Part I

Efficient Market Hypothesis

1. Capital Market Efficiency

An efficient capital market is one in which security prices adjust rapidly to the arrival of new information and, therefore, the current prices of securities reflect all information about the security. This is referred to as an informationally efficient market. (In other words, an efficient market is a market in which all transactions have net present value equal to zero). Alternatively, it can be said that the price of any asset is always equal to its present value, so that the return for an investment is equal to the equilibrium return for a given level of risk. All that is required for a market to be efficient is that current market prices reflect available information. If a market is efficient with respect to some piece of information, then that piece of information can not be used to identify a positive NPV investment.

The efficient market hypothesis (EMH) asserts that prices for assets are efficient with respect to available information. The hypothesis implies that no investment strategy based on current or historical information produces extraordinary large profits. With thousands of investment advisory services, mountains of information, and millions of investors, the adjustment of prices to new information is almost instantaneous.

Assumptions made for the requirements of an efficient market include:

- A large number of competing profit-maximizing participants analyze and value securities, each independently from the others;
- New information regarding securities comes to the market in a random fashion;
- The competing investors attempt to adjust security prices rapidly to reflect the new information. (i.e., security prices adjust rapidly because numerous profit-maximizing investors are competing against one another).

The combined effect of the first two assumptions means that one would expect price changes to be independent and random and the expected returns implicit in the current prices of the security should reflect its risk, because security prices adjust to all new information that is publicly available at any point in time (i.e., security prices that prevail at any time should be an unbiased reflection
of all currently available information, including the risk involved in owning the security).

2. The Forms of Market Efficiency

The early work related to efficient capital markets was based on the random walk hypothesis, which contended that changes in stock prices occurred randomly. Fama (1970) presented the efficient market theory in terms of a fair game model. The model requires that the price-formation process be specified in enough detail so that it is possible to indicate what is meant by “fully reflect”. Available models formulate prices in terms of rates of return that are dependent on alternative definitions of risk. All such expected returns theories of price formation can be described as follows:

\[
E(\bar{P}_{j,t+1}/\Phi_t) = [1 + E(\bar{r}_{j,t+1}/\Phi_t)]P_{j,t}
\]

where:
- \(E\) = expected value operator
- \(P_{j,t}\) = price of security \(j\) at time \(t\)
- \(P_{j,t+1}\) = price of security \(j\) at time \(t+1\)
- \(\bar{r}_{j,t+1}\) = the one period percent rate of return for security \(j\) during period \(t+1\)
- \(\Phi_t\) = the set of information that is assumed to be “fully reflected” in the security price at time \(t\)

The equation states that the expected price of security \(j\), given the full set of information available, is equal to the current price times 1 plus the expected return on security \(j\), given the set of available information. The set of information should include all current and past values of any relevant variables such as inflation, interest rates, earnings, GDP, and so forth. In addition, it is assumed that this information set includes knowledge of all the relevant relationships among variables.

Financial economists generally identify three forms of market efficiency, based on the kinds of information which might be expected to influence stock prices.

2.1. Weak-Form Efficient Market Hypothesis:

A market is said to be weak-form efficient if current security prices completely incorporate the information contained in past prices. The set of information includes the historical sequence of price, rates of return, trading volume data, and other market-generated information, such as odd-lot transactions, block trades,
and transactions by exchange specialists or other unique groups. Since this hypothesis assumes that current market prices already reflect all past returns and any other security-market information, this means that it is pointless to analyze past prices in an attempt to predict future prices. In other words, past rates of return and other market data should have no relationship with future rates of return. Such an evaluation procedure is called technical analysis or (“charting”). Weak-form efficiency implies that technical analysis can not be used successfully to forecast future prices and therefore that technical analysts do not earn extraordinary profits. There is a great deal of evidence indicating that financial markets are weak-form efficient.

2.2. Semistrong-form EMH

A market is said to be semistrong-form efficient if current prices incorporate all publicly available information. That is, current prices fully reflect all public information. It encompasses the weak-form hypothesis because all the market information considered by the weak-form hypothesis - such as stock prices, rates of return, and trading volume - is public. Public information also includes all nonmarket information, such as earnings and dividend announcements, price-to-earnings (P/E) ratios, dividend-yield (D/P) ratios, book value-market value (BV/MV), stock splits, news about the economy, and political news. Semistrong-form efficiency implies that the analysis of published financial statements, for example, does not result in earning excess profits. Notice that a semistrong efficient market is also weak-form efficient, since past prices are a form of publicly available information.

2.3. Strong-form EMH

At the extreme, a market is strong-form efficient if current prices reflect all information - public and private -, including inside information; inside information is information about a firm which is available only to “insiders” including corporate executives and major shareholders. There seems to be little reason to believe that markets are strong-form efficient: that is, available evidence seems to indicate that valuable inside information does exist. At the other extreme, there are compelling reasons for believing that markets are weak-form efficient. There is a great deal of debate, however, over semistrong-form efficiency. A reasonable compromise view might be summarized as follows: some prices, some of the time, might not reflect all publicly available information, but most assets, most of the time, do reflect this information.
2.4. Security Prices and Random Walks

The efficient market hypothesis states that the current stock price fully reflects relevant news information. While some of the news is expected, much of it is unexpected. The unexpected portion of the news, by definition, arrives randomly - the essence of the notion that security prices follow a random walk because of the random nature of the news. Some days the news is good, some days it is bad. You cannot predict specifics of the new with much accuracy. When the news relevant to a particular stock is good, people adjust their estimates of future returns upward or they reduce the discount rate they attach to these returns. Either way the stock price goes up. Conversely, when the news is bad, the stock price goes down.

Substantial uncertainty even surrounds news that seems reasonably predictable. An article in Forbes reported the results of a study showing that over the period 1973-1990, the average error made by security analysts in forecasting the next quarter’s corporate earnings for the firms they covered was 40%. On an annual basis, the average error was never less than 25%. From 1985 to 1990, the average error was 52%, indicating that the analyst’s forecasting ability had not improved over the period.

Many people misunderstand what the random walk idea really means. It does not say that stock prices move randomly. Rather, it says that the unexpected portion of the news arrives randomly, and that stock prices adjust to news, whatever it is. In a famous analogy, a drunk staggers from lamppost to lamppost with a point of departure and a target destination. The path of the drunk shows a trend from one post to the next. Along the way, however, the rather is erratic. The drunk wanders right and left, perhaps occasionally out into the street or into a building wall. We cannot determine the precise route in advance. The same is true of a security price and its consequent return. Over the long run, security returns are consistent with what we expect, given their level of risk. In the short-run, however, many ups and downs seem to cloud the long-run outlook.

3. Tests And Results of Alternative EMH

The evidence on the EMH is mixed. Results from some studies have supported the hypothesis and indicate that capital markets are efficient, while other results have not been consistent with the hypothesis and have revealed some anomalies related to these hypotheses.
3.1. Weak-form hypothesis tests and results

Statistical Tests of independence:

The EMH contends that security returns over time should be independent of one another because new information comes to the market in a random, independent fashion, and security prices adjust rapidly to this new information.

Autocorrelation tests of independence measure the significance of positive or negative correlation in returns over time. The serial correlation measures the correlation between price changes in consecutive time periods, whether hourly, daily, or weekly, and is a measure of how much the price change in any period depends on the price change over the previous period. Does the rate of return on day $t$ correlate with rate of return on day $t-1$, $t-2$, or $t-3$? A serial correlation of zero would therefore imply that price changes in consecutive time periods are uncorrelated with each other, and can thus be viewed as a rejection of the hypothesis that investors can learn about future price changes from past ones. A serial correlation that is positive and statistically significant could be viewed as evidence of price momentum in markets, and would suggest that returns in a period are more likely to be positive (negative) if the prior period’s returns were positive (negative). A serial correlation that is negative and statistically significant could be evidence of price reversals, and would be consistent with a market where positive are more likely to follow negative returns and vice versa.

From the view of investment strategy, serial correlations can be exploited to earn excess returns. A positive serial correlation would be exploited by a strategy of buying after periods with positive returns and selling after periods of negative returns. A negative serial correlation would suggest a strategy of buying after periods with negative returns and selling after periods with positive returns. Since these strategies generate transaction costs, the correlations have to be large enough to allow investors to generate profits to cover these costs. It is therefore entirely possible that there is serial correlation in returns, without any opportunity to earn excess returns for most investors.

Those who believe that capital markets are efficient would expect insignificant correlations for all such combinations. Results indicates insignificant correlations in stock returns over time, but recently, some studies considered portfolios of stocks with different market values (size) have indicated that the autocorrelation is stronger for portfolios of small stocks.

Example 3.1. In this example, we calculate the daily returns on TSE300 from 11/16/1987 to 11/14/2002 as $\log(\text{TSE300}_t/\text{TSE300}_{t-1})$. The returns are graphed accordingly. Then we generate the following correlation matrix between today’s returns, and those at $(t-1)$, $(t-2)$, $(t-3)$, $(t-4)$ and $(t-5)$. In other words, we
present the correlation matrix of the returns on Monday, with those of Tuesday, Wednesday, Thursday, Friday of the same week, and Monday of the previous week. The table shows that yesterday’s returns explain about 10% of today’s returns and the coefficient is positive (i.e., about 0.108) (note: significance tests should be carried further in this case). The matrix is as follow:

<table>
<thead>
<tr>
<th></th>
<th>rtse300</th>
<th>rtse300(-1)</th>
<th>rtse300(-2)</th>
<th>rtse300(-3)</th>
<th>rtse300(-4)</th>
<th>rtse300(-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>rtse300</td>
<td>1.000</td>
<td>-0.0047</td>
<td>0.026</td>
<td>-0.016</td>
<td>-0.018</td>
<td></td>
</tr>
<tr>
<td>rtse300(-1)</td>
<td>1.000</td>
<td>0.1083</td>
<td>-0.005</td>
<td>0.026</td>
<td>-0.016</td>
<td></td>
</tr>
<tr>
<td>rtse300(-2)</td>
<td>1.000</td>
<td>0.1081</td>
<td>-0.005</td>
<td>0.026</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rtse300(-3)</td>
<td>1.000</td>
<td>0.1083</td>
<td>-0.0047</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rtse300(-4)</td>
<td></td>
<td></td>
<td></td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rtse300(-5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.1081</td>
<td></td>
</tr>
</tbody>
</table>

**Runs test:** A runs test is a nonparametric variation on the serial correlation, and it is based on a count of the number of runs (i.e., sequences of price increases or decreases) in the price changes. Given a series of price changes, each price change is designated either a plus (+) if it is an increase in price or a minus (-) if it is a price decrease. The result is a set of pluses and minuses as follows: ++++++++ ++ ++. A run occurs when two consecutive changes are the same; two or more consecutive positive or negative changes constitute one run. To test
for independence, you compare the number of runs for a given series to the number in a table of expected values for the number of runs that should occur in a random series. If the actual number of runs is greater than the expected number, there is evidence of negative correlation in price changes. If it is lower, there is evidence of positive correlation.

Studies have confirmed the independence of stock price changes over time using runs tests. These procedures have been repeated for stocks traded on the OTC market, and the results supported the EMH, however, studies that examined price changes for individual transactions on the NYSE found significant serial correlations. A 1966 study by Niederhoffer and Osborne of price changes in the Dow 30 stocks assuming daily, four-day, nine-day, and 16-day return intervals provided the following results:

<table>
<thead>
<tr>
<th></th>
<th>Daily</th>
<th>Four-day</th>
<th>Nine-day</th>
<th>Sixteen-day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual runs</td>
<td>735.1</td>
<td>175.7</td>
<td>74.6</td>
<td>41.6</td>
</tr>
<tr>
<td>Expected runs</td>
<td>759.8</td>
<td>175.8</td>
<td>75.3</td>
<td>41.7</td>
</tr>
</tbody>
</table>

Based on these results, there is evidence of positive correlation in daily returns but no evidence of deviations from normality for longer return intervals. Again, while the evidence is dated, it serves to illustrate the point that long strings of positive and negative changes are, by themselves, insufficient evidence that markets are not random, since such behavior is consistent with price changes following a random walk. It is the recurrence of these strings that can be viewed as evidence against randomness in price behavior.

### 3.2. Semistrong-form hypothesis tests and results

Studies that have tested the semistrong-form EMH can be divided into the following:

1. Studies to predict futures rates of return using available public information beyond the pure market information, involve either time series analysis of returns or the cross-section distribution of returns or other characteristics (i.e., price/earnings ratios, size based upon market value, or price/book value ratios) for individual stocks. Those who believe in the EMH would contend that it would not be possible to predict future returns using past returns or to predict the distribution of future returns using any public information.
2. Event studies that examine how fast stock prices adjust to specific significant economic events. A corollary approach would be to test whether it is possible to invest in a security after the public announcement of a significant event and experience significant abnormal rates of return. Advocates of EMH contend that it would not be possible for investors to experience superior risk-adjusted returns by investing after the public announcement of any significant information and paying normal transaction costs.

For any of these tests, you need to adjust the security’s rates of return for the rates of return of the overall marked during the period considered. A 5 percent in a stock during the period surrounding an announcement is not meaningful until you know what the aggregate stock market did during the period and how this stock normally acts under such conditions. If the market had experienced a 10% during this period, the 5% return for the stock may be lower than expected.

Studies prior to 1970 recognized the need to make such adjustments for market movements. That entails subtracting the market return from the return for the individual security to derive its abnormal rate of return, as follows:

\[ AR_{it} = R_{it} - R_{mt} \]

where
\[ AR_{it} = \text{abnormal rate of return on security } i \text{ during period } t \]
\[ R_{it} = \text{rate of return on security } i \text{ during period } t \]
\[ R_{mt} = \text{rate of return on a market index during period } t \]

In the above example, the stock’s abnormal return would be minus 5 percent.

Some authors adjusted the abnormal rate of return to take account of the expected rate of return for the stock based on the market rate of return and the stock’s relationship with the market. Instead of using the market rate of return, we use the expected rate of return on the stock itself, that is:

The abnormal rate of return is based on the following:

\[ AR_{it} = R_{it} - E(R_{it}) \]

where \( E(R_{it}) \) is the expected rate of return for stock \( i \) during period \( t \) based on the market rate of return and the stock’s normal relationship with the market (its beta), i.e., say a stock is generally 20% more volatile than the market, and if the market experience a 10% rate of return, you would expect this stock to experience 12% rate of return. If the return on the stock is 5%, we expect abnormal rate of return of -7%.

In general, in both tests, the emphasis is on the analysis of abnormal rates of return that deviate from long-term expectations, or returns that are adjusted
for a stock’s specific risk characteristics and overall market rates of return during the period.

The time series tests assume that in an efficient market the best estimate of future rates of return will be the long-run historical rates of return. The tests try to determine whether there is any public information that will provide superior estimates of returns for a short-run or a long-run horizon. The results of these studies have indicated that there is a limited success in predicting short-horizon returns, but the analysis of long-horizon returns has been quite successful. It is found that the aggregate dividend yield (D/P) as a proxy for the risk premium on stocks, indicated a positive relationship between the D/P and future stock-market returns.

Other studies also found that the (1) default spread (the difference between the yields on lower-grade and Aaa-rate long-term bonds); and (2) term structure or horizon spread (the difference between the long-term Aaa yield and the yield on 1-month Treasury bills, can be used to predict stock returns and bond returns and have even been useful for predicting returns for foreign common stocks.

The two variables -dividend yield (D/P) and default spread - have been significant, because when they are high, it implies that investor are expecting a high return on stocks and bonds, and this occurs when the economic environment has been poor, as reflected in the growth rate of output.

Quarterly earnings studies: the question is, is it possible to predict future returns for a stock based on a publicly available quarterly earnings reports? Some studies consistently have failed to support the semistrong EMH.

Standardized Unexpected Earnings (SUE): normalize the difference between actual and expected earnings by the standard deviation of the regression estimate used to derive expected earnings:

\[ SUE_t = \frac{(\text{Reported EPS}_t - \text{Predicted EPS}_t)}{\text{Standard Error of Estimate of Regression Equation}} \]

1. Some authors found that Big SUEs are associated with abnormal stock price moves. They found that 51% of the price adjustment occurred after the earnings announcement.

2. Reinganum confirmed the previous authors results for a longer time period.

Calender Studies: Do seasonal patterns in returns exist?

1. The January Anomaly: downward pressure placed on stocks in late December and a following rise in prices in early January.
   a. Branch: Due to tax selling, investors could buy in December and sell in January to earn excess profits.
   b. Dyl: Stocks that had declined the previous year earned abnormal returns in January.
c. Roll: Pattern is for the last day of December and the first four trading
days of January. Small stocks seemed to do especially well.

d. Keim: Inverse relationship between size and abnormal returns, with the
strongest results for January, and most of the effect in the first week.

e. Tinic and West: Strong seasonal relationship between risk and return, most
significant in January.

Other Calendar Effects:
1. A “weekend effect” research showed that Monday’s returns were signifi-
cantly negative.

2. Harris: for large firms the negative Monday effect occurred before the
market opened, while for the smaller firms it was a trading day effect. The only
differences were in the first 45 minutes of trading. Prices also tended to rise on
the last trade of the day.

Predicting Cross Sectional Returns
Studies attempt to find out what types of publicly available information are
useful in predicting future returns.

• Price-Earnings Ratios and returns: some have suggested that the mar-
ket tends to overvalue high growth high P/E stocks, while undervaluing low
P/E stocks. Basu found that low P/E stocks had higher returns and lower
risk.

• The size effect: Banz, and Reinganu: size and not the P/E ratio accounts
for the effect found by Basu. Some of the problem may stem from the use of
the CAPM to generate the expected returns. Roll found that small firms’
measured betas are lower than they should be.

• Book Value - Market Value ratio: Rosenberg, Reid and Lanstein found
a positive relation between returns and the ratio of the book value of a
firm’s equity to the market value of the equity. Fama and French also found
the positive relationship even when other factors were included. Kothari,
Shanken, and Sloan found the relationship between BV/MV and returns
may be periodic and probably not significant in the long run.

Results of Event Studies

• Stock split studies: Fama, Fisher, Jensen, and Roll: found that stock
splits alone should not affect returns because they do not add to firm value.
Any effect would be due to other factors, such as higher adjusted dividend,
which have information content.
• **Initial public offerings**: studies found that on average, initial public offerings are underpriced by 16%. The market seems to respond within one day to the mispricing. Hanley and Wilhelm found that institutional investors reap a large part of short-term profits from IPOs.

• **Exchange listing**: despite the potential increase in liquidity and exposure, listing on a national exchange does not appear to lead to a permanent increase in firm value. There appear to be profit opportunities around the time of the announcement, as well as price declines following the listing. There is no change in systematic risk. Dahran and Ikenberry confirmed price declines after listing.

• **Unexpected world events and economic news**: Reilly and Drzymski found that market adjusts to world events very rapidly. Pierce and Roley: market’s reaction to economic news did not persist past the day of the announcement. Jain found that the impact of surprises in economic reports reflected in prices in about an hour.

• **Corporate events**: if there is a real economic impact, then prices will change in the direction indicated by the event. For instance, firms being acquired in a takeover experience positive excess returns. The adjustment is fairly rapid.

**Summary on the Semistrong-form EMH**

• Event studies provide heavy support for the semistrong-form of the EMH.

• Rate of return prediction studies do not support the EMH. Several anomalies were found that still persist.

**3.3. Strong-Form Hypothesis: Tests and Results**

The studies in this part focus on the returns earned by groups that have access to valuable private information or can act on public information before the public can.

• **Corporate Insider Trading**: corporate insiders are required to report their trades once each month, and after 6 weeks the information is made public. Jaffe found that public traders using the publishes reports of insider trading would have earned positive excess returns after commissions. Trivoli found that such data would be useful if combined with financial ratios. Seyhun found that insiders do earn abnormal returns but some insiders do better than others.
Stock Exchange Specialists: because specialists have a monopoly on certain types of market information (i.e., the limits book) one would expect that they might be able to earn excess returns. Several studies support this contention, though many were done in the early 1970s. More recent studies show lower rates of return than before.

Performance of Professional Money Managers: money managers typically do not have a monopoly on a source of information. They do, however, spend their working days at portfolio management. They might outperform the market. Most studies on mutual funds suggest that managers outperform the market before costs, but not after. Thus managers might be able to select stocks better than the average investor, but the fund is unable to pass these benefits on to the mutual fund investor.

Conclusions regarding the Strong-Form EMH

1. The evidence for corporate insiders and stock exchange specialists suggests that these groups are able to beat the market, in part because of their monopolistic access to certain information.
2. Some analysts’ recommendations, especially to sell, may contain significant information.
3. Performance of professional money managers, especially mutual fund managers, is consistent with the strong-form EMH.

4. Implications of Efficient Capital Markets

Efficient market hypothesis could have some implications regarding the following:

- Technical analysis: markets adjust gradually to new information. Traders can develop rules to detect a move to a new equilibrium price and buy or sell ahead of the rest of the market. EMH assumes that the market adjusts to new information much more rapidly and therefore such technical trading rules should be useless.

- Fundamental analysis: assets have an intrinsic value. This can be determined by analysis of various factors. If the market price differs from the intrinsic value, one buys or sells as appropriate. One must estimate intrinsic value better than the market on average.
• **Aggregate market analysis:** EMH states that past data are not useful in themselves in selecting superior stocks, so in order to take advantage of long-run price moves one must do a superior job of identifying and estimating the relevant variables that cause prices to move.

• **Industry and Company Analysis:** the crucial factor here is to be able to forecast the relevant variables that affect industry and firm performance better than the market. The strong-form EMH tests suggest that there may be superior analysts, and cross-sectional tests suggest that some variables may have useful information for analysts. For fundamental analysts to do better than the market is to: (1) identify the relevant variables that affect a security’s return; and (2) do a better job than average in forecasting those variables.

• **Portfolio Management:** If one has a superior analysts, one should follow their recommendations. Analysts should concentrate their energies on taking advantage of a possible neglected firm effect. In case a portfolio without superior analysts, then one should measure clients’ risk preferences, then build a portfolio that reflects those preferences. The portfolio should be completely diversified and one should be minimizing transaction costs.

• **The Rationale and Use of Index Funds:** the EMH and the lack of superior performance dictate that many portfolios should just match the performance of the overall market. Market funds or index funds are designed to mimic the market composition and performance.

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

1. In an efficient market, equity research and valuation would be a costly task that would provide no benefits. The odds of finding an undervalued stock would always be 50-50, reflecting the randomness of pricing errors. At best, the benefits from information collection and equity research would cover the costs of doing the research.

2. 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.
3. In an efficient market, a strategy of minimizing trading would be superior to a strategy that required frequent trading.

5. The Market Anomalies

The EMT has some widely known and well-documented violations. Recall that a market anomaly is any event that can be exploited to produce abnormal profits. Market anomalies imply market inefficiency. The following table identifies four categories of anomalies: seasonal, event, firm, and accounting anomalies. Firm anomalies are anomalies that result from firm-specific characteristics (i.e., small firm effect). A seasonal anomaly depends solely on time. For example, the January anomaly (or January effect). Event anomalies are price changes that occur after some easily identified event, such as a listing announcement. Finally, accounting anomalies are changes in stock prices that occur after the release of accounting information.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Firm Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Returns on small firms tends to be higher even on a risk adjusted basis</td>
</tr>
<tr>
<td>Closed-end mutual funds</td>
<td>Returns on closed-end funds that trade at a discount tend to be higher</td>
</tr>
<tr>
<td>Neglect</td>
<td>Firms that are not followed by many analysts tend to yield higher returns</td>
</tr>
<tr>
<td>Institutional Holdings</td>
<td>Firms that are owned by few institutions tend to have higher returns</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seasonal Anomalies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>Prices tend to be up in January, especially the first few days and last days in December</td>
</tr>
<tr>
<td>Week-end</td>
<td>Securities tend to be up on Fridays and down on Mondays</td>
</tr>
<tr>
<td>Time of day</td>
<td>Securities tend to be up in the first 45 minutes and the last 15 minutes of the day</td>
</tr>
<tr>
<td>End of month</td>
<td>Last trading day of the month tends to be up</td>
</tr>
<tr>
<td>Seasonal</td>
<td>Firms with highly seasonal sales tend to be up during high sales periods</td>
</tr>
<tr>
<td>Holidays</td>
<td>Returns tend to be positive on the last trading day before a holiday</td>
</tr>
</tbody>
</table>

what about other anomalies
<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Event Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysts' recommendations</td>
<td>The more analysts recommending a stock the more likely it will go up</td>
</tr>
<tr>
<td>Insider trading</td>
<td>The more insiders buying a stock, the more likely it is to go up</td>
</tr>
<tr>
<td>Listings</td>
<td>Prices rise after is announced that a firm will be listed on an exchange</td>
</tr>
<tr>
<td>Value Line rating changes</td>
<td>Prices continue to rise after Value Line places a security in its #1 category</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accounting Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/E ratio</td>
</tr>
<tr>
<td>Earnings surprises</td>
</tr>
<tr>
<td>Price/sales ratio</td>
</tr>
<tr>
<td>Price/book ratio</td>
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<tr>
<td>Dividend yield</td>
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<td>Earnings momentum</td>
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