LUISS

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Is Cash still the king in valuation? An empirical analysis.

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To my family and friends

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Introduction

The increasing need to find ways to value businesses, company branches, or shareholdings was driven by many phenomena and tendencies that have been taken place in the last years. Firstly, companies' growth is usually achieved through external ways rather than internal ones. The acquisition of businesses, branches of them or shareholding represents for companies the easiest and fastest way to develop and increase profits. Valuation is needed to make the best bid. Consequently, also the extraordinary operations, such as mergers, contributions, spin-offs, have intensified. Another reason that brought valuation under the spotlight can be found in the increasing presence of institutional investors on the financial market and need to assure the right market price to prevent market control situations or the massive phenomenon of privatizations.

Over the years, firm valuation has gained more and more attention in the academic world and it has been the center of discussion and still is. The main goal is to find the best valuation method that will get in return the most reliable value possible. Since the financial statements were introduced, several schools of thought have alternated. The first strong current, called Anglo-Saxon, adopted valuation approaches based on the financial methods and multiples. In particular, proponents of this theory, such as Copeland T., Koller T., Murrin J., pose a strong reliance over the cash flows identifying them as the main company value driver. Indeed, proponents state that the discounted cash flow provides the most reliable value in a long term perspective, and, as so, management should target this measure in order to take the best decision in a long term growth perspective. Moreover, according to this current, accounting measures such as EBIT or earnings are considered biased due to common accounting manipulation practice. Cash flow is unaffected by manipulation on financial statements since it is not affected by those items that are usually under the management discretion (i.e. accruals). As the proponents of this current would say: "*cash is king, accounting is irrelevant*".

In contraposition to this first school of thought, another important current, denominated European, stated that the valuation should be based on accounting value rather than cash flow. The theoretical current starts from the criticism of the DCF model, which was considered overly based on projections and assumptions in general. As the proponents say it was necessary a "return to the fundamentals" (Penman), since those are certain values and therefore they should be the basis of the valuation process. Book value of equity and earnings

were chosen as the starting point of the model. In particular, the latter can be understoood as a sort of normalized cash flow, in the sense that earnings are usually less volatile and more predictable, due to the use of accruals, therefore making the model based on earnings more reliable than the one based on cash flow.

Even though earnings present those extremely useful characteristics for a valuation setting, they bring with them a huge drawback related to the items that can be accounted in a discretionary way, such as accruals, estimated liabilities, and so on. Even though those manipulations can be detected, this issue can make earnings a less reliable measure that can compromise the future projections as well.

A final school of thought states that the chosen valuation method does not matter because valuation will be biased in every case. An analyst can easily get to very different values for the same company even by using the same method, because the assumptions underneath each valuation strongly drive the valuation result, but they rely on the ability, knowledge, and experience of the analyst.

There is mixed literature around the actual efficiency of valuation models. Each valuation method provides several analyses in favor of the theory proposed, but there is not an extensive study over the different value drivers at the base of each valuation method.

In this elaborate, we want to provide an empirical analysis on the main valuation methods used in valuation theory and practice, by observing the relationship of their main value drivers with the business value itself. In order to reach this goal, we will conduct an analysis over an extensive sample of companies over a 6 years' period. In particular, we will apply a multiple regression analysis to find which of the main variables underneath the valuation methods is the most associated to the stock's price change, and ultimately find if Cash, and therefore the Discounted Cash Flow, can still be considered the king in the business valuation world.

We will first provide an overview over the main valuation methods, highlighting advantages and disadvantages for each one of them. We first discuss the infamous Discounted Cash Flow (DCF) valuation, first used and brought up to life by the Anglo-Saxon school. Through financial methods, future flows can be actualized to find the current company value, starting from dividends, free cash flow to equity, or to the firm.

The second group of methods falls into the category of accounting models, due to their strong reliance over accounting numbers such as book value of equity, earnings, and other measures observable in the financial statements. Among these methods, we find the famous Residual

Income model, first outlined by Ohlson and then subject to multiple modifications. In this model, the book value of equity represents the anchor value of the firm overall value and the earnings projections will account for a little fraction that final value. The supporter of this methodology strongly criticized the DCF for making most of the final value come from the future projections, making all the valuation extremely biased.

We will then explore the relative valuation method, which is not considered a stand-alone method due to its strong reliance over the volatile market values and on the choice of comparables, which are the companies that most resemble the one under evaluation process. This method mostly works when there are plenty of public companies and consequently the market is active, which is especially the case for the Anglo-Saxon countries (USA, United Kingdom). We will also touch on other noteworthy valuation models. Firstly, the real option valuation model, based on the work of Black-Scholes and Merton on option pricing. Finally, we will look at the asset-based valuation methods, which try to find a way to evaluate those intangible assets not considered in the financial statements.

After giving an overview of the main valuation approaches, we will make an in-depth discussion on the value drivers behind the main models used which are the DCF and accounting methods. In particular, we will find out why the cash flow has been appealed as the "king" in a valuation setting, due to its economic relevance and implications confirmed in empirical studies as well. On the other side, we will look at earning, underlying both the goods and the bad. Indeed, we will see how and why earnings manipulation is usually carried out by managers.

Even though the models all look theoretically perfect, we should not forget that valuation is a very subjective process which makes it biased by the analyst who is carrying it out. We will dedicate a section to underline the most important biases in valuation.

Then we will proceed with the actual empirical analysis, discussing the sample choice, methods and finally, results. A discussion over the results obtained will follow with a brief reference to the limitation and future suggestion for the research.

CHAPTER 1

The valuation methods

This chapter aims to answer two specific questions: why valuation is important and what are the approaches to identify this famous intrinsic value. The valuation takes an important role in many types of discipline. This is due to the fact that it can be applied to a specific asset, a collection of assets, and an entire firm as well. The last case, which is also the main point of this elaborate, has still many applications in the real world. We can highlight the most relevant ones:

- M&A: valuation is made to understand which is the fair bidding price at which the company should acquire the target one, and the target company should determine which is its selling price as well. Moreover, after the merger, a valuation is needed to determine the ultimate value of the merged firm.
- IPO: valuation determines the prices at which the company should offer its shares to the market in the public offering.
- Leverage decision and dividend policy: valuation is made to determine which could be the leverage and the dividend policy that can maximize the firm value.
- Portfolio investment: valuation is made to understand if the price to pay for a certain stock is fair or not.
- Private equity and investment capital: valuation to understand the potentiality of the business.

Some think that valuation is a perfect science, while others usually refer to it as an art. Reality is always to be found in the middle; even though valuation models could seem theoretically perfect, analysts will always come across some biases, both in the market and in the valuation itself (it will be discussed in depth in the second chapter).

There have been proposed so many models to compute valuations. It is possible to classify those approaches in six big categories:

1. Discounted cash flow valuation;
2. Accounting-based valuation;
3. Relative valuation;
4. Real Option models;

5. Mixed Methods.

All those valuation techniques are based on different assumptions and beliefs. In this chapter, an overview of the most famous and used valuation methods will be provided, highlighting the advantages and disadvantages of each one, and ultimately trying to identify the ones that are most easily applicable to the largest number of cases and situations.

1.1 DISCOUNTED CASH FLOW VALUATION

The main theory behind the discounted cash flow valuation states that the value of a certain item is given by the value of all the futures cash flow discounted at a rate that reflects the riskiness of the item itself. Regarding enterprises, in particular, there are two points of view: the investor view and enterprise view.

From an investor's point of view, all the attention is given to the equity valuation, which represents the actual return for the investor. In this perspective, a first model will be described which relates strictly to the investors' returns: dividend discount model.

1.1.1 Dividend discount model

When an investor performs a certain investment in a company, her/his gains on the investment will be represented by the dividends she/he will receive during the holding period and the expected price at the end of the holding period. In this view, from an investor perspective, the investment value will be the sum of the two cash-in discounted at the rate of return appropriate for the equity risk of the investment itself. If we think that also the expected price at the end of the period will be the sum of the same future cash in, and going on with this iterative approach, it is easy to understand that the final value of the company is given by the present value of all the future dividends. In mathematical terms:

$$Equity = \sum_{t=1}^{\infty} \frac{E(D_t)}{(1+K_e)^t}$$

where:

D = Dividends

k_e *= Cost of Equity*

This valuation is used widely for three main reasons[1]. Firstly, its simplicity and intuitiveness. Secondly, this model does need very few assumptions about the growth rate of the dividends and the dividend payout ratio. Finally, those assumptions are not hard to make because

[1] Damodaran A., *Valuation Approaches and Metrics: A Survey of the Theory and evidence*, 2006

managers usually place dividends at a level sustainable even with volatile earnings, this means that dividends are usually stable over time, making the valuation even easier.

Even if the theory behind the model seems to have no flaws and even if the simplicity of the model is very attractive, there are few important considerations to be made. This model is really sensitive to the enterprise's policies. For example, a company that retains those balances that could be paid out to stockholders will build up its cash balances. Even though stockholders don't have any claim on the cash balances, they have a claim on the equity value increase that this increase in cash will represent. Using the model, it will bring to an underestimation of the company. In an extreme opposite case, if a company pays out high, not sustainable dividends, it will bring to an overvaluation instead. These simple examples bring out the main problem of this valuation: dividends are a distortive representation of an investor's gain.

Despite those big limitations, the DDM is still widely used because it can still point out a baseline value for those firms whose cash flow to equity exceed dividends. Moreover, the DDM can provide instead a very good approximation of a firm's intrinsic value for mature firms who do calibrate their dividend based on the available cash flows. Finally, in those cases where the cash flow estimation is difficult or impossible (e.g. financial institutions such as banks, insurance companies, etc.), the DDM stands out as it can be the only model applicable.

1.1.2 Discounted Cash Flow (DCF) to Equity or Firm

From an enterprise point of view, it is necessary to look at its specific gains which are expressed as by an amount in real terms (ex. Free Cash flow) rather than accounting terms (such as earnings). According to the cash flow models' logic, the intrinsic value of the enterprise is therefore given by the cash flow it produces, discounted at a rate of return that represents the riskiness of the company, on the assumption that cash flows represent the enterprise actual gains in real terms rather than in accounting terms (i.e. earnings). There are however different cash flows that generate different valuations.

Discounted Free Cash Flow to Equity

In the Free Cash Flow to Equity (FCTE) model, the main limits of the DDM are trying to be overcome. In fact, in this model, the valuation baseline is represented by the *potential* dividends rather than the actual dividends. The Free cash flow to Equity is a measure of the cash flow left over after all the reinvestment needs and debt payments.

The formula is:

$$FCFE = Net\ Income + Depreciation - CAPEX - \Delta NWC - \Delta Debt$$

where:

CAPEX = Capital Expenditure

NWC = Net working capital

Δ Debt = New Debt – Debt repayment

The sum of the FCFE discounted at the cost of equity gives the Equity value.

Relationship between FCFE and DDM.

It is straightforward that, if dividends are equal to the FCFE and the same growth assumptions are made, the two models just presented will give the same result. However, this eventuality is hard to occur and there are multiple reasons.

Usually, as stated earlier, dividends represent a part of the overall free cash flow to equity, hence the part that is given to investors. Therefore, in the most usual situations, dividends are lower than the FCFE, therefore the value resulted from the FCFE model will be greater than the one resulted from the DDM.

If instead, dividends are greater than FCFE, it means that the firm will have to use one of the following strategies to pay out those dividends, that in a way or another will contribute to a decrease in value:

- Issuance of new equity, the issuance costs will decrease value;
- Issuance of new debt, the firm will likely be over-levered, causing a decrease in value;
- Cuts on investments will bring a loss of value equal to the present value of the rejected projects.

Another important aspect to touch is the different assumptions regarding FCFE and dividends. In reality, the growth rates should be different because dividends are assumed to be paid out to shareholders, while the excess FCFE will be reinvested in a project and will increase the cash balance to be used in future acquisitions. Therefore, when firms pay out much less in dividends than they have available in FCFE, the expected growth rate and terminal value will be higher in the dividend discount model, but the year-to-year cash flows will be higher in the FCFE model.

Given that the value from the FCFE model is usually higher than the value from the DDM,

what are the real implications behind this difference? According to Damodaran (2016), the difference between the values resulted from the two models can be explained as the value of controlling a firm, so the value of controlling the firm dividend policy. Therefore, in evaluating an enterprise, the choice between the two models should depend on the openness of the market corporate control. So in an open market of corporate control, DCFE represents the best option, as the higher value will reflect the change in dividends policy. In a highly regulated market or for a highly mature and stable business, the DDM will provide a realistic value.

Discounted Free Cash Flow to the Firm

The previous two models provided the valuation process for the equity of a certain business. However, it is possible to value the entire business by using the Discounted Cash Flow. The underlying logic remains the same, but the discounted item and the discounting rate change. In this case, the firm value is the sum of the future Free Cash Flows discounted at the Weighted Average Cost of Capital, which represents the riskiness of the overall Invested capital, therefore of both equity and debt, including also the embedded tax benefits. The Free Cash Flow to Firm is usually defined as follows:

$$\begin{aligned} &Free\ Cash\ Flow\ to\ Firms \\ &\quad = After\ tax\ Operating\ Income \\ &\quad - (Capital\ Expenditures\ Depreciation) - \ Change\ in\ non \\ &\quad - cash\ Working\ Capital \end{aligned}$$

Therefore, the firm value is given by the sum of the FCFF discounted at the weighted average cost of capital. In formula:

$$Enterprise\ Value = \sum_{t=1}^{n} \frac{FCFF_t}{(1 + WACC)^t}$$

1.1.3 Adjusted Present Value

Modigliani & Miller's studies highlighted that the tax benefits of debt increase firm value and decrease the cost of using debt capital. In the previous model, the tax benefits of debt are incorporated in the cost of capital itself by the use of the WACC. However, an alternative method would consider the value of a firm as the sum of the firm value funded by only equity, and the value of the financial effects of debt to this value.

Therefore:

$$V_L = V_U + V_{TS} + V_{DC}$$

Where

V_L*= Levered value of the firm*

V_U*=Unlevered value of the firm (i.e. all equity funded)*

V_{TS} *= Present value of the tax benefits of debt (tax shield)*

V_{DS}*= Present value of net distressed related costs.*

In particular, the unlevered value of the firm is given by the present value of the Cash flows used also in the DCF to the Firm method, but discounted at the unlevered cost of equity. The value of the tax shield is given by the value of the tax benefits over time, discounted at their risk rate. The APV method overcomes some of the issues related to cash flow methods. In particular, some simplistic approximations can be eliminated, bringing a more precise estimation of the final value. The main advantages of this method are that, since the tax shield calculation occurs separately from the firm valuation, it is possible to change the amount of debt over time, giving a deeper understanding of the value brought by the specific leverage chosen. Moreover, it is easy to see that to apply the APV valuation method it is not needed any separate valuation of the Equity value, eliminating another great assumption made by the DCF.

To conclude the Discounting Valuation method, the DCF valuation is one of the most used techniques in valuation and will be a key character in this elaborate. The main advantages of this valuation are:

- It is based on asset's fundamentals;
- It requires a deep understanding of the business (to make the right assumption);
- It makes you understand and think about where the value comes from.

However:

- It requires more inputs than any other valuation tool;
- Those inputs are strongly based on assumptions.

Moreover, this model hardly applies to young firms or startups where the intrinsic value is given in the long term, while in the short term the development is uncertain, and in case of negative cash flow, because that will result in a negative value overall.

1.2 ACCOUNTING-BASED VALUATION

Another current in valuation is the one that mostly relies on the accounting values found in the financial statement. The main assumption behind these models is that there's no need to make shaky assumptions about the future when there is plenty of data in the financial statements already.

Within this category, the main methods are the earnings valuation model (residual earnings and abnormal profit growth) and the fair value accounting/equity method.

1.2.1 Earnings valuation models

The earnings valuation models are based on the combination of book values and expected earnings. They were first designed by Ohlson (1995) and Feltham and Ohlson (1995). Follow the two most relevant model among the many variations on the theme that have been proposed over time.

Residual income model

The residual income model expresses the equity value as a function of book value and residual income (also sometimes referred to as abnormal earnings or excess profit). The relationship can be formalized as follows:

$$Equity\ Value = Book\ Value\ of\ Equity + PV\ of\ residual\ earnings$$

Where the residual earnings are given by

$$Residual\ Earnings = Profit(Loss)_t - r_e BVE_{t-1}$$

Where

r_e = *Cost of equity*

BVE_{t-1} = *Book value of equity at time t-1*

This model has a strong intuitive basis: if the firm can earn a normal rate of return on its book value, investors should be willing to pay no more than the book value for its shares. If the firm can earn higher profits than the market, the investors should pay a value higher than the book value for its shares. Therefore, the deviation of the firm's market value from its book value is strongly based on the ability to generate abnormal profits.

Equivalently, RE can be calculated as:

$$Residual\ Earnings = (ROCE - r_e) * BVE_{t-1}$$

Where ROCE (Return On Common Equity) is given by:

$$ROCE = \frac{Profit/Loss_t}{BVE_{t-1}}$$

Residual Earnings are driven by two variables: the ROCE and the book value of equity in the previous period. This means that the value of the company will increase by increasing the ROCE above the cost of capital. Alternatively, a company can increase its value by increasing the book value of equity that will earn at a certain ROCE.

Discounted Abnormal Profit Growth

Another method, equivalent to the residual income model, focuses on the rate of growth of abnormal profits. In particular:

$$Abnormal\ profits = Change\ in\ abnormal\ profit$$
$$= (P/L_2 - r_e\ BVE_1) - (P/L_1 - r_e\ BVE_0)$$

Considering that

$$BVE_1 = BVE_0 + P/L_1 - Dividends_1$$

The formula can be written as follows:

$$Abnormal\ Profit\ Growth = \Delta Profit\ or\ Loss_2 - r_e(Profit\ or\ Loss_1 - Dividends_1)$$

Applying this formula to firm valuation, the equity value will be given by:

$$Equity\ Value = \frac{Profit\ or\ Loss_1}{r_e} + \frac{1}{r_e}[PV\ of\ future\ Abnormal\ Profit\ Growth]$$

This valuation formula has a practical appeal since it starts with the capitalization of the first year already, therefore there's no need to make any effort in the estimation of the starting point.

By using the same underlying assumptions to forecast earnings and cash flow, the residual income model, abnormal profit growth and the DCF are equivalent methods.

The accounting methods presented above share the following advantages:

- They focus on the profitability of the investment and growth in net assets, the two main value drivers;
- They incorporate the value recognized in the balance sheet (the book value of equity), while the value-added is forecasted from the income statement, which is easier to predict;
- Concerning the DCF, the forecasting horizon can be shorter, and most of the value is recognized in the earlier stages;
- They can be used for several accounting principles;

- They make sure than the stock is not paid too much for growth;
- These models don't rely on the continuing value calculation or speculation about long term growth.

However, these models present two big drawbacks. First, it is needed an in-depth-comprehension of accrual accounting. Moreover, the high reliance on the accounting numbers can be mined by non-ethical behaviour, such as accounting manipulation, which will be discussed in detail in a later section.

1.2.2 Asset-based methods

If the value of an asset is given by the sum of the cash flow that it can generate, the value of the firm is the sum of the value of all the assets it is made of. This current, the fair value/equity method valuation is therefore based on the valuation of the assets already existing in the firm. Although this method can represent a good indicator of capital strength, it involves a different kind of valuation techniques based on the asset that needs to be valued. In particular, some assets like cash & cash equivalent, receivables are easy to value and usually, the face value represents already the market value (ex. Cash & cash equivalents); tangible assets are valued according to the type of assets and the kind of market activity for that asset (ex. Real estate). While the valuation of intangible represents the most difficult, but yet fundamental, part.

By making assets valuation, the equity value will be given by:

$$Equity\ value = \{Book\ Value\ of\ Equity + [(P_1 + P_2 + \cdots) - (M_1 + M_2 + \cdots)] + I\}(1 - t)$$

Where:

P = gains over the book value of the specific assets

M = losses over the book value of the specific assets

I = intangible assets

t = tax rate

In the last decade, regulators and accounting rules makers have pushed towards "fair value accounting". The fair value accounting is the accounting policy by which assets and liabilities are reported on the balance sheet at fair value and changes in fair value are recognized as gains or losses in the income statement. This accounting method aims at renovating financial statements to make a better representation of the real value of the assets

and therefore of the equity. However, there are mixed opinions about fair value accounting. Some say that this is a positive development because it links financial statements to the true value of the firm, providing more useful information to financial markets. Others say that fair value accounting increases the potential for accounting manipulation, hence the financial statements will lose credibility and will be less informative.

Regarding the intangible part of the balance sheet, goodwill can be defined as the ability to produce a certain income through a synergic work of all the intangible and tangible assets inside a company. In this sense, the goodwill can be calculated as the difference between the theoretical value of equity and the book value of shareholder's equity, assuming values that can be either positive and negative. From this perspective, to value a company, given its book value of equity, it is only necessary to value the goodwill. However, this component is made of several aspects that should be considered: human capital, commercial licenses, order book, brand, customer portfolio, and customer database, mineral exploration, and research concessions.

Human Capital

Even though there are several methods to value human capital, the most widely used one is based on the replacement cost criteria. This method calculates the human capital value as the cost of that the company would sustain to replace all the staff available at the time of estimation with a staff of equivalent quality under the same given environmental and market condition. In general, this cost is usually three times the company's total annual salary costs (Likert, 1970). In particular, the recruitment selection and training cost mainly represent the 17% to 50 % of the total annual salary costs, while the cost or hiring and induction can be between 17% to 200% of the total annual labor cost. Therefore, the main decision is about the staff cost multiplier, which, although empirical researches show that can take values between 1/6 to 2 times the annual salary, can be hard to determine. In particular, aspects such as quality of in-house research, quality of technology used, the complexity of any financial marketing, supply, staffing, and/or administrative problems, quality of the style of management, have to be taken into consideration.

Commercial Licenses

Licenses are those administrative concessions that allow the pursuit of some of the entrepreneurial activities. The value of licenses is therefore linked to the given ability to operate in a certain location offering a certain pinpointed sales and income potential, without even taking into consideration the entrepreneur's abilities and employees' quality.

As well as the replacement cost method, also a fundamentals-based method is used. The

latter, however, is used to find the value of the license starting from the value of the company retrieved from one of the valuation methods explained so far. In the replacement cost method, the license is valued through the application of a multiplier and a quantity linked to the volume of sales i.e. those achieved due to the certain location of the shop.

Order Book

This intangible asset relates to those businesses that operate based on commissioned work. The order book represents all those orders that have been placed by the company's client and yet to be completed. Its value is therefore related to the ability to express earnings potential. Similar to the methods used to value an entire firm, also in this case the order book value is given by the discounted future earnings, given for each commission and the main difficulty lies in the definition of future projections. The latter can be made by looking at financial plan for future years, at historical data from previous balance sheet, calculating the average between the current financial result and the previous year result or referring exclusively to the past year. From this analysis, it is possible to determine the Earnings on Sales ratio (E/S) to be applied for each order to estimate each profit.

Brand

The brand usually represents the most valuable of the intangible assets, yet maybe the hardest to value. The most common method, the earnings-based method consists in the evaluation of royalties derived from the brand over some time as long as the duration of the brand itself.

Customer portfolio and customer database

The customer portfolio and its database represent all the people that do business with the firm itself. They represent the actual clients, therefore the quality and richness of this portfolio is a strong index of company profitability, which should be indeed valued individually. The methodologies are mainly empirical since they identify a certain multiplier, able to describe the relationship existing between the business and its clients. A typical technique consists in calculating the customer portfolio by taking a percentage between 0.8% and 2% of sales. Alternatively, it can be taken a percentage between 2% and 3.5% of the volume of annual profit. In the case of a huge mismatch in results between these two methods, the second one is preferable.

Mineral exploration and research concessions

These concessions represent a high-value intangible assets and their valuation implies some special problems. In particular, any solution should include an accurate analysis of geophysical features, validated by an expert. The valuation methods used in this field are the capitalization of historical cost methods and, again, the option valuation. The first method

consists of the capitalization of all the expenses sustained in acquiring technical know-how and in obtaining a specific research license. The evaluation of both expenses happens to be particularly complicated and subjected to an expert subjective point of view. The option methods can be based on the calculation of the probability of success of a drilling operation, the number of attempts to discover an economically productive deposit, or of the research cost of every drilling operation.

1.3 RELATIVE VALUATION

According to the law of One Price, a firm's value is given by the sum of its future cash flow, since the present value is the amount to pay elsewhere in the market to replicate the same cash flow with the same risk. Therefore, two companies that share the same risks and the same cash flows should have the same value. However, it is impossible to find two identical firms in the market, but it is possible to value a certain firm by looking at how comparable companies are priced in the market and expressing their value through valuation multiples. Despite the DCF valuation, where the valuation is based on the firm's ability to generate cash flow (internal point of view), the relative valuation is based upon what the market is paying for similar firms. It is therefore implicit that if the market is somehow overpricing or under-pricing a certain sector, there will be a substantial difference between the DCF valuations and the relative one. Some multiples take into consideration the Equity value alone, by allowing a direct estimation (e.g. P/E). Other multiples take into account the enterprise value instead; from this value, it is possible to deduce the equity value by subtracting the value of net debt (e.g. EV/EBITDA). To carry out the relative valuation it is necessary to find a group of comparable companies, that share indeed the same sector, competitive conditions, market size, and similar profit margins. Moreover, to successfully apply the multiples method, there should be a) a similarity between the comparables in the growth rate of the expected cash flows and the degree of risk, b) the value of the firm should be correlated with the measure taken as a performance parameter. Considering that all of these conditions are rarely met, the choice of the comparables is extremely subjective, especially in the choice of comparables that are experiencing a certain growth rate. Many analysts adjust for these differences qualitatively, making every relative valuation a storytelling experience; analysts with better and more believable stories are given credit for better valuations. Due to these reasons, some think that relative valuation does not return reliable values, however, others (Liu J Nissim and Thomas, 2001) remains strong supporters of this method that, according to their studies, can explain price changes with almost the same accuracy of all the other

methods presented in this elaborate. The simple reason is that the multiple valuations follow the same logic of the other valuation methods: firms with higher growth potential, less risk, and greater cash flow should trade with higher multiples and vice versa.

1.3.1 Equity Multiples

Intuitively, a firm value can be intended as a multiple of the earning that it generates. Or in other terms, buying a stock means in some sense to buy a right to the firm's future earnings. Being this intuitive, the Price-Earnings multiple is one of the most common multiples used in relative valuation. The Price-Earnings multiple can be estimated as the ratio between the current stock price and current earnings-per-share (EPS) or the estimated next year earnings-per-share. In formula:

$$Price - Earnings \left(\frac{P}{E}\right) = \frac{Share\ price}{Earnings\ per\ share}$$

Another famous multiple, widely used by investors, is the Price-to-Book value per share, given by:

$$Price - to - Book\ value\ per\ share \left(\frac{P}{B}\right) = \frac{Share\ price}{Book\ value\ of\ equity\ per\ share}$$

this particular ratio is a measure of how under- or overestimated is the firm's stock, comparing is book value to market value. This ratio can capture the investors' expectations regarding the future performance of the company. In other words, the higher the expected future earnings/returns on investments, the higher the P/B ratio. The analysis of this ratio can return much interesting information on how some businesses are valued across industries or how the industry itself is being valued by the market.

1.3.2 Enterprise Multiple

When valuing a business, as opposed to valuing just the equity, many multiples can be taken into consideration, based on the feature of interest of the company itself. Generally, the most used one is the multiple of EBITDA (Earnings before interests, taxes, depreciation, and amortization.

$$Enterprise\ Value = \frac{Equity\ value + Debt\ value}{EBITDA}$$

In Kaplan and Ruback research (1995) this multiple has been found to provide similar valuation accuracy of the DCF valuation. This could probably be due to the EBITDA driver as a realistic performance indicator, not influenced by accounting policies.

Another important value driver for some business is the number of sales. For this reason, the sales multiple is widely used in a relationship with the overall enterprise value rather than the only equity value.

$$Enterprise\ Value = \frac{(Equity\ value + Debt\ value)}{Sales\ or\ revenues}$$

Another big advantage of using this multiple is that, while earnings and book values can be influenced by accounting systems, sales are rarely affected by those, therefore it is easier to compare firms in different markets using the EV/Sales multiple.

Relative valuation has very important advantages that make it one of the most used valuation methods. In the relative valuation, far less information is needed than DCF valuations. For example, there's no need to create assumptions regarding the future and that makes it an easy and straightforward method. Moreover, the valuation is much more likely to reflect market perceptions and moods than the discounted cash flow valuation. This can be extremely important regarding situations where the market perception is the main price determinant, for example in case of an IPO or for investing in "momentum" based strategies. However, by taking information and perception from the market, the relative valuation brings all the market biases with it. The relative valuation is based on the assumption that the market could be wrong on individual securities, but is correct in the aggregate. So, if the base assumption is wrong, the valuation will be wrong consequently. As stated previously, for example, it is easy that a whole industry could be in a certain moment overvalued by the market, a relative valuation carried out at that moment will point out an overvalued estimation.

It is straightforward that this valuation can be used when there is a large number of comparables, that have common variables on which it is possible to standardize the price. Moreover, it is a good valuation option in a short time horizon and it is the main method to value privately-held firms overall.

1.4 REAL OPTION

Anything that shares the following option's features can be valued as an option:

- Their value depends on the value of underlying assets;
- The payoff on a call (put) option occurs only if the value of the underlying asset is greater (smaller) than an exercise price that is specified at the time the option is created;
- Their life is fixed.

The method consists in applying the classical option pricing model to the firm. The underlying assumption is that every company has embedded the possibility of making

different choices and in particular, the company has the right but not the obligation to undertake any investment decision. Different from the classical financial options, those are called real options.

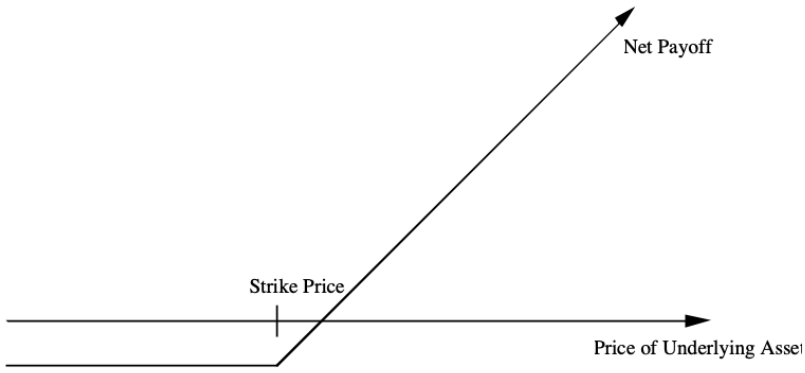
1.4.1 Financial option theoretical framework

To have a better understanding of the real option corporate valuation method, it is useful to give an overview of the theoretical framework of the financial options. The financial options are financial instruments that give the right, not the obligation, to sell a certain quantity of an underlying asset at a fixed price (strike price), at or before the expiration date. At the expiration date, the owner can decide to not exercise the option. The options consist of two main types: call and put option. The call option gives the owner the right to buy the underlying asset at a certain price during the exercise period. Since it represents a right, the option has its price. At the exercise date, two possible situations can take place:

- The value of the underlying asset is less than the strike price, the option will not be exercised, and the owner loss will be represented just by the option's price;
- The value of the underlying asset is greater than the strike price, the option will be exercised and the owner profit will be represented by the difference between the price of the underlying asset and the strike price, net of the price paid for the call initially.

Therefore, the payoff scheme can be represented by the following diagram:

Image 1.1: *Call option payoff scheme*[2]



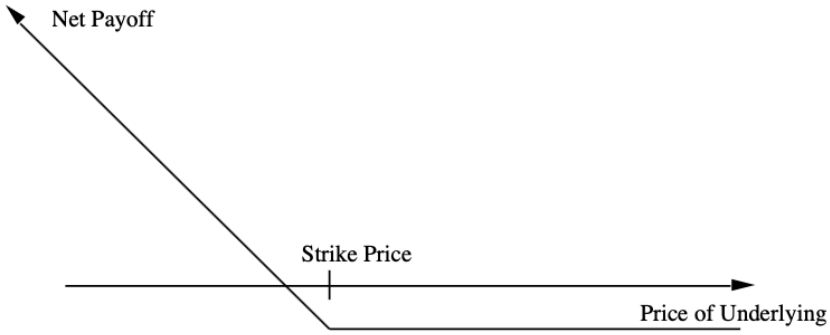
[2] DAMODARAN A., *The Promise and Peril of Real Options*, Stern School of Business, retrieved from*:* *http://people.stern.nyu.edu/adamodar/pdfiles/papers/realopt.pdf*

Conversely, a put option gives the owner the right to sell the underlying asset at a fixed price during the exercise period. Again, this right, and therefore the option, has its price. At the exercise date, two possible situations can take place:

- The value of the underlying asset is less than the strike price, the option be exercised, and the owner profit will be represented by the difference between the strike price and the underlying asset's price, net of the price paid for the put initially;
- The value of the underlying asset is greater than the strike price, the option will not be exercised and the owner loss will be represented by the price paid for the put initially.

The put's payoff can be described by the following diagram:

Image 1.2: *Put option payoff scheme*



The option's value is determined by the following variables, related both to the underlying asset and financial markets:

1. The current value of the underlying asset,
2. Variance in value of the underlying asset. The higher the variance of the underlying asset's value, the greater the option's value. The reason behind this statement is that a high variance gives more chances to earn returns from large price movements.
3. Dividends paid on the underlying asset. The value of the underlying asset is expected to decrease if dividends are paid. Therefore, the value of the call option decreases as a function of the size of the expected dividends. Conversely, the value of the put option increases.
4. The strike price of the option. According to the payoff logics explained previously, the call option value will decline as the strike price increases. While for the put option, the value will increase as the strike price increases.

5. Exercise time. Options, both calls, and puts, are more valuable as the exercise horizon increases since there are more chances of price movements of the underlying asset.
6. The riskless interest rate corresponding to the life of the option. The riskless rate represents the opportunity cost involved in the purchase of an option. A higher interest rate corresponds to a higher call's value and a lower put's value.

There are two option pricing models: binomial tree and Black and Scholes. For the sake of focusing on enterprise valuation, there will be a major deepening on the latter. In the binomial trees method, the value of the option is calculated by looking at all the possible price movements in the future, by assuming that at the end of each period the stock price can have only two possible values, and creating a replicating portfolio of the option payoff using other securities. In the end, for the law of one price, the option has to have the same value as the replicating portfolio. While the binomial trees method is a discrete one, the Black and Scholes method assumes that the price process is continuous and there are no jumps in the asset's price. The model is described by the following formulas:

$$Value\ of\ the\ call = S\ N\ (d_1) - K\ e^{-rt} N(d_2)$$

where

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

and

S = Current value of the underlying asset

K = Strike price of the option

t = Life to the expiration of the option

r = Riskless interest rate corresponding to the life of the option σ2 = Variance in the ln(value) of the underlying asset

1.4.2 Real option in corporate valuation

The Black and Scholes model can be used also to value an entire corporation. If we look at an enterprise from an equity holder perspective, it is stated that:

- An equity holder has a residual claim, namely, she/he can claim over the cash flow left after all the other claim holders (debt, preferred stock, etc.) have been satisfied.
- In the case of firm liquidation, equity holders will therefore receive whatever is leftover given that the company has paid off all the financial claims and outstanding debt.
- So, the limited liability protects the equity investor if the value of the firm is less than the value of the outstanding debt.

Given this information, it is possible to outline the following pay-off scheme **(image 1.3)**:

Equity investors payoff $= V-D$ *if* $V>D$

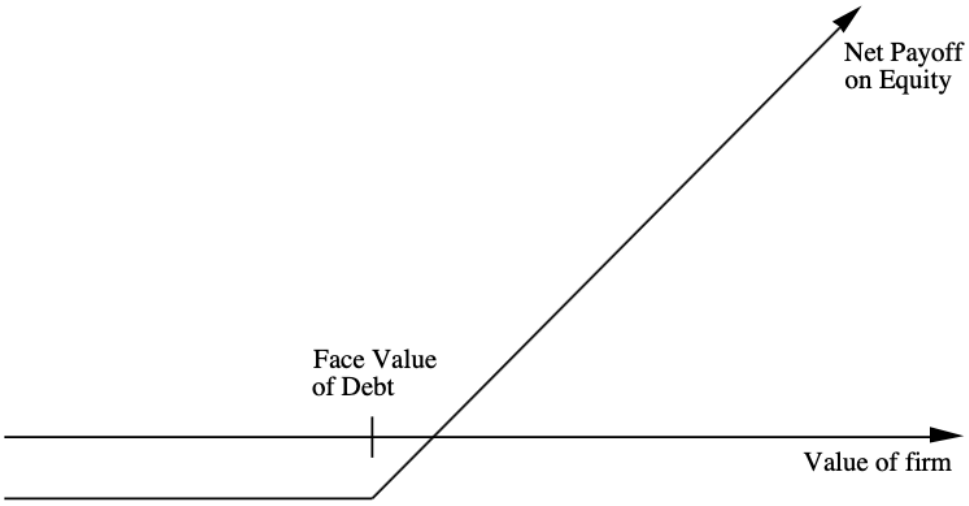
$= 0$ *if* $V<=D$

Where:

V = Liquidation value of the firm

D = Face value of the outstanding debt, including the other financial claims

Image 1.3: *Real option payoff scheme*[3]



[3] DAMODARAN A., *The Promise and Peril of Real Options*, Stern School of Business, retrieved from*:* *http://people.stern.nyu.edu/adamodar/pdfiles/papers/realopt.pdf*

The payoff scheme resembles the payoff of a call option; therefore, the same option pricing method can be used giving the following assumptions:

- Value of the underlying asset = **S** = Value of the firm
- Exercise price = **K** = Face Value of outstanding debt
- Life of the option = **t** = Life of zero-coupon debt
- Variance in the value of the underlying asset = $\boldsymbol{\sigma^2}$ = Variance in firm value
- Riskless rate = **r** = Treasury bond rate corresponding to option life

And then applying the Black and Scholes option pricing model.
One big implication of this model is that even if the value of the firm falls below the face value of the outstanding debt, the equity will still have value. Unlike all the previously listed methods, the real options method does not understate the equity value considering the option that:

- Before the end of the period, the value of the firm may increase above the face value of the outstanding debt and financial claims,
- At the end of the period, the firm will be liquidated.

This method presents for sure some advantages and some drawbacks. Even though the model is extremely easy to use, it makes some inevitable simplifying assumptions.
In particular:

1. It considers only two claim holders in the firms (debtholders and equity holders). This assumption is mandatory since the inclusion of another claim holder such as preferred stock would make the model difficult or impossible to solve.
2. It considers a unique issue of debt, that can be retired at face value to look the most similar to the option typical payoff.
3. The outstanding debt is plain without any special feature (coupons, convertibility, etc.). If so, the equity investors could be forced to liquidate the firm (exercise the option) at these earlier coupon dates if they do not have the cash flows to meet their coupon obligations.
4. The variance of the firm value can be estimated.

Also, since the option pricing models derive their value from an underlying asset, it is necessary to value that underlying asset first, in this case, the firm value, therefore another

valuation approach is needed anyway. This model presents also some advantages. First, as stated previously, the model considers those options that the previous models exclude, explaining why, even when companies are almost bankrupt, their equity still has value. Moreover, this model could be helpful in the following situations that couldn't be valued otherwise:

- When valuing firms do not have publicly traded debt or have wrongly valued bonds;
- When valuing a firm is in a troubled situation;
- When valuing a small and new firm (even without revenues and profits);
- Finally, the model provides some insight over the effects of actions taken by the firm.

1.5 MIXED METHODS

The last valuation category is represented by those methods that are a middle ground between the methods explained, taking the best of both parties. Within them, two methods stand out as the most commonly used: the average value methodology and the goodwill limited life. The average value is a mix of the stock-based and earning-based methods, and consist of taking the average of the Net Asset Value and the value discounted earnings. In formula:

$$E = \frac{1}{2}\left(NAV + \frac{E[Earnings]}{r_e}\right)$$

where:

E = Equity value

NAV = Net Asset Value

r_e *= cost of equity capital*

W is the equity fair value; K′ is the NAV; E is the expected normalized earnings; k_e is the cost of capital.

In the second method, the Goodwill Limited Life, the equity value is measured as the sum between the NAV and the present value of the excess return/residual earnings, over a time span of 3 to 8 years. The limited-time horizon is explained by the same reason of the Residual Income model, namely the impossibility of maintaining a competitive advantage (source of the excess earning) for a long period by a company.

In formula:

$$E = NAV + (E[Earnings] - r_e NAV)a_{n,i}$$

where:

E = Equity value

NAV = Net Asset Value

r_e *= cost of equity capital*

$a_{n,i}$ *= discount factor*

CHAPTER 2

The value driver

In the previous chapter, several methods used in the firm valuation were discussed, highlighting the goods and the bad for each one of them. Among those methods, the DCF and the accounting-based valuation methods stood out as the most universal and most grounded methods. While the DCF, as the word says, is based on the process of discounting the projected cash flow, the accounting-based method, and in particular the Residual Earning method, is based on the book value of equity and the discount of the projected future earnings. As a result, to discover if the DCF may still be considered as the king method in valuation, it should be shed a light over the information content provided by cash flow rather than earnings, by understanding which of those variable represents the most reliable value driver. In this chapter, it will be shown how the two measures can capture a wide variety of information regarding firm performance and governance. However, they also present some major drawbacks that can mine their reliability, both as a stand-alone measure and as the base of the valuation methods previously mentioned. Moreover, it will be shown how literature and empirical research have mixed views and results on this topic. The reason behind this inconsistency may be given by the fact that the valuation process always presents some biases related to the unrealistic hypothesis used as the starting point in the building of the Financial Theory.

2.1 CASH FLOW AS A DRIVER

The cash flow is the main valuation driver within the Discounted Cash Flow valuation method, which has been the most used valuation method until 1990. We will look at the reasons behind its fame and its critical issues as well.

2.1.1 Overview

The cash flow is one of the most important accounting variables that analysts take into consideration since this particular measure can provide many different kinds of information. First and foremost, the cash flow is calculated as the difference between the total amount of cash received, cash in, and the total amount of cash paid out, cash out, by an organization.

However, taken by itself, this amount does not identify the actions or policies that consume money and the ones that produce it. For this reason, every company has to provide a cash flow statement, among the other financial statements, to explain the change in the firm's amount of cash over the accounting period. The relevance of this document is provided by the fact that the cash flow is broken down into three main categories: cash flow from operating activities, cash flow from investing activities, and cash flow from financing activities. The sum of all these three streams of cash for a given period gives the free cash flow as a result, and it has to coincide with the firm's change in a cash position for the same period.

Starting from the cash flow from operating activities, as the word says, it is the cash generated and used in operating activities only (sales revenues and operative cost), excluding any financial transaction. In contrast with the income statement, some costs are not considered in the calculation (i.e. depreciation) as they do not imply any cash movement. The operating cash flow will be therefore calculated as:

$$\begin{aligned} &Operating\ cash\ flow \\ &\quad = EBITDA - \Delta Net\ Working\ Capital - Taxes \\ &\quad - Net\ Interest\ expenses \end{aligned}$$

where:

$$\begin{aligned} &\Delta Net\ working\ capital \\ &\quad = net\ short\ term\ operating\ assets \\ &\quad - net\ short\ term\ operating\ liabilities \end{aligned}$$

Concerning investing activities, meaning activities related to the acquisition and the disposal of long-term assets and other non-current assets different from those included in cash equivalents, those are usually described by the companies in the notes to the financial statements. However, they are usually hard to detect on their own from the financial statements. To calculate the cash flow from investing activities, an inductive procedure is performed to consider the following cash inflow and outflow:

- disposal or purchase of PPE (Property Plant Equipment);
- acquisition or disposal of debt instruments (unless held for trading purposes);
- acquisition or sale of equity instruments (unless held for trading purposes).

Overall it can be summed up as:

$$Cash\ flow\ from\ investing\ activities = PPE\ net_{\ 1} - (PPE\ net_0 - Depreciation)$$

The cash flow from financing activities should consider the following cash movements:

- Increase or decrease in short term borrowing
- Increase or decrease in long term borrowing
- Share issuance or share repurchase
- Dividend payment

Therefore:

$$Cash\ flow\ from\ financing\ activities = \Delta short\ term\ borrowings + \Delta long\ term\ borrowings - dividends$$

The sum of the Cash flow from operation, cash flow from investing activities, and cash flow from financing activities gives as a result the Free Cash Flow (FCF).

The same value can be obtained with an equivalent formula:

$$FCF = EBIT(1-t) + Depreciation\ expense - \Delta Net\ working\ capital - Net\ capital\ expenditure$$

Several people are interested in the Cash Flow statement and its analysis. In particular, it is possible to identify the following profiles:

- Managers are interested in seeing if the firm has enough resources to pay back any debt and how long does it takes to get those;
- Investors are interested in looking if the cash generated is enough, and how the cash is generated itself;
- Business analysts look at the cash flow to analyse if it is sufficient to face all the firm's third parties' obligations and loans.

Projections of the cash flow can provide even more useful information. For example, creditors will be able to identify the company profile, the future business trend, and the amount the client will be able to pay in the future.

Moreover, free cash flow is surrounded by the common belief that this value driver is not affected by accounting policies/distortion. The underlying reason is that the items most affected by the accounting discretion (namely amortization and depreciation) are excluded by the free cash flow calculation, as they do not represent any cash inflow or outflow. This important feature, in conjunction with the ability to provide meaningful information, made the cash flow the most valuable driver in corporate finance.

2.1.2 Why is cash flow the king in valuation?

The DCF valuation owes its success to the comprehensive studies made by the authors Copeland M., Koller T., and Murrin J. which were able to find the following results in late 2000:

- There is a strong correlation (equal to 0,92) between market value and the value resulted from DCF valuation, by looking at a sample of 31 Large U.S. Companies in 1999;
- The market is not fooled by basic earning manipulation, and it focuses on the underlying economic results, in particular, valuation is driven by return on invested capital and growth;
- The market puts great weight on long-term results rather than short-term performance. Also, the market is not driven by actual results, but mainly by expectations. Moreover, since the long term value of a company is given by the results from DCF valuation, the authors suggest managers to focus on the long term cash flow generation.

The authors do not deny that current cash flow may be subject to manipulation, but the long term projections will still give as a result the intrinsic firm value. However, one can say that the main drawback of this method can be found in the projections, indeed, the analyst has to make predictions over the future amounts of sales, which are usually very volatile and difficult to identify from the outside.

The authors also state that even in a non-efficient market, DCF and cash flow analysis should reign, since in the long term the firm value will converge to the value resulted from the DCF. Even though the above statements have been verified through the empirical research made by the authors, and their underlying theory appears to be flawless, the cash flow presents some important criticism made by researchers that might diminish its fame and importance. A relevant thesis, supported among others by Penman and Ohlson, states that the cash flow is not a measure of value. The main reason behind this thinking is that, by looking at how the cash flow is calculated, it is a measure that can be influenced in the following ways:

- By increasing investments, the cash flow diminishes;
- By making disinvestments, the cash flow increases.

Therefore, the cash flow goes in a different direction than the value creation process. The value creation has to be captured in the future and for this reason, in the DCF model, it is needed a projection to infinity. The projections are based on assumption and the terminal value (which is the part of the future cash flow that is discounted to infinity) can play the

most important role in the valuation and still be substantially subjective. Moreover, cash flow projection can be tricky since those are mainly based on the management objective, intuition, and knowledge of the business. From the outside, it requires a forecast of sales level which is very difficult to identify. For these reasons, it is possible to conclude that the DCF model does not represent the best model for seasonal business and highly volatile business environments.

2.2 EARNINGS AS A DRIVER

2.2.1 Overview

Earnings are the basic measure of firm performance. Those represent the actual profit made by the company after including all the expenses related to the specific year. Earnings are used in the firm as a driver to calculate executive compensation plans, debt covenant, the prospectus of firms that are looking to go public, and are observed from the outside by the investors and creditors. At variance with the cash flow, earnings follow two important accounting principles: revenue recognition principles and the matching principles. The first states that the revenue should be recognized when the firm has performed all or a portion of the services and there is a cash receipt. In contraposition to the DCF method, Penman and Ohlson believe that earnings are a true measure of value due to the matching principle that requires cash outlays associated directly with revenues to be expensed in the period in which the firm recognizes the revenue. These two accounting principles allow earnings to incorporate some information regarding future periods/events.

Going ahead, earnings can be predicted quite easily. Studies demonstrate that profits own superiority in terms of being the baseline to make predictions over future cash flows. Moreover, by looking at which accounting measure investors usually look for, a survey made in 2005[4] reported the following results:

[4] Graham J.R., Harvey C.R., Rajgopal S., *The economic implications of corporate financial reporting*, in Journal of Accounting and Economics, Dec. 2005, vol. 40, p.3 ss.

Table 2.1: *Most requested accounting measure by investors in 2005*

Ranking	Accounting Measure	Percentage
1	Earnings	15%
2	Revenues	12%
3	Cash Flow from Operations	12%
4	Free Cash Flow	10%
5	Pro-forma earnings	12%
6	Others	2%
7	Economic Value Added	1%

Therefore, it seems that even though the cash flow gets the greatest attention from a theoretical perspective, earnings get the most of it in a practical perspective.

In particular, this interest can be better understood because the main target in an industrial plan is expressed as Earning Per Share (EPS), and the degree of achievement of the target is verified through the publication of quarterly results. Also, these numbers can strongly influence the market. For example, if every three months the EPS is not meeting the expectation, there is a "negative surprise" and the prices decrease. While in the case of an outperformance of the expectations, there is a "positive surprise" and prices increase. For this reason, also the ability of the management to beat the EPS targets is somehow essential and increases credibility in investors' eyes. In other terms, the success of a firm in the financial market is based on management credibility, which is periodically tested.

From these important statements, it easy to find the main drawback regarding the earning accounting measure, and why the affirmation stated not only that "cash is king…", but also "…accounting is irrelevant". In the past, there has been general refuse of using earnings as a valuation driver because they are a measure subject to accounting manipulation. Within this huge topic, which will be discussed in depth later in the chapter, in its most light form, management usually pursues the so-called Income Smoothing Hypothesis. This hypothesis, firstly described in 1964 in the work of Gordon, states that management tends to minimize the fluctuation of the income variable around a specific trend to achieve the following goals:

a) distribute the usual (compared to the past ones) and normal (compared to the peers) dividends;
b) resize the firm risk perceived by the shareholders and stakeholders

Gordon states the following proposition and theorem:

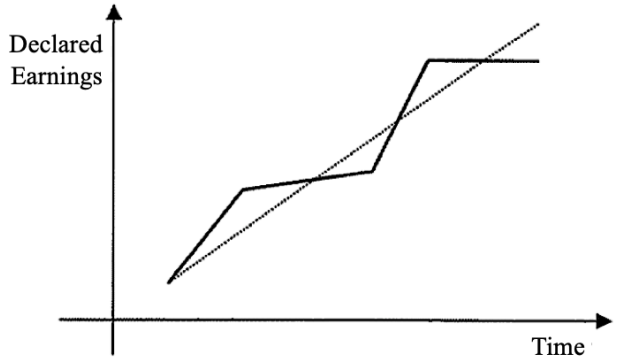
Proposition 4:

Income variance represents an important measure of the firm's financial and economic risk, and it is directly related to the risk premium used by analysts to discount the future corporate flows.

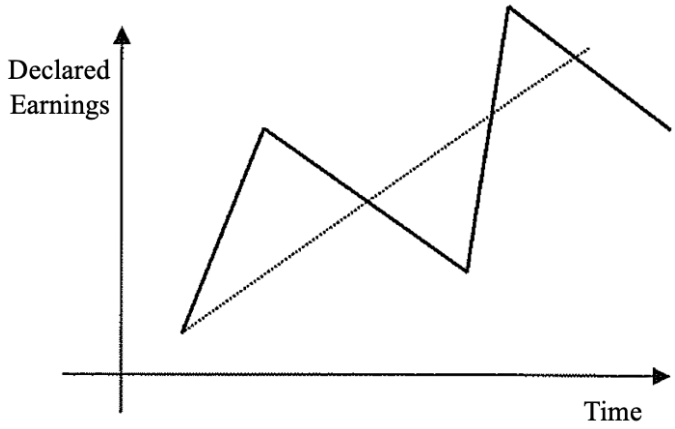
Theorem 4:

Top management aims at minimizing the variance of expected results around a specific trend to increase the firm value (as seen in the figure below).

Image 2.1: *Relationship between earnings volatility and value of future earnings*[5]



Low declared earnings fluctuations → low-risk premium → low required return → high present value of future earning



High declared earnings fluctuations → high-risk premium → high required return → low present value of future earnings.

[5] GORDON M.J. (1964), Postulates, Principles and Research in Accounting, *The Accounting Review* (vol 39), pages 251-263

2.2.2 Earnings quality

To better understand the earning measure and its reliability, an excursus over the earnings quality issue is mandatory. Within the branch of the phenomenology of accounting reporting, two important behaviours shed a light over the reliability of earnings as a value measure. In particular, it is possible to distinguish:

- Creative accounting: the practice by which firms use different valuation and accounting criteria to influence the profit calculation and therefore, influence all those indicators of the equity, financial, and economic situation of companies. The practice is usually focused on those accounting items subject to discretion: extraordinary and exceptional income components, potential liabilities, changes in the depreciation policy, currency mismatching, hidden reserves on pension funds, etc.
- Real earnings management: the practice by which the top management uses real operational activities to conduct earning manipulation.

Those practices that aim at trying to affect the final firm result to achieve certain profit goals, to be reported in the financial statement, are called earnings management. This behaviour will provide, as a result, misleading information to the market through the reported earnings to have an impact in the market overall and ultimately on the firm valuation itself.

The reasons why managers carry out this practice are many. According to Palepu, Healy, and Peek, managers introduce noise and bias into accounting to achieve the following goals:

- Meet contractual agreements, especially regarding financing activities with banks and other financial institutions. The violation of certain covenants can lead to different penalties.
- Increase management compensation. As stated earlier, earnings are used to calculate the executive's compensation. Therefore, the management chooses the accounting policies and behaviour that can maximize their expected compensation. For example, in case of extensive use of stock options, it is in the management interest to inflate the earnings and therefore the stock price at the end of the exercise time.
- Manage corporate control context. In case of a hostile takeover, managing the accounting numbers on the financial statement can bring to a greater deal or a discouragement of the bidder.
- Manage tax payments. By inflating losses and accruals in the financial statements, the reported profit will be lower, thereby reducing the tax payments.

- Comply with the regulators' disposition. Sometimes, making some adjustments to the financial statements can prevent any infringements of laws, such as competition laws, tax policies, or import tariffs.
- Influence the market. For example, not meeting the expectations of the market in terms of financial results can be a very negative sign that can have a huge impact on the share price.
- Influence stakeholders. During wages negotiation with trade unions, the firm can manipulate accounting numbers to understate profits.
- Influence market competition. Making profit-decreasing accounting choices can discourage new entrants in the markets.

There is mixed literature on whether the market detects the earning management and on how it behaves consequently. For sure it can depend on how much is the market sophisticated, or in other terms, how much do the investors go in-depth performing a firm analysis. The same considerations should be made for real earning management as well.

The stress point is whether the earnings management practice has an actual effect on earnings quality.

It is possible to define earnings quality as the ability of earnings and similar accounting measures in describing the actual firm financial performance during a period of time. According to Dechow and Schrand, earnings' quality depends on different factors: firm characteristics, financial reporting practices, governance and controls, auditors, equity market incentives, and external factor periods the firm characteristics, those are directly related to the probability of carrying out some accounting manipulation, like the ones listed above. For example, a company with a high level of debt is more likely to commit earnings manipulation due to the possibility of breaching covenants. The same goes for the firm with weak performance, firms with high growth, or big firms. Another influence on the earnings quality is given by financial reporting practice. Indeed, the reporting quality could be threatened by the choice of accounting techniques. While in Penman analysis the choice of accounting standards is irrelevant for valuation purposes, the choice of accounting behaviour, prudent or aggressive, can be instead detrimental. Another important, yet controversial factor influencing accounting quality is the firm's governance and control, however, studies do not express a unique response to this relationship, however, is somewhat straightforward that a stable and respected board should be less implied with earnings manipulation. The choice of auditor can affect accounting reliability. Studies usually demonstrate that if companies are audited by one of the big audit companies, are less exposed

to market manipulation. Going ahead, the equity market is a great incentive to provide misleading accounting results. For example, in case of an IPO, capital raising, M&A, companies want to give a brilliant impression to the market, therefore in those situations, earnings manipulation can be more attractive, resulting in a lower earnings quality. To conclude, an external factor can also imply a more biased financial reporting i.e. regulation, taxes, etc.

These considerations bring the following conclusion. Earnings quality is a real issue that can have a big impact on the earnings capacity of measuring firm performance, and therefore on its ability to be the starting point of a firm valuation technique. Even though accounting manipulation does, to some extent, affect both earnings and cash flow measures, it is undeniable that manipulation pursued mainly by the use of accruals can have a relevant impact on earnings and their projections as well.

2.3 VALUATION BIASES

A huge section of the Finance Theory mainly developed in the USA is based on the Efficient Market Hypothesis. The latter is the theory on which all the theoretical constructions regarding financial markets are built. From a USA perspective, the following statements are considered some staples in the financial theory:

- The best method to evaluate economic firm capital consists in the actualization of the projected future cash flows;
- The discounting rate used in the actualization of the future flows should be calculated according to the Capital Asset Pricing Model (CAPM);
- There should always be a coherence between the cash flow to be discounted and the risk parameter that has to be considered in the discount rate calculation. In particular, the cash flows are discounted at a rate determined by considering a risk measure captured by the variable beta.
- Market prices reflect the present value of cash flows in a long term perspective.

Accounting reporting is considered irrelevant in picturing the management activities and it should not be taken into consideration in evaluating the equity capital. The choice within different accounting methods is perceived as irrelevant unless it produces a fiscal effect. In other words, the accounting values are taken into consideration in case they modify the tax cash flow. Regarding this perception of accounting reporting, T. Smith states that earnings result from opinions, while liquidity is a fact.

However, starting from the fathers of the finance theory, Modigliani, Miller, Sharpe, Lintner, and Mossin, they all started from the same postulates, which state the following:

- Information is costless;
- Market operators are rational.

These postulates identify the market operator as an "economic man" who can solve problems by knowing all the different solution alternatives and by evaluating each one of them. In this case, choices are necessarily optimal. In contrast with that theory, the limited rationality theory affirms that the individual that takes a decision (administrative man) do not know all the available alternatives and he is not able to evaluate them, considering also the time and effort that he should put to get and elaborate the information needed, other than being influenced by its motivational status. In this case, choices cannot be considered optimal, but just satisfactory.

Moreover, the world around the administrative man is characterized by a strong dynamicity, and gathering information represents a hard activity.

By going from the economic man, who can describe reality through mathematical schemes in a complete way, to the administrative man, whose rationality is limited, the existence of biases in the valuation theory becomes evident. At the same time, by eliminating the market efficient hypothesis used behind each valuation methods, some common misconception arises. Firstly, the idea of intrinsic value may not be useful. Namely, the intrinsic value may be considered as the value justified by facts, e.g. the assets, earnings, dividends, definite prospects, rather than the one displayed by financial markets (price). However, Graham and Dodd said that it is a great mistake to think that intrinsic value can be a definite and determinable measure such as the market price. And if the intrinsic value presents this rather uncertain behaviour, it's easy to see how the struggle in the process of capturing the ultimate output can be doubtful or misguided. Moreover, the stock value can vary within the same company accordingly to the corporate control. Indeed, theory predicts that controlling stocks, owned by the majority stakeholders, include a premium value due to the ability to influence the choices and future performance of a company. On the other hand, the floating stocks, which are the ones that are available for trading purposes, have indeed a discount in value due to the lack of power in determining the fate of the company. Therefore, associating the intrinsic value of a firm to the sum of the stock prices on the market, could be inaccurate.

Looking at another bias in the valuation theory, even though the starting numbers are taken from the financial statement, and as so they can be considered certain, forecasts are estimates. For forecasts, it is meant all the variables used for the prediction and discounting

process, that is the growth rate and required return. For the second variable, the usual practice consists in using the Capital Asset Pricing Model (CAPM). Regarding this topic, many studies have clarified the uncertainty and the difficulty of capturing the riskiness of the firm, and consequently its required return, by using two variables, beta and risk premium, which are highly subject to uncertainty, other than they are retrieved only by looking at the past values and performance of the firm.

Regarding the first uncertain variable mentioned, the growth rate, Benjamin Graham in *The intelligent investor* said that it is not right to use highly precise formulas with highly imprecise assumptions, because the latter can justify any value that the analyst wants to achieve. The long term growth rate, or continued growth, is considerably uncertain, as the analyst should theoretically predict the firm's performance for the rest of its life. These considerations make clear how Graham was sceptical about any valuation model and formulas in general, so then what is the goal of valuation ad valuation models? In other words, how useful are those valuation models in challenging the market price?

Investing is a game against other investors, not against nature. Valuation models then should not serve as tools to get to that infamous intrinsic value, but they should be used to understand how the investor thinks differently from other market investors. Therefore, the study on the valuation model should be taken to retrieve the general perceptions of other investors in the market in the "negotiation with Mr. Market" (Graham B.).

CHAPTER 3
Empirical Analysis

This analysis aims to understand which of the main variables can be considered as the driver of the firm value, which is approximated to its stock price. In particular, to find out if the Cash Flow represents still the king in the valuation world.

3.1 SAMPLE DATA

To carry out the analysis, we considered a sample of 350 companies that belongs to the S&P Europe 350 index. The latter consists of 350 leading blue-chip companies drawn from 16 developed European markets. In particular, companies have to meet the following criteria:

- They have to be domiciled in one of the following countries: Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, or the United Kingdom
- They are among the largest stocks from these 16 markets in terms of float-adjusted market cap.
- They present a high level of trading volume per day. [6]

Those elements are essential for this kind of analysis because the sample should be constituted by mature businesses since it is undeniable that companies in different stages of life (new, distressed) have a more suitable and specific model for their evaluation. Moreover, the high level of liquidity accounts for a higher probability that companies' prices reflect market expectations at any point in time.

Starting from those 350 companies, only the companies that met the following conditions were kept:

I. they belong to any industry except for financials ones (banks, assurance…), real estate and constructions;
II. there is evidence of at least six years of data for each company.

[6] S&P Down Jones indices: https://www.spglobal.com/spdji/en/indices/equity/sp-europe-350/#overview

3.2 VARIABLE SELECTION

We retrieved six-year data for the following variables:

I. X_1 - Price: the latest available price.
II. X_2 - Earnings (Profit after tax): represents the sum of Provision for Income Taxes and Income Before Tax.
III. X_3 - EBITDA: is EBIT for the fiscal year plus the same period's Depreciation, Supplemental, Amortization of acquisition cost and amortization of intangibles.
IV. X_4 - Free Cash Flow: is the sum of Net Income After Tax minus Preferred Dividends and General Partner Distribution plus Depreciation and Amortization of intangibles for the fiscal period.
V. X_5 - Cash flow from operating activities: cash a company brings in from ongoing, regular business activities. It does not include long-term capital or investment costs.
VI. X_6 - Dividends: corporation's common stock dividends on annualized basis, divided by the weighted average number of common shares outstanding for the year.

Where Earnings, EBITDA, FCF, FCFO, and Dividends are independent variables versus the dependent variable, price.

3.3 RESEARCH METHODOLOGY

To observe the relationship between the price and the other variables, the multiple regression model was used. In particular, this model tries to put the dependent variable Y in relationship with the other explanatory and predictive variables based on the following model:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5$$

Where β_0, β_1, β_2, β_3, β_4 and β_5 are the regression coefficients and x_1, x_1, x_2, x_3, x_4 and x_5 are the values assumed by the explanatory variables X_1, X_2, X_3, X_4, X_5, while ε represents a random variable with expected value 0 and variance σ^2. The estimation of the coefficients is performed through the least squares method, which aims at determining the best-fitting line for the set of data, expressing the relationship between the data points.

To apply this method, we first standardized all the variables by calculating the yearly changes for the 6 years.

$$x_{n,i} = \frac{X_{n,i,t} - X_{n,i,t-1}}{X_{n,i,t-1}}$$

where *n re*presents the type of variable, while *i* represents the company.

Moreover, to analyze more deeply the price movement, we subtracted the yearly change of the S&P Europe 350 index's prices from the price changes. In this way, the price is freed from the overall market trend component, and those are the values assumed by the dependent variable Y.

$$Y_t = \frac{Y_{i,t} - Y_{i,t-1}}{Y_{i,t-1}} - Index\ \%\ variation_t$$

Where Y represents the pure price movements at time *t*.

The final sample, was therefore represented by 209 companies with data for 5 yearly percentage variation.

We then conducted a multiple regression analysis for all the panel data, for a total of 1046 observations, having Price movements (intended as the change in Price over the change in price's Index) as the dependent variable and Profit, EBITDA, FCF, FCFO and Dividends as the independent ones.

3.4 RESULTS

The relationship between the price change and the change in the independent variables (Income, EBITDA, Cash Flow, Free Cash Flow and Dividends) observed in **table 3.1**

Table 3.1: *Regression results by using as the pure price movements as the dependent variable.*

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0,036116755	0,008529681	4,234244721	2,4963E-05
INCOME	0,003421192	0,002261797	1,512598905	0,130685668
EBITDA	-0,007538505	0,021156048	-0,356328612	0,721666828
FCF	0,000842754	0,00053215	1,583676089	0,113571763
FCFO	0,003068953	0,001421584	2,158826978	0,031091996
DIV	0,010879146	0,004866376	2,235574621	0,025591429

Firstly, it can be observed how the coefficients are almost near to 0, meaning that those variables do not have a strong influence over price. However, two coefficients stand out being three times at least the other coefficients meaning that the change in FCFO and Dividends have three times more ability to influence the dependent variable with respect to the other variables.

We can test the intercepts using the p-value test. Indeed, by choosing the p-value threshold at 0.05, the change in FCFO and in dividends are statistically significant variables. In particular, FCFO has a p-value of 0.03 (<0.05) and dividends presents a even lower p-value of 0.2. In this view, those variables present a potential ability in predicting/driving the changes in stock price.

Meanwhile, income, EBITDA, FCF, are not statistically significant, having a p-value of 0.13, 0.72 and 0.11 respectively. These results may highlight the fact that there isn't any relationship between the trend of these variables and the change in stock price.

However, if we consider the simple change in prices as the dependent variable, results change, as can be observed in the following **table 3.2.**

Table 3.2: *Regression results by using as the simple price movements as the dependent variable.*

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0,045360456	0,007795313	5,818939403	7,88189E-09
INCOME	0,003836367	0,002067067	1,855947599	0,06374401
EBITDA	0,000103011	0,019334607	0,005327787	0,995750084
FCF	0,000900796	0,000486335	1,852214853	0,064278464
FCFO	0,000517196	0,001299192	0,398090343	0,690645375
DIV	0,008155217	0,004447402	1,833703371	0,066983952

In this case, more variables seem to have the potential for influencing the price, given a p-value around 0.05 for Income, FCF and DIV, given that the strongest variables remain the DIV with a coefficient at least two times (up to 8 times) bigger than the other significant variables.

However, the former results, stemming out from a more correct methodological model, should deserve more consideration than the latter ones.

CHAPTER 4

Conclusive remarks

4.1 DISCUSSION

From the carried out analysis, earnings theory is somehow discouraged in favor of the most traditional theory regarding the dividends. However, it is not surprising. In fact, during our analysis, in the absence of equally valid alternatives, we made the main assumption that the value of a company is described by the sum of the value of its shares. Although in theory this statement may be true, shares of the same company can have different prices. In particular, the free float of a company always represents the minority shareholder, which, unlike the majority shareholder, cannot be traded on the market.

For this intrinsic feature, common stocks are, by definition, less valuable than the majority shareholding' shares which encloses the so-called controlling interest, that is the ability of directing a company's fate. On the other hand, the minority shareholder is subject to the decision taken by the controlling shareholder, therefore they are powerless with respect to the future behaviour and performance of the company. Theory predicts that controlling shares have an intrinsic market premium, that is a mark-up in the stock price itself. Meanwhile, the minority shares have indeed a minority discount. In the end, the share prices are not able to capture the real value of a company, but indeed the value of the company that is not under the controlling group. If we start from this assumption, the dividend discount model would be the most suitable model in predicting the value of non-controlling shares.

Finally, we can't deny the statement "Cash is king", but only if the cash considered is the Cash Flow from Operating activities. The reason behind this could be found in the contradicting behaviour of the Free Cash Flow. As already mentioned, this measure tends to decrease if a company increases investments, while it decreases when the company liquidates investments. Indeed, whenever a firm increases investments for a longer period, free cash flow will be negative as well for the same time. In a DCF valuation perspective, given that the short term flows are negative, the analyst would place all the value of the company on the terminal value, taking into consideration the type of investments made and their future realization. This valuation would end up being strongly biased. For this reason, the Free Cash Flow to Operation can be considered a better value driver.

4.2 LIMITATION AND SUGGESTIONS FOR FUTURE RESEARCH

While this empirical analysis provides new insights on the topic of valuation and financial statement analysis, the present work can be improved in consideration of the following limitations.

A factor that could limit the universal validity of the research, is the heterogeneity in the sample with regards to the industry type, considering the high concentration of industrial companies within the sample, observable through the **table 4.1.**

Table 4.1: *Sample industry composition*

Energy	5%
Industrials	30%
Consumer Discretionary	17%
Consumer Staples	11%
Health Care	10%
Information Technology	8%
Communication Services	10%
Utilities	9%

Thus, the observed model might not fully apply to a different mix of companies.

Furthermore, it is uncertain whether the quality of the financial information, which founds any kind of analysis, is fine for the whole set of companies. Finally, it cannot be excluded that second level analysis based on Artificial Intelligence might provide a more efficient predictive model. Thus, present conclusions apply to the domain of traditional statistic approach.

A final consideration should be made regarding the data sample. Indeed, given the fact that the market data as well as accounting variables are volatile and difficult to predict, a linear model would not appear as the optimal model to describe those behaviors, and a more sophisticated one could be preferable.

With regard to these limitations, further research is needed to enlarge the scope of application and to give the results a universal validity. In particular, it would be interesting to evaluate the validity of the results for other relevant geographical areas, such as China or the USA. It is also suggested to retrieve data for a longer period of time, and for different industries, in case of a relevant number of companies per industry. Finally, after getting evidence over the validity of the findings for different combinations of companies, industries and countries,

the ultimate test could be to assess the performance of the same analysis over a time period characterized by market instability and perturbation.
A further research could be focused on ratios, which were not included in this paper for the sake of connecting variables to the valuation model.

4.3 CONCLUSION

Many valuation models aim at predicting the value of a company, and starting from theoretical point of view, they highlight one feature or another. Over the last years, the models that have been the main actors in the valuation theory were the Discounted Cash Flow and Residual Earnings model, which respectively pose a strong emphasis on the cash flow and earnings. Empirical analysis in support of those models have presented mixed results, especially looking at the theoretical current behind them. To better evaluate the models, theorist have focused on fundamentals, and on the analysis of those fundamentals as value drivers by a theoretical point of view. This analysis aimed at evaluating those models by testing those value drivers from an empirical point of view. What emerged from the analysis, is a strong relevance of dividends as value driver for price changes. However, we cannot state that dividends are a value driver for the overall company, because we assumed the value of the company being described by its prices. This approximation should be taken into consideration in choosing the best valuation model possible. In particular, in view of the result of the present analysis, the dividend discount model should be used to evaluate floating stocks, therefore, in case of portfolio investment valuation. In case of an M&A, for example, other methods can be considered instead, since the aim of the valuation is to identify the actual overall value of a company or a branch of it. Moreover, the evidence of the high variability of the variables, both price and other accounting measure, makes it difficult to find a strong relationship with price, since it is also undeniable that the price is influenced by many other factors, not necessarily related to the financial statements. Therefore, an analyst should not rely on one method only to conduct valuation, although based on theoretical foundations. Rather, several methods should be considered to identify the most the most appropriate to different settings and aims of the analysis.

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Summary

The increasing need to find ways to value businesses, company branches, or shareholdings was driven by several phenomena and tendencies that have been taken place in the last years. Firstly, companies' growth is usually achieved through external ways rather than internal ones. The acquisition of businesses, branches of them, or shareholding, represents for companies the easiest and fastest way to develop and increase profits. Valuation is needed to make the best bid. Consequently, also the extraordinary operations, such as mergers, contributions, spin-offs, have intensified. Another reason that brought valuation under the spotlight can be found in the increasing presence of institutional investors on the financial market and the need to assure the right market price to prevent market control situations or the massive phenomenon of privatizations. Over the years, firm valuation has therefore gained always more attention in the academic world and it has been the center of discussion and still it is. The main goal is to find the best valuation method that will get in return the most reliable value possible.

Since the financial statements were introduced, several schools of thought have alternated. The first strong current, called Anglo-Saxon, adopted valuation approaches based on the financial methods and multiples. In particular, they put a strong reliance over the cash flows which were considered the most important value drivers for companies. As they would usually say: cash is king.

Financial valuation methods group includes the Dividend Discount Model, the Discounted Cash Flow, and the Adjusted Present Value. The main theory behind the discounted cash flow valuation states that the value of a certain item is given by the value of all the futures financial flows discounted at a rate that reflects the riskiness of the company itself. Each of those model poses emphasis on different drivers: dividends, free cash flow to equity, free cash flow, unlevered cash flow to the firm and tax shield respectively. In particular, the DDM associates the value of the equity to the sum of the discounted dividends, which represent the actual pay-off of an investor. In the DCF method, the future projection of cash flows (to equity or to the firm) are discounted at the required return on equity or at the WACC, to achieve the value of the equity or firm. Finally, in the APV method, the firm is considered as the sum of its unlevered value and the tax shield resulting from its financial structure. In detail, the method discounts the future unlevered cash flow at the required return on equity

and adds the value of future tax benefits based on the projections of interests paid over certain level of leverage.

In addition to these methods, the Anglo-Saxon school of thought used the relative valuation method. In particular, this method based on the law of One Price, affirmed that two companies that share the same risks and the same cash flow should have the same value. However, it is impossible to find two identical firms in the market, but it is possible to value a certain firm by looking at how comparable companies are priced in the market and expressing their value through valuation multiples. Despite the DCF valuation, where the valuation is based on the firm's ability to generate cash flow (internal point of view), the relative valuation is based upon what the market is paying for similar firms (external point of view). For its simplicity and for the absence of assumptions to carry out this model, it is a widely used valuation method, although it is used as a comparative method next to a principal and more structured one. Indeed, to apply this model there should be a similarity between the comparables in the growth rate of the expected cash flows and the degree of risk, and also the value of the firm should be correlated with the measure taken as a performance parameter. Considering that all of these conditions are rarely met, the choice of the comparables is extremely subjective, especially as for that of comparables that are experiencing a certain growth rate, making the method less reliable.

In alternative to this first school of thought, another important current, denominated European, stated that the valuation should be based on the streams of income rather than cash flow, and accounting numbers in general. The reasons behind this theory were strongly related to the fact that the operative income can be seen as a sort of normalized cash flow, in the sense that these values are usually less volatile and more predictable, due to the use of accruals. Moreover, theorists of this current affirmed that the discounting cash flow valuation was too much dependent on the value projections. In particular, the Residual Earning Model (and its variant the Abnormal Profit Growth) expresses the equity value as a function of book value and residual income (also sometimes referred to as abnormal earnings or excess profit). The model is based on the strong assumption that, if the firm can earn a normal rate of return on its book value, investors should be willing to pay no more than the book value for its shares. If the firm can earn higher profits than the market, the investors should pay a value higher than the book value for its shares. The advantage of this model is that it doesn’t rely on the continuing value calculation or speculation about long term growth, while it puts the most emphasis on the book value of equity, which is a certain starting point.

Similar to this previous method, asset-based methods try to find the value of those intangible assets that are not written in the financial statements. In this view, the final value of a company should be given by the sum of its book value and the value of its intangible assets, such as licenses, human capital, brand, order book etc. The union of this asset-based and the earnings-based method has also developed a new branch named mixed methods, that try to incorporate the best part of each method into a final and more efficient one.

Another noteworthy valuation method is the real option valuation one. In the latter, the value of a company is compared to the value of a call option, and it is evaluated applying the Black and Scholes option pricing model. The information needed to carry out this evaluation are the following: the value of underlying assets, the face value of outstanding debt, the life of zero-coupon debt, variance of firm value and the treasury bond rate corresponding to option life.

A final school of thought states that the choice of a valuation method does not matter because the valuation would happen to be biased in any case. An analyst can easily get to very different values for the same company even by using the same method, because the assumptions underneath each valuation are the main value drivers and they depend on the ability, knowledge, and experience of the analyst. As Graham said, "*The concept of future prospects and particularly of continued growth in the future invites the application of formulas out of higher mathematics to establish the present value of the favoured issue. But the combination of precise formulas with highly imprecise assumptions can be used to establish, or rather justify, practically any value one wishes, however high, for a really outstanding issue".*[7]

The studies regarding those methods have been extremely mixed, based on the theorists behind the model. The most used models both in theory and in practice have been the Dividend Discount Model, the Discounted Cash Flow and the Residual Earnings model, both for their theory foundation and for the universality in application with respect to the other methods proposed. To understand and evaluate the models deeply, the main value driver underneath the models should be taken in consideration. First of all, why is cash considered the king in valuation? First and foremost, the cash flow is calculated as the difference between the total amount of cash received, cash in, and the total amount of cash paid out, cash out, by an organization. However, taken by itself, this amount does not identify the

[7] Benjamin Graham, *The Intelligent Investor*, 4th rev. ed., 315-316.

actions or policies that consume money and the ones that produce it. For this reason, every company has to provide a cash flow statement, among the other financial statements, to explain the change in the firm's amount of cash over the accounting period. The relevance of this document is provided by the fact that the cash flow is broken down into three main categories: cash flow from operating activities, cash flow from investing activities, and cash flow from financing activities. Those flows, as the words say, identify the cash flow explained by operating, investing and financing activities. The sum of all those gives the Free Cash Flow, which represents the cash that a company is able to generate after laying out the money required to maintain or expand its asset base. Several people are interested in the Cash Flow statement and its analysis. Managers are interested in seeing if the firm has enough resources to pay back any debt and how long does it takes to get those. Investors are interested in looking if the cash generated is enough, and how the cash is generated. Business analysts look at the cash flow to analyse if it is sufficient to face all the firm's third parties' obligations and loans. Projections of the cash flow can provide even more useful information. For example, creditors will be able to identify the company profile, the future business trend, and the amount the client will be able to pay in the future. Moreover, free cash flow is surrounded by the common belief that this value driver is not affected by accounting policies/distortion. The underlying reason is that the items most affected by the accounting discretion (namely amortization and depreciation) are excluded by the free cash flow calculation, as they do not represent any cash inflow or outflow. This important feature, in conjunction with the ability to provide meaningful information, made the cash flow the most valuable driver in corporate finance. It was officially crowned by the authors Copeland, Koller and Murrin, which were able to find that Cash Flow during 1999 presented a strong correlation with the market value of 31 Large U.S. Companies. Moreover, they identified the Cash Flow as the best long term measure for value and suggested managers to focus indeed on the long term cash flow generation. In consideration of these statements, it is no surprise that the DCF was considered the best valuation method, and they stated that the company value will always converge to the value resulted from the DCF.

The Discounted Cash Flow, however, have also been hardly criticized by the opponents for several reasons. Firstly, the model is strongly dependent on the assumption made for the terminal value, which represents the largest part of the final value, and those assumptions are made on the sales item, which is very volatile and difficult to predict. Then, focusing on the cash flow, authors such as Penman and Ohlson, stated that the cash flow is not a measure of value. The main reason behind this thinking is that, by looking at how the cash flow is

calculated, it is a measure that can be influenced in a contradicting way. For example, by increasing investments, the cash flow diminishes; while by making disinvestments, the cash flow increases. Therefore, the cash flow goes in a different direction than the value creation process. The value creation has to be captured in the future, and for this reason, in the DCF model, it is needed a projection to infinity.

In contraposition to the cash flow, earnings are considered the basic measure of a firm performance, by calculating the actual profit made by the company after including all the expenses related to the specific year. This accounting measure has many implications due to its relevance in the calculation of executive compensation plans and of debt covenant, for the prospectus of firms that are looking to go public, and from the outside the firm by the investors and creditors. At variance with the cash flow, earnings follow two important accounting principles: revenue recognition principles and the matching principles. The first states that the revenue should be recognized when the firm has performed all or a portion of the services and there is a cash receipt. In contraposition to the DCF method, Penman and Ohlson believe that earnings are a true measure of value due to the matching principle that requires cash outlays associated directly with revenues to be expensed in the period in which the firm recognizes the revenue. These two accounting principles allow earnings to incorporate some information regarding future periods/events. Going ahead, earnings can be predicted quite easily. Studies demonstrate that profits own superiority in terms of being the baseline to make predictions over future cash flows and that they are also the most requested accounting measure by investors. Moreover, earnings have important relevance in the financial markets, given that the meeting or not of the expectations will cause the so-called “positive surprise” and “negative surprise”, identified by a sharp stock price variation for that specific company. Keeping up with the expectation is a good practice in terms of management credibility. However, this behaviour can be pursued by making accounting manipulation. In its most common and soft form, managers practice the so-called Income Smoothing, which is the phenomenon in which managers try to increase firm value by decreasing earnings volatility by making some accounting manipulations in the income statement. Beside this practice, managers usually tend to give misleading information by changing those accounting measures that are based on subject to subjectivity such as extraordinary and exceptional income components, potential liabilities, changes in the depreciation policy, currency mismatching, hidden reserves on pension funds, etc. It is easy to find the main drawback regarding the earning accounting measure, and why the affirmation stated not only that "cash is king…", but also "…accounting is irrelevant". In the

past, there has been general refuse of using earnings as a valuation driver because they are a measure subject to accounting manipulation.

Literature is mixed regarding those points of views, and the reason could be found in the valuation biases that affect any type of valuation method. Indeed, finance theory is based on the following postulates: information is costless and market operators are rational. However, the limited rationality theory affirms that the individual that takes a decision do not know all the available alternatives and he is not able to evaluate them, considering also the time and effort that he should put to get and elaborate the information needed, other than being influenced by its motivational status. In this case, choices cannot be considered optimal, but just satisfactory. Moreover, the world around him is characterized by a strong dynamicity, and gathering information represents a hard activity. By denying those postulates, many biases arise, starting from the misleading idea of intrinsic value may not be useful. Namely, Graham and Dodd said that it is a great mistake to think that intrinsic value can be a definite and determinable measure such as the market price. And, if the intrinsic value presents this rather uncertain behaviour, it's easy to see how the struggle in the process of capturing the ultimate output can be doubtful or misguided.

As said previously, even though the starting numbers are taken from the financial statement, and as so they can be considered certain, forecasts are estimates. For forecasts, the growth rate and required return are implied for the prediction and discounting process. Both of those measures present strong critical issues.

To analyze which valuation method would empirically best suit empirical data, we focused the analysis on the value drivers behind the valuation models. In particular, we analyzed a sample of 209 companies over a 6 years' horizon, taken by the S&P Europe 350 index, eliminating those companies that belong to the financial, construction, real estate, insurance industries, and those that do not have evidence of at least 6 years' data for each variable selected. The sample was then elaborated by calculating yearly change in value for each variable, considering the price change as the dependent variable, and the earnings, EBITDA, FCF, FCFO and dividends' changes as the independent ones. We then conducted a multiple regression analysis, looking for a relationship between the variables taken into consideration. The results show that each coefficient is almost near 0, meaning that those variables do not have a strong influence over price. However, two coefficients stand out being three times at least the other coefficients meaning that the change in FCFO and Dividends have three times more ability to influence the dependent variable with respect to the other variables. We tested

the intercepts using the p-value test. Indeed, by choosing the p-value threshold at 0.05, the change in FCFO and in dividends are statistically significant variables. In particular, the variable that achieved statistical significance are the dividends (p-value < 0.05). In this sense, the variable presents a potential ability in predicting/driving the changes in stock price. Meanwhile, changes in earnings, EBITDA and FCF, are not statistically significant, having a p-value of respectively 0.13, 0.72 and 0.11. These results may highlight the fact that there isn't any relationship between the trend of these variables and the change in stock price.

From the analysis carried out, it was highlighted that dividends represent the main driver of market prices. However, it is not surprising. In fact, during our analysis, in the absence of equally valid alternatives, we made the main assumption that the value of a company is described by the sum of the value of its shares. Although in theory this statement may be true, shares of the same company can have different prices. In particular, the free float of a company always represents the minority shareholder, which, unlike the majority shareholder, cannot be traded on the market.

For this intrinsic feature, common stocks are, by definition, less valuable than the majority shareholding' shares which encloses the so-called controlling interest, that is the ability of directing a company's fate. On the other hand, the minority shareholder is subject to the decision taken by the controlling shareholder, therefore they are powerless with respect to the future behaviour and performance of the company. Theory predicts that controlling shares have an intrinsic market premium, that is a mark-up in the stock price itself. Meanwhile, the minority shares have indeed a minority discount. In the end, the share prices are not able to capture the real value of a company, but indeed the value of the company that is not under the controlling group. If we start from this assumption, the dividend discount model would be the most suitable model in predicting the value of non-controlling shares. Finally, we can't deny the statement "Cash is king", but only with reference to the Cash Flow from Operating activities. The reason behind this could be found in the contradicting behaviour of the Free Cash Flow. Indeed, the latter tends to decrease if a company increases investments, while it decreases when the company liquidates investments. Therefore, the investments can potentially make the Free Cash Flow negative for a certain period of time. In a DCF valuation perspective, if the short term FCF are negative, the analyst would place all the value of the company on the terminal value, taking into consideration the type of investments made and their future realization. This valuation would end up being strongly

biased. For this reason, the Free Cash Flow to Operation can be considered a better value driver.

While this empirical analysis provides new insights in the topic of valuation and financial statement analysis, the present work can be improved in consideration of selected limitations. A factor that can somehow limit the universal validity of the research, is the heterogeneity in the sample with regards to the industry type, considering the high concentration of industrial companies within the sample. Thus, the observed model might not fully apply to a different mix of companies. Furthermore, it is uncertain whether the quality of the financial information, which founds any kind of analysis, is fine for the whole set of companies. A final consideration should be made regarding the data sample. Indeed, given the fact that the market data as well as accounting variables have a strong volatility and are difficult to predict, a linear model will not be the best model to describe those behaviors, and a more sophisticated one could be preferable. It cannot be excluded that second level analysis based on Artificial Intelligence might provide a more efficient predictive model. Thus, present conclusions apply to the domain of traditional statistic approach.

With regard to these limitations, further research is needed to enlarge the scope of application and to give the results a universal validity. In particular, it would be interesting to evaluate the validity of the results for other relevant geographical areas, such as China or the USA. It is also suggested to retrieve data for a longer period of time, and for different industries, in case of a relevant number of companies per industry. Finally, after getting evidence over the validity of the findings for different combinations of companies, industries and countries, the ultimate test could be to assess the performance of the same analysis over a time period characterized by market instability and perturbation. A further research could be focused on ratios, which were not included in this paper for the sake of connecting variables to the valuation model.

Many valuation models aim at predicting the value of a company, and starting from theoretical point of view, they highlight one feature or another. Over the last years, the models that have been the main actors in the valuation theory were the Discounted Cash Flow and Residual Earnings models, which pose a strong emphasis on the cash flow and earnings respectively. Empirical analysis in support of those models have presented mixed results, especially looking at the theoretical currents behind them. To better evaluate the

models, theorist have focused on fundamentals, and on the analysis of those fundamentals as value drivers by a theoretical point of view.

This analysis aimed at evaluating those models by testing those value drivers from an empirical point of view. What emerged from the analysis, is a strong relevance of dividends as value driver for price changes. However, we cannot state that dividends are a value driver for the overall company, because we assumed the value of the company being described by its prices. This approximation should be taken into consideration in choosing the best valuation model possible. In particular, in view of the result of the present analysis, the dividend discount model should be used to evaluate floating stocks, therefore, in case of portfolio investment valuation. In case of an M&A, for example, other methods can be considered instead, since the aim of the valuation is to identify the actual overall value of a company or of a branch of it. Moreover, the evidence of the high variability of the variables, both price and other accounting measure, makes it difficult to find a strong relationship with price, since it is also undeniable that the price is influenced by many other factors, not necessarily related to the financial statements. Therefore, an analyst should not rely on the same method to conduct different valuations, rather an in-depth analysis should be considered in order to identify the most appropriate to different settings and goals.