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Risk and Return Analysis of Stocks listed On The Kuala Lumpur Stock Exchange's (KLSE) Main Board

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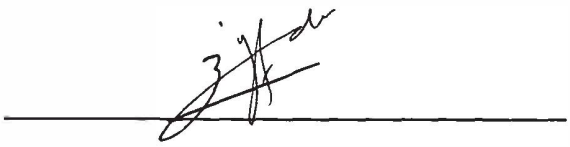

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Risk and Return Analysis of Stocks Listed On

The Kuala Lumpur Stock Exchange's (KLSE) Main Board

by

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ABSTRACT

Relationship between risk and return of the stock in KLSE is important to the investor when making the selection decision for portfolio investment. Decision made weather to invest or not in particular stock depends greatly on investor's level of risk aversion and also the returns per unit of risk offered by the particular stock.

Investor's ultimate goal is to maximise the gain or return from investment depends on how much risk is assumed. Construction of portfolio was use to diversify unsystematic risk of individual stocks to reduce the overall risk of portfolio but maintaining the return.

This study is to analyse the relationship of risk and returns of stock listed on KLSE's Mainboard. The analysis was to determine whether portfolio construction can diversified unsystematic risk and which portfolio strategies to be use to construct efficient portfolio.

The findings indicate that portfolio construction can diversify unsystematic risk. Portfolio by design strategy in portfolio construction was better in diversifying risk rather than using naïve portfolio strategy.

ABSTRAK

Hubungan di antara risiko dan pulangan saham di Bursa Saham Kuala Lumpur (BSKL) adalah penting kepada pelabur apabila membuat keputusan pemilihan pelaburan portfolio. Keputusan pelaburan di dalam sesuatu saham bergantung kepada paras mengelak risiko seseorang pelabur dan juga pulangan per unit risiko yang di tawarkan oleh saham tersebut.

Matlamat akhir pelabur adalah untuk memaksimakan keuntungan atau pulangan dari pelaburan bergantung kepada risiko yang perlu di tanggung. Pembentukan portfolio di gunakan untuk pelbagai risiko tak-bersistem saham bagi mengurangkan risiko keseluruhan portfolio tetapi mengekalkan pulangan.

Kajian ini adalah untuk menganalisa hubungan risiko dan pulangan saham yang di senaraikan di Papan Utama BSKL. Analisa juga di buat untuk menentukan samada pembentukan portfolio pelbagaikan risiko tak-bersistem dan strategi-strategi bagi membentuk portfolio efisyen.

Hasil kajian mendapati pembentukkan portfolio dapat ppelbagi risiko tak-bersistem. Strategi portfolio dengan rekaan dalam pembentukan

portfolio adalah cara terbaik untuk pelbagaikan risiko daripada strategi portfolio secara rambang.

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CHAPTER ONE

INTRODUCTION AND OBJECTIVE

1.1 INTRODUCTION

When investing in stock market such as Kuala Lumpur Stock Exchange (KLSE), an investor has to consider the returns and risk involved in a particular investment. Analysing the relationship between risk and return of the stock in KLSE is important to the investor when making the selection decision for portfolio investment.

For an investor, a decision made weather to invest or not in particular stock depends greatly on their level of risk aversion and also the returns per unit of risk offered by the particular stock.

Return from the investment is related to their risk level where high-risk investment will give higher returns. As an investor,

the ultimate goal is to maximise the gain or return from investment depends on how much risk is assumed.

Risk of the stocks from various sectors in KLSE Main Board are analysed to know the relationship between risk and return of the stocks. Market risk factor or beta (β) is also determined by correlating the return of the stocks with the returns on the KLSE Composite Index (KLCI), the benchmark representing the market.

Portfolio of stocks can also be constructed to maximise the gains by diversifying the unsystematic risk of individual stocks to reduce the overall risk of portfolio but maintaining the return.

Stocks that can greatly contribute toward constructing an efficient portfolio will be used as guideline for investor when investing in the KLSE Main Board.

1.1 RETURNS

Returns was expected future cash flow generated by an asset whether an investment or stock. Total returns comprise of two components i.e. dividends and price changes.

Dividends are periodic cash receipt on investment in stock whereby price changes is capital gain/(loss) resulting in value appreciation (or depreciation) of the stock compared to the purchase price.

1.2 RISK

Risk is a potential variability of future cash flows whereby associated with the possibility of actual returns being less than from the expected returns. Standard deviation measures the total risk by finding dispersion level of return distribution from average return (mean).

There are two components made up of total risk i.e. systematic risk and unsystematic risk. The formula to derive total risk can be expressed as follows: -

Total Risk = Systematic Risk + Unsystematic Risk

Systematic risk is market-related risks due to changes in broad economic, social or political factors that affect the return on investment and is uncontrollable. Systematic risk is common to all

securities (except risk-free securities) that non-diversifiable. Beta measures the systematic risk or market risk.

Unsystematic risk is firm's specific risks or unique risk i.e. variation in returns due to factors related to individual firm that can be control by the management. Unsystematic risk can be diversified through creating of portfolios.

1.3 RETURN PER UNIT OF RISK

Return per unit of risk measure the reward received by an investor for delaying in receiving payment for an investment to future or later date. This measure compares investments with different level of returns and risk.

In other word, investor can choose an investment according to their risk aversion level whether to maximise the returns or to minimise the risk from a pool of investment opportunities.

1.4 OBJECTIVE OF STUDY

Objectives of this project are: -

- To find the relationship between risk and return of stocks listed on the KLSE's Main Board.
- To construct efficient portfolios which maximise the return per unit of risk and/or minimise the risk per unit of return.

CHAPTER TWO

LITERATURE REVIEW

Studies on risk and return of stocks were drive by the needs of the investor to maximise the returns with minimum risk. This was making possible by availability of tools to measure the performance of stocks.

Statman (1987)[11] shown that at least 30 stocks for a borrowing investor and 40 stocks for a lending investor must be included for a well diversified portfolio which in contrast with earlier evidence concluded by Evans and Archer (1968) that portfolio of 10 stocks can attained maximum naïve diversification.

Alexander and Chervany (1980)[13] indicates their finding on the estimation and stability of beta that stability of portfolio beta directly related to number of stocks in portfolio, which significantly stable for portfolio of 10 or more stocks.

Alexander and Benson (1982)[10] shows that Fabozzi and Francis (1978)[15] suggestion overstated beta as being random coefficient for a "significant minority" of NYSE stocks due to

methodological problem of beta analysis which was corrected in their paper discussing more on

Carvell and Strebel (1984)[9] suggested in research on new beta incorporating analysts' forecast that new beta provides a more accurate estimate of the true ex-ante risk for neglected stocks that their superior returns can still be exploited.

Alexander and Resnick (1985)[5] indicates that there is no need to consider estimation risk for optimal portfolio selection by using EGP (Elton, Gruber and Padberg) technique for finding efficient portfolio suggested by Chen and Brown (1983)[3]. The finding shows that there is no different in the result whether consider or not to consider estimation risk.

Pari and Chen's (1985)[8] shows that the need to estimates the expected returns and betas in their study on estimation risk and optimal portfolios where these estimations were subject to sampling error or estimation risk. Ignorance of estimation risk will end up with sub-optimal portfolios.

Reichenstein's (1987)[7] finding on standard deviation and risk reported that the of investment horizon affect the riskiness of a portfolio.

Shamsher and Anuar (1994)[4] indicates in the study on stability of beta of 148 listed companies on KLSE that individual

stocks and portfolio betas are relatively stable and can be rely on to be use in portfolio construction and investment decision.

Hsu (1984)[12] argued that stock market risk is not stationary but evolutionary which reflects political, economic and general investment climate as substantiated by the empirical findings in his studies on the behaviour of stock returns.

Theobald (1981)[14] shows that beta stationarity increase with length of estimation period when discussing the analytical result on beta stationarity and estimation period.

Banz (1980)[1] found that small size firm has higher risk adjusted returns compared to big size firms on common stocks on NYSE for period of 1926 – 1975. However, there is little different in risk adjusted returns for average size and big size firms.

James and Edmister's (1983)[2] study on relationship between common stock returns with firm size and trading on 500 issues for 4 years; 1975, 1978 and 1979 listed on NYSE and AMEX indicates that small size firm gave higher risk return than big size firm.

CHAPTER THREE

DATA ANALYSIS AND METHODOLOGY

The principal data used consist of monthly prices for 100 stocks of companies listed on KLSE's Main Board. The stock prices are those of the last trading day of each month for 24 months (from April 1995 to April 1997) were collected.

The stocks were selected randomly from various sectors i.e. consumer product, property, finance and trading/services. The criteria were continuos listing for the period selected and minimal present of KLCI component stock.

Monthly returns, adjusted for capitalisation changes without any adjustment for dividends, were computed by using this formula:

$$R_i = (P_t - P'_{t-1}) / P'_{t-1}$$

where: R_i is the return on the individual stock

P_t is the price in time period t

P'_{t-1} is the price one period before t

KLCI will be use as market benchmark to estimated market beta of stocks. The returns of KLCI were computed using the following formula:

$$R_{m,t} = (CI_t - CI_{t-1}) / CI_{t-1}$$

where: $R_{m,t}$ is the return on the KLCI

CI_t is the KLCI in time period t

CI_{t-1} is the KLCI period (t-1)

To measure the expected return of the stocks or portfolio, Capital Asset Pricing Model (CAPM) was use as a model for the analysis. The CAPM is illustrated by the following equation:

$$E(R_i) = R_f + \beta_i(R_m - R_f)$$

where: R_i is expected return on the individual stock

R_f is the risk free rate

R_m is the returns of the market

β_i is the market risk of the stock.

The empirical version of the Capital Asset Pricing Model (CAPM) was used to analyse relationship between risk and return of stocks. The empirical model of the CAPM or known as Market Model can be represented by the following equation:

$$E(R) = \alpha + \beta R_m$$

where: **R** is expected return on the individual stock or portfolio

α is the intercept of the Security Market Line (SML) with the returns (Y-axis)

R_m is the returns of the market represent by KLCI

β is the market risk of the stock or portfolio

3.1 Average Return (R)

The average return by summing up all the returns and divide by number of data. The formula to calculate the average return as follow: -

$$R = (\Sigma R_t)_{t=1,2,....,n}/n$$

where: R_t is the return of stock

R is average return of the stock

n is number of period of **t**

3.2 Beta (β)

There are two types of beta namely accounting beta and market beta. Accounting beta use accounting rate of returns (AROR) by considering earning in calculating beta whereby market beta use future cash flow that was reflected in market price when calculating the beta.

Accuracy of accounting beta was doubtful due to inaccuracy in earning reported. Earning reported was affected by accounting standard use in preparing the financial statement where different standard will give different value.

Market beta is more accurate due to calculation of returns using market price reflected by future cash flow. Market price was perceives fair or real values of the firm in the eye of investors. In the study, only market beta was use.

Beta is the measurement of an asset's risk based on its returns in relation to changes with the market's returns. The relationship between asset and market return can be represents by

best-fit line called characteristic line. Beta was the slope of that line, which measure systematic risk or market risk.

Individual beta of stocks was estimated by correlating or regressing the returns of individual stock with the returns on KLCI. Meanwhile, portfolio's beta was estimated by regressing the returns on portfolio of stocks with the returns on KLCI. KLCI was use to represent the market benchmark.

3.3 Standard Deviation (σ)

Standard deviation is a measure of the total riskiness of an asset. The more the returns of an asset fluctuate from its mean or average return over a period of time, the higher it's standard deviation and hence the more risky is the investment in that security. The formula for standard deviation as follow: -

$$\sigma_i = \sqrt{\{\Sigma(R_t - R)^2_{t=1,2,...,n.} /(n-1)\}}$$

where: σ_i is the standard deviation

R_t is the return of stock

R is average return of the stock

n is number of period of t

Standard deviation of KLCI is a measure of volatility of the returns on KLCI with respect to time. The same formula can be use as follow: -

$$\sigma_m = \sqrt{\{\Sigma(R_{m,t} - R_m)^2_{t=1,2,...,n.} /(n-1)\}}$$

where: σ_m is the standard deviation

$R_{m,t}$ is the return of KLCI

R_m is average return of KLCI

n is number of period **t**

3.4 Coefficient of Covariance (CoV)

The **CoV** is a ratio that measures amount of risk per unit of return and can be used to compare investments with different expected return to determine the investment with the minimum risk.

The **CoV** is derived from the following formula:

$$\mathbf{CoV} = \sigma/\mathbf{R}$$

where: σ is the standard deviation

R is the average return.

3.5 Correlation Coefficient (ρ)

In this study, the correlation of each stock returns with that of the market was estimated to ascertain the suitability of the asset as a member of a portfolio.

The correlation coefficient indicates the strength of the correlation between two variables and the value ranges from -1.0 to +1.0. The formula used is as follows:

$$\rho_{i,m} = \beta_i \, (\sigma_m / \sigma_i)$$

where: $\rho_{i,m}$ is the correlation coefficient

β_i is the market risk of the stock

σ_i is the standard deviation of the stock

σ_m is the standard deviation of the KLCI

3.6 PORTFOLIO CONSTRUCTION

Portfolio construction can be form using naïve strategy and by design. Naïve portfolio can be constructed by randomly select the stocks to form a portfolio. Meanwhile portfolio