CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

"The term efficiency, used in its ordinary sense, might suggest that market efficiency relates to the organizational and operational smooth-running of the securities market. In fact, the term is used here in a much narrower sense, being concerned specifically with how successful the market is in establishing security prices that reflect the " worth" of the securities. This notion of "worth" will shortly be discussed more fully, but already it should be evident that the efficiency of the market in this sense is not an issue that can be determined by reasoning alone or even by simple personal observation. It is possible to argue, for instance, that, if share prices are the products of the transactions of large numbers of investors of varying degrees of sophistication, the prices are unlikely consistently to represent the best estimate of worth. Against that, it is equally possible to argue that, provided there is no systematic bias in the reactions of naïve investors to new information, their naiveties may cancel one another out, and the share prices that result may reflect the assessment of the sophisticated minority, thus possibly providing the best estimate of worth. The first view may be described as the conventional one. The second view is the one underlying the efficient market hypothesis (EMH)" ...Keane (1980:6)

Most of the past literature on futures market concentrated on the market efficiency[1]. Following Robert's (1959) suggestion, Fama (1970) distinguished three types of potential levels of efficiency namely weak-form (predictability efficiency), the semi-strong form (information efficiency) and the strong-form (private information efficiency) market efficiency hypotheses.

2.1 The Efficient Market Hypothesis (EMH)

- *Weak Efficiency*

The market is efficient in the weak form if share prices move independently of previous moment. Thus, in such a market there would be no predictive patterns enabling future price movements to be predicted from studying chart of past prices. Nor would there be any effective "trading" rules, (such as "sell" a share if it falls by x% below a certain price) which produced above-average returns. Prices would respond only to new information or to new economic events. Cootner (1964) and Fama (1965) among others indicated that the security price behavior is well described by a multiplicative random walk model.

[1] In this review random walk hypothesis and efficient market hypothesis are used interchangeably. Prior to Fama's article (1970), most writers referred to these subjects as random walk hypothesis.

- *Semi-Strong Efficiency*

The market is efficient in the semi-strong sense if share prices respond instantaneously and in an unbiased manner to new information. Thus, although the users of information might differ among themselves about the significance of new data, the implication is that prices that are actually arrived at in such a market would invariably represent the best interpretation of the information. It would be futile for investors to search for bargain opportunities from an analysis of published data. Tests of the semi-strong efficiency are usually conducted using market adjusted return model and risk-adjusted model (Marsch, (1979); Brown and Warner (1980, 1985); Annuar Md. Nasir and Shamseer Mohamad, (1993))

- *Strong Efficiency*

The market is efficient in the strong sense if share prices fully reflect not only published information but also all relevant information including data not yet publicly available. If the market were strongly efficient, therefore, even an insider would not be able to profit from his privileged position. Strictly, this third level has little to do with the efficiency of the stock market itself, but relates to the efficiency of the capital market in its broadest sense. Thus, semi-strong efficiency is concerned with how well the market process the information disclosed to it, but strong efficiency is concerned primarily with the adequacy of the information disclosure process. It follows that if the market is found to be inefficient in the strong sense (by failing to capture unpublished information in

share prices) this has to be seen as a comment more about the suppliers of information than about the users.

2.2 Futures Market Efficiency

Many studies on futures market efficiency utilized Fama's concept developed in 1970. Fama stated that an efficient market generates price which, at any point in time, always reflects all available information. Thus, at any point of time, let's say t, an actual price will emerge that reflects current information on supply and demand. Simultaneously, current expectation concerning futures levels of supply and demand will be fed into today's futures price of a contract maturing in time t + j.

Tucker and Fuller (1986) also stated that the market is efficient if futures prices exhibit two separate though related characteristics. First, futures price will follow a random walk model suggested by Samuelson (1965). Second, futures prices will provide the best available estimates of the subsequent actual prices (or matures futures prices).

Whether the futures prices are biased estimates of subsequent cash prices remains an empirical issue. Roberts (1967) and Fama (1970) classified three different types of test concerning efficiency of market as "weak", "semi-strong" and "strong" form. Weak form test relies on a historical set of prices often reduced to test on the randomness of prices. The market is said to be semi-strong if prices reflect all publicly available information as it is released. A strong-form test examines if any particular group in the market has monopolistic access to information as it is released. Most studies on efficiency tend to cluster around the "semi-strong" form using linear regression.

2.3 Forecast Pricing Accuracy

Many studies have examined the pricing accuracy of futures market. Tomek and Gray (1970), Kofi (1973) and Leuthold (1974) investigated the forecasting ability of futures markets within the context of allocative efficiency. Tomek and Gray compared price relationships in two storable commodities, corn and soybeans, with non-storable commodity, Maine potatoes. All three are produced seasonally but while stocks of corn and soybeans are held continuously from harvest to harvest, stocks of potatoes are not. They found that corn and soybeans market prices are relatively a better forecast a potato market prices. The difference in pricing performance between these markets indicates the significance of stock on the price spread and the influence of expectations on the price level.

Kofi's study provides further support to Tomek and Gray's findings. He examined the Chicago's futures market for wheat and maine potatoes during 1953-1969. He found that storable commodity, in this case wheat, provides relatively reliable forecasts of cash prices at any point of time. Kofi also shows that the longer the horizon, the worse the futures market performs as a predictor of spot prices.

Leuthold (1972) also found that futures prices were efficient forecasts of spot prices for only near maturity dates. He also compared futures price of live beef representing a non-storable commodity with corn- a commodity with continuous production. Despite the clear differences between the two with respect to storage and production, he found no significant difference in the pricing accuracy. He showed that futures prices were efficient forecasters of spot prices for only near-maturity dates. Leuthold and Hartman (1979) examined monthly average of daily futures prices of live

hogs during 1971-1978. Using an economic forecasting model as a performance norm, they found that the futures market "has not at all times fully reflected available information". Peck (1975) found that futures prices for eggs are as accurate as several econometric models examined.

Giles and Goss (1980) studied the forward pricing functions of wool using General Instrumental Variables Estimator (GIVE). The results support the view that lagged futures prices are unbiased estimates of delivery date spot prices for wool with lags one to 12 months, and for live cattle with lags from one to three months. This hypothesis is generally accepted for wool except for lags of 3 or 12 months) and is rejected for beef. Recent works by Bigman, et al., (1983) further support the previous findings on futures price efficiency, i.e., the market is inefficient for more distant futures contract.

Rausser and Carter (1983) examined the forecasting accuracy of futures prices versus multivariate and Autoregressive Integrated Moving Average (ARIMA) models, for various soybean futures. They found that the multivariate and ARIMA models "outperform" the futures market for soybean meal but not for soybean oil both for long and short run horizons. Earlier, Rausser and Just (1979) examined the forecasting accuracy of futures prices versus econometric models for average quarterly cash price of several agricultural commodities. Their findings are inconclusive as to the strength of each model. They indicate striking differences among markets, reflecting different degrees of available information. Besides, there is a sufficient degree of information independence between the econometric forecasts and futures price.

In view of the mixed results and findings, it is highly probable that in the event of inaccuracies in forward pricing it may have caused social losses in particular in the non-inventory markets. Social losses are minimized in an inventory market where futures prices are reliable forecasts. Kamara (1982) indicated that more research is needed to determine the magnitude of the avoidable social losses, and more important, to examine the causes of these inefficiencies. Some of the factors that contribute to the inefficiencies are lack of a sufficient proportion of producers and firms actively trading in the market (suggested by Leuthold and Hartman, 1979, and Cappoza and Cornell, 1979). Other causes of inefficiencies include irrational trades, poor-quality speculation, tax effects, misinterpretation of information, transaction costs, capital controls and others. Theoretical and empirical research in this area are yet to be explored.

2.4 Random Walk Theory

The efficient markets theory is most commonly associated with Sharpe (1964), Lintner (1965) and Fama and Miller (1972). Samuelson (1965) used the model of price formation in terms of expected returns, which depend on the risk vis-à-vis other securities and are conditional of information set (S) where E (pt + 1I S) = [1 + E (rt +1 I S] pt.

Where E = expectation operator, pt = the price of a security at time t, rt +1 = the one-period return and pt and rt are random variables.

These assumptions imply that trading systems using only information in S cannot have returns greater than equilibrium expected returns. Thus excess return must have expectation zero i.e. it is " fair game" with respect to S. He also proved that properly anticipated price would fluctuate randomly. This is consistent with empirical studies, which showed price changes or returns behaving like random walks. Prices would fully reflect available information if there were no transactions costs, all information were costless available to all participants and they agreed on the implications of current and future information for prices.

Praetz (1975) has studied the independence of price changes on the Sydney Wool Futures Exchange; a commodity futures exchange. Independence is important of price, as if it is true, knowledge of past price changes will not help to predict future price changes and prices. He tested for independence using serial correlation tests, runs tests and spectral test. He found out that spot and six months are significant in serial correlation tests and runs tests but spectral analysis provides some insight into the non-randomness, which may be due to the harmonics of weak seasonal movements. The evidence on the independence of price changes from all four tests is remarkably consistent in its support for the efficient market theory.

2.5 The Theory of Anticipatory Prices

Taussig (1921) in his theory held that the equilibrium price in the time series is only roughly determinate, and that the market price is free to fluctuate within a penumbra of uncertainty about the equilibrium price. At the edge of the penumbra, there would be a reaction, or at least a check, presumably caused by equilibrating forces asserting themselves, returning the price toward equilibrium. Since no one knows just where within the penumbra the price should be, it moves in this zone in response to the slightest impulse, which may be completely unrelated to market information. Taussig assigned a big role to the market manipulator. Taussig's theory apparently differentiates between prices changes caused by manipulation and those caused by market information.

However, Larson (1975) supported the studies from Working (1958) which used the time series test statistics (the index continuity in the commodity futures to analyze anticipatory prices). Analysis based on the index of continuity has demonstrated the existence of a high-order, low-weight moving average stochastic process generating price changes and the statistical results can be given the economic interpretation that market price changes are closely tied to market news, which tends to be a true reflection of changing demand and supply conditions. But this interpretation rests on the assumption that price cannot wander away from the equilibrium and remain away for long.

2.6 Studies on the Stock Market in Malaysia

Several empirical studies have been conducted on the efficiency of the Kuala Lumpur Stock Exchange (KLSE) such as weak-form efficiency on the Kuala Lumpur Stock Exchange using traditional method, unit root and other methods. Numerous tests have been conducted on the semi-strong form efficiency on the Kuala Lumpur Stock Exchange using risk-adjusted returns with DFR (Dimson-Fowler-Rorke) method corrections and also the strong-form efficiency of the Kuala Lumpur Stock Exchange using moving window technique for re-estimating risk mitigating from Fama and Macbeth (1973).

Cheng's (1982) study on the weak-form efficiency found that the correlation of stocks price changes was small and therefore concluded that the Kuala Lumpur Stock Exchange was weak-form efficient. The results obtained by Lim (1982) agreed on Cheng that there has been no significant deviation from the weak-form of the EMH when he conducted the test on monthly closing price of 30 actively traded counters and 6 sector indices from June 1974-June 1980.

Othman (1989) used the weekly closing prices of 30 randomly selected companies from the Kuala Lumpur Stock Exchange Industrial Index covering a period from January 1977-January 1988, which showed a deviation from the random walk model. Saw and Tan (1986) then conducted a study by using six sectoral indices and the all share index over the period 1975-1982. Their studies show a remarkable results suggesting that the Malaysian stock market was inefficient in a weak form when weekly data were used, but market efficiency exists when monthly data were used.

Fatimah and Zainal (1991) have estimated the relative forecasting accuracy of futures price on spot compared to well proven statistical techniques like Box-Jenkins, econometric and various types of moving averages. They have shown that futures prices outperform the other techniques in forecasting forward price.

Kok and Goh (1995) stated that the findings on the weak form efficiency of the Malaysian stock market are fairly mixed. The results of the various statistical tests on the KLSE daily stock indices indicate serial dependence in successive price changes. A tentative conclusion would be that the Malaysian stock market is inefficient in the weak form and there is no noticeable improvement over time. When the weekly data were used, they found that all the tests show that the Malaysian stock market has improved its efficiency from a weak inefficiency market in the mid 1980's to a weak form efficient market by the late 1980's and early 1990's.

Loh (1998) in his findings stated that the study in the KLSE Composite Index (KLSE CI) and the 20 selected component stocks show that the introduction of futures trading had no significant impact on volatility and efficiency of the Malaysian stock market. It seems that futures market is quite an independent market.

However, author found no empirical findings or studies on the efficiency on the Malaysian Stock Index Futures market itself (weak-form efficiency or semi-strong form efficiency). Therefore the objective of this study is to examine whether Moving Averages, Single Exponential Smoothing and Econometric Model forecasting ability combined with some trading rules and assumptions could be used to outperform the Malaysian Stock Index Futures market.