

FN452: Asset management and portfolio analysis

Efficient market hypothesis

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Efficient capital markets

- An efficient market is one in which **security prices adjust rapidly to the arrival of new information**, which implies that the current prices of securities **reflect all information about the security**
- Why should capital markets be efficient?
 - There exists a large number of independent profit-maximizing participants who analyze and value securities
 - New information regarding securities comes to the market in a random fashion
 - The buy and sell decisions cause security prices to adjust rapidly to reflect the effect of new information

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Version of the efficient market hypotheses (EMH)

- **Weak-form** - Security prices already reflect all information contained in history of trading
- **Semistrong-form** – Security prices adjust rapidly to the release of all public information
- **Strong-form** – Security prices fully reflect all information from public and private sources

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Weak-form hypothesis – Test and results

- **Tests of independence** – Tests whether security returns over time are independent of one another
 - Several studies find significant serial correlations, indicating that momentum could be used to generate excess risk-adjusted returns
- **Tests of trading rules** – to compare risk-return results from trading-rule simulations to the results from a buy-and-hold policy
- Both tests show that transaction costs can wipe out the profits

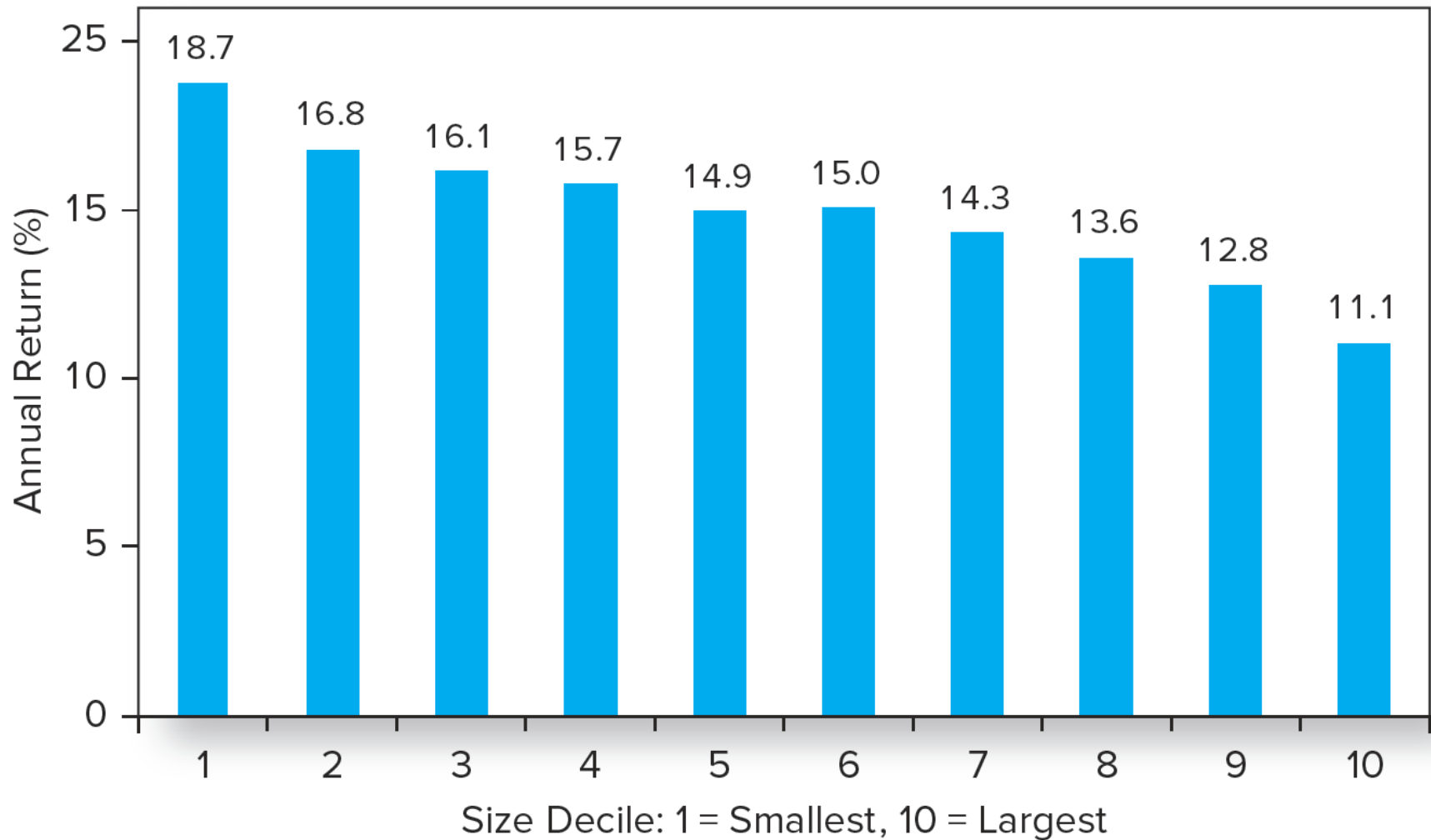
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Semistrong-form hypothesis – Test and results

- Studies to predict future rates of return using **available public information** beyond pure market information considered in the weak-form tests
 - Earnings reports, January anomaly, other calendar effects
 - P/E ratio, book-to-market ratio, size effect, neglected firms
- **Event studies** that examine how fast stock prices adjust to specific significant economic events
 - Test whether it is possible to invest in a security after the public announcement of a significant event such as corporate events, unexpected world events, exchange listing

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Average Annual Return: Ten Size-Based Portfolios, 1926-2015



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Average Annual Return: Ten BTM-based Portfolios, 1926-2015



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Semistrong-form hypothesis – Test and results

- For any tests, expected rates of return should be calculated based on asset pricing models such as market model, CAPM, or multifactor models

- For example, we can use the market model:

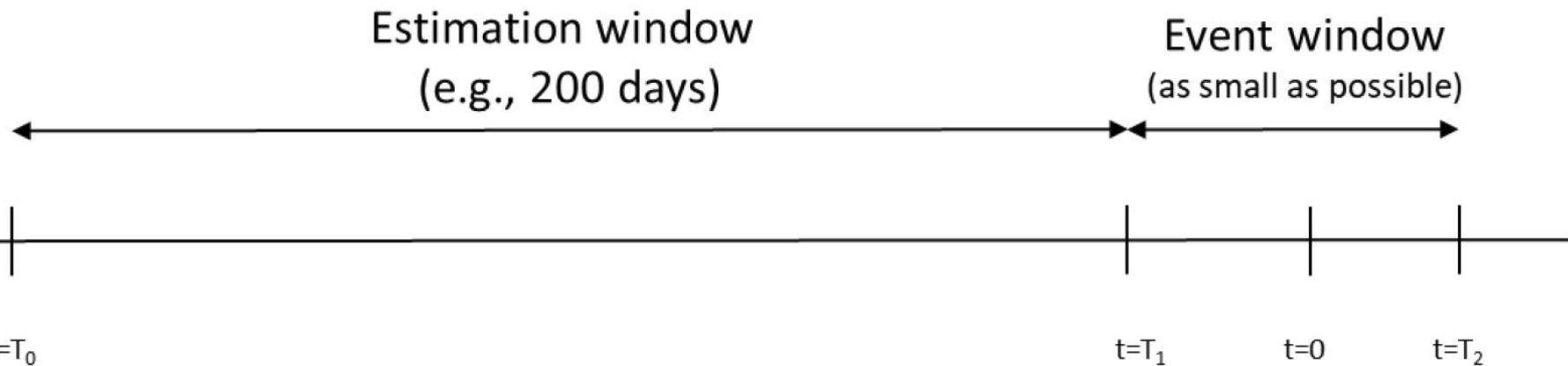
$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + u_{i,t},$$

- Next, we estimate the parameters of the market model during the estimation window. The abnormal return of stock i at time t ($AR_{i,t}$) is

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t},$$

- If the stock that was expected to have a 12% return had only a 5% return, its abnormal return during the period would be minus 7%

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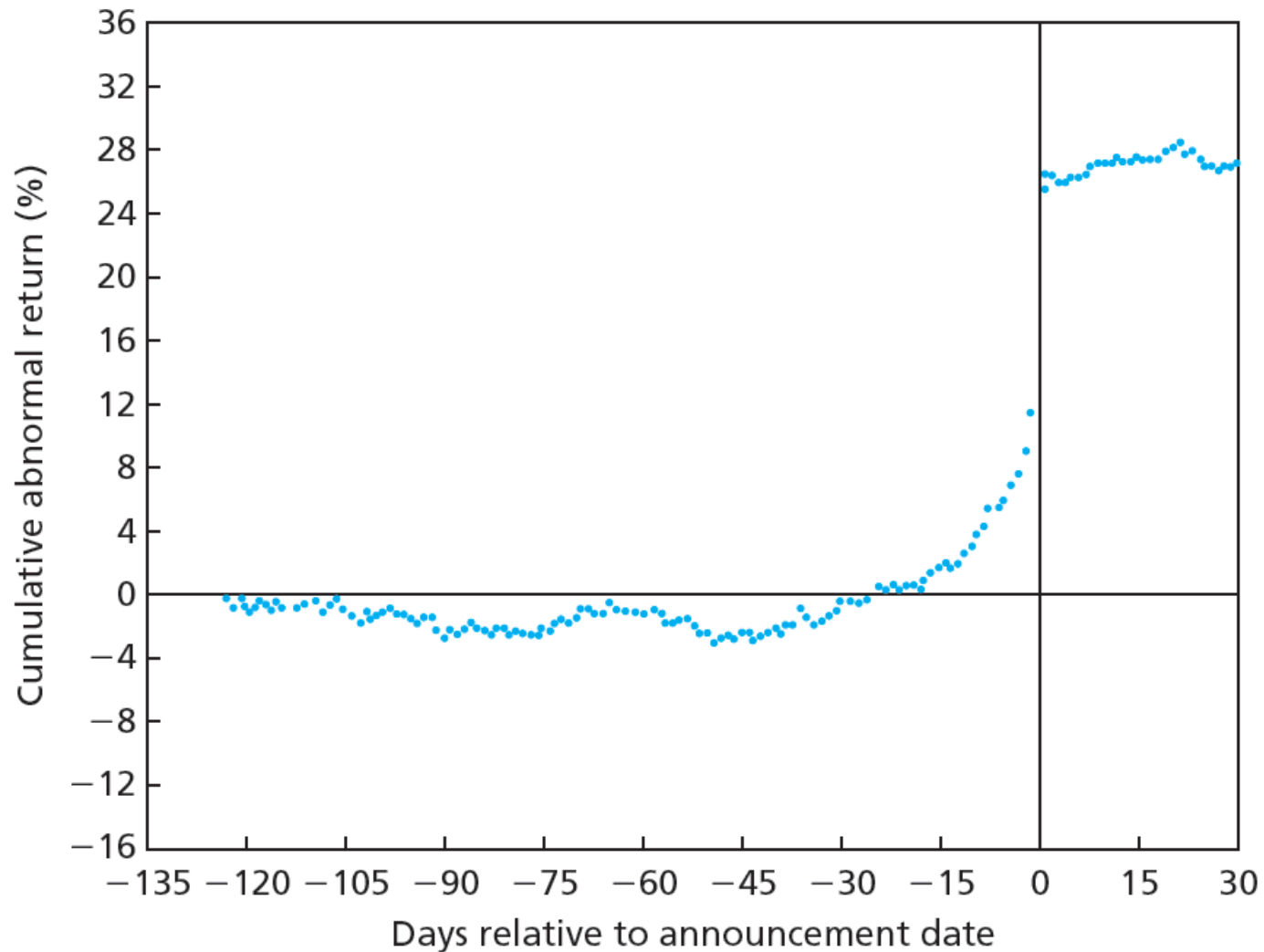


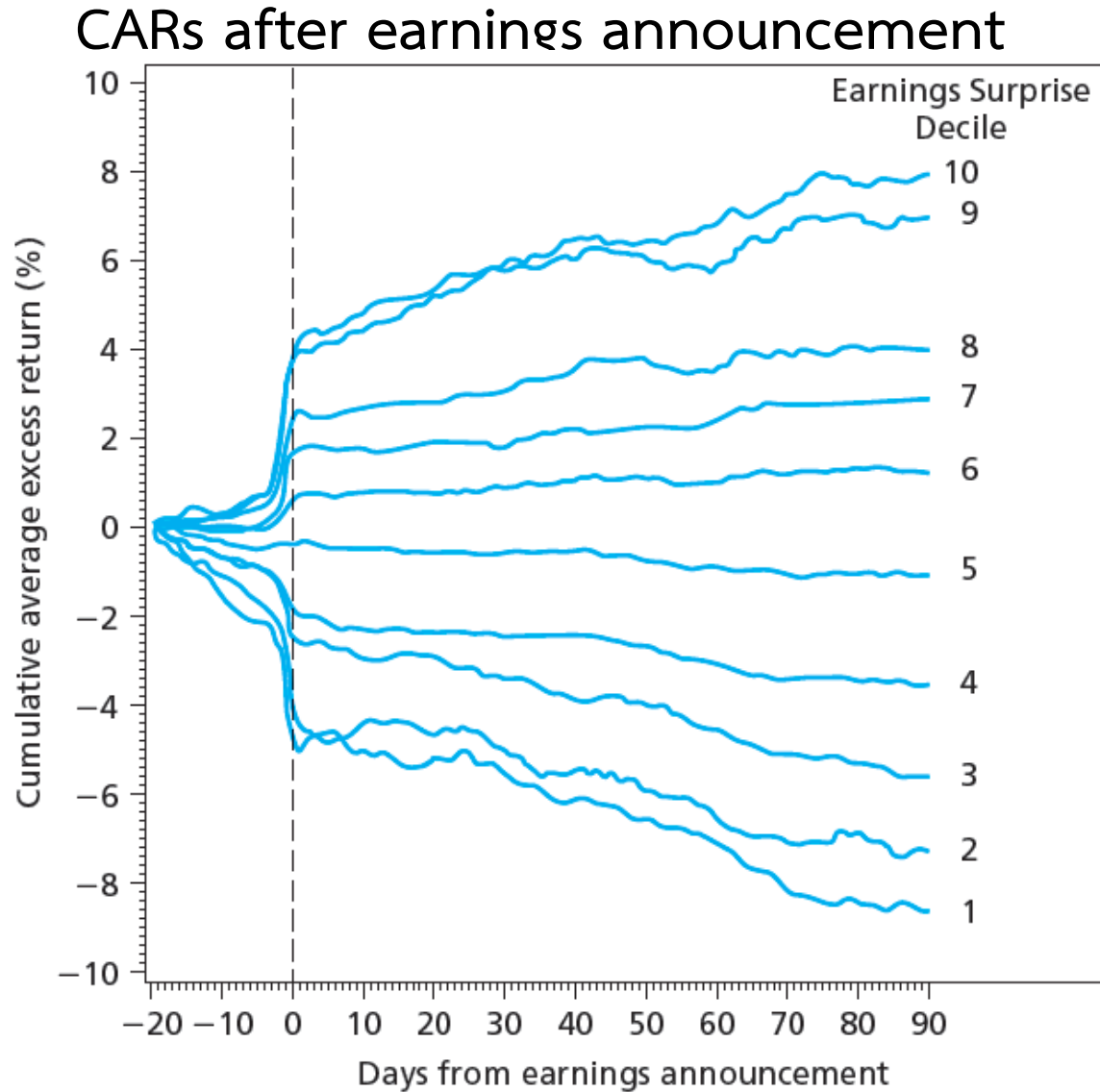
- The cumulative abnormal return of stock i from time t_1 to t_2 ($CAR_{i,(t_1,t_2)}$) is defined as

$$CAR_{i,(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

- We use an event window of the period from 5 days before each event date to 5 days after the event date $[-5,+5]$

CARs before takeover attempts: Target firms





Strong-form hypothesis – Test and results

- **Corporate insiders** enjoy above-average profits, based on selling prior to low returns and not selling before strong returns
- There is unclear evidence in favor of the existence of **superior analysts** who apparently possess private information
- **Professional money managers** could not consistently outperform a simple buy-and-hold policy on a risk-adjusted basis

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To summarize...

- There are enough anomalies in the empirical evidence to justify the search for underpriced securities
- But the **market is competitive** enough that only differentially superior information will earn money
- **Professional manager's margin of superiority likely too slight** for statistical significance

Implications of the EMH

Active vs. Passive Portfolio Management

- Active management assumes market inefficiency
- Passive investment strategy
 - Passive management consistent with semi-strong efficiency
 - Buying well-diversified portfolio (e.g. an index fund) without attempting to find mispriced securities

Implications of the EMH

- **In 2007, Warren Buffett entered a million-dollar bet with the fund manager Protégé Partners that the S&P 500 would beat a basket of hedge funds over the next decade.**
- **His S&P 500 index fund compounded a 7.1% annual gain over 10 years, beating an average increase of 2.2% by the basket of funds selected by Protégé Partners.**
- **Buffett's prize money will go to Girls Inc. of Omaha, Nebraska.**
- **Buffett has taken issue with hedge funds' high fees and their promise of outperforming the market.**



Source: <https://www.businessinsider.com/warren-buffett-wins-million-dollar-bet-against-hedge-funds-2018-1>

Implications of the EMH

Role of Portfolio management in efficient markets

- Even in an efficient market, fund management companies can still have many jobs to do including
 - Create well-diversified portfolio to reduce systematic risk
 - Provide funds that match investors' age, tax bracket, risk aversion, and employment
- Inefficient market pricing leads to inefficient resource allocation
 - If securities are commonly mispriced, then resources would be systematically misallocated