## DEMAND FOR MONEY IN SELECTED DEVELOPED AND DEVELOPING COUNTRIES: DOES ECONOMIC UNCERTAINTY MATTER?

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### ABSTRACT

The purpose of this research is to investigate the relationship between the demand for money (namely, narrow money demand and broad money demand) and optimal economic uncertainty index; in addition to the optimal economic uncertainty index, two control variables are included in the money demand function, namely exchange rate and inflation; note that the optimal economic uncertainty index is a summary information of economic uncertainty for the future state of the economy. The optimal economic uncertainty index applies in this research is an optimal algorithm approach. The relationships between the demand for money and the optimal economic uncertainty index, the real exchange rate, the real income, the real interest rate and the inflation are examined by using the autoregressive distributed lag (ARDL) dynamic heterogeneous panel cointegration test. Four selected developed countries and five selected developing countries are taken up as samples in this research. Using the panel cointegration method, the findings provide some policy implications; the optimal economic uncertainty index can serve as a signaling indicator of uncertainty about future economic events to promote the stability of money demand function (namely, narrow money demand function and broad money demand function), and the exchange rate and inflation are useful indicators of central bank's decision making process that eventually enhance the control of monetary aggregates in the transmission of monetary policy.

## PERMINTAAN WANG DI NEGARA-NEGARA MAJU DAN NEGARA-NEGARA MEMBANGUN TERPILIH: ADAKAH PERMASALAHAN EKONOMI TIDAK MENENTU?

### ABSTRAK

Tujuan kajian ini adalah untuk mengkaji hubungan di antara permintaan wang (iaitu, permintaan wang sempit dan permintaan wang luas) dan indeks ekonomi tidak menentu yang optimum; sebagai tambahan kepada indeks ekonomi tidak menentu yang optimum, dua pemboleh ubah kawalan dimasukkan ke dalam fungsi permintaan wang, iaitu kadar pertukaran dan inflasi; untuk makluman indeks ekonomi tidak menentu yang optimum ialah ringkasan maklumat ekonomi tidak menentu untuk keadaan masa depan ekonomi. Indeks ekonomi tidak menentu yang optimum digunakan dalam kajian ini ialah kaedah optimum algoritma. Hubungan di antara permintaan wang dan indeks ekonomi tidak menentu yang optimum, kadar pertukaran sebenar, pendapatan sebenar, kadar faedah sebenar dan kadar inflasi dikaji dengan menggunakan ujian autoregressive distributed lag (ARDL) dynamic heterogeneous panel cointegration. Empat negara maju dan lima negara membangun yang terpilih diambil sebagai sampel dalam kajian ini. Dengan menggunakan kaedah panel cointegration, dapatan kajian mengemukakan beberapa implikasi dasar; indeks ekonomi tidak menentu yang optimum boleh berfungsi sebagai penunjuk isyarat ketidakpastian mengenai peristiwa-peristiwa ekonomi masa depan untuk menggalakkan kestabilan fungsi permintaan wang (iaitu, fungsi permintaan wang sempit dan fungsi permintaan wang luas), dan kadar pertukaran dan inflasi merupakan petunjuk yang berguna dalam proses membuat keputusan bank pusat yang akhirnya meningkatkan kawalan monetari agregat dalam penghantaran dasar monetari.

# TABLE OF CONTENTS

# Pages

ACKNOWLEDGEMENT	iii
ABSTRACT	iv
ABSTRAK	v
TABLE OF CONTENTS	vi
LIST OF TABLES	xi
LIST OF FIGURES	xiii

## CHAPTER 1 INTRODUCTION

1.1	Introduction	1
1.2	Matters of Study	5
1.2.1	Economic Uncertainty Matter	6
1.2.2	Income Matter	9
1.2.3	Interest Rate Matter	11
1.2.4	Inflation Rate Matter	13
1.2.5	Exchange Rate Matter	16
1.3	Motivations of the Study	19
1.3.1	Can the demand for money serve as an	19
	important predictive content for the	
	monetary policy strategy?	

1.3.2	What is the response of economic	20
	uncertainty to demand for money?	
1.3.3	What is the response of exchange rate	21
	to demand for money?	
1.4	Objectives	22
1.4.1	General Objective	22
1.4.2	Specific Objectives	22
1.5	Significance of the Study	24
1.6	Framework of the Study	25
1.7	Concluding Remarks	27

## CHAPTER 2 LITERATURE REVIEW

2.1	Introduction	28
2.2	Theoretical Literatures	29
2.2.1	Quantity Theory	29
2.2.2	The Cambridge Approach to the	31
	Quantity Theory	
2.2.3	Friedman Theory of Demand for Money	31
2.2.4	Keynesian Theory	33
	2.2.4.1 Transactions Demand Motive 34	
	2.2.4.2 Precautionary Demand Motive	35
	2.2.4.3 Speculative Demand Motive	35
	2.2.4.4 Putting Three Motives Together	36

2.3	Empirical Literatures	37
2.3.1	The Determinants of Demand for	37
	Money Function	
	2.3.1.1 Economic Uncertainty Variable	38
	2.3.1.2 Income	43
	2.3.1.3 Interest Rate	45
	2.3.1.4 Inflation Rate	47
	2.3.1.5 Exchange Rate	49
2.4	Background of Selected Developed and	51
	Developing Countries	
2.4.1	The Case of Canada	52
2.4.2	The Case of Japan	59
2.4.3	The Case of Switzerland	65
2.4.4	The Case of United States (US)	72
2.4.5	The Case of Indonesia	79
2.4.6	The Case of Malaysia	87
2.4.7	The Case of Philippines	94
2.4.8	The Case of Singapore	101
2.4.9	The Case of Thailand	110
2.5	Research Gaps	117
2.5.1	Lacking Evidence of Economic	118
	Uncertainty with Demand for Money	

Demand for Money can serve as	119
Important Predictive Content for	
Monetary Policy Strategy	
	Demand for Money can serve as Important Predictive Content for Monetary Policy Strategy

2.6 Concluding Remarks	120
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# CHAPTER 3 METHODOLOGY

3.1	Introduction	121
3.2	Model Specifications—Theoretical Model	122
3.3	Estimation Techniques	126
3.3.1	Unit Root Test	126
	3.3.1.1 Augmented Dickey-Fuller (ADF)	129
	Test	
	3.3.1.2 Phillips-Perron (PP) Test	129
	3.3.1.3 Generalized Method of Moments	130
	(GMM)	
	3.3.1.4 Grid Search Method	133
3.4	Data and Sources	136
3.5	Empirical Results	138
3.5.1	Unit Root Test Results	138
3.5.2	Generalized Method of Moments	144
	(GMM) Results	
3.5.3	Grid Search Method Results	148
3.6	Concluding Remarks	151

# CHAPTER 4 EMPIRICAL EVIDENCE RELATING TO DEMAND FOR MONEY

4.1	Introduction	153
4.2	Objectives	154
4.3	Research Hypotheses	155
4.4	Model Specifications	156
4.5	Estimation Techniques	158
4.5.1	Panel Unit Root Tests	158
	4.5.1.1 Levin, Lin and Chu Test	159
	4.5.1.2 Im, Pesaran and Shin Test	160
	4.5.1.3 Maddala and Wu Test	161
4.5.2	Autoregressive Distributed Lag Model	162
	(ARDL) Dynamic Heterogeneous Panel	
	Cointegration Tests	
4.5.3	Diagnostic Test: Hausman Test	165
4.6	Empirical Results	166
4.6.1	Panel Unit Root Tests Results	166
4.6.2	ARDL Dynamic Heterogeneous Panel	168
	Cointegration Test Results	
4.7	Research Findings	188
4.8	Concluding Remarks	189

# CHAPTER 5 CONCLUSIONS

APPENDIX

	5.1	Introduction	1	91
	5.2	Contributions	1	92
	5.3	Policy Implications	1	94
	5.4	Limitations and Recommendations	1	95
	5.5	Concluding Remarks	1	95
REFERENCES			1	97

217

# LIST OF TABLES

Tabl	e	Pages
3.1	Summary Statistics for the Phillips-Perron (PP) Unit Root Test	140
3.2	Summary Statistics for the Augmented Dickey-Fuller (ADF) Unit Root Test	142
3.3	GMM Estimations of the Standard Macroeconomic Reaction Function	146
3.4	Optimal Coefficients, Unconditional Variances of Goal Variables,	150
	Losses (result depend on $\mu_{\gamma_g}$ , $\mu_{\pi_g}$ and $\gamma_{r_g}$ ) and Optimized	
	Economic Uncertainty Index	
4.1	Panel unit root tests	167
4.2	Panel error correction model (ECM) estimations of the m1 money	169
	demand function (Four selected developed countries and five	
	selected developing countries) from 1994Q1 until 2012Q4	
4.3	Individual results of the PMG estimates of the m1 money demand	170
	function (Four selected developed countries and five selected	
	developing countries) from 1994Q1 until 2012Q4	
4.4	Panel error correction model (ECM) estimations of the m1 money	173
	demand function (Four selected developed countries) from 1994Q1	
	until 2012Q4	
4.5	Panel error correction model (ECM) estimations of the m1 money	173
	demand function (Five selected developing countries) from 1994Q1	
	until 2012Q4	

4.6	Individual results of the PMG estimates of the m1 money demand function (Four selected developed countries) from 1994Q1 until 2012Q4	174
4.7	Individual results of the PMG estimates of the m1 money demand function (Five selected developing countries) from 1994Q1 until 2012Q4	177
4.8	Panel error correction model (ECM) estimations of the m2 money demand function (Four selected developed countries and five selected developing countries) from 1994Q1 until 2012Q4	180
4.9	Individual results of the PMG estimates of the m2 money demand function (Four selected developed countries and five selected developing countries) from 1994Q1 until 2012Q4	180
4.10	Panel error correction model (ECM) estimations of the m2 money demand function (Four selected developed countries) from 1994Q1 until 2012Q4	184
4.11	Panel error correction model (ECM) estimations of the m2 money demand function (Five selected developing countries) from 1994Q1 until 2012Q4	185
4.12	Individual results of the PMG estimates of the m2 money demand function (Four selected developed countries) from 1994Q1 until 2012Q4	185
4.13	Individual results of the PMG estimates of the m2 money demand function (Five selected developing countries) from 1994Q1 until 2012Q4	187

# LIST OF FIGURES

Figure		Pages
1.1	The nexus of demand for money and economic uncertainty	25
2.1	Liquidity-Money (LM) curve	36
2.2	M1, M2 and gross domestic product of Canada	53
2.3	M1, M2 and the real interest rate of Canada	55
2.4	M1, M2 and inflation rate of Canada	57
2.5	M1, M2 and real exchange rate of Canada	58
2.6	M1, M2 and gross domestic product of Japan	60
2.7	M1, M2 and the real interest rate of Japan	62
2.8	M1, M2 and inflation rate of Japan	63
2.9	M1, M2 and real exchange rate of Japan	65
2.10	M1, M2 and gross domestic product of Switzerland	67
2.11	M1, M2 and the real interest rate of Switzerland	68
2.12	M1, M2 and inflation rate of Switzerland	70
2.13	M1, M2 and real exchange rate of Switzerland	71
2.14	M1, M2 and gross domestic product of US	73
2.15	M1, M2 and the real interest rate of US	75
2.16	M1, M2 and inflation rate of US	76
2.17	M1, M2 and real exchange rate of US	78
2.18	M1, M2 and gross domestic product of Indonesia	81
2.19	M1, M2 and the real interest rate of Indonesia	83

2.20	M1, M2 and inflation rate of Indonesia	85
2.21	M1, M2 and real exchange rate of Indonesia	87
2.22	M1, M2 and gross domestic product of Malaysia	88
2.23	M1, M2 and the real interest rate of Malaysia	90
2.24	M1, M2 and inflation rate of Malaysia	92
2.25	M1, M2 and real exchange rate of Malaysia	93
2.26	M1, M2 and gross domestic product of Philippines	95
2.27	M1, M2 and the real interest rate of Philippines	97
2.28	M1, M2 and inflation rate of Philippines	99
2.29	M1, M2 and real exchange rate of Philippines	101
2.30	M1, M2 and gross domestic product of Singapore	103
2.31	M1, M2 and the real interest rate of Singapore	105
2.32	M1, M2 and inflation rate of Singapore	107
2.33	M1, M2 and real exchange rate of Singapore	109
2.34	M1, M2 and gross domestic product of Thailand	111
2.35	M1, M2 and the real interest rate of Thailand	113
2.36	M1, M2 and inflation rate of Thailand	115
2.37	M1, M2 and real exchange rate of Thailand	117

**CHAPTER 1** 

### **INTRODUCTION**

'No proposition in macroeconomics has received more attention than that there exists, at the level of the aggregate economy, a stable demand for money function.'

Laidler, D. (1982, pg. 39)

## 1.1 Introduction

Since the 1990s, the countries around the world are forced to face the increasing number of economic disturbances. In 1997, the negative impact from Asian financial crisis which originated in Thailand has spill over to other Asian countries. The economic disturbances continue to grow greatly after the eruption of the subprime crisis in early 2007. Following the global financial crisis in 2008 that caused by the systemic financial risk, the world's economic recovery is in a slowing pace (Gan,

2014). Thereafter, the uncertainties in the future forecasts of the world continue to grow, such as the occurrence of the European sovereign debt crisis since 2009 that prolonged a severe recession, the uncertain 'Abenomic' policy in projecting Japan's longer-term economic growth that kindled a more volatile financial environment, sub-par economic growth in the United States and a slackening growth in emerging Asia (International Monetary Fund, 2013). These economic disturbances have caused bad influences to the world's economy and this may eventually affect the demand for money. Atta-Mensah (2004) argues that the uncertainties in the economy may cause a negative impact on the demand for money. This may eventually affected the role of the demand for money in helping the central bank in decision making.

In many central banks practice, e.g., developed and developing countries, the role of the demand for money is deficient in macroeconomic analysis that in turn degrades its role in the assistance of selecting the appropriate monetary policy.<sup>1</sup> Developed countries, for instance, the US has reduces the role of the growth of money as an economic indicator regarding the uncertainty movements in the growth of money. The demand for money is useful to predict the inflation and the income growth in 1995 for Canada, however, Bank of Canada (1997) reports that the demand for money cannot serve as a predictive content for the future inflation regarding the robust portfolio shift into the mutual funds. On the other hand, in developing countries, for the case of Malaysia, Bank Negara Malaysia announced that the movements of the demand for money are inconsistent. Even though the growth of money is ineffective in the short-run business cycles, but it may be useful to manage

<sup>&</sup>lt;sup>1</sup> The evidence is originated from the central bank's website.

inflation (Dwyer, 2001). The failure of the demand for money to serve as a predictive content raises a question that whether the demand for money still plays an important role in monetary policy.

A well organize monetary policy depends on a stable function of demand for money (Friedman and Schwartz, 1982; Laidler, 1982; Goldfeld, 1973; Bahmani-Oskooee and Karacal, 2006; Ozturk and Acaravci, 2008).<sup>2</sup> Sriram (1999) and Bathalomew and Kargbo (2009) declare that a stable function of demand for money enables the monetary aggregates<sup>3</sup> to have a predictable impact on the economic variables such as income, interest rate and inflation rate. In line with this backdrop, the stable function of demand for money also plays an important role in understanding the transmission mechanisms of the monetary policy (Laumas and Mehra, 1977; Laidler, 1999). Judd and Scadding (1982) and Friedman (1987) explain that the stable function of demand for money means that the quantity of money probably has connection with a set of economic variables which links the money to the real sectors of the economy. Thus, this may help the central banks to select the most efficient monetary policy.

Theoretically, the demand of money may classified into three segments, namely the transactions demand segment, the precautionary segment and the speculative demand segment. The transactions demand segment has a positive relationship with the income and has a negative relationship with the interest rates. The precautionary segment is positively related with the income while the speculative

<sup>&</sup>lt;sup>2</sup> The function of the demand for money describes that the relationship between the money with the economic variables (e.g., real income and interest rate) (Narayan and Narayan, 2008).

<sup>&</sup>lt;sup>3</sup> The measures of the money supply used by the central bank.

demand segment has a negative relationship with the interest rates. The demand for money are positively related with the income as the demand for money may increase when there is growth in the economy that caused the national income and the incomes for the individuals to increase and this may increase the expenditure (Fischer, 2007 and Clovis, 2010). Therefore, the changes in the national income will influence the demand for money. On the other hand, the interest rate has an inverse relationship with the demand for money as the higher interest rate implies that the opportunity cost is high and this cause the money to become less attractive (Sriram, 2001). Garner (1986), Abdullah et al. (2010) and Bassey et al. (2012) explains that the households and firms may hold larger money balances when the volatility of interest rate increases as the risk of holding fixed-term interest-paying securities may increase when the volatility of interest rate increased.

Besides the conventional variables (i.e., income and interest rates), this research extends the function of demand for money by including the role of the exchange rate and inflation rate. The exchange rate matters because the changes in the exchange rate may have a direct influence on the demand for money as the capital outflows may influence the exchange rate (Combes et al., 2011); International Monetary Fund (2013) argues that, the decreased in the investment and capital outflows from the emerging countries lead to a sharp tightening in financial conditions. United Nations (2013) reported that the sovereign debt crisis, recession in the Euro countries, the effects of expansionary monetary policies in developed economies and the financial deleveraging in numerous developed countries have influence the capital flows to the developing countries and caused the volatility in the exchange rate. On the other hand, the inflation also plays an important role in the

demand for money. The higher inflation may encourage individuals and household to substitute physical assets for money balances, thus the role of the inflation is sufficient to be included into the function of demand for money (Khan and Sajjid, 2005; Nassar, 2005; Sharifi-Renani, 2007; Dritsakis, 2011; Budha, 2012).

The remainder of this chapter will provide the discussion regarding the matters and motivations of this research. The importance of the determinants is presented in the next section, matters of study. Next, the general objectives and the specific objectives of this research are highlighted in Section 1.4. Section 1.5 and Section 1.6 discusses the significance of this study and the framework of this research, respectively. Section 1.7 concludes this chapter.

### 1.2 Matters of Study

The matters considered in this research are the economic uncertainty<sup>4</sup>, income, interest rate, inflation rate and exchange rate. (*Note* that only the matters for chosen determinants which are relevance to the interest of this study are discussed in the following section.)

<sup>&</sup>lt;sup>4</sup> The uncertainty of the economic conditions will be measured by the economic uncertainty index. There are few researchers who have developed their own economic uncertainty index such as Atta-Mensah (2004), Baker et. al (2013) and Gan (2014). However, the research in this study is restricted to Gan's approach because Gan (2014) has constructed an optimal economic uncertainty index.

### **1.2.1** Economic Uncertainty Matter

Economic uncertainty may influence the demand for the money by affecting the willingness of the individual to hold the money. When uncertainty increased, the risk may increase too. However, the discussion on the role of economic uncertainty in the literature on the demand for money is mixed and not comprehensive. For example, Bruggerman et al. (2003) find no evidence to prove that there is any relationship between the demand for money and economic uncertainty. However, Atta-Mensah (2004) shows that the economic uncertainty may lead to a higher M1 that agents willing to hold but the economic uncertainty affects M2 negatively. Bahmani-Oskooee and Xi (2011) find that the measurement of uncertainty does affect the demand for M3 in both the long and short run. However, Bahmani-Oskooee et al. (2012) argues that the measure of uncertainty only affect the demand for money in the short-run but not in the long-run.

Other than economic uncertainty per se, the uncertainty on policy variables (i.e., exchange rate uncertainty and interest rate uncertainty) and macro variables (i.e., inflation uncertainty and income uncertainty) may affect the demand for money. With respect to the uncertainty on policy variables, Pozo and Wheeler (2000) find that the Singapore's demand for money is affected by the fluctuations in the exchange rate uncertainty. Exchange rate uncertainty may cause the demand for domestic currency to decrease and increase in the demand for foreign currency in Singapore but not for Malaysia and Thailand (Harvey, 2012). Baum et al. (2001) and Azid et al. (2005) suggest that the estimation on overall impact of the exchange rate uncertainty on the volatility of stock returns may lead to improper implications regarding the underlying

relationships. Ozturk (2006) reviews that the profit and the benefits of the international trade are associated negatively with the exchange rate uncertainty. Grydaki and Fountas (2009) argues that the uncertainty in the demand for money influence the exchange rate uncertainty positively. Bahmani and Bahmani-Oskooee (2012) review that the volatility of the exchange rate may affect the demand for money directly as the exchange rate volatility creates uncertainty in the wealth.

The interest rate uncertainty, on the other hand, Turnovsky (1971) declares that the interest rate instability must be included in the function of the demand for money as the explanatory variables. Mason (1977) postulates that the demand for money is positively associated with the interest rate uncertainty as the interest-bearing assets are less desirable when interest rate uncertainty increase. Golob (1994) argues that interest rate uncertainty may lead the economic agents to postpone their decisions on investment and the economic agents might prefer to invest in long-term fixed rate debt (i.e., to evade the increasing short-term interest rates) when the interest rate uncertainty increased. Thus, the demand for money decreased when the interest rate uncertainty may embody useful and predictive information over to forecast the money. Dixit (1992) and Chang and Feunou (2013) highlight that the economy may influenced negatively by the interest rate uncertainty as the interest rate uncertainty may cause the firms to delay their investment decision.

With respect to the uncertainty on macro variables, Atta-Mensah (2004) suggests that the inflation uncertainty may cause nominal assets become riskier and unpredictable and thus, it may induce the investors to transfer the nominal assets including money into other tangible assets such as gold or other commodities. Belke and Polleit (2009) argue that the individuals may not hold money if the future inflation is uncertain. Higgins and Majin (2009) find mixed effect of the inflation uncertainty on the demand for money. The study reports that the inflation uncertainty have a negative effect on demand for M1 while have a positive effect on demand for M2. However, Klein (1977) find that the inflation uncertainty affects the demand for money positively where individuals request for more money when inflation uncertainty increased. Next, Mizrach and Santomero (1990) and Asilis et al. (1993) argue that the inflation uncertainty may relate with the demand for money negatively.

The income uncertainty, on the other hand, Choi and Oh (2003) prove that the income uncertainty has a positive significant relationship with demand for money but the demand for money relates negatively with the uncertainty of money growth. Longworth (2004) finds that the central bank of Canada includes numerous different and relevant variables to reduce the uncertainty regarding the income gap estimation. Price (1995) who used the conditional variance of GDP as a proxy of uncertainty proved that the uncertainty is associated negatively with the investment decision by the investors and thus affects the demand for money. Coenen et al. (2001) find that money still plays an important role in reducing the uncertainty in estimating the income. Jongwanich and Kohpaiboon (2008) explain that the income uncertainty creates higher opportunity cost in delaying the investment and thus the investment from the firm may decrease. This may eventually reduce the demand for money.

Dahmardeh et al. (2011) argue that the economic uncertainty which measured by the volatility of GDP has a negative relationship with the demand for money in Iran.

### 1.2.2 Income Matter

The level of income (i.e., income) is appropriate scale variable where the transactions motive of holding cash balance emphasis on the current income. In the empirical researches, the level of income has been used widely to represent the scale variable of the function of the demand for money because the level of income poses only little measurement problem. In addition, recently, the level of income is widely represented by the variable namely, gross domestic product (GDP). Laidler (1993) claims that there are varieties of variables namely, GDP, gross national product (GNP) and net national product (NNP) commonly used to represent income in the studies which may substitute for one and other does not have any significant differences. However, Judd and Scadding (1982) argue that there are some problems by using GNP as representative of income such as (i) the GNP does not consider the transfers and transactions in the financial assets and existing goods; (ii) the GNP nets out intermediate transactions.

There are researchers who emphasize the importance of income in the function of the demand for money as the policy aimed at changing level of income may influence the demand for money in the same direction. The policy makers should implement policies that will reduce the disposable income in the economy if the policy makers aimed at moping liquidity (Bitrus, 2011). Mulligan and Sala-I-Martin (1992) propose that the specification of the demand for money has important implications for a number of issues regarding the macroeconomics such as (i) policy makers must have a reliable quantitative estimations of the demand for money to achieve price stability and (ii) the elasticity of income will yields the money growth rate which is consistent with the long-run price stability only in the function of demand for money is stable. When income increased, the number of transactions will increase and thus the demand for money will increase too.

However, the transactions in the theories of demand for money suggested that the increase in the inequality distribution of income will decrease the demand for money (Cover and Hooks, 1993). Das et al. (2004) argues that the income inequality has a positive relationship with the aggregate demand under decreasing marginal impatience. Lambert and Pfähler (1997) and Pfähler and Wiese (1990) find that the aggregate demand will be higher than the more equally income (or total of transaction volume) is distributed among the household by incorporating a Lorenz curve variable into their estimation of the aggregate demand for an economy in the high income countries. Brown (2004) argues that the consumption is negatively affected by the income inequality, when the expenditure of the household is expected to be incomeconstrained.

Besides that, there are some studies which concern about the income inelasticity on demand for money. The income elasticity of demand for money is significant as it discloses the quantity of the demand for money reacts to the changes in national income (Kilroe, 2012). Clovis (2010) reviews that demand for money may

increase when there is growth in the economy which caused the national income to increase and the incomes for individuals may become higher and thus, the expenditure may increase. Therefore, the changes in the national income will influence the demand for money. Fischer (2007) reports that the estimation of income elasticity is stable across the time and regions offers renewed confidence for money as an important indicator for monetary policy.

### **1.2.3 Interest Rate Matter**

The interest rate matters the demand for money because it is the opportunity cost that households and firms faced for holding wealth in the form of money. Falls and Zangeneh (1989) emphasis that the interest rate must be included as an essential variable in the function of the demand for money to estimate the demand for money. Higher interest rates may discourage the households and firms to hold their wealth in the form of money. During high interest rates, the households and firms will choose to hold more financial assets such as treasury bills and bonds (Bassey et al., 2012). Therefore, there is a negative relationship between the interest rate and demand for money also supported by the evidence find by Dahmardeh et al. (2011), Arize and Nam (2012) and Raksong and Janposi (2012). Besides that, Hsing (2008) also finds similar negative relationship between foreign interest rate and demand for real M1 where lower foreign interest rate may increase the demand for money.

<sup>&</sup>lt;sup>5</sup> Interest rate in this discussion refers to the movements of the interest rate (i.e., increasing interest rate or decreasing interest rate). This research also assumes that the movements of interest rate are similar with the interest rate volatility and the interest rate variability.