

DEFINING MARKET EFFICIENCY

Market Efficiency:

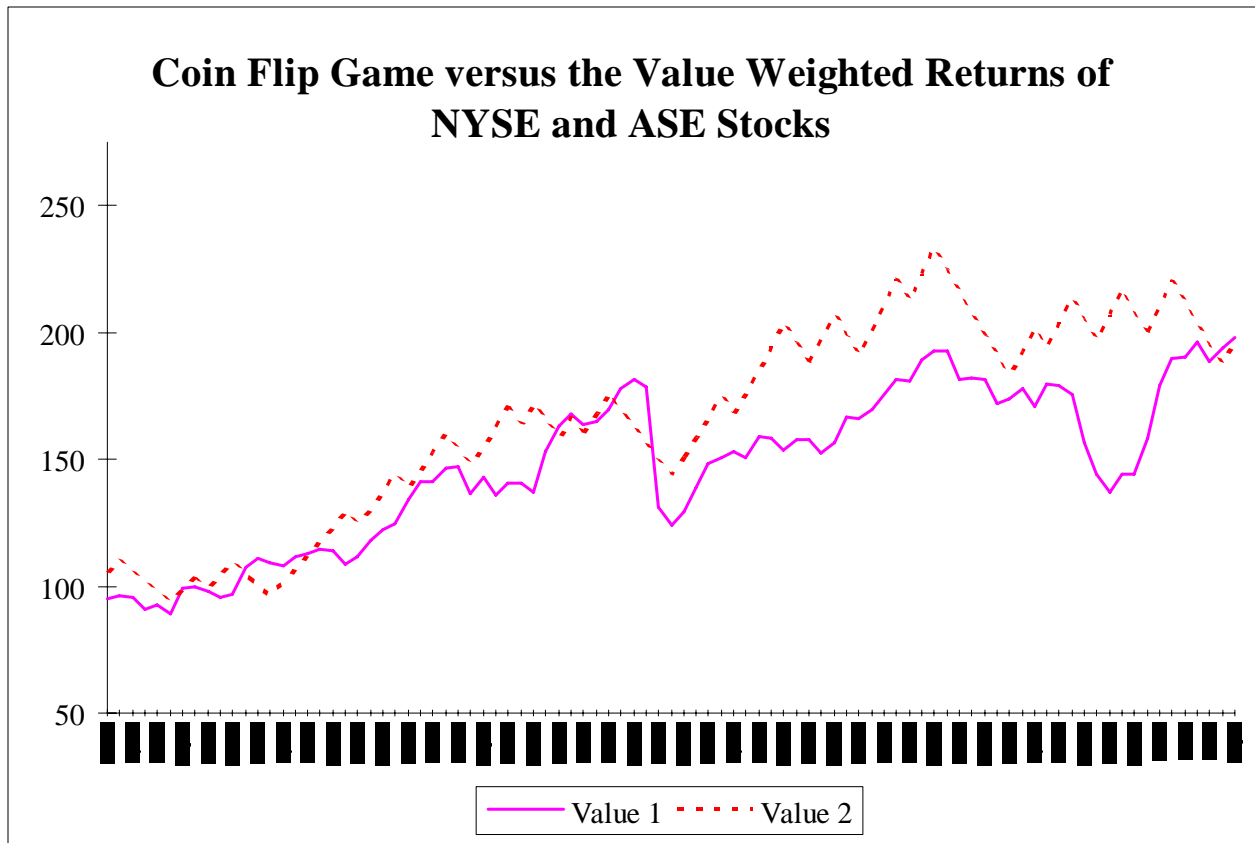
If capital markets are efficient, prices today reflect all currently available information.

The only way to consistently “beat the market” (obtain a higher return than the S&P 500 for the same level of risk) is to be incredibly lucky.

Defining a random walk:

- Tomorrow’s price change is independent of what happened to today’s prices.
- Consider a simple \$100 bet: Flip a coin
 - if heads you win 5%,
 - if tails you lose 4%
 - After 2 flips what are your possible winnings?

Seems like a pretty random experiment. Well if we compare the results of this experiment to the returns from the stock market, without any labels, they look pretty similar.



- If stock prices behave like a random walk, you cannot predict the future movements of prices using the history of prices.
- Clearly, the coin flip experiment is a random experiment and yet stock prices look pretty similar.
- Technical Analysis is intended to read the patterns in stock returns. There is very little evidence that any technical analyst has consistently beaten the market with such analysis.
- How do technical analysts survive? Luck and a desire to believe that it can be done.

WEAK FORM EFFICIENCY

Weak form market efficiency says that *all information from the history of past prices* is currently incorporated into today's price. A random walk would characterize a market that is weak form efficient.

Evidence in support of weak form efficiency:

- Correlation between last period's return and today's return tends to be insignificantly different from zero.
- Studies of technical analysts show that they cannot beat the market on average.

SEMI-STRONG FORM EFFICIENCY

Semi-strong form market efficiency says that *all publicly available information* is incorporated into today's prices.

Fundamental analysts study the business in which a company is engaged, trying to feel the pulse through the published material about the company and the effect that innovations in the marketplace will have on the companies' fortunes.

Evidence of semi-strong form efficiency has for the most part been based on the stock market reaction to various announcements: (Event Studies)

- Announcements of dividend changes,
- Earnings
- Mergers and Acquisition activity

The studies have found that stock prices react to new announcements nearly immediately (*within 15 minutes*) and without much in the way of a correction afterwards. There is over and under reaction, but the market overreacts as often as it underreacts.

These studies suggest that market prices unbiasedly impound publicly available information. Markets appear to be semi-strong form efficient.

Studies of mutual fund performance have consistently shown that fund managers do not beat the market on average.

STRONG FORM EFFICIENCY

Strong form market efficiency says that *all information* is incorporated into today's prices.

Evidence on strong form efficiency:

- Corporate insider sales signal declines in prices
- Corporate insider buys signal increases in prices
- Investors with inside information do appear to earn some additional returns.

It appears as if the market on the whole is not strong form efficient. If you have inside information you can earn abnormal returns on your investments.

Is it surprising that the market is not strong form efficient?

Why can insider traders make money?

MUTUAL FUNDS AND INDIVIDUAL INVESTORS

1. We learned earlier that diversification is a fundamental issue to investors.

- We can reduce the risk of our portfolio by increasing the number of assets we hold in our portfolio.
- Diversify away unsystematic risk.

2. We learned that investments in common stocks outperform all other investments when you look at long horizons.

| | Treasury Bills | Long Gov't Bonds | Long Corp Bonds | Common Stocks | Small Firm Com Stks |
|-----------------|----------------|------------------|-----------------|---------------|---------------------|
| Avg Returns | 3.7% | 4.9% | 5.5% | 12.1% | 17.1% |
| Std Dev Returns | 3.4% | 8.5% | 8.4% | 20.8% | 35.4% |

3. We learned that markets appear to be weak and semi-strong form efficient. This means that you are unlikely to be able to “Beat the Market”.

- Just because you can't beat the market does not mean that you should not invest in stocks and bonds.
- In fact, the table above suggests that over the long-term investments in stocks are a wise investment.

MUTUAL FUNDS AND INDIVIDUAL INVESTORS

Mutual Funds provide individual investors, who do not have enough wealth to diversify independently, the ability to buy shares in a well diversified portfolio.

- A mutual fund is a big basket holding many different stocks, bonds and other assets. Shares are purchased by individuals which entitle the holder to a proportionate interest in the basket of assets.
- These mutual fund shares can usually be purchased with a minimum investment of \$500 for an Individual Retirement Account (IRA) or \$1000-\$5000 for a normal (non-tax advantaged) account.
- **Closed-end funds:** mutual funds which initially issue a fixed number of shares. To purchase a closed-end fund you must purchase the shares from someone that already owns the fund shares, just like any other stock.
- **Open-end funds:** mutual funds which will continually add to the number of shareholders in the mutual fund. If you purchase shares in a fund they will take your money and add to the funds portfolio of assets.
- **Load Fees for Open-end funds:** Fees charged up-front to purchase shares in the mutual fund. There is no evidence that funds that charge load fees outperform funds that do not charge a load.
- **Mutual Fund Performance Studies** suggest that mutual fund managers do not “Beat the Market.” Minimize the fees that you pay to the Mutual Fund to maximize your return. You can usually do this by purchasing “Index Funds.”
- **Index Funds** are mutual funds that have a stated purpose to buy and hold securities. They do not trade except to buy new shares when investors buy shares in the fund, and sell when people pull their money out of the fund. As a result they have very low fees.

Diversify internationally: Index funds from various countries are not perfectly correlated.

INVESTMENT OPTIONS FOR INDIVIDUALS

There are many different options for individual investors who are looking to save money for the future.

Regular Investment Account

You can invest in stocks, bonds, options, futures, ETFs, etc. through a brokerage firm. There are no tax advantages to regular investment accounts (the money you invest is after-tax income, you pay taxes annually on investment income, and capital gains taxes apply when you sell an investment), but there are also no restrictions governing how much you can invest and what you can invest in.

401-k and 403-b retirement plans through employers

Most employers offer the ability for employees to save money directly from their paychecks into a retirement account, up to a maximum of \$16,500 per year. Employees usually have a range of investment options for this money, usually involving a set of mutual funds to choose from. Most people have heard of 401-k plans... 403-b plans are identical to 401-k plans, except that 403-b plans are offered by non-profit organizations.

There are many advantages to 401-k plans:

- The savings are taken out of pre-tax income, so you pay less taxes today
- The money in a 401-k plan grows tax-free until you withdraw money during retirement (ie: no taxes on dividends and capital gains)
- Most employers will match your contributions to a certain amount, which is effectively an immediate 100% return on your savings

401-k plans are *very tax-friendly* to encourage people to save for retirement. There are steep penalties and fees for making withdrawals from a 401-k plan before you reach the age of 59 ½. However, you can roll your 401-k money into an IRA without penalty.

To open a 401-k plan, you talk to the benefits manager at your firm. There may be several different plans to choose from, with each plan offering a variety of mutual funds.

IRAs

Individual Retirement Accounts (IRAs) are retirement accounts allowed by the government. Most individuals are eligible to contribute to an IRA. Contribution to an IRA is capped at \$5,000 per year currently, but this will increase in future years to compensate for inflation. Certain IRAs provide the same or better tax-shielding as 401-k plans, but you must meet certain income requirements to be eligible. The most common IRAs are:

- **Traditional IRAs:** these work like 401-k plans. They provide immediate tax relief today, and the investments grow tax-free until you withdraw the money at retirement.
- **Roth IRAs:** these give different tax-shielding than traditional IRAs. Your initial investment is does not provide any tax relief today... you'll pay the same taxes as before you invest. However, your money grows tax-free during the life of the investment, and your withdrawals during retirement are *NOT* taxed! For most people, Roth IRAs are considered more tax friendly than traditional IRAs due to the avoidance of taxes on your investment's capital gains.
- **Rollover IRA:** these are just like traditional IRAs, but are used specifically for investors wanting to move their 401-k money into an IRA. Reasons for doing so include the possibility of more/better investment options through the Rollover IRA and keeping retirement savings in one account.
- **Educational IRAs:** these are IRAs that are designed specifically for saving for college. Also similar to these are 529 plans... they allow individuals to save money in a tax-deferred account (like 401-k plans) until the money is used for education.

For all IRAs, there are penalties for early withdrawal of your money.

Investors can open IRA accounts with any of the main brokerage firms (like Fidelity, Vanguard, UBS, ScottTrade, Janus, Charles Schwab... and this is only a VERY partial list). Each firm will have different mutual funds and investment options, as well as different fees and services.