CHAPTER I

Introduction

1.1 Background and Problem Review

The term structure of interest rates or yield curve is the relation between interest rate and time to maturity. The term structure of interest rates plays an important role in pricing all market securities since they are used in time discounting. The term structure of interest rates are also important on a corporate level since most investment decisions are based on some expectations regarding alternative opportunity and the cost of capital both depend on the interest rate. Moreover, it provides information about future economic activities as perceived by the capital market. Hence, it is an important tool for policy maker as well as financial intermediaries to monitor the future economy.

Estimating the term structure of interest rates falls into two broad classes. The first is an equilibrium model, which derives the term structure in models with consumer maximization and occasionally production function. The most famous example is Vasicek (1977) and Cox-Ingersoll-Ross (1985) (henceforth referred to as CIR). The second approach is non-equilibrium model that measure the term structure using statistical techniques or fitting the data. The well-known examples are McCulloch (1971) and Nelson and Siegel (1985).

Many studies on term structure of interest rates are conducted in well-developed capital market such as the U.S, Japan, UK and other European countries. The treasury bills and government bonds are used in term structure of interest rates model since they are regarded as having no default risk securities and they are benchmark of rate of return.

For the Thai bond market, the debt market was established in 1994 by the Bond Dealer Club (BDC). To create a more expansive bond market that caters to a full range of Thai debt instruments, the BDC was transformed to the full bond exchange and renamed to the Thai Bond Dealing Centre (ThaiBDC) in April 1998.

The emergence of the ThaiBDC led to a significant improvement in bond trading (total trading volume increased from 51,528.39 million baht in 1995 to 2,606,655.36 million baht in 2003). However, in most emerging markets such as Thailand, estimating the term structure is quite problematic because of the small size of these markets and relative illiquidity of bonds. Although the ThaiBDC has provided the yield curve to the public, the published curve is obtained by a generalized bootstrap method of the yield to maturity of government bonds which may have drawbacks documented by academic studies in this area. Besides, Choudhry (2004) suggested that when modeling the term structure in a developing or emerging market, it is more efficient to use an equilibrium model since this model can be used under one particular set of circumstances and when reliable market data is not available.

Hence, this study focuses on estimating the term structure of interest rates in Thailand during January 1999 to January 2004 by using two models: the Vasicek model (1977) and the CIR (1985) model.

1.2 Objectives of the Study

- To describe the empirical properties of the term structure of interest rates in Thailand.

-To compare the performance of pricing both in sample and out of sample between Vasicek model and CIR model in order to find that provides the best fit against market data.

- To verify the suitability of proposed models allowing for any profitable trading strategy.

1.3 Research Hypotheses

Hypothesis 1: The mean of speed of mean reversion is greater than zero since there is the equilibrium borrowing and lending adjustment in the economic system.

Hypothesis 2: The CIR model outperforms the Vasicek model in term of goodness of fit since the volatility of spot rate is not constant over time.

Hypothesis 3: The term structure of interest rates from the CIR model can be a better benchmark in bond trading than the Vasicek model since the CIR model has better pricing performance.

1.4 Scope of the Study

This study focuses only on the equilibrium approach in order to estimate the term structure of interest rates, not the curve fitting approach. The sample covers only treasury bills and government bonds traded on the ThaiBDC from January 1999-January 2004.

1.5 Limitation

During the study period, there were a few bonds traded each day and bonds with longer maturities were rare despite the increasing bond issued and trading volume. So, the paper estimates the Vasicek and CIR models with monthly pooling since the illiquidity of the Thai bond market.

1.6 Contributions

The relationship between rates and term to maturity has proved to be critical to policy makers and to market practitioners. This study gives investors more understanding in the behavior and role of term structure. Investor can utilize their knowledge about the term structure and its tendency to forecast risk and return from investment in the financial market by employing the models in this study.

In particular, one of the major applications of the Vasicek and CIR model is a more accurate valuation of bond and other financial assets. Hence, this study helps investors to value their assets more efficiently.

1.7 Organization of Paper

The structure of the paper is as follows. Chapter II theoretical reviews the term structure models, the earlier empirical work on both models and trading strategy. Chapter III deals with the estimation of term structure models and test whether the Vasicek model or the CIR model allows any profitable trading strategies from the estimated yield curve. Chapter IV presents and discusses the empirical results. The paper ends with conclusions and suggestions.