MARKET EFFICIENCY - DEFINITION AND TESTS

What is an efficient market?

- Efficient market is one where the market price is an **unbiased estimate** of the true value of the investment.
- Implicit in this derivation are several key concepts -

(a) Market efficiency **does not require that the market price be equal to true value** at every point in time. All it requires is that errors in the market price be unbiased, i.e., that prices can be greater than or less than true value, as long as these deviations are random.

(b) The fact that the deviations from true value are random implies, in a rough sense, **that there is an equal chance that stocks are under or over valued** at any point in time, and that these deviations are uncorrelated with any observable variable. For instance, in an efficient market, stocks with lower PE ratios should be no more or less likely to under valued than stocks with high PE ratios.

(c) If the deviations of market price from true value are random, it follows **that no group of investors should be able to consistently find under or over valued stocks** using any investment strategy.

Market Efficiency for Investor Groups

- Definitions of market efficiency have to be specific not only about the market that is being considered but also the investor group that is covered.
    - It is extremely unlikely that all markets are **efficient to all investors**, but it is entirely possible that a particular market (for instance, the New York Stock Exchange) is efficient with respect to the average investor.
    - It is also possible that **some markets are efficient** while others are not, and that a market is efficient with respect to some investors and not to others. This is a direct consequence of differential tax rates and transactions costs, which confer advantages on some investors relative to others.
- Definitions of market efficiency are also linked up with **assumptions about what information is available** to investors and reflected in the price. For instance, a strict definition of market efficiency that assumes that all information, public as well as private, is reflected in market prices would imply that even investors with precise inside information will be unable to beat the market.

Classifications

- Strong versus Weak Form Efficiency:

- *Under weak form efficiency*, the current price reflects the information contained in all past prices, suggesting that charts and technical analyses that use **past prices** alone would not be useful in finding under valued stocks.

- *Under semi-strong form efficiency*, the current price reflects the information contained not only in past prices but **all public information** (including financial statements and news reports) and no approach that was predicated on using and massaging this information would be useful in finding under valued stocks.

- *Under strong form efficiency*, the current price reflects **all information**, public as well as private, and no investors will be able to consistently find under valued stocks.

Implications of market efficiency

- An immediate and direct implication of an efficient market is **that no group of investors should be able to consistently beat the market** using a common investment strategy.
- An efficient market would also carry **very negative implications for many investment strategies** and actions that are taken for granted -

(a) 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). At best, the benefits from information collection and equity research would cover the costs of doing the research.

(b) In an efficient market, a **strategy of randomly diversifying across stocks** or **indexing** to the market, carrying little or no information cost and minimal execution costs, would **be superior to any other strategy**, that created larger information and execution costs. There would be no value added by portfolio managers and investment strategists.

(c) In an efficient market, a **strategy of minimizing trading**, i.e., creating a portfolio and not trading unless cash was needed, would be superior to a strategy that required frequent trading.

What market efficiency does not imply:

An efficient market **does not imply that** -

(a) **stock prices cannot deviate from true value**; in fact, there can be large deviations from true value. The only requirement is that the deviations be random.

(b) **no investor will 'beat' the market in any time period**. To the contrary, approximately half of all investors, prior to transactions costs, should beat the market in any period.

(c) **no group of investors will beat the market in the long term**. Given the number of investors in financial markets, the laws of probability would suggest that a fairly large number are going to beat the market consistently over long periods, not because of their investment strategies but because they are lucky. It would not, however, be consistent if a disproportionately large number of these investors used the same investment strategy.

- In an efficient market, the **expected returns** from any investment will be **consistent with the risk** of that investment over the long term, though there may be deviations from these expected returns in the short term.

Necessary conditions for market efficiency

- **Markets do not become efficient automatically**. It is the actions of investors, sensing bargains and putting into effect schemes to beat the market, that make markets efficient.
- The **necessary conditions** for a market inefficiency to be eliminated are as follows -

(1) The market inefficiency should provide the **basis for a scheme** to beat the market and earn excess returns. For this to hold true -

(a) The asset (or assets) which is the source of the inefficiency **has to be traded**.

(b) The **transactions costs** of executing the scheme have to be smaller than the expected profits from the scheme.

(2) There should be **profit maximizing investors** who

(a) **recognize** the 'potential for excess return'

(b) **can replicate** the beat the market scheme that earns the excess return

(c) **have the resources** to trade on the stock until the inefficiency disappears

Efficient Markets and Profit-seeking investors: The Internal Contradiction

- There is an **internal contradiction** in claiming that there is no possibility of beating the market in an efficient market and then requiring profit-maximizing investors to constantly seek out ways of beating the market and thus making it efficient.

- If markets were, in fact, efficient, **investors would stop looking for inefficiencies**, which would lead to markets becoming inefficient again.
- It makes sense to think about an efficient market as a **self-correcting mechanism**, where inefficiencies appear at regular intervals but disappear almost instantaneously as investors find them and trade on them.

Propositions about market efficiency

Proposition 1: The **probability of finding inefficiencies** in an asset market **decreases as the ease of trading on the asset increases**. To the extent that investors have difficulty trading on a stock, either because open markets do not exist or there are significant barriers to trading, inefficiencies in pricing can continue for long periods.

- Example:
- **Stocks versus real estate**
- **NYSE vs NASDAQ**

Proposition 2: The probability of finding an inefficiency in an asset market increases as the transactions and information cost of exploiting the inefficiency increases. The cost of collecting information and trading varies widely across markets and even across investments in the same markets. As these costs increase, it pays less and less to try to exploit these inefficiencies.

Example:

Initial Public Offerings: IPOs supposedly make excess returns, on average.

Emerging Market Stocks: Do they make excess returns?

Investing in 'loser' stocks, i.e., stocks that have done very badly in some prior time period should yields excess returns. Transactions costs are likely to be much higher for these stocks since-

(a) they then to be low priced stocks, leading to higher brokerage commissions and expenses

(b) the bid-ask becomes a much higher fraction of the total price paid.

(c) trading is often thin on these stocks, and small trades can cause prices to move.

Corollary 1: Investors who can estabish a cost advantage (either in information collection or transactions costs) **will be more able to exploit small inefficiencies** than other investors who do not possess this advantage.

- Example: **Block trades** effect on stock prices & specialists on the Floor of the Exchange
- **Establishing a cost advantage, especially in relation to information, may be able to generate excess returns on the basis of these advantages**. Thus a John Templeton, who started investing in Japanese and othe Asian markets well before other portfolio managers, might have been able to exploit the informational advantages he had over his peers to make excess returns on his portfolio.

Proposition 3: The speed with which an inefficiency is resolved will be directly related to how easily the scheme to exploit the ineffficiency can be replicated by other investors. The ease with which a scheme can be replicated itselft is inversely related to the time, resouces and information needed to execute it. Since very few investors single-handedly possess the resources to eliminate an inefficiency through trading, it is much more likely that an inefficiency will disappear quickly if the scheme used to exploit the inefficiency is transparent and can be copied by other investors.

- Example: **Investing on stock splits versus Index Arbitrage**