

CHAPTER 2

LITERATURE REVIEW

2.1 Literature review about Bayesian Approach

Harvey and Zhou (1990) studied “Bayesian Inference in Asset Pricing Tests”. Their paper tests the mean-variance efficiency of a given portfolio with a Bayesian framework. They impose a prior on all the parameters of the multivariate regression model. The approach is also easily adapted to other problems. They use Monte Carlo numerical integration to accurately evaluate 90-dimensional integrals. Posterior-odds ratios are calculated for 12 industry portfolios from 1926–1987. The sensitivity of the inferences to the prior is investigated using three distributions. The probability that the given portfolio is mean-variance efficient is small for a range of plausible priors.

Fhanjit Teething (1994) studied about “Inference of Population Mean by Bayesian Method”. The aim of this paper is to study the statistical inference by Bayesian method. Bayesian inference needs prior information of the studied population and more information from its sample. The final result gives posterior information which can conclude about population. In case of either known, unknown population variance or vague prior information, it found that the square error loss function of Bayesian inference can be used as good as the well-known inference.

Anan Dejprom (1996)'s "Hypothesis Testing of Two Population Means by Bayesian Method" is a comparison between classical statistics and Bayesian statistics on hypothesis testing of two population means. The data was generated by Basic programming with Monte Carlo simulation method. The distribution of data was symmetry distribution from exponential power function and asymptotic with position skewness distribution.

Ilias Tsiaskas (2001) studied about "Bayesian Empirical Applications of Generalized Stochastic Volatility Models". This dissertation examines three empirical finance applications of univariate, multivariate and generalized specifications of discrete-time stochastic volatility (SV) models. These models are applied on daily stock index return data from the Toronto Stock Exchange. The SV parameters are estimated by implementing existing Bayesian Markov Chain Monte Carlo (MCMC) econometric methods. The main objective of the dissertation is to assess the ability of stochastic volatility to (i) forecast the daily conditional variances and covariances implied by daily returns, and (ii) hedge against adverse return movements. Models of stochastic volatility are designed to parsimoniously capture the time-series properties of daily returns, notably the asymmetry, fat tail and persistence of the conditional and unconditional distributions. The dissertation examines the conditional dynamics implied by all relevant SV specifications, computes one-step ahead volatility forecasts, and assess the contribution of stochastic volatility to risk management.

Aompilai Manorat (2005) studied about “Gene Regulatory Network Prediction Using DNA Microarray Data with Bayesian Network Technique”. In this research, the group of genes HAP2, HAP3, HAP4 and CYC1 under diauxic shift condition of *Saccharomyces Cerevisiae* is considered. The objective of this study is to infer the regulatory mechanism of these genes from their expression levels under diauxic shift condition; i.e. changing carbon resource from glucose to ethanol. Bayesian inference technique is applied to evaluate the conditional probabilities and scores of all probable regulatory networks. Experimentally, eight networks of maximum score are found. These networks all report the co-regulation of CYC1 by HAP2, HAP3. The result coincides with prior biological reports confirming that HAP2, HAP3, HAP4 are co-regulators of CYC1. HAP2 and HAP3 proteins bind at specific promoter site of CYC1 gene and HAP4 is reported to be the activator of CYC1. This shows that the inference of gene regulatory network from the expression data could be reasonably done by using Bayesian network technique.

2.2 Literature review about Capital Asset Pricing Model

McCauley and Gunaratne (2003) conducted a study about “On CAPM and Black–Scholes differing risk-return strategies”. This paper shows the contrast between Black and Scholes presented two separate derivations of their famous option pricing partial differential equation. The second derivation was from the standpoint that was Black’s original motivation, namely, the capital asset pricing model (CAPM) and Joseph L. McCauley, Gemunu H. Gunaratne show the contrast, that the option valuation is not uniquely determined; in particular, strategies based on the delta-hedge and CAPM provide different valuations of an option although both hedges are

instantaneously risk free. Second, we show explicitly that CAPM is not, as economists claim, an equilibrium theory.

Jarinya Balsuk(2004) studied about “A Test of the Fama and French Model with Commercial Bank Securities in the Stock Exchange of Thailand”. Fama and French Model was applied to examine the factors affecting the rate of return of banking sector securities listed in the Stock Exchange of Thailand as well as to assess their rates of return, Nine securities were selected in this study as samples including TMB, SCB, NBANK, BAY, KBANK, BBL, KTB, BOA, and DTDB. Weekly closing prices of these securities between 1 January 1999 and 26 December 2003 for five year period were used to represent their rates of return. The SET index data were used to serve as proxy for the market rate of return. The average interest rate of 3-month deposit of four national leading commercial banks including Krung Thai, Bangkok Bank, Siam Commercial, and Kasikorn Thai was used to represent the rate of return of risk-free investment.

A Unit Root Test was performed to ensure the absence of non-stationary situation in time series which might cause the problem of spurious regression from Ordinary Least Squares application. The results of ADF-Test indicated the stationary nature of data. Then, two OLS estimations were undertaken by computer program following the Capital Asset Pricing Model : CAPM and the Fama and French Model a modified version of CAPM by adding two more independent variables namely business size whether large or small based on the value of paid up capital, and book-to –market value whether high or low.

The study results indicated that Fama and French Model, for having a higher R^2 -value compared to CAPM, was relatively more powerful in explaining and forecasting the changes in rate of return. The finding from both models indicated the values of $\beta > 1$ with positive relationship for TMB, NBANK, BAY, KBANK, BBL, KTB, and DTDB and thus these securities could be regarded as aggressive stock. BOA was found to have $\beta < 1$ with positive relationship and hence could be considered as defensive stock. Meanwhile, SCB estimation obtained different conclusion, for having $\beta > 1$ from CAPM but $\beta < 1$ from Fama and French Model all with positive relationship. The estimated values were compared with the stock market values for investment decision. Based on the results of both models, the prices of BOA, NBANK, and BAY tended to be undervalued. Investors should decide to purchase these securities before the prices adjust upward as the demand increases, which a process is rendering the decline in expected rate of return until coinciding with the desired rate of return-an equilibrium situation.

Rintip Channual(2005) studied about “Estimation of Expected Returns in Transportation Sector in the Stock Exchange of Thailand by the Fama and French Model”. The objective of this independent study on Estimation of Expected Returns in Transportation Sector in the Stock Exchange of Thailand by the Fama and French Model was to study risk and return on investment in order to use a guideline in estimating security prices in transportation sector in the Stock Exchange of Thailand.

Eight securities in transportation sector that were studied namely THAI, AOT, BECL, JUTHA, RCL, TTA, PSL and ASIMAR by using the weekly closing price of 260 weeks for 5 years from January 9, 2000 to September 26, 2004 for representing rate of

returns, the SET index data for representing market rate of return, and the average 3 month fixed deposit interest rate of 5 large commercial banks data for representing risk free rate. These data also included the paid up capital, the book to market and the oil prices, which were utilized for testing Unit Root. Subsequently, Autocorrelation and Heteroscedasticity testing on the Fama and French model and the Fama and French plus oil prices model that estimated by the least square analysis.

In this study, the Fama and French model and the Fama and French plus oil prices model, the results were used in analysis and these model gave the same results that ASIMAR, AOT, BECL, THAI, PSL, and JUTHA had the value of R^2 . And Adjusted R^2 of 0.99. These would mean that the both models fit the data nearly perfect. Meanwhile, the results using only the Fama and French model found that AOT and TTA had the value of the $\beta > 1$. This could indicate the changes in the returns of these securities were more than the change in the return of the whole market which could be determined as the Aggressive Stock. Six securities namely ASIMAR, JUTHA, THAI, PSL, RCL and BECL had the value of $\beta < 1$. This signified the changes in the returns of these securities were less than the change in the return of the whole market which could be determined as the Defensive Stock. At the same time as using the Fama and French plus oil prices model, the results had just a little change of the value of β , however, it affected JUTHA security, which was become Aggressive Stock. Comparing to these results of the whole securities in transportation sector, the expected were higher than the Securities Market Line. This implied that the values of securities were undervalued. Therefore, all securities in transportation sector were interesting securities because the securities prices were likely to increase.

Apiwat Pumcharoen (2005) studied about “Tests of Capital Asset Pricing Model for Selected Sectoral Indices in the Stock Exchange of Thailand”. In this study, Capital Asset Pricing Model (CAPM) was applied to five selected sectoral indices in the Stock Exchange of Thailand (SET) to test the predictive power of the model. Consequently, the conditional covariances of most sectoral indices were found to be constant. The study on reward-to-risk ratio revealed that the ratio would vary through time for each sectoral index, and the ratio differed among various indices. The investigation also indicated that CAPM applications should have constant intercept term which was contrary to the condition in the traditional models. Another important test of CAPM was on the permission for expected returns, variances and covariances to vary through time. The result exhibited that this assumption could not be accepted in all cases of sectoral indices. The final test was on the nature of B which was found to be constant according to the provision of the model for both single portfolio and multiple portfolio cases.

The overall results suggested certain conditions defined by CAPM were not appropriate and the application of CAPM to explain the rates of return to assets in the selected sectors in this study would not be appropriate accordingly.

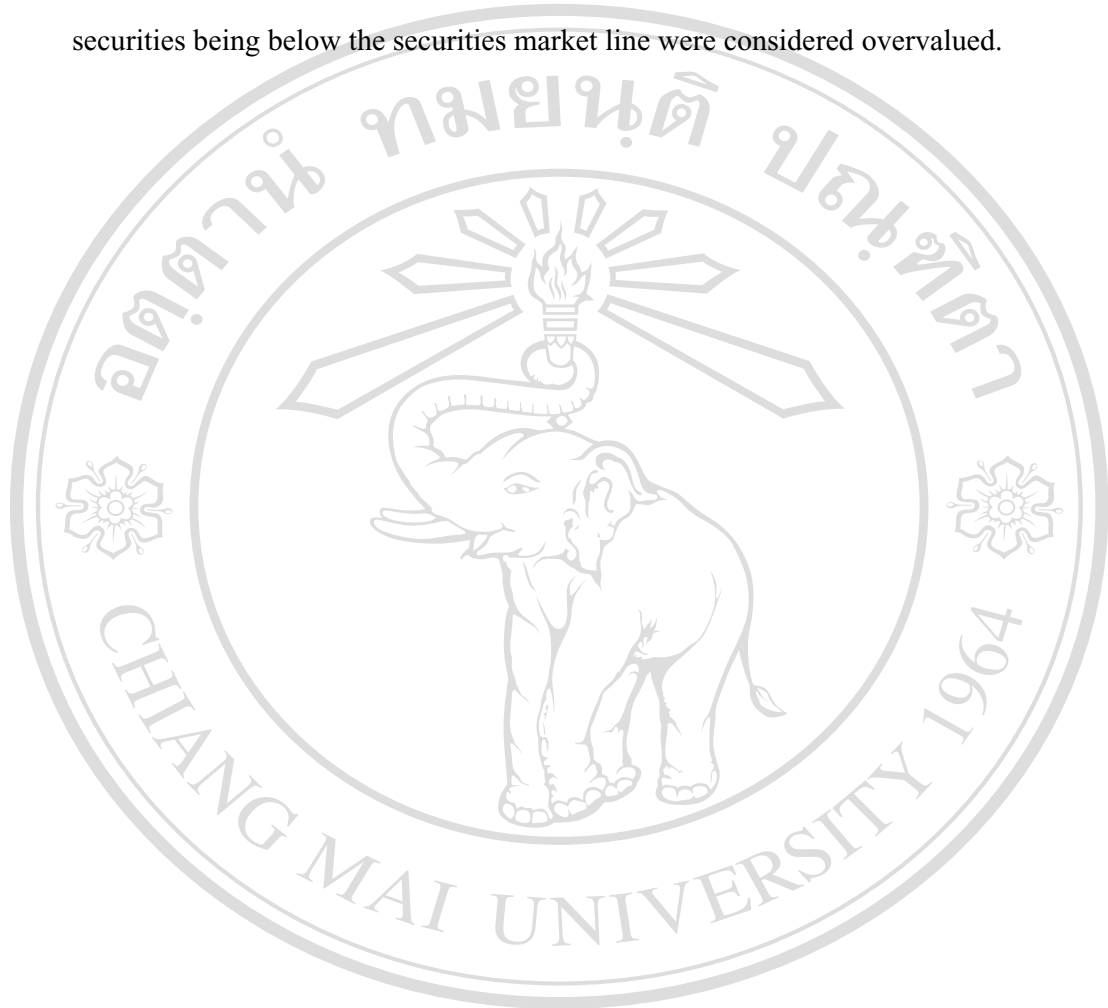
Kattareeya Panprasert (2007) studied about “Risk and Return Analysis of Securities in the Commercial Bank Sector in the Stock Exchange of Thailand by Using the Fama and French Model”. This study on risk and return of securities in the commercial bank sector in the Stock Exchange of Thailand using the Fama and French model aims to examine the factors affecting the rates of return to banking sector securities listed in the Stock Exchange of Thailand as well as to assess their

rates of return. Eleven securities were selected in this study as samples including ACL, BAY, BBL, BT, KBANK, KK, KTB, SCB, TBANK, TISCO and TMB. Weekly closing prices of these securities since January 1, 2002 to December 29, 2006 were used to represent their rates of return. The SET index data and the average 3-month fixed deposit interest rates of 4 large domestic banks were used for calculating the risk-free market rate of security return.

The R^2 result ranged between 37.72-72.99 percent. The estimated β – *coefficients* to determine the prospect of risk from investment in securities suggested that the ACL, BAY, BBL, BT, KBANK, KK, KTB, SCB, TBANK, TISCO and TMB securities had significant relationship between the rates of securities return and the rates of market return. The study on s – *coefficients* to determine the difference between the rate of return of the small business size and the rate of return of the big business size showed that the BAY, BBL, BT, KBANK, KK, SCB and TISCO securities had significant relationship between the rate of return of securities and the size of business. Meanwhile, the estimated h – *coefficients* to confirm the difference between the rate of return of business with high book-to-market ratios and the rate of return of business with low book-to-market ratios indicated that the ACL, BAY, KTB, TBANK, TISCO and TMB securities had a statistically significant relationship between the rates of securities return and the book-to-market ratios.

The ACL, BBL, BT, KBANK, KK, KTB, SCB, TISCO and TMB securities were also found to have the values of β greater than 1, implying that the change in the rate of securities return was greater than that of the market return. And thus they could be determined as aggressive stock. Meanwhile, BAY and TBANK having of $\beta < 1$ could be determined as defensive stock. By comparison with the securities market line

(SML), BAY, SCB, BBL and KBANK appeared to be undervalued at the same risk level as in the market. While the BT, TBANK, KTB, KK, TISCO, TMB and ACL securities being below the securities market line were considered overvalued.



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