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FACTORS AFFECTING DEMAND FOR MONEY IN JAPAN

Norhidayu Rosli, Norsiah Kadir, Sabri Nayan and Norasyikin Abdullah Fahami
Universiti Teknologi MARA Perlis, Malaysia

ABSTRACT

Demand for money is considered as an important function of stabilization and structural adjustment policies where such policies depend on the ability to adjust the money supply to its demand in order to prevent monetary disturbances from affecting real output. Monthly data from 2005 to 2012 for various monetary aggregates, consumer price index, industrial production index, and Bond are analysed. Global economic crisis and natural disaster as additional variables have been included in this study. The Pearson correlation tests, Unit root tests, Ordinary Least Square method and Granger Causality tests have been tested for empirical analysis. The results show the existence of the relationship among variables. Bidirectional causality found from CPI and Bond to monetary. All the five variables are significantly affecting the money demand in Japan.

Keywords: demand for money, Bond rate, Gross Domestic Product (GDP), Consumer Price Index (CPI), special event

INTRODUCTION

The supply of money is the quantity of money, currency and bank deposits set by the Federal Government also refers to the number of dollars available to be held in wallets and bank accounts. According to Nelson (2011), demand for money is the amount of money that people desire to hold. Since every dollar is held voluntarily, the quantity of money supplied by the Federal must be equal to the quantity demanded by money holders. Economists have identified three primary motives for holding money. First, to settle transactions, since money is the medium of exchange; secondly as a precautionary store of liquidity; and finally, money is held for speculative purposes. In the past several decades, there has been research done on the money demand function due to its vital role plays in macroeconomic analysis, especially with regard to the formation and transmission of monetary policy. According to Ali Khan and Adnan Hye (2011), in the developing countries the demand for narrow and broad money has become temporally unstable after continuous changes in the financial sector. It was due to financial restructuring where it increases the competition, introduce additional money substitutes, improve the use of credit cards and electronic money transfer, liquidity of the time deposits and increase the international capital mobility which make the money demand function become unstable.The history of research into money demand is still the key element in the development of monetary economics in general. Money demand is considered as an important function of stabilization policies where stabilization depends on the ability to adjust the money supply to its demand in order to avoid monetary instabilities from affecting real output. It is argued that the relationship between money supply on one hand and prices, income, and balance of payments on the other is determined by the demand for money and such relationship plays an important role in macroeconomic theory.Due to its important role, this paper aims to analyze the factors affecting demand for money specifically in Japan to incorporate some of the crises; Global Economic Crisis (GEC) and Natural Disaster (ND). Other factors are Consumer Price Index (CPI), Industrial Production Index (IPI) and Bond rate (Bond).

LITERATURE REVIEW

In this study, the dependent variable will beMoney demand of Japan.The independent variables are theConsumer Price Index (CPI), Industrial Production Index (IPI), Bond Rate (BOND), Global Economic Crisis (GEC), and Natural Disaster (ND).Money demand stability implies that the quantity of money can be predictably related to various macroeconomics variables. Thus, CPI will be included as a proxy for inflation. There are many tests have been done regarding to GDP-Money demand nexus. According to Padhan (2011), by using CUSUM and CUSUMQ tests shows that the entire alternative functions of demand are stable.

Gross Domestic Product is significantly affecting the money demand function.Hsing and Jamal (2013) also stated that, real money demand affected inversely by Treasury bill rate and the nominal effective exchange rate but positively affected by real GDP. Ali Khan and Adnan Hye (2011)explained that, the study found a positive correlation between money demand and GDP but a negative relationship between money demand and domestic as well as foreign interest rate. Based on their findings, GDP and real deposit rate have shown significant effects on M2. It seemed to be effective variables in explaining demand for money.Celikoz and Arslan (2011) found the similar result as GDP is positive and statistically significant to money demand in the case of Turkish.According to Skrabic and Plazibat (2009), by using Vector Auto regression system (VAR) found that industrial production index is the most significant factor to money demand.According to Tahir (1995), demand for real cash balances is adversely related to the yield of the interest rate in the traditional money demand models. The public would prefer to hold more financial assets such as bonds and treasury bills during times of high interest rate because the domestic interest rate represents the opportunity cost of holding money. A global financial crisis is a difficult business environment to succeed in due to the majority of the customers tends to reduce their purchases of goods and services until the economic situation improves. According to Vollmer and Bebenroth (2012), until 2012 Japan is experiencing their second major financial crisis of the last two decades. Japan first crisis happened in the 1990s had effects not only in Japan but entire major economies worldwide. Bank of Japan (BOJ) and other Japanese government agencies started to react to the financial crisis since September 2008 by learning from their past financial crisis experience. According to Kapounek (2011), by using Postkeynesian he found that money demand is not stable during financial crisis. Central banks also cannot fix the stock of money in a country. The causality is directed from economic activity to money demand.Natural Disaster is a major adverse event resulting from natural processes of the Earth. According to Popp (2006), natural disaster certainly effects on long run growth. It affects technology, human capital accumulation, physical capital accumulation and the natural resource stock. In 2011, there was one of the most terrible earthquakes in the Japan history. Wu et al (2012) stated that, during earthquake, tsunami caused tremendous damage to infrastructures, death, and buildings in the districts along the coastlines of the East Kanto region and ground shaking also caused significant damage to buildings in the inland districts. Total collapse buildings whose basic functions totally collapsed cannot be recovered through the repair.As for this study, it is conducted to determine the factors attribute to the money demand in one of the largest economies in the world; that is Japan. The study also incorporates the global economic crisis and earthquake that happen in Japan.

RESEARCH METHODOLOGY

The data used in this research are obtained from Thomson Reuters Datastream.Monthly data on money demand of Japan (M2), Consumer Price Index (CPI), Industrial Production Index (IPI) and Bond rate (Bond) for the period January 2005 until December 2012 are collected. On the other hand, the data about the occurrences of Global Economic Crisis (GEC) and Natural Disaster (ND) are referred through the previous journal. All the collected data was being analyzed using E-views software. The Pearson correlation test is conducted in order to know the relationship between variables. Correlation here means degree and type of relationship between any two or more variables in which they vary together over a period. A correlation can vary from 0 to 1. In order to conduct a Unit Root Test, Augmented Dickey-Fuller test (ADF) and Phillip Perron test are being utilized. An ADF test is an investigation for a unit root in a time series sample. An ADF test is a version of the Dickey-Fuller test for a larger and more complicated set of time series models. Phillip Perron test is a test of a unit root hypothesis in a series of data. In the Phillips-Perron statistic, negative number used in the test. The more negative it is, the stronger the rejection of the hypothesis that there is a unit roots at some level of confidence. Another test is Regression Technique or Ordinary Least Square (OLS). OLS method is a universal linear modelling technique that may be used to construct a single response variable which has been recorded on at least an interval scale. The technique may be applied to single or multiple descriptive variables and also categorical descriptive variables that have been properly coded. Finally,Granger Causality Test is utilized to determinethe direction of causality between variables. A simple definition of Granger Causality, in the case of two time-series variables, X and Y where X is said to Granger-causes Y if Y can be better predicted using the histories of both X and Y rather than it can by using the history of it alone.

FINDINGS AND ANALYSIS

Table 1. Results of Correlation Analysis

	LM2	LCPI	LIPI	LBOND	GEC	ND
LM2	1.0000	0.9548	-0.7385	-0.1182	0.1992	0.6446
LCPI	0.9548***	1.0000	-0.7679	-0.2587	0.2810	0.5174
LIPI	-0.7385***	-0.7679	1.0000	0.0839	-0.6877	-0.2697
LBOND	-0.1182*	-0.2587	0.0839	1.0000	0.0880	-0.0217
GEC	0.1992*	0.2810	-0.6877	0.0880	1.0000	-0.1749
ND	0.6446**	0.5174	-0.2697	-0.0217	-0.1749	1.0000

Note: (***), (**) and (*) denotes significant at 1%, 5% and 10%

From the above table, all of the independent variables have correlation with the money demand in Japan. Consumer Price Index (LCPI) and Industrial Production Index (LIPI) show strongest correlation to Money demand (LM2) with 0.9548 and -0.7385 respectively. However, the weak correlation affects the money demand in Japan are Bond (LBOND) and the Global Economiccrisis (GEC) with only -0.1182 and 0.1992 correspondingly. Meanwhile, Natural Disaster (ND) had given moderate impact only to demand for money in Japan with 0.6446. This result is similar to previous studies done by Padhan (2011) where it shows that the correlation coefficient of IPI with money aggregates is highly correlated.

Table 2. Results of Unit Root Test

Variables	Augmented Dickey-Fuller (ADF) Unit Root Test		Philips-Perron (PP) Unit Root Test	
	Level	1st difference	Level	1st difference
LM2	-0.717136	-9.649079*	-0.717136	-9.649136*
LCPI	-1.623211	-10.74794*	1.623211	-10.74794*
LIPI	-2.010039	-7.197796*	-1.823838	-7.186099*
LBOND	-2.411430	-4.339667*	-2.183917	-9.580752*
GEC	-2.346204	-9.591663*	-2.451032	-9.591663*
ND	-1.743935	-9.591663*	-1.769246	-9.591663*

Note: * denotes significant at 1% significant level

Table 2 shows the result for the Unit Root Test by using two methods. The first method is The Augmented Dickey-Fuller (ADF) Test and second is Phillips-Perron (PP). Based on the results, it shows that all variables are significant at 1st different, or I (1) where I (1) is equal to Integrated of order 1 for both tests. It is similar to previous study results by Ewing and Payne (2007) where all the respective time series are stationary at first-difference or integrated of order one, I (1).

Table 3: Result of Granger Causality Test

Dependent variables	LM2	LCPI	LIPI	LBOND	GEC	ND
LM2		4.5662**	3.9077*	7.4186***	0.4377	0.6763
LCPI	4.1652**		7.0225***	10.122***	1.5484	0.1881
LIPI	0.1856	0.0052		6.0277**	5.7223**	0.1353
LBOND	3.5789*	1.4611	1.0762		0.6748	3.0E-05
GEC	0.2669	0.0677	0.4182	0.6071		0.0975
ND	0.4196	1.0773	0.0517	0.5894	0.1767	

Note: (***), (**) and (*) denotes significant at 1%, 5% and 10%

The Granger Causality Test result in table 2 shows that there are bidirectional relationshipsbetween LM2 and LCPI and also for the LBOND and LM2 nexus. The results also revealed that there are unidirectional relationships between money demand and LIPI and LBOND respectively. For the Ordinary Least Squared Method (OLS) the result shows that all variables are significant since the p-value less than 5% confidence level. All variables are highly explained the money demand (LM2) based on the R-squared value of 96.15%. It shows that, LM2 is affected about 96.15 percent by LCPI, LIPI LBOND, GEC and ND and another 3.85 per cent will be influenced by other factors. F-statistic measure the overall performance of the variables and it shows that all variables are significantly affected the demand for money in Japan.

CONCLUSIONS

Based on the analysis, there are two major findings; high correlation between inflation and money demand and also bidirectional relationship between those two variables. The result from this study confirms the economic theory on a link between money growth and inflation. In money market equilibrium, real money supply is equal to real money demand: $M/P = L^d(Y, i)$. There is an assumption that the aggregate price level is free to adjust to keep the money market in equilibrium: $P = M/L^d(Y, i)$. That means, the price level is directly related to the nominal money supply and to real money demand (which is a function of real income and the nominal interest rate).And, inflation itself is just the growth rate of aggregate prices.It is recommended that central banks should control the monetary policy through the setting off interest rates, open market operation and banking reserve requirement. Furthermore Japan should keep the inflation rate low and steady level to reduce the risk of liquidity in the economy.

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