MARKET EFFICIENCY, BEHAVIORAL FINANCE AND ADAPTIVE MARKETS

Explanations for the Behavior of Market Participants

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The Record of Professional Money Managers

• Research into active money management concludes that most managers underperform their benchmarks (they earn negative alphas).
• Students—and the general public—are usually unaware of this basic “fact of life” of the investing world; it’s a well-kept secret on Wall Street.
• This finding is documented by well-respected researchers such as Elton et al. (1993), Carhart (1997), and Bogle (1998), the founder of Vanguard.
• Standard & Poor’s SPIVA scorecard tracks the performance of professionally managed funds—S&P finds that the majority of the pros underperform their benchmarks in every category every year.
• Writing for Institutional Investor magazine, O’Hara (2009) asks: “If managers can’t beat the market, what purpose do they serve?”
• Statman (2004) suggests that investors may be willing to accept lower returns for the chance to signal their social status by placing money with prestigious firms and managers.
Why Do Active Managers Underperform? The Paradox of Fundamental Analysis

- We need to understand why such intelligent, competitive, and well-trained individuals underperform their benchmarks so consistently.
- The fundamental analysis process—identifying mispriced securities, buying the undervalued ones, and selling the overvalued ones—contains an inherent contradiction, or paradox.
- The paradox involves the assertion that the market is currently making a mistake in the way it values a stock.
- How does the analyst know that the market won’t continue making this mistake, and continue ignoring security mispricings for long periods?
- Most analysts stop at simply identifying valuation errors.
- But the best analysts work to identify potential events, or catalysts, that will change investors’ minds about the way a particular stock or sector is valued.
- This is why we need a theory, or model, of the way information gets incorporated into securities prices, which is the topic of the next section.

Market Efficiency, Behavioral Finance and Adaptive Markets

Market Efficiency, Behavioral Finance, and Adaptive Expectations

- Next, we’ll consider three competing explanations of the way investors process information and incorporate it into their trading decisions, and thus securities prices as well.
- The first explanation, the efficient markets hypothesis (EMH), is the oldest, known for emphasizing a high level of rationality in investor behavior and aggregate market outcomes.
- The second comes from the newer field of behavioral finance, which allows investor emotions to play a larger role in securities pricing. Behavioral finance recognizes that pricing errors can not only exist but sometimes persist for long periods.
- The third explanation, the adaptive markets hypothesis (AMH), views the interactions among investors, securities, markets, and institutions as a dynamically evolving ecosystem. Winners are determined by their ability to both compete and adapt to constantly changing circumstances.
The Efficient Markets Hypothesis

- Any time we’re talking about “beating the market,” we’re talking about market efficiency because we’re asserting that we possess tradable information that the market does not fully understand, or cannot accurately pass through to a security’s valuation for some reason.
- The academic perspective: “A securities market is informationally efficient when news is rapidly and accurately impounded into the prices of financial securities.”
- Perfectly accurate—but dull. Why would investors care?
- The practitioner perspective: “Are there any trading strategies based on historical and/or publicly available information that consistently outperform the market after adjusting for risk?”
- Approaching the topic from this perspective allows for the possibility that understanding market efficiency will make us better investors.

Securities Prices in Efficient Markets

- In an efficient market the prices of stocks and other securities accurately reflect all information that is relevant regarding their valuation because prices react rapidly and accurately to news.
- We’ll define news as information that is (1) relevant to the value of the security and (2) unanticipated by the market (in other words, “new”).
- Markets are thought to be efficient due to the research conducted by rational, wealth-maximizing analysts and investors.
- The large potential profits from making the right call motivate analysts to work hard to identify new information, assess its relevance for securities prices, and quickly trade on the results of their analysis.
- It’s the diligent efforts of investors that keep prices efficient.
The Three Levels of Market Efficiency

- Market efficiency is often further defined by one of three “levels,” depending on how much information is thought to be accurately reflected in prices.
- Completing the two blanks in the following sentence with one of the following three choices makes this clear:
  - Securities markets are ... efficient if gathering and analyzing all ... information does not consistently produce excess returns.
  - Weak-form/historical
  - Semistrong-form/current and publicly available
  - Strong-form/private or inside
- Weak-form efficiency is associated technical analysis and charting, which uses past information to forecast stock price movements.
- Semistrong efficiency is associated with fundamental analysis, which uses current, publicly available information.
- Strong-form efficiency is associated with private or inside information.

The Behavior of Securities Prices in an Efficient Market

- The “fact” that securities markets are highly efficient is cited as the main reason professional money managers underperform their benchmarks.
- Imagine that news is released regarding a large, unexpected change in the profit outlook for a firm.
- In an efficient market we would expect to see the stock price react immediately upon release of the information.
- Since the market is so competitive, only the investors who receive the news first and immediately act upon it will earn excess returns.
- Everyone else will be too late to use the news, as the trades of the first investors cause the stock’s price to quickly correct to fair value.
IBM's Stock Price Reacts Efficiently Following Their October 2012 Earnings Miss

Amazon's Stock Price Reacts Efficiently around Its April 2012 Earnings Announcement
Do Analysts Dig Deep Enough to Keep Markets Efficient?

- Amazon provided analysts with “guidance” indicating the company would report EPS of 7 cents/share.
- But immediately before its earnings announcement, Amazon moved profits from another venture onto its income statement and reported 28 cents/share—four times what it had preannounced to analysts.
- The firm did nothing illegal, but what’s concerning is the way analysts handled the surprise. Peter Eavis of the New York Times DealBook noted:
  - Amazon’s first quarter earnings diverged significantly from the guidance they offered; the company offered no explanation for the large divergence; there were 17 analysts on the call, but none asked about it; and Amazon’s investor relations department did not respond to Eavis’s messages.
  - That type of behavior is not consistent with analysts digging deeply.
  - Without access to all relevant information, including information that requires fervent due diligence by analysts, markets can’t be efficient.

Do Analysts Ignore Relevant Information?
Amazon’s Shrinking Profit Margins

Datasource: S&P’s Capital IQ

Market Efficiency, Behavioral Finance and Adaptive Markets
More Criticism of the EMH—Anomalies the Theory Cannot Explain

While the EMH is an important starting point for understanding how information gets incorporated into securities prices, there are many anomalies the theory cannot explain, including:

- There are significant correlations in security returns, yet in a highly efficient market, prices should follow a patternless “random walk.”
- Mean reversion: portfolios of stocks with the best records over the past two to three years subsequently underperform the market, and portfolios of stocks with the worst records over the past two to three years subsequently outperform.
- Underreaction to news: there is significant short-term “drift” in prices following both good and bad news announcements (the tendency for prices to keep moving in the same direction well after announcements).
- The size effect: 1931–1975, the 50 smallest stocks on the NYSE outperformed the 50 largest stocks by 1 percent per month.
- Market volatility is excessive relative to changes in stocks’ fundamentals.

Behavioral Finance Allows for Investor Errors Due to Cognitive Biases

- Behavioral finance maintains that investors suffer from cognitive biases.
  - Heuristics: Convenient mental shortcuts that make decision-making easier can lead to biased reasoning and suboptimal decisions.
  - Extrapolation errors: Assuming the current situation will continue into the future causes investors to ignore evidence of changing circumstances.
  - Overconfidence results in too little diversification and too much trading.
  - Hindsight errors confuse people into thinking they can foretell the future because the past is so easily observable.
  - Confirmation errors result when investors place too much weight on information that confirms prior opinions (cognitive consonance) and too little weight on information that contradicts prior beliefs (cognitive dissonance).
  - Misunderstanding randomness: Humans see patterns where none exist.
  - Vividness bias: Overweighting memorable but irrelevant experiences.
The Adaptive Markets Hypothesis: Dynamically Evolving Complex Systems

- The adaptive markets hypothesis (AMH) is the newest theory of how investors, institutions, information, and securities interact to determine market outcomes.
- The AMH views markets as an evolutionary-type process.
- Under the AMH, economic agents adapt via their competitive interactions, but unlike the efficient markets theory, the AMH does not assert that market outcomes are always optimal.
- Roots of the AMH theory can be found in E. O. Wilson’s (1975) concept of sociobiology, which states that competition and natural selection determine the outcome of many social interactions.
- Economist Joseph Schumpeter’s (1942) emphasis on “creative destruction” in capitalism, which paves the way for “bursts of entrepreneurial activity,” also provides support for the AMH.

The Adaptive Markets Hypothesis: Cognitive Errors, Competition, and Adaptation

- According to Lo (2007), the AMH is preferable to the EMH because it allows for the cognitive errors identified by behavioral finance while recognizing the importance of competition and adaptation.
- The AMH explains how market behaviors that appear anomalous under the EMH can emerge, persist for awhile, and disappear just as quickly:
  - Bubbles (technology stocks, credit, residential real estate)
  - Dollar down, stocks up (2011)
  - Risk-on, risk-off (2012)
- Researchers continue to advance these types of theories.
- Lo and Repin (2002) find that emotions don’t always cloud decision making—these authors assert that properly channeled emotions can help investors better understand risk and make decisions in real time.

- This paper is based on a previous study called “Trading as Entertainment.”
- The authors surveyed a large number of traders, asking them to rate themselves on characteristics such as “I enjoy trading” and “I enjoy risky propositions.”
- Their main findings: “Entertainment appears to be a straightforward explanation for why . . . active traders trade much more than others, and why active traders underperform their peers after transaction costs.”
- The Dorn et al. findings complement results from the behavioral finance literature and Ellis’s advice: Keeping things simple and avoiding cognitive errors is an important part of an investor’s strategy.
- Traders should consider asking: “Am I trading for strategic or tactical reasons, or to simply entertain myself?”

Keynes’s Famous Beauty Contest Analogy

- Keynes compares investment valuation to beauty contests that were popular in his day.
- Contestants voted for the prettiest face among 100 photos.
- Votes were placed in a jar corresponding to each face, with a winner being randomly selected from the jar containing the most votes.
- To win, first you have to guess which face will win the most votes.
- Keynes says the stock market works the same way.
- Investors aren’t concerned with calculations of intrinsic value.
- They just try to guess which stock will most captivate popular opinion.