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LECTURE 08: PERSONAL FINANCE & DJIA

I. Reaction times
   a. Suppose some favorable news came out for a company. How long would it take for the stock price to change?
      i. A few seconds, depending on the nature of the information
   b. *Efficient market hypothesis* (EMH)—prices of traded assets reflect all publicly available information
      i. Note this doesn't mean the market is always right. Just that when it's wrong, there's no public information to suggest it's wrong.
      ii. If every tradable is valued fairly at all times, there's little point to trade frequently.
   c. Why do some people beat the market?
      i. *Luck*. With so many gambling, by chance you'll get a few that have won many, many, many times over
      ii. *Insider trading*. US Senators beat the stock market by an average of 12.3 percentage points (if the stock market's value grows by 3%, Senators' portfolio's value grows by 15.3%). House Representatives beat it by 6% and corporate insiders by 7.4%.[1] Note insider trading laws do ***not*** apply to Congress.
      iii. *Psychology*. People panic. They succumb to overconfidence, group think, bubbles, etc. Those who can keep their head can profit.

II. Picking stocks
   a. <u>Diversify</u>: buy lots of different kinds of stocks to limit risk to any one area (this is also sometimes referred to as hedging your bet).
      i. *Buy and hold*—buying and holding stocks for the long run, regardless of what their short run fluctuations are.
   b. <u>Avoid high fees</u>: because stock picking is a fool's game, there's no reason to pay a lot for people to do it. But if you're doubtful of the EMH, maybe it's worth it. Maybe.
   c. <u>Compound returns build wealth</u>: A 4% annual rate of return means you will earn interest on the interest you earned in previous years. \$100 becomes \$104, then \$108.16, then \$112.49, then 116.99, etc. This supports a buy and hold strategy.

[1] http://insidertrading.procon.org/view.answers.php?questionID=001034

i. *Rule of 70*—Again, the Rule of 70 appears. To estimate how many periods it will take to double your money, divide seventy by your rate of return.

ii. At 4% rate of return, you will double your money in 17.5 periods. Without compound interest, it would take 25 periods.

d. No Return Without Risk: Profit opportunities that are sure things are quickly bought up, reducing the return.

i. *Risk-return trade-off*—higher returns come at the price of higher risk

III. Dow Jones Industrial Average

a. Started in 1896, the DJIA selected a dozen companies which the DJIA group felt captured the composition of the U.S. economy.

i. Original Components of the DJIA (1896)

Company	Industry
American Cotton Oil Company	Cotton products
American Sugar Company	Sugar products
American Tobacco Company	Tobacco products
Chicago Gas Company	Natural gas
Distilling & Cattle Feeding Company	Agricultural products
General Electric	Edison’s electric company
Laclede Gas Light Company	Gas lighting products
National Lead Company	Lead products
North American Company	Utilities
Tennessee Coal, Iron and Railroad Company	Steel and railroad
U.S. Leather Company	Industrial leather supplies
United States Rubber Company	Rubber products

b. The Dow has since expanded to thirty components. Note only one company is still on that list.

i. Current Components of the DJIA (As of 1/20/2014)

Company	Industry
3M	Diversified industrials
American Express	Consumer finance
AT&T	Telecoms
Boeing	Aerospace & Defense
Caterpillar	Construction & Mining Equipment
Chevron	Oil & Gas
Cisco Systems	Computer Networking

Coca-Cola	Beverages
DuPont	Commodity Chemicals
ExxonMobil	Integrated Oil & Gas
General Electric	Diversified Industrials
Goldman Sachs	Banking & Financial Services
The Home Depot	Home improvement retailers
Intel	Semiconductors
IBM	Computer Services
Johnson & Johnson	Pharmaceuticals
JPMorgan Chase	Banks
McDonald's	Fast food
Merck	Pharmaceuticals
Microsoft	Software
Nike	Apparel
Pfizer	Pharmaceuticals
Procter & Gamble	Consumer goods
Travelers	Insurance
UnitedHealth Group	Managed health care
United Technologies	Diversified industries
Verizon Communications	Telecoms
Visa	Consumer banking
Walmart	Retailers
Walt Disney	Broadcasting & Entertainment

c. The DJIA tracks the stock price of each company and reports the average. When you hear what the Dow is, you're hearing the average stock price.

$$Average = \frac{Sum\ of\ all\ stock\ prices}{number\ of\ stocks}$$

   i. But wait! The DJIA, as of March 12, 2014, is over $16,000. No stock price in that list gets even close to that. What's going on?
   ii. It's because of stock splits.

d. Firms, especially ones successful enough to get on the DJIA, issue what are called *stock splits*—they issue one or two (or more) stocks to everyone who has one and the price of the stock drops proportionally. If you double the number of stocks, you halve the price. Triple the stocks and the price is one-third.
   i. The key idea is that the company's value doesn't change.
   ii. The problem is, if we use the same denominator with this new lower price, we'd record a drop in value.
   iii. What does the DJIA do? They change the denominator.

e. The *Dow Jones Industrial Average divisor* is the denominator the DJIA uses to compensate for stock splits.
    i. As of March 11, 2014, it's 0.15571590501117[2]
f. To find it, the DJIA looks at what the index was before the split and sets that number equal to an incomplete average equation.

$$Average\ before\ stock\ split = \frac{Sum\ of\ all\ new\ stock\ prices}{x}$$

g. By solving for x (the new divisor), it finds what it will be using until another stock split.

IV. Example
a. Consider two firms and their stock prices.
    i. Alpha Corp $40
    ii. Beta Corp $60
b. An index of these two firms would be $50.
c. If Beta Corp splits its stock in three parts (tripling the number of stocks), what's it's new stock price?
    i. $60 / 3 = $20
d. Now we solve for x:

$$\$50 = \frac{\$40 + \$20}{x}$$
$$x = \frac{\$60}{\$50} = 1.2$$

    i. The new divisor is 1.2; this index will use that instead of 2 when determining the average price. This will continue until another stock split.

V. Final words
a. Here's the thing about the DJIA: now that you know what it is, you can see it's not as important as people treat it.
b. Yes, these firms are important. They are big players in the economy and if they have a problem, other firms probably have a problem as well.
c. But many firms (notably Apple) are not in the DJIA. It's just 30 firms at the end of the day. Your retirement might be tagged to it, but as a measure of the economy as a whole, it presents a very incomplete picture.

[2] http://wsj.com/mdc/public/page/2_3022-djiahourly.html