Selecting a Valuation Method to Determine a Stock's Worth

By Robert R. Johnson, Ph.D., CFA, CAIA, Thomas R. Robinson, CFA, and Stephen M. Horan, Ph.D., CFA, CIPM

Article Highlights

- There are two overall approaches to valuation: relative and absolute. We give guidance on when each is appropriate.
- Relative valuation compares the current price to an underlying fundamental factor or to other companies.
- Absolute valuation strategies determine a company's value without reference to its current market price.

Investing is about earning a financial return. Valuation is at the heart of investing—you need to find a stock selling at an attractive price relative to its intrinsic or underlying value, otherwise your prospects for a financial return are poor.

Wait, you say, that sounds like value investing and I am a growth investor. We feel this dichotomy is unnecessary. All investing is about identifying companies for which we expect to earn a handsome financial return. Why would we want to buy companies selling above their intrinsic value? We might be willing to buy them if the current price is equal to the intrinsic value, as a fair financial return would be expected. However, ideally we would prefer to find companies where the current price is well below intrinsic value. Whether you are a value investor or a growth investor, you are likely concerned about the price you are paying relative to intrinsic value (including the company's growth prospects). All investors should therefore assess the value of the company using some valuation method and compare that value to the current market price. Doing otherwise is to speculate, not invest.

All valuation methodologies are not created equal and no single method applies to all companies or works in all market conditions. Some valuation methodologies are more appropriate in certain circumstances and not in others. In this article, we examine different valuation methodologies and provide guidance for selecting the method most appropriate in particular circumstances.

Price Versus Intrinsic Value

The price of a security is based on a number of factors: the prospects for the company, the current overall market sentiment (including periods of fear and greed), supply and demand for the shares, liquidity of the shares, and the market in which the shares trade, just to name a few. Intrinsic value, on the other hand, is what we think the company is worth independent of transitory factors that may be currently influencing the price.

Valuation is an exercise where we determine what a company is worth and whether the price is reasonable relative to this intrinsic value. There are a couple of overall approaches to valuation: relative valuation and absolute valuation. In relative valuation we are looking at the price in relation to some underlying fundamental or alternative measure of value, such as income statement or balance sheet figures. These relationships have meaning when viewed over time or in relation to similar securities or the market as a whole. One of the most common approaches that individual investors use is examining price-earnings ratios, price relative to some measure of the firm's accounting earnings.

Absolute valuation is a process by which we assess, independently of price, the current intrinsic value of the company. Absolute valuation methods include discounted cash flow methods (e.g., discounted dividends or free cash flow), asset-based methods and residual income methods.

Table 1. Relative Valuation Measures

Price Multiple or Yield Measure	When Most Appropriate
In general for all multiples and yields	• When there is a good peer group of companies, an industry or a market index that is appropriately valued (or perhaps undervalued).
Price-earnings ratio (P/E), or earnings yield	• When earnings are seen as good indicators of company performance (e.g., not subject to accounting manipulation) and are not heavily impacted by temporary or transient factors. • P/E may only be used when earnings are positive and not near zero, whereas earnings yields may be used in all cases.
Price-to-book ratio (P/B), or book-to-price ratio	• Commonly used for financial companies where balance sheet values are closer to current values and the balance sheet is an important driver of performance. • Can be used when earnings are near zero or negative in any industry.
Price-to-cash-flow ratio (P/CF), or cash flow yield	• Can be used in most circumstances, but is especially appropriate when earnings may not be indicative of company performance. • Best used for non-financial companies, as financial company cash flows are often not comparable to those of operating companies.
Price-to-dividend ratio (P/D), or dividend yield	• When a company is paying dividends that are stable or growing at a relatively stable rate. • When the dividend stream is correlated with underlying earnings (e.g., earnings and dividends are both stable and growing).
Price-to-sales ratio (P/S)	• Can be used for cyclical companies where earnings are transitory. • Can be used when earnings are negative. • More commonly used for retail companies.

Relative Valuation Methodologies

In a relative valuation, you are typically not interested in assessing the dollar value of the company as a whole or the value per share; instead you are interested in assessing the current price compared to some underlying fundamental factor and relative to other companies.

Multiples and Yields

Relative valuation methodologies involve the use of price multiples or their inverse, measures of yield. For example, you might be looking at the price-earnings ratio (P/E), which is the price per share divided by the earnings per share, or its inverse, the earnings yield, which is earnings per share divided by the price. This multiple or yield is then compared to other comparable peer companies, the industry or the market as a whole to determine if the company is valued low or high.

In the case of a price multiple, you prefer to pay a lower multiple relative to other companies with similar profitability, growth rates and risk. You would be willing to pay a higher multiple for firms with higher profitability or growth potential. You would also be willing to pay a higher multiple for companies of lower risk. [For a full discussion of factors impacting price multiples, see "Equity Asset Valuation," 2nd edition, by Jerald E. Pinto, Elaine Henry, Thomas R. Robinson and John D. Stowe (John Wiley & Sons/CFA Institute Investment Series, 2010).] The inverse or earnings yield would be the opposite. You desire a higher earnings yield in general, but would accept a lower yield for higher profitability, higher growth potential or lower risk.

An important assumption in using a relative valuation method is that the companies or index you are using for comparison purposes are fairly valued. If you feel the peer companies or index are overvalued, then relative valuation may not be an appropriate method.

There are a variety of other price multiples or yields that may be used instead of a price-earnings ratio. These include price-to-book ratio (P/B), price-to-cash-flow ratio (P/CF) or price-to-dividend ratio (P/D), and the inverse yield measure for each. Table 1 summarizes important considerations in selecting a price multiple or yield approach to valuation.

A Price-Earnings Ratio Example

Facebook Inc. (FB), the popular social media network, went public in an initial public offering (IPO) on May 17, 2012, at $38 per share. A week later it was trading at less than $27 per share. As of this writing, it is trading at over $64 per share. What is it really worth?

According to Table 1, multiples are useful tools when there are good peers for comparison purposes and when those peers and the market are appropriately valued. Presuming the latter is true, and we have our doubts, we can use price-earnings ratios to help answer the question because Facebook and many of its peers have positive earnings.

Table 2 shows price-earnings multiples and yields for Facebook and some of its peers. Facebook has a trailing 12-month (TTM) price-earnings ratio of 107, compared to almost 700 for LinkedIn Corp. (LNKD) and around 30 for both Google Inc. (GOOG) and Yahoo! Inc. (YHOO), as of February 7, 2014. That puts Facebook somewhere in the middle of the range of some comparable peers, but the range is quite large, typical of stocks in their growth phase. Google's price-earnings ratio in 2004 was 131. So, it is reasonable to expect Facebook's price-earnings ratio to decline over time. If you own Facebook stock, the hope, of course, is that the price-earnings ratio declines because earnings (the denominator) grow rather than the price (the numerator) falling. Notice, the price-earnings ratios in this industry are markedly higher than those for the market overall. That is characteristic of growth stocks as well.

The price-earnings ratio can be calculated in a variety of ways, and because markets are forward-looking rather than backward-looking, we can look at the price-earnings ratio based on estimated (forward) earnings. Again, using this relative measure, Facebook's valuation appears to be somewhere in the middle of the pack. So, we might look at other qualitative factors to make a distinction.

Twitter Inc. (TWTR) went public on November 7, 2013, at $26 per share. As of this writing, Twitter shares are trading at almost $55 per share. Because its earnings are negative, we cannot calculate a price-earnings ratio. We can, however, look at the earnings yields for guidance. In this case, Twitter's trailing 12-month earnings per share is not dramatically negative so its earnings yield is comparable to the earnings yield for LinkedIn, which went public in May of 2011.

We can also look at where Facebook's price-earnings ratio is relative to its history. The stock is trading at the low end of the range of price-earnings ratios investors have assigned to it over the last three years—similar to how LinkedIn has traded within its valuation range. On the other hand, Yahoo! is trading near the high end of its three-year range while Google is trading in the middle of its range.

Although Facebook and many of its peers have positive earnings, this price-earnings analysis is limited by at least two factors. First, the period of time over which its earnings and those of some of its peers have been positive is extremely limited (i.e., about three years). Ideally, we would like to see trends in multiples over a complete economic cycle. Second, the analysis of price-earnings multiples is most powerful when earnings are not subject to transient factors. In 2013, Facebook took a $9 million charge against earnings. We have not specifically adjusted for that here because it is a modest figure and because Facebook has not had any other special charges. Google, however, took a $690 million charge against earnings in 2013 for discontinued operations and we are using that as a comparison.

Table 2. Comparison of Social Networking Stock Valuations

	Price ($)	Earnings per Share ($)	P/E (x)	Earnings Yield (%)	Forward P/E (x)	3-Year High P/E (x)	3-Year Low P/E (x)
Facebook Inc. (FB)	64.31	0.60	107.2	0.93	40.4	1,666.7	92.6
Google Inc. (GOOG)	1,177.13	39.92	29.5	3.39	19.7	32.9	21.2
LinkedIn Corp. (LNKD)	209.59	0.30	698.6	0.14	56.8	714.3	555.6
Twitter Inc. (TWTR)	54.35	(0.18)	nmf	(0.33)	nmf	nmf	nmf
Yahoo! Inc. (YHOO)	37.23	1.17	31.8	3.14	23.9	34.6	6.1
S&P 500 index	**—**	**—**	**17.9**	**5.59**	**15.3**	**18.6**	**13.7**

nmf = no meaningful figure
Source: Morningstar.com. Data as of February 7, 2014. Earnings and valuation ratios based on trailing earnings except for forward P/E.

There have been no similar charges in the last four years, though.

Investors should perform a similar analysis on Facebook using price-to-cash-flow and price-to-sales ratios for more direction. Because the tangible assets associated with social networking companies is limited, the price-to-book ratio is a more troublesome metric to use in valuing firms in this nascent industry.

Absolute Valuation Methodologies

In absolute valuation, you are interested in determining the value of the company without reference to its current price. You determine the value independently and then compare it to the current price to determine if there is sufficient expected return. Absolute valuation methodologies are typically based on either a cash flow approach or an asset approach.

In a cash flow approach, you forecast a future expected stream of cash flows and then determine the present value of those cash flows using a desired rate of return on that investment. The cash flows involved might be dividends or free cash flow that the company is generating internally. In some circumstances, you might discount earnings instead of cash flows. This latter method is a known as the residual income approach to valuation.

In an asset-based approach, you determine the value of the net assets of the company (assets owned less any liabilities). In essence you are valuing the company not as a going concern, but as if you were going to liquidate the company, sell off the assets and pay off all liabilities. Table 3 summarizes important considerations in selecting a cash flow

Table 3. Absolute Valuation Methodologies

Absolute Valuation Method:	When Most Appropriate
In general for all absolute valuation methods	• When you desire to compute an explicit value of the subject company to compare to the price, compute expected returns and/or margin of safety.
Dividend discount model	• When a company has stable dividends or dividends are growing at a stable rate. • When the dividend stream is correlated with underlying earnings (e.g., earnings and dividends are both stable and growing).
Free cash flow to equity (FCFE) model	• Can be used in most circumstances. • Can be used when a company is not paying a dividend or has negative earnings. • Best used for non-financial companies, as financial company cash flows are often not comparable to those of operating companies.
Free cash flow to the firm (FCFF) model	• Same as above for FCFE model. • Often used when an acquirer may change capital structure, whereas FCFE is best used when leverage levels are stable.
Residual income model	• Best used for companies where the balance sheet is an important driver of earnings and where other methods above are not most appropriate. • Commonly used for financial companies.
Asset-based model	• Least often used relative to other models. • Most appropriate when the company is expected to be liquidated or where there are substantial assets that can be valued individually (sum of the parts valuation or commodities).

or asset-based approach to valuation.

Discounted Cash Flow

Discounted cash flow methods generally involve taking the present value of cash flows expected to be received by investors in the future and discounting them back to today (determining their present value). A classic example is the dividend discount model, where the investor forecasts future dividends expected to be received.

Other common discounted cash flow models are those that forecast overall excess cash flows the company is able to generate from its business (known as free cash flow). In its simplest terms, free cash flow is the company's operating cash flow less any needed capital expenditures to maintain current operations.

Two specific variations are free cash flow to equity, which measures the excess cash flow that accrues to the benefit of shareholders, and free cash flow to the firm, which measures the excess cash flow that goes to all capital providers—both debtholders and shareholders.

A Dividend Discount Example

Boeing Co. (BA) has a trailing 12-month dividend of $1.90 per share and trades at $127 per share. Its dividend growth has slowed dramatically over the last four or five years, but has averaged approximately 11% to 12% over that last 10 years or so. If we assume that dividends per share grow at 12% annually over the next four years, we can estimate what those dividends will be (see Table 4) and estimate what those dividends are worth in today's dollars.

We need to also forecast a terminal value at the end of four years (e.g., a price at which we believe we could sell our shares if we wanted to). We can assume that Boeing will trade at the long-run average price-earnings ratio of the S&P 500 index, which is about 15.0, at that time. Boeing historically has paid out about 45% of its earnings as dividends. So, its earnings four years from now can be estimated as $2.99 ÷ 45%, or $6.64. If the share price trades at the stock market's long-term average of 15 times earnings, the share price four years from now would be $99.66 (see Table 4). Notice the terminal value is relatively large in comparison to the annual dividends over the next four years.

We can estimate what these cash flows are worth today at a discount rate of, say, 12% per annum and get an intrinsic value of only $70.93. Boeing would have to trade at 28½ times earnings four years from now to justify its current share price based on the dividend forecast we assume here. For what it's worth, Boeing traded near 30 times earnings in 2006, but its subsequent share price performance was very disappointing. The stock traded at 29 times earnings in 2009 followed by long-term returns that were reasonable, but lagged the market average by substantial amounts. Boeing's average price-earnings ratio over the last 10 years is closer to 20.

Residual Income

A residual income model assumes a company is worth its current book value (net assets minus liabilities on the balance sheet) plus the present value of any excess earnings it can generate in the future. Excess earnings is the difference between the earnings the company is able to generate and those that are required by investors (represented by the firm's cost of capital).

In contrast to a discounted cash flow model, there is not a large terminal value in a residual income model. In fact, this valuation model usually assumes that earnings will eventually decline to a level required by investors (i.e., no excess earnings). Further, this is an attractive model to apply when a company's future cash flow can be difficult to discern (for example, when valuing financial companies where cash flow is quite different than for traditional operating companies).

However, this model relies upon accounting data versus cash flow and can be subject to manipulation or misstatement if companies are playing accounting games or if accounting rules permit some transactions to bypass the income statement.

Basic Residual Income Example

Citigroup Inc. (C) is trading at $49.21 per share and a price-to-book-value ratio of 0.76, which would appear to be a bargain: Why is the company selling for less than what the assets are listed at on the balance sheet?

A residual income model would show us that since Citigroup currently has an return on equity (ROE) of 7% and investors are more likely to require a higher return (upward of 10%), it has negative excess earnings and should be trading at a substantial discount to book value.

Asset Based

The valuation methods presented so far are commonly used when the company is a going concern that is expected to generate earnings and cash flows well into the future. An asset-based approach does not require that assumption, as the company is valued based solely upon the underlying assets that it owns.

Essentially, you would value the company as if it were broken up and the individual parts or assets were sold off, liabilities were paid and any net proceeds

Table 4. Dividend Discount Valuation for Boeing

Year	2014	2015	2016	2017	2018
Estimated Dividend ($)		2.13	2.38	2.67	2.99
Terminal Value ($)					99.66
Total Cash Flow ($)		2.13	2.38	2.67	102.65
Present Value ($)		1.90	1.90	1.90	65.23
Intrinsic Value ($)	70.93				

Source: Morningstar.com. Data as of February 7, 2014.

were distributed to the shareholders.

Asset-Based Example

Berkshire Hathaway (BRK.A) is a holding company for many distinct businesses. Rather than valuing Berkshire based on its overall cash flows, an alternative method is to value these individual businesses and then value the holding company based on the sum of the parts.

Conclusion

No one method to estimate intrinsic value is the "best." The choice of model to apply depends on the specific circumstances. Purchasing securities without making some attempt to estimate intrinsic value, however, is mere speculation rather than true investing. This article provides some guidelines on which method might be best applied in a particular situation. ▲

Robert R. Johnson, Ph.D., CFA, CAIA, is a professor of finance in the Heider College of Business at Creighton University. Dr. Thomas R. (Tom) Robinson, CFA, provides leadership to CFA Institute's largest region, the Americas, which includes Canada, the U.S., the Caribbean and Latin America. Stephen Horan is a managing director and co-leads educational activities at CFA Institute. Together, they authored the book "Strategic Value Investing: Practical Techniques of Leading Value Investors" (McGraw-Hill, 2013). For more on the authors, go to www.aaii.com/authors/april-2014.

(continued from page 16)

goals. In our view, flexibility is the one word that best describes a prudent spending strategy. Rigid spending rules cannot eliminate investment volatility; they simply push its consequences into the future. Spending strategies insensitive to returns are risky, in that they assume a portfolio will recover before a crisis point is reached—at which time much more dramatic reductions in spending would be necessary.

If a portfolio is to rely on the capital markets for growth, investors must either accept continuous, relatively smaller changes in spending or else risk having to make abrupt and significantly larger adjustments later. The more investors can tolerate some short-term fluctuations in spending, the more likely they are to achieve their longer-term goals. ▲

Colleen M. Jaconetti, CPA, CFP, is an investment analyst, Francis M. Kinniry Jr., CFA, is a principal, and Michael A. DiJoseph, CFA, is an investment research analyst in the Vanguard Investment Strategy Group. This article was adapted from their recent (October 2013) Vanguard research paper, available at www.vanguard.com/jumppage/researchpapers. For more on the authors, go to www.aaii.com/authors/april-2014.