

Understanding Valuation Metrics for Equity Securities

A discussion of various valuation metrics,
their practical applications, and their limitations

By Terrence Burgess

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Quantitative Valuation Metrics

The following is a discussion of various quantitative valuation metrics that can be used to estimate the relative valuation or worth of equity securities. It is intended to provide a generic definition of various metrics, with a brief discussion surrounding their common use, the sectors and industries where they can be practically applied, as well as their limitations. It should be noted that quantitative valuation metrics have very little use in an absolute sense, and should only be used to approximate the value of companies with relation to some common standard – whether it be their sector/industry peers, the overall market, or the history of the particular security in question.

With that in mind, an analyst can use these metrics to develop a frame of reference for stocks of similar attributes, upon which a valuation can be approximated, and a relative standing (premium/discount) assigned. A prudent analyst might then decide whether or not the premium or discount of the stock is justified based on qualitative or further quantitative measures.

Price-to-earnings (P/E)

Definition: This ratio compares the price of one share of a common stock to annual earnings per share (either forward/estimated or trailing/actual) of that stock. In other words, what is an investor willing to pay for the earnings of a particular company?

$$\text{Price-to-earnings ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

Common use: This is perhaps the most widely used metric in the financial community, and for that reason alone, it can be a meaningful starting point in determining the relative worth of a company. The P/E ratio can be computed in two different ways. First, an investor can look at a stock's price relative to its trailing earnings, in which case the denominator would be the last four quarters of a company's earnings. For example, if a stock is trading at \$40.00 per share, and it earned \$1.00 over the last year, it is trading at 40 times (40x) its trailing earnings. In other words, an investor is willing to pay \$40.00 for every \$1.00 of actual or historical earnings that the company has generated. The second P/E method is forward looking, and calculates the price relative to the next four quarters of predicted earnings. Using the same values, an investor is willing to pay \$40.00 today for the promise of \$1.00 of earnings in a year's time (perhaps because the investor is convinced that the company will be able to perpetually grow earnings).

While the trailing P/E ratio is considered to be the more reliable of the two methods, as it is based on actual rather than predicted earnings, the forward P/E is more reflective of current expectations of the company. In either case, if the analyst decides that the P/E ratio is lower or higher than the benchmark you have chosen, you might deduce that it is either "cheap" or "expensive."

Sectors: The P/E ratio is most appropriate in the valuation of companies that have relatively stable earnings. Such companies can be found in sectors where prices and demand are relatively stable, such as regulated utilities or consumer staples, or industries with highly variable costs. Variable cost industries allow a company to adjust expenses as sales fluctuate, keeping profit margins and earnings relatively steady.

Limitations: Not all companies, particularly in today's "new economy," have earnings. For example, fast-growing biotechnology companies may be investing all of their revenue into research and development, while telecommunications or cable companies earmark their money for infrastructure development and subscriber acquisitions (rather than worry about turning a profit). For these industries, where earnings could be nonexistent, this metric is obviously of no use.

Another caveat is that earnings are, to some extent, manageable. A company can use accounting tactics to manipulate the absolute value (and the inherent quality) of their earnings by simply adjusting their tax assumptions, method of revenue recognition, pension accounting, or rapidity of depreciation. While a good analyst can adjust earnings for these varying accounting methods, such adjustments can produce a wide range of earnings estimates for any given company.

The last caveat is that earnings lose much of their meaning when comparing companies in different countries. There is no single governing body that sets international accounting standards, and therefore earnings can vary considerably based on the domicile of the company.

Price-to-earnings growth (PEG)

Definition: This ratio compares the P/E ratio to the forecasted or trailing annual growth rate for a particular company. It allows an investor to see where a company's valuation is in relation to its growth rate.

$$\text{Price-to-earnings growth} = \frac{\text{Price-to-earnings ratio}}{\text{Annual earnings growth rate}}$$

Common use: This ratio is used to get a sense of how the market is valuing a particular company's ability to grow, or its future growth potential. For example, if a company is trading at 45x its projected earnings for the next 12 months, and has an expected growth rate of only 15%, then the company has a PEG of 3.0x. The market appears confident that the company will be able to accelerate its growth rate and investors are willing to pay more today for the promise of future growth. Historically, a PEG of 1.0x has been considered to be "fair value".

Sectors: This metric can be used across sectors (providing they have earnings) but is most commonly used in high growth industries (such as technology and telecommunications). PEG is a measure of a company's potential earnings power. It loses its meaning, to some degree, in slow growth sectors such as electric utilities, where earnings generally grow in line with GDP, and the projection of growth is therefore much flatter and more predictable.

Limitations: As with all ratios, this metric only makes sense when used in conjunction with other ratios, and in comparison with similar companies. Its absolute value has no merit. In addition, many investors are hesitant to use the PEG ratio, particularly on a forward basis, as it relies on analyst projections rather than actual company fundamentals.

Applying the Ratios: Common Usage Across Sectors

The chart below depicts the ratios that are typically used for specific sectors. It is important to note, however, that these metrics are selectively applied within the sector as well, depending on the specific attributes of the industry or company being measured.

Sector	P/E	PEG	Rel. Yield	P/S	P/B	P/FCF	EV / EBITDA
Autos & Housing			*		*	*	*
Basic Materials			*		*	*	*
Consumer Staples	*		*			*	
Energy			*		*	*	*
Financial Services	*	*			*	*	
Healthcare	*	*	*			*	*
Industrial Goods and Services	*		*		*	*	*
Leisure				*			*
Retailing	*					*	
Technology	*	*	*				*
Transportation	*		*		*	*	*
Telecommunications	*	*	*				
Utilities	*			*	*		*

Earnings yield

Definition: Earnings yield is related to price-to-earnings. In fact, it is the inverse of the P/E ratio. In other words, how much of the earnings can an investor lay claim to?

$$\text{Earnings yield} = \frac{\text{Annual earnings per share}}{\text{Price per share}}$$

Common use: The earnings yield is typically used by value investors to compare a stock to a non-equity investment, such as a bond, as a measure of the relative risk. For example, if a stock is trading at 40x, then the earnings yield is 1/40, or 2.5%. This suggests that for every dollar invested, the investor has claim to 2.5 cents of current earnings. By contrast, if a risk-free bond is currently paying 5%, an investor has claim to 5 cents on the dollar. So an investor buying the stock is betting that earnings will increase dramatically, exceeding the bond's currently higher yield and attracting new investors along the way. The investor is willing to trade the higher level of risk in the equity market for the potential reward. A typical value investor may be more attracted to equities that are trading at a valuation closer to the risk-free rate. For example, at 20x earnings, or 1/20 earnings yield, an investor basically has the same claim to a dollar of earnings as the hypothetical risk-free rate of 5%, and therefore this may "set the risk tolerance bar" for a value investor.

Sectors: The earnings yield, like the P/E ratio, is limited to those companies that have earnings. In addition, it is most useful for valuing companies in sectors where profit margins are relatively stable, for the purpose of comparison over time. Such sectors, again, would be those where prices are relatively constant (utilities or consumer staples) or where costs are variable (business services).

Limitations: The earnings yield is similar to the P/E ratio. Because earnings can vary based on accounting methods, you cannot always count on a fair comparison between companies even within the same sector or industry.

Relative yield

Definition: Relative yield compares the annual dividend yield of a particular stock (as defined by annual dividend over current stock price) to that of the broader market or pre-defined benchmark (in most cases the S&P 500 Composite Index¹ is used to define the "broader market"). In other words, how much is this particular company paying to its investors relative to the market average?

$$\text{Relative yield} = \frac{\text{Annual dividend yield of a stock}}{\text{Average yield of the broad market}} \times 100$$

Common use: The relative yield metric can be used as a proxy for P/E in the event that there is a particularly volatile or cyclical earnings stream, but a consistent dividend. For example, if an investor notices that a stock is paying a relative yield in excess of a particular standard (its history or its peers), this may indicate to the investor that the stock is undervalued. In other words, the price of the stock should appreciate to a level that lowers the relative dividend yield to a range similar to its industry peers or its historical average. For example, if ABC stock is paying a 1.25% dividend yield and the market (S&P 500) is paying a 1% dividend yield, then the relative yield of the stock is 125% (.0125/.01 x100). If the stock has historically had a relative yield to the market of 100%, this may suggest that the stock is undervalued by 25% (or the appreciation in the price that would bring its yield down to the market average).

¹ Standard & Poor's 500 Stock Index is a commonly used measure of the broad stock market. It's not possible to invest directly in an index.

Sectors: This is a popular metric for sectors or industries that do not have stable earnings, but provide a consistent dividend yield. One such industry would be pharmaceuticals, where earnings are very much driven by product cycles, but where managements tend to pay a consistent dividend yield to shareholders who fund their drug development. Cyclical industries may also be well-suited for this metric. Their earnings fluctuate dramatically from the peak to trough of a business or industry cycle, yet they often pay a consistent dividend. In these industries, the relative yield may provide a more meaningful measure of a company's value than the P/E ratio, which may swing dramatically over the course of a business, industry, or product cycle.

Limitations: This metric is not very powerful on its own, and like all metrics, is best used in conjunction with other valuation tools. The most obvious limitation of this valuation metric is that many companies in the S&P 500 Index no longer pay a dividend. In fact, close to 40% of the stocks in the index no longer pay a dividend. Therefore, if this metric were used as the sole screen in defining an investment universe, 40% of the market would be overlooked.

Price-to-sales (P/S)

Definition: The price-to-sales ratio compares a company's market capitalization (price per share of stock times number of shares outstanding) to the annual sales of that company (either trailing or forward/predicted).

$$\text{Price-to-sales} = \frac{\text{Market capitalization}}{\text{Annual sales}}$$

Common use: This is a traditional valuation metric that has gained much more prominence in the recent past, as "new economy" stocks produced a number of companies without any earnings, such as Internet and early cycle technology companies. Without earnings, revenue projections can be a useful tool in approximating the relative worth of a company. The thought behind this valuation metric is that with rapidly growing sales, earnings will at some point follow. The ratio basically illustrates how much an investor is willing to pay for \$1.00 in revenue from a particular company. For example, a company that has a market capitalization of \$100 million and has annual sales of \$50 million has a price-to-sales ratio of 2x. In other words, an investor pays \$1.00 for the right to \$.50 worth of company revenue. A high price-to-sales ratio can be indicative of the quality of a company's sales, and the company's ability to turn those sales into profit. Generally speaking, a company with a price-to-sales ratio of less than 1.0x should attract investor attention, although, as with all ratios, price-to-sales has very little absolute meaning, and only has merit when compared to some common standard. In addition, a low valuation may be justified based on other qualitative or quantitative factors.

Sectors: Price-to-sales can be used across sectors as a valuation check in conjunction with other metrics, as most companies have sales, and sales are not as easily manipulated as earnings. The metric is particularly useful in the valuation of "under-earners" or companies without any visible earnings, such as early stage technology companies, or companies with high fixed costs (and thus volatile earnings). A good example would be semiconductor companies, which have a large amount of fixed costs associated with the construction of their wafer fabrication plants, and extremely volatile pricing as determined by the supply/demand in a commoditized industry. In this case, price-to-sales may be a more stable and more meaningful measure of comparison, particularly relative to history.

Limitations: This ratio is less appropriate for service companies such as banks or insurers who do not technically have sales. These companies generate their revenue by charging a fee for a service provided, and therefore revenue is basically a function of how well they can grow the asset base on which that fee is charged.

Price-to-book value (P/B)

Definition: This ratio compares the market capitalization (price per share multiplied by shares outstanding) of a company to its shareholders' equity. Simply put, book value is equal to a company's assets minus its liabilities, or what would be left over for shareholders if the company were sold and its debt obligations retired. The price-to-book ratio measures what the market is willing to pay for those net assets, or shareholders' equity.

$$\text{Price-to-book value} = \frac{\text{Market capitalization}}{\text{Shareholders' equity}}$$

Common use: This ratio works well in the valuation of companies that have a lot of hard assets, such as factories or oil reserves, or financial assets such as loans. In addition, this ratio is commonly used to compare companies with different countries of origin, as assets generally have a universal definition, while other metrics such as earnings are subject to a wide range of accounting standards. This ratio gives an investor a quick look at how the market is valuing a company's assets, as the P/B ratio is assigning a value to the net assets of a company based on their quality, or their ability to generate earnings.

Generally speaking, a book value of less than 1.0x would be an indication of good value, as the market is assigning a value to the company that is less than what you would get if you were to sell the company and pay off all liabilities. A book value of greater than one may indicate that the company has high quality assets capable of generating solid earnings that will eventually increase shareholders' equity, or net assets, for the firm and its equity investors.

This ratio is often used in conjunction with return-on-equity (defined as net income divided by shareholders' equity), which measures how efficiently a company employs the capital of equity investors. Generally, a company with a low price-to-book value but high return on equity (all else being equal) would be a better investment than a company with a higher valuation and less efficient financial management. In short, an investor would be paying less for greater returns on his component of the company's capital structure (shareholders' equity).

Sectors: This ratio is commonly used to value companies with hard, tangible assets. Examples would be industrial companies with property, plants and equipment, oil companies with drilling rigs as well as proven oil reserves, or financial companies such as banks and insurance companies with loan portfolios and cash.

Limitations: In the new economy, this particular metric does not work well, as many companies have intangible assets, such as intellectual capital. For this reason, as with most ratios, price-to-book value loses any significant meaning when comparing companies of different industries. For example, while a technology company may have a much higher price-to-book value, this may be due to a lack of physical assets, and therefore a lower level of shareholders' equity as a base for the ratio. This does not necessarily mean that the technology company is more expensive than an auto company, which has a large amount of physical assets (in the form of plants and equipment) and subsequently a higher level of shareholders' equity and lower price-to-book value.

Price-to-free cash flow (P/FCF)

Definition: This ratio compares the price per share of a company to its projected or trailing free cash flow per share. Free cash flow is defined as (net income + non-cash expenses – change in working capital) – (capital expenditures + dividends). It gives the investor an idea of how the market is valuing the quality of free cash flow at a particular company, or the actual money that it is generating in excess of its current obligations.

$$\text{Price-to-free cash flow} = \frac{\text{Price per share}}{\text{Free cash flow per share}}$$

Common use: Many consider this valuation metric to be one of the most important in measuring the quality of earnings, cash flow, and overall health of a particular company. This ratio essentially assigns a value to the quality of the cash that a company is generating in excess of that which has been committed to either the growth of the company or shareholder distributions (or both). As with most ratios, the lower the P/FCF ratio (all else being equal), the more attractive the investment, as an investor is paying less for a claim on the cash generation of the business. Cash flow is particularly important as it gives an indication of the company's potential to raise its dividend, buy back shares, make acquisitions, and deal with unexpected problems without affecting the long-term health of the company. Cash flow also makes the company a more attractive acquisition target.

Sectors: Price-to-free cash flow can be used across sectors and industries. It is commonly used in growth industries such as technology or telecommunications, where companies may not generate earnings due to heavy capital investment and subsequently high depreciation and amortization. These are also industries that may require increasing levels of capital expenditure to remain competitive, and therefore P/FCF gives an investor a sense of the company's ability to finance its own growth independent of the capital markets.

Limitations: As always, this measure is meaningless in an absolute sense, and should always be used in a comparative manner and in conjunction with other metrics to arrive at a meaningful estimate of a company's worth. In general, however, this metric provides valuable insight across industries.

Enterprise value-to-EBITDA (EV/EBITDA)

Definition: This ratio compares the enterprise value of a company (which is defined as market capitalization + total long-term debt – cash) to their EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization). In other words, enterprise value is the amount of money you would have to spend to buy a company and retire its debt, and EBITDA is essentially the earnings power that can be generated net of accounting inconsistencies.

$$\text{EV-to-EBITDA} = \frac{(\text{Market capitalization} + \text{long-term debt} - \text{cash})}{\text{Earnings BITDA}}$$

Common use: EV/EBITDA is commonly used to measure companies in similar industries but different countries, as the calculation essentially backs out all of the accounting and financing methods that can vary across borders. Examples would be varying levels of interest and/or subsidized cost of debt, differing tax rates, tax sheltering or government subsidies, and differing accounting standards for the method of depreciation and amortization. This ratio attempts to level the playing field for companies operating in different regions of the world.

- Sectors:** EV/EBITDA can be used across sectors and industries, although it is perhaps more important in capital-intensive industries where you have larger amounts of depreciation and amortization, and therefore a larger variation in EBITDA. Cable and telecommunications companies are often valued using this ratio, as they tend to deploy large amounts of capital in the building of network infrastructure and often lack earnings.
- Limitations:** This ratio can punish companies that carry debt, even though a certain level of financial leverage can be useful in generating a higher return-on-equity (ROE). As with most ratios, the lower the level of EV/EBITDA the more attractive the investment (all else equal). However, a company that employs debt as a lever to increase returns (a key component of the DuPont Model for ROE) may appear more expensive than a company that simply uses equity, which is often more expensive, to finance growth.

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