



Valuation of Stocks by Sorting Method
Advanced Technology (Semiconductors and Equipment)
MATH 575 (Asset Pricing and Financial Engineering)
Fall 2015

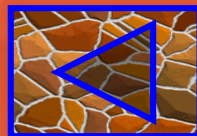
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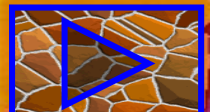
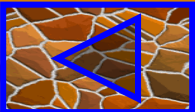


Outline

- 10 Companies were selected from the advanced technology (semiconductor and equipment) section in S&P 500 (Large Capitalization “ \geq \$10 B”) using Yahoo Finance and finviz
- Average capitalization and dividend rate were found in the past three years
- Average *P/B*, *P/S*, *P/E* and forward *P/E* were found from analysts
- By using S&P 500 *P/E*, *P/S* and forward *P/E*, we selected one company, and then we justified our conclusion about advanced technology such as undervalued, overvalued, or just about right valuation
- By using DCF model, we estimated one company’s stock price and compared it with the current real market data

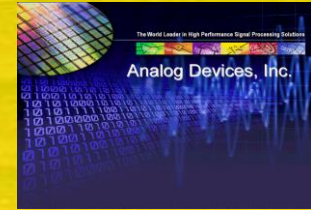
finviz

YAHOO!
Finance



Ten Companies from the advanced technology

1. Altera Corp. (ALTR)
2. Analog Devices, Inc. (ADI)
3. Avago Technologies Limited (AVGO)
4. Broadcom Corp. (BRCM)
5. First Solar, Inc. (FSLR)
6. Intel Corporation (INTC)
7. Linear Technology Corporation (LLTC)
8. Microchip Technology Inc. (MCHP)
9. NVIDIA Corporation (NVDA)
10. QUALCOMM Incorporated (QCOM)



Why do we need to invest in Advanced Technology?

- **The semiconductor industry is a huge market on its own.**
- **There are numerous types and categories of semiconductors.**
- **Chips can be divided into analog, digital and mixed-signal circuits, but it is more common to discuss chips in terms of their ultimate function – like power management, microprocessors, micro controllers, sensors and amplifiers.**
- **the ability to design superior products (more features per chip, less power consumption, more reliability, etc.) at the best price.**

Reference: A Primer On Investing In The Tech Industry (<http://www.investopedia.com/articles/stocks/10/primer-on-the-tech-industry.asp>)



Key Indicators for Valuation of Stocks

a. Valuation:

$$P/B = \frac{\text{Share Price}}{\text{Book Value}}$$

$$P/S = \frac{\text{Share Price}}{\text{Revenue}}$$

$$P/E = \frac{\text{Share Price}}{\text{Earning}}$$

b. Profit Margin:

$$\text{Return of Capital} = \frac{\text{Profit}}{\text{Capitalization}}$$

$$\text{Operating Margin} = \frac{\text{Profit}}{\text{Revenue}}$$

$$\text{Profit Margin (Net)} = \frac{\text{Net Profit}}{\text{Revenue}}$$

Reference: Dr. Hong-Ming Yin Lecture Notes

c. Growth:

Revenue Growth (Top Line)

Profit Growth (Bottom Line)

Dividend Rate Growth

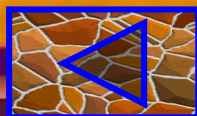
- $PEG = \frac{P/E}{\text{Growth in Net Earnings}}$
- $\text{Forward P/E} = \frac{\text{Market Price Per Share}}{\text{Expected Earnings Per Share}}$



Average capitalization and dividend rate were found in the past three years

| Advanced Technology Companies | Market Capitalization | Dividend Rate |
|--------------------------------------|-----------------------|---------------|
| Altera Corp. (ALTR) | 15.88 B | 4.2 |
| Analog Devices, Inc. (ADI) | 17.78 B | 1.6 |
| Avago Technologies Limited (AVGO) | 32.19 B | 1.68 |
| Broadcom Corp. (BRCM) | 30.65 B | 0.56 |
| First Solar, Inc. (FSLR) | 5.17 B | 0 |
| Intel Corporation (INTC) | 152.83 B | 0.96 |
| Linear Technology Corporation (LLTC) | 10.07 B | 1.2 |
| Microchip Technology Inc. (MCHP) | 9.77 B | 1.43 |
| NVIDIA Corporation (NVDA) | 14.05 B | 0.39 |
| QUALCOMM Incorporated (QCOM) | 90.78 B | 1.92 |
| Companies of S&P 500 Average | 37.917 B | 1.394 |

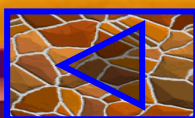
Table 1.1: Market Capitalization and Dividend Rate



Average *P/B*, *P/S*, *P/E* and forward *P/E* were found from analysts

| Advanced Technology Companies | P/B | P/S | P/E | Forward P/E | PEG | Beta |
|--------------------------------------|-------|-------|--------|-------------|-------|----------|
| Altera Corp. (ALTR) | 14.71 | 8.55 | 43.02 | 35.47 | 4.2 | 0.532636 |
| Analog Devices, Inc. (ADI) | 3.57 | 5.54 | 25.43 | 16.92 | 1.95 | 1.13 |
| Avago Technologies Limited (AVGO) | 7.49 | 4.89 | 30.67 | 12.27 | 5.49 | 1.32 |
| Broadcom Corp. (BRCM) | 3.2 | 3.59 | 28.62 | 16.66 | 2.64 | 0.44 |
| First Solar, Inc. (FSLR) | 1.02 | 1.58 | 16.56 | 16.33 | -2.85 | 2.41 |
| Intel Corporation (INTC) | 2.68 | 2.8 | 13.62 | 13.91 | 1.81 | 0.808815 |
| Linear Technology Corporation (LLTC) | 6.35 | 6.79 | 19.44 | 19.26 | 2.37 | 1.02161 |
| Microchip Technology Inc. (MCHP) | 4.5 | 4.58 | 25.07 | 15.74 | 1.37 | 0.850374 |
| NVIDIA Corporation (NVDA) | 3.37 | 2.95 | 27.73 | 22.47 | 5.65 | 0.819802 |
| QUALCOMM Incorporated (QCOM) | 2.74 | 3.42 | 15.81 | 12.32 | 1.93 | 1.45533 |
| Companies of S&P 500 Average | 4.963 | 4.469 | 24.597 | 18.135 | 2.456 | 1.078857 |

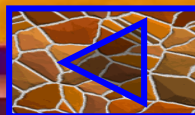
Table 2.2: *P/B*, *P/S*, *P/E* and forward *P/E*



Company's Stock Price and Valuation

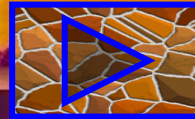
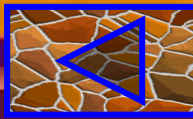
| Advanced Technology Companies | Stock Price | DCF | Difference | Valuation |
|--------------------------------------|-------------|--------|------------|-------------|
| Altera Corp. (ALTR) | 52.29 | 49.56 | -2.73 | Overvalued |
| Analog Devices, Inc. (ADI) | 56.05 | 67.56 | 11.51 | Undervalued |
| Avago Technologies Limited (AVGO) | 113.42 | 164.33 | 50.91 | Undervalued |
| Broadcom Corp. (BRCM) | 50.09 | 35.4 | 5.31 | Undervalued |
| First Solar, Inc. (FSLR) | 50.58 | 62.59 | 12.01 | Undervalued |
| Intel Corporation (INTC) | 32.04 | 33.79 | 1.75 | Undervalued |
| Linear Technology Corporation (LLTC) | 41.16 | 41.21 | 0.05 | Undervalued |
| Microchip Technology Inc. (MCHP) | 46.06 | 49.4 | 3.34 | Undervalued |
| NVIDIA Corporation (NVDA) | 26.4 | 23.92 | -2.48 | Overvalued |
| QUALCOMM Incorporated (QCOM) | 57.51 | 71.83 | 14.32 | Undervalued |
| Companies of S&P 500 Average | 52.56 | 59.959 | 9.399 | Undervalued |

Table 3.3: Company's Stock Price and Valuation



Conclusion

- **NVIDIA Corporation (NVDA) is a bubble at the current level.**
- **First Solar, Inc. (FSLR) has a negative PEG (-2.85).**
- **There are two possibilities for negative PEG: negative P/E ratio or negative growth.**
- **Avago Technologies Limited (AVGO) has the highest stock price.**
- **Intel Corporation (INTC) has the highest market capitalization.**





THANK YOU FOR LISTENING TO ME!!!

