Fundamentals of Corporate Valuation

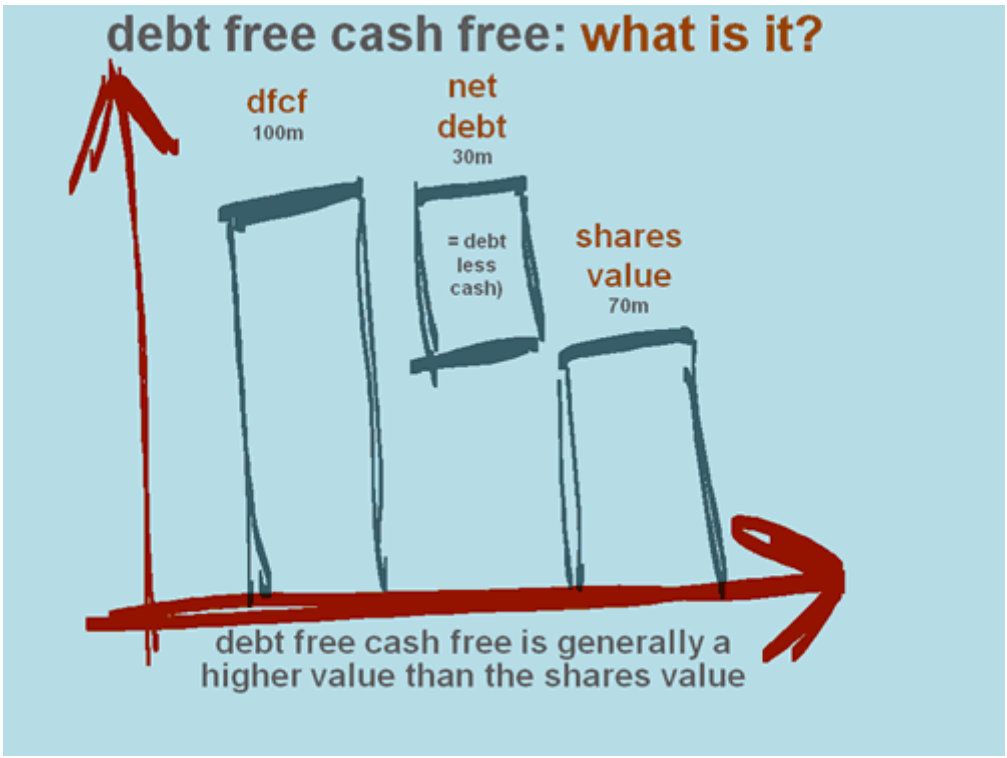
Debt free cash free company valuations: what are they?

Imagine a typical company which has some amount of net debt (where net debt equals debt less cash that could be applied to refinancing that debt). Imagine too that those net liabilities could magically be removed, perhaps by a magnificent benefactor or a fairy godmother – someone who could work a wonder over the company and take away its net debt. Without those net liabilities, magically the company's value would increase. That's the debt free cash free valuation: the value of the company imagining it had no net debt.

Shares/ equity valuation vs. debt free cash free

How does debt free cash free valuation compare to shares or equity value? Let's imagine a company that has shares/ equity with a valuation of 70 million. You can see that 70 million on the right hand side of the chart below. Let's imagine that same company had debt less cash (= net debt) of 30 million. The debt free cash free valuation would be 100 million. That's the value on the left hand side.

Equity valuation vs. DFCF



Equity valuations are usually higher than DFCF values

For a company that has net debt (that is, where debt is greater than cash) the debt free cash free value is higher than the shares/ equity valuation for the business. You can see that in the chart above: the 100 million on the left is higher than the 70 million on the right. Working from left to right, if the owner of a company had received a debt free cash free offer of 100 million, and if net debt was 30 million, the owner would expect to receive 70 million for the shares/ equity in the business.

Debt free cash free: why is it used in business valuation?

Given that debt free cash free business valuation differs from shares or equity value, it's easy for confusion to result. For example, the letter a buyer writes offering for a business might contain a debt free cash free offer of 100 million. However, as shown previously (when we looked at the difference between DFCF and equity valuation), the 100 million debt free cash free valuation differs from the 70 million the seller expects to receive for their equity/ shares. Why is debt free cash free used in business valuation at all? Here are some possible explanations.

DFCF business valuation helps with comparability

Debt free cash free provides a common basis for comparing offers for businesses. Debt levels in a business are likely to fluctuate up until the day the business is sold. By focussing on debt free cash free valuation we have a consistent way of measuring business value, irrespective of how debt levels fluctuate up until completion.

Business valuation: the buyer's perspective

DFCF is a business valuation that takes the purchaser's perspective. In the equity valuation chart, the buyer of the business is going to have to purchase the shares in the company for 70 million, plus make sure that banks are prepared to lend 30 million of debt. The buyer of the business is responsible for making sure a total of 100 million of financing is in place. DFCF takes the buyer's perspective: the total 100 million of funding the purchaser is responsible for.

Business valuation & deal inflation

Perhaps people working on business transactions would rather talk about higher values rather than lower values. An adviser might prefer to tell another potential client that they have just sold a business at a 100 million valuation, because that's a higher number than 70 million! The business owner, after the deal is done, might prefer to tell their friends at the golf club that they've just sold their business at a 100 million valuation!

A business valuation convention

DFCF is a convention in business valuation. We have already seen how DFCF valuation reconciles to shares/ equity value, with the bridge between the two net debt. Because we can reconcile between the two, it doesn't really matter where we start. Convention means that debt free cash free is often used in business valuation.

Comparable Company Analysis

The two most common ways of valuing businesses are:

(i) valuing a business as a multiple of its earnings (= relative or comparable company analysis),

(ii) valuing a company as the sum of its discounted cash flows (= DCF valuation).

Comparable company valuation

Companies are often valued as a multiple of their earnings. A buyer might take a business's earnings and multiply those to calculate the debt free cash free value used in their offer letter.

Comparable company valuation: what multiple to use? The role of past transactions

A buyer might survey comparable company transactions (i.e. past business sales), looking at the relationship of deal valuation to the business' earnings. Averaging those value/ earnings multiples would help the buyer judge what multiple should be used in the valuation of the company they were looking to purchase.

Picking a multiple for comparable company valuation. The role of share market information

As well as looking at past transactions, a buyer could also survey businesses listed on the share market (each with a published share price). Averaging value/ earnings multiples for share market listed businesses would also help the purchaser determine what multiple to use to value the company they were looking to buy.

EBITDA Multiples

Imagine a potential buyer is going to conduct some comparable company valuation work, averaging value against earnings for a selection of similar businesses. When looking at earnings/ value multiples, the buyer has to decide which company earnings figure to focus on. Valuation analysts often focus on EBITDA (earnings before interest, tax, depreciation and amortisation) when conducting comparable company work. But why EBITDA?

Why an EBITDA multiple? It's before a few things!

EBITDA is "before" a few things: interest, tax, depreciation and amortisation. All of these items can differ between companies, even if the operations/ activities of those businesses are similar. Interest expense is a function of how much debt a particular company has used to finance itself. Tax is going to vary between companies depending on which country the business operates in (different countries have different corporate tax rates). The tax charge for each company is going to vary depending on specific issues such as how much tax planning the business has put in place (i.e. how hard it has worked to reduce its tax charge), or whether the business has a history of prior tax losses which have been used to offset more recent taxable income and reduce recent tax bills. Depreciation and amortisation are non-cash

accounting entries designed to spread the cost of a company's investment in assets over a number of years.

EBITDA multiples help with comparability

By focussing on EBITDA multiples, what a valuation analyst is trying to do is strip out the impact of items that can differ between businesses, but have nothing to do with underlying company performance. Interest depends on how much debt one particular company has chosen to finance itself with. Tax depends on local tax rates and company-specific tax planning. Depreciation and amortisation are non cash and depend on past acquisitions and local accounting policies. The valuation analyst is trying to strip out the impact of all of these things and understand underlying company performance.

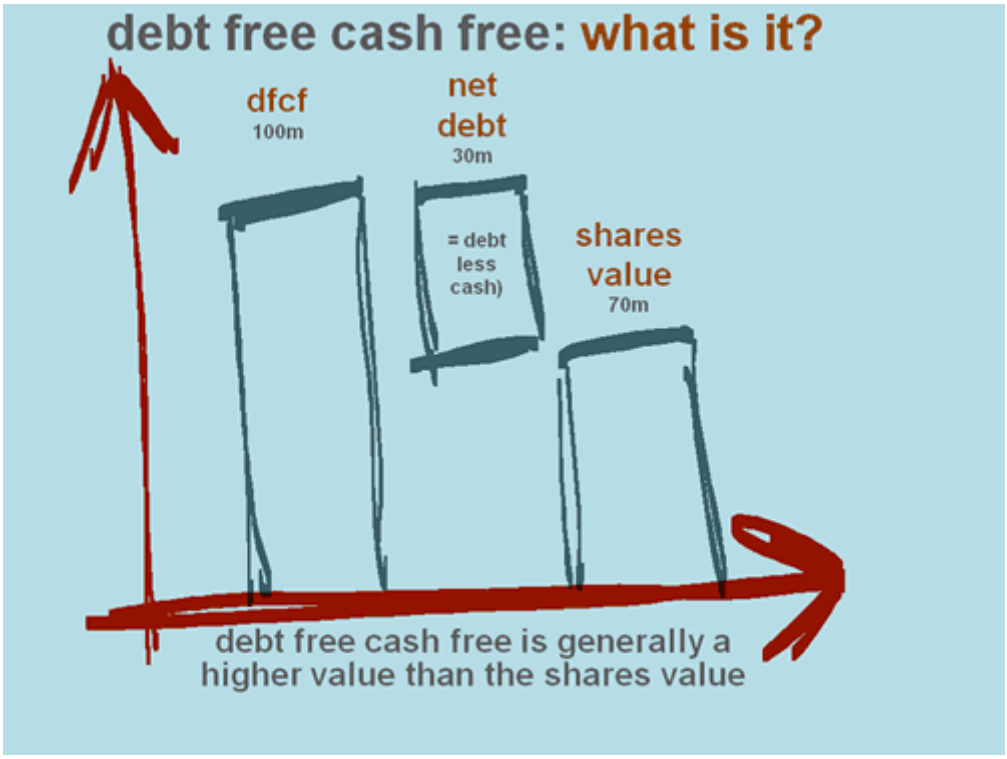
Relative valuation – applying it in practice

When using relative valuation an analyst is going to take an average EBITDA multiple (determined through comparable company valuation), multiply by EBITDA of the company they are interested in, to arrive at debt free cash free value.

EBITDA multiple x EBITDA = DFCF valuation

Perhaps you can spot the consistency of thought here? EBITDA is an earnings figure that is before finance costs i.e. it excludes banks' claims on the business – it's pre-finance. Debt free cash free is the value of a company assuming banks' claims were magically removed. It's the value imagining the company had no debt. It's a pre-finance value too. When using relative valuation in practice, what we are doing is taking a pre-finance multiple, applying that multiple to a pre-finance earnings steam (EBITDA) to arrive at a pre-finance debt free cash free value.

5 x 20 = 100



Relative valuation: a simple example

Imagine we were trying to conduct relative valuation work for the company above. Imagine we had looked at the relationship of value/ EBITDA for a number of past transactions, as well as similar share-market listed companies, and reached the conclusion that a reasonable EBITDA multiple was 5x. Furthermore, imagine that the company above was generating 20 million of EBITDA. The average EBITDA multiple of 5, multiplied by 20, would yield a debt free cash free valuation of 100 million.

DFCF value minus net debt = shares/ equity valuation

In the chart above we have a route from debt free cash free valuation to equity or shares value (what the seller expects to receive). We could subtract net debt from the DFCF valuation to get to the value for the shares/ equity in the company. 100 million DFCF valuation minus 30 million net debt = 70 million shares/ equity valuation.

Relative valuation multiples: summary

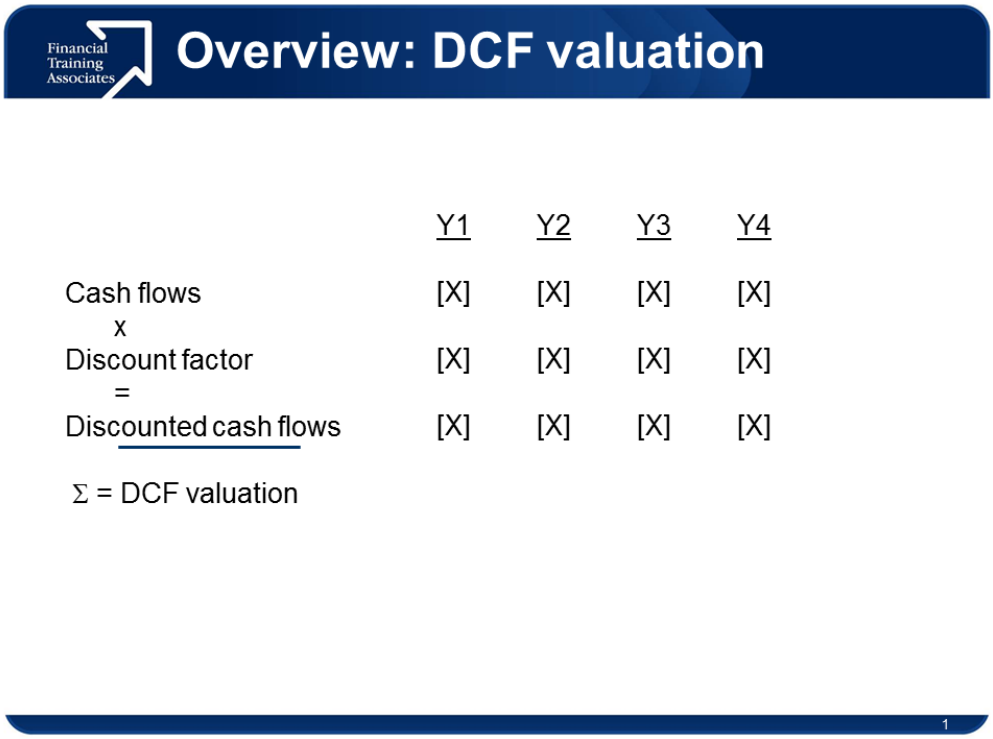
The most important point is that an EBITDA multiple x EBITDA = DFCF valuation. A buyer could conduct some research into valuation multiples other companies had sold at, or research into values other businesses were trading at in the share market, thereby obtaining an average multiple for comparable companies. The buyer might then apply that average multiple to EBITDA earnings for the company they were trying to analyse, helping them decide what their DFCF valuation should be. The bridge between DFCF and shares/ equity valuation is net debt, as per the chart above.

DCF Valuation

Discounted Cash Flows (DCF)

Under the DCF valuation methodology, the company is seen as the sum of its projected cash flows. Cash flows that are further out are seen as more risky – i.e. there is less certainty about whether the cash flow might be delivered. The further away a cash flow, the more it is discounted or reduced. Under the DCF valuation methodology, cash flows are projected into the future, with cash flows that are a long way into the future discounted heavily. Cash flows are then totalled to calculate the value for the company.

DCF: just an overview



Enterprise Value

We canl recognise the similarity between debt free cash free and another term used in finance: “enterprise value”. Both measures value the company including certain of its liabilities. This makes the two measures of company value very similar. The difference is that some valuation practitioners would involve a few more liabilities in their calculation of enterprise value. For example, items that may not bear interest but still have to financed, such as a pension liability. This makes the two concepts very similar. DFCF includes debts. Enterprise value includes debt and debt-like items.

Valuation summary: DFCF and enterprise value

To summarise, debt free cash free valuation:

- Represents the valuation of a company with net debt removed;
- Is greater than the shares/ equity value for a company that has net debt (remember the 100 million DFCF against the 70 million shares value);
- Is often used in letters offering to buy a company; and

- Is very similar to another term used in valuation: “enterprise value”.

Private Company Valuation Methodologies

Since private companies may manage their balance sheets and earnings for alternative purposes, discounted cash flow analysis or comparable valuation techniques require additional research. Earnings and capital structure might need to be reorganized or modified accordingly. When it comes to private companies, some non-traditional valuation techniques may be appropriate such as analysis of invested capital, replacement cost, asset appraisal and capitalization of earnings.
As discussed earlier, there are several methods for estimating the value of a particular private company. When it comes to private companies, the following three techniques are most commonly used:

1. **Comparable Company Trading Multiple Analysis (also known as "peer group analysis", "equity comps", "trading comps", and "public comps")**
2. **Precedent/Comparable Transaction Analysis (also known as "transaction comps" and "deal comps")**
3. **Discounted Cash Flow ("DCF") Analysis**

Other Valuation Methodologies Include:

1. **Break-up Analysis**
2. **Asset Valuation**
3. **Analysis of Invested Capital/Replacement Cost**
4. **Leveraged Buyout (LBO) Analysis**

Comparable Private Company Trading Multiple Analysis (Public Comps)

Comparable company trading multiples analysis or trading comps uses the valuation multiples of similar or comparable publicly-traded companies to value a target private company. Peers can be grouped based on any number of criteria, such as industry focus, private company size, or growth. The multiples can be Enterprise Value (EV) based multiples like EV/Sales, EV/EBITDA or EV/EBIT, and Equity based multiples like Price to Earnings (P/E). The multiples derived from this type of analysis are at a given point in time and generally change over time. It is important to note that trading multiples do not reflect control premiums or potential synergies. Generally, the following steps are applied to compare your target private company to a similar public company:

Compile and select the list of comparable companies

To select the comparable universe or peer group for a given private company target, one must understand the target private company's business to ensure that its peers share similar industry, business, and financial characteristics with the target. Among the few suitable sources that can provide insight in identifying accurate public comparables are annual reports or 10-K (especially the section on competition), the public companies' prospectus, SIC code lookup, and PrivCo's private company reports.

Once you have identified the comparable universe, the next step is to gather all necessary information for each peer company, usually from 10-K, 10-Q, and/or 8-K earnings press release, consensus financial projections or a recent analyst research report with financial projections.

Calculate relevant financials and multiples

Making pro forma adjustments to a comparable company's financial statements is often the trickiest part. It requires normalizing the financials to adjust for one-time / non-recurring items that temporarily distort earnings. Income statement items (denominator) should be adjusted for one-time or non-recurring items. For the valuation purposes, non-recurring items should not be included in financials (e.g. P&L statements, EBIT, EBITDA, Net income, etc).

After selecting a universe of comparable companies, create a list of ratios and values you want to compare. These can include price, shares outstanding or market capitalization, earnings per share (EPS), growth rate (five-year), price-to-earnings ratio (P/E), price-to-sales ratio (P/S), EV (enterprise value), EBITDA (earnings before interest taxes, depreciation and amortization), etc.

Next step is to calculate multiples. Multiples are the heart of the comparable companies analysis as it is hinged on both the comparable company's risk profile and operating performance. Multiples that are used should be relative to the industry and appropriate in relating the public and private companies.

Equity Multiples—Certain flows apply to equity holders only, like net income and book value of equity. The balance sheet and income statement values utilized are after discretionary debt payments. Hence, equity multiples are used to derive an implied equity value.

Relevant multiples:

- **Price/Earnings (market equity value / net income to common shareholders)**
- **Price/Book (market equity value / book value of equity)**
- **Price/Cash Flow (market equity value / after-tax cash flow)**
- **PEG Ratio—measures growth prospects (PE Ratio / Annual EPS Growth)**

Enterprise multiples—Other flows apply to all capital providers (debt & equity). The balance sheet and income statement values utilized are before the effects of discretionary debt payments. Hence, enterprise multiples are used to derive an implied enterprise value.

Relevant multiples:

- **Enterprise value/Sales**
- **Enterprise value/EBITDA**
- **Enterprise value/EBIT**

It is best to compare several multiples during the analysis to determine which one(s) the market uses to value the universe of comparable private companies.

Apply valuation and analyze the results

Finally after calculating relevant multiples, one must determine implied valuation ranges. To compare comparable private companies effectively, one must understand why their multiples are different. Reasons why one private company's projected EV/EBITDA multiple might be lower than that of a peer could include slower projected growth, declining margins, or a higher risk profile. For example, performing a comparable company analysis is an art, not a science. It's important to pay careful attention to the selection of comps, how one spreads the financial for each private company, and selection of favourable multiples.

Apply a private company discount, if applicable

It is not merely enough to simply use the same multiple as that of another publicly traded company. In most, if not all cases, the multiples that the "comps" universe is trading at must be subjectively adjusted as public companies will typically receive higher valuations than their privately held peers due to a lack of liquidity and the potential restructuring or accounting reorganization challenges that may arise in the event of an exit. Valuation discounts for liquidity should be applied to the private company that best reflects the target private company's risk and often ranges from 20-30%.
A major disadvantage of this valuation method is that it is often difficult to determine the right comparable private companies. Very rarely does one find two identical private companies. Hence, adjustments should be made to reflect differences, such as business mix, geographic spread and capital structure.

Transaction Analysis (Deal Comps)

Comparable transactions analysis or analysis of selected acquisitions is very similar to trading comps except deal comps utilize actual transaction multiples instead of trading multiples from the universe of comparable private companies. The analysis uses multiples and premiums paid in comparable transactions to value target private companies. When using this approach to value private companies, transactions should have relevant attributes:

- **Comparable Industry group**
- **Timing - Transactions should be recent (typically no more than five years)**
- **Business mix (products, markets served, distribution channels, etc.)**

- **Geographic location**
- **Size (revenues, assets, market cap)**

The process of compiling deal comps is similar to assembling trading comps, but data can be more difficult to locate. Sources of information for public deals include internal firm resources, press releases, SIC/NAICS code screen, 8-K's, Proxy's and other SEC filings. The major disadvantage of this method is the only commonly available metric is sales, and value is not always clearly tied to sales or even profit. Moreover, precedent transactions are rarely directly comparable. Every transaction has its own set of unique circumstances and not all aspects of a transaction can be captured using valuation multiples.

Discounted Cash Flow Analysis

This method uses the forecasted free cash flow of the target private company (meeting all the liabilities) discounted by the firm's weighted average cost of capital (the average cost of all the capital used in the business, including debt and equity), plus a risk factor measured by beta. Since risks are not always easy to determine precisely, Beta uses historic data to measure the sensitivity of the private company's cash flow, for example, through business cycles.

Key Components of a DCF	
Free Cash Flow (FCF)	**Cash generated by the assets of the business (tangible and intangible) available for distribution to all providers of capital. FCF is often referred to as unlevered free cash flow, as it represents cash flow available to all providers of capital and is not affected by the capital structure of the business.**
Terminal Value (TV)	**Value at the end of the FCF projection period (horizon period).**
Discount Rate	**The rate used to discount projected FCFs and terminal value to their present values.**

Estimating Beta—Beta is a historical measure of a stock's volatility versus the market as a whole. Since private companies do not have equity traded on any exchange, there is no concrete method for determining the beta of a private company's equity. Therefore the estimation of beta is based on the trading volatility of comparable public companies. It is important to calculate the unlevered betas of the universe of comparable private companies.

$$\beta unlevered = \beta levered / (1+Debt / Equity) (1-T)$$

Following the calculation of unlevered beta, determine the optimal debt ratio for the private company by either using the existing company capital structure or taking on the industry average capital structure. It is then that you must re-lever the average unlevered beta for the private company using the optimal capital structure.

$$\beta levered = \beta unlevered / (1+Optimal\ Debt / Equity) (1-T)$$

Problems with Equity Risk Premium—Equity risk premium is the return that investors seek to obtain by investing in the stock market. Equity risk premium is the difference between the

risk free rate and the demanded rate of return from the stock market. The equity risk premium for private companies needs to be adjusted to reflect a higher return for a riskier investment.
Estimating Cost of Equity—The cost of equity of a private company is calculated as a function of the risk free rate, beta, and the market premium.

Cost of Equity = RFR + Beta (MP)

The risk free rate is often known as the interest rate associated with what is considered a "riskless" security (typically the yield on the highest rated government bonds in the 10-20 year maturity range).
Estimating Cost of Debt—The problem with the cost of debt of private companies is that many private companies rely on bank loans as their primary source of funding. Bank loan rates are outdated and term structures are long-term. Therefore bank debt does not reflect the current debt cost of capital and is usually offered at a premium to public debt.
Calculating the current cost of debt capital would require analysis of comparable public company cost of debt or the approximation of the cost of acquiring new funding as of the valuation date.

After-Tax Cost of Debt = Cost of Debt * (1 — Tax Rate)

Estimating Cost of Capital—Percent of debt and equity is obtained from the capital structure.

WACC = (Percent Debt)*(Cost of Debt) + (Percent of Equity)*(Cost of Equity)

Special Problems with Private Company Cash Flows—It is important to normalize cash flows to reflect an arm's-length approach to management. Recasting cash flows for the private company is to determine the true value of the private company based on "real" cash flows.

Issues with Calculating Terminal Value—The two main ways of calculating the terminal value of a private company is through comparable multiples or perpetuity growth method. Considerations must be made in both methods that appropriate recast cash flows are used and growth rates are inline with potential growth opportunities for the private company based on management discussion and industry analysis.

Using the comparable multiples method requires that the private company's financial statements are recast to reflect the style of their public comparables. In addition, since private companies are organized under different corporate structure (LLC, LP or S-Corp), financial statements may not be a reasonable view of the private company's performance on which an earnings multiple may be used.

Final Observations on DCF Analysis

Valuing a private company using a discounted cash flow analysis requires consideration to be given to recasting financial statements to mirror public counterparts and adjusting components of the WACC to mirror current cost of capital in an illiquid market. It is important to make sure that all adjustments are reasonable and defensible.
The major disadvantage of this method is that the precision of the valuation is not always accurate. The outcome of the valuation is highly dependent on the quality of the assumptions made regarding FCF, TV, and the discount rate. As a result, DCF valuations are usually expressed as a range of values rather than a single value by using a range of values for key inputs.

Other Valuation Methods

Asset Appraisal—Asset valuation applies to companies that have heavy fixed assets, such as manufacturing plants or refineries; it is appropriate to value the assets independently from the firm. An asset appraisal will yield a more accurate valuation than a discounted cash flow analysis in private companies such as these. In this method, the fair market value of fixed assets and equipment (FMV/FA) is calculated as a means of evaluating the business.

Break-up Analysis—A break-up analysis is simply a sum of parts valuation based on different business lines. Each part is valued separately employing above methodologies and then summed together. This is very relevant for private companies with dissimilar business lines.

Internal Rate of Return—Internal Rate of Return is a valuation methodology that can be used to calculate the entry price, exit price, or average cash flows in an investment. IRR, given certain inputs such as exit price and cash flows within the investment, can be used to calculate a desired return rate, entry price, or other factors.
Given the high risk on investment in venture capital and private equity, the firms require a high IRR in their target companies. In this case, the IRR represents the percentage of profits made on an investment in a specific period of time. Technically, the internal rate of return is the discount rate that generates a zero net present value.

Ex. A firm acquires a private company for $35 million in 2011 and exits in 2012 at $70 million. The firms IRR is 100% with a return of $35 million and an NPV of $0.

Price Exited / (1 + r)^t - Price Entered

LBO Analysis—Another valuation methodology that is used is Leveraged Buyout or "LBO" analysis. Leverage is simply the use of debt; an LBO is the purchase of a private company through the use of borrowed funds, or debt. This method is used to determine the range of prices that a financial buyer would be willing to pay for a company based on target rates of return to equity (IRRs) and leveraged capital structure. Typically, the target company of an LBO analysis is public. The public equity is being bought out by a small number of investors, thus taking the public company private. In some cases, an LBO involves strong management support and participation. In such a case, management, with the help of a private equity firm, employ their own funds to take the public company private. This is also referred to as a Management Buyout.

Replacement Cost—Similar to the total invested capital valuation; replacement cost valuation considers the total cost of reproducing the operations of the business in today's environment. This accounts for start-up expenses, real estate, equipment, and inventory and labour costs.

Total Invested Capital—Cash generated by the assets of the business (tangible and intangible) available for distribution to all providers of capital. FCF is often referred to as unlevered free cash flow, as it represents cash flow available to all providers of capital and is not affected by the capital structure of the business.

Conclusion

How do you go about valuing a private company?

It's a simple question with a complex answer. While there are numerous valuation methodologies that can be utilized to establish value, not all methodologies would be appropriate in all situations.

Among the techniques used for valuation of private companies; break-up analysis, asset valuation and DCF models are less feasible options as they require detailed financial information from inside the private company. Since private companies manage their balance sheet and earnings for different end goals than public companies, using discounted cash flow or comparable valuation techniques require additional insight. Due to lack of liquidity and increased risk in business, the discount rates used in DCF analysis needs to be modified accordingly. Therefore a more feasible approach is to find comparable public companies whose values are known. Comparable companies' analysis is mostly used in M&A advisory, fairness opinions, restructuring, IPOs and follow-on offerings, and share repurchases. Furthermore, the trade comp approach is pertinent if there are publicly traded competitors; in its absence deal comp approach is used.

Each valuation approach has its own particular use and should be used in that respect. It is doubtful that any one analysis by itself will yield a pinpoint number that can be relied upon. Rather, it is likely that one will need to use multiple approaches to yield a range of values for a private company. Each methodology provides additional clarity on the other valuations. Evaluating the results of numerous methods provides a better understanding of a business' true worth. It is also important to note that different people will have different ideas on the value of a company depending on factors such as public status of the seller and buyer, nature of potential buyers (strategic vs. financial), nature of the deal, market conditions (bull or bear market, industry specific issues) and tax position of buyer and seller.

A fair amount of experience, judgment and corporate finance and equity market knowledge is required. In each case, seemingly straightforward tools contain several hidden layers of complexity and restraints. PrivCo.com helps the private company valuation process by providing the comparable companies—both private and public—and comparable transactions needed in this process.

How do you determine the value of a private company?

Examples

Often we will want to discover how much a private company is worth (aka**private company valuation**). There is no precise way of doing this, but plenty of accepted means of making estimates. The most common for our purposes is based on a multiple of sales, determined by industry statistics. This method is widely used by screening services.

Rules-of-thumb/multiple of sales method:

The multiple of sales figure, read as a percentage of sales. In the sample case of a grocery store, 11% - 18% of annual sales + inventory. So if the grocery store had $500M in annual sales, the firm would be worth between $55M to $90M, plus the value of the inventory.

Comparable firm method:

Like a home up for sale, a private company's value is not a sure thing until it is actually sold. And just as in the real estate field, a researcher can look at comparable properties to get a feel for what the business may be worth.

Find a publicly traded company, in the same industry, with comparable revenue and number of employees. Find that company's total market capitalization. You are almost there. Now you have to discount the value of the private firm somewhat. That is because a privately held firm is not as liquid as a public company. That means that the owners can't easily convert their ownership into cash, as a public company stockholder can quickly do by selling shares. Other factors could come into play as well, such as cost of borrowing.

Calculating the Enterprise Value of public companies is a pretty simple math exercise. First, you need access to some information about the company's stock and a recent set of their financial statements. Once you have those it's as simple as Market Cap – Cash & Marketable Securities + Debt = Enterprise Value. Of course there are a few other nuances but for 95% of the companies you could look at this formula will work just fine.

The challenge a lot of people have, however, is how to calculate the enterprise value of private / non-public companies. Unless you have access to the target company's financial statements, the simple, honest answer is that in most cases you cannot determine a private company's enterprise value with any degree of certainty. You can determine an approximate range of enterprise values with a bit of research and Internet data mining.

We will use an example to make this process real. Let's say that you are interested in estimating the enterprise value of the popular retailer Crate & Barrel. Here is a four step process you can use:

1. Find Basic Information about Crate & Barrel. The first thing you need to do is gather some basic information about Crate & Barrel. You are looking for information about the total number of employees and estimated revenues. Even though Crate & Barrel is a private company, there are several places where this type of information is readily available. For medium to large companies (>$25 million revenue/year) Hoovers and Yahoo business profiles are good places to start. A simple Google search works just as well. In the case of Crate & Barrel a little surfing revealed that the chain is actually owned by Euromarket Designs, Inc. – a German company. So the next step would be to do a little surfing on Euromarket Designs, Inc. It was pretty easy to find this profile on Yahoo that shows that Euromarket Designs, Inc. did approximately $401 million in revenue in 2007 and had approximately 6,000 employees. You should cross check results with another site to see if the data is consistent. This profile on Hoovers confirms the 6,000 employee figure.
If you cannot find the company you are researching in the major business information portals like Hoovers or Yahoo you can use a specialized portal like Manta. Manta tracks information on 63 million small to medium sized business. If you strike out on Manta, the last place to

look is Dun & Bradstreet. The challenge with D&B is that they will charge you $39.99 for a basic background report(they used to only charge $9.99 but I guess times have changed.)

2. Find Industry Comparables. The second step in the process is to build a list of public companies that are in basically the same industry as the company you are targeting. You can leverage the same profiles and information sources you used to find basic information about Crate & Barrel – Yahoo, Hoovers, Manta, or D&B – to find a list of competitors. You should come up with a list of at least three companies. Public companies are highly preferable but you can make do with only two public companies and multiple private companies. In the case of Crate & Barrel we identified three good public company competitors – Bed, Bath & Beyond, Ethan Allen, and La-Z-Boy.

3. Build Summary Metrics Matrix. The third step in the process is to build a summary spreadsheet of a few key financial and business metrics.

Take a look at the following spreadsheet:

Metric	Bed Bath & Beyond	Ethan Allen Stores	La Z Boy
Revenues $M (ttm)	$ 7,048	$ 867	$ 1,310
EBITDA $M (ttm)	$ 874	$ 88	$ (2)
Full Time Employees	39,000	5,800	10,057
Market Cap $M	$ 5,350	$ 270	$ 53
Cash $M	$ 237	$ 64	$ 18
Debt $M	$ -	$ 203	$ 90
Enterprise Value $M	$ 5,250	$ 417	$ 126
EV/Revenue Multiple	.7x	.5x	.1x
Revenue / Employee	$ 180,718	$ 149,483	$ 130,258
EV / FTE	$ 134,615	$ 71,852	$ 12,501

Probably the best place to get the numbers to populate this spreadsheet is from Yahoo Finance's 'Key Statistics'. For example, here are links to Bed, Bath & Beyond (BBBY), Ethan Allen (ETH), andLa-Z-Boy (LZB) key statistic pages. As the spreadsheet indicates there is a wide variation in valuation between the various companies. In this sample set Bed, Bath, & Beyond is clearly the market leader in terms of revenue, profitability, and enterprise value while La-Z-Boy is clearly the worst. In the next step of the process we will use the information gathered in this analysis to estimate Crate & Barrel's enterprise value.

4. Develop Enterprise Value Estimates. The last step in the process is to apply the facts you learned studying the competitors to what you know about Crate & Barrel. Take a look at the following table:

Crate & Barrel	
Revenues $M	$ 401
Employees	6,000
Revenue/Employee	$ 66,833
Enterprise Value Estimates $M	
High EV [Revenue Multiple]	$ 299

Avg EV [Revenue Multiple	$	193
High EV [EV/FTE]	$	808
Avg EV [EV/FTE]	$	431
Overall Average EV Estimate	$	433

This spreadsheet leverages what we know about Crate & Barrel ($401 million revenue and 6,000 employees) and then calculates a range of possible enterprise values by using the multiples contained in the competitor analysis. When you look at the competitor analysis it is very clear that La-Z-Boy has a very distressed valuation – a $53 million market cap, a $126 million enterprise value, and 0.1x Enterprise Value/Revenue multiple for a company that does over $1 billion in revenues is basically an insult from the market. For the purposes of this analysis I excluded La-Z-Boy from the analysis. The EV estimates were calculated by using two factors from the competitor analysis – the Enterprise Value/Revenue multiple and the Enterprise Value / Employee multiple. When you apply those multiples against the facts we know about Crate & Barrel you end up with a possible Enterprise Value range of $193 million to $808 million, with an average of $433 million. To be conservative I would estimate Crate & Barrel's enterprise value to be between $350 and $450 million.

What is my company worth? What are the ratios used by analysts to determine whether a stock is undervalued or overvalued? How valid is the discounted present value approach? How can one value a company as a going concern, and how does this change in the context of a potential acquisition, or when the company faces financial stress?

Finding a value for a company is no easy task -- but doing so is an essential component of effective management. The reason: it's easy to destroy value with ill-judged acquisitions, investments or financing methods. This article will take readers through the process of valuing a company, starting with simple financial statements and the use of ratios, and going on to discounted free cash flow and option-based methods.

How a business is valued depends on the purpose, so the most interesting part of implementing these methods will be to see how they work in different contexts -- such as valuing a private company, valuing an acquisition target, and valuing a company in distress. We'll learn how using the tools of valuation analysis can inform management choices.

Asset-Based Methods

Asset-based methods start with the "book value" of a company's equity. This is simply the value of all the company's assets, less its debt. Whether it's tangible things like cash, current assets, working capital and shareholder's equity, or intangible qualities like management or brand name, equity is everything that a company has if it were to suddenly stop selling products and stop making money tomorrow, and pay off all its creditors.

The Balance Sheet: Cash & Working Capital

Like to buy a dollar of assets for a dollar in market value? Ben Graham did. He developed one of the premier screens for ferreting out companies with more cash on hand than their current market value. First, Graham would look at a company's cash and equivalents and short-term investments. Dividing this number by the number of shares outstanding gives a quick measure that tells you how much of the current share price consists of just the cash that the company has on hand. Buying a company with a lot of cash can yield a lot of benefits -- cash can fund product development and strategic acquisitions and can pay high-caliber executives. Even a company that might seem to have limited future prospects can offer tremendous promise if it has enough cash on hand.

Another measure of value is a company's current **working capital** relative to its market capitalization. Working capital is what is left after you subtract a company's current liabilities from its current assets . Working capital represents the funds that a company has ready access to for use in conducting its everyday business. If you buy a company for close to its working capital, you have essentially bought a dollar of assets for a dollar of stock price -- not a bad deal, either. Just as cash funds all sorts of good things, so does working capital.

Shareholder's Equity & Book Value

Shareholder's equity is an accounting convention that includes a company's liquid assets like cash, hard assets like real estate, as well as retained earnings. This is an overall measure of how much liquidation value a company has if all of its assets were sold off -- whether those assets are office buildings, desks, old T-shirts in inventory or replacement vacuum tubes for ENIAC systems.

Shareholder equity helps you value a company when you use it to figure out **book value**. Book value is literally the value of a company that can be found on the accounting ledger. To calculate book value per share, take a company's shareholder's equity and divide it by the current number of shares outstanding. If

you then take the stock's current price and divide by the current book value, you have the **price-to-book ratio** .

Book value is a relatively straightforward concept. The closer to book value you can buy something at, the better it is. Book value is actually somewhat skeptically viewed in this day and age, since most companies have latitude in valuing their inventory, as well as inflation or deflation of real estate depending on what tax consequences the company is trying to avoid. However, with financial companies like banks, consumer loan concerns, brokerages and credit card companies, the book value is extremely relevant. For instance, in the banking industry, takeovers are often priced based on book value, with banks or savings & loans being taken over at multiples of between 1.7 to 2.0 times book value.

Another use of shareholder's equity is to determine **return on equity** , or ROE. Return on equity is a measure of how much in earnings a company generates in four quarters compared to its shareholder's equity. It is measured as a percentage. For instance, if XYZ Corp. made a million dollars in the past year and has a shareholder's equity of ten million, then the ROE is 10%. Some use ROE as a screen to find companies that can generate large profits with little in the way of capital investment. Coca Cola, for instance, does not require constant spending to upgrade equipment -- the syrup-making process does not regularly move ahead by technological leaps and bounds. In fact, high ROE companies are so attractive to some investors that they will take the ROE and average it with the expected earnings growth in order to figure out a fair multiple. This is why a pharmaceutical company like Merck can grow at 10% or so every year but consistently trade at 20 times earnings or more.

Intangibles

Brand is the most intangible element to a company, but quite possibly the one most important to a company's ability as an ongoing concern. If every single McDonald's restaurant were to suddenly disappear tomorrow, the company could simply go out and get a few loans and be built back up into a world power within a few months. What is it about McDonald's that would allow it to do this? It is McDonald's presence in our collective minds -- the fact that nine out of ten people forced to name a fast food restaurant would name McDonald's without hesitating. The company has a well-known brand and this adds tremendous economic value despite the fact that it cannot be quantified.

Some investors are preoccupied by brands, particularly brands emerging in industries that have traditionally been without them. The genius of Ebay and Intel is that they have built their company names into brands that give them an incredible edge over their competition. A brand is also transferable to other products -- the reason Microsoft can contemplate becoming a power in online banking, for

instance, is because it already has incredible brand equity in applications and operating systems. It is as simple as Reese's Peanut Butter cups transferring their brand onto Reese's Pieces, creating a new product that requires minimum advertising to build up.

The real trick with brands, though, is that it takes at least competent management to unlock the value. If a brand is forced to suffer through incompetence, such as American Express in the early 1990s or Coca-Cola in the early 1980s, then many can become sceptical about the value of the brand, leading them to doubt whether or not the brand value remains intact. The major buying opportunities for brands ironically comes when people stop believing in them for a few moments, forgetting that brands normally survive even the most difficult of short-term traumas.

Intangibles can also sometimes mean that a company's shares can trade at a premium to its growth rate. Thus a company with fat profit margins, a dominant market share, consistent estimate-beating performance or a debt-free balance sheet can trade at a slightly higher multiple than its growth rate would otherwise suggest. Although intangibles are difficult to quantify, it does not mean that they do not have a tremendous power over a company's share price. The only problem with a company that has a lot of intangible assets is that one danger sign can make the premium completely disappear

IBM Balance Sheet

Assets	$Mil	Liabilities and Equity	$Mil
Cash	5,216.6	Current Liabilities	30,239.0
Other Current Assets	32,099.4	Long-Term Liabilities	31,625.0
Long-Term Assets	46,640.0	Shareholders' Equity	22,092.0
Total	**83,956.0**	**Total**	**83,956.0**

The Piecemeal Company

Finally, a company can sometimes be worth more divided up rather than all in one piece. This can happen because there is a hidden asset that most people are not aware of, like land purchased in the 1980s that has been kept on the books at cost despite dramatic appreciation of the land around it, or simply because a diversified company does not produce any synergies. Sears, Dean Witter Discover and Allstate are all worth a heck of a lot more broken apart as separate companies than they ever were when they were all together. Keeping an eye out for a company that can be broken into parts worth more than the whole makes sense, especially in this day and age when so many conglomerates are crumbling into their component parts.

Using Comparables

The most common way to value a company is to use its earnings. Earnings, also called net income or net profit, is the money that is left over after a company pays all of its bills. To allow for apples-to-apples comparisons, most people who look at earnings measure them according to **earnings per share (EPS)**.

You arrive at the earnings per share by simply dividing the dollar amount of the earnings a company reports by the number of shares it currently has outstanding. Thus, if XYZ Corp. has one million shares outstanding and has earned one million dollars in the past 12 months, it has a trailing EPS of $1.00. (The reason it is called a trailing EPS is because it looks at the last four quarters reported -- the quarters that trail behind the most recent quarter reported.

$1,000,000
---------- = $1.00 in earnings per share (EPS)
1,000,000 shares

The earnings per share alone means absolutely nothing, though. To look at a company's earnings relative to its price, most investors employ the **price/earnings (P/E) ratio**. The P/E ratio takes the stock price and divides it by the last four quarters' worth of earnings. For instance, if, in our example above, XYZ Corp. was currently trading at $15 a share, it would have a P/E of 15.

$15 share price
----------= 15 P/E
$1.00 in trailing EPS

Is the P/E the Holy Grail?

There is a large population of individual investors who stop their entire analysis of a company after they figure out the trailing P/E ratio. With no regard to any other form of valuation, this group of un-foolish investors blindly plunge ahead armed with this one ratio, purposefully ignoring the vagaries of equity analysis. Popularized by Ben Graham (who used a number of other techniques as well as low P/E to isolate value), the P/E has been oversimplified by those who only look at this number. Such investors look for "low P/E" stocks. These are companies that have a very low price relative to their trailing earnings.

Also called a "multiple", the P/E is most often used in comparison with the current rate of growth in earnings per share. The Foolish assumption is that for a growth company, in a fairly valued situation the price/earnings ratio is about equal to the rate of EPS growth.

In our example of XYZ Corp., for instance, we find out that XYZ Corp. grew its earnings per share at a 13% over the past year, suggesting that at a P/E of 15 the company is pretty fairly valued. Fools believe that P/E only makes sense for growth companies relative to the earnings growth. If a company has lost money in the past year or has suffered a decrease in earnings per share over the past twelve months, the P/E becomes less useful than other valuation methods we will talk about later in this series. In the end, P/E has to be viewed in the context of growth and cannot be simply isolated without taking on some significant potential for error.

Are Low P/E Stocks Really a Bargain?

With the advent of computerized screening of stock databases, low P/E stocks that have been mispriced have become more and more rare. When Ben Graham formulated many of his principles for investing, one had to search manually through pages of stock tables in order to ferret out companies that had extremely low P/Es. Today, all you have to do is punch a few buttons on an online database and you have a list as long as your arm.

This screening has added efficiency to the market. When you see a low P/E stock these days, more often than not it deserves to have a low P/E because of its questionable future prospects. As intelligent investors value companies based on future prospects and not past performance, stocks with low P/Es often have dark clouds looming in the months ahead. This is not to say that you cannot still find some great low P/E stocks that for some reason the market has simple overlooked -- you still can and it happens all the time. Rather, you need to confirm the value in these companies by applying some other valuation techniques.

The Price-to-Sales Ratio

Every time a company sells a customer something, it is generating revenues. Revenues are the sales generated by a company for peddling goods or services. Whether or not a company has made money in the last year, there are always revenues. Even companies that may be temporarily losing money, have earnings depressed due to short-term circumstances (like product development or higher taxes), or are relatively new in a high-growth industry are often valued off of their revenues and not their earnings. Revenue-based valuations are achieved using the price/sales ratio, often simply abbreviated PSR.

The price/sales ratio takes the current market capitalization of a company and divides it by the last 12 months trailing revenues. The market capitalization is the current market value of a company, arrived at by multiplying the current share price times the shares outstanding. This is the current price at which the market is valuing the company. For instance, if our example company XYZ Corp. has ten

million shares outstanding, priced at $10 a share, then the market capitalization is $100 million.

Some investors are even more conservative and add the current long-term debt of the company to the total current market value of its stock to get the market capitalization. The logic here is that if you were to acquire the company, you would acquire its debt as well, effectively paying that much more. This avoids comparing PSRs between two companies where one has taken out enormous debt that it has used to boast sales and one that has lower sales but has not added any nasty debt either.

Market Capitalization = (Shares Outstanding * Current Share Price) + Current Long-term Debt

The next step in calculating the PSR is to add up the revenues from the last four quarters and divide this number into the market capitalization. Say XYZ Corp. had $200 million in sales over the last four quarters and currently has no long-term debt. The PSR would be:

$$PSR = \frac{(10{,}000{,}000 \text{ shares} * \$10/\text{share}) + \$0 \text{ debt}}{\$200 \text{ million revenues}} = 0.5$$

The PSR is a measurement that companies often consider when making an acquisition. If you have ever heard of a deal being done based on a certain "multiple of sales," you have seen the PSR in use. As this is a perfectly legitimate way for a company to value an acquisition, many simply expropriate it for the stock market and use it to value a company as an ongoing concern.

Uses of the PSR

The PSR is often used when a company has not made money in the last year. Unless the corporation is going out of business, the PSR can tell you whether or not the concern's sales are being valued at a discount to its peers. If XYZ Corp. lost money in the past year, but has a PSR of 0.50 when many companies in the same industry have PSRs of 2.0 or higher, you can assume that, if it can turn itself around and start making money again, it will have a substantial upside as it increases that PSR to be more in line with its peers. There are some years during recessions, for example, when none of the auto companies make money. Does this mean they are all worthless and there is no way to compare them? Nope, not at all. You just need to use the PSR instead of the P/E to measure how much you are paying for a dollar of sales instead of a dollar of earnings.

Another common use of the PSR is to compare companies in the same line of business with each other, using the PSR in conjunction with the P/E in order to confirm value. If a company has a low P/E but a high PSR, it can warn an investor that there are potentially some one-time gains in the last four quarters that are pumping up earnings per share. Finally, new companies in hot industries are often priced based on multiples of revenues and not multiples of earnings.

What Level of the Multiple is Right?

Multiples may be helpful for comparing two companies, but which multiples is right? Many look at estimated earnings and estimate what "fair" multiple someone might pay for the stock. For example, if XYZ Corp. has historically traded at about 10 times earnings and is currently down to 7 times earnings because it missed estimates one quarter, it would be reasonable to buy the stock with the expectation that it will return to its historic 10 times multiple if the missed quarter was only a short-term anomaly.

When you project fair multiples for a company based on forward earnings estimates, you start to make a heck of a lot of assumptions about what is going to happen in the future. Although one can do enough research to make the risk of being wrong as marginal as possible, it will always still exist. Should one of your assumptions turn out to be incorrect, the stock will probably not go where you expect it to go. That said, most of the other investors and companies out there are using this same approach, making their own assumptions as well, so, in the worst-case scenario, at least you won't be alone.

A modification to the multiple approach is to determine the relationship between the company's P/E and the average P/E of the S&P 500. If XYZ Corp. has historically traded at 150% of the S&P 500 and the S&P is currently at 10, many investors believe that XYZ Corp. should eventually hit a fair P/E of 15, assuming that nothing changes. The trouble is, things do change.

Key Valuation Ratios for IBM (April 2003)

Price Ratios	Company	Industry	S&P 500
Current P/E Ratio	38.2	116.7	34.9
P/E Ratio 5-Year High	61.4	184.5	64.2
P/E Ratio 5-Year Low	14.5	9.6	25.7
Price/Sales Ratio	1.67	1.28	1.29
Price/Book Value	5.95	2.83	2.67
Price/Cash			

Free Cash Flows Methods

Despite the fact that most individual investors are completely ignorant of **cash flow**, it is probably the most common measurement for valuing public and private companies used by investment bankers. Cash flow is literally the cash that flows through a company during the course of a quarter or the year after taking out all fixed expenses. Cash flow is normally defined as **earnings before interest, taxes, depreciation and amortization (EBITDA).**

Why look at earnings before interest, taxes, depreciation and amortization? Interest income and expense, as well as taxes, are all tossed aside because cash flow is designed to focus on the operating business and not secondary costs or profits. Taxes especially depend on the vagaries of the laws in a given year and actually can cause dramatic fluctuations in earnings power. For instance, Cyberoptics enjoyed a 15% tax rate in 1996, but in 1997 that rate more than doubled. This situation overstates CyberOptics' current earnings and understates its forward earnings, masking the company's real operating situation. Thus, a canny analyst would use the growth rate of **earnings before interest and taxes (EBIT)**instead of net income in order to evaluate the company's growth. EBIT is also adjusted for any one-time charges or benefits.

As for **depreciation** and **amortization**, these are called **non-cash charges**, as the company is not actually spending any money on them. Rather, depreciation is an accounting convention for tax purposes that allows companies to get a break on capital expenditures as plant and equipment ages and becomes less useful. Amortization normally comes in when a company acquires another company at a premium to its shareholder's equity -- a number that it account for on its balance sheet as goodwill and is forced to amortize over a set period of time, according to generally accepted accounting principles (GAAP). When looking at a company's operating cash flow, it makes sense to toss aside accounting conventions that might mask cash strength.

In a private or public market acquisition, the price-to-cash flow multiple is normally in the 6.0 to 7.0 range. When this multiple reaches the 8.0 to 9.0 range, the acquisition is normally considered to be expensive. Some counsel selling companies when their cash flow multiple extends beyond 10.0. In a leveraged buyout (LBO), the buyer normally tries not to pay more than 5.0 times cash flow because so much of the acquisition is funded by debt. A LBO also looks to pay back all the cash used for the buyout within six years, have an EBITDA of 2.0 or more times the interest payments, and have total debt of only 4.5 to 5.0 times the EBITDA.

IBM's Income Statement

Annual Income Statement (Values in Millions)	**12/2002**	**12/2001**
Sales	81,186.0	85,866.0
Cost of Sales	46,523.0	49,264.0
Gross Operating Profit	34,663.0	36,602.0
Selling, General & Admin. Expense	23,488.0	22,487.0
Other Taxes	0.0	0.0
EBITDA	11,175.0	14,115.0
Depreciation & Amortization	4,379.0	4,820.0
EBIT	6,796.0	9,295.0
Other Income, Net	873.0	1,896.0
Total Income Avail for Interest Exp.	7,669.0	11,191.0
Interest Expense	145.0	238.0
Pre-tax Income	7,524.0	10,953.0
Income Taxes	2,190.0	3,230.0
Total Net Income	**3,579.0**	**7,723.0**

Free Cash Flow goes one step further. A company cannot drain all its cash flow -- to survive and grow is must invest in capital and hold enough inventory and receivables to support its customers. So after adding back in the non-cash items, we subtract out new capital expenditures and additions to working capital. A bare-bones view of IBM's free cash flows is given below.

IBM: Free Cash Flows

Fiscal year-end: December				TTM = Trailing 12 Months
	1999	**2000**	**2001**	**TTM**
Operating Cash Flow	10,111	9,274	14,265	14,615
- Capital Spending	5,959	5,616	5,660	5,083
= Free Cash Flow	4,152	3,658	8,605	9,532

How to Use Cash Flow

Cash flow is the only method that makes sense in many situations. For example, it is commonly used to value industries that involve tremendous up-front capital expenditures and companies that have large amortization burdens. Cable TV companies like Time-Warner Cable and TeleCommunications have reported negative earnings for years due to the huge capital expense of building their cable networks, even though their cash flow has actually grown. This is because huge depreciation and amortization charges have masked their ability to generate cash. Sophisticated buyers of these properties use cash flow as one way of pricing an

acquisition, thus it makes sense for investors to use it as well. It is also commonly used method in venture capital financings because it focuses on what the venture investor is actually buying, a piece of the future operations of the company. Its focus on future cash flows also coincides nicely with a critical concern of all venture investors, the company's ability to sustain its future operations through internally generated cash flow.

The premise of the discounted free cash flow method is that company value can be estimated by forecasting future performance of the business and measuring the surplus cash flow generated by the company. The surplus cash flows and cash flow shortfalls are discounted back to a present value and added together to arrive at a valuation. The discount factor used is adjusted for the financial risk of investing in the company. The mechanics of the method focus investors on the internal operations of the company and its future.

The discounted cash flow method can be applied in six distinct steps. Since the method is based on forecasts, a good understanding of the business, its market and its past operations is a must. The steps in the discounted cash flow method are as follows:

- Develop debt free projections of the company's future operations. This is clearly the critical element in the valuation. The more closely the projections reflect a good understanding of the business and its realistic prospects, the more confident investors will be with the valuation its supports.

- Quantify positive and negative cash flow in each year of the projections. The cash flow being measured is the surplus cash generated by the business each year. In years when the company does not generate surplus cash, the cash shortfall is measured. So that borrowings will not distort the valuation, cash flow is calculated as if the company had no debt. In other words, interest charges are backed out of the projections before cash flows are measured.

- Estimate a terminal value for the last year of the projections. Since it is impractical to project company operations out beyond three to five years in most cases, some assumptions must be made to estimate how much value will be contributed to the company by the cash flows generated after the last year in the projections. Without making such assumptions, the value generated by the discounted cash flow method would approximate the value of the company as if it ceased operations at the end of the projection period. One common and conservative assumption is the perpetuity assumption. This assumption assumes that the cash flow of the last projected year will continue forever and then discounts that cash flow back to the last year of the projections.

- Determine the discount factor to be applied to the cash flows. One of the key elements affecting the valuation generated by this method is the discount factor chosen. The larger the factor is, the lower the valuation it will generate. This discount factor should reflect the business and investment risk involved. The less likely the company is to meet its projections, the higher the factor should be. Discount factors used most often are a compromise between the cost of borrowing and the cost of equity investment. If the cost of borrowed money is 10% and equity investors want 30% for their funds, the discount factor would be somewhere in between -- in fact, the weighted-average cost of capital.

- Apply the discount factor to the cash flow surplus and shortfall of each year and to the terminal value. The amount generated by each of these calculations will estimate the present value contribution of each year's future cash flow. Adding these values together estimates the company's present value assuming it is debt free.

- Subtract present long term and short term borrowings from the present value of future cash flows to estimate the company's present value.

The following table illustrates the computations made in the discounted cash flow method. The chart assumes a discount factor of 13% (IBM's estimated weighted-average cost of capital) and uses the growing perpetuity assumption to generate a residual value for the cash flows after the fifth year.

Valuation for IBM
2-stage growth model

Stage 1	10% growth							
Stage 2	5.7% growth							
End of year		2002	2003	2004	2005	2006	2007	2008
Revenue		81.2	89.32	98.252	108.0772	118.8849	130.7734	138.2275
-Expenses		-67.99	-74.789	-82.2679	-90.4947	-99.5442	-109.499	-115.74
-Depreciation		-4.95	-5.445	-5.9895	-6.58845	-7.2473	-7.97202	-6.9413
EBIT		8.26	9.086	9.9946	10.99406	12.09347	13.30281	15.5462
EBIT(1-t)		5.9	6.49	7.139	7.8529	8.63819	9.502009	11.10443
+Depreciation		4.95	5.445	5.9895	6.58845	7.247295	7.972025	6.941298
-CapEx		-4.31	-4.741	-5.2151	-5.73661	-6.31027	-6.9413	-6.9413
-Change in WC		-0.9	-0.99	-1.089	-1.1979	-1.31769	-1.44946	-1.53208
FCFF		5.64	6.204	6.8244	7.50684	8.257524	9.083276	9.572354
							235.2537	
Total			6.204	6.8244	7.50684	8.257524	244.3369	
PV			5.651872	5.663768	5.67569	5.687636	153.3175	
Total PV	175.9964							
less debt	-61.864	billion						
Equity value	114.1324	billion	divided by		1.69	gives	67.53397	per share

Option-Based Methods

Executives continue to grapple with issues of risk and uncertainty in evaluating investments and acquisitions. Despite the use of net present value (NPV) and other valuation techniques, executives are often forced to rely on instinct when finalizing risky investment decisions. Given the shortcomings of NPV, real options analysis has been suggested as an alternative approach, one that considers the risks associated with an investment while recognizing the ability of corporations to defer an investment until a later period or to make a partial investment instead. In short, investment decisions are often made in a way that leaves some options open. The simple NPV rule does not give the correct conclusion if uncertainty can be "managed." In acquisitions and other business decisions, flexibility is essential -- more so the more volatile the environment -- and the value of flexibility can be taken into account explicitly, by using the real-options approach.

Financial options are extensively used for risk management in banks and firms. Real or embedded options are analogues of these financial options and can be used for evaluating investment decisions made under significant uncertainty. Real options can be identified in the form of opportunity to invest in a currently available innovative project with an additional consideration of the strategic value associated with the possibility of future and follow-up investments due to emergence of another related innovation in future, or the possibility of abandoning the project.

The option is worth something because the future value of the asset is uncertain. Uncertainty increases the value of the option, because if the uncertainty is interpreted as the variance, there are possibilities to higher profits. The loss on the option is equal to the cost of acquiring it. If the project turns out to be non-profitable, you always have the choice of non-exercising. More and more, the real options approach is finding its place in corporate valuation.

Example Case Study: Utilities

Expect consumption of electricity to swell as the world becomes increasingly electrified. The Energy Information Administration projects that 355 giga-watts of new electric generating capacity - or more than 40% more than the industry currently supplies - will be needed by 2020 to meet growing demand.

While upward consumption growth is almost guaranteed over the coming decades, the short-term direction of the market still remains a risky bet. Demand for electricity - whether it's used to run heaters or air conditioners - fluctuates on a daily and seasonal basis. An unusually mild winter, for instance, can moderate consumption and squeeze generator revenues. Gauging the appropriate level of investment in generation capacity is never an easy task.

At the same time, wholesale electricity prices are no longer set by regulatory agencies; for the most part, they are free to fluctuate with supply and demand. This heightens the risk of uncontrollable price increases. Electricity typically costs $10 to $20 per megawatt hour. But if conditions are right, it can very quickly go to $5,000 or $10,000 per megawatt hour. Wrestling with pricing risk is a full-time job for utility managers. In a deregulated market, forwards and futures options provide energy buyers with the tools to help hedge against unexpected price swings.

Despite efforts to loosen up the industry, authorities are still not completely comfortable leaving utilities alone to the vagaries of the market. The U.S. wholesale market was deregulated in 1996, and the industry has been further liberated on a state-by-state basis since. The process, however, is often marked by political wrangling between consumer and other special-interest groups. Regarded by authorities as natural monopolies, transmission and distribution operations will likely remain highly regulated service areas. Legislators, sensitive to fall-out from unexpected price spikes, want to have a say on retail pricing.

Power generation is a lightning rod for environmental regulation. Approval for new coal-powered plants is tough to obtain, despite much progress in developing so-called cleaner coal. Natural gas burns cleaner than coal, but still creates some emissions. Nuclear plants, which supply about 20% of U.S. electric power, still operate under the shadow of the Three Mile Island and Chernobyl accidents. The push for cleaner energy ignites interest in renewable sources like hydro power but also solar, wind and biomass. Regulation and environmental issues will likely remain at the top of utility boardroom agendas.

Key Ratios/Terms

Power Purchase Agreements (PPA): A contract entered into by a power producer and its customers. PPAs require the power producer to take on the risk of supplying power at a specified price for the life of the agreement - regardless of price fluctuations.

Megawatt Hour: The basic industrial unit for pricing electricity, equal to one thousand kilowatts of power supplied continuously for one hour. One kWh equals 1,000 watt hours. One kWh = 3.306 cubic feet of natural gas. An average household uses 0.8 to 1.3 MWh/month.

Load: The amount of electricity delivered or required at any specific point or points on a system. The load of an electricity system is affected by many factors and changes on a daily, seasonal and annual basis. Load management attempts to shift load from peak use periods to other periods of the day or year.

Federal Energy Regulatory Commission (FERC): Regulation in the U.S. electricity industry is provided by the Federal Energy Regulatory Commission, which oversees rates and service standards as well as interstate power transmission.

Public Utility Holding Company Act: Enacted during the Great Depression, this act was designed to prevent industry consolidation. Utility executives speculate that the act's repeal will unleash a wave of mergers among publicly traded utility firms.

Analyst Insight
The allure of utility and power as investment safe havens has faded as new and riskier

business models populate the industry. Utility monopolies once attracted investors with reliable earnings and fat dividends; today the same companies, operating in open markets, divert cash into expansion opportunities while they try to keep growth-hungry competitors at bay. As the utility industry evolves, as markets grow more volatile and as regulations change, investors can expect more lucrative opportunities. Simultaneously, they must learn to embrace more risk.

Firms that make the bulk of their money from wholesale trading, arguably carry the highest risk. Their shares react instantaneously to wholesale energy markts' wild price swings, credit ratings, and news headlines. Power trading companies can make a lot of money for investors, but they can also lose them a lot. They demand close investor scrutiny.

Risk-averse investors should, for the moment, seek out players with features that best reflect those of the old fashioned monopolies: power transmission and distribution. Still regulated, these companies are largely buffered from wild swings of commodity trading and prices. On the other hand, they offer - at best - only modest returns.

Investors ought to keep an eye on debt levels. High debt puts a strain on credit ratings, weakening new power generators' ability to finance capital expenditure. Poor credit ratings make it awfully difficult for traders to purchase energy contracts on the open market. Leverage, measured as debt/equity ratio, offers a good instrument for comparing indebtedness and credit worthiness. Rating agencies like Moody's and Standard & Poor's (S&P) say 50% is a prudent ratio for merchant power operators. Companies in more stable, regulated markets can afford debt/equity ratios that are a tad higher.

While utility stocks are no longer synonymous with big dividends, that doesn't mean that dividends no longer matter. Utilities still go to great lengths to ensure distribution of cash to shareholders; relative to others, the industry offers good income potential. Dividend yield, measured as the annual dividend/market price at the time of purchase, probably offers the best tool for gauging the income generated by utilities stocks. Besides, a solid dividend yield suggests a more attractive proposition for conservative investors.

Don't ignore the good old price-earnings ratio (P/E) P/E ratio. It remains the key yardstick for comparing players in the industry.

Value in the utilities industry will be determined not only by the health of the companies' balance sheets and income statements, but by their corporate reputations as well. In an industry that is under constant scrutiny by regulators, environmentalists and ordinary people, corporate image really matters.

Porter's 5 Forces Analysis

1. **Threat of New Entrants.** Incumbent utility players enjoy considerable barriers to entry. Setting up new generation plants carries high fixed costs and new power producers need a lot of upfront capital to enter the market. Gaining regulatory approval to build new plants can be a long and complicated process for merchant generators. Achieving brand-name recognition and the trust required to convince consumers to switch from incumbent utility providers is not just costly but also time consuming. Meanwhile, once a power plant is built and a market established, the cost of serving one more customer or offering one more kilowatt-hour is minimal.

This is a barrier because new entrants can only hope to realize similar unit costs by rapidly capturing a large market share. There is also a relative shortage of talented, experienced managers for which new entrants must compete. Nonetheless, the structural unbundling trend does offer entry opportunities, especially at the trading and retailing end of the market where upfront capital requirements are less onerous.

2. **Power of Suppliers.** The power systems supply business is dominated by a small handful of companies. There isn't a lot of cut-throat competition between them; they have significant power over generation companies. Meanwhile, as the industry's vertical structures dissolve into a chain of generation suppliers, network suppliers, traders and retailers expect the leverage of any one of them to be reduced. As profits are spread over more players, each one's share will shrink.

3. **Power of Buyers.** The balance of power is shifting toward buyers. Because one company's electricity is no different from another's, service can be treated as a commodity. This translates into buyers seeking lower prices and better contract terms from energy providers. Commercial and industrial customers, in particular, have great leverage. Long-term power purchasing agreements, for instance, are now the norm for commercial buyers; by replacing more traditional short-term contracts, these shift much of the risk associated with wholesale pricing from buyers and onto utilities. Meanwhile, consumers are forming online communities and buying groups and cooperatives in bids to bolster their market power. As the industry becomes more competitive, customers ought to enjoy more power over utilities.

4. **Availability of Substitutes.** Power doesn't have a substitute; it is a necessity in the modern world. Short-term demand for power is inelastic. This means that price hikes do little to diminish consumption, at least in the near term. However, while there are no existing substitutes for electrons or natural gas, there are alternative ways of generating them. Industrial groups have launched programs to develop small generators. Micro-turbines and fuel cells are on the market horizon. These small generators could allow users to bypass traditional power grids altogether, or to limit the use of the grid when prices rise too much over time.

5. **Competitive Rivalry.** Rivalry among competitors is getting increasingly fierce. Utilities must fight for market share in order to create the economies of scale needed to lower costs and remain competitive. Because nearly everybody already uses a utility, competitors are forced to rely mainly on lower prices and to capture market share. This tends to drive industry profitability down. Competitors try to break out of commoditization by trying to differentiate services, segmenting the market and bundling value-added services. However, the characteristics of the electricity market threaten to neutralize such efforts.