CHAPTER 11

The Efficient Market Hypothesis
Efficient Market Hypothesis (EMH)

• Maurice Kendall (1953) found no predictable pattern in stock prices.
• Prices are as likely to go up as to go down on any particular day.
• How do we explain random stock price changes?
Efficient Market Hypothesis (EMH)

- EMH says stock prices already reflect all available information.

- A forecast about favorable future performance leads to favorable current performance, as market participants rush to trade on new information.
  
  – Result: Prices change until expected returns are exactly commensurate with risk.
Efficient Market Hypothesis (EMH)

• New information is unpredictable; if it could be predicted, then the prediction would be part of today’s information.
• Stock prices that change in response to new (unpredictable) information also must move unpredictably.
• Stock price changes follow a random walk.
Figure 11.1 Cumulative Abnormal Returns Before Takeover Attempts: Target Companies
Figure 11.2 Stock Price Reaction to CNBC Reports
The market discounts bad news right away...
EMH and Competition

- Information: The most precious commodity on Wall Street
  - Strong competition assures prices reflect information.
  - Information-gathering is motivated by desire for higher investment returns.
  - The marginal return on research activity may be so small that only managers of the largest portfolios will find them worth pursuing.
Versions of the EMH

• Weak
  – All information on trading data (prices, open interest, etc.) is already in the price
  – No point in doing trend or technical analysis

• Semi-strong
  – All *publicly available* information on fundamentals is already in the price

• Strong
  – Prices reflect all the information relevant to the firm, *including that only available to insiders*
Types of Stock Analysis

- **Technical Analysis** - using prices and volume information to predict future prices
- Examples: [here](#)
  - Success depends on a sluggish response of stock prices to fundamental supply-and-demand factors.
  - Weak form efficiency
    - Relative strength
    - Resistance levels
Support & Resistance

Daily Chart - Semiconductor HOLDRS (SMH)

Establishing Resistance → Sell

Resistance

Establishing Support → Buy

Support

Buy at Support, Sell at Resistance

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Technical Analysis on EURUSD

- Price hitting into a resistance level
- Price initially finding selling pressure before breaking through
- Support Level formed
- Support Level formed
- Support Level formed
- Price finding support at a support level
Candlestick Chart – definitions

- High
- Open
- Close
- Low

Upper shadow

Real Body

Lower shadow

INVESTMENTS | BODIE, KANE, MARCUS
Candlestick – Hi-Lo Sequence

Candlestick does not tell sequence
Candlestick Charts: Types

Trend vs Consolidation

Marubozu = one way action

Long versus Short

Marubozu

White Marubozu

Black Marubozu
Candlestick Analysis - Example

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A Football Analogy

1. Bulls controlled most of the game
2. Bears controlled most of the game
3. Neither team could move the ball
4. Bears controlled the ball for part of the game, but lost control at the end of the game, and the Bulls made an impressive comeback
5. Bulls controlled part of the game, but Bears made an impressive comeback
6. Both the Bears and the Bulls had their moments during the game, but neither could put the other away, resulting in a standoff
Types of Stock Analysis

- **Fundamental Analysis** - using economic and accounting information to predict stock prices
  - Try to find firms that are *better than* everyone else’s estimate
  - Try to find poorly run firms that are *not as bad* as the market thinks
  - Semi strong form efficiency and fundamental analysis: *most* of fundamental analysis is doomed to fail
Active or Passive Management

- **Active Management**
  - An expensive strategy
  - Suitable only for very large portfolios

- **Passive Management**: No attempt to outsmart the market (b/c you can’t)
  - Accept EMH
  - Index Funds and ETFs
  - Substantially lower costs
Even if the market is efficient a role exists for portfolio management:

- Diversification
- Appropriate risk level
- Tax considerations
Resource Allocation

• If markets were inefficient, resources would be systematically misallocated:
  – Firm with overvalued securities can raise capital too cheaply
  – Firm with undervalued securities may have to pass up profitable opportunities because cost of capital is too high
  – *Efficient* market does not mean perfect foresight market
Event Studies

• Empirical financial research enables us to assess the impact of a particular event on a firm’s stock price.

• The abnormal return due to the event is the difference between the stock’s actual return and a proxy for the stock’s return in the absence of the event.
How Tests Are Structured

Returns are adjusted to determine if they are abnormal.

Market Model approach:

- $r_t = a + b \cdot r_{mt} + e_t$
  
  (Expected Return)

- Abnormal Return = (Actual - Expected)

  $e_t = r_t - (a + b \cdot r_{Mt})$

Study *Cumulative* Abnormal Returns
Figure 11.1 Cumulative Abnormal Returns Before Takeover Attempts: Target Companies
Are Markets Efficient?

• Magnitude Issue
  – Only managers of large portfolios can earn enough trading profits to make the exploitation of minor mispricing worth it.

• Selection Bias Issue
  – Only unsuccessful or partially successful investment schemes are made public. The really good ones will remain private.

• Lucky Event Issue (tossing coin, newsletter examples)
Weak-Form Tests

- Returns over the Short Horizon
  - Momentum: Good or bad recent performance continues over short to intermediate time horizons (esp. portfolios)
- Returns over Long Horizons
  - Episodes of overshooting followed by correction
- Use of serial correlation
Predictors of Broad Market Returns

- **Fama** and French (more Fama [here](#)):  
  - Aggregate returns are higher with higher dividend ratios
- **Campbell and Shiller**:  
  - Earnings yield can predict market returns
- **Keim and Stambaugh**:  
  - Bond spreads can predict market returns
Semistrong Tests: Anomalies

- P/E Effect (adjustment for risk?)
- Small Firm Effect (January Effect)
- Neglected Firm Effect, Liquidity Effects
- Book-to-Market Ratios (Fama-French)
- Post-Earnings Announcement Price Drift
Figure 11.3 Average Annual Return for 10 Size-Based Portfolios, 1926 – 2008
Figure 11.3 Average Annual Return for 10 Size-Based Portfolios, 1926 – 2011
Figure 11.4 Average Return as a Function of Book-To-Market Ratio, 1926–2008
Figure 11.4 Average Return as a Function of Book-To-Market Ratio, 1926–2011
Figure 11.5 Cumulative Abnormal Returns in Response to Earnings Announcements
Strong-Form Tests: Inside Information

• The ability of insiders to trade profitability in their own stock has been documented in studies by Jaffe, Seyhun, Givoly, and Palmon.

• SEC requires all insiders to register their trading activity.
Interpreting the Anomalies

The most puzzling anomalies are price-earnings, small-firm, market-to-book, momentum, and long-term reversal.

– Fama and French argue that these effects can be explained by risk premiums.

– Lakonishok, Shleifer, and Vishney argue that these effects are evidence of inefficient markets.
Figure 11.6 Returns to Style Portfolio as a Predictor of GDP Growth
Interpreting the Evidence

- Anomalies or data mining?
  - Some anomalies have disappeared.
  - Book-to-market, size, and momentum may be real anomalies.
- Anomalies over time
  - Attempts to exploiting them move prices to eliminate abnormal profits
Interpreting the Evidence

• Bubbles and market efficiency
  – Prices appear to differ from intrinsic values.
  – Rapid run up followed by crash
  – Bubbles are difficult to predict and exploit.
Stock Market Analysts

• Some analysts may add value, but:
  – Difficult to separate effects of new information from changes in investor demand
  – Findings may lead to investing strategies that are too expensive to exploit
Mutual Fund Performance

• The conventional performance benchmark today is a four-factor model, which employs:
  – the three Fama-French factors:
    • return on the market index
    • return based on size
    • return based book-to-market ratio
  – plus a momentum factor (a portfolio constructed based on prior-year stock return)
Figure 11.7 Estimates of Individual Mutual Fund Alphas, 1993 - 2007
Mutual Fund Performance

• Consistency, the “hot hands” phenomenon
  – Carhart – weak evidence of persistency
  – Bollen and Busse – support for performance persistence over short time horizons
  – Berk and Green – skilled managers will attract new funds until the costs of managing those extra funds drive alphas down to zero
Figure 11.8 Risk-adjusted performance in ranking quarter and following quarter
So, Are Markets Efficient?

• The performance of professional managers is broadly consistent with market efficiency
• Most managers do not do better than the passive strategy
• There are, however, some notable superstars:
  – Peter Lynch, Warren Buffett, John Templeton, George Soros (how about Bernie Madoff?)