

CHAPTER II

THEORETICAL BACKGROUND AND PREVIOUS RESEARCH

A. Theoretical Background

1. Investment

Generally, investment means the use of money in the hope of making more money. It is the commitment of money or capital to purchase financial instruments or other assets in order to gain profitable returns in the form of interest, income, or appreciation of the value of instrument. Investment is the purchase of a financial product or other item of value with an expectation of favorable future returns in (<http://www.investorwords.com/2599/investment.html>). Investment involves the choice of individual or organization to place or lend money in assets such as property, commodity, stock, bond, futures, options, or foreign assets denominated in foreign currency that has certain level of risk and provides the possibility of generating returns over a period of time. The investment that has not been analyzed carefully can be highly risky for the owner of the investment because the possibility of losing money is not within the owner's control.

Investments are often made indirectly through intermediaries such as banks, mutual funds, pension funds, insurance companies, collective investment schemes, and investment clubs (Wikipedia). Intermediary makes investment through that money from many individuals, each of whom receives a claim on the intermediary. The main functions in the investments area are sales, the analysis of individual securities, and determining the optimal mix securities for a given investor (Brigham, 1992). Portfolio theory is often applied to help investor achieving a satisfactory return compared to the risk taken. Risk can be defined as an event or series of events that are harmful, in investment analysis it is a probability of result achieved to deviate from the expected (Hanafi, 2006).

Understanding risk is a very important for investment in financial education. The most effective way of minimizing the risk is by using diversification. Diversification involves spreading your portfolio over well researched investment opportunities (Davids, 2006). Return is the profit or loss on the investment, including income and change in value. In mutual fund, it is the change in value of a portfolio over an evaluation period including any distributions made from the portfolio during that period. Return can be expressed as a percentage and calculated by adding

the income and the change in value and then dividing by the initial principal.

2. Mutual Fund

What is mutual fund? Mutual fund is an open-ended fund that is operated by an investment company which raises money from shareholders and invests in a group of assets, in accordance with a stated set of objectives (http://www.investorwords.com/3173/mutual_fund.html). It is an investment company that makes investments on behalf of fund shareholders who share common investment objectives (Liaw, 2004). In different words, many people pool their money in a fund which invests in various securities. It raises money by selling the shares of the fund to public then it take the money from selling the shares along with the money that is created from previous investment. The money is used to purchase various investments vehicle such as stocks, bonds, and money market instruments.

Shareholders receive an equity position in the fund and in each of its underlying securities in return of the money they provide for purchasing shares. Each investor shares proportionately in the fund's investment returns, which is the income paid on the securities and capital gain or loss

caused by sales of the security that fund holds. Each mutual fund investor owns an undivided interest in the portfolio and shares mutually with other investors in the fund's gains and distributions derived from the fund investment. They are free to sell their shares anytime in mutual fund, considering that the price in mutual fund will always fluctuate daily depends on the performance of securities held by the fund.

Mutual funds are typically managed externally, an investment advisor makes the fund's investment and trading decisions pursuant to an advisory contract (Fisch, 2010). Every mutual fund company has a manager that directs the fund's investments depending on the objective like long-term growth, stability, etc. so that the fund may invest in stocks, bonds, cash investments, or a combination of these assets. By getting involved in mutual fund, it becomes easier to own stocks without worrying about choosing individual stocks. The value of a mutual fund portfolio fluctuates as investors invest or redeem money and as the value of securities held by the fund rises or falls. Investment company is responsible for the management of the fund and it sells shares in the fund to individual investors. Fund manager calculates the value of fund's holdings, figures out how many shares have been purchased by shareholders, and then calculates the net asset value (NAV) daily. This

activity is repeated over and over on a never ending basis which is why it is called open-end funds.

Mutual fund creates money through its portfolio by receiving dividends, interests, or capital gains. Dividend is received from the stock that it owns. It is shares of corporate profits paid to stockholders of public companies. Mutual fund also has money in the bank that earns interest or it can receive interest payment through that it owns. The company is responsible to distribute these incomes to shareholders, commonly twice a year which is known as income distribution. A fund makes another distribution in the end of the year. It is from the profits they made by selling stocks or bonds that the price goes up. The activity of passing it to the shareholders is known as capital gains distribution. According to Bogle and Bernstein (2000), the advantages of mutual fund are:

1. Diversification

Mutual fund can hold many securities that most investors cannot afford on their own. The more diversified the fund, more risk reduced from serious loss due to a problem from particular company or industry sector where the fund takes investment. A portfolio can be well diversified when it has various types of fund and securities. Diversification greatly reduces and can even

eliminate the specific risk that comes with the ownership of just a few individual stocks and bonds.

2. Professional Management

Fund manager or investment adviser circulates the money of the investors and is responsible for its growth. The manager investigates securities available in the financial market and decides which to buy and sell for the fund through access to extensive research, market information, and skilled security traders. Investors that have limited time to watch over their investment can trust the fund manager to handle their portfolio. The investment professionals who manage the fund must do so strictly in accordance with the fund's basic investment objectives and policies.

3. Liquidity

Investors can buy or sell shares in mutual fund on any business day, which gives them easy access to their money. While many individual securities are bought and sold readily, they are not widely traded.

4. Convenience

Shares can be bought or sold by telephone, mail, internet, or any other devices. Investors have many access to it and able to move the money from one fund to another as the financial needs change. Investors can schedule automatic investment into a fund from bank account or arrange automatic transfers from a fund to bank account to meet expenses. Mutual fund provides recordkeeping services to keep track the transactions, tax returns, and fund's performance. The purchase of fund's shares may take place through one-step process handled by a representative of a stock brokerage firm or investors may choose multistep process which involves no brokers.

Mutual fund has some disadvantages too which are:

1. No Guarantees

It is regulated by Securities and Exchange Commission (SEC) and requires funds to disclose the information an investor need to make sound decisions. Shares in mutual fund are not guaranteed Federal Deposit Insurance Corporation (FDIC) or any other institution alike. The value of mutual fund may fluctuate even if it invests in government securities.

2. High Cost Potential

A combination of sales commission and high operating expense at some companies will reduce the investment return though mutual fund can be a way to lower cost to invest compared with buying individual stocks through a broker. The more cost occurred in the transaction the more it gives damage to the investment return.

3. Tax Impact

Profits on mutual fund investment are typically subject to income tax. Dividend and other taxable interest distribution received are taxed as ordinary income each year in regular taxable account. Mutual fund company distributes its capital gains each year and these are taxed as short-term gains which has the same rate with ordinary income or long-term gains which is taxed lower depend on how long the fund held the securities. A fund that buy or sell securities frequently may burden the tax bill with big capital gains distributions.

Mutual fund is categorized into three types from its investment portfolio, which are money market funds, equity funds, and fixed income funds. Here are the explanations:

1. Money Market Funds

This fund only invests on debt securities that have maturity date less than one year. The returns are relatively low and in a long term the money loses its purchasing power and becomes less valuable. It is useful for parking cash needed in a short term. Money market funds are stable because they invest in ultra short-term securities like those issued by banks, federal government, or big companies with Grade A credit ratings. The return is in the form of dividend. Money market funds are similar to bank certificate of deposit in these respects. The difference is that the fund is completely liquid, unlike certificate of deposit that lock up the money for certain amount of time. Shares in money market funds can be sold at any time.

2. Equity Funds

Equity funds invest at least 80% of its assets in equities. It has high risk but also offer high return. Fund managers do not just buy funds that they find attractive but they invest in all market capitalization in large-cap, small-cap, and mid-cap stocks. The objective of equity fund is long-term growth through capital gains, although historically dividends have also been an important source

of total return. Specific equity funds may focus in certain sectors of the market or may be geared toward a certain level of risk. Some fund managers use value approach to stocks, searching for stocks that are undervalued. Another approach is growth approach which is finding stocks that are growing faster than their competitors or the market as a whole. The combination of both approaches is blend approach which is buying both kinds of stocks, building a portfolio of both growth and value stocks.

3. Fixed Income Funds

This fund invests solely in fixed income investments such as bonds or certificates of deposits. Fixed income funds invest at least 80% of its assets in debt securities. It stresses current income over growth. The funds objective may be accomplished by investing in companies with long histories of dividend payments such as utility stocks, blue-chip stocks, and preferred stocks. Fixed income funds are dependable and limit the risk that investors will take, although it serves less return that can be achieved in riskier fund. Fixed income mutual funds are compatible for long-term investment with moderate risk. Most existing fixed income mutual funds currently engage in obligation. This kind of fund pay dividend on regular time range whether it is quarterly, semi annually, or annually.

3. Net Asset Value (NAV)

Net asset value is the value of mutual fund's share computed daily at the close of financial markets. It is used to describe the value of an entity asset less the value of its liabilities. Net asset value may represent the value of the total equity or it may be divided by the number of shares outstanding held by investors that represents NAV per share. The fund's investments and other assets are valued on a regular basis such as daily, weekly, or monthly depends on the fund and associated regulatory or sponsor requirements. A fund's offering price is its NAV plus, if any, the applicable sales charge. The redemption price is its NAV minus, if any, the applicable redemption fee (Liaw, 2004). If the value is negative, then the party is considered insolvent. A fund's net asset value changes regularly, daily variations are usually small.

4. Conditional Value at Risk (CVaR)

Conditional value at risk (CVaR) is a risk assessment technique used to reduce the probability of a portfolio will incur large losses (http://www.investopedia.com/terms/c/conditional_value_at_risk.asp). This is performed by assessing at the confidence level that a specific loss will exceed the value at risk (VaR). Conditional value at risk is obtained by

taking a weighted average between the value at risk and losses exceeding the value at risk. Commonly the conditional value at risk exceeds its value at risk. It is also known as mean excess loss, mean shortfall, and tail VaR that is created as the extension of value at risk.

According to Rockafellar and Uryasev (2000), conditional value at risk is defined as the conditional expectation of losses exceeding value at risk in a specified period at a given confidence level. The value at risk confidence level of 1% indicates low tolerance, 5% indicates moderate tolerance, while 10% indicates high tolerance of loss. Due to its nice mathematical properties and its ease to compute, conditional value at risk as a coherent measure is now the most promising risk measure. Usually to ensure the consistence with the calculation of value at risk, conditional value at risk is estimated by relying on the stable distribution (Chen and Lin, 2006). It can be directly calculated by utilizing the simulation data during the calculation of value at risk. The problem with relying solely with value at risk model is that the scope of risk assessed is limited since the tail end of the distribution of loss is not typically assessed. If losses occurred then the amount of the losses will be substantial in value. Conditional value at risk allows manager to limit the tendency of incurring losses caused by all risks.

Weighted average is an average in which each quantity to be averaged is assigned a weight. It determines the relative importance of each quantity on the average. Weightings are the equivalent of having that many like items with the same value involved in average. Weighted average is calculated by dividing the multiplied value and weight with the total weight.

5. Standard Deviation (σ)

The standard deviation is often used by investors to measure the risk of a stock or a stock portfolio. The basic idea is that the standard deviation is a measure of volatility, the more stock's return vary from its average return means the more volatile the stock. Standard deviation is a measure of the dispersion of a set of data from its mean. The more the data deviates from the mean, the higher the risk carried. It is calculated as the square root of variance. Standard deviation is applied to the annual rate of return of an investment to measure the investment's volatility in finance.

Risk is an important factor in determining how to manage portfolio efficiently on investments because it determines the variation in returns on the portfolio and gives investors a mathematical basis for investment

decision known as mean-variance optimization. Investors supposed to estimate both the expected return and the uncertainty of future returns. Standard deviation provides a quantified estimate of the uncertainty of future returns.

6. Efficiency Measurement System (EMS)

Efficiency measurement system is a software for Windows 9x/NT and above that computes data envelopment analysis efficiency measures. It uses LP Solver DLL BPMPD 2.11 for computing the scores. Efficiency measurement system accepts data in MS Excel 97 or older files. It handles inputs and outputs as well as non-discretionary data.

7. Data Envelopment Analysis (DEA)

Data envelopment analysis is a robust non-parametric linear programming approach that is used for benchmarking performance and for making selection decisions (El-Mashaleh, 2010). Data envelopment analysis is used to measure the efficiency from each decision making units (DMUs) that is acquired as maximum from output weight and input weight ratio. According to Talluri (2000), data envelopment analysis is a

multi-factor productivity analysis model for measuring the relative efficiencies of a homogenous set of decision making units. It receives increasing importance as a tool for evaluating and improving the performance of manufacturing and service operations.

In general, a decision making unit is considered to be efficient if it obtains a score of 1. A score of less than 1 implies that it is less efficient. For every inefficient decision making unit, data envelopment analysis identifies a set of corresponding efficient units that can be utilized as benchmarks for improvement. The production is considered efficient when the output created is more than the input determined. Definition from efficiency measurement allows many outputs and inputs without using weight in the beginning. It turned out to be single virtual output and input by optimal weight. Then the efficiency measurement is from the multiplier function from the combination of virtual input-output. Data envelopment analysis allows for computing the necessary improvements required in the inefficient unit's inputs and outputs to make it efficient too. Strengths of data envelopment analysis are:

1. It can handle multiple input and multiple output models.
2. Does not require an assumption of a functional form relating inputs to outputs.

3. Decision making units are directly compared against a peer or combination of peers.
4. Inputs and outputs can have very different units.

Weaknesses of data envelopment analysis are:

1. Measurement error can cause significant problems since data envelopment analysis is an extreme point technique.
2. It is good at estimating relative efficiency of a decision making unit but not absolute efficiency.
3. Statistical hypothesis test are difficult since data envelopment analysis is a non parametric technique.

B. Previous Research

Mutual fund performance assessment has been an important area of research in finance due to its academic and practical importance. It needs a credible and robust measure for assessing the performance. According to Chen and Lin (2006), in order to properly measure the fund risk and evaluate the fund's performance other new risk measures should be adopted. Treynor index (Treynor 1965) of the excess return per unit of the systematic risk, the Sharpe index (Sharpe 1966), and the Jensen's α (Jensen 1968) of the

difference between the actual portfolio return and the estimated benchmark return as earlier performance measures are still in use today. However, these risk measures are incapable of modeling extreme losses. The data envelopment analysis technique has been adopted for assessing mutual fund performance, this approach especially allows to define mutual fund performance indexes that can take into account different risk measures and the investment costs (Cooper et al., 2000).

Recent developments in risk theory suggested that quantile-based measures are compatible for computing risk since it is more sensible for an investor to be concerned with the risk rather than the gain (Morgan, 1996). A portfolio's value at risk is the maximal loss one expects to suffer in that confidence level within certain time period. Nevertheless, recent research shown that value at risk has undesirable properties such as lack of subadditivity that results in value at risk not as a coherent measure (Artzner et al, 1999).

Recognizing the limitation of value at risk to respond the magnitude of possible losses below the threshold it identifies, then conditional value at risk is introduced due to its nice mathematical properties and its ease to compute (Rockafellar and Uryasev, 2000). It is defined as the conditional expectation of losses exceeding value at risk at a given confidence level in certain time period. Conditional value at risk is a coherent and the most promising risk

measure (Chen and Lin, 2006). The research tried to incorporate the coherent measure into data envelopment analysis performance index so it can take into account all the different aspects relevant to the fund performance and allow to compute an indicator of the overall performance of the mutual fund investment. Conditional value at risk should be combined with another traditional risk measure so that different risk characteristics of the fund return can be simultaneously modeled.

C. Hypothesis Development

Fixed income mutual fund performance can be measured with data envelopment analysis. The data envelopment analysis fairly evaluates the relative performance of the same fund during different time periods. In this research the same fund during different period is treated as different decision making units. Data envelopment analysis technique has been found very useful for evaluating the mutual fund performance. This is supported with the research conducted by Chen and Lin (2006).

H1: The performance of fixed income mutual funds listed in BAPEPAM-LK is different with Indonesian Government Debt Indices.