

On valuation multiples: Types, assumptions and uses

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1 Introduction

Valuation multiples are the essential part of relative valuation. Typically they provide a quick way to estimate a company's value by comparing it to peers. The goal of a multiple is to be a single ratio that identifies the strength of a value driver for similar companies. When we say "similar companies", we mean companies that utilize this value driver to the same degree.

Usually, a metric has the same valuation of the company in the numerator and a metric in the denominator. This indicates that *investors are willing to pay \$ X per unit metric*. The valuation is long-term and the metric is typically short-term as a snapshot (especially in non-traditional cases). This makes valuation with multiples difficult, because it uses assumptions on the future of the companies without stating them (or maybe without being aware of them).

In this text we categorize different contexts and discuss the assumptions behind each multiple. This makes us able to see when a multiple can fail or needs adapting.

2 Equity- and Enterprise Value

When discussing multiples for valuation we often distinguish between enterprise value and equity value multiples. Equity value multiples relate to the market value of a company's equity. The common examples are Price-to-Earnings (P/E), Price-to-Book (P/B), Price-to-Unlevered Cash Flows.

Enterprise value (EV) identifies the total value of a firm when both equity and debt is accounted for. Equity value is often defined as the equity value and net debt. Common EV multiples are EV/EBITDA, EV/EBIT, EV/Sales. The neat thing about these ratios is that they act independent of capital structure. This attributes an additional level of abstraction for these metrics, where we can ignore effects of capital structure to some degree.

It is key to note that the denominators of E and EV multiples should be relevant to the correct stakeholders. When we use a multiple to find the equity value of a company, then the denominator should be a metric that is relevant to the equity holders. In practice, this means that earnings should be interest adjusted for P/E ratios. Likewise, the corresponding multiple for EV is EV/EBIT, where we use the earnings before interest and taxes are subtracted. This makes the denominator relevant to all stakeholders, and not just equity holders. This also means that not every ratio that is possible to construct is meaningful; P/EBITDA is not as meaningful as EV/EBITDA.

3 Equity multiples

Price-to-Earnings (P/E)

The P/E ratio is the most famous valuation multiple. Its definition is: The stock price divided by earnings per share. This equals the firm's market capitalization over the net income. We often interpret this as *an investor is willing to pay \$ X per dollar of present earnings*. The typical range to find a P/E ratio is 15.0 to 30.0.

P/E works best for companies with steady, positive earnings and standard accounting. It is common for mature firms with consistent profitability and payout policy. Using earnings as the denominator metric implies that whenever P/E is a good multiple, then earnings is the greatest driver for value in this industry. Although, an even more common is to use P/E as the cheapest benchmark for a company's value.

Of course, the P/E ratio assumes that current earnings reflect future earnings. Usage implies expectations on growth and cost of capital. If we're applying a ratio from another company (or a set of companies), then we assume that the company we will estimate the equity value of has similar growth rate, accounting and capital structure.

P/E will fail and may be useless in cases where earnings are inconsistent, or not the key driver of value. For young firms and startups earnings will often be negative, and in these cases the ratio is useless. For technology firms, which often have near-zero earnings, P/E ratios are usually high and don't carry as much meaning as they do in matured and stable industries. Also, as is the case with most equity metrics, an unusual leverage ratio will also distort the results from P/E usage. But generally, different P/E ratios for companies implies different expectations of future results.

Price-to-Book (P/B)

The price-to-book ratio divides a company's market cap by the value of the equity on the balance sheet. It's interpreted as a measure of how much an investor is willing to pay for each dollar of a firm's net assets. This multiple has deeper meaning in industries where assets are realistically valued on the balance sheet and where asset value is a driver of earnings. Banking and financial institutions are examples of this. Although, some asset-heavy institutions like real-estate also have other ratios that are useful.

We typically find P/B ratios between 1 and 3. Then we can categorize companies with book ratios below 1 as undervalued and companies with ratios above 3 as overvalued. A company with ratio below 1 may also need strategic renovation. Note that these principles are only reliable in relevant industries, as explained above. Companies with intangible assets or companies that use different accounting practices will give misleading results with this analysis. For example, technology firms typically have very low book values. Software, patents, research, human capital, etc. are intangible and their book value will not reflect their effect on future earnings. Even if assets are tangible, if they are old and they are not marked to market or adjusted and may have appreciated (or depreciated), then their book value will only reflect their acquisition cost, and may be misleading.

Therefore, we often say that Price-to-book is one of the most industry sensitive multiples there is, but when applied correctly it is very indicative.

Price-to-Sales (P/S)

Price-to-Sales is the market cap divided by the value of the annual sales. It is interpreted such that investors are willing to pay \$ X per dollar of sales revenue. This multiple is important when valuing companies that are increasing their annual revenues, but may not be profitable. Typically, this includes startups, high-growth firms and tech companies; most of these have earnings next-to-none. Likewise, it can be used in industries with slim profit margins, like airlines or the restaurant business. For tech-companies where P/S have been the standard to value them for years, it usually makes headline news whenever they are profitable for the first time, like with Spotify last year.

P/S assumes that sales will translate into profits later on. This is a strong assumption about the future, and has been followed closely when valuing the tech industry for the past 20 years. Therefore, it should be recognized that sales are mostly useful when earnings are not. This should be important to remember.

On the other hand, whenever P/S is indicative in industries with low profit margins, then those industries often have uniform and low debt levels. This means that, given that P/S is useful in an industry, it will less often fail due to different leverage differences. To compare, P/E is much more often applied in leverage-sensitive cases than P/S is.

Price-to-Cash-Flow (P/CF)

Price-to-Cash-Flow is not applied as often as the ones we've already discussed. It is often defined as the market cap over the operating cash flow or free cash flow. The idea is that cash flows may reflect the actual operations of a company instead of the earnings that are accounted, as they may be misleading when discussing the health of a business. Personally, I have neither used or studied it before, but apparently some prefer it to P/E as earnings might have to follow accounting rules and non-monetary expenses and depreciation. The philosophy is identified by the fact that ultimately "cash is king".

This is expected to be useful in cash-intensive businesses, where accounting practices might obscure the state of actual operations. A fun example, though not relevant to most investors, are elite football clubs. Here accounting treatment downplays the effects of cash flows greatly, and non-cash expenses are large and volatile. Though, this volatility is exactly what may make P/CF hard to apply, so it should be used with care.

Price-to-earnings-growth (PEG)

PEG is the multiple defined by $(P/E) / (\text{EPS growth rate})$. We interpret this is the value relative to growth, where 1 is expected to be a fair trade-off, and a higher PEG represents a overprices P/E ratio, as the earnings won't grow and the P/E ratio is high. Therefore, for many PEG is a popular multiple for growth stocks. Some view it as a way to evaluate the different life stages of companies. This may act as an explanatory variable for the P/E. Furthermore, the PEG ratio is one of the ratios with the least mathematical basis. It carries a lot of assumptions; naming them all would almost

be moot. But all of these assumptions often makes the ratio a colloquially good-enough measure, that is actually somewhat flexible.

On another note, PEG is also unique in the way where we don't compare ratios to solve for a new value, but rather a ratio that can generally tell us whether the company is under- or overvalued.

4 Enterprise Value multiples

EV/EBITDA

EV/EBITDA is a common multiple for valuation. It is calculated as the Enterprise value over the earnings before interest, taxes, depreciation and amortization. EBITDA is often interpreted as a proxy for the operating cash flow to all capital. The benefit of this multiple is somewhat equivalent to what we discussed for P/CF, as it is viewed to be independent of accounting practices. This multiple often ranges from 5.0x to 20.0x for standard companies.

It is often used to evaluate firms when the leverage and depreciation practices are deemed irrelevant to the operations. This assumes that the goal of the firm is to maximize ROIC. This is therefore often viewed as a measure of operating strategy, and therefore adequate for comparability.

However, too heavy reliance on references to EBITDA might obscure the actual health of a business. Anecdotally, Warren Buffet once remarked that in acquisitions companies who only refer to EBITDA are often trying to hide something like large CapEx-es or similar. Remember, this is the main problem that CF multiples are trying to solve: differences in accounting practices; especially in illiquid situations.

Though, EBITDA may fail in some cases. For example, EBITDA multiples will struggle when two firms have very different capital intensities and they are a main value driver for one of them. Then EV/EBIT will be more suited (see below).

Another situation where EV/EBITDA will fail is for R&D heavy industries, like (especially for) pharmaceuticals. This is often important to remember when discussing EBITDA. In firms where main costs and main value drivers for the future are expensed as operating costs, the EBITDA will be lower than actual operations. The same goes for the R&D costs in the tech industry, and for industries where customer acquisition and marketing is a value driver. This explains the main assumption and use cases for EV/EBITDA.

EV/EBIT

EV/EBIT is very similar to EV/EBITDA, but it includes depreciation and amortization of assets. In other words, the use of capitalized assets are added as a cost. This will make the denominator smaller, and therefore the range of the EV/EBIT multiple will be slightly higher than for EBITDA.

The rules for using EV/EBIT is very similar to those of EV/EBITDA. This multiple is more immune to differing accounting practices than EV/EBITDA in terms of depreciation and amortization. Likewise, when comparing firms with different capital intensities then EBITDA will not be suitable. As an example, if we are studying the energy sector and we are comparing the multiples of an energy consultancy and an energy transportation company, then the DA for the former will be close to 0, but not for the latter. Therefore the transportation company will look undervalued if we compare on the basis of EV/EBITDA. We will get a more suitable comparison between these two companies (which are in the same sector) if we use EV/EBIT. This points to an assumption of EBITDA multiples, in that they assume comparable CapEx, which EV/EBIT does not.

But the points made above also shows a weakness of EBIT multiples. This is that EBIT has the potential for being volatile in many companies. For an energy transportation company it may be fine because CapEx will occur at regular predictable intervals due to wear and tear of equipment. This will not be the case for many other subsectors in the energy sector (to continue with our ongoing example). A power producer will not have regular CapEx investments each year, so even if a transportation company and a power producer are equally capital intensive, the power producers unpredictable investment schedule will not make these companies comparable. This may distort the long-time value reflected by the multiple. This ties back into the benefit of using EBITDA. This is a pattern we see.

Likewise, an issue with using EBIT multiples is for the case of using two companies with different interest or tax rates. Then the EBIT will make the company with the higher rates look undervalued.

EV/Sales

EV/Sales is also often called EV/Revenue. This is the enterprise-value analog of the P/S multiple. Like we discussed with the price to sales ratio this is most useful for currently non-profitable companies. Again, we assume that high revenues will translate into profits later on, of course. Therefore the main usecase is for companies which does not have matured income statements. The main advantage of this enterprise value multiple is that it allows for more flexibility when comparing companies with different capital structures as it handles leverage well, for which the P/S multiple will fail to value. Therefore it will also be better applied to companies in financial distress. It is the multiple this far that handles distress best. As with the P/S multiple, this is mainly a last-resort valuation. We use it when we can find a reason not to use any of the above-mentioned methods.

EV/Free Cash Flow (EV/FCF)

Enterprise Value to Free Cash Flow is the last of the mainstream multiples we will analyze. First of all, EV/FCF places the free cash flow in the denominator. This is the the cash flow generated after taking CapEx into account. If we invert the multiple we get what is called the FCF yield. Cash flow multiples are most useful for mature companies where the free cash flows are not expected to change from year to year. If they did, then the multiple would not return a stable valuation, which is undesirable.

Therefore, it is useful for companies which adhere to a specific accounting practice, where some investments are included in EBITDA. This is true for some energy and infrastructure companies, where maintenance investments are handled that way.

Another benefit with Free Cash Flow is that it ignores tax, and interest rate differences. Therefore, if a company has the opportunity to change those rates it makes it possible to value the change quite easily. These rates can be changed in many ways: by refinancing, renegotiation, issuing equity to pay off the debt, or by utilizing tax incentives in the relevant country. This makes it quite useful in a specific scenario.

The assumption, like for any other multiple is that the denominator, free cash flow in this case, remains somewhat constant. It should always be representative of the expected future cash flow. This is a tough assumption though, as FCF is known to be volatile due to irregular CapEx being very common. This is why energy companies had particularly well-suited accounting practices.

In summary, it is a useful metric for many situations, but its specifications makes it rather uncommon compared to many other metrics; retail investors will rarely see it referenced.

5 Specialized multiples

For O&G producers (EV/Resource)

Industries with companies like the oil and gas producers and mining companies may often use Enterprise value per unit resource as a multiple (Often phrased as EV/Reserves). For an oil company this is Enterprise value per barrel of oil in the ground. This makes it very easy to value natural resource driven companies only by the amount of resource they have available. Given that they operate efficiently, have similar costs, produce products of similar value and have similar capital structures this will approach a valuation for a company. Although this does not always reflect reality. For argument's sake, lets compare Norwegian company Equinor and an American company, say Chevron. Equinor produces oil offshore, while Chevron may produce it much cheaper with techniques like fracking. This will mean that Chevron should have much cheaper COGS (or similar label) because of a cheaper production method than offshore drilling. On another note, they do not sell oil of the same quality. Generally, Equinor sells Brent Crude while Chevron sells WTI. Brent crude sells at a premium due to higher quality; this premium is \$7 at time of writing (\$67.70 for BRrnt Crude and \$60.46 for WTI). This also weakens the comparability between the companies based on reserve size.

For Utilitiets and Services (EV/User)

This is a very common metric for utility companies, or other services whose business model is based on subscriber revenues. Other industries that work in the same way is Telecom and Software software companies. This valuation works surprisingly well because the main asset of these types of companies are the users. Especially for startups

and social media companies, the users are the main value driver, and the higher the LTV and the customer loyalty in a given industry, the higher and more meaningful will the EV/User multiple be. A similar metric might also be EV/Engagement. Within software this might be EV/API-usage. In subscription based companies that experience high growth (especially in SaaS) it is also common to reference EV/Annual recurring revenue.

For insurance

As we explained above, for financial institutions P/B ratio is the most common quote and primary metric. However, there are some edge cases where we want to exclude some assets from the book. An example is Price to Tangible Book, where tangible book excludes written goodwill on the assets in a portfolio. We may also see Price to Embedded Value where Embedded value = Present Value of Future Profits (PVFP) + Adjusted Net Asset Value (ANAV).

EV/EBITDAR

This multiple means Enterprise value over Earnings before interest, taxes, depreciation, amortization, and rent. From what I can gather this one mostly used historically. The rent cost represents assets which are leased. In modern industries this is very relevant for retail companies and airlines, who lease locations and airplanes respectively. The reason why we may want to value without considering rent is to compare companies on the basis of EBITDA (and the benefits that comes with that comparison), when one of the companies leases while the other owns.

For Real Estate (P/FFO)

Real Estate Investment Trusts depreciate their assets more than other industries does, and this understates their earnings compared to what equity will receive. FFO, or Funds from Operations remedy this by adding back real estate depreciation. For companies where real estate is a value driver them P/FFO is the P/E equivalent.

For Cyclical multiples

We've already discussed how some multiples might be more cyclical than others. Thus far, it has mainly been due to CapEx varying over a large time-frame, but there are other reasons earnings might be cyclical. An important reason is that a sector might be cyclical in and of itself. For companies in such sectors a single multiple representing the earnings or revenue of a single year would be misleading. Therefore we can utilize normalized earnings, which use a moving average instead of a single snapshot. Therefore, when valuing a company you have to be aware of the cyclic attributes of the relevant sector.