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Revisiting Output and Monetary Uncertainty and Money Demand in Asia

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Abstract

This comprehensive study conducts a meticulous examination of the intricate dynamics governing the relationship between economic and monetary uncertainties and money demand in the Asian context, spanning the extensive timeframe from 1990 to 2023. By utilizing a comprehensive analytical methodology that encompasses both linear and non-linear ARDL models the study illuminates the various elements impacting money demand in the area. Important new information is revealed especially about how uncertainty measures affect money demand in the short term. The substantial impact that different uncertainty measures have on money demand is demonstrated by empirical data highlighting their applicability in Asias complex economic environment. However, exceptions emphasize the nuanced nature of these relationships and the need for context-specific analyses. Delving deeper into the long-term perspective, the study unravels the intricate web of determinants shaping money demand in the scrutinized Asian nations. Variables like exchange rates and interest rates, alongside economic and monetary uncertainties, emerge as pivotal factors with discernible impacts. Nevertheless, intriguing variations in the nature and magnitude of these effects manifest across different countries within the Asian region. A salient conclusion drawn from this research underscores the imperative role of policymakers in the Asian context. To maintain stability and facilitate effective monetary management, policymakers are urged to place heightened emphasis on crafting and implementing judicious monetary policies. These policies should not merely address the critical concern of inflation but also confront economic uncertainties head-on. By adeptly navigating these intricate challenges, policymakers can aspire to achieve the overarching goal of stabilizing money demand in Asia's diverse and dynamic landscape.

Keywords Monetary Uncertainty, Economic Uncertainty, Money Demand and Asymmetry

Introduction

Since the middle of the 1970s one of the main topics in monetary economics has been the investigation of the money demand (MD) functions stability. The need to establish a reliable and consistent relationship between the factors influencing money demand and different metrics of monetary aggregates gave rise to this focus. The implications of this stability extend to monetary policy, particularly the management of money supply (MS) as an effective tool for influencing economic conditions, as articulated by Poole in 1970.

The MD relationship holds a pivotal role in both New Keynesian and New Classical economic models. However, empirical evidence regarding the stability of the MD function has presented some challenges. Studies such as those by Dixon in 1997, Cuthbertson in 1991, and Laidler in 1985 have contributed to the debate by highlighting the inconclusive nature of these stability claims.

There was a big change in 1979 when the U. S. The Federal Reserve shifted its emphasis from interest rate management to monetary aggregate control mainly as a means of containing inflation. This change led to criticism of the Quantity Theory of Money (QTM) a key idea in monetary economics. Critics questioned the validity of the QTM, asserting that the surge in inflation was not solely due to changes in MS but was influenced by the instability of MS itself. As a result, the velocity of money became erratic, and people began holding more money as a precaution against uncertain economic futures. This shift emphasized the role of uncertainty as a significant factor influencing the MD function.

In essence, the stability of the MD function remains a key concern in monetary economics, especially considering historical shifts in monetary policy and the profound impact of uncertainty on individuals' decisions regarding money holdings.

Based on data from the International Monetary Fund (IMF) spanning from 1990 to 2021, this index measures global economic uncertainty, with higher values indicating heightened levels of uncertainty. The graph illustrates a period of relatively low uncertainty at the beginning of the dataset but also highlights a substantial increase in global economic uncertainty from 2010 to 2021. This decade witnessed a significant surge in worldwide economic uncertainty, underlining its persistent relevance.

It's essential to note that existing studies on the effects of uncertainty on money demand have often assumed that these effects are symmetric, implying that higher uncertainty leads to increased money demand. However, this assumption may not always hold true, as individuals' expectations regarding the duration of uncertainty changes can impact their responses. For example, if people perceive a reduction in uncertainty as temporary, they may not increase their cash holdings at the same rate as when uncertainty increases.

In order to fill a significant gap in the literature this study will investigate in detail how monetary and economic uncertainty affect money demand in a sample of Asian economies including China Japan India Singapore Indonesia Malaysia and the Philippines. With an asymmetric analytical approach that takes into account both immediate and long-term impacts this study aims to shed light on the complex relationship between these factors in the context of South Asian economies.

Spanning a substantial dataset that encompasses three decades from 1990 to 2023, this research endeavors to provide valuable insights for policymakers and governments. These insights can aid in the formulation of effective policies that address the intricate factors impacting money demand in a dynamic and diverse economic landscape.

The objectives of this study revolve around assessing the effect of both monetary and economic uncertainty on the demand for money in the selected Asian nations. To achieve this, the study employs an asymmetric analytical method. The subsequent sections will review relevant literature, outline the methodology and theoretical framework, present estimation results, and conclude by offering pertinent policy implications, thus contributing to our understanding of the complex interplay between economic and monetary uncertainty and money demand in the Asian context.

Review of Literature

The examination of the relationship between monetary and economic uncertainty and its impact on the demand for money has been a subject of extensive research conducted across various countries. This body of work has revealed diverse effects on money demand, shedding light on the complex dynamics at play.

Bloom (2014) introduced the concept of "Knightian uncertainty," which has become a significant reference point in subsequent literature. This concept describes situations in which economic agents face unpredictable and unassessable future events, disrupting expectations and informed decision-making. Knightian uncertainty captures scenarios where individuals and businesses are unable to foresee or evaluate future economic conditions, prompting behavioral adjustments. For instance, individuals facing uncertainty regarding future incomes may choose to defer spending and increase savings, a phenomenon known as precautionary saving. This illustrates how economic uncertainty influences money demand by prompting changes in behavior.

Oskooee et al. (2012) delved into the impact of financial and economic uncertainty on money demand across various countries. Their findings suggested that increases in uncertainty factors led individuals to reallocate their holdings between financial assets and other tangible assets, with short-

term impacts evident. However, these effects did not persist in the long run, highlighting the transient nature of uncertainty's influence on money demand.

Oskooee (2011) extended this inquiry to assess the strength of demand for money in Australia, incorporating economic and financial uncertainty measures based on GARCH models. Contrary to earlier research, this study discovered that both forms of uncertainty had both short-term and long-term effects on M3 money demand in Australia.

The effect of monetary and economic uncertainty on money demand in Thailand was studied by Bahamani (2015). According to the study people changed their asset allocations and portfolios between cash and other financial assets in reaction to monetary and economic uncertainty which were both represented in the volatility of nominal monetary aggregates like M2 and real GDP respectively. Risk perceptions affected these changes some people increased their cash holdings as a hedge while others sought to protect themselves from price swings by holding less hazardous physical assets. There were both short-term and long-term impacts on money demand for both uncertainty measures.

Oskooee et al. (2017) investigated how economic and financial uncertainty impacted money demand in Korea. Utilizing GARCH models, they included two measures of uncertainty in their analysis. The study uncovered short-term significance for both measures, but only the adverse effects of output uncertainty persisted over time, resulting in a stable money demand function. According to Oskooes (2022) co-integration revisit of money demand research in Korea none of the countrys financial aggregates showed a long-term correlation with income interest rates or exchange rates pointing to possible deteriorating relationships over time.

Taking into account both positive and negative correlations between exchange rates and money demand Khan and Shafiq (2022) investigated the effect of real effective exchange rates on currency demand in Pakistan between 1974 and 2019. The intricate and complex relationship between monetary uncertainty the economy and money demand is highlighted by this thorough literature review. It emphasizes the need to consider various economic indicators and models to gain a holistic understanding of how these uncertainties affect money demand dynamics across different countries.

Model and Methodology

Theoretical Framework

To gain insights into why individuals choose to save money, we can draw from the foundational theories of Keynes (1936), who asserted that people hold money for facilitating transactions and as a store of value. Keynes identified income as a fundamental determinant of the Money Demand (MD) relationship. Additionally, he recognized that interest rates represent an opportunity cost associated with holding real money balances. In line with Keynes' ideas, scholars like Tobin (1956) and Baumol (1952) argued that higher interest rates discourage the holding of cash. Consequently the following is an expression for the traditional money demand function.

$MD = f(Y, i)$

Where:

MD represents Money Demand.

Y denotes income, reflecting the transactionary aspect.

i signifies the interest rate, representing the opportunity cost of holding money.

This framework serves as the foundation for understanding how economic and monetary uncertainties may influence the demand for money. The study aims to investigate whether these uncertainties introduce additional factors that modify the conventional MD function.

In the context of this theoretical framework, the Money Demand (MD) function can be expressed as follows:

$M/P = m(Y, r)$

M represents the nominal money balance.

P is the price level.

The demand for real money balance is represented by the formula m(Y r) which depends on both income (Y) and interest rate (r). It's essential to note that when $\partial Y > 0$ and $\partial m > 0$, it signifies that as income increases, the demand for real money balance also rises, indicating a positive relationship with income. Furthermore when ∂r 0 and ∂m 0 it implies that the demand for real money balance falls as the interest rate rises indicating a negative correlation between the two variables.

Mundell (1963) introduced the idea that, in the context of a flexible exchange rate system, the exchange rate, along with income and interest rates, would play a significant role in determining the

demand for money. Furthermore, Crockett and Evans (1980) argued that in economically developed countries, interest rates could be seen as the opportunity cost of holding money. Conversely, in developing nations, it's the inflation rate, rather than the interest rate, that should be perceived as a potential cost of holding a currency's value.

Sakib (2021) emphasized the substantial role of inflation and interest rates in various economic theories. Lower interest rates encourage more individuals and businesses to borrow funds, resulting in increased spending and economic growth. Conversely, higher interest rates prompt individuals to save more, leading to reduced spending, economic slowdown, and lower inflation. This dynamic relationship between fluctuating interest rates and inflation influences current fiscal policies, impacting the overall economic trajectory. In essence, there exists a linear relationship between interest rates and inflation, where falling interest rates stimulate borrowing and spending, ultimately fueling economic growth and inflation. Conversely, rising interest rates encourage savings, curbing spending, and potentially leading to economic stagnation.

In this analysis, Money Demand (MD) serves as the dependent variable, while explanatory variables encompass interest rates, exchange rates, inflation rates, economic uncertainty, and monetary uncertainty. Notably, economic, and monetary uncertainties exhibit negative short-term effects on money demand, but their significance grows in the long run due to hedging behaviors. The connection between inflation and interest rates holds a prominent place in various macroeconomic theories. When interest rates decrease, individuals and businesses gain increased access to borrowing from banks and other lenders. Consequently, consumers have more financial resources to allocate toward their businesses, leading to economic expansion and, ultimately, higher inflation rates. Conversely, the inverse relationship is equally valid: high interest rates compel individuals to prioritize saving, as savings offer substantial returns (Ireland, 2008).

In the context of this study, economic uncertainty, denoted as VGDP, is quantified in the selected Asian countries using a comprehensive five-variable index. This index takes into account various economic indicators, including government expenditure, imports, exports, remittances, and foreign direct investment. To capture the degree of fluctuations in each of these five variables, a rolling technique is applied, which calculates the standard deviation over time. Subsequently, the index values are computed using the following formula:

$VGDP = \sum i\ \gamma i(VI - V1)$

Where:

VGDP represents the economic uncertainty index.

VI represents the volatility of the ith variable.

V1 signifies the average volatility.

γi denotes the weight assigned to each individual factor.

On the other hand, to gauge monetary fluctuations, the study relies on the M2 measure, which represents the nominal money supply reported on a monthly basis. These monthly fluctuations are transformed into average fluctuations by computing a 12-month average. The table provided below furnishes comprehensive details regarding data sources and descriptions of the variables under consideration

Table 1: Variables Description

Variable	Symbol	Measure	Source	T
Inflation	INF	Inflation, CPI (annual %)	WDI	1990 -2023
Money demand	M2	Broad money (GDP%)	WDI	
Exchange Rate	EX	Exchange Rates, (Domestic Currency per USD)	IFS	
GDP	GDP	GDP (current US$)	WDI	
Interest rate	IR	Financial, Interest Rates, Monetary Policy-Related Interest Rate,	IFS	
VGDP	VGDP	GDP Volatility		
NVGDP	PVGDP	GDP Negative Volatility		
PVGDP	PVGDP	GDP Positive Volatility		
VM2	VM2	Money supply volatility		
NVM2	NVM2	The negative Volatility Money supply		
PVM2	PVM2	Money supply Positive Volatility		

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

The study evaluated how monetary and economic uncertainty affected the money supply in Asian nations using both linear Autoregressive Distributive Lag (ARDL) and nonlinear Autoregressive Distributive Lag (NARDL) models. Peasaran and colleagues proposed the linear ARDL model. Potential cointegration is indicated by (2001) which allows independent variables with different integration orders. It is suitable for limited sample sizes and can detect interconnected vectors when multiple coherent vectors are present. The nonlinear model, developed by Shinn and Nimo (2014), breaks down the partial sum in both positive and negative directions, allowing for asymmetric impacts in both short- and long-term. Regardless of the order of integration or the use of Ordinary Least Squares (OLS) or Bound Testing, the ARDL model provides reliable long-term predictions. The study builds upon Friedman's work and applies models specific to the chosen Asian nations.

The linear model can be presented as follows.

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

In this equation which is represented as Equation (1) L stands for the variables lag. A number of variables such as the volatility of the money supply (VM) the nominal effective exchange rate (EX) the interest rate (IR) the price level (INF) and the volatility of real GDP (VGDP) are used to model the demand for real money. It is significant to remember that VGDP and VM2 represent monetary and economic uncertainty respectively in this context. The money demand or more precisely M2 is the dependent variable.

Both monetarists and Keynesians theories posit certain expectations regarding the coefficients in this equation. Specifically, the anticipated coefficient for 1 is expected to be positive, implying that monetary demand should increase with rising income, at the expense of foregone interest earnings. Conversely, the coefficient for 2 is expected to be negative, indicating that monetary demand should decrease as the interest rate considered favorable for holding money rises. The signs of the coefficient for 3, however, are not explicitly mentioned in the provided information.

$$\Delta LM2_t = \alpha + \sum_{i=1}^{} \Delta LM2_{t-i} + \sum_{i=1}^{} \Delta GDP_{t-i} + \Sigma^c \lambda i \Delta IR_{t-i} +$$
$$\Sigma^d_{i=1} \varphi i \Delta EX_{t-i} + \Sigma^e_{i=1} \omega i \Delta INF_{t-i} + \Sigma^f_{i=1} \psi i \Delta LVM2_{t-i} + \Sigma^g_{i=1} \phi i \Delta LVGDP_{t-i} +$$
$$r0LM2t-1 + r1GDPt-1 + r2IRt-1 + r3EXt-1 + r4INFt-1 + ct \quad (3)$$

where Δ is the first difference operator α is the drift term and a to f are the ideal lag lengths chosen using the Akaike information criterion (AIC). The short-term parameters are $\gamma\ \eta\ \lambda\ \varphi\ \omega+$ and $\omega-$ and the long-term effects are shown by estimates of r 1 to r 5. The estimates for the long term are normalized on $r0$. Lastly the error term for white noise is εt.

Analysis and Results

This study uses data from 1990 to 2023 to examine the disparate effects of monetary and economic uncertainty on MD in a few South Asian countries. Several essential steps make up the research methodology. The data series stationarity is first evaluated. Following that estimates are made for both linear and non-linear Autoregressive Distributive Lag (ARDL) models. The Augmented Dickey-Fuller (ADF) test is used to evaluate stationarity. According to the null hypothesis (H0) the series is non-stationary because it contains a unit root. The alternative hypothesis on the other hand contends that the series is stationary. The Akaike Information Criterion (AIC) is used to determine the maximum lag length. Table 4. 1 displays the unit-root test results. The results of the study show that the different series that are being studied show both I(1) and I(0) stationarity. In the Philippines for example the inflation rate is I(1) but in all other countries it is stationary at I(0).

Conversely, M2 displays I(1) stationarity in all countries. Additionally, all countries except Indonesia, and Singapore exhibit I(1) stationarity in the currency rate. Interest rates, except in Singapore and Indonesia, display I(1) stationarity in all countries. VGDP remains stable and level across all nations, except for India and the Philippines, where VMS exhibits first-difference stationarity. Due to this mixed stationarity, the adoption of the ARDL model is considered the most appropriate econometric approach in this context.

The short-term projections from the linear ARDL model are presented in Table 4.2. Both monetary uncertainty (VMD) and economic uncertainty (VGDP) exert significant influences on MD

in the short term. Notably, the coefficient of VGDP is positively significant for Indonesia, indicating a direct relationship between VGDP and money demand. Specifically, a 1% change in VGDP leads to a 0.57% increase in money demand for Indonesia. However, in Japan, the VGDP coefficient sign is negative and not statistically significant. In India, there exists a positive and statistically significant association between VGDP and money demand. In contrast, Singapore and the Philippines exhibit a negative and significant relationship between VGDP and money demand.

All countries except India show negative correlations between interest rates and money demand: Indonesia Japan Singapore and the Philippines. This suggests that different interest rate changes cause different amounts of money demand to decline such as -0. 067 percent for Indonesia -0. 57 percent for Japan and -0. 98 percent for Japan. In India on the other hand an increase in interest rates causes the demand for money to rise by 0 to 130 percent which is an unusual trend. Similar to findings in the U. S. the interest rates lag value also shows a negative and significant relationship. S. for the need for money (Choi and Oh 2003).

An inverse relationship between money demand and monetary uncertainty is suggested by the consistently negative and statistically significant coefficient estimate of VM2 which represents monetary uncertainty with the exception of India. People are deterred from holding more money in the chosen nations when monetary uncertainty rises. The money demand in Indonesia the Philippines and Singapore for example decreases by 0 percent 1 percent and 1 point 87 percent for every 1 percent increase in monetary uncertainty. The money demand is also greatly impacted by the short-term inflation forecast. Money demand and inflation have an inverse relationship in Indonesia while they have a negative relationship in Singapore India and the Philippines. This indicates that for every 1 percent increase in inflation money demand immediately declines falling by 0 percent in Indonesia 0 percent in Singapore and 0 point 068 in the Philippines respectively. When there is a lag the relationship is still advantageous for India but becomes unfavorable for Indonesia and Japan. This is in line with what Bahmani-Oskooee et al. found. (2012) in China. Additionally the exchange rates negative correlation with domestic money demand suggests that changes in the exchange rate cause money demand to decline. Overall the study offers thorough insights into the connections between money demand and economic and monetary uncertainty in the chosen South Asian nations emphasizing both immediate and regional variations.

Table 2: Linear ARDL Mode

Vari	**Indonesia**	**Japan**	**India**
D(VGDP)	0.57**(1.99)	-0.51(-1.13)	1.38***(2.360)
D(VM2)	-0.67***(-3.48)		0.130***(2.36)
D(IR)	-0.67***(-3.48)	-0.98(-1.60)	0.00019(0.27)
D(IR-1)	0.73***(3.94)		
D(IR-2)	-0.31***(2.51)	-0.017**(-2.51)	
D(INF)	0.006***(3.64)	0.057(0.83)	-0.0003(-0.62)
D(INF-1)	-0.003***(-4.3)	-0.002*(-1.92)	
D(EX)	-0.10***(-3.30)	-0.09**(2.40)	0.002(-1.52)
D(EX-1)			
CointEq(-1)			0.05(0.60)
Variables	**Philphanese**	**Indonesia**	
D(VGDP)	-0.090***(-2.81)	-3.05***(-2.06)	
D(VGDP-1)			
D(VM2)	-1.87**(-2.58)	5.13***(4.02)	
D(VM2-1)			
D(IR)	-0.62**(2.58)	0.07(1.62)	
D(IR-1)			
D(INF)	-0.068*(-1.74)	-0,20**(-2.07)	
D(INF-1)			
D(EX)	-0.097***(-3.77)	-0.42**(-2,55)	
D(EX-1)			
CointEq(-1)	-0.14**(2.42)	-1.26**(2.51)	

** indicates the 5 percent * indicates the 10 percent and *** indicates the 1 percent.

In Table 4.3, Panel B, the examination of long-term relationships within the six countries is presented. The results reveal distinct associations between economic uncertainty (VGDP) and money demand across these nations. In the long term there is a positive and statistically significant correlation between economic uncertainty and money demand for both Indonesia and Japan. This suggests that as economic uncertainty increases, there is a corresponding increase in the demand for money over the long term, as individuals seek to hedge against economic uncertainties. At both the one and ten percent significance levels VGDP is statistically significant. In contrast, for India, the Philippines, and Singapore, economic uncertainty exhibits a negative and statistically insignificant relationship with money demand over the long term.

Regarding VM2s representation of monetary uncertainty the findings show that there is a largely positive correlation between VM2 and money demand. With positive coefficient estimates seen in Indonesia Japan the Philippines and Singapore monetary uncertainty has a long-term impact on money demand. For example in Indonesia Japan the Philippines and Singapore the money demand rises by 6 points 63 10 points 7 8 and 10 points 9 units for every unit change in monetary uncertainty. However it is determined that the long-term estimate of VM2 is statistically insignificant in India. These results are consistent with earlier studies by Kiptui (2014) and Inoue and Hamori (2008).

In summary, Table 3, Panel B, provides insights into the long-term relationships between economic and monetary uncertainty and money demand in the six listed countries, highlighting the diverse patterns observed across these nations.

Table 3: Long-run Estimate of Linear ARDL

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

** denotes the 5 percent * denotes the 10 percent and *** denotes the 1 percent.

Interesting information about the relationship between interest rate (IR) and money demand in the chosen countries can be found in the results. In Singapore and Indonesia money demand and interest rates are negatively correlated. It is noteworthy nevertheless that in these two nations the impact of interest rates on money demand is deemed to be negligible. This negative correlation can be explained by the fact that the opportunity cost of holding money rises as interest rates rise because saving deposit yields and other interest-bearing assets also rise in tandem. Because of this people are more likely to choose other investment options which lower the demand for money. Mangla (1971) and Ibrahim (2001) conducted earlier research that is consistent with this finding. In Japan India and the Philippines on the other hand interest rates show a positive correlation with money demand albeit a statistically insignificant one.

This suggests that in these countries, there is a tendency for people to hold more money when interest rates are higher. It's crucial to remember that these relationships statistical significance is weak suggesting that other factors might be affecting money demand in these countries as well. Proceeding to the variable INF which stands for inflation the findings imply that the rate of inflation is an opportunity cost of long-term money holding. However, it's noteworthy that only in Indonesia is the inflation rate found to be statistically significant. In Indonesia, as the inflation rate increases, it positively affects money demand. This implies that people in Indonesia prefer to hold more money in response to higher inflation.

In contrast the inflation rate and money demand have a negative and statistically insignificant relationship for Japan India Singapore and Indonesia. The demand for money in these nations does not appear to be greatly impacted by higher inflation. Furthermore with the exception of Singapore most nations show a largely negative correlation between the exchange rate and money demand. Demand for money may be impacted by an increase in the exchange rate which indicates a decline in the value of the domestic currency (M2). The demand for domestic currency may decline as people try to convert their holdings (M2) into foreign assets in anticipation of further depreciation of the home currency. The exchange rate is statistically significant only in Indonesia and the Philippines it should be noted. Money demand is significantly impacted by fluctuations in the exchange rate in these two nations. According to the long-run coefficients overall results money demand can be greatly impacted over the long term by both monetary and economic uncertainty. This conclusion is

corroborated by earlier studies (Gul and Sajid 2020). These results highlight the significance of taking a range of economic factors into account when examining the factors that influence money demand in various nations.

Table 4: Diagnostic test

	Indonesia	India	Philphanese	Japan	Singapore
F TEST	8,73***	3.75*	4.14**	6.18***	8.21***
R^2	0.95	0.45	0.81	0.76	0.76
R^2	0.89	0.29	0.80	0.81	0.70
QS (QS 2)	S,S	S,S	S,S	S,S	S,S
LM TEST	0.13	0.20	0.41	0.80	0.30
Breusch-Pagan	0.70	0.42	0.61	0.20	0.20
JB test	0.89	0.30	0.80	0.50	0.48

The 1 percent is indicated by * the 5 percent by ** and the 10 percent by *.**

Table 4 presents the outcomes of the ARDL diagnostic tests. 4 particularly when the F-test value is higher than the upper-bound critical value. This indicates that the cointegration hypothesis is accepted for all the variables under examination. It's worth noting that the R-squared (R2) values for all the models indicate a good fit, with each value exceeding 0.05. The R2 statistic measures the proportion of variance in an independent variable that can be attributed to the dependent variables, highlighting the models' appropriateness.

Furthermore, to assess autocorrelation between the error terms, the researcher conducted the Lagrange multiplier test. The results of this test indicate the absence of serial correlation among the variables, enhancing the robustness of the models.

In addition to these diagnostic tests, stability tests, namely QS and QS2, were conducted to evaluate the stability of the estimates within the selected sample of countries. The results of these tests affirm that all estimates remain stable over the chosen sample period. These findings collectively reinforce the reliability and soundness of the models used in the analysis.

Estimation Results of Nonlinear ARDL

The Nonlinear ARDL models results including both long-run and short-run estimations are shown in Table 4. 5. The long-term persistence of short-term effects on the demand for money in this non-linear model is an important finding. Notably, among the variables affecting money demand, the coefficient of MD's growth stands out as noteworthy in terms of its impact over time. This suggests the presence of an enduring unbalanced relationship.

To delve deeper into the long-term asymmetrical impact, the study employs the Wald test. This test is instrumental in exploring how certain variables exert varying influences on money demand, and whether these effects change over time. The tests results provide important information about how the relationship between the variables in the model is dynamic and ever-changing.

Table 5: ARDL (Nonlinear)

NLARDL	**Indone**	**Jap**	**Ind**	**Philpin**	**Singa**
SN & variab	(1)	(2)	(3)	(4)	(5)
D(IR)	-2.00**(-2.10)		-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)	-0.001(-0.12)	-0.0009(-1.41)	0.013(1.25)	-2.64(-3.94)
D(EX)	-0.25***(-2.81)	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)	-2.08**(-2.59)	2.12(1.50)	2.38**(2.24)	4.12**(2.91)
D(NVGDP)	0.75(0.50)	-0.094*** (-3.61)	1.96***(2.68)	4.85(1.48)	-0.37*** (-3.21)
D(PVM2)	-0.12**(-2.5)	2.26**(2.76)	3.46**(2.30)	3.81(1.39)	0.52**(2.21)
D(NVM2)		-1.05***(-2.6)	2.03(1.83)	-1.02*(-1,81)	-0.56(-2.65)

CointEq(-1)			-0.19**(2.38)	
IR	0.036**(2.36)	0.002(0.413)	0.052(0.20)	-0.010** (-2.46)
INF	-0.002(-0.12)	-0.0049(1.56)	-0.05(-0.69)	-0.02*** (-3.01)
EX	0.074(10.76)	-0.02*(1.97)	- 0.022***(5.46)	0.90***(8.64)
PVGDP	- 0.37***(2.81)	-10.76***(-4.6)	-0.11**(-2.07)	-4.16***(-2.83)
NVGDP	0.11*(1.93)	14.63*(1.85)	2.004***(3.41)	3.30***(2.68)
PVM2	2.89(4.27)	3.85***(2.41)	-4.75(-5.83)	-8.15*** (-7.72)
NVM2	-5.99(17.84)	-6.85*(-1.93)	7.99(4.02)	8.41(7.62)
R^2	0.85	0.89	0.81	0.94
R^2	0.80	0.90	0.80	0.78
F Stat	8.20***	7.70***	5.39***	0.89
LM Stat	0.72	0.60	0.71	0.31
QS (QS 2)	S,S	S,S	S,S	0.80

The results in Panel C show that there is insufficient evidence to reject the null hypothesis even though the partial sum coefficients of the demand for money show a range of numerical values and significance levels. The rejection of the symmetric long-term effects of money demand is not supported by the test. There must be cointegration between these series if these long-term estimates are accurate. However no statistical conclusions can be made from this test because the computed F-statistic is less than the 10 percent critical value. The concept of cointegration is supported by the fact that the coefficient of ECMt-1 is significant and negative.

The short-run outcomes for the ARDL nonlinear model are shown in Panel A. Except for GDP, the short-term outcomes in the case of Indonesia are negligible. While other factors have a large impact on Japan, money demand and GDP have a little impact. on contrast, all the factors have a big short-term influence on India and the Philippines. In Singapore, each factor has a negligible influence, with the need for money being the only one that has a notable immediate effect. The findings over the long term are shown in Panel B of the table above. In the long term, all factors have a major influence on all nations, with Philippines seeing the greatest effects on the need for money.

Additionally Panel C provides diagnostic data. This panels Lagrange Multiplier (LM) statistic shows no autocorrelation because it is below the 9. 48 critical value at a 5% significance level. QS and QS2 both imply that the anticipated long- and short-term coefficients are stable. Furthermore the models explanatory power is 85 percent for Indonesia 94 percent for Singapore 78 percent for Japan and the Philippines and 89 percent for India according to the corrected R2.

Conclusions

This study examines the effects of monetary and economic uncertainty on money demand in a number of Asian countries using both linear and non-linear ARDL models. The results show that, with the exception of India, monetary uncertainty is adversely correlated with money demand in most nations. Money demand is impacted by short-term inflation, with Indonesia exhibiting a positive link and other nations displaying a negative one. Economic volatility positively influences money demand. Interest rates affect money demand differently across countries. While monetary uncertainty has a positive effect in the majority of countries long-term results indicate that economic uncertainty has a positive effect on money demand in certain countries. Exchange rates and inflation also play a role. The study recommends stabilizing monetary policy in Asian countries to ensure a steady money supply and more effective inflation control.

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