

Efficient Market Hypothesis (EMH)

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Definition

- An efficient capital market is a market that is efficient in processing information.
- We are talking about an “informationally efficient” market, as opposed to a “transactionally efficient” market. In other words, we mean that the market **quickly** and **correctly** adjusts to new information.
- In an informationally efficient market, the prices of securities observed at any time are based on “correct” evaluation of all information available at that time.
- Therefore, in an efficient market, prices immediately and fully reflect available information.

Original definition: Eugene Fama 1960s

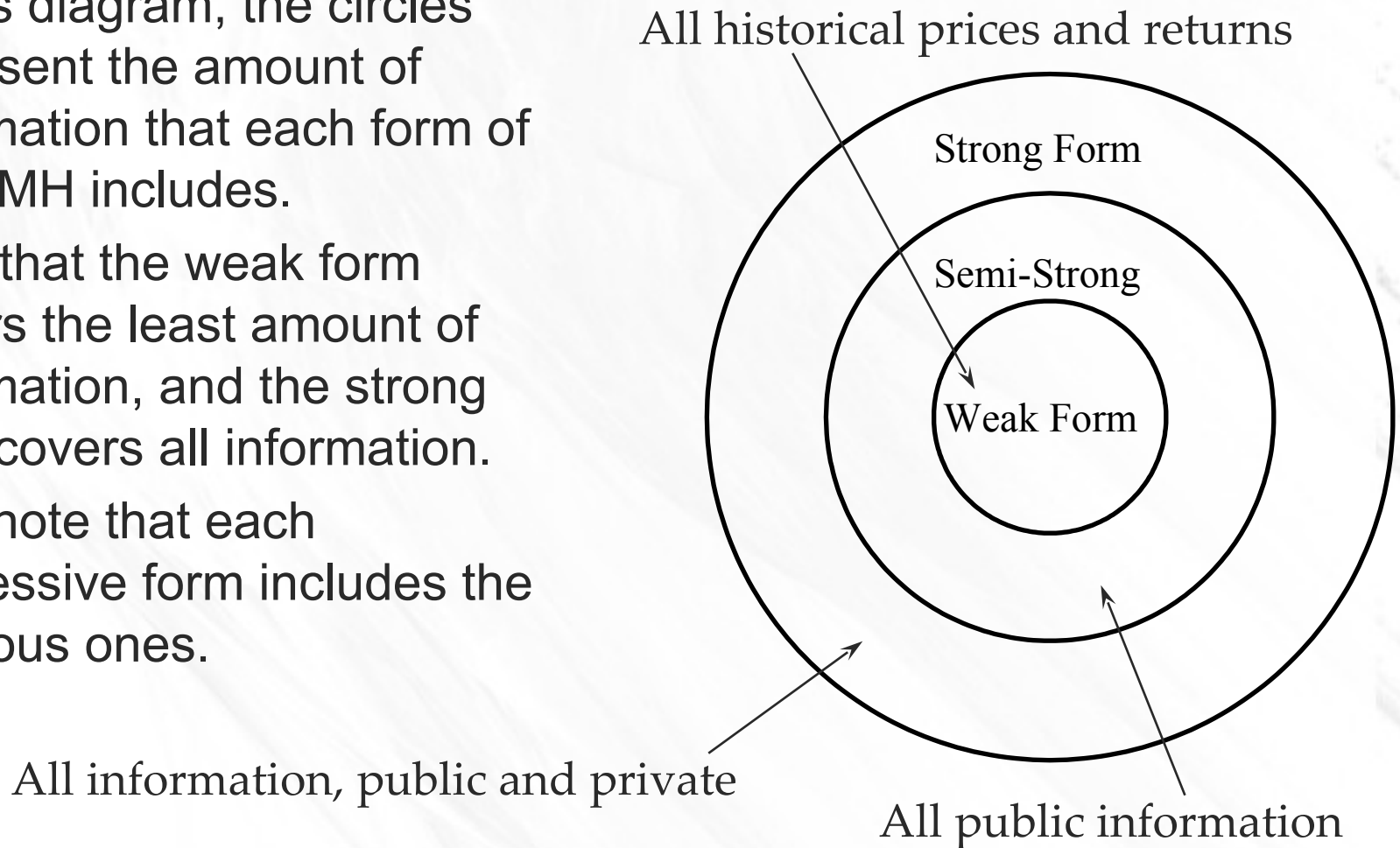
- *"In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value."*

History

- Prior to the 1950's it was generally believed that the use of fundamental or technical approaches could "beat the market" (though technical analysis has always been seen as something akin to voodoo).
- In the 1950's and 1960's studies began to provide evidence against this view.
- In particular, researchers found that stock price changes (not prices themselves) followed a "random walk."
- They also found that stock prices reacted to new information almost instantly, not gradually as had been believed.

3 forms of EMH

- In this diagram, the circles represent the amount of information that each form of the EMH includes.
- Note that the weak form covers the least amount of information, and the strong form covers all information.
- Also note that each successive form includes the previous ones.



The weak form

- The weak form of the EMH says that past prices, volume, and other market statistics provide no information that can be used to predict future prices.
- If stock price changes are random, then past prices cannot be used to forecast future prices.
- Price changes should be random because it is information that drives these changes, and information arrives randomly.
- Prices should change very quickly and to the correct level when new information arrives (see next slide).
- This form of the EMH, if correct, repudiates technical analysis.
- Most research supports the notion that the markets are weak form efficient.
- Many studies have been done, and nearly all support weak form efficiency, though there have been a few anomalous results.

The Semi-strong Form

- The semi-strong form says that prices fully reflect all publicly available information and expectations about the future.
- This suggests that prices adjust very rapidly to new information, and that old information cannot be used to earn superior returns.
- The semi-strong form, if correct, repudiates fundamental analysis.
- Most studies find that the markets are reasonably efficient in this sense, but the evidence is somewhat mixed.

The Strong Form

- The strong form says that prices fully reflect all information, whether publicly available or not.
- Even the knowledge of material, non-public information cannot be used to earn superior results.
- Most studies have found that the markets are not efficient in this sense.
- Studies have shown that insiders and specialists often earn excessive profits, but mutual funds (and other professionally managed funds) do not.

Anomalies

- Anomalies are unexplained empirical results that contradict the EMH:
 - The Size effect.
 - The “Incredible” January Effect.
 - P/E Effect.
 - Day of the Week (Monday Effect).

The Size Effect

- Beginning in the early 1980's a number of studies found that the stocks of small firms typically outperform (on a risk-adjusted basis) the stocks of large firms.
- This is even true among the large-capitalization stocks within the S&P 500. The smaller (but still large) stocks tend to outperform the really large ones.

The “Incredible” January Effect

- Stock returns appear to be higher in January than in other months of the year.
- This may be related to the size effect since it is mostly small firms that outperform in January.
- It may also be related to end of year tax selling.

The Price/Earnings Effect

- It has been found that portfolios of “low P/E” stocks generally outperform portfolios of “high P/E” stocks.
- This may be related to the size effect since there is a high correlation between the stock price and the P/E.
- It may be that buying low P/E stocks is essentially the same as buying small company stocks.

The Day of the Week Effect

- Based on daily stock prices from 1963 to 1985 Keim found that returns are higher on Fridays and lower on Mondays than should be expected.
- This is partly due to the fact that Monday returns actually reflect the entire Friday close to Monday close time period (weekend plus Monday), rather than just one day.
- Moreover, after the stock market crash in 1987, this effect disappeared completely and Monday became the best performing day of the week between 1989 and 1998.

Summary of Tests of the EMH

- Weak form is supported, so technical analysis cannot consistently outperform the market.
- Semi-strong form is mostly supported, so fundamental analysis cannot consistently outperform the market.
- Strong form is generally not supported. If you have secret (“insider”) information, you CAN use it to earn excess returns on a consistent basis.
- Ultimately, most believe that the market is very efficient, though not perfectly efficient. It is unlikely that any system of analysis could consistently and significantly beat the market (adjusted for costs and risk) over the long run.