



# Old School Value

*Stock Valuation Spreadsheets | Value Screens & Ideas*

## How to Use Guide and Examples

### Table of Contents

Table of Contents.....	1
Troubleshooting.....	3
Quick Guide.....	4
DCF Valuation.....	4
Price vs Value Graph .....	4
Benjamin Graham's Formula .....	4
EPV is based on Bruce Greenwald's book.....	5
Net Net.....	5
Piotroski F score.....	5
Altman Z Score .....	6
Beneish M Score .....	6
Competitor Tab .....	7
Charts .....	7
Discounted Cash Flow Valuation Tutorial .....	8
Stable Cash Generator: Johnson & Johnson (JNJ).....	8
Growth Company Valuation: Apple (AAPL) .....	11
Company in a Downturn: American Eagle Outfitters (AEO) .....	12
Benjamin Graham Formula Valuation Tutorial .....	14
Benjamin Graham Formula Discussion .....	14
Step 1 – Adjust Earnings Per Share .....	14

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

Step 2 – Adjust Growth Rate.....	14
Earnings Power Value Technique Tutorial.....	16
1. Reproducing the Assets of Microsoft.....	16
Step 1 – Calculate the Value of Assets.....	16
Step 2 – Add back Marketing, R&D and Value Increasing Expenses .....	17
Step 3 – Non Interest Bearing Debt and Cash.....	18
2. Earnings Power Value Calculation .....	19
Subtract Maintenance CAPEX and Divide by Discount Rate.....	19
Step 6 – Add Cash minus Debt to EPV .....	20

## Troubleshooting

If you get an error, it **will be** one of the following. Make sure to check each one and [refer to the manual](#).

- Only **US listed stocks** or ADR's will work
- **Financial stocks will not work**
- Enter the ticker and then press ENTER followed by the calculate button
- Be sure to **log off Morningstar** accounts from all browsers
- Most pink sheets and OTC stocks will not work
- If a company history is too short there may be errors or #value! errors.
- Check the FAQ below
- Do search in the [forum](#)
- Go to the [yahoo groups page](#) and do a search
- Change computer settings to [US number settings](#) in control panel
- Enable macros

## Quick Guide

**Refer to the manual for all installation, troubleshooting and modification instructions.**

- **Yellow highlighted fields** are user input fields. Enter ticker into the ticker window only.
- Use yellow fields to override the default values without messing up formulas and accidentally saving incorrect values
- **If a graph is squashed** or looks out of place, **zoom in** and **zoom out** to refresh the view.
- **Press the calculate button or F9 to start calculations.** Automatic formula calculations should be turned off in the excel menu to improve start speed and convenience.
- Protected sheets do not have any passwords. Simply unprotect it.
- Dashboard page provides a quick overview of all valuation. Easy to add more or less yourself.

## DCF Valuation

<http://www.oldschoolvalue.com/valuation-methods/discounted-cash-flow-stock-valuation/>

<http://www.oldschoolvalue.com/stock-analysis/aapl-valuation-value-investing/>

- Use "5 Year Multi-Year Performance" numbers if there has been a recent turnaround or a major event changing the fundamentals of the business
- Use "10 Year Multi-Year Performance" numbers for stable, cash cows such as KO or JNJ. You can even use it for stable consistent small caps
- Adjust shares outstanding only in this page. All other valuation models will use the shares outstanding from the DCF page.
- Adjust user growth, discount rate, FCF override, terminal rate (default 3%)
- Select the FCF method. FCF or Owner earnings. You can also adjust the latest full year FCF number.

## Price vs Value Graph

- Price vs Value graph displays only the DCF intrinsic value compared to the historical stock price.

## Benjamin Graham's Formula

<http://www.oldschoolvalue.com/valuation-methods/value-stocks-benjamin-graham-formula/>

- Graham Intrinsic Value is based on Ben Graham's formula defined in the Intelligent Investor  

$$\text{Intrinsic Value} = \text{"normal" earnings} \times (8.5 + (2 \times \text{expected 5 yr growth})) \times (4.4/20\text{yr AAA corp bond})$$
 My modified version is

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

*"normal" earnings x (7 + (1.5 x expected 5 yr growth)) x (4.4/20yr AAA corp bond)*

- Use for companies where FCF is erratic such as cyclicals or short history companies.
- Remember that earnings are usually inflated.
- Companies may overstate earnings by hiding some numbers but they will never understate earnings on purpose, which means, that the value you get with the Graham equation will be higher than normal.
- Use high margin of safety (MOS)
- Adjust the intrinsic value with the User Growth and User EPS input box.

## EPV is based on Bruce Greenwald's book.

Book review: <http://www.oldschoolvalue.com/book-reviews/greenwald-earnings-power-value-investing-epv/>

- Balance sheet "Adjust +/-" column is for adding or subtracting values from the stated numbers
- "Multiplier" is to select what % you want to consider it. e.g. intangibles usually = 0%
- Select the pinkish cell to select either data from MSN or ADVFN
- In the asset valuation section, select either 3 or 4 years of R&D you want to include into the valuation
- Under the income statement, you can also include or exclude extraordinary items to EBIT
- Read my comments throughout the spreadsheet to see references and explanations from the book

## Net Net

Detailed info and explanation: <http://www.oldschoolvalue.com/valuation-methods/ben-graham-net-net-deep-value-stocks/>

- Ben Graham's definition of net net, commonly known as NCAV (Net Current Asset Value) and NNWC (Net Net Working Capital).

*Net Net Working Capital = Cash and short-term investments + (0.75 \* accounts receivable) + (0.5 \* inventory) – total liabilities*

- Used to find the liquidation value of a company. Primarily useful in a recession economy otherwise, there will barely be any companies meeting this requirement.

## Piotroski F score

<http://www.oldschoolvalue.com/investment-tools/free-piotroski-score-spreadsheet/>

1. Positive return on assets in the current year (1 point)

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

2. Positive operating cash flow in the current year (1 point)
3. Higher return on assets (ROA) in the current period compared to the ROA in the previous year (1 point)
4. Cash flow from operations are greater than ROA (1 point)
5. Lower ratio of long term debt to in the current period compared value in the previous year (1 point)
6. Higher current ratio this year compared to the previous year (1 point)
7. No new shares were issued in the last year (1 point)
8. A higher gross margin compared to the previous year (1 point)
9. A higher asset turnover ratio compared to the previous year (1 point)

### Altman Z Score

<http://www.oldschoolvalue.com/investment-tools/free-altman-score-spreadsheet/>

The Z-score formula may be used to predict the probability that a firm will go into bankruptcy within two years.

Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company

### Beneish M Score

<http://www.oldschoolvalue.com/investment-tools/beneish-earnings-manipulation-m-score/>

The M score is to detect earnings manipulation.

- **DSRI** = Days' Sales in Receivables Index. Measured as the ratio of days' sales in receivables in year t to year t-1. A large increase in DSR could be indicative of revenue inflation.
- **GMI** = Gross Margin Index. Measured as the ratio of gross margin in year t-1 to gross margin in year t. Gross margin has deteriorated when this index is above 1. A firm with poorer prospects is more likely to manipulate earnings.
- **AQI** = Asset Quality Index. Asset quality is measured as the ratio of non-current assets other than plant, property and equipment to total assets. AQI is the ratio of asset quality in year t to year t-1.
- **SGI** = Sales Growth Index. Ratio of sales in year t to sales in year t-1. Sales growth is not itself a measure of manipulation. However, growth companies are likely to find themselves under pressure to manipulate in order to keep up appearances.
- **DEPI** = Depreciation Index. Measured as the ratio of the rate of depreciation in year t-1 to the corresponding rate in year t. DEPI greater than 1 indicates that assets are being depreciated at a

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

slower rate. This suggests that the firm might be revising useful asset life assumptions upwards, or adopting a new method that is income friendly.

- **SGAI** = Sales, General and Administrative expenses Index. The ratio of SGA expenses in year t relative to year t -1.
- **LVGI** = Leverage Index. The ratio of total debt to total assets in year t relative to year t-1. An LVGI >1 indicates an increase in leverage
- **TATA** - Total Accruals to Total Assets. Total accruals calculated as the change in working capital accounts other than cash less depreciation.

The eight variables are then weighted together according to the following:

$$M = -4.84 + 0.92*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI - 0.172*SGAI + 4.679*TATA - 0.327*LVGI$$

A score greater than -2.22 indicates a strong likelihood of a firm being a manipulator. In his out of sample tests, Beneish found that he could correctly identify 76% of manipulators, whilst only incorrectly identifying 17.5% of non-manipulators.

The five variable version excludes SGAI, DEPI and LEVI which were not significant in the original Beneish model.

$$M = -6.065 + 0.823*DSRI + 0.906*GMI + 0.593*AQI + 0.717*SGI + 0.107*DEPI$$

A score greater than -2.22 indicates a strong likelihood of a firm being a manipulator.

## Competitor Tab

- Competitors tab allows you to view 6 companies side by side along with a graphical view.
- Can sort competitors based on a selected metric from the drop down menu.
- Enter a ticker into the yellow boxes and press calculate

## Charts

- Over 30 charts for all important data. You can change the graph by clicking on the chart title to bring up a drop down list, then pressing refresh or F9.

## Discounted Cash Flow Valuation Tutorial

With all the examples, keep in mind that the numbers are not the latest. The numbers were correct at the time of writing but the application and methods are the same.

Examples of application will be

- stable cash generators – JNJ
- a high growth company – AAPL
- companies in a down cycle – AEO

### *Stable Cash Generator: Johnson & Johnson (JNJ)*

**Step 1: Enter the ticker and press enter**

**Step 2: Choose a [discount rate](#) for the investment**

Remember that the discount rate is the rate of return that you expect to receive and are willing to pay now. The higher the discount rate, the more emphasis you are putting on today's dollar. A 9% rate I use for JNJ signifies that the future cash flow for JNJ is just as good as today's cash.

For stock investments, the discount rate should always be higher than the risk free rate + inflation + stock risk.

E.g. if the risk free rate is 3% with 3% inflation and 5% stock risk (which should also be higher you're your savings interest rate) comes out to an expected return of 11%.

For large, stable, proven companies that generate cash, a rate of 9% is perfectly fine.

Johnson & Johnson  
(JNJ)

7/5/2010

Enter Ticker

Help

Refresh

CLEAR

Shares Out.	M.O.S	Growth	Discount %	Terminal %	Select FCF	Adjust 2009 FCF			
2,760.00	50%	4.4%	9.0%	3%	FCF				
Select input with each list or enter									
Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 Wk High	52 Wk Low				
\$59.08	\$34.40	\$17.20	-45%	\$66.20	\$55.71				
Fiscal Year	Trend	2000	2001	2002	2003	2004	2005	2006	2007

**Step 3: [Choose a growth rate](#)**

With stable companies, the automatically calculated growth rate is going to be the rate of FCF growth over a multiple timeframe period in order to smooth things out. This method will help to ignore the single good or bad years.

In JNJ's case, the calculated growth rate is 4.4% because it is the average of the 5 yr growth rate (1.8%) and the 10 yr growth rate (7.0%).



86\$	2007-2008	Median	86\$	Median
-17.8%	12.1%	-7.7%	-0.2%	3.3%
11.0%	6.1%	<b>1.8%</b>	3.5%	<b>7.0%</b>
30.9%	30.9%	30.9%	31.2%	30.4%
18.9%	19.1%	19.1%	19.5%	20.3%
14.3%	14.0%	15.4%	14.9%	15.7%
28.4%	27.5%	29.1%	29.1%	29.9%
64.4%	64.2%	64.5%	64.5%	64.5%
26.2%	26.4%	26.2%	26.3%	26.2%
20.7%	20.7%	21.1%	21.1%	20.9%
15.2%	3.6%	9.5%	7.1%	6.8%
7.4%	6.8%	7.4%	7.9%	10.6%
12.7%	7.0%	6.2%	6.5%	8.3%

&amp;

In this case, 4.4% as the growth rate is on the low side so you will need to enter a value into the yellow growth override box.

	Shares Out.	M.O.S	Growth	Discount %	Term
yes	2,760.00	50%	7.0%	9.0%	
with			7%		
nter					
	Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 W
	\$59.08	\$79.55	\$39.77	37%	\$6

I read, maybe it was Peter Lynch, that the PE is going to be the market consensus of the company growth. Whether you agree or not, this quick method has actually proved to be quite accurate.

JNJ's PE is currently at 12. Considering that JNJ usually trades at a premium to its peers, the industry PE of 10. You could raise the growth rate to 10% for JNJ.

If you think otherwise, enter the desired growth rate into the user override box and refresh the spreadsheet.

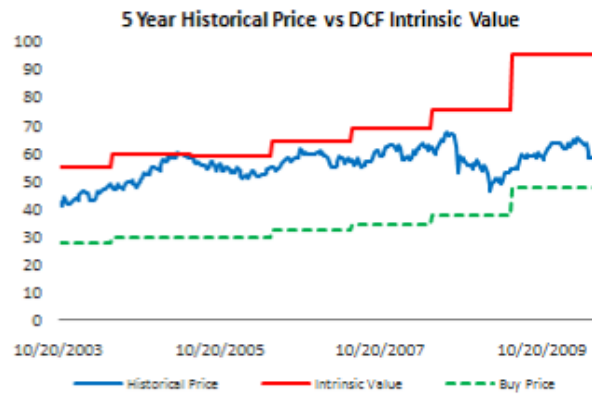
#### Step 4: Margin of Safety

The lower the discount rate, the bigger the margin of safety required because you are assuming more about the future by placing more bias and emphasis on the future cash generation ability.

Anything can happen in 1 year let alone 10, so for a 9% discount rate, I always make sure the margin of safety is at least 50%.

#### Step 5: Check with the historical price and value graph

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.



The red line represents the intrinsic value over the past 5 years and JNJ's historical stock price displayed by the blue line. From the graph the discount rate of 9% and growth rate of 7% produces an intrinsic value graph close in step with the historical stock price.

I can now assume that the rates I have used for JNJ is fairly accurate. The market isn't always efficient but price does follow value over the long term which we can use to our advantage.

These large cash cows are the easiest to value. Try it for yourself by using KO, PG, JNJ etc.

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

## Growth Company Valuation: Apple (AAPL)

Valuing Apple will be slightly harder than JNJ. The difficulty with growth companies is that their growth curve is exponential and there is no real way to graph or value a curve like that.

Enter AAPL in the spreadsheet and I'm given a FCF growth rate of 33.7% and intrinsic value of \$657 per share.

**Apple Inc (AAPL)**  
7/5/2010

Enter Ticker

Help

Select input with each list or enter

Shares Out.	M.O.S	Growth	Discount %	Terminal %	Select FCF	Adjust 2009 FCF
909.94	50%	33.7%	9.0%	3%	FCF	

Refresh CLEAR

Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 Wk High	52 Wk Low
\$246.94	\$657.39	\$328.69	62%	\$279.01	\$134.42

The discount rate remains at 9% because although AAPL is a growth company, it's proven again and again it can create cash quite easily.

At the time of writing this, AAPL's PE is 21. The analysts believe AAPL can achieve 18% each year for the next 5 years.

Assuming that AAPL can grow at 21% for the next 5 years at least, the intrinsic value becomes \$341.04

But my rule of thumb is to be conservative and not go above 15% as the growth rate. In the short term, a 21% growth is achievable but the law of large numbers suggests otherwise.

**Apple Inc (AAPL)**  
7/5/2010

Enter Ticker

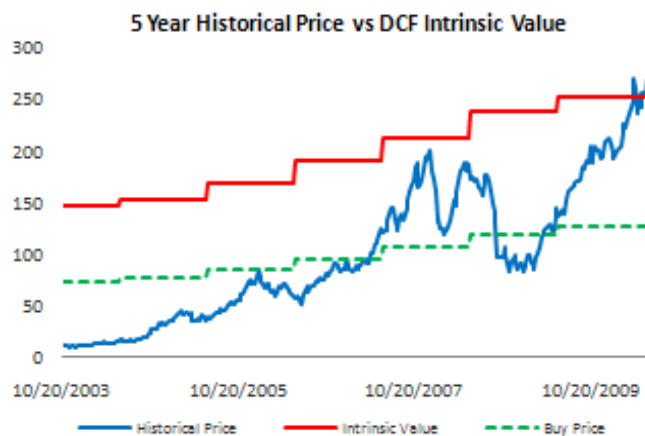
Help

Select input with each list or enter

Shares Out.	M.O.S	Growth	Discount %	Terminal %	Select FCF	Adjust 2009 FCF
909.94	50%	15.0%	9.0%	3%	FCF	

Refresh CLEAR

Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 Wk High	52 Wk Low
\$246.94	\$253.12	\$126.56	2%	\$279.01	\$134.42



<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

## Company in a Downturn: American Eagle Outfitters (AEO)

For companies that were previously producing healthy positive free cash flow but now losing money, it's important to normalize the free cash flow figure.

If you use the latest years FCF number as the starting point of the DCF, it will produce incorrect and overly negative numbers.

Looking at AEO, a retailer is going to be hit hard in any recession which the stock price may already reflect.

Enter AEO into the investment spreadsheet and you get a normalized FCF growth rate of -20.9%. With unstable companies, I require a higher discount rate because I don't want to rely on the future cash.

A 15% discount rate works great for me and assuming that AEO will be in business for the next 5 years, I'll assume a growth rate of 12% for the DCF which will assume that the company is out of a recession environment.

American Eagle Outfitters Inc (AEO)

7/5/2010

Enter Ticker

Help

Select input with each list or enter

Refresh

CLEAR

Shares Out.	M.O.S	Growth	Discount %	Terminal %	Select FCF	Adjust 2010 FCF
205.42	50%	12.0%	15.0%	3%	FCF	
		12%				
Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 Wk High	52 Wk Low	
\$11.79	\$22.33	\$11.17	47%	\$19.86	\$11.35	

Fiscal Year	Trend	2001	2002	2003	2004	2005	2006	2007	2008	2009
5 Year Multi-Year Performance										
		2005-2006	2006-2006	2006-2006	2006-2006	2006-2006	2006-2006	2006-2006	2006-2006	Median
Tang Shareholder Equity	10.0%	8.2%	11.7%	6.9%	3.7%	21.5%	7.7%	-0.3%	8.6%	8.2%
Free Cash Flow	-39.8%	-9.4%	-8.7%	-54.2%	-20.9%	36.5%	-25.4%	-73.4%	10.1%	-20.9%
CROIC	27.3%	15.1%	29.2%	22.8%	14.8%	31.1%	31.1%	14.5%	14.5%	22.8%

When I first wrote this in 2009, AEO FCF was \$36.9m

When I ran AEO in 2009, the intrinsic value using the same assumptions but with \$36.9m as the FCF figure, came out to \$9.72

From the history of the FCF, you can see that \$36.9m was severely depressed.

Fiscal Year	Trend	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cash Flow Data										
Cash from Operations		\$150.6	\$174.9	\$104.6	\$189.5	\$378.1	\$465.6	\$749.3	\$464.3	\$302.2
Capex		\$174.5	\$119.4	\$61.4	\$64.2	\$97.3	\$81.6	\$225.9	\$250.4	\$265.3
Cash Flow		(\$17.2)	\$29.3	\$49.2	\$30.7	\$162.2	\$233.7	\$222.2	\$218.9	\$21.1
Free Cash Flow		(\$23.9)	\$55.5	\$43.2	\$125.3	\$280.8	\$384.0	\$523.4	\$213.9	\$36.9
	YOY% Change		-332.2%	-22.2%	190.0%	124.1%	36.8%	36.3%	-59.1%	-82.7%

What needs to be done is to enter a new FCF number into the user override box.

Assuming that AEO could get back to 2005 levels of \$280.8m, you would have calculated an intrinsic value of \$23.52 in 2009. Fast forward to 2010, and AEO post FCF numbers of \$259m. Not far off the estimate.

An easy way is to highlight the 10 years of Free Cash Flow data in excel and then enter the average value. In this case I get a value of \$182.1m

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

8											
9	Fiscal Year	Trend	2001	2002	2003	2004	2005	2006	2007	2008	2009
10	<b>Cash Flow Data</b>										
11	Cash from Operations		\$150.6	\$174.9	\$104.6	\$189.5	\$378.1	\$465.6	\$749.3	\$464.3	\$302.2
12	Capex		\$174.5	\$119.4	\$61.4	\$64.2	\$97.3	\$81.6	\$225.9	\$250.4	\$265.3
13	Cash Flow		(\$17.2)	\$29.3	\$49.2	\$30.7	\$162.2	\$233.7	\$222.2	\$218.9	\$211
14	Free Cash Flow		(\$23.9)	\$55.5	\$43.2	\$125.3	\$280.8	\$384.0	\$523.4	\$213.9	\$36.9
15		YOY% Change:		-332.2%	-22.2%	190.0%	124.1%	36.8%	36.3%	-59.1%	-82.7%
16											

Average: \$182.1	Count: 9	Sum: \$1,639.1	75%
------------------	----------	----------------	-----

Enter \$182.1 into the spreadsheet for the FCF adjustment and the fair value now comes out to \$17.96.

### American Eagle Outfitters Inc (AEO)

7/5/2010

Enter Ticker

Shares Out.	M.O.S	Growth	Discount %	Terminal %	Select FCF	Adjust 2010 FCF
205.42	50%	12.0%	15.0%	3%	FCF	\$182.1
		12%				
Current Price	Intrinsic \$	Buy Under	Actual M.O.S	52 Wk High	52 Wk Low	
\$11.79	\$17.96	\$8.98	34%	\$19.86	\$11.35	

## Benjamin Graham Formula Valuation Tutorial

### *Benjamin Graham Formula Discussion*

Ben Graham's original formula from Security Analysis is

$$V* = EPS \times (8.5 + 2g)$$

- V is the intrinsic value
- EPS is the trailing 12 month EPS
- 8.5 is the PE ratio of a stock with 0% growth
- g is the growth rate for the next 7-10 years.

This formula was later revised as Graham included a required rate of return.

$$V* = \frac{EPS \times (8.5 + 2g) \times 4.4}{Y}$$

The formula is essentially the same except the number 4.4 is what Graham determined to be his minimum required rate of return.

At the time of around 1962 when Graham was publicizing his works, the **risk free interest rate** was 4.4%, and so if you want to adjust and apply this formula to the present, you must divide this number by today's **corporate bond rate**, represented by Y in the formula above. In the spreadsheet, the **A corporate bond rate** is used.

### Step 1 – Adjust Earnings Per Share

Intrinsic value shouldn't be calculated based on a single 12 month period.

The spreadsheets automatically adjust the EPS to a normalized EPS ignoring one time huge or depressed earnings. The normalized EPS is based off the 5 years or 10 years of history depending on the company you are looking at.

EPS is never really a good number on its own as it is highly prone to manipulation with modern accounting methods. Another reason why you have to always normalize EPS is because management will never understate earnings purposely. While companies may follow accounting procedures which inflate earnings, they will never go out of their way to make it lower than it is.

Another variation of the formula will use the projected EPS but unless it is a pure growth stock with exponential growth like characteristics, the stock value will become absurdly high.

EPS by analysts are also always over optimistic, so it isn't a good idea to use Wall Street guidance.

### Step 2 – Adjust Growth Rate

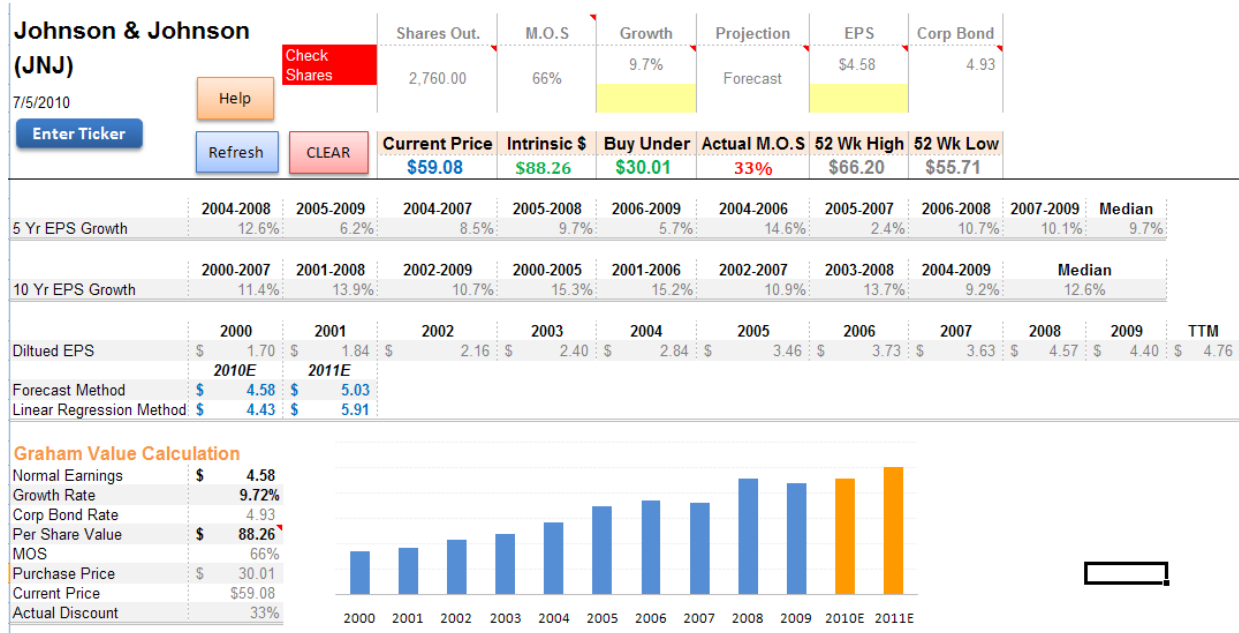
The drawback of the Benjamin Graham formula is that growth is a big element of the overall valuation.

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

You can change 8.5 in the formula to whatever you feel is the correct PE for a no growth company. Depending on your conservativeness, anything between 7 and 8.5 should be fine.

For the actual growth rate, if convenience is important, you could just use the analyst 5yr predictions from Yahoo or other sites, but for most value stocks, predictability is important so a regression of the historical EPS to project the following year is a method I like to use.

The "2 x G" however, is quite aggressive so the multiplier has been reduced to 1.5 instead of 2.



## Earnings Power Value Technique Tutorial

The valuation technique of earnings power value requires the investor to consider 3 things.

1. The **value of assets a competitor will be required to have** in order to achieve the same market value of the incumbent company in the industry.
2. **Earnings power value** calculated based on current financial status where the resulting intrinsic value ignores business cycles.
3. Whether growth is a factor. **Growth is usually ignored in this valuation technique**, so I won't be going into the growth aspect.

### 1. Reproducing the Assets of Microsoft

Let's say a company is currently in the business of selling inkjets for printers.

The company has a market value of \$1m but when the assets are analyzed, the company assets are worth around \$500k. This means that if I were to reproduce the same assets for \$500k, I should be able to create a company that is valued at \$1m in the market.

Applying this idea to Microsoft, the first step is to adjust the balance sheet.

#### Step 1 – Calculate the Value of Assets

Asset reproduction is not discounting inventory and intangibles from the balance sheet. The purpose is to calculate a figure that a competitor will have to realistically pay up in order to enter the market.

For another software company to compete with Microsoft's Windows operating system, office suites and increasing Bing market share, a company will have to fork out money for intangibles and goodwill in order to acquire technology and other company's intelligence.

The only adjustment I made was to reduce goodwill by 50% because I know that Microsoft haven't made the best decisions regarding prices paid for acquisitions.

Quarterly numbers based on:	2010 Q3	Statement Source Date:	22-Apr-10
<b>Adjustments:</b>			
<b>Assets</b>	<b>Book Value</b>	<b>+/- BV</b>	<b>Multiplier</b>
Cash & Equivalents	\$ 8,155.0		
Marketable Securities	\$ 31,511.0		
Accounts Receivable - Gross	\$ 9,137.0		
Other Receivable	\$ -		
<b>Receivables</b>	\$ 9,137.0		
Inventories: Raw Materials	\$ 120.0		
Inventories: Work in Progress	\$ 4.0		
Inventories: Purchased Components	\$ -		
Inventories: Finished Goods	\$ 377.0		
Inventories: Other	\$ -		
<b>Inventories -- Total</b>	\$ 501.0		
Prepaid Expenses	\$ -		
Current Deferred Income Taxes	\$ 2,222.0		
Other Current Assets	\$ 2,992.0		
<b>Total Current Assets</b>	\$ 54,518.0		
Goodwill, Net	\$ 12,463.0	50%	
Intangibles, Net	\$ 1,282.0		
<b>Intangibles</b>	\$ 13,745.0		
Property/Plant/Equipment - Net	\$ 7,372.0		
Long Term Investments	\$ 7,797.0		
Note Receivable - Long Term	\$ -		
Other Long Term Assets, Total	\$ 1,478.0		
<b>Total Assets</b>	\$ 84,910.0		
			<b>Reproduction Asset Value</b>
			\$ 8,155.0
			\$ 31,511.0
			\$ 9,137.0
			\$ -
			\$ 9,137.0
			\$ 501.0
			\$ -
			\$ 2,222.0
			\$ 2,992.0
			\$ 54,518.0
			\$ 6,231.5
			\$ 1,282.0
			\$ 7,513.5
			\$ 7,372.0
			\$ 7,797.0
			\$ -
			\$ 1,478.0
			\$ 78,678.5



<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

The new adjusted asset value in bottom right corner becomes \$78,678.5 million.

## Step 2 – Add back Marketing, R&D and Value Increasing Expenses

The next step is to realize that for a company like Microsoft, there is going to be value added to the company coming from its marketing and R&D. No competitor will be able to compete if they do not try to spend money to increase brand awareness and on R&D efforts.

Small niche companies may spend very little on both items, but it cannot be ignored for MSFT.

The **amount of marketing added back** to the asset value above is calculated by

*Taking the average of marketing, general, administration (MGA) as a % of sales for the most recent 5 years and then multiply the % to the current sales figure.*

We do the same thing with R&D except for a company such as MSFT, R&D will be a very valuable asset.

The book describes a few methods to add the R&D expense back in, but I prefer the simple method of

*take the sum of the past 3 years of R&D and then take 80%*

80% may sound high, but R&D money is never used to maintain a product. R&D is always for future products and to increase future revenues.

The 3 years that I like to use in the calculation could understate the reproduction cost as the competitor may need more than 5 years of R&D in order to be competitive but that's up to you to consider.

Shares Out.	Source	Normalized Income	Discount Rate	R&D Years	SG&A %
8,760.00	MSN	\$18,272.22	9%	3	20%
Current Price	EPV	Net Reproduction Value	EPV MOS	NCAV	52 Wk High
\$23.27	\$24.40	\$6.08	4.6%	\$1.15	\$31.58

17	Total Equity	\$ 45,710.0
18	Average SGA %	30.2%
19	Marketing/Brand Value	\$ 17,631.3
20	R&D Value	\$ 17,495.2
21	Cash Needed for Business	\$ 595.4
22	Interest Bearing Debt	\$ 8,244.0
23	Non Interest Bearing Debt	\$ 22,034.0
24	Excess Cash	\$ 38,497.3

Add the marketing and R&D value of \$17,631m and \$17,495m respectively to \$78,678m calculated from Step 1. The value comes out to \$113,804m.

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

Something else to remember - although off balance sheet liabilities are liabilities, a significant part of off balance sheet liabilities will also have to be reproduced by a new entrant in order to start business.

E.g. QVC may be just another home shopping company, but for a new competitor to enter the market, money will have to be spent on TV carriage licenses, other network equipment and licenses that will sometimes not appear on the balance sheet.

All of these extra items are a liability when valuing the business as a standalone, but when considering what a competitor will have to pay, it definitely should be considered and included.

### Step 3 – Non Interest Bearing Debt and Cash

The final step to calculate the net reproduction cost is to subtract non interest bearing debt and the cash not required to run the business.

Non interest bearing debt is really [spontaneous liabilities](#).

*Liabilities of a company that are accumulated automatically as a result of the firm's day-to-day business. Spontaneous liabilities can be tied to changes in sales - such as the cost of goods sold and accounts payable. These liabilities can also be "fixed", as seen with regular payments on long-term debt.*

Total liabilities is not used because it could also include items that are not related to the business such as liabilities for damages or from being sued, something a new entrant won't have to pay for.

The formula used for "cash not required for operations" is

*cash and cash equivalents – 2% of sales*

Bruce Greenwald mentions a couple of times that in general, 1% of sales is the amount required for a company to continue running operations. I've used 2% for good measure.

Subtract non interesting bearing debt and excess cash from the \$113,804m to get the **net reproduction cost** of \$53,273m which is equal to \$6.08 per share based on the number of shares outstanding at the time of writing.

26	<b>Calculation: Asset Valuation</b>		
27		Total	Per Share
28	Tangible BV	\$ 31,965	\$ 3.65
29	Adjusted BV	\$ 39,479	\$ 4.51
30	NCAV	\$ 10,104	\$ 1.15
31	Reprod. Cost of Assets	\$ 113,805	\$ 12.99
32	Reprod. Cost of Assets BV	\$ 74,605	\$ 8.52
33	Total Net Reprod. Cost	\$ 53,274	\$ 6.08
34			

This means that a new potential competitor will have to spend around \$53 billion in order to compete with Microsoft.

The next step is to calculate the EPV and compare it to the reproduction cost to determine the company's competitive advantage.

## 2. Earnings Power Value Calculation

In the asset valuation section, you had to make adjustments to the balance sheet. The actual EPV section requires adjustments to the income statement to come up with an adjusted income.

The spreadsheet automatically makes all the required adjustments to the income statement to come up with a normalized income.

Three variations of adjustment income are calculated.

<b>EPV Valuation Section</b>	
<b>Values for Normalized Income</b>	
Normalized Income	\$ 18,272.2
Avg Adj. Income 5 yrs	\$ 17,084.6
TTM Adjusted Income	\$ 21,167.5

The default value in the final EPV calculation uses the Normalized income. You can override the value with the other numbers by entering it into the yellow box.

Shares Out.	Source	Normalized Income	Discount Rate	R&D Years	SG&A %
8,760.00	MSN	\$18,272.22	9%	3	20%

### Subtract Maintenance CAPEX and Divide by Discount Rate

With the normalized adjusted income you subtract [maintenance capital expenditures](#) and divide by the [discount rate](#). I used a simple 9% in this example. I don't bother with WACC as it is seriously flawed due to its dependence on beta.

<http://www.oldschoolvalue.com/forum/> for support. If you can't log in, please refresh with CTRL+F5.

### Data: EPV

Cost of Capital		9.0%
Normalized Adjusted Income	\$	18,272.2
Average Maintenance Capex	\$	1,813.1
Interest Bearing Debt	\$	8,244.0
1% of sales	\$	595.4
Cash & Equiv	\$	39,666.0
Cash - Debt	\$	30,826.6
Shares		8760.00

Bruce Greenwald also states in his book that applying simple discount rate as the expected rate of return is perfectly adequate and often times better than trying to calculate the WACC.

The end result is the EPV, which is the value of the company based on current earnings and ignoring growth. But there is one last step.

### Step 6 – Add Cash minus Debt to EPV

The last step is to add cash minus debt to EPV because operating earnings ignore the interest on cash balances so you have to add the surplus cash to the EPV.

### Calculation: EPV

Cost of Capital Rates	EPV	Per Share	+ Cash - Debt	Per Share
5%	\$ 329,183.4	\$ 37.58	\$ 360,010.0	\$ 41.10
7%	\$ 235,131.0	\$ 26.84	\$ 265,957.6	\$ 30.36
<b>9%</b>	<b>\$ 182,879.7</b>	<b>\$ 20.88</b>	<b>\$ 213,706.3</b>	<b>\$ 24.40</b>
11%	\$ 149,628.8	\$ 17.08	\$ 180,455.4	\$ 20.60
13%	\$ 126,609.0	\$ 14.45	\$ 157,435.6	\$ 17.97

Current Price	EPV	Net Reproduction Value	EPV MOS	NCAV	52 Wk High	52 Wk Low
\$23.27	\$24.40	\$6.08	4.6%	\$1.15	\$31.58	\$22.00

So the EPV of Microsoft is \$24.40 and the reproduction value is \$6.08.

It means that the \$18.32 difference is the competitive advantage enjoyed by Microsoft. Refer to slide 18 of [Greenwald's EPV lecture slide](#).

If you have any further questions, please [leave your questions in the forum section](#) or feel free to send me an email at [jae.jun@oldschoolvalue.com](mailto:jae.jun@oldschoolvalue.com)