EFFICIENT MARKET HYPOTHESIS

The Collective Wisdom

RANDOM WALK

- Maurice Kendall found that stock prices followed a random walk, implying that successive price changes are independent of one another.

- A number of researchers have employed ingenious methods to test the randomness of stock price behaviour.

- Academic researchers concluded that the randomness of stock prices was the result of an efficient market.

WHAT IS AN EFFICIENT MARKET

- **AN EFFICIENT MARKET IS ONE IN WHICH THE MARKET PRICE OF A SECURITY IS AN UNBIASED ESTIMATE OF ITS INTRINSIC VALUE**

- **MARKET EFFICIENCY IS DEFINED IN RELATION TO INFORMATION THAT IS REFLECTED IN SECURITY PRICES. FAMA DISTINGUISHES THREE LEVELS OF MARKET EFFICIENCY.**

  - **Weak-form efficiency**

  - **Semi-strong form efficiency**

  - **Strong-form efficiency**

STOCK MARKET EFFICIENCY

STRONG
SEMI-STRONG
WEAK

MISCONCEPTIONS

1. EMH.. IMPLIES… MARKET HAS PERFECT FORECASTING.
2. AS PRICES TEND TO FLUCTUATE THEY CANNOT REFLECT FAIR VALUE.
3. INABILITY OF INSTITUTIONAL PORTFOLIO MANAGERS TO ACHIEVE SUPERIOR INVESTMENT PERFORMANCE IMPLIES THAT THEY LACK COMPETENCE.
4. THE RANDOM MOVEMENT OF STOCK PRICES SUGGESTS THAT THE STOCK MARKET IS IRRATIONAL.

EMPIRICAL EVIDENCE ON WEAK-FORM EFFICIENT MARKET HYPOTHESIS

- **SERIAL CORRELATION TEST**

- **RUNS TEST**

- **FILTER RULES TEST**

EMPIRICAL EVIDENCE ON SEMI-STRONG FORM HYPOTHESIS

- POSSIBLE TO EARN SUPERIOR RISK-ADJUSTED RETURN BY TRADING ON INFORMATION EVENTS? (EVENT STUDY)

- POSSIBLE TO EARN SUPERIOR RISK-ADJUSTED RETURN … BY TRADING ON AN OBSERVABLE CHARACTERISTIC OF A FIRM? (PORTFOLIO STUDY)

EVENT STUDY

1. IDENTIFY THE ANNOUNCEMENT DATE OF THE EVENT

ANNOUNCEMENT DATE

2. COLLECT RETURNS DATA AROUND THE ANNOUNCEMENT DATE

R_{j-n} $\quad\quad\quad\quad$ $R_{j,0}$ $\quad\quad\quad\quad$ $R_{j,+n}$
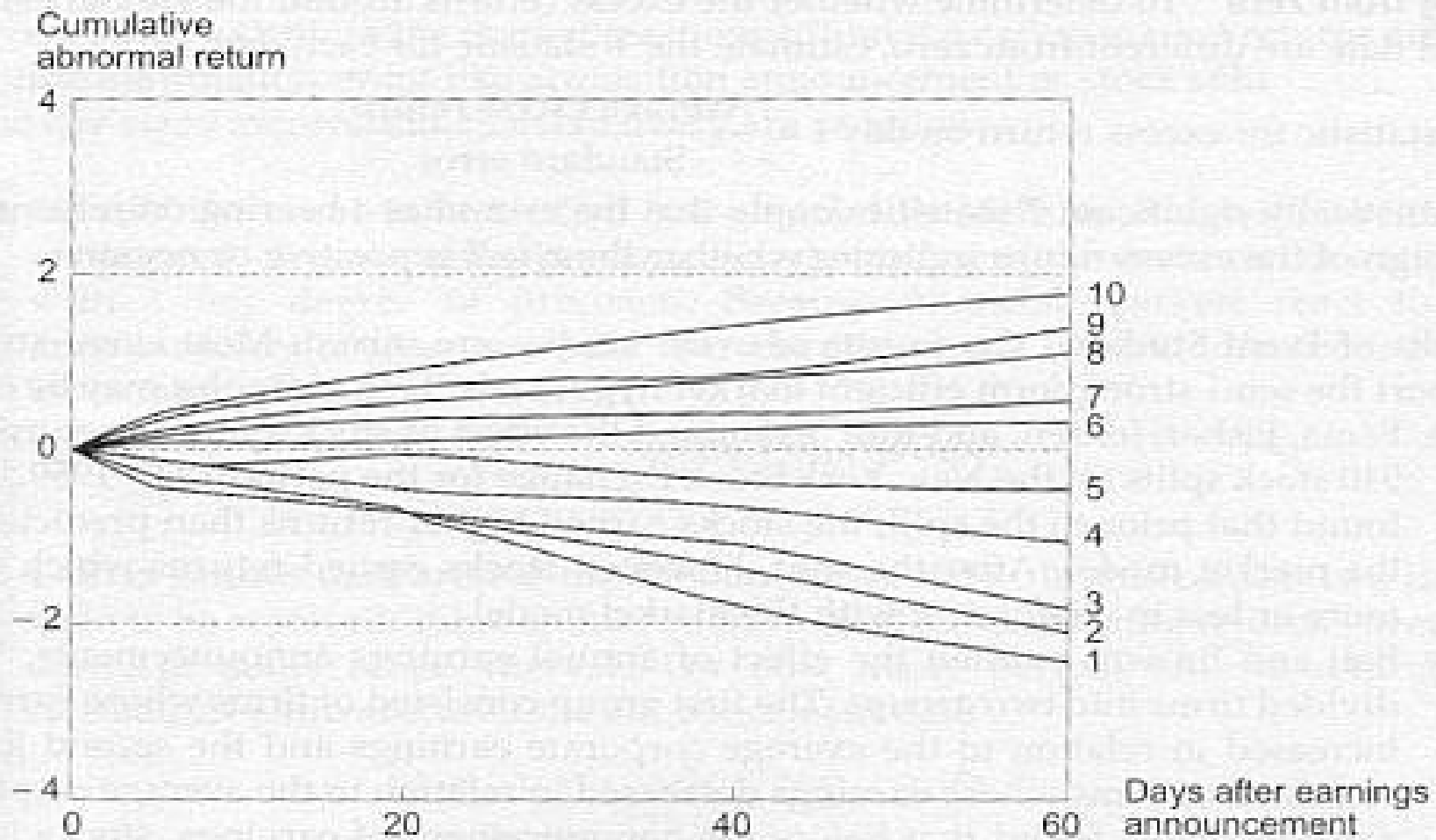
$-n$ TO $+n$
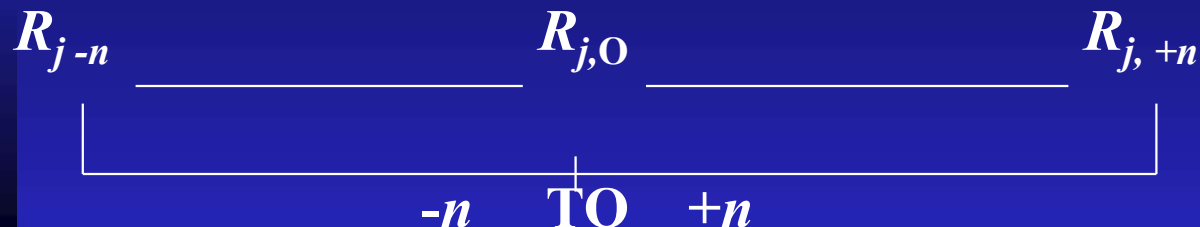
3. CALCULATE THE EXCESS RETURN

$$ER_{jt} = R_{jt} - BETA_j \times R_{mt}$$

4. COMPUTE THE AVERAGE AND THE STANDARD ERROR OF EXCESS RETURNS ACROSS ALL FIRMS

5. ASSESS WHETHER THE EXCESS RETURNS AROUND THE ANNOUNCEMENT DATE ARE DIFFERENT FROM ZERO

T STATISTIC FOR EXCESS
RETURN ON DAY *t* $\quad\quad=\quad$ $\dfrac{\text{AVERAGE EXCESS RETURN}}{\text{STANDARD ERROR}}$

GRADUAL ADJUSTMENTS TO EARNINGS ANNOUNCEMENTS

PORTFOLIO STUDY

1. DEFINE THE VARIABLE (CHARACTERISTIC) ON WHICH FIRMS WILL BE CLASSIFIED

2. CLASSIFY FIRMS INTO PORTFOLIOS BASED UPON THE MAGNITUDE OF THE VARIABLE

3. COMPUTE THE RETURNS FOR EACH PORTFOLIO

4. CALCULATE THE EXCESS RETURNS FOR EACH PORTFOLIO

   $$E\ R_{ji} = R_{ji} - BETA_j\ x\ R_{Mt}$$

5. ASSESS WHETHER THE AVERAGE EXCESS RETURNS ARE DIFFERENT ACROSS THE PORTFOLIOS

RETURNS BY P - E MULTIPLE CLASS

	LOWEST	2	3	4	5	6	7	8	9	HIGHEST
Return	17.40%	16.60%	14.10%	14.10%	11.50%	10.80%	11.10%	10.80%	7.80%	7.40%
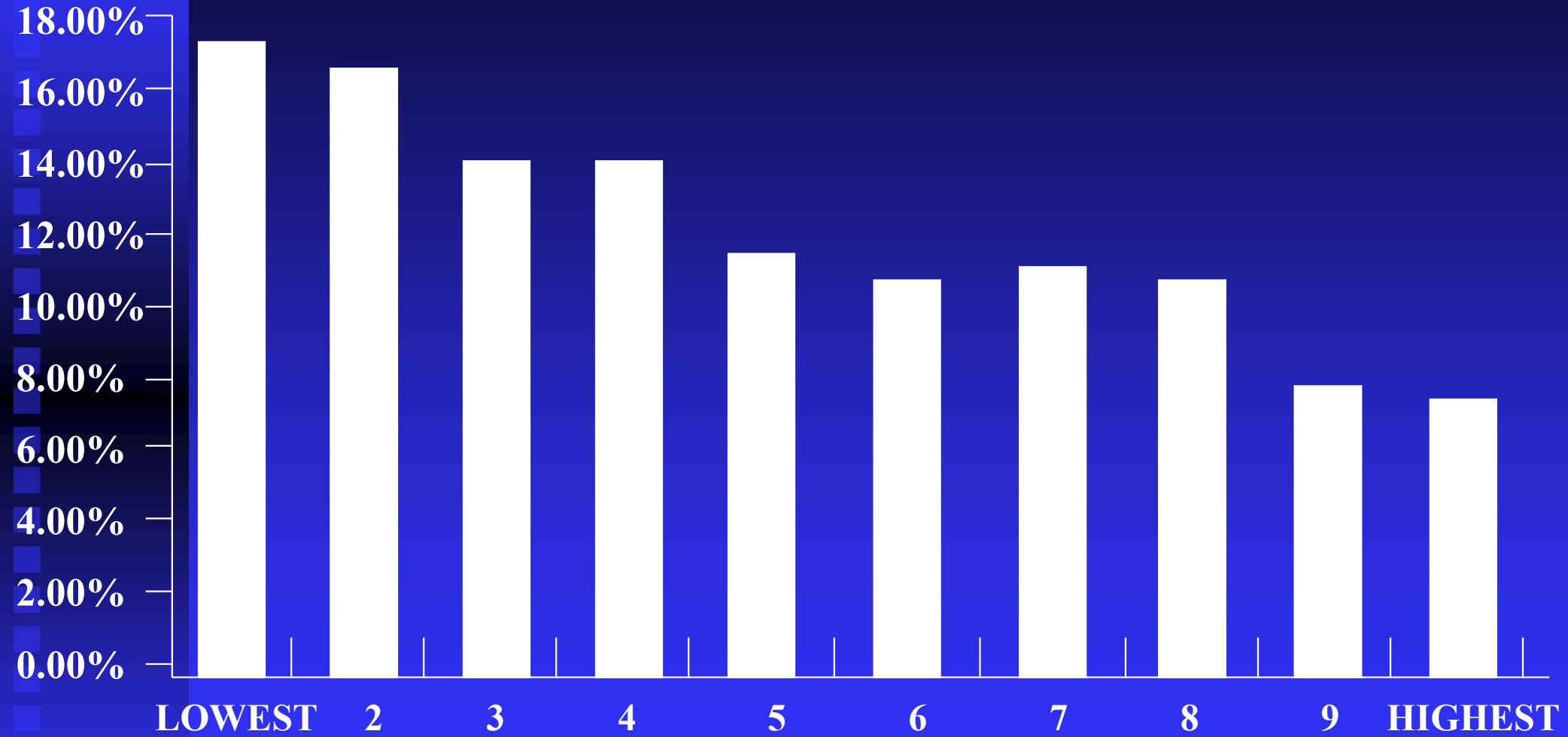
EMPIRICAL EVIDENCE ON STRONG-FORM EFFICIENT MARKET HYPOTHESIS

EMPIRICAL EVIDENCE BROADLY SUGGESTS THE FOLLOWING:

- CORPORATE INSIDERS EARN SUPERIOR RETURNS, AFTER ADJUSTMENT FOR RISK.

- MUTUAL FUND MANAGERS, ON AVERAGE, DO NOT EARN SUPERIOR RETURNS AFTER ADJUSTMENT FOR RISK.

OTHER EVIDENCE

- **PRICE OVERREACTIONS**

- **CALENDAR ANOMALIES**

- **EXCESS VOLATILITY**

- **NORMAL RANGE OF INTEREST**

THE CRASH OF 1987

OCTOBER 19, 1987 DJIA $\downarrow$ 23%

P $\simeq$ IV APPEARS LESS APPEALING

DIFFICULTY . . VALUING EQUITIES …

$$100 = \frac{3}{0.16 - 0.13}$$

$$75 = \frac{3}{0.16 - 0.12}$$

DIFFICULTY IN VALUING EQUITY STOCKS … TWO IMPLICATIONS :

1. INVESTORS TYPICALLY PRICE AN EQUITY STOCK IN RELATIVE
   TERMS

2. ALMOST IMPOSSIBLE . . TEST THE HYPOTHESIS … P $\simeq$ IV

ABSOLUTE EFFICIENCY
VS
RELATIVE EFFICIENCY

VERDICT

- TRUE, THE EFFICIENT MARKET HYPOTHESIS, LIKE ALL THEORIES, IS AN IMPERFECT AND LIMITED DESCRIPTION OF THE STOCK MARKET. HOWEVER, THERE DOES NOT, AT LEAST FOR THE PRESENT, SEEM TO BE A BETTER ALTERNATIVE.

- MERTON MILLER : "IT IS CLOSER TO BEING A 'PARADIGM' THAN A MERE HYPOTHESIS, BRINGING A COMMON AND COHERENT EXPLANATORY FRAMEWORK TO A WIDE VARIETY OF SEEMINGLY UNRELATED PHENOMENA. LIKE ALL SCIENTIFIC PARADIGMS, IT WILL SURVIVE UNTIL DISPLACED BY A BETTER ONE. AT THE MOMENT, AT LEAST NO BETTER PARADIGM IS IN SIGHT"

IMPLICATIONS FOR INVESTMENTS

- Substantial evidence in favour of randomness suggests that technical analysis is of dubious value.

- Routine and conventional fundamental analysis is not of much help in identifying profitable courses of action

- The key levers for earning superior rates of returns are:
    - Early action on any new development.
    - Sensitivity to market imperfections and anomalies.
    - Use of original, unconventional, and innovative modes of analysis.
    - Access to inside information and its sensible interpretation
    - An independent judgment that is not affected by market psychology.

SUMMING UP

- Stock prices appear to follow a random walk. The randomness of stock prices is the result of an efficient market

- It is useful to distinguish three levels of market efficiency : weak form efficiency, semi-strong form efficiency, and strong form efficiency.

- The weak form efficient market hypothesis says that the current price of a stock reflects all information found in the record of past prices and volumes.

- The semi-strong form efficient market hypothesis holds that stock prices adjust rapidly to all available public information.

- The strong form efficient market hypothesis holds that all available information, public and private is reflected in stock prices.

- **Empirical evidence seems to provide strong support for weak-form efficiency, mixed support for semi-strong form efficiency, and weak support for strong-form efficiency.**

- **The efficient market hypothesis is an imperfect and limited description of the stock market. however, at least for the present, there does not seem to be a better alternative.**

- **The key implications of the efficient market hypothesis are that technical analysis is of dubious value and routine fundamental analysis is not of much help.**