The Efficient Market Hypothesis (EMH): Definition and Practical Implications

Definition

The **Efficient Market Hypothesis (EMH)** is a controversial theory that states that **security prices reflect all available information, making it fruitless to pick stocks** (this is, to analyze stock in an attempt to select some that may **return** more than the rest).

Stock picking takes, in the best of cases, a lot of work to be just feebly fruitful, so there are probably better things to do with our resources.

The rationale behind this is that the plentiful well-informed motivated professionals that work in the financial markets allegedly form an efficient system for assigning each security the **most adequate price, given the available information**. Therefore, no individuals can outsmart this fabulous group and **beat the market** by regularly buying securities at prices that are lower than what they should be.

Put in other words, the hypothesis is saying that no stock trades too cheaply or too expensively; hence, it would be useless to select which ones to buy or sell. According to the EMH, the reason for this perfect pricing is that, if one stock happens to be trading even just a bit too cheaply (or too costly), then its demand increases (or decreases), rapidly moving the price to its most reasonable value.

This sounds against ordinary wisdom, as we have all heard stories of successful stock picking by keen traders. Sometimes, these traders justify their accomplishments, explaining how they anticipated certain news that
produced a change of price, which was unseen for most of the other stock traders. Nevertheless, these cases don't necessarily contradict the EMH. When some news triggers a change of value, the previous price may have reflected the amount of probability of the news really happening and the price shift it would produce. There was a probability of the news not happening, and if that had been the case, the price would have shifted in opposite direction. If the EMH happens to be right, those who were lucky to select the right outcome this time, may be unlucky the next.

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To decide if investors can beat the market or not, what we need to know is if their predictions are more often right than wrong (actually, that "more often" should be a weighted average that considers the amount of possible profits and losses). On the one hand, people tend to remember and communicate their success stories more than their failures, especially if they are trying to sell a service. Moreover, among the veteran traders in the markets, there are more who won in the past, because those who lost money were more inclined to finding something else to do with their time and remaining assets. So **you will hear a lot of success stories about traders supposedly using their knowledge to beat the market, but that doesn't necessarily prove the EMH to be wrong.***

**Weak, Semi-Strong and Strong EMH**

There is **scientific evidence** to support the EMH. According to some it is conclusive (and so they talk about an Efficient Market *Theory*) and according to others it is not. In part, it depends on the **flavor of EMH being under study**, as there are three versions of it, which differ in their definition of *available information*. We said that the hypothesis states that this fabulous team called the market assigns the more adequate price given a certain *information*. It is key to know what kind of information that is,
because if we had more than that data then the EMH wouldn't say anything about our chances to beat the market.

The EMH version that most interests us (semi-strong) has strong factual support, although it is arguable to say that it is conclusive.

The **weak version** of EMH says that this information is past prices and trading volumes. This type has the strongest support but it is the least significant, as everyone has access to more information than past trading data. For example, company earnings, indebtment, product profile, among other facts (that are called *fundamentals*). Therefore not much is said about the possibility of investors beating the market or not. Nevertheless, it has an interesting consequence: it would be of no use to perform technical analysis (which is stock price prediction based exclusively on past trading data, in contrast to *fundamental analysis*, which studies the financial performance of the corporation).

A stronger flavor of EMH, called **semi-strong**, says that the information in question is all which is publicly available. This version is the **most interesting** for our case because, as investors, that is exactly the information that we have access to, so if semi-strong EMH is true, then it is useless for us to analyze stock in an attempt to separate winners from losers.

There is a stronger version, or **strong EMH**, which is based on all information, public or private. This one has evidence against. Therefore, it is illegal to use insider information for trading, as it would mean insiders taking profits from the general public and thus pushing them away from stock trading, something that society doesn't want. Corporate officers can buy their corporations' stock, but when they do they have to inform the government, and that information is made public so that their purchase becomes a publicly-known fact.

**Implications**
The EMH version that most interests us (semi-strong) has **strong factual support**, although it is arguable to say that it is conclusive. Personally I take it to be not totally true but to a high degree, and that level of acceptance is enough for inferring some important practical conclusions:

- Stock picking takes, in the best of cases, a lot of work to be just feebly fruitful, so there are probably better things to do with our resources.
- Instead of picking stocks, it makes sense to buy **passively-managed funds** with low commissions, such as various ETFs, to obtain the market's average returns.
- If we are hiring professionals to do stock picking for us (which happens, for example, when we purchase shares of an actively-managed fund) their fees shouldn't be too high, because the potential benefits aren't.
- Whenever we attempt to beat the market, by performing security picking ourselves or through a professional (fund manager), lets consider the rationale behind the EMH, to identify potential sources of market inefficiency. For example, we better not try to beat the market by analyzing large-cap companies, because lots of people are doing it, with the same information that is available to us. Instead, coming to know a small company and a niche market could put us (or our fund manager) in an advantageous position compared to the rest of the market. Therefore, active management sounds like a better idea for small-cap funds than for large.
- Don't feel too bad if you bought a security and then its price fell, you only were as silly (or intelligent) as that fabulous team called the market. There are other better criteria for judging your portfolio-building skills.

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EMH shouldn't be misinterpreted into thinking that there is no such thing as **investment-portfolio design**. There are still important decisions to
make in order to obtain a portfolio with a risk that suits you; a good (expected) reward for that risk, and the lowest possible costs, meaning commissions and other fees. Modern Portfolio Theory is a set of theories that provide the basis for doing it, with EMH as one of its pillars, and will be treated in subsequent articles. Just as the Efficient-Market Hypothesis, much of the rest of Modern Portfolio Theory is easy to grasp and has immediate practical consequences, even for small investors.

1) The meaning of financial market efficiency

Financial market is a market for the exchange of capital and credit, which consists the money markets and the capital markets. Money market is the market for short-term debt securities, which is a typically safe and highly liquidable investment. While capital market is the market where long-term debt or securities are traded.

Market efficiency refers to a condition, in which current prices reflect all the publicly available information about a security. The basic idea underlying market efficiency is that competition will drive all information into the price quickly.

In the financial market, the maximum price that investors are willing to pay for a financial asset is actually the current value of future cash payments that discounted at a higher rate to compensate us for the uncertainty in the cash flow projections. Therefore what investors are trading actually information as a "commodity" in financial market for the future cash flows and information about the degree of certainty.

Efficient market emerges when new information is quickly incorporated into the price so that price becomes information. In other words the current market price reflects all available information. Under these conditions the current market price in any financial market could be the best-unbiased estimate of the value of the investment.

2.1) The theory relating to Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) has been consented as one of the cornerstones of modern financial economics. Fama first defined the term "efficient market" in financial literature in 1965 as one in which security prices fully reflect all available information. The market is efficient if the reaction of market prices to new information should be instantaneous and unbiased. Efficient market hypothesis is the idea that information is quickly and efficiently incorporated into asset prices at any point in time, so that old information cannot be used to foretell future price movements. Consequently, three versions of EMH are being distinguished depends on the level of available information.
The weak form EMH stipulates that current asset prices already reflect past price and volume information. The information contained in the past sequence of prices of a security is fully reflected in the current market price of that security. It is named weak form because the security prices are the most publicly and easily accessible pieces of information. It implies that no one should be able to outperform the market using something that "everybody else knows". Yet, there are still numbers of financial researchers who are studying the past stock price series and trading volume data in attempt to generate profit. This technique is so called technical analysis that is asserted by EMH as useless for predicting future price changes.

The semi strong form EMH states that all publicly available information is similarly already incorporated into asset prices. In another word, all publicly available information is fully reflected in a security's current market price. The public information stated not only past prices but also data reported in a company's financial statements, company's announcement, economic factors and others. It also implies that no one should be able to outperform the market using something that "everybody else knows". This indicates that a company's financial statements are of no help in forecasting future price movements and securing high investment returns.

The strong form EMH stipulates that private information or insider information too, is quickly incorporated by market prices and therefore cannot be used to reap abnormal trading profits. Thus, all information, whether public or private, is fully reflected in a security's current market price. That's mean, even the company's management (insider) are not able to make gains from inside information they hold. They are not able to take the advantages to profit from information such as take over decision which has been made ten minutes ago. The rationale behind to support is that the market anticipates in an unbiased manner, future development and therefore information has been incorporated and evaluated into market price in much more objective and informative way than insiders.

The random walk model of asset prices is an extension of the EMH, as are the notions that the market cannot be consistently beaten, arbitrage is impossible, and "free lunches" are generally unavailable.

2.2) The implications of the EMH for optimal investment strategies

The EMH has implied that no one can outperform the market either with security selection or with market timing. Thus, it carries huge negative implications for many investment strategies. Generally, the impact of EMH can be viewed from two different perspectives:

i) Investors perspective:
Technical analysis uses past patterns of price and the volume of trading as the basis for predicting future prices. The random-walk evidence suggests that prices of securities are affected by news. Favourable news will push up the price and vice versa. It is therefore appropriate to question the value of technical analysis as a means of choosing security investments.

Fundamentals analysis involves using market information to determine the intrinsic
value of securities in order to identify those securities that are undervalued. However, semi-strong form market efficiency suggests that fundamentals analysis cannot be used to outperform the market. In an efficient market, equity research and valuation would be a costly task that provided no benefits. The odds of finding an undervalued stock should be random (50/50). Most of the time, the benefits from information collection and equity research would not cover the costs of doing the research.

For optimal investment strategies, investors are suggested should follow a passive investment strategy, which makes no attempt to beat the market. Investors should not select securities randomly according to their risk aversion or the tax positions. This does not mean that there is no portfolio management. In an efficient market, it would be superior strategy to have a randomly diversifying across securities, carrying little or no information cost and minimal execution costs in order to optimise the returns. There would be no value added by portfolio managers and investment strategists. An inflexible buy-and-hold policy is not optimal for matching the investor’s desired risk level. In addition, the portfolio manager must choose a portfolio that is geared toward the time horizon and risks profile of the investor.

ii) Financial managers perspective
Managers need to keep in mind that markets would under react or over react to information, the company's share price will reflect the information about their announcements (information).

The historical share price record can be used as a measure of company performance and management bear responsibility for it. When share are under priced, managers should avoid issuing new shares. This will only worsen the situation. In normal circumstances, market efficiency theory provides useful insight into price behaviour. Generally, it can be concluded that investors should only expect a normal rate of return while company should expect to receive the fair value for the securities they issue.

3) Empirical Tests for the EMH

Two different local studies on the Kuala Lumpur Stock Exchange (KLSE) have been chosen, which each of the studies test on the different form of efficiency of the KLSE.

The first study, "Weak Form Efficiency and Mean Reversion in the Malaysian Stock Market" conducted by Kok Kim Lian and Goh Kim Leng, addresses the issue of weak form market efficiency in the Malaysian case by examining the random walk behaviour of stock prices over the short run in the KLSE using the closing levels of the seven KLSE stock indices: Composite Index, Emas Index and the five sectorial indices. The tests employed are run tests, serial correlation test, Ljung-Box-Pierce Q test and the von Neumann's ratio test, which are based on returns of short horizons.

Kok and Goh used the daily, weekly and monthly closing levels of the seven KLSE stock indices over a period of 9 years, 1984 to 1992. Meanwhile, the results are given for the two equal sub periods 1984 - June 1988 and July 1988 - 1992 in order to determine the attributable of any significant result of the sub periods towards the whole period result and also to make comparisons.
Study on the long run random walk behaviour in the KLSE is also being given attention by the Kok and Goh as the phenomenon of short run random walk behaviour may not hold in the long run. This is because they may revert to some mean level over longer horizons and is thereby said to be mean reverting. The study is done by investigating whether indices exhibit mean reversion.

In the run test to confirm the efficiency, which compared the actual number of runs with the expected in order to determine the dependence in price changes, no conclusion can be made by Kok and Goh as the results are in contrast among daily, weekly and monthly data.

In the statistical tests for independence, serial correlation, Ljung-Box-Pierce Q test and von Neumann's ratio test are being adopted. The results of serial correlation test on daily, weekly and monthly data are doubled confirmed by the Ljung-Box-Pierce Q tests, which can tests up to 12 lags. The results are being reinforced again with the Von Neumann's ratio test. The results of the various statistical tests on the KLSE daily stock indices indicate serial dependence in successive price changes. All the tests show that the Malaysian stock market has improved its efficiency from a weak form inefficient market in the mid 1980's to a weak form efficient market by the late 1980's and early 1990's.

Another study being chosen is "A Test of Semi-Strong Form Efficiency on the Kuala Lumpur Stock Exchange. The Effect of Annual Earnings and Dividend Announcements on Stock Prices" by Annuar Md Nasir and Shamsher Mohamad. This study as the title say it, is concerned with semi strong efficiency of listed stock on KLSE with adjustments for thin trading mis-estimates: the effect of information content of changes in annual earnings and dividend announcements on share prices is analysed.

Annuar and Shamsher used the monthly closing prices of all stocks traded during January 1975 to December 1989 with adjustments on any capitalisation changes. Earnings and dividend were collected from a sample size.

Annuar and Shamsher have employed event studies in the effort to show markets react quickly to new information. In the process to analyse the effects of annual earnings on stock prices, market model was used to generate expected returns with the consideration of market wide factors as well as the systematic risk of individual stock. Annuar and Shamsher also adopted the use of equally-weighted market return with supporting evidence for the method. Thus, the stock's abnormal return is derived from the differences between actual and expected returns.

The average abnormal returns and cumulative abnormal returns for 12 months are then taken as measures of average and cumulative impacts of earnings and dividend announcements, with the expectation that the cumulative abnormal returns would fluctuate randomly around zero after the announcement. In conjunction, Annuar and Shamsher estimated 2.7 percent of risk-adjusted abnormal returns net of costs are not achievable by investors.

In addition, Annuar and Shamsher have employed moving window technique for re-estimating risk in order to mitigate the possibility of a shift in the risk of the stock as a result of the announcements. Besides that, the Dimson-Fowler-Rorke (DFR) method
was employed to correct the thin-trading bias by applying a two lead and two lag specifications.

Finally, Annuar and Shamsher used the Wilcoxon signed-ranked test to analyse for possible significant differences in the monthly abnormal returns for both earnings and dividend changes, with 5 percent of significant level to accept the semi strong efficiency theory.

Another additional methodology need to be highlighted here is that Annuar and Shamsher have actually differentiated the samples of securities to two categories based on their traded volume.

Please take note that, for both studies, we are not looking in-depth into the statistical tests formula which have been employed in order to maintain the length of this article. Besides that, we feel that the collection of data, adjustment to data and the selection on which statistical tests to be used is more important than the formula. This is because the formula is "death" and is in the standard form for all researchers around the world unless the researcher made modification to the formula. However, both of the studies are enclosed in the appendices for references.

4) Assessment of the extent to which financial markets are efficient in the light of relevant empirical studies

The two studies being discussed have actually come to the same conclusion that accept or in line with the underlying theory of each form of efficiency. In order to assess which financial markets are more efficient according to the studies, we may need to look in-depth to the methodology and basis for accept or reject for each studies.

In the first study on weak form efficiency, the researchers have strong evidence to prove their conclusion as 4 statistical tests are being used to reinforce the result. However, with only statistical tests are being employed can be a major drawback as the trading rule tests are being over looked such as the filter rules may beat the market. Moreover, the data used are not adjusted to any capitalisation changes which may bring huge impact to the result of the findings.

In the second study on semi strong form efficiency, the researchers have test on two events, namely the effect of annual earnings and dividend announcements on stock prices. The two events studies chosen are appropriate according to the local environment where most local investors concern about although there is more other events that can be look into. Besides that, it is a good approach that the researchers have made adjustments on capitalisation changes on the stock prices since this may differ the findings. The idea of categories the stock according to the volume traded is seen to be able to identify the monopoly problem of certain higher traded stock because the market can be efficient if only a fraction of the stock traded.

From the both studies, we noticed that no initiative has been taken to forecast for the expectational errors. No tests is free from error, users of the research need to know the degree of error in order to rely on the findings of the research. However, we have reached to the final conclusion that the second study on semi strong form show that the
financial market under research is more efficient.

References


