

BSVI - Finance Guide

Topics discussed:

- Pre-valuation analysis
- Absolute and relative valuation tools
- The discounted cash flow model
- Multiple Analysis

PRE-VALUATION ANALYSIS

Before starting any attempt to estimate the value of a company, it is crucial to perfectly understand the nature of the business, how it creates cash, which are its main customers, its recent history and performance. Acquiring this knowledge will allow you to develop a profound understanding of the business, improving the ability to predict how it will perform in the future and assessing more precise outcomes. Moreover, understanding the specific characteristics of the company will allow for a more punctual identification of its comparable business, something which will be crucial to perform a **multiple analysis**.

What to look for when analyzing a company strategy, business segments and industry?

When an analyst approaches a company for the first time it is essential for them to understand what the firm day to day business looks like, the industry it is in, its competitors and growth drivers. The Sector&Strategy division will certainly provide many useful information, it is however also suggested to briefly read the company annual reports, recent 10-K(for US company listed in the US) or 20-F(for non-US companies listed in the US) SEC filings. All those files can be found in the investor relations page of the company website. Here you will also find many other resources which might be useful for your analysis.

What to look for when analyzing financial statements?

Given that to evaluate a company it is necessary to forecast future earnings, revenue and possibly other statistics, it is essential to gain a profound

understanding of how the company has evolved during recent years. Noticing various trends in revenues, profits or margins growth, but also whether working capitals increased more or less proportionally than revenue and whether PPE (property plant and equipment) increased or decreased along with revenues. In general, understanding the path the company followed in recent years allows analysts and investors to become more confident in forecasting and projecting future results. Most of those trends will be underlined by the FSA division, which will be of great help to the finance one, however, to succeed in conducting a precise valuation it is essential that the analyst gains themselves a profound knowledge of how the company performed and how it might perform in the future.

DIFFERENT VALUATION METHODS

After having gained a deep understanding of how the company works and its financials, it is necessary to assess which valuation methods to use, so that we can find the intrinsic value and disguise whether the company is overvalued or undervalued. There are several tools which allow us to discern the fair value of a business, however they are mostly divided into two different categories **absolute and relative methods**. Absolute valuation tools determine a stock fair price from its fundamentals, while relative valuation tools do so by comparing the business to similar ones, looking at whether the stock is more or less expensive compared to its peers. By using this method, during market craziness a stock can look cheap in comparison with its peers, but being expensive in absolute terms and therefore prone to a crash whenever the market craziness vanishes. On the other hand however, running an absolute valuation tool is more complicated and requires projecting and estimating different financial measures. Making mistakes is simple and this could lead to a misvaluation. To sum up, a relative valuation tool alone can't be of much help, but if used with an absolute valuation tool can help us double check whether our model was based on the correct assumption. In this guide we will therefore explain both

the DCF model and the multiple analysis, respectively an absolute and relative valuation tool.

DISCOUNTED CASH FLOW MODEL

The rationale behind the discounted cash flow (DCF) model is that a company is worth the **sum of all the future cashflows discounted at the present value.**

FREE CASH FLOW

What is free cash flow(FCF)?

What is always used when running a discounted cash flow model is the free cash flow, which is a measure of profitability and given that it removes all non cash items, it is tougher to manipulate. It is in fact computed starting from EBIT, subtracting the taxes at the **marginal tax rate**, then adding Depreciation and Amortization, subtracting Capex(Capital Expenditures) and finally subtracting the change in NWC(net working capital), which is the difference between a company's current assets and its current liabilities.

FREE CASH FLOW COMPUTATION

	EBIT
×	(1- marginal tax rate)
=	NOPAT or EBIAT
+	Depreciation and amortization
-	Capital Expenditures
-	Change in Net Working Capital
=	FREE CASH FLOW

Why the marginal tax rate?

Most times, companies' financial data published to investors and the one on which they based their tax payments are completely different. In fact, when presenting the two data goals are the opposite, on one hand they want to show high profits to investors, while on the other hand they prefer to have the lowest net income possible so that they need to pay less taxes. For this reason, the tax rate shown or publicly available financial statements

THE DISCOUNT RATE

The discount rate is an essential part of the valuation tool, in fact it is used to discount all cash flows at the present value.

The appropriate rate to use is the cost of capital, which is the cost of financing for the firm, the most common way to compute it is the WACC (weighted average cost of capital), where the cost of capital is the average between cost of debt and cost of equity weighted by the debt to equity ratio(D/E) of the firm.

$$WACC = \frac{D}{D+E} \times K_d + \frac{E}{D+E} K_e$$

Beta

In this section we will be explore what the beta is, so that it can be used later on to compute the cost of equity. The Beta is a financial coefficient which indicates how an asset moves with respect to the market. Beta is a concept that measures the expected move in a stock relative to movements in the overall market. A beta greater than 1.0 suggests that the stock is more volatile than the broader market, while a beta less than 1.0 indicates a stock with lower volatility. The Beta can in fact be computed as the ratio between the covariance of the asset and the market and the variance of the asset. It is worth mentioning that probably the fastest way to compute the beta is by using excel and downloading markets' and assets' data from Yahoo Finance. Moreover, both Bloomberg terminal and Refinitiv provide data regarding Beta for most of the stocks on the market.

$$\beta = \frac{Cov(r_b, r_a)}{Var(r_b)}$$

The cost of equity

The most common way to compute the cost of equity is using the CAPM (capital assets pricing model), according to which the cost of equity (K_e) is the sum of the risk-free rate(r_f) and the product between the risk premia ($r_m - r_f$) and the Beta. While the risk-free rate commonly used is the ten-year yield of the country taken into account, the risk premium($r_m - r_f$) can be

derived by analyzing historical data. Luckily for us, one of the greatest value investors and Stern's University's professor, Aswath Damodaran, calculate the Equity risk premium data for basically all countries on earth at: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

$$K_e = r_f + \beta \times (r_m - r_f)$$

The cost of debt (K_d)

The cost of debt is an opportunity cost, and it measures the rate of return that is deemed acceptable by the holders of the firm debt, counterpart of risks such as defaults or inability of the firm to thoroughly fulfill its obligation. It expresses the costs that a firm must bear to finance new investments with debt. The computation of this rate depends on different assumption such as the financial equilibrium of the firm and stable macroeconomic prospects.

We can use different methods to calculate the cost of debt, the most used are the following:

- **Yields to maturity (YTM) on listed bonds:** If the company has different bonds, we can make a weighted- average YTM on the analyzed company's bonds. If we don't have the YTM of our specific bonds, we can take this value from bonds with a comparable rating.
- **Model based on rating:** according to this method the cost of debt is the sum of the base rate (R_f) and the spread. The first is expressed by the current return on long term risk-free investments, chosen regarding geographic location and accessible opportunities of the firm. The second, also known as risk premium, is defined by industry, geographical location and rating which allow us to create different bands of spread. To compute this value, we can use the spread calculator offered by Damodaran which considers the opinions of the two main rating agencies and the EBIT/Interests ratio.

EBIT/interests ratio range	Moody's rating	S&P rating	Spread
lower than 0.5	D2	D	14.0%
0.5-0.8	C2	C	10.5%
0.8-1.2	Ca2	CC	8.0%
1.3-1.5	Caa	CCC	6.5%
1.5-2	B3	B-	5.5%
2-2.5	B2	B	4.5%
2.5-3	B1	B+	3.8%
3-3.5	Ba2	BB	3.0%
3.5-4	Ba1	BB+	2.5%
4-4.5	Baa2	BBB	1.6%
4.5-6	A3	A-	1.3%
6-7.5	A2	A	1.1%
7.5-9.5	A1	A+	1.0%
9.5-12.5	Aa2	AA	0.8%
above 12.5	Aaa	AAA	0.6%

$$K_d = R_f + SPREAD$$

- **Contractual:** weighted average contractual interest rate for each type of debt (used for small-medium companies)
- **Accounting/Effective interest rate:** according to this method the cost of debt is equal to the effective interest rates reported in the Income Statement divided by the Total Debt.

$$K_d = \frac{INTERESTS}{DEBT}$$

FORCASTING FREE CASH FLOW

As mentioned above, according to the discounted cash flow model a business' intrinsic value is equal to the sum of the present value of all its future cash flow. Therefore, it would be necessary to forecast all cash flows occurring from the date of the valuation to when the business ceased to exist.

Forecasting what predictable

To avoid forecasting all future cash flows, most textbooks usually suggest to project FCF to a point in the future when the company financial performance reaches a steady state. For financial analyst this usually means around **5 years**, a time span during which allows businesses to go over an entire business cycle and for the realization of in process or planned initiatives.

Instead, **Value Investors** many times opt for longer time spans, commonly **10 years**. This is done, because before markets quit being irrational and go back to sanity, revaluing the acquired stock properly it can take long periods. Moreover, in other occasions, value investors can decide to invest in a company because the market is pricing current events too heavily and not seeing the end of a downturn, there is therefore need to wait a long time before being able to collect the desired gains.

Consideration for projecting FCF

Determining what free cash flow will be in future years is undoubtedly one of the most difficult part of the discounted cash flow model. In fact, while for the modelling side it is easier to learn the process, projecting FCF is more of an art and requires a lot of past experience and expertise. Firstly it is definitely helpful to look for **historical performance**, however there is no guarantee that they will repeat in the future. It is important to oversee how a company behaved during a full business cycle and during crisis. Being optimistic when projecting FCF is strongly not advised, instead it is better to be conservative, this way even if things don't turn out as well as we hoped, the investment will deliver a decent return. For instance if you are projecting FCF for the next ten years, it is probable that the economy will incur at least a mild recession and it must therefore be included in the projections. It is also important to look out for analyst forecast, which can be found easily on Yahoo finance, but also on Bloomberg or Refinitiv. For most companies, analyst are usually excessively optimistic and Value Investors need to bear this in mind, however looking at their projections definitely gives a general idea of where the company is headed.

In order to balance between conservatism and optimism analyst many times have different forecasts, a base case a worse case and a best case, so that we can have a range of valuation. Understanding companies performance drivers, such as customer strength, the completion of a new plant, strong dependency on certain customers or sector trends.

In order to project any financial measure it is essential to determine revenue growth. While profitability measures depend a lot on the single company, sector trends and different growth drivers can send strong signal of what revenues will do in the next years.

Moreover, industry reports and consulting studies can definitely be helpful. COGS (cost of sales) and SG&A (Selling General and Administrative expenses) are estimated as a percentage of revenues, using historical data from the most recent years. It is however of extreme importance that banker find out whether the company had extremely high gross margins for a certain year and therefore avoid using it in the forecasts. For instance this is what happened with tech companies in 2020 and 2021, in this case when running a DCF it was appropriate to use as a growth margin number which is was a middle way between the 2020 and 2019 data. To project free cash flow it is instead essential to start from EBIT and EBITDA. In this case consensus estimates can be used for the first two or three years if available, after that it is common to hold EBIT and EBITDA margins constant, however they can still be momentarily reduced or increased to align them with a full business cycle performance. After determining EBIT, all the component of the FCF computation needs to be determined so that cash flow can be adequately projected, we will explain how to project each single line item here below:

- **The tax rate** can be easily projected using the marginal tax rate, which can be found in the company annual report, in the US it is common to use a 25% for modelling purposes. The effective tax rate can also serve as a reference point.
- **Depreciation** are scheduled over several years corresponding to the useful life of each of the company's respective asset classes. Depreciation can therefore be projected as percentage of sales or capex. Building a PP&E schedule based on company's existing depreciable and future capex projections or also the company specific assets. Watching the following video, you will be able to understand how different financial statements and especially PP&E and depreciation (from minute 16:00) are linked together, this will definitely help improving your modeling skill. Here it is: <https://www.youtube.com/watch?v=VOrQieAbihw&t=30s>
- **Amortization** instead it reduces the values of definite life intangible assets. Again amortization can be projected as a percentage of sales or by building a detailed schedule upon a company's existing

intangible assets. In general it is common to forecast D&A together.

- **Change in Net working capital (NWC).** While forecasting NWC as a percentage of revenues might work it is strongly suggested to forecast current assets and liabilities components, on the basis of historical ratio, historical performance and management guidance (mainly from earnings calls 10-Q or 10-K). In particular, capital efficiency ratios as DSO DIH DPO and Inventory turnover can all signal where NWC components are headed. For instance, accounts receivable are projected on the basis of DSO, while Inventory on DIH and accounts payable on DPO.

The terminal value (TV)

After having forecasted the first five or ten years it is necessary to find a way to determine the discounted value of all cash flows after that date.

In order to do that it is sufficient to determine the value of the business at that point in time and discount it to the present, this is called Terminal value as it represents the value of the company at the point in time during which we terminate to forecast cash flows. In order to do so there are two possible approaches listed here below:

- **The Perpetuity growth method**, which assumes that after the business reached its financial steady state, it will grow at a fixed rate for ever. This rate of growth is usually low and can lie between **2.5 and 3.5 per cent**, depending mostly on macroeconomic factor such as GDP growth. The formula to calculate the present value of a perpetually growing cash flow can be found starting from the cash flow at period n , the one at which terminal value is calculated. The formula here below assumes g being the perpetual rate of growth and WACC being the discount rate computed.

$$\frac{FCFn \times (1 + g)}{(WACC - g)}$$

- **The exit multiple method**, which consists in computing the Terminal Value by multiplying a financial metrics by a multiple which allows to discern the Enterprise Value or the Equity Value. In

Investment Banking the most used is the EV/EBITDA (Enterprise Value over EBITDA) multiple. Therefore, by forecasting EBITDA (earnings before interest taxes depreciation and amortization, one of the most common metrics used in finance) until the final year of projections and then multiplying it by the multiple to obtain the Enterprise Value. When considering the world of investing it is however worth mentioning the importance of the P/E (price to earnings) ratio, which is probably the dominant ratio used when talking about financial markets. In case the P/E is used it is however essential to forecast the net income and then multiply it by the P/E multiple to compute the TV.

The latter ratio for many companies can be found on most financial websites, including for instance Yahoo Finance. The EV/EBITDA multiple instead is less common to find and can be found mostly on pay-to-access platforms as Capital IQ, Bloomberg (accessible at the Bocconi library) or Refinitiv (to which BSVI supervisors have remote access) which are widely available to investment banks. Moreover, professor Damodaran published a list of the average EV/EBITDA multiple in different industries at this link: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/vebitda.html

It is strongly suggested to our members to gain an understanding on what values those multiples usually take on, so that when estimating the one for the target company, a more accurate one will be chosen, leading to a better and precise valuation. When deciding the multiple to apply for the selected company it is crucial to look at what were the historical multiples for companies similar to the target at the valuation end period, with regard to size, margins, industry and growth expectation. When mentioning historical multiples, I did so because in case a relative valuation tool as the multiples method is used it is common to overvalue a companies because others are overvalued. If instead, the analyst or investor looks at how multiples moved historically for similar company, it is

easier but not easy to better understand which multiple values the company correctly.

$$TV = \text{Financial Metric} \times \text{Trading Multiple}$$

DISCOUNTING THE CASH FLOWS

After having projected all the cash flows and computed the terminal values on Excel we will have a table like the one below, therefore it is then necessary to discount each year cash flow with to the present value and then sum all of them together.

When discounting the cash flows, It is common to use the discount factor, a value equal to 1 over the sum between one and the discount rate powered to the number of years for which you need to discount. The discount factor multiplied by the cash flows gives us the present value of those cash flows. By summing all the discounted cash flows we obtain the **Enterprise Value** of the business as shown below.

DETERMINING THE BUY PRICE

As the most attentive reader probably noted, from the discounted cash flow model we do not obtain neither the market cap nor the share price, but the Enterprise Value. How do we therefore determine whether the stock is overvalued or undervalued?

DISCOUNTED CASH FLOW MODEL						
Year	2022	2023	2024	2025	2026	Terminal Value
FCFF	¥10.847	¥11.932	¥13.125	¥14.437	¥15.881	¥ 718.108
Disc. Rate	1,06	1,13	1,20	1,28	1,36	1,36
Discounted FCFF	¥10.204	¥10.559	¥10.928	¥11.306	¥11.703	¥ 529.188
ENTERPRISE VALUE						¥ 583.889

What is Enterprise Value?

Enterprise Value tells us how much money it would be needed to buy a company. This is considered a more accurate representation of a firm value than the market cap or equity value. The Enterprise Value is in fact computed starting from the equity value, adding net debt, the difference between total debt and cash

and cash equivalents, then adding Preferred Stock (which is treated as debt, given that in the event of an acquisition it is repaid by the acquirer) and Noncontrolling interest (any minority stake the target has, which produces cash flows but can be sold if we are solely interested in the business itself).

From EV to the stock price

From the formula mentioned in the previous paragraph it is easy to understand how to compute the Equity Value starting from the Enterprise Value. Once the Equity value or Market cap is calculated it is just necessary to divide it by the number of shares, which can be easily found in the most recent 10-Q a quarterly report, to the number of stocks it is also important to add in the money stock options, which will be exercised by their owners.

Margin of safety (MOS)

An important concept in Value Investing is Margin of Safety. Value investors usually prefer to buy a security when its stock price is below the fair price. To add a margin of uncertainty to the projections made and to minimize losses it is therefore used a Margin of safety, which is the discount from the fair price the investor believes necessary in order to minimize losses and risks. The Margin of Safety can depend on the uncertainty of the projections, underlying risk in the business or also the mere lack knowledge and experience with regard to a specific sector. Normally used margins of safety are in the range of 20%-30%. If a company carries significant risks, maybe liabilities in their balance sheets or the fact that the company is at an early stage of growth, investors can also opt for margins of safety of around 50%.

$$\text{Target price} = \text{Fair value} \times \text{MOS}$$

MULTIPLES ANALYSIS

The multiples approach is a comparable analysis or relative valuation method that seeks to evaluate similar companies using the same standardized financial metrics under the assumption that these metrics remain stable within companies with similar firm size, industry, and profitability. Due to this assumption, the selection of the group of comparable companies plays a crucial role in the success of a multiple analysis.

How to choose comparable companies?

A comparable firm is one with **cash flows**, **growth potential**, and **risk** similar to the firm being valued. The implicit assumption being made here is that firms in the same **sector** and **geographic location** are similar in these aspects and therefore can be compared with much more legitimacy. Our definition of comparable company can be broader or stricter depending on the case, nevertheless we need to take into account that the efficiency that derives from a stricter definition, in most of the cases, bring to an extremely small pool of companies.

No matter how carefully you construct your list of comparable firms, you will end up with firms that are different from the firm you are valuing. The differences may be small on some variables and large on others, and you will have to control for these differences in a relative valuation. We can face this problem in three different ways:

- **Modified Multiples:** in this approach, you modify the multiple to take into account the most important variables that create differences among the companies in our pool. These modified ratios are then compared across companies in a sector. One example of this application could be turning the PE into the PEG, as explained below, implementing the growth dimension inside the PE ratio. Doing so we can use a ratio with the same properties of the PE ratio, but we can simultaneously take into account differences in the growth ratio.
- **Subjective Adjustments:** the multiple is calculated for each of the comparable firms, regardless of these small differences, and the average is computed. To evaluate an individual firm, you then compare the

multiple it trades at to the average computed; if it is significantly different, you make a subjective judgment about whether the firm's individual characteristics (growth, risk, or cash flows) may explain the difference.

- **Sector Regressions:** this approach is typically used when firms differ in different dimensions, situation in which it becomes difficult to modify the multiple to account for the differences across firms. In this scenario we run a regression of the multiple against the variables and then use this regression to find the predicted value for each firm. This approach works reasonably well when the number of comparable firms is large and the relationship between the multiple and the variables is stable. When these conditions do not hold, a few outliers can cause the coefficients to change dramatically and make the predictions much less reliable.

Market Regressions:

Searching for comparable firms within the sector in which a firm operates is fairly restrictive, especially when there are relatively few firms in the sector or when a firm operates in more than one sector.

Based on the variables that determine each multiple, you should be able to regress any multiple (PE, EV/EBITDA, P/B...) against the variables, using all of the firms in the market in your sample. You can then use the market regression to get predicted values for individual companies. A company that trades at a PE ratio lower (higher) than the predicted PE from the market regression is undervalued (over valued) relative to the market. By looking at all firms in the market, this approach allows you to make more meaningful comparisons of firms that operate in industries with relatively few firms.

What is a multiple?

A multiple summarizes in a single number the relationship between the market value of a company's stock (or of its total capital) and some fundamental quantity, such as earnings, sales, or book value. We can distinguish two main categories of multiples used in such analysis: **Equity Multiples** and **Enterprise Value Multiples**.

The first ones are ratios of a stock's market price to some measure of fundamental value per share. The second ones, by contrast, relate the total market value of all sources of a company's capital to a measure of fundamental value for the entire company.

Equity multiples can be artificially impacted by a change in capital structure, even when there is no change in enterprise value (EV). Since enterprise value multiples allow for direct comparison of different firms, regardless of capital structure, they are said to be better valuation models than equity multiples. Additionally, enterprise valuation multiples are typically less affected by accounting differences since the denominator is computed higher up on the income statement. However, equity multiples are more commonly used by investors because they can be calculated easily and are readily available via most financial websites and newspapers.

EQUITY MULTIPLES:

Price/Earnings Ratio (PE)

P/E ratios are used by investors and analysts to determine the relative value of a company's shares in an apples-to-apples comparison. It can also be used to compare a company against its own historical record or to compare aggregate markets against one another or over time. Sometimes, analysts are interested in long-term valuation trends and consider the P/E 10 or P/E 30 measures, which average the past 10 or past 30 years of earnings, respectively. Doing so we can compensate the effects of business cycles.

$$PE \text{ Ratio} = \frac{\text{Price}}{EPS}$$

The P/E ratio helps one determine whether a stock is overvalued or undervalued, for that reason it plays a crucial role in Value Investing strategies.

For example, if we compare two identical companies that differ only in their P/E ratio we can say that the one with the higher P/E is overvalued in relation to the other.

In essence, the price-to-earnings ratio indicates the dollar amount an investor can expect to invest in a company in order to receive \$1 of that company's earnings.

A high P/E often suggests that investors are expecting higher earnings growth in the future compared to companies with a lower P/E. A low P/E can indicate either that a company may currently be undervalued or that the company is doing exceptionally well relative to its past trends.

When a company has no earnings or is posting losses, in both cases, the P/E will be expressed as N/A and it loses its meaning in the context of a valuation. Another limitation, present in most of the multiples, is the difficulty in finding similar firms to compare. Valuations and growth rates of companies may often vary wildly between sectors due to both the different ways companies earn money and the differing timelines during which companies earn that money.

Price/Earnings to Growth Ratio (PEG)

The PEG ratio is used to determine a stock's value while also factoring in the company's expected earnings growth, and it is thought to provide a more complete picture than the more standard P/E ratio.

In order to find the EPS growth rate, we can use different approaches:

- Historical forecast using an average of past years growth rate.
- Analysts estimates available on financial tools such as Bloomberg or Refinitiv.
- Using the product of ROE and Plowback ratio as an estimate of this growth rate, where the plowback ratio is calculated subtracting common and preferred dividends from net income, and then dividing this difference by net income. This last method assumes that the growth rate strictly derives from earnings that are not distributed to shareholders, but reinvested in the company.

$$PEG \text{ Ratio} = \frac{PRICE/EPS}{EPS \text{ Growth}}$$

Price to Book Value (P/B)

Price-to-book value (P/B) is the ratio of the market value of a company's shares (share price) over its book value of equity. The book value of equity, in turn, is the value of a company's assets expressed on the balance sheet. The book value is defined as the difference between the book value of assets and the book value of liabilities.

Investors use the price-to-book value to gauge whether a stock is valued properly.

The assumption under this approach is the following: when someone pays the market price for stocks of a specific firm, he is buying a percentage of this firm assets; discrepancies between the price paid and the book value of these assets create condition for over/under valuation.

A P/B ratio of one means that the stock price is trading in line with the book value of the company. In other words, the stock price would be considered fairly valued, strictly from a P/B standpoint.

A company with a **high P/B** ratio could mean the stock price is overvalued. A high share price versus asset value could also mean the company is earning a high ROA. However, the high stock price could indicate that most of the goods news regarding the company has already been priced into the stock. As a result, any additional good news might not lead to a higher stock price.

A company with a **low P/B** could be considered undervalued, which means that the stock price is trading at a lower price relative to the value of the company's assets. Conversely, market participants might believe that the company's values are overstated. If the company has overvalued assets, investors would likely avoid the company's shares because there is a chance that asset value will face a downward correction by the market, leaving investors with negative returns. A low P/B ratio could also mean

the company is earning a very poor (even negative) return on its assets (ROA). If the company has poor earnings performance, there is a chance that new management or new business conditions will prompt a turnaround in prospects and give strong positive returns

In any case the P/B ratio should be compared with companies within the same sector. The ratio is higher for some industries than others. So, it's important to compare it to companies with a similar makeup of assets and liabilities.

$$P/B = \frac{\text{market price}/S}{\text{book value}/S}$$

Price to Sales Ratio (P/S)

The price-to-sales ratio is a valuation tool that compares a company's stock price to its revenues. It is an indicator of the value that financial markets have placed on each dollar of a company's sales or revenues. It can be calculated either by dividing the company's market capitalization by its total sales over a designated period (usually twelve months) or on a per-share basis by dividing the stock price by sales per share. Like most of the ratios that we have seen up to this point, The P/S ratio is not much useful if took alone, for that reason we asses its relevance in relation to the one of other comparable companies in our pool. A low ratio, in relation to its industry average, may indicate that the stock is undervalued, while a ratio that is significantly above the average may suggest overvaluation.

One limit of this multiple is that the P/S ratio doesn't consider whether the company makes any earnings or whether it will ever make earnings. For that reason, with this multiple in particular we have to be sure about the homogeneity of the industries in which the companies we are comparing operate, due to the fact that firms in different industries often have different degrees of profitability, which is not measured by this simple ratio. In addition, P/S ratios do not account for debt loads or the status of a company's balance sheet; to avoid this problem we can use the EV/SALES multiple, which is discussed below.

$$P/S = \frac{\text{Market Cap}}{\text{Total Sales}}$$

ENTERPRISE VALUE MULTIPLES:

Enterprise Value to EBITDA Ratio (EV/EBITDA)

This multiple compares the enterprise value of a company to its EBITDA, relating a measure of the company's total value to capital structure neutral cashflow metric. Conceptually it represents how much investors are willing to pay for each dollar of EBITDA generated by the company.

There are no set rules on what determines a low or high EV/EBITDA valuation multiple because the answer is contingent on the industry that the target company operates within. For example, an EV/EBITDA multiple of 10.0x could be viewed as being on the higher end for a consumer goods company. However, a software company valued at 10.0x may even be on the lower end of the valuation range commonly found in the software industry.

Analysts have different opinions about the use of EBITDA as a metric in an EV multiple, we can in fact highlight different pros and cons about it. For example it is easy to calculate, widely used among practitioners, and particularly appropriate for companies late in their Lifecycle, but at the same time could be considered as an inaccurate proxy for Operating Cashflows, it is prone to management and accounting discretion, and because it doesn't consider the CAPEX is not appropriate for capital intensive firms.

In certain scenarios, adjusted valuation multiples such as **EV/(EBITDA – Capex)** can be used instead, which is oftentimes seen in industries industry where there is the need to account for capital expenditures due to the sheer degree of impact that Capex has on the cash flows of companies in these types of industries.

Another widely used variant is the **EV/EBIT** multiple, which consider depreciations and amortization. As depreciation and amortization reflect a company's capital expenditure in previous years, they give investors better guidance on profit growth and future

sustainability. After all, some companies require frequent capital expenditure to sustain their profits, but some don't. Thus, EV/EBIT is often more reflective of a company's true financial strength. A secondary consideration is that the EBITDA numbers we often find on websites tend to exclude important expenses that can vary among companies.

Enterprise Value to Sales Ratio (EV/SALES)

Enterprise value-to-sales is a financial valuation measure that compares the enterprise value of a company to its annual sales. Enterprise value-to-sales is an expansion of the price-to-sales (P/S) valuation, the latter of which uses market capitalization instead of enterprise value. EV/Sales is perceived to be more accurate than P/S, in part, because the market capitalization alone does not take a company's debt into account when valuing the company, while enterprise value does.

EV-to-sales multiples are usually found to be between 1x and 3x. Generally, a lower EV/sales multiple will indicate that a company may be more attractive or undervalued in the market. The EV/sales measure can also be negative when the cash balance of the company is greater than the market capitalization and debt structure, signaling that the company can essentially be bought with its own cash. The EV-to-sales measure can, however, be slightly deceptive in that a higher multiple is not always a signal of over-valuation. A high EV-to-sales can be a positive sign that investors believe that future sales will greatly increase. A lower EV-to-sales can likewise signal that future sales prospects are not very attractive. A limitation to be aware of is that sales do not take into account a company's expenses or taxes, for that reason, using this multiple, we need a degree of homogeneity among the fiscal regimes that are applied to our comparable companies.

$$EV/SALES = \frac{\text{Enterprise Value}}{\text{Total Sales}}$$

Limitations of using Enterprise value multiples:

An enterprise multiple is a metric used for finding attractive buyout targets. But, beware of value traps—

stocks with low multiples because they are deserved (e.g. the company is struggling and won't recover). This creates the illusion of a value investment, but the fundamentals of the industry or company point toward negative returns. Investors assume that a stock's past performance is indicative of future returns and when the multiple comes down, they often jump at the opportunity to buy it at a "cheap" value. Knowledge of the industry and company fundamentals can help assess the stock's actual value. One easy way to do this is to look at expected (forward) profitability and determine whether the projections pass the test. Forward multiples should be lower than the TTM multiples. Value traps occur when these forward multiples look overly cheap, but the reality is the projected EBITDA is too high and the stock price has already fallen, likely reflecting the market's cautiousness. As such, it's important to know the catalysts for the company and industry.