CHAPTER 6

Conclusions and Future Research

6.1 Summary of the Study

The main objective of this thesis was to analyze how to make appropriate investment decision using Markov switching approach. Chapter 1 offered an extensive literature review on the linkages between stock market and other three financial markets, portfolio optimization, and speculation trading strategy.

Following the regime-switching methodology described in Chapter 2, this study presented three empirical chapters, where Chapter 3 analyzed the linkages between stock returns/index, bond price/yield, interest rate and exchange rate movements; Chapter 4 focused on measuring the dependency of the variables to assess the role of investing in stock to optimize multi-asset portfolio returns by applying Markov Switching with high dimensional copula; and Chapter 5 provided an approach to investigating the trading signal for stock pairs taking into consideration the structural change in the pairs returns.

Chapter 3 focused on examining whether the spillover effects exist and take place across exchange rate, interest rate, government bond yield and the stock return. We estimated the correlations between these variables using the MS-VECM approach. In this part, the datasets used were collected from Thomson DataStream. The sample is weekly time series which goes from March 2009 to February 2016, covering totally 362 observations. The data variables include exchange rate, stock price, interest rate and bond yield from Thai, Malaysian, Singapore, Japanese, South Korean, and Chinese financial markets. Consistent with previous works (Diamandis and Drakos 2011;Tsai 2012;Tudor and Popescu-Dutaa 2012; Caporale, Hunter, & Ali 2014;Yang et al.2009, Andersen et al. 2007; and Baele 2010), the results confirmed the dynamic linkages between these four financial markets. However, the MS-VECM model performed well in capturing the long-run relationship of the financial variables compared to the linear model. It also explained the non-linearity embedded in the relationship of financial markets in each country. In addition, the obtained regime probabilities allow us to detect and identify the factor or event affecting the movement of the financial markets. Thus, following the results of Chapter 3, the MS-VECM model can be recommended as the preferred model for examining correlation between financial variables.

Chapter 4 investigated portfolio risk structure for multi-asset allocation issue using a copula-based Markov Switching approach. Similar to the studies by Autchariyapanitkul, Chanaim&Sriboonchitta (2014) and Ayusuk and Sriboonchitta (2014), the empirical results confirmed copula based multivariate GARCH model can interpret portfolio risk structure for multi-dimensional asset allocation issue. However, the best performance of portfolios was achieved by a combined Markov Switching and high dimensional copula in order to capture the economic behavioral change over time. These results suggest that copula-based GARCH model can be employed to investigate asymmetric or tail dependence structures, while the Markov Switching models are capable of capturing the different structure of dependency for a long time. Thus, for different states of the financial market characterized by either heavy tail information or regime shifts, the combination of copula based GARCH model and Markov Switching models seems to be most preferable.

In addition, following research confirming that the high dependence regime as the market downturn regime and the low dependence regime as the market upturn regime, Chapter 4 included an estimation of the conditional Value at Risk taking into account the economic change. The approach is different from the previous studies in terms of economic change. The findings confirm the investor will face higher risk during the market upturn. Thus, the copula-based Markov Switching approach was concluded as the appropriate model to estimate the Conditional Value at Risk in both market upturn and market downturn.

Chapter 5 specified the trading signal for stock pairs taking into consideration the structural change in the pairs returns using Markov Switching Regression GARCH model. The study approached the topic of pairs trading strategy somewhat differently from the previous studies (Gatev, Goetzman and Rouwenhorst 2006; Vidyamurthy 2004; Elliott, van der Hoek and Malcolm 2005) in terms of employing a non-linear framework to identify the pairs trading signal. The findings revealed the proposed pairs trading strategy is relatively more effective for financial investment management compared with the single mean return from individual stock method. Bock and Mestel (2009) mentioned that the regime-switching rules for pairs trading generate a positive return and hence it can be employed as an alternative model to traditional pairs trading rules. Yang et al. (2015) combined the Markov regime-switching and Vasicek models with a mean-reverting strategy, and found that their proposed method provided the best performance in a simple portfolio. Despite the evidence in certain cases of linear models to generate equally accurate results, it is essential that the presence of non-linearity is not ignored. However, as pointed out by Kuan (2002), the non-linear optimization algorithms are hardly able to identify the global or the optimal solution in the parameter space and the threshold models are suggested to describe certain nonlinear patterns of data and hence may not be so flexible. Moreover, Kuan suggested that Markov Switching model is more appropriate for interpreting correlated data that represent different behavior in unusual economic condition. Thus, this study suggested a Markov Switching Regression GARCH as an alternative tool for capturing pairs trading signals. All possible stock pair combinations are selected by considering the level of correlation. The study used a Minimum Squared Distance method (MSD) approach to measure the correlation between all possible pairs. The correlation of each pair was measured by two normalized stock prices. The study selected five lowest MSD in this application. Then, the five selected pairs are used to calculate the return spread through the Markov Switching Regression GARCH.

6.2 Future Research

Firstly, as we know, Elliptical and Archimedean are the two main classes of copula functions. This study only focuses on the Elliptical class which has symmetrical tail dependence. It would be interesting to see whether Archimedean copulas benefit from these advantages in multi-asset allocation issue using a Markov Switching approach when the data set has asymmetrical tail dependence.

Additionally, this thesis assumes that the dependence of copula parameters does not change over time. It would be interesting to extend dynamic portfolio risk for multi-asset allocation issue using a Markov Switching with time-varying copulas.

Lastly, a regime switching Copula-based approach is able to be applied to the stock pairs trading strategy. It could be helpful for connecting the marginals to obtain possible joint distributions and investigating the dependency structure between two stock returns. This is particularly useful when investors could obtain preferential entry positions and get more trading opportunities.