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Concepts about Company Valuations

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Introduction

Valuation means to determine or estimate the value of something.

However, this value may depend on numerous aspects as, for example, the person who is making the valuation, his/her individual preferences, values, interests, personal goals, as well as the context in which the valuation is taking place.

One of the difficulties in measuring the value is, therefore, its subjective feature:

> ***"Valuation is not an objective exercise, and any preconceptions and biases that an analyst brings to the process will find its way into the value"***
>
> *Aswath Damodaran*

Introduction

The assessor's role

The valuation's quality is in direct proportion to the **data's quality**, **information** and **time spent** in understanding the company to evaluate.

The most important part must be on the **valuation process** rather than its end result.

Another important aspect to consider is that the **value obtained** by any method of valuation can be **modified** according to **new information** that appear in relation to the **company** and/or to the **market**.

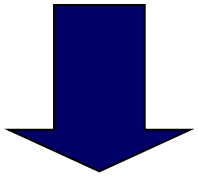
As continually arise information, a company's valuation is not "endless" and needs to be quickly updated to reflect the most current information.

Business Valuation Models

In order to estimate a business value we can use several valuation methods. In fact:

"*the problem in valuation is not that there aren't enough models to assess an investment, but rather that there are too much models!*" (...).

DAMODARAN (1997),



There are not perfect valuation models.

Introduction

Business Valuation Models

The suitable model and parameters to use in a specific scenario will depend on a variety of asset characteristics or even on the company to be evaluated”(...).

The reality is that the reverse is often true.

Time and resources are spent trying to make the assets fit in a given pre-specified **valuation model**, because:

It is consider the best model

or because,

did not think enough about the model selection process

Business Valuation Models

Fundamental premises for each valuation

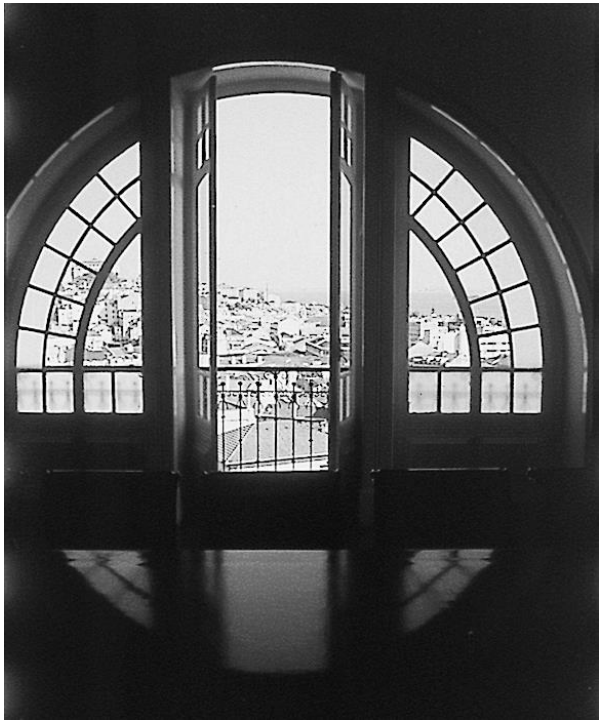
- Business Continuity
- Degree of Equity Control
- Degree of Liquidity
- Valuation's Purpose

A company's valuation can be made in different stages of its life:

- The Growth stage vs Crucible stage
- Old companies vs new companies
- Loss-making companies vs profitable companies

In order to make a business valuation is necessary to have rigorous knowledge about

- The company's industry as well as its business
- The economic environment on which the company operates
- The company's organization and its internal functioning
- The company's ability to generate incomes



Different business valuation methods

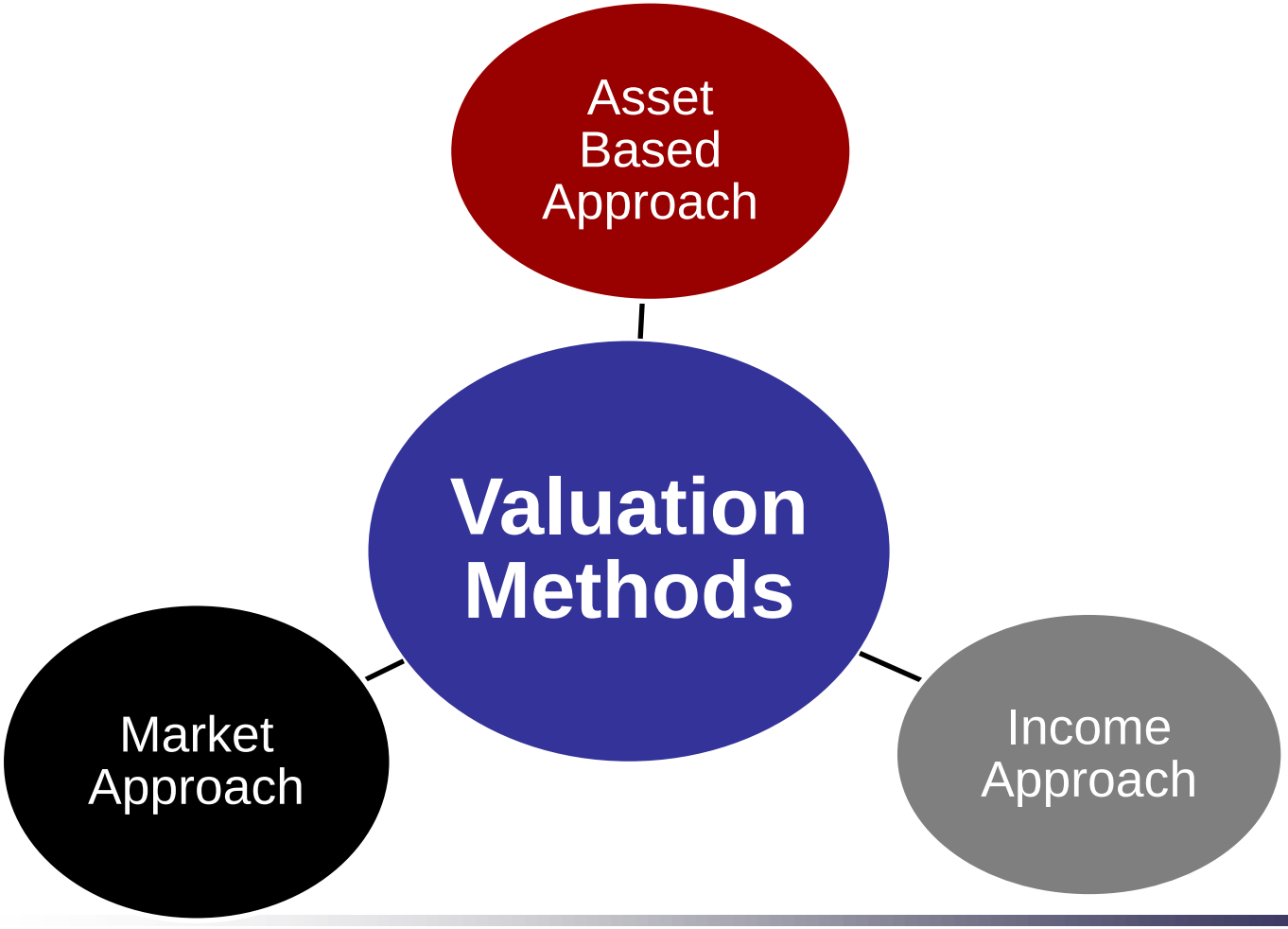
Different business valuation methods

Besides the existence of different companies' valuation methods, there are also other different classifications where these methods fit. Pablo Fernandez (2004) introduces six groups in which the valuation methods could be classified.

Main Valuation Methods					
Balance Sheet	**Income Statement**	**Mixed (Goodwill)**	**Cash Flow Discounting**	**Value Creation**	**Options**
Book Value	Multiples	Classic	Equity cash flow	EVA	Black and Sholes
Adjusted Book Value	PER	Abbreviated income	Dividends	Economic profit	Investment option
Liquidation Value	Sales	Others	Free cash flow	Cash value added	Expand the project
Substancial Value	P/EBITDA		APV	CFROI	Delay the investment
	Other multiples				Alternative uses

Classification of the valuation methods

There are, however, many other classifications of the business valuation methods. A quite common classification is as follows:



Classification of the valuation methods

1. Asset Based Approach

The Asset-Based Approach focuses on a company's net asset value, or the fair-market value of its total assets minus its total liabilities.

Within the asset based approach we will highlight the following methods:

1.1. *Book value*

1.2. *Adjusted book value*

Classification of the valuation methods

1. Asset Based Approach

1.1. *Book Value Method*:

The book value method is a simplistic approach that, in general terms, defines the net amount of a company's assets and liabilities as its value.

Being so, subtracting liabilities from assets gives us the value of the stockholders which is the book value of the business.

The major limitation of the book value method is the fact that **not all assets** are properly **recognized and measured** in companies' financial statements for the purposes of financial reporting.

Classification of the valuation methods

1. Asset Based Approach

1.2. Adjusted Book Value Method

According to the Adjusted Book Value Method, the valuation is made by the market value, item by item from the balance sheet. The Adjusted Book Value Method consist, mainly, in the following criteria:

- Substitution Value
- Market Value
- Liquidation Value

Classification of the valuation methods

1. Asset Based Approach

1.2. Adjusted Book Value Method

It is based on the values stated in the balance sheet (Assets and Liabilities), but review those values (one by one) and, if necessary, adjust those in order to reflect realizable (or replacement) values.

The major adjustments can be:

- correction of hidden reserves and “hidden liabilities”

- correction of permanent reserves and “permanent liabilities”

Classification of the valuation methods

1. Asset Based Approach

1.2. Adjusted Book Value Method

Correction of hidden reserves and "hidden liabilities"

What are the hidden reserves?

Resource not listed on a balance sheet, or listed bellow its market value. Sometimes hidden reserves are deliberately (and illegally) created by undervaluing the assets or by overvaluing the liabilities to show a lower taxable income.

How to correct it?

Through the application of the accounting principles generally accepted, auditing for that purpose the Financial Statements and, afterwards proposing the suitable adjustments.

Classification of the valuation methods

1. Asset Based Approach

1.2. Adjusted Book Value

Correction of permanent reserves or "permanent liabilities"

What are the permanent reserves?

Situations on which there are undervalued assets, or overvalued liabilities, although respecting the generally accepted accounting principles – for ex.: land, building and equipment listed at historical cost

("permanent liabilities": overvalued assets/ undervalued liabilities- for ex.: installation costs or capitalized losses)

How to correct it?

Through the revaluation of tangible and intangible assets for its market value, the annulment of intangible assets that are not sellable in separate, and the valuation of liabilities for its current value.

Classification of the valuation methods

1. Asset Based Approach

Criticisms pointed out to the Asset Based Approach

1. Difficulty to measure the effects of the successive and general price variations, mainly influenced by the inflation, once that the values are listed at historical costs and, therefore, it is applied representative rates of the purchasing power evolution, which may not coincide with the real evolution of prices as, for example, the equity values.

2. None of these methods considers, in a direct and explicit way, the human capital.

Classification of the valuation methods

1. Asset Based Approach

Criticisms pointed out to the Asset Based Approach

3. It did not reflect that the value of the company depends on the kind of market where the company is in as well as on the perspective of market developments.

4. It did not represent neither the distribution of power within the company, neither the motivations, the number and nature of the people interested in making a possible transaction.

Being so, nowadays it is considered that the companies' valuation regarding the **asset based approach**, presents some limitations, therefore this approach should be **adopted complementarily** to other methods, as for example the *Discounted Cash Flow* (DCF), which will be developed ahead.

Classification of the valuation methods

1. Asset Based Approach

When should we use the asset based approach?

1. When the **company is losing money at an operational level**.

   In these cases, it is not possible to use results available to apply valuation methods as, for example, the *Discounted Cash Flow* (DCF) or the multiples (as for ex., EBITDA, *cash flow* or net profit).

   The market value of the total Assets deduced of the liabilities could be a suitable option for the valuation purposes.

Classification of the valuation methods

1. Asset Based Approach

When should we use the asset based approach?

2. In the case of **small companies** whose success at most situations is linked, mainly, to the **personal relations** of its **management partner** with the main customers and suppliers of the company.

   These relationships are, in most cases, faint because they are not usually formalized and transferable. In these circumstances make sense that the company' valuation would be in an asset based approach since in an **scenario** where **the key person leave the company, would dramatically alter the *cash flows*** generated.

Classification of the valuation methods

1. Asset Based Approach

When should we use the asset based approach?

3. Another significant aspect in relation to the asset based is the fact that the **book value method** can being sometimes be used as a **reference** when the valuation method are the multiples.

   In fact, some buyers will **increase** or **decrease** the **multiple**, for example, the EBITDA for the valuation basing on the **relation** between the **book value** and the possible **transaction value.**

   The higher the book value in relation to the possible transaction value, the higher will be the tendency to offer an upper multiple to transaction effects.

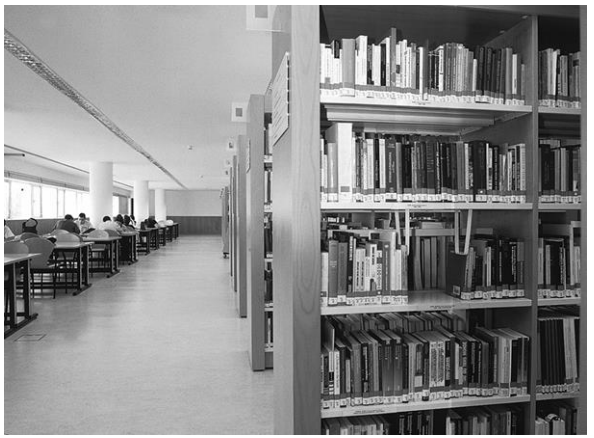
Classification of the valuation methods

2. Market Approach

The market approach is based on the premise that in a free market, the supply and demand will adjust in order to achieve the equilibrium price of a company stock.

It is more suitable for companies in the stock exchange. However, it could be also applied to other companies, by using indicators of similar company (-ies) regarding to risk, profitability and dimension or using even the average indicators of the sector.

In this case, the company's value is calculated through the comparisons with the transactions already made in companies' market with similar characteristics.



Classification of the valuation methods

2. Market Approach

According to NEVES (2002a), in the market approach the financial analysts and the investors try to **analyze the value** of the **companies by comparison with its main competitors**.

For this end, they use several indicators, such as the ***Price Earnings Ratio* (PER)**, ***Price Book Value* (PBV)** and the ***Price Sales Ratio* (PSR)**.

PER has an important meaning within the market approach, and that is why we will detail its main concepts in the following slides.

Classification of the valuation methods

2. Market Approach

2.1. PER

PER is a valuation ratio of a company's current share price compared to its per-share earnings.

In fact, it indicates **how much times** the **share is worth** compared to **profit**. This technique is based on calculating the **Earning Per Share** (EPS), and the **Price Earnings Ratio** (PER), and takes into account eventual adjustments coming from equity increasing that have occur in the period on which the analysis is being made.

Classification of the valuation methods

2. Market Approach

2.1. PER

Although it must be carefully analyzed, according to some authors, what we can see is:

- The companies with the highest growing trends, have usually an higher PER, between 20 and 50.

- If the company grow slightly over the inflation, then the company's PER will usually be between 10 and 20.

The formula to estimate the PER is:

PER = Share Price / EPS

With this formula is possible to determine the **company's value** through another one:

Value = estimated PER × expected EPS

Classification of the valuation methods

2. Market Approach

2.1. PER

In order to calculate **EPS,** we need to divide the **expected result**, after taxes, by the **number of shares** that represent the total company's equity.

When the net profit is adjusted, it must be take into account its continuity, excluding the non recurring items that occurred during the year in question.

It is relatively common the **comparison between the EPS and the PER of the company** with the **EPS and the PER of the industry average** on which the company works.

Most of time, a **company** is **valuated** by comparison with another company through its **PER**.

Classification of the valuation methods

2. Market Approach

2.1. PER

When we choose to compare two or more companies, we must take into account that those companies must follow the same accounting criteria, for example, about:

•Capitalization of Costs

•Depreciations, amortizations and provisions of the exercise

•Profits and losses

When **PER ratio** is **multiplied** by the **number of shares** and by the **net profit** of the company we obtain the **market value** of the **equity** or the value at the stock exchange.

Classification of the valuation methods

2. Market Approach

2.1. PER

Limitations

Despite of being an indicator quite used, it presents some **limitations**, that are based on an **stable relation** between the **company's value** and its **results**.

Another limitation considered, is the inability to overcome the difficulties generated by the **companies that do not get earnings** as happens with some companies that work into the sector of Information Tecnology (IT) or Biotechnology when these companies start its activity.

Classification of the valuation methods

2. Market Approach

2.1. PER

Advantages and Disadvantages

Some **advantages** of using this method are the following:

- It is easy to use
- It includes the perceptions of the market
- It allows with relatively ease to measure the value of all companies within specific industry and compare it with the industry average.
- It shows the profitability, the growing and the risk of the company. It starts with the assumption that the companies in the same industry are comparable, that the market is efficient regarding the prices at the stock exchange and that the comparisons that have been made, already include risk, growing and profitability.

Classification of the valuation methods

2. Market Approach

2.1. PER

Advantages and Disadvantages (cont)

Some **disadvantages** of using this method are the following:

- Companies with **different accounting criteria** are not easily comparable, since the PER is influenced by these criteria.
- It is relatively **difficult to find** two **companies** that could be considered **comparable** since it is very strange that both companies or more competitors show the same **level of risk**, **profitability** and the same **trends of** future **growing**.
- It is based on **an stable relation** between the company's **value** and its **results**.

Classification of the valuation methods

2. Market Approach

2.1. PER

Advantages and Disadvantages (cont)

- When a company has **losses,** it is not possible to use the PER since the PER does not have a real meaning – this situation is relatively often, for example, for some companies that work at the IT and Biotechnology industry and are at the beginning of its activity.

- The **PER** value can be influenced, so it could become **volatile**.

Classification of the valuation methods

2. Market Approach

Using other methods in order to valuate a company

For valuation purposes, multiples as the **EBIT, EBITDA or Sales** are frequently used

Sales

This multiple is the most used *benchmark* of company's valuation.

The information necessary is the annual selling of the company and an industry multiplier, that in most industries is between 0,25 and 1, although there are exceptions.

Ex. Travel Agencies: 0,1

Classification of the valuation methods

2. Market Approach

Using other methods in order to valuate a company

Advantages

The main advantage of this method is its ease of calculation as well as the fact that it is quite intuitive.

Disadvantages

A disadvantage of this method is that it assumes the **existence of recent transactions** in a given **industry** which not always happen.

Another disadvantage is based on the fact that **companies** within the same industry could have **significant different cost structure** and for that reason companies with very similar sales can show very different profitability levels.

Classification of the valuation methods

2. Market Approach

EBIT (*Earnings Before Interest and Taxes*) or EBITDA (*Earnings Before Interest, Taxes, Depreciation and Amortization*)

The EBIT Method (or EBITDA), show some advantages in comparison with PER.

At the *EBIT Method,* it is possible to avoid the problems of the differences in the indebtedness and the taxes situation between the comparable companies. In case of the *EBITDA,* such as *EBIT,* it is possible avoid the need of making an adjustment for the indebtedness and the taxes, and additionally, removes the problem of recording the accounting in a different way of the amortizations, since these are not included in the EBITDA.

Both methods ignore the variations in fixed assets and working capital what can help us to get a wrong performance.

Classification of the valuation methods

2. Market Approach

EBIT (*Earnings Before Interest and Taxes*) or EBITDA (*Earnings Before Interest, Taxes, Depreciation and Amortization*)

Advantages

This method has also as a main advantage that it is easy to estimate because once the EBIT or EBITDA is calculated, then it would be just necessary multiply it for the appropriate multiple.

Classification of the valuation methods

2. Market Approach

EBIT (*Earnings Before Interest and Taxes*) or EBITDA (*Earnings Before Interest, Taxes, Depreciation and Amortization*)

Disadvantages

The main disadvantage of EBIT (or EBITDA) is the fact companies could be very **different** and for this reason, sometimes this method, distorts the valuation analysis.

This is a method that was quite used as an estimator of the value, with some companies' leaders referred that the **company's value** was **5** or **6** times the **EBIT** or **EBITDA**.

However, this kind of comment has lack of scientific rigor.

Classification of the valuation methods

2. Market Approach

EBIT (*Earnings Before Interest and Taxes*) or EBITDA (*Earnings Before Interest, Taxes, Depreciation and Amortization*)

Limitations in using EBITDA (or EBIT)

There are no two equal companies. Even two companies operating in the same industry, from a point of view of valuation, could be significantly different. The application of EBITDA multipliers concepts to all businesses and do not respect those differences. Among others **limitations** it can be highlighted the following:

- It is an analysis of the past.
- It is not *cash flow*
- Ignores the risk
- Ignores the amount of capital invested
- It is possible to manipulate it

In summary, while the value of a company can be expressed with an EBITDA multiplier, the EBITDA multiplier do not determine the value of a company.

Classification of the valuation methods

2. Market Approach

An illustrative example of the limitations previously mentioned

In order to illustrate the limitations of EBITDA, we are going to consider an empiric example of two companies operating in the same industry. Both of them have the same EBITDA as you can see below.

	Companie A	% (sales)	Companie B	% (sales)
Sales	50000		75000	
Gross Margin	17500	35%	22500	30%
Operating Results	7500	15%	6750	9%
Amortization	2500		3250	
EBITDA	10000		10000	
Working Capital Needs	9000	18%	19000	25%
Investment in fixed assets	2000		3000	
Invested Capital	25500		48500	
Return on invested capital	31%		15%	

The company A, smaller, invested in systems and equipments that will contribute to an higher efficiency as can be observed with a bigger gross margin (relatively in percentage) and also the more efficient use of the working capital.

Classification of the valuation methods

2. Market Approach

An illustrative example of the limitations previously mentioned

Initially, could be supposed that the biggest company (company B) would have higher value **considering** the **sales**, or, if we consider the EBITDA method then **both companies would have the same value**.

However, a more careful analysis would reveal not only that the **company A operational performance** is **better** than company B but also that the company A has a more rigorous management of its balance sheets.

Classification of the valuation methods

2. Market Approach

	Companie A	% (sales)	Companie B	% (sales)
Sales	50000		75000	
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Investment in fixed assets	2000		3000	
Invested Capital	25500		48500	
Return on invested capital	31%		15%	

Regarding higher receivable days and inventory days, the **company B**, needs a proportionally higher investment to get an euro of sales.

With a lower **liquid cash flow** (EBITDA – Investment in Fixed Asset) and a higher investment in current asset, the **return on asset** (ROA) for the company B is near to be the half of the company A.

Unlike the conclusion through the use of EBITDA, an analysis based on *fundamentals* value would indicate that the **company A** has an **higher value** that the **company B**.

31% = (10.000 – 2000)/25.500

Exercise

Example of a company valuation using the market approach

Exercício

Exercise

The workgroup should present a:

- Valuation of a company listed in the PSI 20 following the PER method.
- Valuation of the same company using the EBITDA method.

Additionally should be done a:

More detailed explanation of the PER used;

More detailed explanation of the EBITDA used.

Classification of the valuation methods

3. Income Approach

Income approach considers that the value of a company results on its capacity in generate future cash flows. According to this approach, the company's value is measured by its potential in creating richness, and should be based on static models (as in the asset based approach).

Classification of the valuation methods

3. Income Approach

3.1 Discounted Dividends

Gordon Model

It is assumed that the company is in a stationary situation, with the dividends (and the underlying results) growing at a constant rate equal to **g**, perpetually:

$$\mathbf{P0} = \Sigma \left[(DPS0\ (1+g)t\ )/\ (1+r)t\ \right] = \mathbf{DPS1\ /\ (r\ -\ g)}$$

where:

DPS1 - expected dividends for the next year
r – rate of return demanded by the investor (equity)
g – dividends' perpetual growing rate

Classification of the valuation methods

3. Income Approach

3.1 Discounted Dividends

Gordon Model

The **advantage** associated to this method is that it is only necessary to estimate three variables – the **expected dividends** for the next year, the **equity cost** and the **dividends growing rate.**

However, this model shows some **limitations** as:

- The dividends are neither sure or predetermined
- The financial market and the demand of the shareholders change with time and are not the same for all shareholders
- This model is just only applied if the cost of the equity was higher than the dividends growing rate.

Classification of the valuation methods

3. Income Approach

3.1 Discounted Dividends

Two stage model

In this model there is an initial period of high growth during n years and after that a period of constant growth, stable in perpetuity.

Three stage model

Here it is assumed that there is a stage of extraordinary growing, a transition stage and a stage of steady growing.

In these two models it is necessary take into account several aspects such as the growing rates in different stages, the number of years of the stages, the equity cost evolution (reducing Beta) and the evolution of the *payout ratio* (raising).

It is also important to mention that one of the major difficulties on applying these models occurs when the **companies do not distribute dividends.**

Classification of the valuation methods

3. Income Approach

3.1 Discounted Dividends

Three stage model (cont)

In these situations, by the simple algebraic application of the model, discounting null dividends **will result on a null value** and therefore we get to the absurd conclusion that the company does not have value.

However, although the companies do not distribute dividends, these have market value, since the reinvestment of the profits can create more earnings for shareholders and in this way, increase the residual value of each share.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Discounted Cash Flow, is nowadays the more applied and acknowledge method within the fundamental analysis, being normally seen as the most "objective" among the valuation methods, since it explains with detail the relation between risk/environment and the necessary investment for the generation of future income and it is not limited by the book value (sometimes manipulated for companies that are not subjected to an auditing on its accounts).

Moreover, there is an empirical evidence suggesting that the financial market values more the *cash* than the *earnings*.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

These valuation method is based on the "present value" rule, on which the price of a share is given by the sum of the future *cash flows* present value, that is:

$$\text{value} = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t}$$

where,
n = number of years of a share
CFt = *cash flow* at the "t" period
r = discount rate that reflect the risk of the estimated *cash flows*
The discount rate will be based on the risk of the estimated *cash flows*. Higher rates will concern projects with more risk and lower rates on less riskier projects.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Horizon and financial projections

In the DCF method, the valuation is normally based in two components. One is the *cash flows* obtained in the period of **detailed projections** and the one is the **residual value** or continuity value.

In general, the horizon of detailed projections must be, at least, **5 years**, but the most important is that must considerer a **complete economic cycle** and should be extended until the ***cash flows* are steady or positives**.

The period of detailed projections must be the period in which the company has extraordinary profits, coming from a competitive advantage. In the period covered by the value of continuity, this situation will be faded or will not exist at all.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Horizon and financial projections

The **residual value** should cover the life cycle of the company from the period of detailed projections until the moment when it achieves a constant growing period.

The financial projections to prepare must include **Profit & Loss Account, Balance sheets and** estimated ***Cash Flows***, to ensure a total coherence and integration, essential for good analysis and simulations.

Given the Discounted Dividends Model by stages, the advantage of DCF is that, in order to include (through continuity value) the second steady stage, could **change the relevant parameters** as much as it is necessary during the **period of the detailed projections**, improving the explanatory and the adherence of the model.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Estimation of the Cash Flow

According to this model, the company value, or the share price of the company, it is the same than discounted cash flows of the company, which is also called **Free Cash Flow to Firm - FCFF**, discounted on the **Weighted Average Cost Of Capital - WACC**.

FCFF = Operational Result After Taxes
+ Amortizations, Depreciations and Provisions of the Exercise
– Δ Investment in Fixed Asset
– Δ Iinvestment in Working Capital

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Estimation of the Cash Flow

Alternatively to the use of the FCFF, it can be also used the ***Free Cash Flow*** **to Equity** (**FCFE**).

The share price of the company is the **Free Cash Flow to Equity – FCFE**, discounted to the minimum return rate demanded by the shareholders, that is, the cost of the equity (**ke**).

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

Estimation of the Cash Flow

FCFE = Net Profit of the year
+ Amortizations, Depreciations and Provisions of the Exercise
– Δ Investment in Fixed Assets
– Δ Investment in Working Capital
+ Δ Liquid Debt

Being so, the **FCFE** shows free cash flow or available cash of the company to distribute dividends, that is, shows the potential dividends to distribute.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

The use of suitable discounted rate

In a valuation is essential to use a consistent discount rate with the kind of *cash flow* considered.

Using the FCFF or the FCFE is not irrelevant for the value obtained, if they are properly used.

If we use the FCFF, we will obtained the Company/Business value.

If we use the FCFE, we will obtained the Equity value.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF
CAPM – Capital Asset Pricing Model

The CAPM Model is employed to estimate the cost of equity, which is applicable to the return on the investor.

The model is based on the assumption that the investor must choose an asset portfolio which maximizes its utility, taking into account the binomial risk/profitability. The CAPM formula is composed by several elements, such as the interest rate and the risk associated. It is represented as it follows:

$$Ke = Rf + \beta(Rm - Rf)$$

Where *Rf* (*risk free*) is the variable of interest rate of the assets without risk, for example Treasury bonds.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

CAPM – Capital Asset Pricing Model (cont)

The risks valuation inherent to any investment has to analyze two components:

• **Specific Risk** – the risk that affects only one specific company, what allows the diversification of this risk;

• **Sistematic Risk (or not able to diversificate)** - represent the market risk and it is not possible to make a diversification, that is, it is measured by the β (Beta).

The CAPM theory defends that the only risk recompensed is the market risk, that is, the βeta, because this is the one that will be always present while the specific risk can be removed by the diversification of the assets.

Classification of the valuation methods

3. Income Approach

3.2. Discounted Cash Flow – DCF

CAPM – Capital Asset Pricing Model (cont)

In practice, given the difficulty on finding comparable companies, sometimes it is used the average *beta of* the companies or customer industries and suppliers, if they are available.

Market Risk Premium

The Market Risk Premium (*Rm-Rf*) is the extra-yield demanded by the shareholders in order to change their respective investments in portfolios without risk, to portfolio with a risk similar to the weighted average risk of all application within the market. The existing studies in the EUA (Ibbotson, covering more than 70 years) and UK (BZW, for the same number of years) point for risk premium between 5% and 7,5%.

Classification of the valuation methods

3.2. Discounted Cash Flow – DCF

WACC – Weighted Average Cost of Capital

The *weighted average cost of capital* is the average of the equity and the debt cost by their respective weigth at the total liabilities (own+foreign), obtaining an average cost of the total liabilities used.

$$WACC = \frac{E}{E+D} \times Ke + \frac{D}{E+D} \times Kd \times (1 - Tc)$$

where:
Ke – Equity Cost, estimated by the CAPM
D/E – Equity (E) and debts (D)
D – Debts value, that is, the liabilities or the financing cost
E – Equity value
Tc – Tax rate on profits (normally the theoretical rate)
Kd – Debt Cost which is applicable to the liabilities or financing cost

Classification of the valuation methods

3.2. Discounted Cash Flow – DCF

The residual value

The residual value can be calculated in different ways such as the book value, the liquidation value, PER, book value multiplier, EBITDA multiplier. However, the most commom formula is the one which is called perpetuity formula based on the *cash flow* of the last period projected:

$$VR = \frac{FCF_{t+1}}{(WACC - g)}$$

where,

FCF_{t+1} = FCF normalized for the first year after the projections period.
g = growth nominal rate of the *cash flows* in perpetuity.

The estimation of the residual value is critical since it can represent between 60% and 80% of the total value of the valuation.

Classification of the valuation methods

3.2. Discounted Cash Flow – DCF

Some points which we should be careful to estimate the residual value

Typically are committed some faults on estimating the residual value. Taking into account that it can mean between **60% and 80% of the total value** (for detailed projections periods from 5 to 10 years and stable business), there can be hard consequences at the value.

The FCF must be, in fact, normalized, and a special attention must be given to the investments in working capital and in fixed assets of the closing year – because maybe it is not suitable for the perpetuity. If the business is cyclic, then use an average FCF.

Regarding “g”, notice that it includes real growth + inflation (if relevant) – if we estimate g>inflation, there must be an additional investment.

Example of a company valuation

Example of a company valuation

Example:

Company valuation

Stages

1) Analyze the accounts and the historical indicators (integrated historical perspective)
2) Elaborate forecast accounts
3) Making the assumptions and valuation models
4) Determine the Business value and the Equity's value
5) Elaborate sensitive analysis on key variables

Example of a company valuation

1) Analysis of the accounts and the historical indicators (integrated historical perspective) – Income Statement by Nature

Income Statement by Nature

Income Statement by Nature	2009	2010	2011
Sales and services rendered	1.902.197	1.721.211	2.224.580
Government grants		2.885	8.397
Gains / (losses) of subsidiaries, associates and joint ventures		-1.560	-4.715
Variation in production			
Own work capitalised			
Cost of inventory sold and consumed	-130.106	-99.189	-96.734
Cost of materials and services consumed			
External supplies and services	-414.958	-430.944	-649.836
Payroll costs	-950.243	-1.104.495	-1.300.252
Inventory impairment			
Accounts receivable impairment ((expenses)/reversals)			
Provisions ((increases)/decreases)			
Other operating income	18.899	3.438	2.289
Other costs and losses	-5.399	-30.115	-4.268
Profit before taxes, depriciation and financing expenses	**420.390**	**61.232**	**179.461**
(Expenses) / reversals of depreciation and amortisation	-12.943	-17.005	-11.485
Impairment of depreciable / amortisable investments (Expenses / reversals)			
Operational results (before tax and financing expenses)	**407.447**	**44.226**	**167.975**
Interest and similar income			5.587
Interest and similar expenses	-1.576	-8.026	-7.932
Profit before tax	**405.871**	**36.200**	**165.631**
Income tax	-102.815	-15.141	-43.892
Net profit for the year	**303.056**	**21.059**	**121.738**

Example of a company valuation

1) Analysis of the accounts and the historical indicators (integrated historical perspective) – Balance Sheet

Balance sheet

ASSETS	2009	2010	2011
Non-current assets	**38.943**	**28.179**	**21.960**
Intangible Assets	**0**	**0**	**0**
Intangible assets			
Goodwill			
Property, plant and equipment	38.943	28.179	21.960
Investment in subs and associates - Equity method			
Deferred tax assets			
Current assets	**811.613**	**778.319**	**908.380**
Inventories	0	0	0
Accounts receivable	261.257	433.561	579.191
Advances to suppliers	154		
State ans other public entities	17.607	51.753	1.572
Other current receivables	33.284	16.051	4.778
Shareholders	49.900	0	39.600
Cash and cash quivalents	145.357	270.291	280.086
Other financial assets	250.000	2.211	2.211
Deferred assets	54.055	4.452	942
TOTAL ASSETS	850.556	806.498	930.339
EQUITY AND LIABILITIES			
Equity			
Share capital	100.000	100.000	100.000
Legal reserves	7.559	22.715	22.715
Adjustments to financial assets			
Retained earnings			21.059
Other changes in equity	0	-16.628	-16.628
Sub-total	**107.559**	**106.087**	**127.146**
Net profit of the year	303.056	21.059	121.738
Total Equity	**410.615**	**127.146**	**248.884**
Liabilities			
Non current liabilities	**0**	**0**	**0**
Provisions			
Interest-bearing liabilities			
Pensions and other post-employment benefits			
Deferred tax liabilities			
Other non-current liabilities			
Current liabilities	**439.941**	**679.352**	**681.454**
Accounts payable	13.651	25.306	207.475
State and other public entities	221.364	160.016	194.201
Shareholders			
Interest-bearing liabilities	37.500	237.479	29.992
Other current liabilities	167.426	256.551	249.787
Total liabilities	**439.941**	**679.352**	**681.454**
Total equity and liabilities	850.556	806.498	930.339

Example of a company valuation

1) Analysis of the accounts and the historical indicators (integrated historical perspective) – Main Ratios

MAIN RATIOS

ITEMS	CALCULATION
Operating	
- Average Receivable Term	Avg. Trade Debtors less Provs. *365 / Net Sales
- Average Payment Term	Avg. Trade Creditors*365 / Purchases
- Average Stock Term	
- Average Stock Term of Finished Products	Average Stock of Finished Products / Cost of goods sold
- Average Stock Term of Merchandises	Average Stock of Merchandises / Cost of goods sold
- Average Stock Term of Raw Materials	Average Stock of Raw Materials / Cost of goods sold
- Asset Turnover	Operating Profit / Net Total Assets
- Current Assets Turnover	Operating Profit / Total Current Assets
- Stock Turnover	Sales / Stock
Financial	
- Working Capital (PTE 000')	(LT Debt+Equity) - Net Fixed Assets
- Working Capital Needs (PTE 000')	
- Treasury (PTE 000')	WC-WCN
- Equity Ratio	Shareholders' Funds / Net Total Assets
- Debt Ratio	Total Debt / Total Liabilities+Shareholders' Funds
- Debt to Equity Ratio	Total Debt (incl. financial leases) / Shareholders' Funds
- Interest Cover	EBIT + Depreciation / Interest Expense
Profitability	
- Return on Equity (ROE)	Net Profit * 100 / Shareholders' Funds
- Return on Investment (ROI)	EBIT * 100 / Net Total Assets
- Operating Income Return	EBIT / Operating Profit
- Return on Net Sales	Ret Profit / Sales

Example of a company valuation

2) Preparation of the forecast accounts – Forecast Income Statement by Nature

Forecast Income Statement by Nature

Income Statement by Nature	SNC	2011 (basis year)	2012	2013	2014	2015	2016
Sales and services rendered		2.224.580	2.447.038	2.447.038	2.447.038	2.447.038	2.447.038
Goods	711	128.478	141.326	141.326	141.326	141.326	141.326
Services rendered	72	2.096.102	2.305.712	2.305.712	2.305.712	2.305.712	2.305.712
Government grants	75	8.397	8.397	8.397	8.397	8.397	8.397
Gains / (losses) of subsidiaries, associates and joint ventures	785	-4.715	-4.715	-4.715	-4.715	-4.715	-4.715
Variation in production	73						
Own work capitalised	74						
Cost of inventory sold and consumed	61	-96.734	-106.407	-106.407	-106.407	-106.407	-106.407
Cost of materials and services consumed	61						
External supplies and services	62	-649.836	-401.535	-415.769	-430.568	-445.957	-461.962
Payroll costs	63	-1.300.252	-1.304.278	-1.321.425	-1.339.044	-1.356.928	-1.375.317
Inventory impairment							
Accounts receivable impairment ((expenses)/reversals)							
Provisions ((increases)/decreases)							
Other operating income	78	2.289	2.518	2.518	2.518	2.518	2.518
Other costs and losses	68	-4.268	-4.268	-4.268	-4.268	-4.268	-4.268
Profit before taxes, depreciation and financing expenses		**179.461**	**636.750**	**605.368**	**572.950**	**539.678**	**505.283**
(Expenses) / reversals of depreciation and amortisation	64/761	-11.485	-18.738	-8.332	-5.110	-6.814	-8.517
Impairment of depreciable / amortisable investments (Expenses / reversals)	65/762	0					
Operational results (before tax and financing expenses)		**167.975**	**618.012**	**597.036**	**567.840**	**532.865**	**496.766**
Interest and similar income	79	5.587	4.764	13.137	21.178	29.875	38.220
Interest and similar expenses	69	-7.932	0	0	0	0	0
Profit before tax		**165.631**	**622.776**	**610.172**	**589.018**	**562.740**	**534.986**
Income tax	812	-43.892	-155.694	-152.543	-147.255	-140.685	-133.746
Net profit for the year		**121.738**	**467.082**	**457.629**	**441.764**	**422.055**	**401.239**

Example of a company valuation

2) Preparation of the forecast accounts – Forecast Balance Sheet

Forecast Balance sheet							
ASSETS	SNC	2011 (basis year)	2012	2013	2014	2015	2016
Non-current assets		21.960	11.739	11.924	15.331	17.034	17.034
Intangible assets - Gross value	44	2.860	2.860	2.860	2.860	2.860	2.860
Intangible assets - Cumulative amortization	448	-2.860	-2.860	-2.860	-2.860	-2.860	-2.860
Goodwill							
Property, plant and equipment - Gross Value	43	85.717	94.234	102.752	111.269	119.786	128.303
Property, plant and equipment - Cumulative amortization	438	-63.758	-82.495	-90.828	-95.938	-102.752	-111.269
Investment in subs and associates - Equity method	4111+4121+4131						
Deferred tax assets	2741						
Current assets		908.380	1.192.945	1.553.751	1.997.142	2.423.416	2.831.622
Inventories		0	0	0	0	0	0
Accounts receivable	21	579.191	637.110	637.110	637.110	637.110	637.110
Advances to suppliers	228						
State and other public entities	24	1.572	0	0	0	0	0
Other current receivables	27	4.778	5.256	5.256	5.256	5.256	5.256
Shareholders	26	39.600	39.600	39.600	39.600	39.600	39.600
Cash and cash quivalents	11+12+13	280.086	509.943	870.749	1.314.140	1.740.415	2.148.621
Other financial assets	143	2.211	0	0	0	0	0
Deferred assets	28	942	1.036	1.036	1.036	1.036	1.036
TOTAL ASSETS		930.339	1.204.684	1.565.675	2.012.473	2.440.451	2.848.657
EQUITY AND LIABILITIES							
Equity							
Share capital	51	100.000	100.000	100.000	100.000	100.000	100.000
Legal reserves	551	22.715	22.715	22.715	22.715	22.715	22.715
Other reserves	552+56	0	121.738	588.821	1.046.450	1.488.214	1.910.268
Adjustments to financial assets							
Retained earnings	53	21.059	21.059	21.059	21.059	21.059	21.059
Other changes in equity	59	-16.628	-16.628	-16.628	-16.628	-16.628	-16.628
Sub-total		127.146	248.885	715.967	1.173.596	1.615.360	2.037.415
Net profit of the year	818	121.738	467.082	457.629	441.764	422.055	401.239
Total Equity		248.885	715.967	1.173.596	1.615.360	2.037.415	2.438.654
Liabilities							
Non current liabilities		0	0	0	0	0	0
Provisions	29						
Interest-bearing liabilities	25						
Pensions and other post-employment benefits	273						
Deferred tax liabilities	2742						
Other non-current liabilities	27						
Current liabilities		681.455	488.717	392.079	397.113	403.036	410.003
Accounts payable	22	207.475	191.466	196.713	202.292	208.094	214.129
State and other public entities	24	194.201	165.826	61.987	59.455	57.557	56.435
Shareholders	26	0	0	0	0	0	0
Interest-bearing liabilities	25	29.992	0	0	0	0	0
Other current liabilities	27	249.787	131.425	133.379	135.366	137.385	139.440
Total liabilities		681.455	488.717	392.079	397.113	403.036	410.003
Total equity and liabilities		930.339	1.204.684	1.565.675	2.012.473	2.440.451	2.848.657

Example of a company valuation

3) Valuation model

1.1. Cost of Capital		
1.1.1. Equity Cost		
Risk free	R f	3,00%
Risk Premium	R m - R f	9,50%
Beta	B	1,45
Equity cost	K e = Rf + B (R m - R f)	16,78%
1.1.2. Debt Cost		
Euribor 6 months		3,00%
Spread		5,00%
	k d	8,00%
Tax at 2011 (IRC + Municipal tax)	t	26,50%
Debt Cost	K d = (1 - t) k d	5,88%
1.1.3. Financial Structure		
Observed structure		
Equity		
Bearing debt		
Target structure		
Equity	E / (E + D)	60,00%
Bearing debt	D / (E + D)	40,00%
1.1.4. Weighted Average Cost Of Capital (WACC)		
WACC = R e . E / (E + D) + R d . D / (E + D)		12,42%

Example of a company valuation

3) Valuation model

1.2. "DISCOUNTED CASH FLOW" (DCF)						
1.2.1 Discount Factor						
Period	1	2	3	4	5	Normalized
Discount factor - anual = 1/(1+WACC)	0,890	0,890	0,890	0,890	0,8895	0,8895
Discount factor - period (cumulative)	0,890	0,791	0,704	0,626	0,557	0,56
1.2.2 Cash Flow						
EBIT	618.012	597.036	567.840	532.865	496.766	496.766
taxes	-155.694	-152.543	-147.255	-140.685	-133.746	-133.746
Variation taxes (unpaid balance)	72.299	12.418	9.966	8.156	7.130	7.130
Amortization + Var. Provision	18.738	8.332	5.110	6.814	8.517	8.517
Net Operating Profit Less Adjusted Taxes (NOPLAT)	553.355	465.243	435.661	407.149	378.667	378.667
1.2.3 Investment in Working Capital Needs and Fixed Asset						
Investment in Working Capital	323.274	-7.135	-7.487	-7.733	-7.992	-7.992
Investment in Fixed Assets	8.517	8.517	8.517	8.517	8.517	-8.602
1.2.4 Free Cash Flow						
Free Cash Flow	221.563	463.861	434.631	406.365	378.142	378.142
Discounted Free Cash Flow of the period	197.090	367.049	305.932	254.442	210.618	210.618
Discounted Free Cash Flow (Cumulative)	1.335.130					

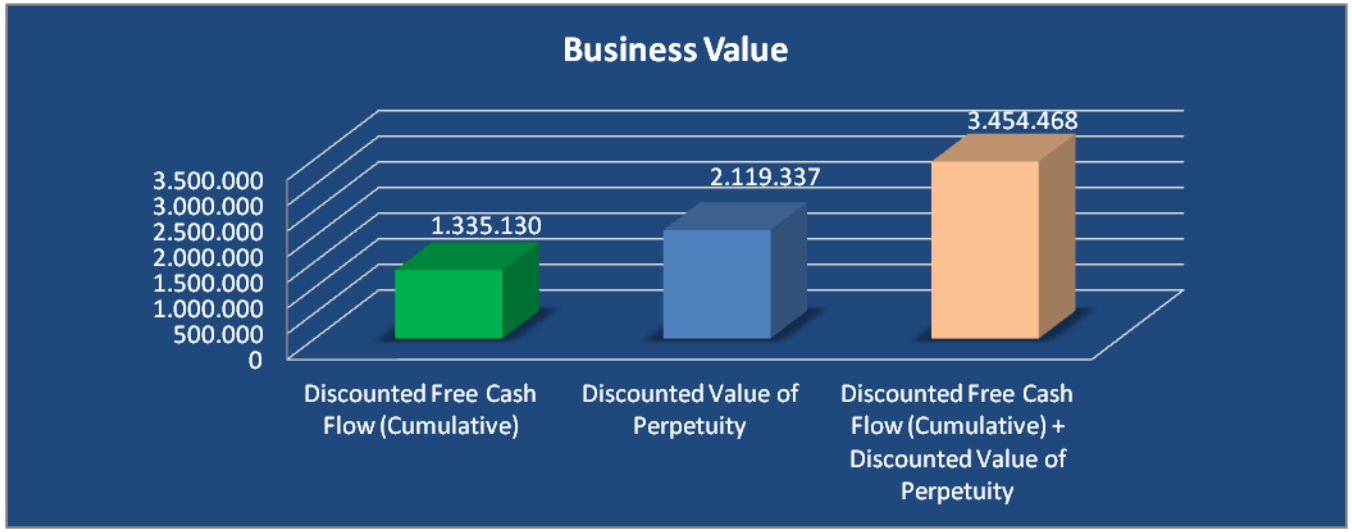
Example of a company valuation

3) Valuation model

1.3. Residual Value		
Free Cash Flow "Normalized"	FCF "normalized"	378.142
Free Cash Flow at t+1	FCF t+1	386.669
Growth rate in perpetuity	r	0,25%
inflation rate	π	2,00%
Growth rate assumed by the company	g	2,26%
Perpetuity	FCF t+1 / (WACC-g)	3.805.047
Discounted Value of Perpetuity		2.119.337

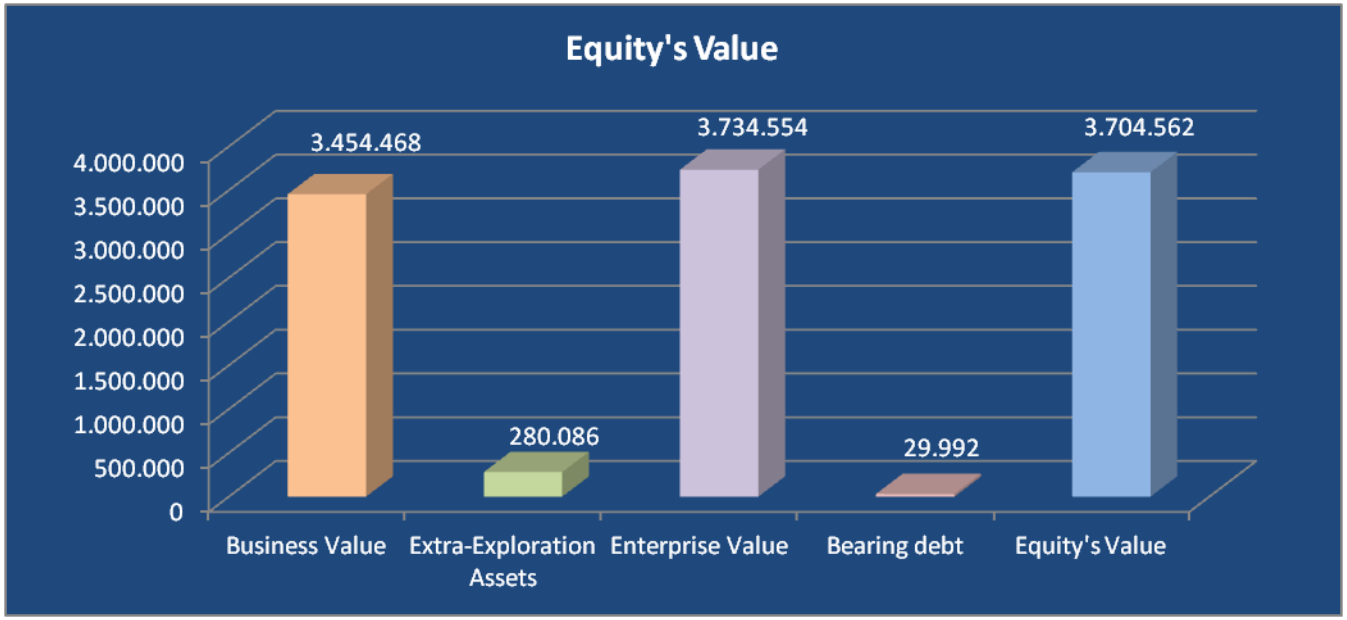
Example of a company valuation

4) Estimation of the Business value and the Equity's value



Example of a company valuation

4) Estimation of the Business value and the Equity's value



Example of a company valuation

5) Elaboration of sensitivity analysis of the key variables

Sensitivity Analysis				
Scenarios	Pessimist	Conservative	Basis	Optimistic
r	-0,25%	0,00%	**0,25%**	0,50%
π	2,00%	2,00%	**2,00%**	2,00%
g=(1+i)(1+r)-1	1,75%	2,00%	**2,26%**	2,51%
Business Value	3.343.122	3.397.432	**3.454.468**	3.514.439
Extra-Exploration Assets	280.086	280.086	**280.086**	280.086
Enterprise Value	3.623.209	3.677.519	**3.734.554**	3.794.526
Bearing debt	29.992	29.992	**29.992**	29.992
Equity's Value	3.593.217	3.647.527	**3.704.562**	3.764.534

Sensitivity Analysis on Beta

Different Scenarios	Sensitivity Analysis on Beta	Business Value
		3.454.468
Scenario 1	1	4.516.816
Scenario 2	1,1	4.219.153
Scenario 3	1,2	3.962.484
Scenario 4	1,3	3.739.206
Scenario 5	1,4	3.543.472
Scenario 6	1,5	3.370.717
Scenario 7	1,6	3.217.319
Scenario 8	1,7	3.080.372
Scenario 9	1,8	2.957.519
Scenario 10	1,9	2.846.824

Exercise

Company valuation using the Discounted Cash Flow (DCF) method

Exercise

Make the financial valuation of PORTUCEL taking into account the financial report available.

Purpose:

Make the valuation using the **DCF method** and compare it with the value obtained with other valuation methods that your consider appropriate.

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