CHAPTER 8
The Efficient Market Hypothesis

8.1 RANDOM WALKS AND THE EFFICIENT MARKET HYPOTHESIS


Efficient Market Hypothesis (EMH)

- Do security prices reflect information
- Why look at market efficiency
  - Implications for business and corporate finance
  - Implications for investment

Random Walk and the EMH

- Random Walk - stock prices are random
  - Randomly evolving stock prices are the consequence of intelligent investors competing to discover relevant information
    - Expected price is positive over time
    - Positive trend and random about the trend

Random Walk with Positive Trend

Security Prices

Time
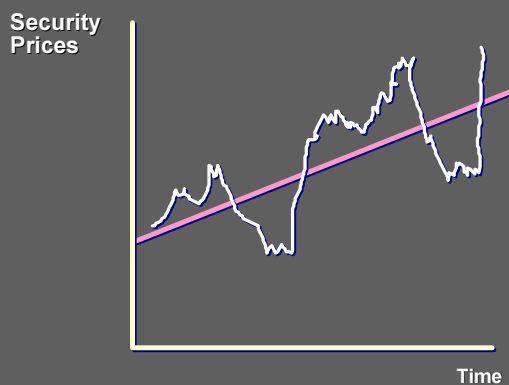
Random Price Changes

- Why are price changes random
  - Prices react to information
  - Flow of information is random
  - Therefore, price changes are random

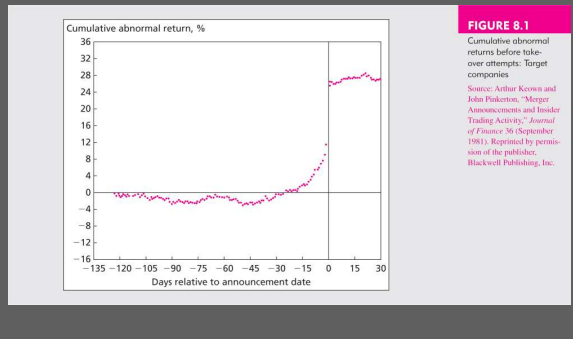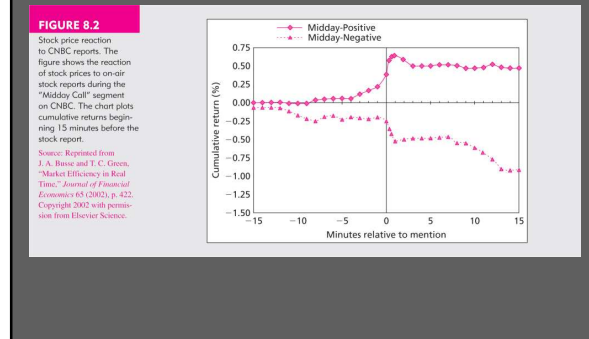## Figure 8.1 Cumulative Abnormal Returns Before Takeover Attempts

FIGURE 8.1

Cumulative abnormal returns before take-over attempts: Target companies

Source: Arthur Keown and John Pinkerton, "Merger Announcements and Insider Trading Activity," *Journal of Finance* 36 (September 1981). Reprinted by permission of the publisher, Blackwell Publishing, Inc.

Figure 8.2 Stock Price Reaction to CNBC Reports

FIGURE 8.2

Stock price reaction to CNBC reports. The figure shows the reaction of stock prices to on-air stock reports during the "Midday Call" segment on CNBC. The chart plots cumulative returns beginning 15 minutes before the stock report.

Source: Reprinted from J. A. Busse and T. C. Green, "Market Efficiency in Real Time," *Journal of Financial Economics* 65 (2002), p. 422. Copyright 2002 with permission from Elsevier Science.

EMH and Competition

- Stock prices fully and accurately reflect publicly available information
- Once information becomes available, market participants analyze it
- Competition assures prices reflect information

Versions of the EMH

- Weak
- Semi-strong
- Strong

8.2 IMPLICATIONS OF THE EMH

Types of Stock Analysis

- *Technical Analysis* - using prices and volume information to predict future prices
  - Weak form efficiency & technical analysis
- *Fundamental Analysis* - using economic and accounting information to predict stock prices
  - Semi strong form efficiency & fundamental analysis

Implications of Efficiency for Active or Passive Management

- Active Management
  - Security analysis
  - Timing
- Passive Management
  - Buy and Hold
  - Index Funds

The Role of Portfolio Management in an Efficient Market

- Even if the market is efficient a role exists for portfolio management:
  - Appropriate risk level
  - Tax considerations
  - Other considerations

8.3 ARE MARKETS EFFICIENT

Empirical Tests of Market Efficiency

- Magnitude Issue
  - Actions of intelligent investment managers are the driving force
- Selection Bias Issue
  - The outcomes we observe have been preselected in favor of failed attempts
  - Cannot evaluate the true ability of portfolio managers
- Lucky Event Issue

Weak-Form Tests: Patterns in Stock Returns

- Returns over short horizons
  - Very short time horizons small magnitude of positive trends
  - 3-12 month some evidence of positive momentum
- Returns over long horizons – pronounced negative correlation
- Evidence on Reversals

Predictors of Broad Market Returns

- Fama and French
  - 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
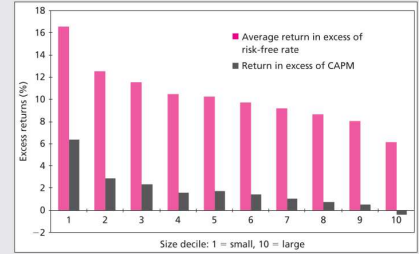
Semi-Strong Tests: Market Anomalies

- P/E Effect
- Small Firm Effect (January Effect)
  - Invest in low-capitalization stocks
  - Earn excess returns

Figure 8.3 Returns in Excess of Risk-Free Rate and in Excess of the SML

FIGURE 8.3

Returns in excess of risk-free rate and in excess of the Security Market Line for 10 size-based portfolios, 1926–2005.

Source: © 2007 Morningstar. All rights reserved. Used with permission.

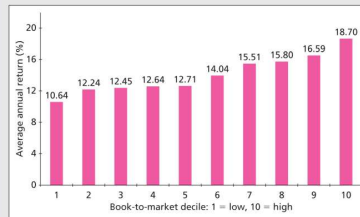## Semi-Strong Tests: Market Anomalies (Con't)

- Neglected Firm
  - Small firms tend to be neglected by large institutional traders
- Book-to-Market Ratios
  - Beta seems to have no power to explain average security returns

Figure 8.4 Average Annual Return as a Function of Book-to-Market

FIGURE 8.4

Average annual return as a function of the book-to-market ratio, 1963–2005.

Source: Web site of Prof. Kenneth French, **http://mba. tuck.dartmouth.edu/pages/ faculty/ken. french/data_ library.html.**

## Semi-Strong Tests: Market Anomalies (Con't)

- Post-Earnings Announcement Drift
  - There is a large abnormal return on the earnings announcement day

Figure 8.5 Cumulative Abnormal Returns in Response to Earnings Announcements

FIGURE 8.5

Cumulative abnormal returns in response to earnings announcements

Source: Reprinted from R.J. Rendleman Jr., C. P. Jones, and H. A. Latané, "Empirical Anomalies Based on Unexpected Earnings and the Importance of Risk Adjustments," *Journal of Financial Economics* 10 (1982), pp. 269–287. Copyright 1982 with permission from Elsevier Science.
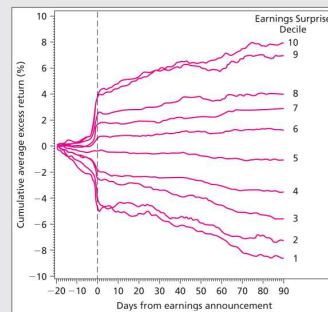
Strong-Form Tests: Inside Information

- 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 Evidence

- Risk Premiums or market inefficiencies—disagreement here
  - Fama and French argue that these effects can be explained as manifestations of risk stocks with higher betas
  - Lakonishok, Shleifer, and Vishney argue that these effects are evidence of inefficient markets

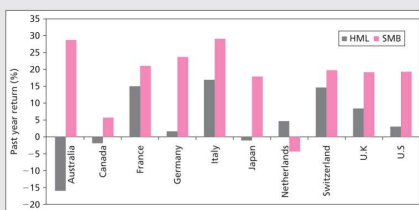## Figure 8.6 Return to Style Portfolio as a Predictor of GDP Growth

FIGURE 8.6

Return to style portfolio as a predictor of GDP growth. Average difference in the return on the style portfolio in years before good GDP growth versus in years before bad GDP growth. Positive value means the style portfolio does better in years prior to good macroeconomic performance. HML = high minus low portfolio, sorted on ratio of book-to-market value. SMB = small minus big portfolio, sorted on firm size.

Source: Reprinted from J. Liew and M. Vassalou, "Can Book-to-Market, Size, and Momentum Be Risk Factors That Predict Economic Growth?" *Journal of Financial Economics* 57 (2000), pp. 221–45. Copyright 2000 with permission from Elsevier Science.

Interpreting the Evidence (Con't)

- Anomalies or Data Mining
  - Rerun the computer database of past returns over and over and examine stock returns along enough dimensions:
    - Simple chance may cause some criteria to appear to predict returns

8.4 MUTUAL FUND AND ANALYST PERFORMANCE

Stock Market Analysts

- Do analysts add value—mixed evidence
  - Womack study found that positive changes are associated with increased stock prices of about 5%
  - Negative changes result in average price decreases of 11%
  - Are prices change due to analysts' information or through pressure brought on by the recommendations themselves

Mutual Fund Managers

- Some evidence of persistent positive and negative performance
- Potential measurement error for benchmark returns
  - Style changes
  - May be risk premiums
- Superstar phenomenon

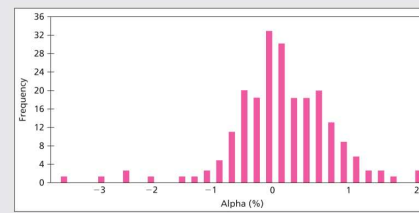## Figure 8.7 Estimates of Individual Mutual Fund Alphas

FIGURE 8.7

Estimates of individual mutual fund alphas, 1972–1991

Note: The frequency distribution of estimated alphas for all equity mutual funds with 10-year continuous records.

Source: Burton G. Malkiel, "Returns from Investing in Equity Mutual Funds 1971–1991," *Journal of Finance* 50 (June 1995), pp. 549–72. Reprinted by permission of the publisher, Blackwell Publishing, Inc.

Table 8.1 Performance of Mutual Funds Based on Three-Index Model

TABLE 8.1

Performance of mutual funds based on three-index model

Type of Fund (Wiesenberger Classification)	Number of Funds	Alpha (%)	t-Statistic for Alpha
Equity funds			
Maximum capital gain	12	−4.59	−1.87
Growth	33	−1.55	−1.23
Growth and income	40	−0.68	−1.65
Balanced funds	31	−1.27	−2.73

Note: The three-index model calculates the alpha of each fund as the intercept of the following regression:

$$r - r_f = \alpha + \beta_M\,(r_M - r_f) + \beta_S\,(r_S - r_f) + \beta_D\,(r_D - r_f) + e$$

where r is the return on the fund, r_f is the risk-free rate, r_M is the return on the S&P 500 index, r_S is the return on a non–S&P small-stock index, r_D is the return on a bond index, e is the fund's residual return, and the betas measure the sensitivity of fund returns to the various indexes.

Source: E. J. Elton, M. J. Gruber, S. Das, and M. Hlavka, "Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios," *Review of Financial Studies* 6 (1993), pp. 1–22.

Figure 8.8 Persistence of Mutual Fund Performance

FIGURE 8.8

Persistence of mutual fund performance. Performance over time of mutual fund groups ranked by initial year performance

Source: Mark M. Carhart, "On Persistence in Mutual Fund Performance," *Journal of Finance* 52 (March 1997), pp. 57–82. Reprinted by permission of the publisher, Blackwell Publishing, Inc.
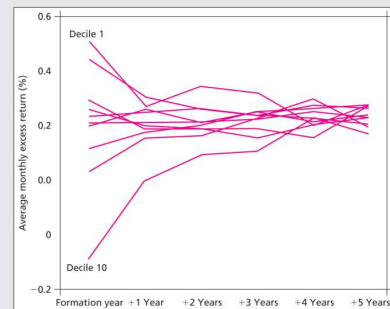

Table 8.2 Two-Way Table of Managers Classified by Risk-Adjusted Returns over Successive Intervals

TABLE 8.2

Two-way table of managers classified by risk-adjusted returns over successive intervals

	Second-Period Winners	Second-Period Losers
A. No cut-off (n = 600)		
First-period winners	150.09	149.51
First-period losers	149.51	150.09
B. 5% cut-off (n = 494)		
First-period winners	127.49	119.51
First-period losers	119.51	127.49
C. 10% cut-off (n = 398)		
First-period winners	106.58	92.42
First-period losers	92.42	106.58

Source: S. J. Brown, W. Goetzmann, R. G. Ibbotson, and S. A. Ross, "Survivorship Bias in Performance Studies," *Review of Financial Studies* 5 (1992), pp. 553–580.