not want to hold an asset with

a price that is expected to decline. Thus, it would lead to a recession on the financial sectors as well as the consumption of the domestic market in China because not enough money is found circulating in the economy while the consumption behaviour would also become conservative. If the economy is stuck in a liquidity trap in a long-run, from a macro perspective it would narrow the potential of the economy and have a significant negative impact on the economic growth of the country. In a micro perspective, it would limit the business activities and create problems to the capital chain of the enterprises.

CURRENT ECONOMIC BACKGROUND IN CHINA

During the past decade, the rapid growth of China has shown the world the potential of the Chinese economy. The growth mainly performed an increase in GDP (Gross Domestic Product), at 2010 the GDP of China overtook Japan and became the second-largest economy and remained with an average growth rate of 6 per cent each year. However, some economists argue that the development of the Chinese economy is unhealthy. This is because the government increases expenditure by implementing deficit fiscal policies. Most of the provincial governments and state-owned companies are running on high debt. Table 1 shows the financial report of the Beijing government which is one of the biggest cities in China.

Table 1 shows the income and expenditure in RMB from 2012 to 2016

Year	Income (100 million RMB)	Expenditure (100 million RMB)
2012	3,314.93	3,685.31
2013	3,661.11	4,173.66
2014	4,027.16	4,524.67
2015	4,723.86	5,737.70
2016	5,081.26	6,406.77

Beijing government accumulated 401.9 billion RMB debt within these 5 years and the situation was mostly similar in other provinces. Even though with the scale of China's economy being large, the increasing fiscal deficit would put the economy on the risk of the debt crisis. Besides, the loose monetary policies could not emerge broad credit, even though the market liquidity was eased. But funds were still pooling between banks and savings, not flowing into the real economy. That was mainly reflected in the recent resumption of repurchase agreement by the central bank, policy rates and market rates that appeared upside down and the credit expansion couldn't hedge the contraction of social financing.

The diminishing effectiveness of monetary policies on money demand has led to a growing concern that China could end up in a "liquidity trap" as Japan did in the 1990s. In fact, there were many macro similarities between China and Japan before they fell into the liquidity trap, including the transformation from high growth rate to lower growth rate, abundant liquidity but sluggish stock market, a large number of zombie enterprises, increasing aged-population, rising bad debt rate of banks.

Moreover, the real estate market also played a unique role in effecting the liquidity of money in China.

Table 2 shows the prices in RMB for every metre square

Year	Prices (RMB/ Metre square)
2012	17,021.63
2013	18,553.00
2014	18,833.00
2015	22,633.00
2016	27,497.00

Table 2 shows the average real-estate price in Beijing from 2012 to 2016, the average housing price per metre square in Beijing raised more than RMB 10,000 which is almost

60 per cent. The people who purchased land or house, the reasons were generally to stay or invest. For buyers especially, young people who purposed in staying, the increasing housing price would cost most of their savings as well as bank credits because their income could hardly support such an expense. For investors, increasing real estate gave them high expectation for higher return, so they would allocate more funds in the real estate market. To conclude, the high real estate price, an increasing amount of money that circulates in the market are attracted into real estate assets which have low liquidity. If this situation cannot be controlled effectively, it would become the factor that drags China's economy into a liquidity trap. By relating the theory of liquidity trap with the current China economic background, has China's economy fallen into a liquidity trap? The research objective of this study is to justify if the economy of China has fallen into a liquidity trap.

LITERATURE REVIEW

Past studies and economic theories selected the independent and dependent variable to be used in this study. The ratio between hard currency and board currency supply was used as the dependent variable to represent the liquidity of money in China. Besides, past studies suggested that interest rate, real estate price and the stock index would affect the liquidity of money in other economies. In general, the empirical findings of those studies supported the rationality of applying the selected variables to achieve our objectives. The study generally meant to define which are the factors that would affect the liquidity of money in China and is China's economy facing the risk of the liquidity trap. M1 and M2 money supply in China were used to calculate the ratio of M1 over M2. We use the economy indicator M1 (hard currency) over M2 (board currency) to indicate the liquidity of money because by referring to the definition of M1 and M2, the most liquid portions of the money supply are

measured by M1 because it contains currency and assets that can be quickly converted to cash while M2 is M1 plus "near money". It also refers to savings deposits, money market securities, mutual funds, and other time deposits. These assets are less liquid than M1 and not as suitable as exchange mediums. Thus, the ratio of M1 over M2 is able to indicate the percentage of the liquid asset in the market and assigned as liquidity of money.

Interest rates would have an impact on the liquidity of money in the market. According to the liquidity preference theory from John Maynard Keynes (1936), in the market economy, investors demand a higher interest rate or premium on securities with long-term maturities that carry greater risk because when all other factors being equal, investors would prefer cash or other highly liquid holdings which are easier to convert and worth their full values. Thus, the liquidity performance theory suggests that the investors would expect a higher premium from the long-run securities as opposed to short-term securities. In other words, the investors are trading off between their asset liquidity and return of the investment, higher interest would give investor stronger motivations to invest in less liquid assets.

On the other hand, based on the Keynes' assumption of the liquidity trap, the elasticity of money demand on the interest rate would close to infinity. Thus, to identify the relationship between the interest rate and M1/M2 will help to determine if the economy of China has fallen into a liquidity trap. Hall, Hondroyannis, Swamy Tavlas and Ulan (2010) also used the same approach in their study identifying the liquidity trap in Japan. They applied RC (random coefficient) estimation and series of the econometric method to determine the linkage between the market interest rate and board money plus deposit (M2+ certificates of deposits). Both variables are converted into a log to show the elasticity of interest on money demand. Their result

suggested that during the estimation period, the interest rate elasticity of money demand has declined in absolute value in recent years, contrary to the liquidity trap hypothesis and that indicated that Japan hadn't fallen into a liquidity trap.

Real estate price played a unique role in effecting the liquidity of money in China. Real estate market attracted most of the investments and savings with its raising price. Liu Xing and Zhang Jing (2017) selected the monthly data of the real estate price of 11 major cities in China from January 2008 to December 2015 and indicated the relationship between them and their M2 demand within the same period. The result demonstrated only two cities-Hang Zhou and Shen Zhen respectively, the real estate prices were significantly affecting the M2 on 5 per cent of significant level with positive coefficients. That proved the real estate prices were positively correlated with the board money demand in those cities within the estimation period. However, Burdekin and Tao (2014) indicated that the increasing housing price in China is due to the expansion of liquidity in China. Their estimated VAR model showed a unidirectional causality from liquidity to real estate price in China.

Shanghai Stock Exchange index, as one of the major stock indicators, is able to perform the general condition of the stock market and economic development in China. Based on the result of the study from Grossman and Miller (1988) regarding the 1987 stock market crisis in America, they found the failure of the liquidity supply from New York stock exchange was one of the main factors that caused the drop of stock prices. Besides, Amihud and Mendelson (1991) also indicated that the stock crisis in 1987 severely affected the market liquidity of money in the United State market. Furthermore, by referring to Sun and Fan (2017), price change would also have "fly to liquidity effect", when the overall stock prices are having a negative growth,

investors would prefer to invest in the stock or financial product which carries a higher degree of liquidity instead of less liquid stock, it would also significantly crackdown the less liquid stock prices. Additionally, the liquidity trap could come from the loose of confidence or expectation from investors on the financial market, since stock index enables to reflect the general economic development as well as the financial market. Thus, the Shanghai stock exchange index is being selected as one of the essential cause that would affect the liquidity of money in China.

METHODOLOGY

Data

To analyze what factors are significantly affecting the liquidity of money in China's economy, by referring to the relative theory and past studies, three main economic indicators which are "M1/M2" the ratio of M1 currency in the total amount of M2 currency to measure the liquidity of money in China market; "Interest Rate", to identify the relationship between Interest Rate and liquidity is able to indicate if China's economy has fallen into a liquidity trap. "Real estate price", considering the special situation in China because the high real estate price, most of investment and savings flowed into real estate market, we want to define if there is any correlation between liquidity with the factor; "Shanghai Stock Exchange Index", as one of the main stock index in China is able to reflect the performance of the Chinese stock market as well as the overall of the economic performance.

Considering the accuracy and effectiveness of the study, we selected the data of the most recent years from 2016 to 2018. The frequency of the data is monthly the total population of the data is 36 for each variable. All the data are collected from the CEIC data website. For the variable "Real estate price" we choose percentage growth each month to directly search for the co-movement with the

liquidity of money in China.

Method of Analysis

Firstly, we applied a computer method to test the unit root of our data and define whether a time series variable is non-stationary and possesses a unit root. Furthermore, based on the result of our unit root test, we applied the Johansen cointegration test which is for testing cointegration of several time series. Just like a unit root test, there can be a constant term, a trend term, both, or neither in the model.

To find out if there are any long-term trends amount the data and time series. The p -value will show how many cointegrations are in the relationship between independent variables. Then, we proceeded to FMOLS model to found out the long-run coefficient between our dependent variable (M1/M2) and independent variables (Interest rate; Real estate price growth; SSE index). The coefficient and p -value demonstrate the long-run relationship between the dependent variable and each independent variable. Additionally, based on the result of unit root and Johansen cointegration test, we applied VAR-VECM model to indicate the short-run relationships between our dependent and independent variables. When all of the variables are cointegrated at the difference, the VAR-VECM model can be demonstrated.

ECM is a theoretically-driven approach useful for estimating both short-term and long-term effects of one-time series on another. The term error-correction relates to the fact that the last period's deviation from a long-run equilibrium, the error, influences its short-run dynamics. Thus, ECM directly estimates the speed at which a dependent variable returns to equilibrium after a change in other variables in other word is it can indicate the short-run coefficient between our dependent and independent variables. Last but not least, we applied the Granger Causality test to find out the directional effects between a dependent variable and independent variables.

RESULTS

Initially, the unit root of the variables is stationary at first difference. Based on the findings, we continue to test for the cointegration between our dependent and independent variables. The result shows one cointegration equation was found. Furthermore, we apply FMOLS method to find out the long-term coefficient between our dependent variable and each independent variable. The result demonstrates interest rate and real estate price have a negative relationship with the liquidity of money in China while the Shanghai Stock Exchange Index has a positive relationship with the liquidity of money in China. Also, we applied error correction model named as VAR-VECM model, the test shows a negative coefficient and significant relationship which indicate the excess of the short-run relationship as well as determines the short-run coefficient between our dependent and independent variables. Finally, we applied the Granger Causality test to justify the Granger causality between dependent and independent variables. The result shows LT (liquidity) granger cause IR (interest rate) and SSE (Shanghai stock exchange index) while REP (real estate price growth) granger cause LT and SSE. IR has a bidirectional impact on IR and no relationship with SSE.

Cointegration Test

Based on the result of our unit root test, because all of the variables are stationary at first difference. We continued to test the cointegration between our variables. The cointegration is able to indicate the long-run linkages between the liquidity of money in China and IR, REP, SSE. By referring to the p -value, in both trace test and max-eigenvalue test are significant on 5 per cent of significant level with p -values of 0.0142 and 0.0249 in a condition of no CE is hypothesized. The null hypothesis is "There is no cointegration

between the variables" and we rejected the null hypothesis and accept the alternative which is "There is a cointegration between variables". To summarize, only one cointegrating equation is found on the 5 per cent of significant level. To summarize, the result indicates that there is long-run cointegration between the liquidity of money China and selected economic or financial indicators. The result of the Johansen cointegration test indicates there is a long-run relationship between M1/M2 and IR, REP, SSE. In this section, we applied FMOLS method to define the long-term coefficient between the dependent variable and each independent variable. We can form our long-run coefficient equation as written:

$$LT = -0.013314IR - 0.00102REP + 3.82e-05SSE + 0.264629$$

Between LT and IR, test p -value shows it significant at 5 per cent of significant level. Thus, we can reject the null hypothesis which is: There is no long-run coefficient between the variables. The coefficient shows IR has a negative long-run impact on LT, each unit change in IR will result in -0.013314 units change in LT. For REP and SSE, they both significant at 1 per cent of significant level. For the coefficient, between REP and LT, each unit change in REP will cause negative 0.001020 unit change in LT while each unit change of SSE will contribute 3.82e-05 units growth in LT. The constant also significant on 1 per cent of significant level with a value of 0.264629 and that means if other variables are constant or equal to 0, the LT will have a value of 0.264629. In general, all of our independent variables have long-run coefficient with the liquidity of money in China and only SSE has a positive contribution to it. The R square demonstrates the percentage of variables which are in tone with our estimated linear regression model, the result shows more than 78 per cent of our variables are following the distribution of our estimated equation and that confirmed the reliability of our long-run coefficient result.

VAR-VECM (Error Correction Model)

After determined the long-run coefficient, since our variables are not cointegrated at a level and we found at least one cointegration, we continued to test for the short-run coefficient by applying an error correction model. According to the given equation of VAR-VECM and results, we can write our estimation equation as:

$$\Delta LT = 0.104511 * ECT_{t-1} - 0.159106 * \Delta LT_{t-1} - 0.003015 * \Delta IR_{t-1} - 0.000544 * \Delta REP_{t-1} + 0.039781 * \Delta SSE_{t-1} + 0.000147$$

By referring to the coefficient between LT and ECT_{t-1} , we are able to know that the previous year's deviation from long-run equilibrium is corrected at a speed of 10.4511 per cent. Besides, the short-run coefficient between IR and LT shows a percentage change in IR is associated with 0.3015 per cent decrease in LT while the short-run coefficient between REP and LT demonstrates a percentage change in REP associated with 0.0544 per cent decrease in LT within a short period. Furthermore, the coefficient between SSE and LT associates a percentage change in SSE would lead to 3.9781 per cent increase in LT in the short run. In general, only SSE has a positive contribution to the liquidity of money in China while IR and REP have a negative impact on it in the short run. The result confirmed the long-run co-movement from short-run relationship at the same time.

Granger Causality Test

Between IR and LT, the p -value for the null hypothesis "IR does not granger cause LT" is 0.7043 which is higher than the critical value, so we cannot reject the null hypothesis. While "LT does not granger cause IR" has a p -value of 0.066, that means it is significant on 10 per cent of significant level, so we reject the null hypothesis and accept the alternative "LT granger cause IR". To conclude, LT unidirectional granger cause IR. Under the same concept, between REP and LT, only the first null hypothesis is rejected on 1 per cent

of significant level, REP unidirectional granger causes LT. LT has a unidirectional granger cause on SSE since only the second null hypothesis is rejected on 5 per cent of significant level. Furthermore, REP and IR bidirectional Granger cause each other because both null hypotheses are rejected at 10 per cent of significant level. Additionally, no Granger causality is found between SSE and IR since both null hypotheses cannot be rejected. Last but not least, the result between SSE and REP indicates a unidirectional granger cause from REP to SSE and the null hypothesis is rejected on 10 per cent of significant level.

CONCLUSION AND POLICY RECOMMENDATION

Based on the results of our statistical tests, amount our selected independent variables, the interest rate and real estate price had a negative impact on money liquidity in China while Shanghai stock exchange index had a positive contribution on money liquidity in both long-run and short-run (during the period Jan 2016 – Dec 2018). Due to the interest rate still functioning in adjusting the liquidity of money, the economy of China did not fell into a liquidity trap. However, we cannot ignore that the high real estate price raised the liquidity trap risk. Besides, according to the results of Granger Causality test, we found the changes in liquidity of money granger caused the movement of interest rate as well as the Shanghai stock index while real estate price was the single factor that granger cause liquidity money in China. Additionally, real estate price, the interest rate had bidirectional Granger causality and real estate price change would affect Shanghai stock exchange index. Last but not least, no granger causality was indicated between the Shanghai stock exchange index and interest rate. Those factors indicated that the prosperous of the financial market would stimulate money circulation in China. On the other hand, better liquidity of money also contributed to the development

of the financial market as well as the affected interest rate. Furthermore, the rising real estate price affected the liquidity of money, interest rate and financial market in China while the adjustment of interest rate would contribute to controlling housing price at the same time.

According to these factors, we learned previously, we came out with several suggestions for the policymakers to stabilize the liquidity of money or preventing China's economy from liquidity issue. Initially, the government should strengthen the development of the financial market in China by enhancing the construction of financial infrastructure. It can be emphasized in several ways. First, improve the relative judicial system, establish a specialized organization (a group of experts in the finance sector or representatives from financial institutes) for researching legal blank in the financial system and develop countermeasures. Secondly, develop a reliable and universal standard social credit investigation system in China, to facilitate banks or financial institutes when they are loaning out the money. Finally, enlarge government expenditure and investment in the financial sector. Encouraging state governments consume financial services from private financial institutes and investment in financial markets can stimulate the vitality of financial sector especially during an economic recession period or when there is a shortage of liquidity in the market.

Moreover, the government regulation and control of interest rate is an effective method to explore the potential investment because when the interest rate is relatively low, savers would look for better growth opportunities for their financial assets even though they are with higher risks. Thus, it would contribute to a higher level of money circulation and active trading in the financial market. Last but not least, the government should control the real estate price growth by establishing a price ceiling in real estate

market, that can guide more funds flow to the other markets and relieve the stress on liquidity on money that caused by real estate price. Additionally, insist on the supply-side structural reform policies will fundamentally bring new growth opportunities to the economy of China. Previously, manufacturing products trading generated the major income of governments. However, the economic recession in the international market limited the benefit from goods trading and that led to some state governments have to trade land to plug their deficit. Thus, they desperately need new opportunities from new industries and innovations.

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