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Economic Uncertainty, Monetary Uncertainty and the Demand for Money in Asia: An Asymmetry Analysis

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ABSTRACT

The research explores the influence of both economic and monetary uncertainty on money demand in the short and long term in Asia for 1990 to 2020. The study applied linear ARDL and nonlinear ARDL approaches for estimation. The result of the study shows that more of the countries' uncertainty measures significantly affect money demand in the short run. The Linear

ARDL model output shows in the short run economic and monetary uncertainty negative association with money demand except in India and Bangladesh where economic uncertainty positive link. In the long run, effects where exchange rate interest rate and both uncertainties measure negative link with money demand. But in Japan, Singapore, India, and the Philippines most of the estimator coefficients were found insignificant in long run. The results of the non-linear ARDL model show in the short run all countries significantly affect positive and negative money demand. In long run, all variables were found significant for money demand. Further, the stability test shows all variables are stable. These findings suggest that policymakers should focus on stabilizing monetary policy to control inflation and reduce uncertainty, as it directly influences money demand in various Asian economies.

Keywords: Economic Uncertainty, Monetary Uncertainty, the Demand for Money, Asymmetry

Introduction

The stability of the money demand (MD) function has attracted solid attention in monetary economics since the mid-1970s, which leads a consistent and predictable relationship between driving forces of money demand and the monetary aggregates. Hence, money supply (MS) can be used as an effective monetary policy tool explained by (Poole 1970). The MD function plays an important role in the New Classical and New Keynesian models. However, the factual confirmation upon the stability of MD function is vague analyzed by (Dixon 1997; Cuthbertson 1991; Laidler 1985). When the managing interest rate aiming by the US federal reserve turns to monetary aggregates in 1979, the trying to lower its inflation rate targets. Several critics in the monetarist model believed that the QTM (quantity theory of money) had collapsed. Therefore, Fried-man (1984) maintained the QTM (quantity theory of money) and asserted that the unrestrained inflation rate risen because of the instability of MS. Because of the volatility, the velocity of money became unstable. People keep extra money on hand as a buffer against such uncertain futures. As a result, uncertainty appears as an excessive factor in the MD function.

Certain empirical and theoretical research on the MD function examines various types of

uncertainty. Friedman discovered that as the volatility of the money supply grew, the demand for money in Germany also increased. Brüggemann & Nautz (1997) investigated the effect of the volatility growth of money on demand for money after monitoring for other applicable variables; Choi & Oh (2003) used US data from 1959 to 1996 to create a theoretical model of the MD function to measure the monetary uncertainty; they discovered that this uncertainty has an impact on MD. Peoples's holding money less while forecasting high inflation percentage rate, and demand for cash balances rises if people believe that uncertainty will lead to job loss. Alsamara et al. (2017) used an oil price shock to estimate Saudi Arabia's MD function from 1990 to 2014. They sharp out that shocks of oil prices had asymmetric impacts on Saudi Arabia's MD function and discovered that uncertainty can be added to Turkey's MD function to demonstrate stability in this function. Oskooe et al. (2013) examined both monetary and economic policy ambiguity into the MD purpose of rising nations, including Armenia, Bulgaria, the Czech Republic, Hungary, Poland, Russia, Bolivia, and South Africa, Colombia, and Malaysia. They discovered the short-run influence of uncertainty on MD function in most economies. Sahin (2018) investigated the effects of various sources of un-uncertainty (particularly, income uncertainty, money supply uncertainty, uncertainty of monetary policy of US, uncertainty of oil price, interest rate uncertainty, and exchange rate uncertainty) on the velocity of money of fuel producer economies. Although they discovered varied results, they concluded that when uncertainty grew, people stored more cash as a hedge, and so the velocity of money decreased. On the other hand, Baker et al. (2016) have established a complete portion of uncertainty entirely for some emerging economies and advanced, that refers the uncertainty of economic policy. Moreover, Alting's et al. (2020), before and during the COVID-19 epidemic, saw numerous indicators of economic uncertainty for the United States and the United Kingdom, including implied stock market volatility, newspaper- based policy uncertainty, and economic uncertainty. These include Twitter conversations about the situation, thematic uncertainties about business growth, and predictor disagreements. Scale based on future GDP growth and a macro-uncertainty model. There are four consequences. First, all indicators suggest a significant increase in uncertainty due to this epidemic and its economic consequences. Most indicators have reached their highest levels ever. Second, there is a dramatic difference in the peak dimensions, ranging from a 35%

increase in the model-based US economic uncertainty (compared to January 2020) to the UK's growth forecast that increased 20 times. Third, there is a difference with time: the implicit fluctuations increased in late February, peaked in mid-March, and then fell by a third.

In all preceding studies, both uncertainty measures' consequences are considered symmetric, implying that if higher uncertainty reduces money demand, reduced uncertainty increases. It does not have to be like this. It's worth noting that the nominal money supply can become endogenous, and insignificant money supply fluctuations can quickly reflect changes in money demand. They will not respond to reduced uncertainty since they believe the slump is just transitory, resulting in an unequal response. Even if they react, the shift in their outlook may prevent them from increasing their cash holdings at the same rate as they decreased them. Oskooee & Kones (2014) state that the Fed lost its inflation target in 1979 when it manipulated the monetary aggregate by regulating interest rates. Many have blamed the Fed for the theory of money, and an economic quantity has failed. Friedman (1984), a researcher, argued that monetary policy should target financial aggregates and achieve a stable and projected growth rate for those aggregates. Since the Fed failed to meet the latter, he was blamed the problem on instability in the money supply. He claims that fluctuations in extraordinary financial growth increase the level of perceived uncertainty, which in turn leads to higher inflation.

Previous research indicates that the effects of both uncertainty measurements are symmetric, which implies that as uncertainty rises, so does the need for money. However, a decrease in uncertainty may be perceived as temporary by the public, who will not react to decreasing uncertainty, resulting in an unequal response. Due to the change in their expectations, they may not be able to increase their cash holdings at the same rate as they lowered them. Previous research looked at the effects of economic growth and currency exchange rates on money demand in various developed and emerging countries. Only a few researchers have looked at how economic and financial uncertainty affect money demand. This research uses an asymmetric approach to examine the relationship between economic uncertainty, monetary uncertainty, and money demand in Asian countries, namely Japan, China, India, Singapore, Malaysia, Indonesia, the Philippines, and Bangladesh.

All the previous studies consider limited explanations of monetary uncertainty, while in this study, we used both economic and monetary uncertainty. This study will provide knowledge about economic and monetary uncertainty and their impact on money demand in South Asia in an asymmetric analysis. This study also used the most recent data for the 30 years from 1990 to 2020. Policymakers and governments might utilize these policies to develop and interfere with the important factors that affect money demand.

The remaining study is organized as follows. In the next part, we have discussed the relevant literature review. Methodology and theoretical framework are presented in the third part. The fourth section contains estimation results and the last section concludes the study and provides relevant policy implications.

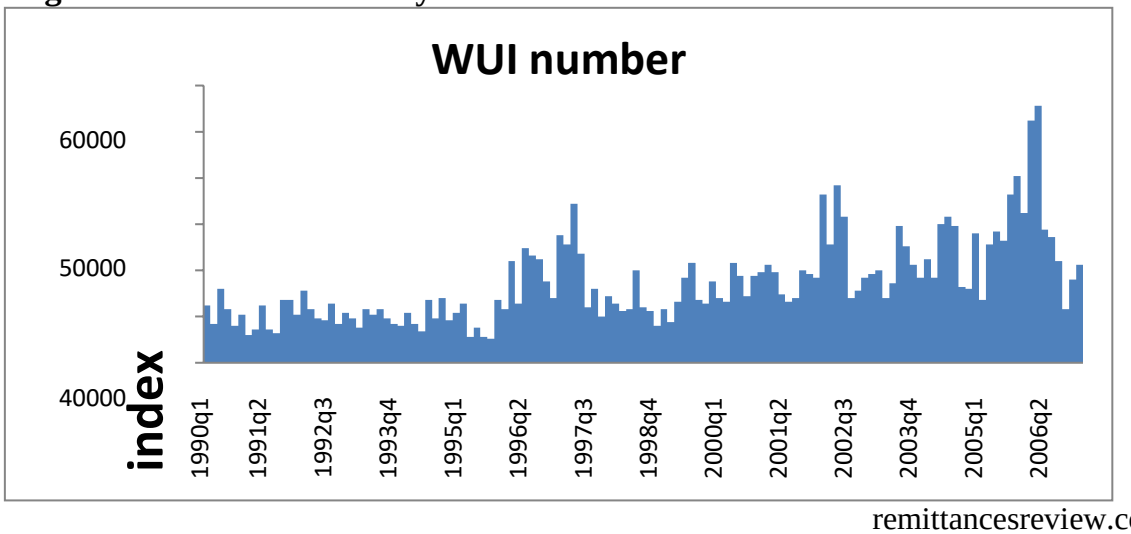
Literature Review

This part of the research study, includes some earlier studies has been worked on the economic uncertainty, monetary uncertainty, and the demand for money different countries of the world. Many researchers are observed that economic uncertainty, is positively associated with money demand, while in few studies monetary uncertainty negatively affects money demand.

Economic Uncertainty

Bloom 2014 used the word "uncertainty" for the first time in literature in a well-known book by Frank Knight. The notion is now commonly referred to as "Knighting uncertainty." The term refers to a circumstance in which economic agents cannot predict or assess the possibility of

Figure 1: World uncertainty overview Index



Source: International Monetary Fund (IMF)

future events. The most in-depth examination of the theoretical foundations is a relationship between uncertainty and economic activity provided. Cloak et al. (2020) defined economic uncertainty as a scenario in which the future outlook for the economy is unknown. Agents in the economy are badly affected by growing uncertainty because their expectations are disrupted, and they cannot assess the implications of their choices. Consumers who are not sure about their future income streams will, for example, choose to delay spending and save more to get a smooth path to lifelong consumption. It is known as the careful saving goal. Figure 2.1 shows the world uncertainty index. The quarterly data was taken from the IMF database from 1990 to 2021. A higher value of the index represents a higher uncertainty. The vertical axis shows the index, and the horizontal axis shows the quarterly year. From the very beginning, the graph shows low uncertainty, but uncertainty increased significantly from 2010 to 2021. In this decade, the economic uncertainty of the world is on top.

The world uncertainty for selected countries are reported in figure 1.2. The graph shows the behavior of uncertainty through a line graph. Different coolers and lines show different countries labels. The world uncertainty index is very high in the Philippines, which shows the data line label is red. The world uncertainty index changes from time to time, explained by the line graph.

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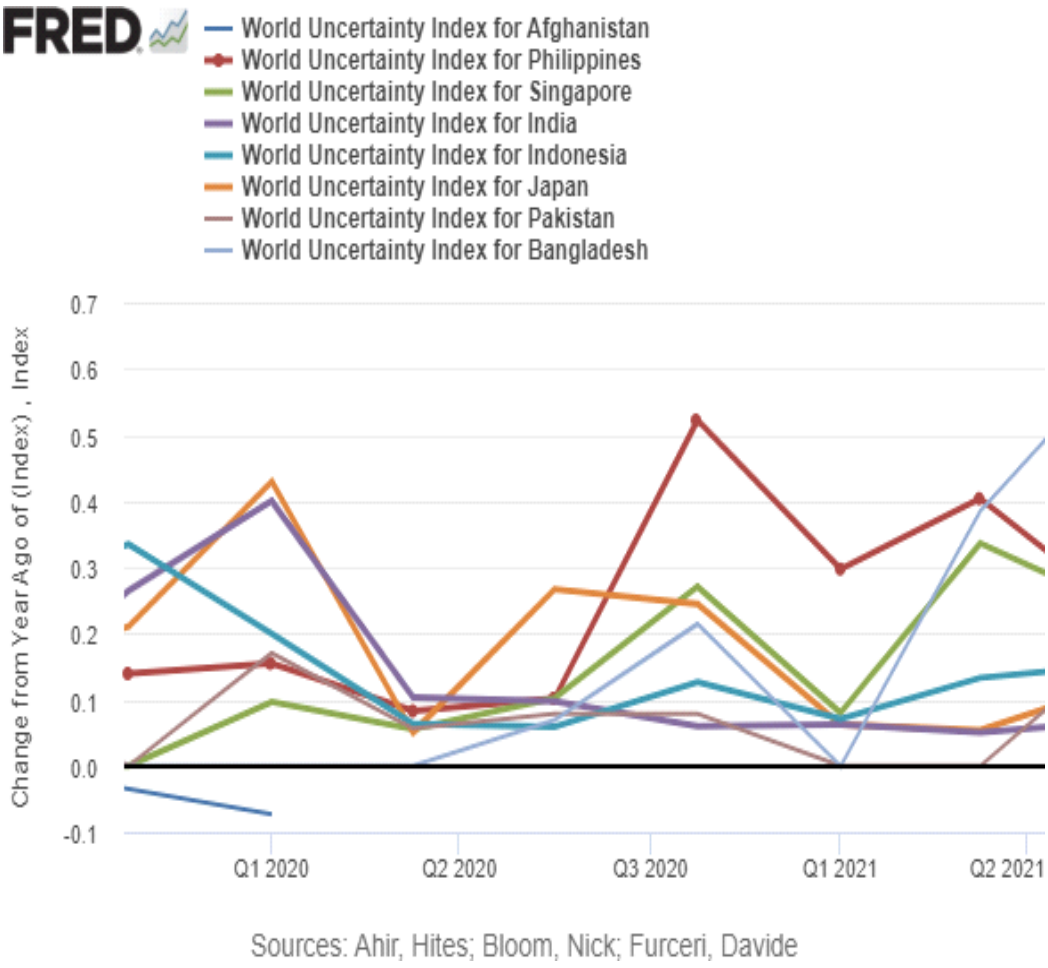
Figure 1.2: World Uncertainties for Selected Countries



Economic and Monetary Uncertainty and its impact on money demand.

Oskooee et al., (2012) examined that uncertainty and financial uncertainty are influenced by the output of money demand in each country. An increase in both dimensions of uncertainty can cause people to divide their wealth into different amounts between money and other financial or real assets. According to empirical findings, both uncertainty indices have short-run implications on the amount of money sought. On the other hand, short-term impacts do not endure in the long run.

Oskooee (2011) realized the need for money and stability in Australia. Previous studies have shown varied results depending on the estimation technique and the duration of the analysis. The researchers provide substantial evidence that demand for M3 funds is stable in Australia. The demand for money includes a measure of economic and financial uncertainty (based on GARCH), and the Bounds Testing Approach allows variables to be static or non-static. Both measures of uncertainty have short-term and long-term consequences for M3 demand in Australia, which previous studies did not consider.

Bahamani (2015) was modified their portfolios and re-allocate their assets between cash and other financial assets due to economic uncertainty, and its represented in the volatility of real GDP and monetary uncertainty indicated in the volatility of nominal monetary such as M2. Regardless of the uncertainties, they may become more cautious and keep more cash and fewer other assets. On the other hand, the public may protect themselves against fluctuating prices by accumulating more actual, less risky assets and less cash. In demand for money function in Thailand, we include a measure of production and monetary uncertainty to evaluate these predictions. Using a limits testing technique, we discover that both short- and long-run effects exist for both measures of uncertainty. Oskooee et al. (2017) explained that economic and financial uncertainty affect people's access to money in both directions. The researcher considered Korea's demand for money in the study and included two measures of GARCH-based production and financial uncertainty. The results show the short-term significance of both is in the demand for money in Korea and their effects. On the other hand, only the adverse effects of output uncertainty persist over time. Combining the two-uncertainty metrics has resulted in constant demand for money in Korea.

Oskooe (2022) explored previous research in Korea, which used a coherence approach to estimate the function of money demand, saw the coherence between money demand variables as an indicator of a stable function of money demand. According to experimental results, none of the financial aggregates in Korea have a permanent relationship with income, interest rates, or exchange rates. We believe that as additional observations become available after the 1997 East Asian Crisis, it will be. Relationships will get worse. Khan & Shafiq (2022) explained along with income and interest rates, a significant amount of recent work identifies the

exchange rate as a key predictor of money demand. However, these studies suggest that the exchange rate measures the demand for money. There is a similar effect. On the other hand, the study claims that the exchange rate can negatively affect the demand for money. As a result, they use the synchronized and disproportionate auto regressed distributed interval model to estimate the harmonious and disproportionate effects of real effective exchange rates on currency demand in Pakistan from 1974 to 2019.

Methodological Approach

This section discusses methods and measures to understand the impact of monetary and economic uncertainty on MD. In the proceeding sub sections the study has discussed theoretical framework, variable construction, data sources and appropriate econometric techniques.

Theoretical Framework

Why do individuals save their money? Keynes (1936) contended that individuals keep money because it serves as a stockpile of rate and smooth monetary dealings. The Keynes considered income to be a basic driver of the MD function, whereas interest rates are integrated as an opportunity cost of maintaining real money balance. Like Keynes (1936), Baumol (1952) and Tobin (1956) claimed that interest rates had a detrimental impact on the motivation to keep money. As a result, the typical MD function is as follows

$$M_p = m = b_i\,(y, r)$$

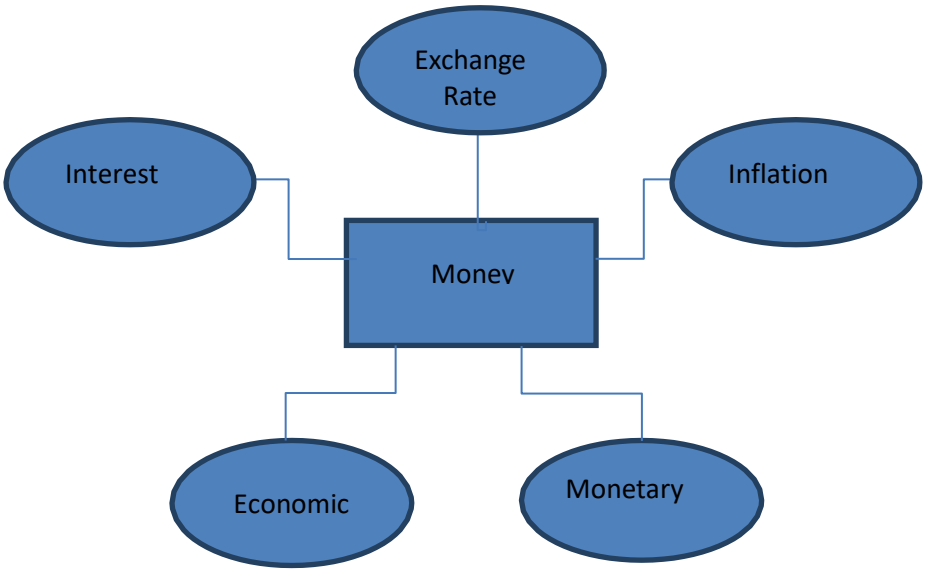
where M = nominal money balance, P = price level, m = demand for real money balance, Y = income, r = interest rate.

Mundell (1963) suggested that, in the case of a bendy alternate price device, the alternate charge, together with interest rate and earnings, should be considered in figuring out the call for money. Furthermore, Crockett and Evans (1980) claimed that interest charges in financially evolved international locations can be considered as an opportunity price for keeping cash. In line with Crockett & Evans (1980), in the case of developing countries, the inflation rate, instead of the hobby price, needs to be visible as a possible price of keeping a

coin's stability. The conceptual framework is summarized as follows.

Sakib (2021) explored that inflation and interest rates are the primary references to the economy in many economic laws. More people and businesses will borrow extra funds from banks and alternative lenders with lower interest rates. As a result of the subsequent savings, higher interest rates force people to go into savings mode. There will be a less financial gain for consumers to pay, which will slow down the economy and reduce inflation. This relationship affects current fiscal policies as the most influential people decide the course of the economy. A linear relationship between fluctuating interest rates and inflation will affect economic strength. Inflation and interest rates are common economic indicators in various macroeconomic laws. In short, as interest rates fall, more people and businesses can borrow more money from banks and other lenders. As a result, end-users have more money to spend on their businesses (expenses), which leads to economic growth and, consequently, higher inflation. The reverse is also true: "High-interest rates." Rising interest rates encourage consumers to save because savings offer big rewards (Ireland, 2008). As a result, consumers have less money to spend, which causes the economy to stagnate.

Figure 3.1: Conceptual Framework



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Here, Money demand (MD) is the outcome variable and interest rate, exchange rate, inflation rate, economic uncertainty, and monetary uncertainty are the explanatory variables. Economic and monetary uncertainty also effect money demand negatively in short runs but in long run its effects significands because of hedging. Inflation and interest rates are common references to the economy in various macroeconomic laws. In short, as interest rates fall, more people and businesses are able to borrow more money from banks and other lenders. As a result, end users have more money to spend on their businesses (expenses), which leads to economic growth and consequently higher inflation. The reverse is also true: "High interest rates." Rising and rising interestrates encourage consumers to save because savings offer big rewards (Ireland, 2008).

Variable Construction and Data Sources

To measure uncertainty GARCH (1,1) is approach. For economic uncertainty (VGDP) for the selected Asian countries five variable index is used. It includes government expenditure, exports, imports, remittances, and foreign direct investment (FDI). The standard deviation of each of the five observations is used to calculate the variable fluctuations using the rolling technique. Next, the index values are created by pluggingin the formula: where

$$VGDG = \sum_{i=1}^{n} \gamma_i \ (V_1 - V_1)$$

Where v shows the volatility of ith variables the and V_1 shows the average volatility. Where γi showing the actual weights close to separate factors. Similarly, for monetary fluctuations (VM2) monthly data on nominal money supply M2 is used and apply GARCH (1,1) approach. The study has converted monthly fluctuations into average fluctuations by taking average of 12 months. The variable description and the data sources are summarized in table

Table 1: Description of Variables

Variable	Measure	Symbol	Source	Time Period
Money Demand	Broad money (% of GDP)	M2	WDI	1990 to 2020
Inflation	Inflation, consumer prices (annual %)	INF	WDI	

Exchange Rate	Exchange Rates, Domestic Currency per U.S. Dollar, End of Period, Rate	EX	IFS
Interest rate	Financial, Interest Rates, Monetary Policy- Related Interest Rate,	IR	IFS
GDP	GDP (current US$)	GDP	WDI
VGDP	Volatility of GDP	VGDP	
PVGDP	Positive Volatility of GDP	PVGDP	
NVGDP	Negative Volatility of GDP	PVGDP	
VM2	The volatility of the Money Supply	VM2	
PVM2	Positive Volatility of Money Supply	PVM2	
NVM2	The negative Volatility Money Supply	NVM2	

Source: World Development Indicator (WDI), International Financial Statistics (IFS)

Econometrics Techniques

The study has used linear Autoregressive Distributive Lag (ARDL) model and Nonlinear Autoregressive Distributive Lag (NARDL) methods to analyze the effect of monetary and economic uncertainty on MD in selected Asian countries.

Linear ARDL Model

Unlike previous approaches to testing cointegration, Peasaran et al. (2001) proposed a unique equation which was a linear ARDL co-integration-model which shows the order of integration of the independent variables might be one or zero, or mutually cointegrated. Even with a small sample size, ARDL model can be estimated. Because of these appealing properties, the testing of ARDL bounds approach is used. F-statistic determines the long-term relationship between the basic variables (Wald test). When the F-statistic exceeds the critical value band, this implies that long run relationship exists. The most significant advantage of this method is that it can identify interconnected vectors when there are multiple coherent vectors. However, this strategywill fail in the face of an integrated stochastic trend of I (2).

Nonlinear ARDL Model

Shinn & Nimo examined a nonlinear model during 2014; the model were utilized this model

was used for both positive and negative decomposition of partial sum, permitting the asymmetric effects in short and the long run, and executed the cointegration examination. Due to the construction of partial sum and non-linearity, Shin & Nimmo (2014) used the non-linear ARDL model. The study established that the model estimated using OLS and Bound Testing can provide long run reliable estimates, irrespective of their order of integration.

The main factors of each country's money demand are real or nominal GDP, price levels, interest rates, and exchange rates. Following Oskooee et al. (2020); and Friedman (1984), the following models are formulated for the selected Asian countries.

The linear model can be presented as follows.

$$LM2_t = \beta_0 + L\,(\beta_1 VGDP_t + \beta_2 IR_t + \beta_3 EX_t + \beta_4 INF_t + \beta_5 VM_t) + u_t \qquad (1)$$

Here L shows the lag of variables. According to Equation (1), the demand for real money is the function of the volatility of real GDP (VGDP), price level (INF), interest rate (IR), nominal effective exchange rate (EX), and volatility of money supply (VM). Where the VGD and VM2 represents monetary uncertainty and economic uncertainty. M2 is the money demand which is the outcome variable.

According to the monetarists' & Keynesian hypotheses, the expected β_1 should be positive, which means that the monitory demand should be increases along with income at the cost of inescapable earnings of interest. Simultaneously, the β_2 should negative till the rate of interest considered prospect of holding money. However, the signs of $\beta 3$Type equation here.

$$\Delta LM2_t = \alpha + \sum_{i=1}^{a} \gamma_i\, \Delta LM2_{t-i} + \sum_{i-1}^{b} \delta_i\, \Delta GDP_{t-i} + \sum_{i=1}^{c} \varepsilon_i \Delta IR_{t-i} + \sum_{i=1}^{d} \theta_i \Delta EX_{t-i} + \sum_{i=1}^{e} \vartheta_i \Delta INF_{t-i} + \sum_{i=1}^{f} \varepsilon_i \Delta LVM2_{t-i} + \sum_{i=1}^{g} \mu_i \Delta LVGDP_{t-i} + \varepsilon_t \qquad (2)$$

where Δ is the first difference operator; α is the drift term; a to f are the optimum lag lengths selected by the Akaike information criterion (AIC). γ, η, λ, δ, θ, ϑ and μ are the short-run parameters while The long-run effects of the variables are captured through a separate cointegrating equation, often normalized on one of the variables (e.g., r0r_0r0).Finally, εt is the white noise error term.

Analysis, Results and Discussion

The study examines the asymmetric effect of economic and monetary uncertainty on MD for

the selected South Asian countries by using data from 1990 to 2020. First, the study checked the stationarity of the data series. Second, the linear and non-linear ARDL models are estimated in the proceeding sections.

Unit root test (ADF)

The study used Augmented Dicky Fuller (ADF) test to investigate the stationarity of the data. The H_0 (Null-Hypothesis) tells us that the series has a unit root. The alternative hypothesis is the series is stationary. To determine maximum lag length Akaike information criterion (AIC) is used. The results of unit-root test are given in the following table. No.4.1.

Table 4.1: ADF Unit root test

S. No.	Countries		Variables					
		Status	M2	INF	EX	IR	VGDP	VM2
1	Bangladesh	I(0)	-0.30	4.80***	-3.94***	-0.22	-23.58***	-1.97
		I(1)	-3.90***			-5.660***		-4.42***
2	India	I(0)	-1.19	4.25***	-0.62	-2.22	-5.13***	-8.30***
		I(1)	-3.91***		-7.44***	-6.97***		
3	Indonesia	I(0)	-2.29	-3.14**	-0.65	-2.71***	6.51***	-2.52
		I(1)	-3.24**		-5.70***			-1.52***
4	Japan	I(0)	-1.37	3.13***	-3.53**	-2.43	-9.24***	-2.06
		I(1)	-5.25***			.5.69***		-4.26***
5	Philippines	I(0)	-1.40	-1.90	-1.49	-2.35	-5.03***	-8.73***
		I(1)	-5.26***	-9.26***	-6.01***	-9.16***		
6	Singapore	I(0)	-1.98	-3.48**	-2.03	-5.54***	-9.21***	-1.27
		I(1)	-6.16***		-5.29***			-5.91***

***** shows the 1 %, **shows the 5 %, and * shows the 10 % level of significance**

The result shows that some series are I (1) stationary and some are I (0) stationary. For instance, M2 is I (1) stationary for all countries, the inflation rate is I (0) stationary for all countries except for the Philippines, it is I (1) stationary for the Philippines. Similarly, the exchange rate is I (1) stationary for all countries except for Bangladesh, Indonesia, and Singapore. Interest rate is also I (1) stationary for all countries except Indonesia and Singapore. VGDP is level stationery for all countries. VMS is the first difference stationary for

all countries except for India and the Philippines. Hence, some series are level stationery and some are I (1) so in this situation, the ARDL model is the most appropriate econometric technique.

The Short-run and Long-run Estimates of Linear ARDL

The Short-run Estimates

The short-run estimate of the linear ARDL model is reported in table 4.2. In the short run, monetary uncertainty (VMD) and economic uncertainty (VGDP) significantly affect MD. The coefficient of VGDP is positive and significant for Indonesia. It means that VGDP has a positive link with money demand. It implies that a one percent change in VGDP brings a 0.57 percent change in money demand. The coefficient sign of the VGD of Bangladesh is positive and significant. It means a one percent change in VGDP brings a 2.51 percent change in money demand. The coefficient sign of VGDP for Japan is negative and insignificant. The association between VGDP and money demand is positive and statistically significant for India. For Singapore, and the Philippines thestudy found it negatively significant.

The interest rate with money demand found negative associations for Indonesia, Bangladesh, Japan, and Singapore Philippines except for India. It means a change in IR rate brings a -0.067, -0.57, and -0.98 % decrease in Money demand. In the case of India, a change in IR rate brings a 0.130 % change in money demand cash holding is increased. The lag value of IR was also found negative and significant. Precisely the same finding was found in the U.S for money demand (Choi & Oh 2003).

VM2 represents the monetary uncertainty coefficient, and the estimate of Vm2 is negatively founded but statistically significant. The relationship between money demand and monetary uncertainty is inversely related to all countries except India. An increase in Monterey uncertainty causes the money demand of the people of selected countries not to hold more money. If a one percent change in Monterey uncertainty brings -0.67***, -1.17**, and -1.87** percent decrease in money demand in Indonesia, Philippines, and Singapore respectively. The short-run estimate of inflation also significantly affects the money demand. Inflation was founded positively linked with money demand for Indonesia. Further money demand and inflation are negatively associated with India, Singapore, Bangladesh, and the Philippines. It

means a one percent change in inflation brings **0.02**, -0.0003**,** and -0.068* decrease in money demand and inflation without lag for Indonesia, Japan, and a positive link with money demand. After a lag, it becomes negative associations with money demand. A similar finding was founded by (Bahmani- Oskooee et al. 2012) for China. Moreover, the Exchange rate is a negative association with money demand. A change in the exchange rate brings a decrease in money demand domestically.

Table 2: Linear ARDL Model

	Linear ARDL			
Variables	**Indonesia**	**Bangladesh**	**Japan**	**India**
	Panel A: Short run			
D(VGDP)	0.57**	2.51***	-0.51	1.38***
	(1.99)	(2.01)	(-1.13)	(2.360)
D(VM2)	-0.67***	-1.17**		0.130***
	(-3.48)	(-2.5)		(2.36)
D(IR)	-0.67***	-0.58**	-0.98	0.00019
	(-3.48)	(2.02)	(-1.60)	(0.27)
D(IR-1)	0.73***			
	(3.94)			
D(IR-2)	-0.31***		-0.017**	
	(2.51)		(-2.51)	
D(INF)	0.006***	-0.02	0.057	-0.0003
	(3.64)	(0.13)	(0.83)	(-0.62)
D(INF-1)	-0.003***		-0.002*	
	(-4.3)		(-1.92)	
D(EX)	-0.10***	-1.33*	-0.09**	0.002
	(-3.30)	(-2.01)	(2.40)	(-1.52)
D(EX-1)				
CointEq(-1)		-0.16*		0.05
		(-2.29)		(0.60)
Variables	**Philphanese**		**Indonesia**	
D(VGDP)	-0.090***		-3.05***	
	(-2.81)		(-2.06)	
D(VGDP-1)				
D(VM2)	-1.87**		5.13***	

	(-2.58)	(4.02)
D(VM2-1)		
D(IR)	-0.62**	0.07
	(2.58)	(1.62)
D(IR-1)		
D(INF)	-0.068*(-1.74)	-0,20**
		(-2.07)
D(INF-1)		
D(EX)	-0.097***(-	-0.42**
	3.77)	(-2,55)
D(EX-1)		
Coint Eq(-1)	-0.14**	-1.26**
	(2.42)	(2.51)

*** shows the 1 %, **shows the 5 %, and * shows the 10 % level of significance

The long-run Estimate of Linear ARDL Model

Table 4.3 Panel B shows the long-run associations of the listed six countries. The results indicate that VGDP economic uncertainty is positive and significantly associated with money demand for Bangladesh, Indonesia, and Japan. Economic uncertainty increases the money demand also increases in the log-run because they will be a hedge against economic uncertainty. VGDP is significant at1 and 10 percent. Economic uncertainty is a negative and statistically insignificant association with India, Philphanese, and Singapore money demand. VM2 shows monetary uncertainty, and the results reveal that VM2 has a positive link with money demand except in Bangladesh. Monterey uncertainty is significantly Table.

No. 4.3 Panel B shows the long-run associations of the listed six countries. The results indicate that VGDP economic uncertainty is positive and significantly associated with money demand for Bangladesh, Indonesia, and Japan. Economic uncertainty increases the money demand also increases in the long run because it will be a hedge against economic uncertainty. VGDP is significant at1 and 10 percent. Economic uncertainty is the negative and statistically insignificant association with India, Philphanese, and Singapore money demand.

VM2 shows monetary uncertainty, and the results reveal that VM2 has a positive link with money demand except in Bangladesh. Monterey uncertainty significantly affected the money

demand. The long-run monetary uncertainty coefficients are positively associated with money demand in most countries except Bangladesh. A positive link explained that if one change in the monetary uncertainty brings (6.63, 10.7, 8.7 10.9) an increase in money demand in Indonesia, Japan, Philphanese, and Singapore. The long-run estimate of VM2 in India is statistically insignificant. The coefficient estimates of vm2 for Bangladesh founded negatively, but it is statistically significant. Previous studies support our findings by Inoue & Hamori (2008) and Kiptui (2014).

Table 3: Long-run Estimate of Linear ARDL

Panel B: Long run						
	Indonesia	**Bangladesh**	**Japan**	**India**	**Philippines**	**Singapore**
VGDP	10.83***	15.2***	5.59*	-0.003	-0.062	-8.52
	(2.92)	(3.63)	(1.97)	(-0.03)	(-0.09)	(-0.97)
VM2	6.63***	-1.25**	10.77***	0.007	8.73**	10.79*
	(5.73)	(-2.27)	(3.36)	(0.14)	(2.56)	(1.96)
IR	-0.043**	0.79***	0.001	0.05	0.011	-0.021
	(-2.06)	(18.60)	(0.25)	(0.93)	(0.98)	(-1.16)
INF	-0.097**	0.02	-0.06	-2.599	0.047	-0.087
	(-2.04)	(0.13)	(-0.82)	(-0.49)	(1.49)	(-0.92)
EX	-0.021***	-0.09	-0.027	-1.53	0.069***	0.76
	(-4.33)	(-0.22)	(4.98)	(0.74)	(3.67)	(5.09)

Note: *** shows the 1 %, **shows the 5 %, and * shows the 10 % level of significance

IR shows the interest rate. The output indicates that interest rate is negatively linked with money demand in Indonesia and Singapore. But interest rate significantly affects the money demand in Indonesia and Singapore, found insignificant. The negative association of interest rate shows that "whenever IR becomes higher, the yields on saving deposits and other assets increased, which raises the opportunity cost of holding money." Consequently, the people wanted to hold alternate money, so the demand for money declined. Same like the previous study support our results of Mangla, (1971) and Ibrahim (2001).in different countries. Interest rate is positively linked with money demand in Bangladesh, Japan, India, and the Philippines, but all were found statisticallyinsignificant except in Bangladesh.

INF represents inflation in the results showing that the inflation rate is an opportunity cost of holding money in the long run. The inflation rate is founded significant only in Indonesia. The inflation rate is negative and insignificant associated with money demand in Indonesia, Japan, India, and Singapore, except Bangladesh, which is positively linked with money demand. Further, the exchange rate is negatively linked with money demand in more countries except for Singapore. If a rise in the exchange rate indicates a decrease in the value of the domestic currency (M2), it affects the demand for money. The people want to convert their holdings (M2) into foreign assets due to the prediction of a further fall in domestic currency value. The exchange rate is statistically significant, found only in Philippines and Indonesia. The results of the long-run coefficient show that economic and monetary uncertainty both affect money demands significantly in the long run (Gul & Sajid 2020) supporting our results.

Table 4: Diagnostic test

Panel C: Diagnostic test						
	Indonesia	Bangladesh	Japan	India	Philippines	Singapore
F TEST	8,73***	598**	6.18***	3.75*	4.14**	8.21***
R^2	0.95	0,87	0.76	0.45	0.81	0.76
Adj R^2	0.92	0.85	0.73	0.31	0.76	0.69
QS (QS 2)	S,S	S,S	S,S	S,S	S,S	S,S
LM TEST (P-Chi ^{2})	0.20	0.16	0.78	0.12	0.35	0.21
Breusch-Pagan Godfey (chi ^{2})	0.67	0.34	0.17	0.31	0.51	0.15
JB test (P value)	0.99	0.41	0.44	0.23	0.79	0.51

Note *** shows the 1 %, **shows the 5 %, and * shows the 10 % level of significance

Table 4.4 shows the ARDL diagnostic test where the F test value is greater than the upper bound critical value; hence we accept the hypothesis of co-integration among all

variables. The value of R2 indicates that all models are of good fit. All values are above

0.05. R2 explained the variation of an independent variable due to dependent variables. The researcher also noted the Lagrange multiplier test to check the serial correlation among the residuals. The results show that there is no autocorrelation among variables. Furthermore, the

stability tests QS and QS2 shows that all estimates are stable in the selected sample of countries.

Estimation Results of Nonlinear ARDL

The long-run and short-run estimate of Nonlinear ARDL are reported in table 4.5. In this non-linear model, short-run impacts of demand for Money seems last in long run. Moreover, only increase in the coefficient of MD is significant, compare to decrease in the MD, which implies that there exists asymmetric relationship in the long run. To investigate long-run asymmetric impact, Wald test is employed.

Table 5: Nonlinear ARDL

Panel A: Short run						
NLARDL	**Indonesia**	**Bangladesh**	**Japan**	**India**	**Philippines**	**Singapore**
SN & variables	(1)	(II)	(III)	(IV)	(V)	(VI)
D(IR)	-2.001** (-2.36)	-.011* (1.99)		-0.0003 (-0.35)	-0.054** (-2.51) 0.05 (-1.10)	0.021** (2.65) 0.026 (3.54)
D(IR-1)	0.09** (2.22)		-0.031*** (-3.21)	-0.001 (1.61)		
D(INF)	-0.037*** (-3.08)	- 0.0008** (2.17)	-0.001 (-0.12)	-0.0009 (-1.41)	0.013 (1.25)	-2.64 (-3.94)
D(EX)	-0.25*** (-2.81)	0.007 (0.93)	0.005 (0.84)	0.002 (0.54)		
D(EX-1)	4.07*** (4.20)		-1.10 (-0.77)		-6.2* (-1.97)	-6.28 (-5.58)
D(PVGDP)	-0.55** (-2.04)	2.21 (3.41)	-2.08** (-2.59)	2.12 (1.50)	2.38** (2.24)	4.12** (2.91)
D(NVGDP)	0.75 (0.50)	-0.77 (-0.45)	-0.094*** (-3.61)	1.96*** (2.68)	4.85 (1.48)	-0.37*** (-3.21)
D(PVM2)	-0.12** (-2.5)	1.96** (2.76)	2.26** (2.76)	3.46** (2.30)	3.81 (1.39)	0.52** (2.21)

D(NVM2)		-5.6*** (3.01)	-1.05*** (-2.6)	2.03(1.83)	-1.02* (-1,81)	-0.56 (-2.65)
CointEq(-1)		0.32** (2.81)		-0.19** (2.38)		
PANEL B LONGRUN						
IR	0.006668 (0.40)	-0.011* (1.99)	0.036** (2.36)	0.002 (0.413)	0.052 (0.20)	-0.010** (-2.46)
INF	-0.07**(-2.07)	0.031 (0.84)	-0.002(-0.12)	-0.0049 (1.56)	-0.05 (-0.69)	-0.02*** (-3.01)
EX	-0.030*** (-3.38)	0.28** (2.60)	0.074 (10.76)	-0.02* (1.97)	- 0.022*** (5.46)	0.90*** (8.64)
PVGDP	-2.81* (-1.98)	8.12** (2.60)	- 0.37*** (2.81)	-10.76*** (-4.6)	-0.11** (-2.07)	-4.16*** (-2.83)
NVGDP	19.24*** (5.08)	-0.77 (-0.45)	0.11* (1.93)	14.63*(1.85)	2.004***(3.41)	3.30***(2.68)
PVM2	22.05** (2.03)	-9.61*** (-3.01)	2.89 (4.27)	3.85*** (2.41)	-4.75 (-5.83)	-8.15*** (-7.72)
NVM2	5.31(0.51)	1.96 (1.21)	-5.99 (17.84)	-6.85* (-1.93)	7.99 (4.02)	8.41 (7.62)
Panel C: Diagnostic test						
F TEST	4.67**	4.31***	8.17***	7.62***	5.41***	0.97
R^2	0.89	0.94	0.85	0.89	0.81	0.94
Adj R^2	0.85	0.91	0.78	0.86	0.78	S,S
QS (QS 2)	S,S	S,S	S,S	S,S	S,S	0.76
LM TEST (P-Chi ^{2})	0.12	0.32	0.60	0.51	0.61	0.29

Although advantageous and negative, partial sum additives of demand for money coefficients with one-of-a-kind numerical values and importance, the take a look at the result in Panel C shows there isn't sufficient evidence to reject the null hypothesis. The test can't reject symmetric, lengthy-run effects of demand for money. If those lengthy- run estimates are valid,

it must establish co-integration between those series. The calculated F-statistic is lower than the ten% critical value. Consequently, no statistical inference may be made based totally on this test. But, the coefficient of ECMt-1 is badand great and supports co-integration.

In the non-linear ARDL model, Panel A shows the results of the short run. In the case of Indonesia, short-run results are insignificant except for GDP. Money demand and GDP are insignificantly affected in Bangladesh and Japan, while other variables have a significant influence. In the case of India and the Philippines, all the variables are significantly affected in the short run. In Singapore, all the variables have an insignificant effect, while demand for money has a significant impact in the short run.

In the above table, Panel B presents long-run results. In the long run, all variables significantly impact all countries. At the same time, demand for money was affected considerably in the case of Bangladesh and the Philippines.

Some additional diagnostic information is also pronounced in Panel C. Lagrange Multiplier (LM) statistic is for this panel much less than the important fee of 9.48 at a five% importance level, which helps a loss of autocorrelation. Both QS and QS2 suggest that expected quick- and long-run coefficients are stable. Subsequently, I report the version's explanatory energy, adjusted R2, eighty-five% for Indonesia, 94% for Bangladesh and Singapore, Japan and Philippines 78%, 89% for India.

Conclusions

The demand for money depends on the price of different factors, such as the exchange rate, inflation rate, opportunity cost, among other variables in any country. In literature, there is a controversy that whether economic and monetary uncertainty affects MD of domestic currencies positively or negatively. Interestingly empirical literature reached to ambiguous conclusion. Some studies note that economic and monetary uncertainty positively affect MD while other note it negatively affects MD. The present study has contributed to the controversy by investigating the impact of monetary and economic uncertainty on selected Asian countries by using linear and non-linear ARDL models. The data has been collected from WDI and IMF from 1980 to 2020. Money demand is dependent variable, whereas real GDP, exchange rate,

volatility of real GDP (i.e., positive volatility of GDP, negative volatility of GDP), inflation rate, interest rate, the volatility of money supply (i.e., positive volatility of money supply, negative volatilityof money supply) are explanatory variables.

The linear ARDL model shows monetary uncertainty is negatively related to money demand. The results are statistically significant for all countries except India. The short- run estimate of inflation also significantly affects money demand. For Indonesia study observes positive relationship, whereas for India, Singapore, Bangladesh, and Philippines negatively affects money demand. Moreover, the economic volatility positively affects money demand. Further, study notes that interest rate negatively affect money demand except for India.

The long-run coefficient results indicate that VGDP economic uncertainty is positively and significantly associated with money demand for Bangladesh, Indonesia, and Japan. Economic uncertainty increases the money demand in the long run because individuals will hedge against economic uncertainty. Economic uncertainty negative effects money demand in India, Philippines and Singapore, however, results are insignificant. The result reveals that monetary uncertainty significantly affect money demand in positive

direction except for Bangladesh and India. For India results are insignificant. However, in Bangladesh monetary uncertainty negatively affects money demand. The interest rate on the other hand, negatively affect money demand in Indonesia and Singapore. However, results are significant only for Indonesia. Similarly, for Bangladesh interest rate positively affect money demand. The inflation rate negatively affects money demand in Indonesia, Japan, India, Singapore, however results are significant only for Indonesia. Similarly, exchange rate positively affects money demand in Philippine and negatively effects money demand in Indonesia. However, for other countries results areinsignificant.

The results of the non-linear model show that short-run impacts of demand for Money last into the long run. Only an increase in demand for Money is a significant coefficient and not a decrease in demand for Money, which can signify asymmetric long-run impacts. To statistically test asymmetric long-run impacts, the study has employed the WALD test and examine if long-run coefficients are equal. In the long run, all variables significantly impact all countries. At the same time, demand for money was affected considerably in the case of

Bangladesh and Singapore.

Recommendation

Monetary policy in most Asian countries is not stable. Therefore, it is recommendedthat some steps needed to be taken to try more stability in Asian countries.

1. It is needed to avoid disordered variations in the money supply.
2. The government needs to focus on monetary policy and control the moneysupply through the open market operation.
3. The exchange rate in the Asian nation is a big problem the policymaker shouldneed to control the exchange rate variation.
4. This strategy will result in a steady money supply and a more precise approachto inflation targeting.

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