Something To Hang Your Hat On

The Truth Behind PEG

The computation of the PEG ratio is so seemingly simple and yet is often reported in different ways, sometimes unbeknownst to the user. Let's look at how PEG should be calculated and why.

by Douglas Lyon, PhD

To a pure technical analyst, the PEG ratio—P/E ratio over growth—may not come into play often. But for those who throw in some fundamentals to their analysis, especially when screening stocks to trade, it may come as a surprise that the PEG is often misrepresented.

Over the years, widely varying ways of calculating the PEG have crept in, confusing the financial community, investors, data miners, and programmers. Here, I'll first go back to its roots to look at how it was calculated when it first arrived on the scene. Then I'll survey how some of the major data providers calculate it and compare them. I'll conclude by revealing which calculation is the one I believe is the best to use.

HOW PEG BECAME, WELL, PEG

Famed investor and mutual fund manager Peter Lynch wrote about PEGY ratios in his book *One Up On Wall Street,* originally published in 1989. In it, he describes the computation of PEGY as the P/E ratio divided by the growth plus yield. According to Lynch as well as an article at Investopedia.com on determining P/E and PEG ratios, the P/E used in the PEGY is the trailing 12-month P/E ratio, computed by taking the current price of the stock and dividing it by the last 12 months of total earnings per share (EPS).

The PE is a historic metric, and with generally accepted accounting practices in place, it's easy to compute without dispute. The growth figure, on the other hand, is forward-looking. Some say that growth is a measure of how the annual EPS will grow, on average, over the next five years, such as described in an Investopedia.com article on the subject.

One cause of dispute is that different people will have different projections on growth. A dispute also arises over the use of EPS growth vs. revenue growth. Some sources report the

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PEG ratio as backward-looking, using the P/E ratio divided by the growth rate over the past 12 months, such as described in an article on Zacks.

Zacks also uses a forward PE ratio with a forward EPS growth estimate. Let's compare the PEG values from two well-known sources of financial data and see why a poor understanding of how these metrics are calculated can lead to confusion.

DIFFERENT SOURCES, DIFFERENT RESULTS

Yahoo Finance enables users to obtain statistics about most publicly traded stocks. These numbers are sourced from Thomson Reuters and there is little information about how the calculations are performed. The public typically takes these numbers as correct without question. But if you compare the PEG of a sample stock as reported on Yahoo Finance with the PEG for the same stock as reported on Zack's, you may get different numbers.

As an example, I will use the stock Alcoa (AA). On Yahoo Finance, we get a PEG ratio (five-year expected) of 1.50 (as quoted on 3/21/2018).

Meanwhile, Zacks reports a PEG of 1.52 for AA (also quoted on 3/21/2018). The number given by Zacks for EPS growth is 8.62%. With a PE of 41.34, wouldn't the PEG then be 41.34/8.62 = 4.79 on Zacks? However, Zacks uses a forward PE ratio (FPE) in its PEG calculation. The FPE is reported as 13.06, and thus, the calculation would be:

$$PEG = 13.06/8.62 = 1.51$$

Zacks indicates the forward P/E (FPE) is computed by dividing the current market price by the forecasted earnings per share (EPS). An FPE of 13.06 is a rather large departure from the trailing 12-month (TTM) PE ratio 41.34. The Zacks PEG of 1.52 is very close to the Yahoo Finance PEG of 1.50, but neither resource reports the PEG is computed using a forward PE rather than a trailing PE. Alcoa seems like a much better value according to the PEG metric that uses the forward PE than when the PEG uses the trailing PE.

Next I'll look at Finviz.com and the methodology it uses for computing the PEG. Finviz.com publishes several statistics regarding various publicly traded companies. These statistics can be obtained for free (with advertisements) or for a fee (without advertisements). Using the stock screener feature and ticking the appropriate boxes for the data I'm interested in, I got the following set of metrics:

Ticker: AA
Company: Alcoa Corporation
P/E: 37.70
PEG: 4.38
Dividend: -
EPS next 5Y: 8.60%
Price: 47.95

If you calculate the PEG as P/E divided by a forward-looking five-year EPS, you get:

$$PEG = 37.70 / 8.60 = 4.38$$

The computation is clear but the PE ratio of 37.70 is not close to Yahoo's reported PE ratio (41.34). Meanwhile, TD Ameritrade shows the P/E ratio (trailing 12-month or TTM) is 36.54x (with the "x" read as *times*, meaning the stock is trading at 36.54 times its EPS), which is closer to the FINVIZ number than to the Yahoo data. I am encouraged that TD Ameritrade displays the following comment: "Therefore, AA seems highly valued with a PEG value of 4.25x." This is quite close to the FINVIZ computation (and confirms the use of a historical PE with a forward-looking growth metric). Recall that Zacks' PEG was 1.52 and Yahoo's PEG was 1.50, although it's not clear how these numbers were calculated.

E*Trade reports Alcoa with a P/E ratio (TTM) of 36.54x. This matches TD Ameritrade's number. Analyst earnings projections enable a consensus estimate (8.6%) and could enable the computation of the PEG. However, neither TD Ameritrade nor E*Trade explain how they calculate PEG. And E*Trade offers revenue and earnings projections.

WHICH ONE SHOULD YOU USE?

The question of which growth figure to use—earnings growth or revenue growth—remains open. The argument to use revenue growth is that the company may be investing in its own factories, people, or acquisitions. If your focus is on earnings, you could miss fast-growing businesses.

I'll take Amazon.com, Inc. (AMZN) as an example. FINVIZ reports a PEG of 14.39 for AMZN. Yahoo Finance reports a PEG of 7.95. However, if you look at Amazon's projected total revenue out to 2022, you see a projected revenue growth from $166 billion to $356 billion, which is an average 114% growth rate in revenue over a five-year period. I used revenue growth figures from an article on the topic at www.statista.com.

Using a PE of 253, you get a PEG of 253/114 = 2.2—far less lofty. In the case of many fast-growing companies, shareholders expect revenue growth to turn into earnings growth. This accounts for the apparently lofty PEG ratios (since they are based on EPS and not revenue growth).

So the question of which growth metric to use when valuing a company is still open.

WHICH PEG?

From examining several data sources, I found that FINVIZ divides the trailing P/E ratio by the EPS over the next five years to obtain the PEG. By comparison, Yahoo computes the PEG by using *revenue* growth over the next five years, not earnings. As you have seen, this can result in large differences. In the example I gave, you saw the PEG from Yahoo for AMZN was 7.88, yet from FINVIZ it was 14.30. That's a 180% difference!

The saying "consistency is the hobgoblin of small minds"

may sometimes be true, but in this case, there needs to be some consistency in the agreed-upon definitions. For the computation of the PEG, I tend to side with Yahoo on this one—I prefer using revenue (or sales), and not earnings, as the growth figure in PEG. However, investors should select a version of PEG based on its suitability for them as well as its availability to them. For the risk-averse, the figure used could be that of earnings; for everyone else, the PEG used could be based on revenue (sales).

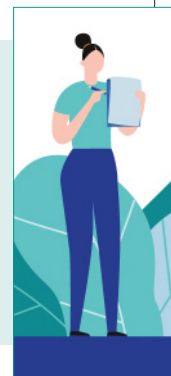And then you'll have something to hang your hat on.

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FURTHER READING

Barnes, Ryan. "PEG Ratio Nails Down Value Stocks," https://www.investopedia.com/articles/analyst/043002.asp, retrieved 3/19/2018.

Lynch, Peter, and John Rothchild [2000]. *One Up On Wall Street*, 2d. ed., Simon & Shuster.

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Smith, Thomas. "How To Find P/E And PEG Ratios," https://www.investopedia.com/articles/fundamental-analysis/09/price-to-earnings-and-growth-ratios.asp, 12/12/2017, retrieved 3/19/2018.

Statista, "Project Total Revenue Of Amazon From 2002 to 2022," https://www.statista.com/statistics/745091/annual-net-revenue-of-amazon/, retrieved 3/22/2018.

Zacks, "About PEG Ratio (TTM)," https://www.zacks.com/stock/chart/AA/fundamental/peg-ratio-ttm, retrieved 3/21/2018.

_____, "Key Earnings Data," https://www.zacks.com/stock/quote/AA, retrieved 3/21/2018.