

Valusim Value Report

Microsoft (MSFT)

December 30, 2011

Valusim utilizes a discounted cash flow based valuation model. In simple terms, this uses the company's past performance to forecast its future performance and then calculates the value of the cash flows that this will generate. This is referred to as the intrinsic value.

The model runs on Microsoft Excel. It allows the user to override some of the forecast numbers and to change some of the assumptions, thereby creating alternative scenarios. The screenshot below represents the default scenario. This simple interface hides a lot of complexity in the methods used to predict future performance. The Valusim model uses more than 600 historical data points and uses these to predict more than 10,000 data points.

Summary of Findings

Microsoft appears to be significantly undervalued. It has high and relatively stable profit margins and a healthy growth rate. Valusim's model values the company at almost \$70 per share while the market price is less than \$26. There is no obvious explanation for this large difference.

Screenshot:

	Baseline	Alternative	Difference	%age
Equity Value (M)	\$ 594,121	\$ 594,121	\$ -	0.0%
Stock Value	\$ 69.98	\$ 69.98	\$ -	0.0%

Income Statement

	Baseline	Alternative
Revenue Growth:		
Last Year	8.2%	
Last Five Years	9.4%	
Years 1-5	8.7%	
Years 6-10	7.5%	
Revised Years 6-10	7.5%	

Balance Sheet

	Baseline	Alternative
Days of Sales in Inventory:		
Last Year	32.4	
Last Five Years	33.0	
Years 1-5	45.7	
Years 6-10	59.6	
Revised Years 6-10	59.6	

Revenue Seasonality:	Baseline	Alternative
Quarter 1	11.4%	
Quarter 2	-4.4%	
Quarter 3	-3.4%	
Quarter 4	-3.6%	

Days Sales Outstanding in A/R:	Baseline	Alternative
Last Year	61.7	
Last Five Years	64.3	
Years 1-5	62.4	
Years 6-10	61.0	
Revised Years 6-10	61.0	

Gross Profit Margin:	Baseline	Alternative
Last Year	77.2%	
Last Five Years	79.1%	
Years 1-5	80.3%	
Years 6-10	80.0%	
Revised Years 6-10	80.0%	

Asset Leverage:	Baseline	Alternative
Last Year	179.3%	
Last Five Years	179.1%	
Years 1-5	176.1%	
Years 6-10	177.0%	
Revised Years 6-10	177.0%	

Operating Profit Margin:	Baseline	Alternative
Last Year	38.3%	
Last Five Years	37.3%	
Years 1-5	39.2%	
Years 6-10	38.9%	
Revised Years 1-5	39.2%	
Revised Years 6-10	38.9%	

Days Payables Outstanding in A/P:	Baseline	Alternative
Last Year	32.5	
Last Five Years	33.3	
Years 1-5	34.4	
Years 6-10	35.1	
Revised Years 6-10	35.1	

Equity Value / Stock Value

The Stock Value is the intrinsic value of a single share in the company. Multiplying by the number of shares outstanding arrives at the Equity Value.

The Stock Value for Microsoft in the default scenario is \$69.98 per share. This compares with a market value of \$25.96 as at the time of the analysis. This

indicates that Microsoft is significantly undervalued. However, it is worth looking at the major elements of the valuation to identify areas where alternative assumptions may result in significantly different results.

Revenue Growth

Revenue has been growing at an average rate of 9.4% over the last five years. The model projects that growth will drop to an average of 8.7% per annum over the next 5 years and to 7.5% for the following five years. The table below shows the resulting Stock Value under alternative scenarios:

Average Growth Rate		Stock Value
Years 1-5	Years 6-10	
7.5%	5.0%	\$ 64.27
8.7%	7.5%	\$ 69.98
10.0%	10.0%	\$ 75.58

Although the revenue growth rate has a significant impact on Stock Value, differences in growth rate assumptions do not appear to explain the difference between the intrinsic and market value of the stock.

Revenue Seasonality

The Revenue Seasonality results indicate that Microsoft typically enjoys a spike in demand in the first quarter of their financial year. Microsoft has a June 30 year end. This has virtually no impact on the Stock Value but is used when leveraging the tool for comparing actual to forecast results.

Gross Profit Margin

The Gross Profit Margin is the Revenue less Cost of Goods Sold, as a percentage of Revenue.

The Gross Profit Margin has averaged 79.1% over the last five years but dipped to 77.2% last year. The model predicts that the Gross Profit Margin will increase to an average of 80.3% over the next five years but then fall slightly to 80.0% for the next five years. The table below shows the resulting Stock Value under alternative scenarios:

Average Gross Profit Margin		Stock Value
Years 1-5	Years 6-10	
75.0%	75.0%	\$ 61.70
80.3%	80.0%	\$ 69.98
85.0%	85.0%	\$ 78.20

A movement of 5 percentage points in the Gross Profit Margin results in a change in the Stock Value of almost 12%. However, different assumptions regarding the

Gross Profit Margin do not explain the large difference between the intrinsic and market value of the stock.

Operating Profit Margin

The Operating Profit Margin is the Revenue less Cost of Goods Sold, Research & Development, Sales & Marketing Expense, and General expenses, expressed as a percentage of Revenue.

The Operating Profit Margin averaged 37.3% over the last five years, rising to 38.3% last year. The model predicts that it will increase to an average of 39.2% over the next five years, falling slightly to 38.9% over the next five years. Changes in the Operating Profit Margin have a very similar impact to those in the Gross Operating Margin, so no sensitivity analysis is provided.

Days of Sales in Inventory

Days of Sales in Inventory (DOS) is the value of inventory divided by annual Cost of Goods Sold, multiplied by 365. It can be thought of as the number of days of sales that could be supplied out of existing inventory.

The DOS has averaged slightly over one month for the last five years. There is enormous variance quarter to quarter, with figures as low as 16 and as high as 89 days (not shown in screenshot). This is partly due to seasonality of the revenue but also reflects large variance in the level of inventory held. The model predicts that DOS will increase to an average of 46 days over the next five years and 60 days over the following five years. Inventory DOS has an extremely small impact on Stock Value. DOS would have to equal one year or more for Stock Value to be impacted significantly.

Days Sales Outstanding in Accounts Receivable

Days Sales Outstanding in Accounts Receivable (DSO) is the value of accounts receivable divided by annual Revenue, multiplied by 365. It can be thought of as the average number of days that customers take to pay.

The DSO has averaged 64 days over the last five years, with a figure of 62 last year. The model predicts that the average over the next five years will be similar, at 62 days. The seasonality of Revenue is reflected in the quarterly DSO numbers but there is little variability beyond this. DSO has an extremely small impact on Stock Value.

Asset Leverage

Asset Leverage is the Revenue divided by the Assets of the company. Assets exclude Inventory, Accounts Receivable and Cash & Investments. Asset Leverage indicates the ability of the company to generate Revenue while minimizing Assets.

Assets Leverage has been very consistent over the last five years, with an average of 179%. The model predicts that this consistency will continue, with an average of 176% for the next five years and 177% for the next five years. It would take an extremely large movement in asset leverage to have a noticeable impact on Stock Value.

Days Payable Outstanding in Accounts Payable

Days Payables Outstanding in Accounts Payable (DPO) is Accounts Payable divided by Cost of Goods Sold, multiplied by 365. It can be thought of as the average time that the company takes to pay its suppliers.

DPO has been very consistent over the last five years, averaging 33 days. The model predicts that it will average 34 days over the next five years and 35 days over the following five years. DSO has only a tiny impact on Stock Value. Even if DSO was to double, Stock Value would go down by only 1%.

Discount Rate

The Discount Rate is the rate used to discount cash flows in the model's calculation of intrinsic value. It is not shown on the screenshot. The Discount Rate that has been used in this valuation is 8.3%. The impact of the Discount Rate increases as the growth rate of the cash flows increases, given that this leads to larger cash flows further in the future.

The discount rate has a very large impact on the Stock Value. The table below shows the resulting Stock Value using different discount rates.

Discount Rate	Stock Value	Discount Rate	Stock Value
5.0%	\$ 120.27	13.0%	\$ 41.20
6.0%	\$ 100.10	14.0%	\$ 37.96
7.0%	\$ 84.54	15.0%	\$ 35.25
8.0%	\$ 72.59	16.0%	\$ 32.98
9.0%	\$ 63.25	17.0%	\$ 31.04
10.0%	\$ 55.85	18.0%	\$ 29.39
11.0%	\$ 49.92	19.0%	\$ 27.96
12.0%	\$ 45.13	20.0%	\$ 26.72

Summary

Differences between the discount rate used in the model and that used by investors may explain the large difference between the model's valuation of Microsoft and the market value. A discount rate of just over 20% would lead the model to produce an intrinsic value of around \$26, which is in line with the market value. However, this is a historically high discount rate. Stocks should be expected to provide a premium over risk free assets but, with risk free assets providing less than 3% at the time of writing, this is an enormous risk premium.

Beyond the discount rate, the primary drivers of Stock Value for Microsoft are the Revenue Growth rate and the profit margin, expressed either as Gross Profit Margin or Operating Profit Margin. All of these drivers have been relatively stable in recent years and assumptions regarding their future performance should be in a tight band. There is no explanation for Microsoft's current low valuation beyond the discount rate. Microsoft appears to be significantly undervalued.