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A FUZZY APPROACH TO PORTFOLIO SELECTION AT BURSA MALAYSIA

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with regulations of Universiti Teknologi MARA. It is original and the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Selecting the right portfolio is one of the problems to fund managers, investors, individual or institutional investors. Some authors introduced portfolio models to solve the portfolio problem such as Markowitz, Fishburn, Konno and Yamazaki, Jorion and Young. The model introduced by the authors did not consider fuzzy number in their model. The portfolio problem arises due to the uncertainty in stock market investment. Therefore, some scholars are seeking a new way to solve uncertainty of stock market investment. The fuzzy approach is the suitable approach to solve the portfolio problem. The scholars that considered the fuzzy approach are Katagiri and Ishii, Inuiguichi and Tanino, Tanaka et al., Vercher et al. and Mohamed. In this study, we refer the extended mean-variance as a controller for our analysis purpose. The problem of the extended mean-variance model is the model assumed that the return distribution is normally distributed and the covariance is not in fuzzy numbers. Hence, the objective of this study is to determine the behaviour return data distribution and to improve the extended mean-variance model by considering the actual return distribution and fuzzy covariance. It is found the return distribution of the stock market is skewed that is not normal. Thus, the appropriate central tendency to measure the skewed return distribution in the fuzzy situation is represented by the mode. Then, the centroid was used to determine the covariance in the extended mean-variance model since the covariance has a relationship with the asset return. The data corresponds to monthly price from February 1998 until December 2011 were considered and analyzed it to the non financial sector portfolio in Bursa Malaysia. Then, the effectiveness of our proposed model was compared with other fuzzy portfolio model that is VBS fuzzy model and extended mean-variance model. This study will give the true picture of the relationship between fuzzy return and covariance. Besides that, the application of fuzzy approach in selecting the portfolio is expected to provide useful model to the investor.

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CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND OF STUDY

One of the major advances in financial market over the last few decades is the introduction of portfolio theory. Portfolios emerge as early as 1920 before the presence of portfolio theory (Gordon, 2005). Ruiz and Suarez (2010) defined a portfolio as a collection of various financial assets and securities such as shares, bonds, stocks, debt investment, mutual fund, and cash equivalent held by institutions or individual. Lian and Li (2010) defined a portfolio as a particular combination of assets in question. According to Lambovska and Marchev (2011) investment portfolio is a combination of securities owned by a given investor meanwhile Vercher et al. (2012) defined a portfolio as a collection of investments held by an institution or private individual. The desire of the most investors was to obtain a higher profit stock and buy it at the lower price (Alan, 2010).

The investors are considering the stock prices only at the price they think is the lowest. However, the development of the portfolio theory was not introduced yet before 1952 and the market is not strong enough although tightened by accounting regulations after the great depression (Bordo & Haubrich, 2011). As a result, it has changed the perception of the portfolio theory especially the people who want to be richer to invest in the form of gambling just to show off of their prowess (Camerer, 2003).

In early 1923, Benjamin Graham was the first advocate of the investment paradigm that based on the idea of investment approach (Kahn & Milne, 1977). Then, the investment information was analyzed depends on the profile of investor by defining the individual preferences in investment decisions. A good money manager will look into the company's fundamentals first when making decisions, because knowing the company's fundamentals is the main aspects to recognize either the company is good or not (Moon, Mentzer, Smith & Garver, 1998).

No one focused on the risk factor of investing until Markowitz (1952) introduced an approach of linear programming which is a field that employs mathematical models to maximize output for a given level of cost or to minimize costs for a given level of output. The desired output from an investor's portfolio is a