Chapter 1

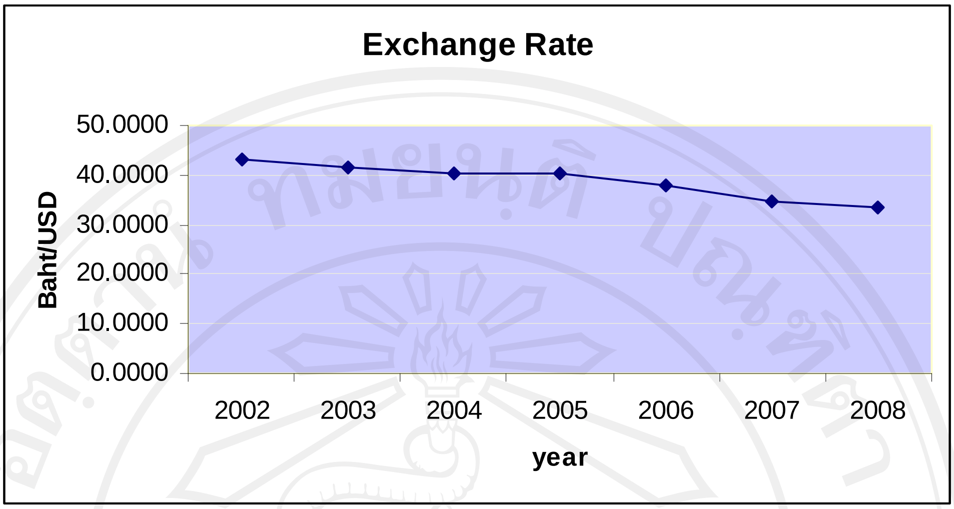
Introduction

1.1 Significance of Study

For decades, Thailand has been searching for a connection with many countries in both trade and investment. Foreign Exchange Markets take an important role in supporting and smoothen with efficiency. Every country in the world has its own currency as a medium of exchange but international trade needs a converted currency on paying. These activities influent the peg to another currency called foreign exchange rate. The exchange rate determination dramatically affects country's economic policy proceeding, changes in exchange rate cause damage in balance of payment which directly effects country's economic growth and development.

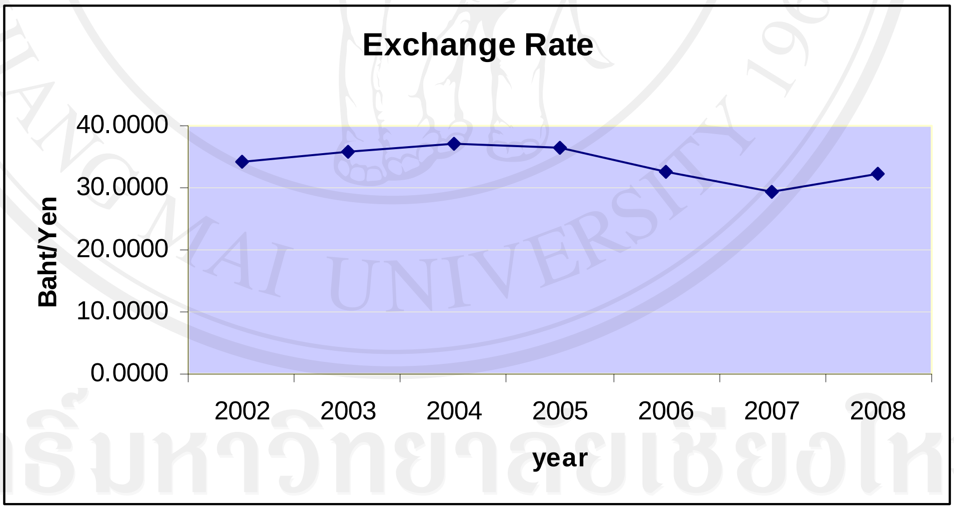
Sequentially, Thailand has been changed the exchange rate determination upon the proper economics condition in that time. Since 2 July 1997, Thailand has adopted the managed-float exchange rate regime, of which market forces determine the value of the baht, to let the currency moves in line with economic fundamentals. The Bank of Thailand will intervene in the market only when necessary, in order to prevent excessive volatilities and achieve economic policy targets. Exchange rate volatility has acquired a special importance in this global framework of international trade due to two main reasons. One is that the national governments have increasingly felt the impact of this volatility on their own monetary policies and this has been more so for those countries where export growth provides a large stimulus to their domestic economy's growth. Secondly, the investors today are increasingly participating in international portfolios and the asset market approach has become the dominant model for such investors.

Figure 1.1 THB/USD Exchange rate



Source : Rates of Exchange of Commercial Banks in Bangkok Metropolis (2002-present)

Figure 1.2 THB/JPY Exchange rate



Source : Rates of Exchange of Commercial Banks in Bangkok Metropolis (2002-present)

Among international exchange rates, the managed floating exchange rate regime has many advantages such as an easier external adjustments or national policy autonomy but it is also very volatile. There is extensive evidence showing that real exchange rates became more volatile when the nominal rates were allowed to float, and that such exchange rate volatility hardly stabilized the domestic economies (see Flood and Rose, 1995). Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk. Exchange rate risk refers to the potential to lose money because of a change in the exchange rate. A volatile exchange rate will sometimes lead to greater losses than expected, and at other times to greater gains from the rate of return. The econometric challenge is to specify how to avoid the exchange rate volatility and predict the rate of return.

The above-mentioned analyses based on the measures have exclusively relied on an ARCH/GARCH specification. Indeed, the ARCH/GARCH framework seemed to be a well-established model and thus a reliable starting point in analyzing volatility.

Volatility is one of the basic identities of many economic time series because of the fluctuation of fundamental, psychological and behavioral factors. The common stylized- facts related to the properties of economic time series data reveal the variation of conditional mean and conditional variance and most exhibit phases of relative tranquility followed by periods of high volatility. So in applied study, the basic assumption of conditional homoskedasticity is inappropriate because the random disturbances for different times should have diverse variances.

In time series regressions, the explanatory variable itself exhibit dynamic behaviors and such specification imply a dynamic structure for the conditional variances. The variation volatility of a time-series process relates to the dynamic pattern of such a process. Engle (1982) modeled the heteroskedasticity by relating the conditional variance of the disturbance term to the linear combination of the squared disturbances in the recent past. This specification is called a simple autoregressive conditional heteroskedasticity (ARCH) because the variance, conditional on prior information, is in an autoregressive form of lagged squared disturbances. This model has been generalized by Bollerslev (1986) with the conditional variance depends on its lagged values as well as squared lagged values of disturbance, which is called generalized autoregressive conditional heteroskedasticity (GARCH) . Because the economic of uncertainty being recognize the importance of econometric approach to estimate the variance of a series, ARCH and GARCH models have being extended and implemented in many forms and in various applications. In particular, following the introduction of the ARCH model by Engle (1982), and the popular GARCH and EGARCH parameterizations proposed by Bollerslev (1986) and Nelson (1991), many empirical studies have noted the extreme degree of persistence of shocks to the conditional variance process; for a recent survey of the extensive literature on ARCH modeling in finance; see Bollerslev, Chou, and Kroner (1992). Analogous to the issues pertaining to the proper modeling of the long-run dependencies in the conditional mean of economic time series, similar questions therefore become relevant in the modeling of conditional variances. This observation led Engle and Bollerslev (1986) to the formulation of the Integrated GARCH, or IGARCH, class of models, which possesses many of the features of the unit root, or 1(1), processes for the mean. 1 For instance, the implied effect of a shock for the optimal forecast of the future conditional variance will be to make the corresponding cumulative impulse response weights tend to a nonzero constant, so that the forecasts will increase linearly with the forecast horizon.

However, this extreme degree of dependence seems contrary to observed pricing behavior. Also, recent studies by deLima, Breidt, and Crato (1994), Dacorogna et al. (1993), Ding, Granger, and Engle (1993), and Harvey (1993) all report the presence of apparent long-memory in the autocorrelations of squared or absolute returns of various financial asset prices. Motivated by these observations, this paper introduces the Fractionally Integrated Generalized AutoRegressive Conditionally Heteroskedastic, or FIGARCH, class of processes and its application on exchange rate. The primary purpose of this new approach is to develop a more flexible class of processes for the conditional variance that are more capable of explaining and representing the observed temporal dependencies in exchange rate volatility.

Exchange rate returns, as a financial time series, is well described by two so-call stylized facts: excess kurtosis of the unconditional distribution, and volatility clustering. These facts can be described with ARCH type time series models proposed by Engle (1982) and Bollerslev (1986). One of the first papers introducing a skewed conditional distribution to GARCH modelling is Hansen (1994). Study proposes a skewed students-t distribution with each parameter being a parametric function of the data. In empirical application to monthly Dollar/Franc exchange rate strong evidence is found for variation in the conditional distribution beyond the mean and variance. GARCH models based on asymmetric distributions have also been proposed for example by Andersen (2001), Jensen and Lunde (2001) and Forsberg and Bollerslev (2002) who use normal inverse gaussian (NIG) distribution as a conditional distribution.

The NIG has several desirable and remarkable features which makes it suitable as a model of a large class of non-Gaussian noise process. Moreover, it is interesting that the NIG distribution can take a variety of different shapes. Having a heavier tail than the Normal distribution, is considered suitable for modeling data sets with many extremal observation.

1.2 Purpose of the study

1.2.1 To apply the analysis of GARCH and FIGARCH model on the exchange rate between Thai baht versus US dollar and Thai baht versus Japan yen.

1.2.2 To compare and find out the fittest distribution among normal, student-t and NIG error distributed.

1.2.3 To study the time volatility and long memory between two exchange rates.

1.3 Advantages

1.3.1 The benefit from the analysis of GARCH and FIGARCH model on the exchange rate between Thai baht versus US dollar and Thai baht versus Japan yen is to guide investors who interested to invest in Thailand.

1.3.2 The result from the studying the impact of the relationship Thai baht versus US dollar and Thai baht versus Japan yen can reduce the risk from exchange rate volatility, because of the past volatility is significant in predicting future volatility.

1.4 Scope of the study and methods

1.4.1 Scope of the study

This paper carried out with daily data of exchange rate between Thai baht versus US dollar and Thai baht versus Japan yen over the period from 21

October 1993 – 12 September 2008 in the presence of the significantly differences between the selected GARCH and FIGARCH model.

1.4.2 Methods

We examined the conditional volatility, the symmetry and the difference among GARCH and FIGARCH with normal, student-t and NIG error distributed.