UNIVERSITI PUTRA MALAYSIA

STOCK PRICES AND LONG-RUN DEMAND FOR MONEY IN THREE SELECTED ASEAN COUNTRIES : INDONESIA, MALAYSIA, AND THAILAND

TAN CHIN SIN

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TAN CHIN SIN

MASTER OF ECONOMICS

FACULTY OF ECONOMICS AND MANAGEMENT

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BY

TAN CHIN SIN

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Table of Contents **Page**

CHAPTER THREE
METHODOLOGY

CHAPTER FOUR
EMPIRICAL RESULTS

CHAPTER FIVE
CONCLUDING REMARKS AND POLICY IMPLICATIONS

List of Tables and Figure **Page**

List of Abbreviations

ADF:	Augmented Dickey-Fuller
AIC:	Akaike Information Criterion
DF:	Dickey-Fuller
ECM:	Error Correction Model
ECT:	Error Correction Term
GDP:	Gross Domestic Product
GNP:	Gross National Product
LDC:	Less Developing Countries
ML:	Maximum Likelihood
OLS:	Ordinary Least Square
VAR:	Vector Auto Regression
VECM:	Vector Error Correction Model

ABSTRACT

Earlier study on money demand has omitted the influence of stock prices in the domestic demand for money especially in ASEAN countries. This paper investigates the relationship between stock prices and the long-run money demand function in Indonesia, Malaysia and Thailand using the multivariate cointegration and error correction model methodology. Results show that stock prices play a significant role in the determination of stationary long-run real M2 demand function in those countries. The direction and magnitude of the role of stock price depends upon the country and also the sampling period included. The results from the vector error correction model (VECM) provide evidence of causality between the real money stock and the determinants of the money demand (including real stock prices).

ABSTRAK

Kajian awal yang dijalankan keatas permintaan wang telah mengabaikan harga stok di dalam permintaan domestic terhadap wang terutamanya keatas negara-nagara ASEAN. Kertas kajian ini menyelidik hubungan diantara harga stok dengan fungsi perminataan wang jangka masa panjang di negara Indonesia, Malaysia dan Thailand dengan menggunakan ujian "multivariate cointegration" dan "error correction model methodology". Hasil kajian menunjukkan harga stok memainkan peranan yang penting dalam menentukan fungsi perminataan M2 benar di negara-negara tersebut dalam jangka panjang. Peranan harga stok dari segi arah tujuan dan magnitudnya bergantung kepada negara yang dipilih dan juga sampel bagi tempoh yang digunakan. Keputusan dari model "vector error correction" membuktikan terdapat hubungkait diantara stok wang benar dengan penentu permintaan wang (termasuk harga stok benar).

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Demand for money plays a major role in macroeconomic analysis, especially in choosing appropriate monetary policy actions. Because of its importance, a steady stream of theoretical and empirical research has been done worldwide over the past decades (see Sriram, 1999). The interest on developing countries has heightened in recent years, triggered primarily by the concern among central banks and researchers on the impact of the movement toward flexible exchange rate regime, globalisation of capital markets, ongoing domestic financial liberalization and innovation, and country-specific issues.

Monetary developments in Indonesia, Malaysia, and Thailand since the early 1980s have to be assessed in the context of remarkably successful economic performance that has contributed to the rapid development of domestic financial markets. The extent of financial liberalization – interest rate deregulation and greater competition in banking markets, as well as the liberalization of restrictions on cross-border capital flows – has been considerably greater than in many other developing countries. A priori, it would be surprising if these structural changes in financial markets and the associated rapid growth did not affect the relation between money, economic activity and inflation. In many industrial countries that went through substantial episodes of financial deregulation and financial innovation during the early and mid-1980s, there were significant shifts in the

orientation of monetary policies. Several countries found it difficult to retain intermediate targets and moved more toward explicit targets for final objectives, typically inflation.

The extensive literature underscores two major points relevant to modelling and estimating the demand for money. They are (1) variable selection and representation; and (2) analytical framework chosen. Failure to provide due consideration on these issues has shown to yield poor results. For the former, proper specification of opportunity cost variable happens to be the most important factor in getting meaningful results. In this regard, careful attention should be paid before deciding (a) whether a model should include both the own-rate and alternative return on money (including the expected inflation rate); and (b) which data series should be selected to represent them? Regarding the latter, the chosen system should be free of theoretical and estimation problems, and should perform well in empirical testing. The error-correction models (ECMs) have shown to meet these criteria.

The earlier work that included stock market activity have found evidence that stock prices are important in determining the holding of real money balances for the major industrialized economies. According to Friedman (1988), increases in stock prices have a positive wealth effect and a negative substitution effect on the demand for money. The implications for monetary policy regarding the role of equity markets are potentially important.

The focus of this paper is to examine the role of stock prices in the long-run demand for money in Indonesia (1983-1996), Malaysia (1976-2000), and Thailand (1989-2000) using the multivariate cointegration and error correction model methodology.

The remainder of this article is set out as follows. Chapter two turns to the literature review on the relevant points to modelling and estimating the demand for money. Chapter three briefly describes the methodology and the data utilized in the analysis. The empirical results are presented in Chapter Four, and concluding remarks and policy implications close the paper in Chapter five.

1.1 History and Theory of Money

1.1.1 A Brief History of Money

Since very early in the history of humanity, societies have recognized the many inconveniences of barter and turned to the use of money. Metallic money came into use around the year 2000 B.C. up until relatively recent times; people have used all sorts of things as money, ranging from coloured shells in India, to cigarettes in concentration camps during World War II, whale's teeth in Fiji, and large stone disks in the island of Yap.

For nearly 400 years, up until the third century B.C., the Athenian *drachma* maintained its silver content virtually unchanged and became by far the dominant coin in use in the Old World. In the days of the empire, the Romans introduced a bimetal scheme based on the silver *denarius,* which coexisted with the gold *aureus.*

Paper money only gained strength in the late eighteenth century. Fiat money was used early on, for example, by the French government at the time of the Revolution in the late eighteenth century, and by the American colonies.

In the second half of the nineteenth century, the world saw a massive shift to a gold standard. Under such a scheme, currencies in the form of coins and fiduciary notes were convertible into gold at an established parity. By the end of the nineteenth century, the use of silver for monetary arrangements had been all but discontinued.

With the advent of World War I, most countries suspended convertibility of their currencies into gold, and the gold standard collapsed. Toward the end of World War II, in 1944, monetary arrangements were once again reorganized. The Bretton Woods accord led to the general acceptance of a gold-exchange standard based on the U.S. dollar, in which all major currencies were pegged to the dollar and the dollar was convertible into gold. The Bretton Woods arrangement collapsed in 1971 when U.S. President Richard Nixon suspended the convertibility of the dollar into gold. Since then, the world has lived in a system of national fiat monies, with flexible exchange rates between the major currencies.

1.1.2 Theory of Money

Money is a set of financial assets (including currency, checking accounts, traveller's checks, and other instruments), which is very special characteristic that differentiate it from other kinds of financial claims. Money is the modern medium of exchange and the standard unit in which prices and debts are expressed. Basically, it serves four major functions-medium of exchange, store of value, unit of account, and source of deferred payment. In general, demand for money is demand for real balances. Money demand theories have evolved overtime and this section briefly touches upon the developments beginning from the classical tradition to the recent ones.

(a) Classical Economics

According to the classical theory, all markets for goods continuously dear and relative prices flexibly adjust to ensure that the equilibrium is attained. The economy is always in full employment levels except for the transitory deviations as a result of real disturbances. In such an economy, the role of money is simple: it serves as the numeral, that is, a commodity whose unit is used in order to express prices and values, but whose own value remains unaffected by this role. It also facilitates the exchange of goods (medium of exchange) as Jevons (1875) pointed out that the use of money satisfied double coincidence of wants. However, it does not influence the determination of relative prices, real interest rates, the equilibrium quantities of commodities, and thus aggregate real income. Money is "neutral" with no consequences for real economic magnitudes its role as a store of value is perceived as limited under the classical assumption of perfect information and negligible transaction costs.

(b) Quantity Theory

The quantity theory brings forth a direct and proportional relationship between the quantity of money and the price level. This relationship was developed in the classical equilibrium framework by two alternative but equivalent expressions. The first version called "equation of exchange" is associated with Irving Fisher of Yale University and the second "Cambridge approach or cash balance approach" is associated with the Cambridge University economists, especially A.C. Pigou.

Both versions are primarily concerned with money as a means of exchange, and hence, they yield models of the transaction demand for money. Fisher (1911) concentrated on institutional details of the payment mechanism in his analysis. The approach associated with Fisher (1911), is based upon the "equation of exchange," $M_s V_T = P_T T$, which relates the quantity of money in circulation M_s to the volume of transactions T and the price level of articles traded P_T in a given period through a proportionality factor V_T called the "transactions velocity of circulation." This equation is not an identity rather an equilibrium condition. Money is held simply to facilitate transactions and has no intrinsic utility.

The cash balance approach of the Cambridge University economists explicitly stressed the demand for money as public demand for money holdings and laid out the formal relationship between demand for real money and the real income. (Motives holding money by individuals)

(c) Keynesian Theory

Keynes built upon the Cambridge approach and developed the money demand theory based on explicit motives that prompt people to hold money and formally introduced the interest rate as an additional explanatory variable in determining the demand for real balances.

Thus the interest rate was formally introduced in the money demand function and the function now can be represented as $m^d = f(y,i)$, where the demand for real money balances m^d is a function of real income y and interest rate i. Thus the Keynesian theory of money demand, like his predecessors, is a theory of demand for real money. The major implication of the Keynesian analysis is that when the interest rate is very low, everyone in the economy will expect it to increase in the future, and hence, prefers to hold money whatever is supplied. At this stage, the aggregate demand for money becomes perfectly elastic with respect to the interest rate. The economy gets into a situation called "liquidity trap" in which the interest elasticity of money demand can be infinite at low levels of interest rate.

(d) Post-Keynes Theories of Money Demand

The post-Keynes economists developed a number of models to provide alternative explanations to confirm the formulation relating real money balances with real income and interest rates. The medium-of-exchange function of money led to the inventory-theoretic formulation that emphasized the transactions costs under certainty and to the precautionary demand for money models that introduced the concept of uncertainty in otherwise transactions cost models. The cash-in-advance models further exemplified money's medium-of-exchange function. The asset function of money led to asset or portfolio approach which evaluated the demand for money under the optimisation of portfolio framework where money was held as part of a portfolio of many assets which inherently differed in the yield and risk characteristics. The overlapping generations

models went to an extreme by completely ignoring money's medium-of-exchange role and emphasizing only the asset role does the money play. The consumers demand theory approach retained the characteristics of the portfolio approach but considered money as any other consumer good providing flow of services and analysed the demand for it under the utility maximization framework. In short, all these models can be broadly lumped into three separate frameworks namely transactions asset and consumer demand theories of money.

As the conclusions, although all these models analysed the demand for money in different angles, the resulting implications are almost the same. In all instances, the optimal stock of real money balances is inversely related to the rate of return on earning assets, that is the interest rate, and positively related to real income. The differences, of course, arise in terms of using the proper transaction (scale) variable and the opportunity cost of holding money. The empirical analysis of money demand estimation takes this conclusion as a starting point.

1.2 Problem Statement

The role of the money demand function as a cornerstone of economic policy has been challenged since the mid-1970s. The traditional approach to the demand for money, from the quantity theory to the Baumol-Tobin model to the portfolio model, has yielded evidence of serious specification errors[1]. In particulars, an unstable money demand function not only erodes the grounds for using monetary policy to stabilize the economy, but also misdirects academic research in important issues such as the income elasticity of money demand. Economists continue to search for a specification of the money demand function that gives a reliable relationship with other macro variables. This is an intriguing and important issue in monetary economics.

Over the past few decades the demand for money function has been empirically examined by researches to determine the important determinants of the demand for money because, the money demand function plays a vital role in the formation and transmission of monetary policy, while much of the empirical research had focused on money demand in several developed and developing countries. The money demand research has been very limited in the growing open economies. For Indonesia, Malaysia, and Thailand, such research is of considerable importance because of the existence of a well defined and stable money demand function can help the monetary authorities achieve the final macroeconomic goals of price stability, lower unemployment and steady economic growth. By estimating the demand for money function, the relationship between this monetary aggregate and other macroeconomic variables can be identified so

[1] See Goldfeld (1976) and Hendry and Ericsson (1991), among others.

that the policy makers can for example, predict the rate of monetary expansion needed to achieve a certain level of economic objective.

Research on money demand functions assumes that there exists a stationary long run relationship between real money balances, real income and the opportunity cost of holding real money balances. Research that progressed in this area has utilized the cointegration procedure and included exchange rate and a foreign interest rate in domestic money holdings (Chowdhury, 1997 and Arize, *et al.*, 1999). However, other financial variables such as stock prices usually have been excluded from the relationship especially for ASEAN countries like Indonesia, Malaysia, and Thailand. According to Friedman (1988) direct studies of the relationship between stock prices and money demand function are not very common. Indirectly stock prices are included in the total nonhuman wealth, which play a role in money demand function. Friedman (1988) also argued that, depending on the sampling period and data set, the effect might be positive or negative for the U.S. The inconclusive nature of the results for Japan is reported in McCornac (1991). Thornton (1998) found that real stock prices play a significant and positive role in the long-run demand function for real M1 balances in Germany. Recent studies by Choudhry (1996), to name a few, have found evidence that stock prices are important in determining the holding of real money balances for the major industrialized economies.

According to Friedman (1988) movements in stock prices may have two kinds of effects on money demand, a positive wealth effect and a negative substitution effect. The

positive wealth effect may be due to three different reasons, for examples an increase in stock prices:

1) Implies an increase in nominal wealth, producing a positive effect.
2) Reflects an increase in the expected return from risky assets relative to safe assets. This change in relative valuation does not have to be accompanied by a decrease in risk aversion or an increase in risk preference. Thus, the resulting increase in relative risk may induce economic agents to hold larger amounts of safer assets, such as money, in their portfolio.
3) May induce a rise in the volume of financial transactions. Such an increase in financial transactions will require higher money balance in order to facilitate these transactions.

As stated earlier, stock prices also impose a negative substitutions effect in money demand. The substitutions effect implies that as stock prices rise, equities become more attractive when compared to other components in a portfolio. Thus, there may be a shift from money to stocks. In summary, the net effect of stock market prices on demand for money may be positive or negative; it is an empirical issue.

1.3 Objective

The general objective of this study is to examines the money demand function for Indonesia, Malaysia and Thailand, that is to determine whether an equilibrium relationship exists between certain combinations of money balances, a scale variables, an opportunity cost measure and stock prices.

The specific objectives of this study include:

1. To determine whether there exists a stationary long-run relationship between money demand and stock prices using the vector time series analysis.
2. To test for the short-run as well as the long-run temporal causal relation between real money balances (M2) and its determinants based on the recent vector autoregressive time series analysis.
3. To test whether structural breaks during Asian Crisis have in real affection money demand function for Malaysia and Thailand for the short-run as well as the long-run by separate the period of the analysis into two: period before crisis and period including crisis.[2]

[2] Indonesia not including in these test due to the non-availability of data. The crisis reflected structural and policy distortions in the countries of the region. Fundamental imbalances triggered the currency and financial crisis in 1997, even if, once the crisis started, market overreaction and herding caused the plunge of exchange rate, asset prices and economic activity to be more severe than warranted by the initial weak economic conditions.

1.4 Significance of the Study

Stock prices are usually not associated with the money demand function. The equity market, which is characterized by high returns and volatility, has attracted many foreign investors (as well as speculators). Since previous studies have excluded the effect of stock prices on the demand for money, in this article stock prices are included as one of the determinants of money demand functions. This is important as it enables us to determine the role of equity market in the relationship. The significance of the study is as follow:

First, if the relationship between the money demand and the stock prices can be identified, therefore, it must be emphasized that in order to accurately attain desired policy targets, policy makers must acknowledge the importance of stock prices variables when designing the monetary policy for their specific economies. If the positive wealth effect dominates, then rising stock prices imply that the monetary authorities should permit faster monetary growth to achieve a nominal income or inflation target to avoid the target being undershot. Conversely, if the substitution effect dominates, higher stock prices imply the need to tighten monetary policy,

Second, knowledge of the size of real income elasticity allows one to determine whether there are economies of scale in cash holdings in Indonesia, Malaysia and Thailand. Aghevli *et al.* (1979) have pointed out that, "for financially developed economies, one would expect a proportional relationship between real income and real

economies, one would expect a proportional relationship between real income and real money balances, but in developing countries the demand for money may well rise at a faster rate than income because of monetization, limited opportunities to economize on cash balances, and the paucity of other financial assets in which to hold savings."

Third, while the long-run effects of the determinants of real money balances are of interest, the short-run adjustment of money demand to changes in these variables also is frequently important, especially in a policy sense. How quickly real money balances respond to changes in real income, interest rate, and real stock prices is important for understanding future effects that may occur as a result of changes in monetary policy and for interpreting recent events.

Fourth, interpretation of the error correction estimation depends upon whether the real money stock is exogenous or endogenous. If it is endogenous, then the error correction equation represents the endogenous response of real money growth to adjustment in the economy.

Finally, if the variables- interest rate differential and real stock prices- turn out to be important determinants of real money balances, this may affect the design of monetary policy because it creates uncertainty in the outcome of monetary policy, as Marquez (1987) noted, "results in a loss of government seigniorage and could precipitate a balance of payments crisis."

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