

Efficiency of finance education in ISCTE and in ISEG

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Abstract

The paper of Finance as a discipline in the workplace has changed through the years and has changed from something that only a few worried about to a daily need for almost every position. Therefore, the push for a more capable and readier to work alumni group in finance has been a key question throughout these years. This thesis analysis the efficiency of the universities on delivering alumni that are ready to cope with those needs, focusing on the alumni from two different faculties, similar in size and reputation, and inquiring them to understand how many financial instruments, from a selected group, do they know when exiting the university. The study focus was on determining how big is the difference in knowledge between the financial course and the management course? If there is any difference between the two faculties in teaching efficiency? And made a self-criticizing inquiry around the usage of each of the chosen instruments on the financial work space? The results were in some way as expected and showed that the students are exiting the faculties with some knowledge on finance but the companies that receive them expect them to have a deeper knowledge of the subject.

Key words: Financial instruments; efficiency, teaching

Resumo

O papel das Finanças como disciplina no local de trabalho mudou ao longo dos anos e passou de algo que poucos se preocupavam com uma necessidade diária de quase todos as posição. Portanto, a pressão por um grupo de ex-alunos mais capazes e prontos para trabalhar nas finanças tem sido uma questão-chave ao longo desses anos. Esta tese analisa a eficiência das universidades na entrega de ex-alunos que estão prontos para lidar com essas necessidades, concentrando-se nos ex-alunos de duas faculdades diferentes, semelhantes em tamanho e reputação, e perguntando-lhes, a fim de entender quantos instrumentos financeiros, de um grupo reduzido, eles sabem quando saem da universidade. O estudo focou-se em determinar o quão grande é a diferença de conhecimento entre o curso financeiro e o curso de gestão? Se há alguma diferença entre as duas faculdades no ensino da eficiência? E fez uma investigação de autocrítica em torno do uso de cada um dos instrumentos escolhidos no espaço de trabalho financeiro? Os resultados foram de alguma forma esperados e mostraram que os alunos estão saindo das faculdades com algum conhecimento sobre finanças, mas as empresas que os recebem esperam que eles tenham um conhecimento mais profundo do assunto.

Palavras chaves: instrumentos financeiros; eficiência; ensino

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Cap I – Introduction

1.1 – Framework

In today's world, any job comes with a list of knowledges that one must have to apply but for almost all of them finance is a part of that list and therefore a critical discipline for the students to know. As a discipline, finance is also a complex and always evolving subject which makes it hard to teach but also critical to nail the basic instruments that compose it, to create a finance base that, if the finance world continues to evolve and change, can provide for the alumni the capacity to cope with this evolution and be able to learn the new instruments easier and quicker.

The level of efficiency that this finance base is created is a key factor for each university to study and, therefore, it is the topic of this thesis.

To study it the first step was to define the financial instruments present on this financial base. A lot of different possible books were explored and to create this base, considering that the idea was to approach finance as an all and debate the efficiency of its teachings at a university level, the books read and studied should be the most influential and still actual books on the topic, regarding that all the books combined would explore all the existing financial fields. The two thesis advisors, professor Renato Costa and professor Renato Pereira, advised to read the following books in finance: Brealey and Mayer and Allen; 2016, Copeland and Weston and Shastri, 2013, Damodaran 2014, Carvalho das Neves, 2005. From them some financial instruments were chosen to create the questionnaire that although, as said before, the questionnaire was destined to the ex-students from ISCTE and ISEG, the financial instruments included are not chosen based on what is explored by the finance teaching programs of the two institutions but by their relevance to the financial field as a whole.

In order to simplify and gain some clarity, the teaching efficiency was studied in the contents efficiency rather than the teaching format efficiency, i.e., the questionnaire only focuses on if the alumni know the instrument and not if they know it well or poorly. This took the focus of the teachers and the financial program of each faculty.

The Two faculties were named Public university 1 (“universidade publica 1”) and public university 2 (“universidade publica 2”), or UP1 and UP2 for short. To keep some confidentiality on the subject there will be no information on which university is UP1 or UP2.

1.2 – Problems of the investigations

Due to how specific the topic is this thesis has some problems in the investigation process from the start. The ones identified may not be the only ones but are the ones that in some way were dealt with before the investigations started.

The first one is how difficult it is to define what comprehend the financial discipline and the way it was dealt with was already explained, by using different renown financial books and authors.

The second aspect was to define a true base of financial instruments for each financial field and it was dealt in a different way. All the authors had slightly different opinions about the same financial field and it was hard because of it determining a true base of financial instruments for each financial field. The problem was dealt with by selecting an author from the ones read, to base most of the financial fields and the one chosen was Damodaran 2014 due to being the author that dealt with every field and the most known one. This lead to the instruments selected for the questionnaire that are not to be considered fully representative of each financial field. There was a clear solution to this problem and it was to use the finance programs that the faculties had to define each area but doing so could bring some bias towards one of the faculties by choosing more instruments from UP1 or from UP2 to define a financial field. It could also violate the proposition of determining an independent base of instruments that could be applied to any university and be used in any student so for this reason, and the one before, this road was not taken.

The third problem was the sample equal distribution, of students from each university at the masters and licentiate degree level, needed to make the analysis fair. This was a problem because most students either take one of the degrees outside of these two universities or they take one of them at UP1 and the second one at the UP2, or vice versa, making it hard to construct a perfect sample. This problem was managed by selecting one of the two degrees to have a perfect distribution and then focusing on getting the other one as perfect as possible. The degree selected was the licentiate degree and the master's degree data were always analyzed, knowing this problem.

1.3 – Thesis structure

The investigation process of this thesis relays almost entirely on the questionnaire and so the first step of this document was to define the structure of said questionnaire and from where to

take the instruments that compose it. This is present in the literature review as well as all the books used to produce it and the steps and decision behind the definition of each financial field.

The second step relates to the methodology used when gathering the sample needed and analyzing it. This helps to have a clear picture of the methods used for the investigation and the assumptions taken to further it.

The third step is divided into two chapters, one that defines the sample characteristics and one that presents the data collected in the form of three tables, that collect the data used for this analysis. In the second chapter it will be presented as well as the data used on each research question study.

The fourth step comprehends the data analysis of this thesis, focusing more on explaining the results obtained and comparing them with the what were the initial expectations. The sample gathered was not perfect and therefore had some influence on the data gathered so in this chapter any misconception that could come from the sample distribution were discussed and defined as such.

Lastly the fifth step was the conclusions taken from this thesis analysis. They were done with the clear idea that this thesis proposition was not to achieve any specific objectives but to define and create a clear image of the teaching efficiency of finance. Some conclusion came as obvious due to how close the results came to the expectations but are not to be considered as final answers to the problems identified.

Cap II – Financial instruments and their analysis parameters

This literature review will try and explain the different financial instruments chosen while mentioning the books from where they were taken from. The explanations of every financial instrument will be very simple, in the hopes that any reader can make sense of some complex financial subjects and understand the reasons why we thought they were important enough to be included in the questionnaire. If by reading the explanations you still are confused about the reason some of the instrument are important enough to be included, we advise you to read the books mentioned on the explanation of each financial instrument. All the books are known worldwide and they all try to explain every dimension of finance, going in on each of these dimensions with different depth, and so most if not all of the financial instruments that are included in this questionnaire are present in more than one book. The books mentioned in each instrument are the ones that not only included the instrument on their book but also gave a more complex and complete explanation of what it is used for.

This chapter will be divided in 6 parts where each one will be about a specific aspect of finance and will be about more than one question asked on the questionnaire. There will be an explanation about what is the instrument, where the objective is to explain it in a way that is simple, short and intuitive; and then following this explanation there will be a procedure explanation where, without explaining all the formulas and their mathematical deduction, we will show what they are used for and how to achieve the final value. The order of the explanations will be different from the order of the questionnaire and the parts are: part 1 - risk models; part 2- investment decision rules; part 3 – dividends; part 4 - internal analysis; part 5 – ratios; part 6 - optimal financial mix and part 7 – option

2.1 – Risk models

2.1.1 - CAPM, APM, Multi Factor and Proxy Models

To determine if a new project is good enough to invest in, it's important to account for all the variables that may affect the success of that investment, in other words, the risk of the project failing. To determine this risk, we must first understand that risk comes in two shapes, firm-specific risk and market risk. If you have all your money in one company, company X, you will be exposed to both types of risk, because you are vulnerable to company X firm-specific risks

and the market risks that affects all companies in the market. This is what happens to every owner of a company that has most its money invested in their own company. Despite these types of investors, most aren't like this, you can choose to invest in hundreds of companies and avoid being exposed to a firm's risk of failure and therefore be only exposed to market risk (Ullah et al 2017, Amaya et al. 2015).

This process is called diversification and it cuts down the firm specific risk to almost zero, gathering in the same portfolio more than one firm per market so that if you invest in two companies that compete in the same market, in the case of one of them failing, the other will raise in value, offsetting the losses of the first one. However, it does not change market risk because if the market the two companies operates in drops in value you cannot offset this loss directly with a gain elsewhere making it impossible to eliminate market risk through diversification. These types of multiple investments are designated as market portfolios (Olsen 2016).

This market portfolios may reduce the volume of firm specific risk that you are affected by when making investments, but you still must calculate how much market risk affects each investment and to do so the financial instrument used are the market risk measuring models.

They use a simple concept which states that in the market there are risk-free assets and risky assets and every investor holds a combination of both. To make an investment in a risky asset worth it the assets must first make a return higher than the return on a risk-free asset. Then you should consider how it will affect the return on the investor existing portfolio, i.e., on the investors existing investments. This concept is called the risk premium, or hurdle rate, because it's the premium return, or rate of return, demanded by an investor to change from a risk-free asset to a risky asset. The risk-free asset return will be calculated using the return on a government treasury bond of the country the currency is from or, if the government treasury bond isn't secure enough, by converting the investment currency to a more stable currency and using the return on the treasury bond. Being the top traded currency and the most solid global economy, the USA treasury bond is the most used (Brealey et al. 2016).

The way a risky asset is calculated will depend on the model that you are using and is calculated through a variable called Beta. The models vary in what they think impacts market risk and the beta reflects the variation the asset makes in the variable being considered by that model. These returns are all calculated in percentages of the return on the initial investment making it independent of the volume of the initial investment.

In this questionnaire, there will be included two of the most known models, the APM and the CAPM, and two lesser known which the multi-factor models and the proxy models are. All the models are entirely dependent on the market portfolio and make some assumptions regarding every investor which are that there is no private information, there is no transaction costs, everyone holds a market portfolio and this market portfolio has every traded asset. With these assumptions, they consider the marginal investor, the stock holder that will be the first to sell, to be someone that matches all these definitions and that has a small quantity of the company. He will react to any bad investment and sell at a lower price than the value of the stock (Damodaran 2014).

The CAPM, or Capital Asset Pricing Model, defines market risk as the risk added by the investment to the market portfolio and calculates the beta by relating the beta of the investment to the beta of the market portfolio (Fernandez 2015; Copeland et al. 2013; Carvalho das Neves. 2005).

$$E(R_i) = R_f + \beta * [E(R_m) - R_f]$$

The APM, or Arbitrage Pricing Model, it tries to define what are the factors responsible for the market risk that are common to every investment. The market risk is the risk exposure the investment made must the factors defined, and it uses multiple betas, each one related to a factor being considered (Davidson 2015; Damodaran. 2014).

$$E(R) = R_f + \beta_1 * [E(R_1) - R_f] + (...) + \beta_n * [E(R_n) - R_f]$$

The Multi-factor model, expands on the APM and tries to define the factors responsible for the market risk using only macro-economic factors, based on the premise that if market risk influences every investment, no matter where you are, then it must come from macroeconomic variables. It calculates market risk by analyzing the risk exposure to the specific asset as to the macro-economic factors and as the APM uses multiple Betas that are all based upon macro-economic factor (Brealey et al. 2016; Lohrmann 2015).

The proxy model is the only one that explore a different method than the previous 3 models. It uses the historical data on the returns of the previous investments and analyses the factors behind the differences in return from one investment to the other, in a year to year frequency. Uses proxy variables instead of betas and calculates them using a linear regression between the

factors responsible for the variances in the return. The market risk is captured in this proxy variables (Carlin 2015, Damodaran 2014).

$$R_t = 1.77\% - 0.11 * \ln(MV) + 0.35 * \ln\left(\frac{BV}{MV}\right)$$

2.1.2 - Betas

The betas are a statistical variable that correlates the risk in investing in a specific asset with the risk of investing in an asset influenced only by a specific variable. This variable can be the risk of the market portfolio, as used by the CAPM, or a more specific variable such as changes in industrial production, as used in the APM or multi-factor model.

To calculate these betas there are three different methods that will all use the same concept of trying to determine how much does external factor change the earnings of a company from one year to the other and what are those external factors. Then they will try to compute a beta that retains all these factors (Brealey et al. 2016, Damodaran 2014, Carvalho das Neves, 2005).

The first one is the **Historical beta** and it's the most common method used, mostly because it includes the service beta, but also because it is the simplest way of calculating the betas. It relies heavily on a good definition of a market portfolio and the accuracy of the historical data. The process of calculating it is by doing a linear regression between the return on an investment and the return on the market portfolio, the slope of this regression is the beta of your company (Serra 2018, Damodaran 2014).

$$R_j = R_f + \beta * (R_m - R_f) \Leftrightarrow R_j = R_f(1 - \beta) + \beta * R_m$$

The **Service beta** is, as mentioned above, included in the historical beta method because they are calculated using the same method. The process of calculating the beta can be complicated and tedious to do, in which you must consider a lot of different constants, so most companies use external services to obtain their beta and the beta associated with their next investment. They are calculated by private firms that profit from selling their beta calculator software to other firms. The reason they are considered a different classification is because, although all the service betas are calculated with the same base method of linear regression, each firm has a slightly different method of calculating their beta that they don't reveal to the public (Otuteye et al, 2017; Damodaran 2014).

The second one is the **Fundamental beta** which focus on the fundamentals of a company and uses this to then compute the value of the beta. This is based on the premise that the company is not defined by their return history but by the decisions it made on where to investments their money and the overall philosophy it follows. The beta is influenced by three factors: the type of business the firm is in; the degree of operating leverage; and the financial leverage it uses to finance each investment. The first factor considers the pre-existing beta and compares it to the market averages, the second one considers how the firm's operations are financed and their cost composition; the third one adds the financial structure of the firm to the beta. By combining these three factors we have a beta that can easily be applied to compare your firm to the market, even one that is not publicly traded by using directly the average of the market. It's also more dynamic, changing from one investment to the other on multiple factors at a time, making it more sensitive to different investments on the firm (Brealey et al. 2016; Kwan 2016).

$$\text{degree of operating leverage} = \frac{\% \text{change in EBIT}}{\% \text{change in sales}}$$

$$\beta_u = \beta_l / \left[1 + (1 - t) * \left(\frac{D}{E} \right) \right]$$

The last one is the **Accounting beta** that uses accounting earnings instead of traded prices or market values. This method measures the beta again with a linear regression but instead of using market return on investment and return on the market portfolio as the two variables, it uses the changes on accounting earnings, in the firm or in a division of the firm, versus the changes in earnings for the market. Although it is a more intuitive method it has some downfalls, as accounting earnings are vulnerable to the accountant's allocation of expenses and income, to the non-operating factors; such as depreciation; and to the number of observation used on linear regression, which is substantially less than the other methods, because accounting earnings are only computed, at best, on a quarterly basis and the market value are computed daily (Brealey et al. 2016; Copeland et al. 2013; Damodaran 2014).

2.1.3 - Final considerations

For this part of the questionnaire we have decided to include some method of calculating risk that aren't the most commonly use on the books, the multi-factor model and the proxy model. The most common models are the CAPM and the APM but they have one problem which is

they both rely too much on the existence of an effective market portfolio which the proxy model does not rely as much. They also lack the problem of using either only one beta to explain all the risk, the CAPM, or on multiple but unspecified beta to explain the risk, the APM. This last characteristic is also a problem on these two risk models, that is solved by the multi-factor model that tries to also explain the risk in multiple factors, identifying that the use of only one beta can be limited, yet it also tries to give a more specific answer to what betas should be used by using only macro factors.

2.2 - Investment decision rules

Investing in a project is not only about considering the risk involved and the return around it, it's also about the earnings and cash flow that come with the new project. By relating the hurdle rate and the earnings we can directly determine if a project will bring value to the company or not but there is a problem, they can't be directly related. This is because the hurdle rate returns a percental value and the earnings and cash flows return a value in dollars, so we must use a financial instrument, explained in this part 2, that will serve as a tool to indirectly relate these two variables and allow us to use this method to accept or decline a project, based on the value it will bring to the company (Brealey et al. 2016).

2.2.1 - Bases for investment decision rules

There are 3 different types of instruments that can be used to make investment decisions using the earnings, they are the accounting earnings based decision, the cash flow based decision and the incremental cash flows based decision. Every company has their own rules to make investment decisions and they normally use more than one of this investment decision rule but to assure that they are useful and well defined it should have a balance between allowing the influence of the manager to help the decision and be able to analyse every investment consistently, no matter the volume of earnings it has. They also have to prioritize investments that bring value to the company and must work to every different kind of investment. In a company that uses more than one investment rule, one of them is defined as a primary rule, so that it can work as a tie breaker. Here follow the three types of investment decision rules:

The **accounting income-based decision rules** is defined by drawing the earnings data from the accounting statements and accounting measures of income. This method uses the accounting values for earnings and divides them with the average book value of the investment in the project. It can deliver two different values depending on the values you consider, if you use the total accounting earnings and the book value of the investment, then it is called the return on capital; if it uses only the equity invested in the project and the net income, also known as the income to equity investors, it is called return on equity. These two financial instruments of return give a percentage value of the earnings gained on the investment and therefore can be compared to the appropriate hurdle rate, return on capital to the cost of capital, and the return on equity to the cost of equity. If the return is higher than the hurdle rate, then the investment will bring value to the company and should be accepted (Rohrbeck et al. 2018, Copeland et al. 2013, Damodaran 2014).

In the questionnaire, these types of investments decision rules will not appear in this part because they will be used in one of the methods to calculate the optimal financial mix, to assure that the questionnaire isn't at any point repetitive and because these two instruments aren't solely recognized as an investment decision rule but also as part of different financial processes.

The **cash flow-based decision rules** result of the inefficiency of the accounting earnings to always being right. Sometimes the cash flows and accounting earnings deviate and when these cases happen the use of the cash flows value is preferred therefore there is an investment decision rule that uses cash flows instead. There are two perspectives on this instrument and the first one is not a different instrument but rather the use of the return on capital and equity with cash flows and cash returns rather than with accounting values. The other perspective involves a new method but again not necessarily a different financial instrument. It's called the payback and it is the amount of time the project takes to return the initial investment, also known as the payback period of the project, upon which the project becomes a source of profit. The payback is a way to quickly and intuitively determine if a project has a low risk by using the payback period as a measuring system. If the project has a low payback period then it's reasonable to assume it has a low risk, since a significant portion of the risk in an investment is related to the possibility of losing the initial investment (Adamczyk et al 2017, Brealey et al. 2016, Campos et al 2016, Copeland et al. 2013).

For this part of the questionnaire there are also no questions about these types of investment decision rules. The decision was not made based on the usefulness or capacity to work on any

case of both the instruments because both are considered, specially the payback, by all the authors in the literature review, as being exceptional and used by most if not all the investors. The decision was made in a more practical perspective of how to include them in the questionnaire. The first one is an adaptation of the return on capital and equity previously discussed on the accounting based decision rules and the second is not a clear financial instrument and cannot be used as an individual investment decision tool, so the decision was to not include any of the two-cash flow-based decision rules on the questionnaire (Damodaran 2014).

The **discounted cash flow-based rules** goes one step forward than the previous rule and substitutes the accounting income with discounted cash-flows, considering here the time value of money. The two instruments in this investment rule are the net present value and the internal rate of return and are considering competitors, among investors, for the most used investment decision rules, and the reason is obvious, they are the only ones that use discounted cash-flows.

The discounted cash flows come as a necessity to consider the time value of money, very easy concept to understand that states that a dollar today is more valuable today than it will be tomorrow. This comes by the fact that if you have one dollar today instead of tomorrow you can invest it at the tax rate and tomorrow they will value more than the original dollar. Applying this concept to an investment with a more than one year life span, using this idea to look ahead, you can conclude that one dollar tomorrow will value less than one dollar today so, when adding up all the value this investment will bring to the company today, you can't add them all without considering this. Here comes the discount rate that will reflect just that and will represent the actual value of all the cash flows on that project. This rate is most times considered to be the cost of capital or the cost of equity (Brealey et al. 2016; Declerck 2016; Damodaran 2014; Copeland et al. 2013).

2.2.2 - The two instruments for discounted cash-flow decision rules

The **net present value**, also known as **NPV**, is calculated by adding up all the cash flows, positive or negative, that a project will have in each year including the initial investment considered in year zero. In this process, it will use a discount rate depending of what cash flows it is considering. This returns a dollar value that reflects the value the project will return to the firm at the end of its lifetime.

This financial instrument has two perspectives to consider. The equity investors perspective that will be calculated using the cash flows to equity, discounting them using the cost of equity and netting out the initial equity investment and the perspective of all the investors that will be calculated with the use of the cash flows to the firm, discounting them with the cost of capital and considering the total initial investment (Willigers et al 2017; Brealey et al. 2016).

The **internal rate of return**, also known as **IRR**, is the value of the discount rate that will bring the NPV down to zero. In a more conceptual way it is a perceptual measure of the return you are getting in an investment, towards the discounted cash flows. It is a simple way of considering the NPV and throw it reaching a percentage value for the return which makes it more useful and easy to then compare to the hurdle rate defined. If his percentage value will be higher than the hurdle rate then the project should be accepted, if it is lower than it then the project should be denied.

Again, it can be used with two perspectives, the equity investors and all the investors. The first one demands the use of only cash flows to equity investors to calculate the NPV and then the comparison with the cost of equity. The second one uses the NPV of all the cash flows and compares it with the cost of capital (Gharari et al 2015; Damodaran 2014).

$$NPV = \sum_{t=1}^t \frac{Ct}{(1+r)^t} - C_0$$

$$IRR \text{ Is when } NPV = 0 \Leftrightarrow \sum_{t=1}^t \frac{Ct}{(1+IRR)^t} - C_0 = 0$$

2.3 – Dividends

In this chapter, we go through the two aspects related to the dividend decision, the first one is the process of deciding what philosophy the company will follow of how much to pay in dividends and how to determine that value, and the second one is how does the market react to the amount of dividends paid by a company and the instruments used to measure it (Eldomiaty et al 2015)

2.3.1 - Company philosophy about dividends

Dividends are an integral part of the business of every firm that they, once a year, must think about and decide whether or not to distribute them and how much they should distribute. In the case of publicly traded firms this is a bigger problem related to how much money to distribute to get a respectful amount per stockholders, in contrast with privately owned firms where it is simpler but also something to be considered. In their case instead of having multiple stockholders to distribute the dividends you only have a few, so the amount per stockholder will be larger, but because it is harder to a private firm to get financial aid they have to consider a larger portion of the earnings to reinvest in the firm.

The reaction of the market, or the changes on the stock price due to the amount of dividends paid will mostly happen on two dates set by the board of directors; first is the dividend declaration date, when the board of directors declares how much money they will pay on dividends and if they will decrease, increase or maintain the value of dividends paid in the previous year. This is the date on which markets will react to these changes in the dividends paid so if they due occurs then the market value of the firm's stock will also change accordingly in that date. Then follows the ex-dividend date that establishes the date after which, if someone buys the stock, they will no longer receive dividends. At this point the price of the stock will fall to reflect the value received in dividends that will no longer happen (Ivanovski et al 2015; Damodaran 2014; Copeland et al. 2013).

In the dividend decision process, there are three different schools of thought, the one that states that dividends are irrelevant, the one that defends that dividends are bad to the stockholder and the one that says that dividends are good to the stockholders.

The "**dividends are irrelevant**" follows the principle that there are no tax disadvantages for the stockholders from receiving dividends and that firms have no additional issuance costs when raising funds in capital markets for a new investment, so there is no benefit from holding on to earnings to make new investments. Adding to this, this theory also relays on the premise that, the operating cash flows don't change with the variation of the dividends paid and that the managers will not use the free cash flows to pursue their own interests such as investing in bad projects to hurt the firm but favour them (Brealey et al. 2016; Copeland et al. 2013).

Although strange this is common when the managers have a lot of power over the board of directors and therefore don't have to follow the stockholders needs opting to use the firm to achieve their own goals that may or may not lead to value maximization of the firm. This was

a big problem in the 90's that got resolved with creation of new laws that protect the stockholders and create more effective board of directors, such as having outside of the firm members on the board of directors (Damodaran 2014).

The dividend policy will also be irrelevant, meaning that the amount of dividend you pay will not be related to the earnings in that year and will not directly affect the value of the equity. This however will not change the fall on stock price value after the ex-dividend date because at that point in time the amount of dividends paid is not responsible for the fall of the stock price, there is no amount of dividends paid that can cover the fact that after that date no dividends will be received so, if you buy the stock, the value of the stock must go down to reflect that loss (Brealey et al. 2016; Varma et al 2016; Copeland et al. 2013).

The second school of thought, "**dividends are bad**", argues that receiving dividends brings a tax disadvantage to the stockholders. To understand this, it's important to first explain what happens if the firm does not give dividends. The extra income stay's in the company as free cash flow and can either be used to repurchase stock, make new investments that add value to the firm or just to accumulate the money for any eventuality. All these activities have one thing in common, they all raise the initial value of the firm's equity, that then raises the overall value of the firm, consequentially increasing the stock price value. This increase on the stock price is considered to the stockholder as a capital gain. If the company decides to distribute dividends instead of retaining them or applying them the stock value will remain the same and the stockholder receives an ordinary income.

Here lays the problem with the tax disadvantage, because the ordinary income has, in some countries, a different, much higher tax rate than the capital gain has, which leads to this dividend school of thought conclusion that paying a high dividend will reduce the firm's stock price, because stockholders will value this stocks at a lower price than other stocks that pay less dividends due to the advantage of receiving their money through capital gains instead of dividends (Angulo-Ruiz et al 2018; Brealey et al. 2016; Damodaran 2014).

This school of thought only works on one assumption, that the marginal investor, i.e., the stockholder most vulnerable to changes making him the first to sell the firm's stock if something does change, is an individual investor and not a pension funds and institutional investors. These two types of investors don't share the same tax problem as the individual investor because they are tax-exempt, so firms with stockholders predominantly from pension funds or institutional

investors may not create a tax disadvantage problem to their investors, and therefore are ok with paying a high dividend (Damodaran 2014; Copeland et al. 2013).

With this tax disadvantage comes also an investment opportunity. After the ex-dividend date, the fall on the value of the stock happens to reflect the preference for dividends. With this theory of a harder taxation of the ordinary income, the fall should be considerably smaller than the amount of dividends paid to accommodate the tax preferences of the marginal investor. Considering this premise there is a possibility for an investor to trade around the ex-dividend day and make excess returns, as long as its tax benefits are higher than the ones of the marginal investor. This action is called dividend capture or dividend arbitrage and is a very risky process and only works on stocks with high dividend yield due to the transaction costs associated with it (Damodaran 2014, Copeland et al. 2013).

The third and last theory is the "**dividends are good**" which says that notwithstanding the existence of a tax disadvantage, firms still pay dividends so there must be some good reasons to do it and here we will first discuss two ideas that aren't entirely true and then present two real advantages of using this dividend school of thought.

The first reason is related to the stockholder perspective of capital gains, that see it as an uncertain source of cash when compared to the immediate cash return from the dividends. They prefer the later form of income, more specifically, they prefer receiving dividends now and not capital gain in some point in the future, ignoring the tax disadvantage associated with it (Brealey et al. 2016, Damodaran 2014).

This is a false argument for two reasons, The first one is because, as it has been discussed in the "dividends are irrelevant" portion, the reaction of the stock price to the payments of dividends occurs at the same time as dividends are paid to the investors, decreasing the value of stock slightly less than the value of dividends being paid, so it is reasonable to believe that the capital gains, resulting from paying less dividends, will happen in the present and not in the future. The second one is, if a company decides to pay more dividends but doesn't change their investment policy, to invest in new projects it will have to finance them by issuing more stock which will cause a decrease in the stock price and lead to the stockholder that prefers a higher dividend to lose more money in price appreciation, than they will in dividend gain (Damodaran 2014).

The second reason to consider in the dividends are good school of thought is the temporary excess cash available at the end of the semester. Companies tend to fall to the temptation of using this extra income to pay an extra dividend to their stockholders and stockholders prefer them to do so to avoid managers having excess cash available. By doing so the expectation for the next year will be to receive a high dividend again. If this cash excess is a temporary phenomenon, then the company must issue more stock to finance the high dividend it started to pay which again does not bring any advantage to the stockholders (Damodaran 2014).

There is obviously some validation to this dividend policy, that brings some valid arguments with it and the first one has already been referred previously which is investors that have low taxes or none, like to receive dividends because, in contrary to an individual investor, after taxes what they get from dividends is higher than what they would get in capital gain. There are also investors that have some valid reasons to prefer receiving dividends, such as the need of a regular cash flow from the dividends to make their own investments or because they don't have an easy way of liquidising their capital gains. Companies with an history of paying high dividends have mostly investors with these characteristics and because of that paying dividends will be a good thing to their stockholders. Companies may also use dividends to reach their optimal financial mix, to reduce the amount of free cash flow available to the incompetent managers and therefore control the conflicts between managers and stockholders; and to use it as a way of signalling the markets that the company will have some positive future years (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013).

2.3.2 - Dividends based instruments to study the market

This last point is the focus of the second part of our questionnaire surrounding dividends. The markets use that information to understand the future of the company and react to these changes in the dividends policy. A company only raises dividends if it is confident that they will be able to pay them not only in the present year but also in the future with cash flows and not with contracting debt and knowing of this relation between dividends and cash flows, the markets will react positively to the raise of dividends, and negatively if the dividends fall (Brealey et al. 2016, Copeland et al. 2013).

To analyse these changes and then compare them to other firms there are two important ratios used by most analysts, the dividend yield and the dividend payout ratio.

The **dividend yield** is the ratio between the amount of dividends paid and the stock price and, when added the price appreciation, it is used to calculate the return on the stock. It can also be used as a measure of risk and as an investment screen, meaning, as a direct way to tell if a stock will have a good return or not (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013)

$$\text{dividend yield} = \frac{\text{annual dividends per share}}{\text{price per share}}$$

The other ratio is the **dividend payout ratio** which will relate the dividends to the earnings of the firm and can be used in valuation of a firm, in calculating the retention rate that gives an insight in future growth of earnings and in determining the current life cycle of a firm (Brealey et al. 2016) and (Copeland et al. 2013).

$$\text{dividend payout ratio} = \frac{\text{dividends per common share}}{\text{earnings per share}}$$

2.3.3 - Final considerations

One cannot apply these ratios to analyse a firm's future without understanding how the relation between dividends and earnings work. They are positively related, this means that if earnings rise or fall dividends will also rise or fall but they will do this with a certain lag, changing sometime after the changes in earnings has occur. The dividends are also sticky, which means that once they are following a rising or falling trend, they will hardly change in the future, because managers are reluctant to change the amount of dividends they pay, afraid of the possible negative reaction markets have when the dividends change and the expectations they create with that change. As said before the dividends will raise with the earnings but this fear leads managers to be more inclined to slightly increasing the dividends even if the earnings are decreasing, which means that dividends will take more time than the earnings to adjust to the real value they should be, leading sometimes to misleading information taken from the dividend payout ratio or the dividend yield. These two instruments are two key methods of taking information's from the markets and therefore they are included in the questionnaire in this part as a way of acknowledging that dividends are indeed a quick way of understanding a company's future cash flows and life cycles (Damodaran 2014).

2.4 - Internal analysis

Until this point all the investments were long term and therefore discussed in the point of long term actions and financing, but there are also short-term needs from every project, especially in financing the business cycle operations of a project. To understand this concept and to apply it we must first understand that these are also investments but smaller ones and considered internal investments, made to cover the operational needs of a company in the short-term for all their current projects. This value although part of the short-term interests of a firm, can influence and condition the long-term investments by taking up a big part of the financial leverage a firm has, that could have been used to finance long-term projects. There are a lot of financial instruments that can be used to do this analysis but there are 3 key ones that we decided to include in this questionnaire: the working capital needs, the financial leverage and the operational leverage; and they are explained in the following chapters (Hofmann et al 2016; Damodaran 2014; Carvalho das Neves, 2005; Capizzi 2005).

2.4.1 - Noncash working capital

In the mathematical formula, the working capital is the difference between the current assets and the current liabilities, which in practice reflects the operational needs of the company in each business cycle. The current assets are considered to be all the assets that are in the form of cash or will be converted to cash in the short term, that is in less one year, and generally include the inventory, cash, marketable securities and accounts receivable. The current liabilities are all the company's debts and obligations in the short-term and they include the short-term debt, accrued liabilities and accounts payable (Brealey et al. 2016; Hofmann et al 2016; Carvalho das Neves, 2005).

because in the duration of the investment it will be necessary money to produce the product or service, either with investments in inventory or with investments in qualified people because of this, when making a new investment, it's necessary to consider the working capital. This will tie up some additional cash flows to the initial investment in the project because these working capital investments are cyclical, so they will happen every year, and if you don't consider the working capital of a new project you may end up with no financial capacity in the short term to run said project.

After defining what is the working capital we can now understand that in every business cycle the amount of working capital may change depending on a variety of factor, such as the number of units a company projects to sell, how much the account receivables and payables are expected to grow or how much of these changes will be paid with short term debt, etc. As you can see there are a lot of variables that come to play so we can consider that the working capital is driven by demand and it is necessary to estimate the working capital needs every year. To do it we must relate it with another financial variable and consider it as a percentage of that variable. The most common variables used to calculate the working capital as a percentage of, are the revenues, the operating expenses or to calculate it per the number of units sold. As in every step of a new investment, the estimates for the working capital becomes more accurate if the firm has done similar projects in the past (Damodaran 2014).

This method of estimating the working capital needs is only an average number, that does not represent directly the real expenses of working capital. As said in the beginning of this chapter there is a formula to calculate the working capital using the data available of the previous year. It uses this data to determine how much working capital expenses the firm had in that year and then estimates the next years working capital needs. This is the formula present in the questionnaire because it is the most common method in all the books and the most accurate one (Brealey et al. 2016; Lourenço et al 2009; Carvalho das Neves, 2005).

$$\text{working capital} = \text{current assets} - \text{current liabilities}$$

$$NFM = \text{cical needs} - \text{cical resources}$$

2.4.2 - Degree of Operational and Financial leverage

When analysing a firm stability, it's important to analyse the operational and financial volatility. To do it we have to look for the income statements of the previous years to see how much is the variation in operational costs or how much debt dependant is a company to then determine the component of risk associated with these two variables.

The operational costs come in two types, the fixed cost, that will remain the same if the company increases the volume of production, and the variable cost, that vary with the volume of product output, rising if the production increases and falling if it decreases. A company with a higher percentage of fixed costs will have a high operational leverage. This is a situation to be avoid

by a company with volatile sales because they will have a more than proportional effect on operational profits, making a bigger impact if sales drop, but to be embraced by a company if the sales have a tendency of rising because in this case having a bigger percentage of fixed costs will provide a more than proportional rise in operational profits (Brealey et al. 2016; Damodaran 2014; JORDAN et al 2008).

The financial leverage is an important tool when analysing the financial structure of a company so that you can ascertain their ability to pay the financial obligation towards debt owner in the short or long term. Even a company with a perfectly balanced financial structure may not earn enough from sales to pay their short-term commitments, so to determine how vulnerable a firm is to the use of debt to finance itself, analysts use the financial leverage that will relate the operational profits to the current earnings. These financial instruments also allow to determine if using debt will have a positive or negative influence in the profitability of a firm (Damodaran 2014; Vieira et al 2006; Carvalho das Neves, 2005).

To understand how vulnerable a firm is to changes in operational and financial leverage we can use the degree of operational and financial leverage that will deliver a value independent of the dimension of a specific company and can then be used to compare with the companies in the same sector and determine if there should or not be an adjustment to the operational costs or the financial structure. We will ask in this questionnaire about the degrees of financial and operational leverage due to their ability of either use it to understand your own vulnerability or to compare yourself to the markets (Devashish 2017; Damodaran 2014; Carvalho das Neves, 2005).

$$\text{degree of operating leverage} = \frac{\% \text{changes in EBIT}}{\% \text{changes in sales}}$$

$$\text{Degree of financial leverage} = \frac{EBIT}{EBIT - \text{interest expense}}$$

2.4.3 - Final considerations

These last two instruments are repeated in the questionnaire and represent the only exception to this rule. The exception happens because although the use of these instruments is also present in the fundamental beta and represent almost the same thing as in this part, it's greater use is to make internal analysis of a company, which is the previous part we discussed. There aren't

really any other instruments that can do this type of internal analysis that are represented at the same time in more than one book, as the degree of operational and financial leverage are, so to make a section dedicated to the study of internal analysis instruments we had to include them (Graham 2017).

2.5 – Ratios

Ratios are the most used technique by financial analysts to relate different financial-economic variables that otherwise would have no reaction. They are used to synthesize the abundant amount of financial data available and try and make some use of it. They are arranged or constructed to give an inside view of a company to then compare it to other similar companies, to give a quick and easy way to relate two variables that originally would not be related and to help managers make strategic decisions. In a world where speed is of the essence, having a quick way of processing the constant renewing of information is a key factor between failure or success and because of their importance the questionnaire has a dedicate part to the most commonly used ratios on the industry and the ones that were more common in (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013, Carvalho das Neves, 2005).

To facilitate their recognition and to provide a cleaner look to the questionnaire the ratios are divided in five categories, Liquidity, Financial, Profitability, Functional and Market ratios

2.5.1 - Liquidity ratios

liquidity ratios are used to evaluate the capacity a firm has to pay its own debt with the financial assets it has in the short-term. These ratios are used mostly by banks when they are coinciding debt to other firms and they are calculated using fiscal units, such as money, time, and workers. They are considered as a marginal security measured by the banks to know how much they will lose if the company they are borrowing money goes bankrupt, ascertaining how much they can take out of them in that situation. The ratios analysed in this part of the questionnaire are "general liquidity", that is used to determine if a company is well balanced or not, and "immediate liquidity", that serves as a tool to know the capacity a firm has to pay their debt with all the available assets (Ismail 2016).

$$\text{General liquidity} = \frac{\text{current assets}}{\text{current liability}}$$

$$\text{Immediate Liquidity} = \frac{\text{bank deposits} + \text{cashflow} + \text{negotiable titles}}{\text{current liability}}$$

2.5.2 – Financial ratios

Financial and operational leverage ratios are the basis of ascertaining the risk of bankruptcy of a company and determining how much adding more debt to that company will affect said risk. They analyse the operational financial needs of the firm's business cycle and how much of it is already financed by debt, then consider how much of that debt is long term or short term. Finally, these ratios also give a look of the percentage of the current debt that is covered by the cash flows directly from sales or the main source of money of that company. The ratios analysed in this part of the questionnaire are the "indebtedness", that ascertains to what extent the company uses debt to finance itself, the "debt to equity", that does the same thing, the "financial costs coverage", measures the capacity the operational income must pay the financial burdens of the company, and the "results variability" is used to determine if there is risk involved in the firm's operations. (Mrša et al 2016).

$$\text{results variability} = \frac{RO_t - RO_{t-1}}{RO \text{ average}}$$

$$\text{financial costs coverage} = \frac{\text{operational results}}{\text{encargos financeiros}}$$

$$\text{debt to equity ratio} = \frac{\text{equity}}{\text{debt}}$$

$$\text{indebtedness} = \frac{\text{borrowed capital}}{\text{total capital}}$$

2.5.3 - Profitability ratios

Profitability ratios are as the name says, indicators of how profitability is a company. They measure this by relating the financial earnings to another capital variable, for example sales. This can also be calculated to be delivering different amounts and return profitability measured per days it takes for a company to be profitable in a business cycle, to the percentage of volume

of sales, etc. so that investors can view profitability from different perspectives. It allows the stockholder and the manager to conclude if the profitability of the equity invested is at the level of all the competition, taking into consideration that it is also dependent of the financing policy of the company. Investors overall consider these types of ratio the most impartial indicator to compare one firm to the other. The ratios analysed in this part of the questionnaire are the "sales operation profitability", which computes how much impact sales had in the operational results, the "own capitals profitability", which is used to see how efficient are the investments made with the equity and considers the financial policy of the company, the "assets profitability" and "invested capital profitability", that will do the same as the last ratio but related to the efficiency of the assets and all of the invested capital, respectfully, and therefore will not consider the financial policy of the company (Jubaedah et al 2016).

$$\text{sales operation profitability} = \frac{\text{operational results}}{\text{business volume}}$$

$$\text{own capitals profitability} = \frac{\text{net results}}{\text{own capitals}}$$

$$\text{assets profitability} = \frac{\text{operational results}}{\text{asset}}$$

$$\text{invested capital profitability} = \frac{\text{operational results}}{\text{invested capital}}$$

2.5.4 - Functional ratios

Functional ratios serve to analyse how efficient are the decisions made by the firm and are usually calculated in terms of product rotation or days of operation. These ratios are specific to each sector because any business sector work in different ways and have different standards for operation, which is fundamental to consider in these types of ratios and therefore they should only be used to compare firms in the same business sector. They can be used to detect how efficient is the use of your assets and to understand if the firm is at maximum capacity, therefore at their own limit or if at the minimum capacity, underutilizing their assets. With these types of ratios, we can also use them to understand how well a firm rotates their stock to understand how quickly a firm receives the money from their sales or business activities. The ratios analysed in this part of the questionnaire are the "invested capital rotation", measures the degree of the assets usage, the "merchandise average storage time", is used to determine the same thing

as the above but returns the value in days instead of percentage, the "days in accounts payable", determines how quickly the company's clients pay for the services they received, the " days in accounts receivable", determines how quick is the firm to pay their clients (Raifur et al 2015).

$$\text{days in accounts receivable} = \frac{\text{clients average balance}}{\text{sales and services} * (1 + VATv)} * 365$$

$$\text{days in accounts payable} = \frac{\text{suppliers average balance}}{\text{purchases and suppliers} * (1 + IVAv)} * 365$$

$$\text{merchandise average storage time} = \frac{\text{merchandise average shelflife}}{\text{cost of goods sold}} * 365$$

$$\text{invested capital rotation} = \frac{\text{business volume}}{\text{invested capital}}$$

2.5.4 – Market ratios

Market ratios are mostly used to understand the competition your company faces in the market, more specifically at the level of what product prices they use and the production costs they have. This ratio will help define the product strategic for the Marketing and production departments. Also, the financial department uses these types of ratios to understand how much they should value the firm stock and in the other hand the individual investors and money lenders use it to determine how much the firm stock will grow over time. In these ratios are included the dividends ratios that we will talk about further into the questionnaire. The ratios analysed in this part of the questionnaire are the "price earnings ratio", represents the relation between the stock value and the dividends per stock, "the P_0 ", that represents a more complex formula for the previous ratio, the " price to cash earnings", that will use the cash earnings per stock to have a value free of any possible accounting mistake, the "market to book ratio", compares the market value of the company to its book value (Mrša et al 2016).

$$\text{market to book ratio} = \frac{\text{stock market value}}{\text{stock accounting value}}$$

$$PCE = \frac{\text{stock market value}}{\text{cash earnings per stock}}$$

$$P_0 = \frac{Div}{r - g}$$

$$PER = \frac{\text{stock market values}}{\text{results per stock}}$$

These ratios are presented in a table form on the questionnaire and the questions asked about them is only if the user knows them and the frequency they use the ratios.

2.6 - Optimal Financial Mix

In every company, no matter the size of it, a decision must be made of how to finance its operations whether with debt or equity. Raising the money only using one kind of the two is feasible but hard to do and it comes in most cases with a great cost of losing control of the company, either by selling it directly to investors or by going into bankruptcy due to too much debt. Because of it every company is financed by a mix of debt and equity, differing only on the percentages of debt and equity they own. The focus is always in the amount of debt that a company owns and the balance of the benefits and costs of owning it (Obuya 2017, Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013).

2.6.1 - Advantages and Disadvantages of holding debt

Firms that use debt benefit in two ways. The first way is a tax benefits because debt is a tax-deductible commodity. This varies from country to country but for most of them tax law allows to deduct interest payments on debt from taxable income, making debt a more interesting financing vehicle than equity. The second way is by imposing more discipline on the managers. Holding debt means that you should make regular debt payments, so if a manager makes several poor investment decisions, the cash flows may decrease to a point where they can no longer sustain the debt payments required and lead the company into bankruptcy, which will obviously make the managers lose a lot with the result (Brealey et al. 2016, Copeland et al. 2013).

Obviously, there are also disadvantages in having debt, more specifically there are three. The first one is related to the increase in expected bankruptcy costs. These costs are related to the incapacity of a company to meet their obligation with the lenders, by generating lower cash flows than what they should pay in interests. Some companies are more vulnerable to these changes than others, varying according to the type of business you operate, the way the rest of the debt is structured and if there is a third entity that provides protection against bankruptcy, such as the government or a mother company (Obuya 2017, Damodaran 2014).

The second disadvantage of holding debt is related to the relation between lenders and equity owners. The two groups have different claims on the cash flows, the lenders receive all their money from the firm cash flows and receive it before the equity owners. The equity owners receive money either from the cash-flows or from selling their share of the firm. This difference becomes more evident when planning on a risky investment. The equity owners will be interested in doing it because if it works the cash flows raise and the stock value grows but if it fails they can always sell their part of the firm and get their money back. In the other hand the lenders have no part of the firm to sell and are more exposed to the changes of the cash flows and therefore are less likely to want a risky investment. This relation problem is denominated as agency costs and reflects in higher rates of debt if the lenders feel that stockholders might make them worse of and restrictive covenants that block risky investments or other types of investments (Damodaran 2014, Copeland et al. 2013).

The last disadvantage is the loss of flexibility. Borrowing comes with an obvious loss of flexibility because after getting a loan part of the money you make on a project most go to pay that loan. This leads to less money going into a firm, to make new investments and therefore losing some flexibility on what it can do their profits. This problem becomes even bigger if related to the last one. If all the loans a firm gets come with restrictions, due to a lack of trust from the lenders on the stockholders, and the restrictions are on the type of investments the firm can make then you lose flexibility in two ways, form having less money available and from having restrictions on investments (Damodaran 2014, Copeland et al. 2013).

So, it's important that you weight the advantages and disadvantages of holding debt when you are considering getting a loan to finance an investment, and to that you must consider how this new loan will affect not only the investment at hands but also the company as a whole. To do this you can calculate **the optimal amount of debt** of your firm and then see if you are at the optimal level, above it or below it (Hrdý 2018, Brealey et al. 2016, Damodaran 2014).

To do so there are no right or wrong financial instruments to use because it all depends on what are the firm restrictions and policies towards debt, so I chose to include on this questionnaire five different methods, the operating income method, the cost of capital method, the leverage and return deferential method, the adjusted present value method and the comparative analysis method. For all the explanations, we will assume that every new investment is financed in some degree with debt.

2.6.2 - The methods to calculate the optimal debt amount

The cost of capital method uses the cost of capital calculating process which is the weighted average of the cost of all the financing components a company has at their disposal such as equity, debt and hybrid securities summed up using different weights of this financial components, to obtain the total cost of capital. This method then proceeds to calculate the cost of capital with different debt ratio and calculates the variations of the cost of debt and cost of equity, with the new debt ratio, to arrive at a new cost of capital. The debt ratio that maximizes the cost of capital will be the optimal debt amount and therefore the optimal financial mix (Fioresi et al 2018, Brealey et al. 2016, Damodaran 2014).

$$\beta_u = \beta_l / \left[1 + (1 - t) * \left(\frac{D}{E} \right) \right]$$

$$COE = \text{riskfree rate} + \beta_l * \text{risk premium}$$

$$\text{Interest coverage ratio} = \frac{EBIT}{\text{interest expense}}$$

$$WACC = COE * \left(\frac{E}{E + D} \right) + COD * \left(\frac{D}{D + E} \right)$$

$$\text{Firm value} = \frac{FCFF * (1 + g)}{WACC - g}$$

The operating income method is the method that gives more space to the managers to decide. The objective is to first determine how much default probability the company is comfortable with and then calculate an operating income distribution for all the existing investments. This

operational income distribution comes with the uncertainty present in a project, with each one the amount of operational income will vary from what are the year's projections. So, to prevent getting surprised by the variations, these predictions will come with a maximum and a minimum value for the operational income, which will then produce, after all the projects are added to produce the total, a probability distribution of the total a firm will make in that year. The optimal financial mix is the amount of debt and equity that, with the current operational income distribution, makes the probability of bankruptcy reach the maximum established. To reach that value a company will do it by accepting new projects, which makes two variables change, the debt to equity ratio and the operational income distribution, but it should only accept new projects until the probability of the operating income being lower than the debt obligations is higher than the default probability the company has set (Amaya et al 2015, Damodaran 2014).

$$t\ statistic_D = \frac{current\ EBITDA - Debt\ payments_D}{\sigma OI * current\ operating\ income} \Leftrightarrow$$

$$\begin{aligned} Debt\ payments_D &= \\ &= current\ EBITDA - t\ statistic_D * (\sigma OI * current\ operating\ income) \end{aligned}$$

$$Optimal\ debt\ level = \frac{Debt\ payments_D}{interest\ rate + sinking\ fund\ rate}$$

The leverage and the return differential method is centred on maximizing, through changing the debt ratio, the differential between the cost of equity and the return on equity. This method depends on the capacity of the company to add the risk of owning more debt to the beta used to calculate the cost of equity. Adding to the fact that these changes in the debt ratio will also implicate changes in the leverage of the company, you can see that the two factors respond when the debt ratio are changed which will give a new differential. Simplifying a complex process, the optimal financial mix is the one where the differential between cost of equity and return on equity is maximized (Damodaran 2014, Copeland et al. 2013).

$$ROE = ROC + \frac{D}{E} [ROC - i(1 - t)]$$

The adjusted present value approach is the most obvious of all because it uses directly the financial benefits and costs of debt. It begins with calculating the unlevered value of the firm

using the current after-tax operating cash flow or FCFF. It uses as a discount rate for the present value of the FCFF, the cost of equity calculated using the unlevered Beta. It then introduces debt percentages to the firm and adds to the value of the unlevered firm the present value of the tax benefits of having debt and subtracts the expected bankruptcy costs. The optimal debt ratio is reached when the firm's value is maximized, therefore reaching also the optimal financial mix (Christofi 2017, Damodaran 2014).

$$\begin{aligned} \text{Value of unlevered firm} &= \\ &= \text{Current value of firm} - \text{PV of tax benefits} + \text{Expected bankruptcy costs} \end{aligned}$$

$$\text{Value of tax benefits} = \text{tax rate} * \text{Debt}$$

$$\text{Expected Bankruptcy costs} = \text{probability of bankruptcy} * \text{Bankruptcy costs}$$

$$\begin{aligned} \text{Value of levered firm} &= \\ &= \text{Value of unlevered firm} + \text{value of tax benefit} \\ &\quad - \text{expected bankruptcy costs} \end{aligned}$$

The comparative analysis approach is the most common of all the methods and most direct one to do because It considers the industry average debt ratio as the optimal debt amount. It has two ways it can be used. In the simpler way, the company makes a direct comparison of its debt ratio to the average of the industry it works on and decides based on the difference of what it wants to do. In the more complex way the company sees itself as being different from the rest of the industry and tries to determine how much this difference separates them from the industry average, and if it brings them a competitive advantage. The debt level should be changed if both previous two conditions are false, but not to the market average but to a value to be considered, by the managers of the firm, to give a competitive advantage (Jubaedah et al 2016, Brealey et al. 2016, Damodaran 2014).

2.6.3 - Final considerations

In this part of the questionnaire we decided to include all the financial instruments available to determine the optimal financial mix. They are not however present in all the books, except for one of the books (Damodaran 2014) that has them all present. This inclusion is necessary since all the methods have flaws on their procedures, in the common fact of how much liberty they

give the firms manager, and with specific limitations on each one of them. These flaws may turn away some firms from choosing a specific method but may also attract some, this is related to the difference in the opinion on some aspects. The common factor and the most predominant one is the control the stockholders are comfortable with a manager having over their firm. Some may see it as a positive thing because the stockholders trust the manager in place to make the right decisions and will always look out for the value maximization of the stock value, but others prefer to take as much as they can from the personal decisions of the placed manager and choose a method that restrains them in that matter. So, to understand which method is the most common among the firms we included all of them in the questionnaire.

2.7 – Options

Until now all the financial instruments that are shown are based on the expected cash flows the company makes or will make with the financial decision it takes. This is not the only tool companies use on their decision process mostly because taking a new investment with a positive net present value may not bring value enough to a company. The new investment may be mostly financed with debt and in a company, that is near its optimal financial mix, it can offset the value created by the investment or even make the firm less valuable (Damodaran 2014, Copeland et al. 2013).

With every decision, after analyzing all the effects it may have, the company has the option of going through with it or not and in this chapter, we will focus on the financial instruments available to calculate the values of these options.

2.7.1 - The black-scholes model

In all the financial instruments, we showed so far, we have used binomial option pricing models to create a replicating portfolio that had the same cash-flows as the option being valued. Although this model is easy to understand and to apply, it requires a lot of inputs. As we consider shorter periods of time there are two possible reactions the asset price can have, it either changes a lot from one moment to the other, or the changes are so small that become a continuous price. Using this last assumption Fischer Black and Myron Scholes designed the black-scholes model that uses the same idea of creating a portfolio with the same cash-flows and the same costs as the option being considered, but instead gives a continuous number that

changes in value as time changes. This model can then be used to value the option of waiting for the right opportunity, the put option, and the option of activating the investment, the call option (Brealey et al. 2016, Chang 2015, Damodaran 2014, Copeland et al. 2013).

for a call position:

$$C = S * e^{-rt} * N(d_1) - K * e^{-rt} * N(d_2)$$

and for a put position:

$$P = K * e^{-rt} * (1 - N(d_2)) - S * e^{-rt} * (1 - N(d_1))$$

Where d_1 and d_2 are:

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

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

By introducing time to the valuing process of an investment option, the black-scholes model can be used to value the three different prospects every company has when facing a project with a positive NPV, of either delaying the project, expanding an investment made on a project, or to abandon a project that although profitable isn't making what was expected of it. These options can then be sold to the companies that pay the extra value on an investment to have the option of delaying their investment on a project, the option to expand on an existing project and the option to abandon a project with no costs or limited costs (Damodaran 2014, Copeland et al. 2013).

2.7.2 - The option to delay, expand and abandon a project

The **option to delay a project** is especially important when a firm has priority or exclusivity over their competitors to invest in a project. Here we have to consider that the net present value is a measure of the value of a project at that time, so it's natural to conclude that, as time progresses, a negative net present value may change and become positive, making a previously bad investment a good one. These changes in the project value over time are considered to be a call option, because the company is the only one that can make the investment and has the opportunity of putting it on hold until it becomes profitable. Patents, reserves with undeveloped

natural resources and research and development are considered options to delay (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013).

The **option to expand a project** gives the company the possibility of making new investment on previously unavailable project or to enter other markets they currently aren't in. In these cases, the initial project is a way of expanding the company's options of future investments and therefore is considered to be the price the company pays for the option to expand. By considering the option to expand, a company can justify the investment in a negative net present value project by analysing how much money they will make in the future by expanding the original investment. This option has a fixed time horizon and, until it comes, the company only expands on the initial investment if the difference between the initial investment negative NPV and the future investment positive NPV, is positive (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013).

The **option to abandon a project** makes it more attractive by adding to the potential value of a project the value of the option to abandon that project, which is a common option to value in projects that are very risky but have high returns. It uses two variables to value the option, the remaining value on a project if it continues, V , and the liquidation or abandonment value of the same project at the same time, L . If the value to continue, V , is higher than the value of liquidation, L , then the project should continue, but in the moment, it changes, and the liquidation value becomes higher than the remaining value of the project then, said project should be abandoned. This option is only considered if the project starts to underperform or if it starts bringing a negative net present value to the company (Brealey et al. 2016, Damodaran 2014, Copeland et al. 2013).

All the options studied should be considered for all investments if they bring value to the project. They are used to transform an unacceptable project into an acceptable one and they do it by not considering the project as an individual investment and instead valuing its future potential.

The option method can also be used in capital structure and in evaluating but they aren't included in this questionnaire both for lack of space in the questionnaire.

Cap III – Theoretical approach

Along with the investigation taken for the purpose of the present literature review, different authors' point-of-view and my own perception of the financial context were contrasted, in both theoretical and practical terms. As a result, there emerged a set of key questions, which will be driving the following discussion.

These questions all have the same common goal of understanding how the financial instruments taught in the Portuguese universities can help students in the financial working market, but they are presented at different stages of this process.

The first stage is the learning stage of the instruments. Most of the financial instruments showed on the literature review have one thing in common which is they are all taught in the two chosen universities. From here we can conclude that all the students were exposed to the instruments at least once in their learning experience but there is a lot more uncertainty of what level of knowledge about these instruments stays with the students when they finish their courses.

This first research question comes to validate the teaching processes used in the Portuguese universities. The base was to understand if the students remember any of the information passed on to them in university. There was also space and interest to understand which university performed better so all the analysis was done by comparing the students from UN1 and UN2. The research question number one is as follows: Is there a difference of efficiency in teaching finance between UP1 and UP2? (RQ1).

The second stage is the pre-entering the work market. The research question was based on how the courses taken by the students affects their financial knowledge when entering their first job. The common knowledge tells us that the students opting for the finance degrees will be more prepared than the others but that might not be the case.

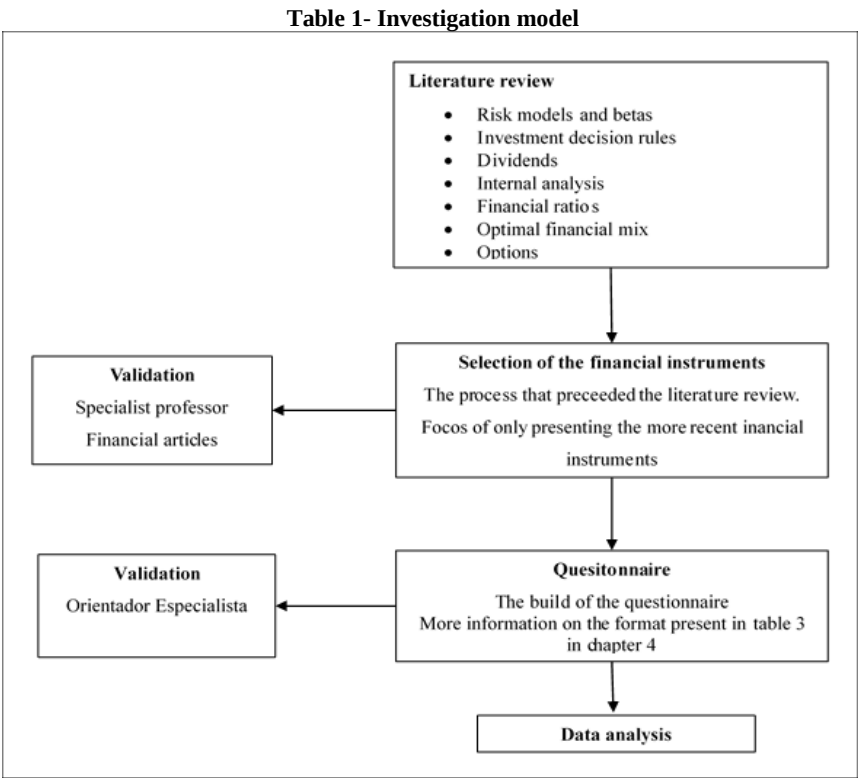
For most courses it probably is but for management degrees the distance may be a bit shorter, so in this thesis one of the objectives was to study this distance and assert if it is the same for all the instruments or if it varies based on the type of financial instruments. For this question there was no concern over the university the student came.

The final formulations of the Second research question is as follows: Is there a difference of knowledge of financial instruments between the students from managing, finance and marketing? (RQ2)

The last stage contemplated was how useful the instruments were in the finance working place. As showed in the literature review the instruments chosen are mostly the bases of the areas they represent but this may not mean that they are the most used ones by the financial world. They are most definitely used as a starting point for some more complex financial instruments, as showed in these articles that do just that, therefore they are crucial for the students to know so that they are ready to use these more complex versions of the instruments.

The third question approaches the usage of each instrument topic, because although the financial instruments presented are definitely part of more complex ones, their usage or not isn't a guaranteed answer so this thesis tries to take a first impression of this subject by investigating how much the students use each of the instruments. This third research question is as follows: Are the students working in the financial area ready to work, or are they lacking any knowledge? (RQ3)

The approach taken to answer these questions is shown in the previous table 1:



authors or used on of the instruments in their studies the said instrument. It was also considered the expertise of the thesis guidance. These were the considered financial instruments to form this questionnaire.

As it is apparent the most practical option was to construct a questionnaire that included all of the financial instruments used. The theoretical approach used to construct this questionnaire were quite simple as the objective was to construct a simple questionnaire. Here only a handful of articles were studied and the expertise of the two professors was primarily used.

Lastly the information taken from the questionnaire was studied and treated using the excel toll and in some cases the SPSS toll in order to get a clear view of all the data.

Cap IV – methodology

4.1 - Investigation model

Considering that the objective of this study is to analyse how efficient is the teaching of finance in UP1 and UP2, it was used an empirical study that consisted of an online questionnaire applied to the ex-student from UP1 and UP2, from the courses of management, finance and marketing, that worked or not in the financial area.

With this purpose in mind, a questionnaire (appendix I) was elaborated and the theoretical support that each question was based on are presented using an organized map of all the questions. This map was constructed using the guide lines from the model of Brites (2015) that demonstrates how to build an effective guide for a questionnaire (table 2).

Table 2- Questions map

Investigation questions / hypothesis / Construct	indicators	measuring level			empirical objects of study
		nominal	ordinal	quantitative	
Alumni general data	Onde concluiu a licenciatura?		x		RQ1 ; RQ3
	Onde concluiu a mestrado?		x		RQ1 ; RQ3
	Qual a área científica da sua licenciatura?		x		RQ2 ; RQ3
	Qual a área científica do seu mestrado?		x		RQ2 ; RQ3
	Em que área trabalha?		x		RQ3
	área da licenciatura		x		RQ2 ; RQ3
	área do mestrado		x		RQ2 ; RQ3
Risk models	área de trabalho		x		RQ3
	Sabe o que são modelos de análise de risco de mercado?	x			All
	Conhece este modelo?	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	Com que frequência usa o modelo?			x	RQ3
	conhece este modelo?	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	com que frequência usa o modelo?			x	RQ3
	conhece este modelo?	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	com que frequência usa este modelo?			x	RQ3
	conhece este modelo?	x			All
Betas	Onde é que o aprendeu?		x		RQ1 ; RQ2
	com que frequência usa este modelo			x	RQ3
	fórmula: $R_j = R_f + \beta * (R_m - R_f) \Leftrightarrow R_j = R_f (1-\beta) + \beta * R_m$	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	Com que frequência usa este beta [frequência]			x	RQ3
	conhece este tipo de betas?	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	Com que frequência usa este beta [frequência]			x	RQ3
	conhece este beta?	x			All
	Onde é que o aprendeu?		x		RQ1 ; RQ2
	Com que frequência usa este beta [frequência]			x	RQ3
	conhece este beta?	x			All
Working capital + leverages	Onde é que o aprendeu?		x		RQ1 ; RQ2
	Com que frequência usa este beta [frequência]			x	RQ3
	conhece a definição de fundo de manio?	x			All
	Onde é que aprendeu?		x		RQ1 ; RQ2
	com que frequência usa este modelo			x	RQ3
	sabe o que é as necessidades em fundo de manio	x			All
	Onde aprendeu este instrumento?		x		RQ1 ; RQ2
	com que frequência usa?			x	RQ3
	usa este instrumento? GAF		x		RQ1 ; RQ2
	Com que frequência o usa?			x	RQ3
	Onde é que aprendeu?		x		RQ1 ; RQ2
	usa este instrumento? GAO			x	RQ3
Liquidity ratios	Com que frequência o usa?		x		RQ1 ; RQ2
	Onde é que aprendeu?			x	RQ3
	Com que frequência usa cada um dos rácios [liquidez geral= (activo circulante)/(passivo circulante)]			x	RQ3
Leverage ratios	Com que frequência usa cada um dos rácios [liquidez imediata= (depósitos bancários+caixa+títulos negociáveis)/(passivo circulante)]			x	RQ3
	Com que frequência usa cada um dos rácios [debt to equity ratio= (capitais próprios)/(capitais próprios)]			x	RQ3
	Com que frequência usa cada um dos rácios [cobertura dos encargos financeiros= (resultados operacionais)/(encargos financeiros)]			x	RQ3
	Com que frequência usa cada um dos rácios [variabilidade dos resultados operacionais = (ROt - RO(t-1))/(media dos RO)]			x	RQ3
Rentability ratios	(resultado operacional)/(volume de negócios)			x	RQ3
	Com que frequência usa cada um dos rácios [rendibilidade do capital próprio= (resultados líquidos)/(capital próprio)]			x	RQ3
	Com que frequência usa cada um dos rácios [rendibilidade do activo= (resultado operacional)/activo]			x	RQ3
	Com que frequência usa cada um dos rácios [rendibilidade do capital investido= (resultado operacional)/(capital investido)]			x	RQ3
Operational ratios	Com que frequência usa cada um dos rácios [rotação do capital investido= (volume de negócios)/(capital investido)]			x	RQ3
	Com que frequência usa cada um dos rácios [permanência média das mercadorias em armazém= (extensão média de mercadorias)/(custo das mercadorias vendidas)*365]			x	RQ3
	Com que frequência usa cada um dos rácios [prazo médio de recebimentos= (saldo médio de clientes)/(vendas e prestação de serviços*(1+IVA))*365]			x	RQ3
	Com que frequência usa cada um dos rácios [prazo médio de pagamentos= (saldo médio de fornecedores)/(compras e fornecedores*(1+IVA))*365]			x	RQ3
Market ratios	Com que frequência usa cada um dos rácios [PER= (preço de cotação)/(resultados por acção)]			x	RQ3
	Com que frequência usa cada um dos rácios [$P_0 = Div/(r-g)$]			x	RQ3
	Com que frequência usa cada um dos rácios [PCE= (preço de cotação)/(cash earnings por acção)]			x	RQ3
	Com que frequência usa cada um dos rácios [market to book ratio = (preço de cotação)/(valor contabilístico por acção)]			x	RQ3

Investigation questions / hypothesis / Construct	indicators	measuring level			empirical objects of study
		nominal	ordinal	quantitative	
Investment financing models	conhece este método?	x			All
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	conhece este método?	x			All
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	Conhece este método?	x			All
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	Conhece este método?	x			All
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	De onde conhece esta fórmula?		x		RQ1 ; RQ2
	com que frequência utiliza?			x	RQ3
	Usa este método	x			All
	Com que frequência o utiliza?			x	RQ3
Investment analysis	De onde conhece estas fórmulas? [NPV]		x		RQ1 ; RQ2
	De onde conhece estas fórmulas? [IRR]		x		RQ1 ; RQ2
	Com que frequência as utiliza? [NPV]			x	RQ3
	Com que frequência as utiliza? [IRR]			x	RQ3
	Com que frequência utiliza cada uma das taxas? [custo de capital]			x	RQ3
present value	Com que frequência utiliza cada uma das taxas? [tabelas ou calculadora financeira]			x	RQ3
	De onde aprendeu cada um dos métodos [custo de capital]		x		RQ1 ; RQ2
	De onde aprendeu cada um dos métodos [tabelas ou calculadora financeira]		x		RQ1 ; RQ2
	Ao aplicar o custo de capital como taxa de desconto por vezes cometemos o erro de aplicar o custo de capital aos retornos sobre os capitais próprios, ou vice versa.	x			All
	Quando é que considera que ocorreram os "cashflows"		x		RQ1 ; RQ2
dividends	conhece esta teoria	x			All
	Onde aprendeu esta teoria?		x		RQ1 ; RQ2
	com que frequência a utiliza			x	RQ3
	conhece esta teoria?	x			All
	Onde aprendeu esta teoria?		x		RQ1 ; RQ2
	com que frequência a utiliza			x	RQ3
	conhece esta teoria	x			All
	Onde aprendeu esta teoria?		x		RQ1 ; RQ2
	com que frequência a utiliza			x	RQ3
	De onde conhece estes rácios? [dividend payout ratio]		x		RQ1 ; RQ2
	De onde conhece estes rácios? [dividend yield]		x		RQ1 ; RQ2
	com que frequência usa o dividend payout ratio			x	RQ3
options	Conhece o modelo?	x			All
	Utiliza o modelo com esta perspectiva?		x		RQ1 ; RQ2
	Para que situação(ões) usa este método para valorizar uma opção?			x	RQ3

Font: author elaboration

The questionnaire had the objective of collecting as much information from the ex-student about their knowledge of a set number of financial instruments and where they acquired that knowledge.

The decision of using a questionnaire (one of the most frequently used techniques in the social sciences, often appearing in samples and sample errors that may be inherent to generalize the sample to a given population (Ghiglione and Matalon 2001, Sierra Bravo 1988) to collect the data was made due to being the least vulnerable method to mistakes, because it is implicated in

a primary knowledge, due to the possibility to group the data in the form of statistical tables that will ease the analysis of the variables being tested. Another factor that lead to the use of the questionnaire is because it is an economical method, although it comes with a possible subjectivity rate in the answers obtained due to the answers having all the same weight, the personal opinions of each

4.1.2 - questionnaire form

The analytical method used to construct the form of this questionnaire was based on frequently used techniques in social sciences (freitas, 2013) that show upon in the company of several samples and authors (Coutinho, 2011). This situation is possible due to the practical knowledge of the population inquired and because the data can be presented in the form of statistical tables.

The questionnaire has two parts, the first one is a set of social-demographic questions that helped to characterize the sample from our questionnaire and characterize (Freitas, 2013), that were all specific to the course and university each ex-student attended and the area where they worked.

The second part was more focused on the financial instruments present in the questionnaire and, because there are a lot to choose from, was built under a set of rules that helped determine which were more relevant to include in it.

To promote the comprehension and facilitate the answer to each question, the questionnaire was built in a self-explanatory way, in which a light introduction was added to the beginning of each financial instrument, explaining what the instrument was and for which purpose it was used for.

At last, regarding the classification of the scaling techniques showed in the outputs, it was used two consistent scales throughout the questionnaire, a comparative scale (that will show a direct comparison between the font of the knowledge) and a non-comparative scale that will evaluate the knowledge of each financial instrument in a scale of 1 to 5 (that will analyse how frequently each instrument is used). As advantages of this comparative method it can be emphasized its easy understanding with the same set of reference points for all respondents and their tendency to reduce the halo or transition effects from one judgment to another. As disadvantages, has had

the ordinal nature of the data and the generalization ability beyond the scaled objects (Vairinhos, 1995).

4.1.3 - questionnaire content

For every instrument, there is a reason for its inclusion in the questionnaire but for most of them the reasons are the same so to justify the inclusion there are three requirements to include an instrument.

The **first requirement (R I)** is the one mentioned above, if an instrument is explained or mentioned in more than one of the four books it is considered an important aspect of finance and therefore must be included. All the authors of the books are among the great minds of finance so the inclusion of one instruments in more one book means that it is considered by the authors to be an important part of finance. We will use one main book, the damodaran, that will then be completed by the other three books and after studying the damodaran book there a quick check through the other three books was made to confirm there was nothing more of relevance to add to the questionnaire.

The **second requirement (R II)** is the process of selecting from the ones that made throw the first step. If we were to include every single one of the instruments that were mentioned in more than one book the questionnaire would be too big to answer so it was necessary to reduce the number. To make this adjustment we decided that the main reasons would be if it was an instrument used by professionals and if it was taught at a university level. I used my professor's expertise and working experience on the subject for the two points of view, the teaching and university perspective, and the working in the financial area perspective to choose the areas that should be present in the questionnaire and then decided which financial instruments would represent said area. For each instrument present in more than one area said instrument was only included once in the questionnaire but described in each chapter it appears one, with an explanation for its lack of inclusion on that part of the questionnaire.

The **third requirement (R III)** is to include financial instruments that aren't consensual in the financial world so that there could be space in this questionnaire to take some conclusions about which method is the most used and therefore the one that should be given more focus by the teachers. In some areas of finance there isn't a consensual financial instrument to be used, either because they all have some limitations or because they all reveal the information in different

ways, and so this questionnaire will try in a limited capacity discuss these topics with the perspective of giving more focus on some of the instruments when teaching them. Although this reason is present in some capacity in all the questions, because the main objective of this thesis is to understand if the financial instruments that are being used at a professional level are taught in UP1 and UP2, in some cases we saw the possibility to use this questionnaire to shed a light into these divergences in what instruments are best suited.

For some of the instruments none of the reasons below will be enough to explain their presence and so for these specific cases there will be an additional topic, following the explanation of the instrument, that will discuss the reasons behind its inclusion and why it was important for it to be there or for their lack of inclusion. This will happen mostly with financial instruments present in the main book of this thesis, (Damodaran, 2004), that brought a different perspective to a subject that does not have a consensus of what instrument to use.

Yet, given the requirements of a case study there was a need of continuous interaction between the theoretical questions being studied and the data collected (Coutinho, 2011). According to (Coutinho, 2011), a bibliographical review of articles and works related to the theme, namely theoretical themes, literature of related authors and public articles, makes it possible to formulate annotations, analyses and syntheses (table 3).

Table 3- The analysis model

dimention	indicators	Scale	Observations / procedures
Alumni general data	Onde concluiu a licenciatura?	0=ISCTE ; 1=ISEG ; 2=outra	Font: (Baraflano, 2008) ; (Coutinho, 2011)
	Onde concluiu a mestrado?	0=ISCTE ; 1=ISEG ; 2=outra	
	Qual a área científica da sua licenciatura?	0=Gestão ; 1=Finanças ; 2=Marketing ; 3=Comunicação social ; 4=outras	
	Qual a área científica do seu mestrado?	0=Gestão ; 1=Finanças ; 2=Marketing ; 3=Comunicação social ; 4=outras	
	Em que área trabalha?	0=Finanças ; 1=Marketing ; 2=logística ; 3=outra	
	área da licenciatura	open answer	
	área do mestrado	open answer	
Risk models	área de trabalho	open answer	Font: (brealey et al; 2016), (Olsen, T. 2016), (Fernandez, P. 2015), (Amaya, D. et al 2015), (Copeland et al; 2013), (Carvalho das Neves, 2005) Note: CAPM model
	Sabe o que são modelos de análise de risco de mercado?	2 = sim ; 3 = não	
	Conhece este modelo?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (brealey et al; 2016), (Davidson, S. R. 2015), (Damodaran, 2014), (Copeland et al; 2013), (Carvalho das Neves, 2005) Note: APM model
	Com que frequência usa o modelo?	1=nunca usei ; 2=usei mas não profissionalmente ; 3=uso mas não regularmente ; 4=uso regularmente ; 5=uso diariamente Note: this will be referred to as "usage scale"	
	conhece este modelo?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (brealey et al; 2016) , (Lohmann, C. 2015) Note: multi-factor model
	com que frequência usa o modelo?	usage scale	
	conhece este modelo?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Carlin, S. 2015), (Damodaran, 2014) Note: proxy model
	com que frequência usa este modelo?	usage scale	
	conhece este modelo?	2 = sim ; 3 = não	
Betas	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Serra, R. G. 2018), (Damodaran, 2014) Note: historical beta
	Com que frequência usa este beta [frequência]	usage scale	
	conhece este tipo de betas?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Orutreye, E. et al 2017), (brealey et al; 2016), (Damodaran, 2014), (Copeland et al; 2013), (Carvalho das Neves, 2005) Note: service betas
	Com que frequência usa este beta [frequência]	usage scale	
	conhece este beta?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (brealey et al; 2016), (Kwan, C. C. 2016). Note: fundamental betas
	Com que frequência usa este beta [frequência]	usage scale	
	conhece este beta?	2 = sim ; 3 = não	
	Onde é que o aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (brealey et al; 2016), (Damodaran, 2014), (Copeland et al; 2013) Note: Accounting betas
	Com que frequência usa este beta [frequência]	usage scale	
	conhece a definição de fundo de maneo?	2 = sim ; 3 = não	
Working capital + leverages	Onde é que aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Hofmann, E. et al 2016), (damodaran, 2014), (Carvalho das Neves, 2005), (Capizzi, V. 2005) Note: Working capital
	com que frequência usa este modelo	usage scale	
	sabe o que é as necessidades em fundo de maneo	2 = sim ; 3 = não	
	Onde aprendeu este instrumento?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (brealey et al; 2016), (Hofmann, E. et al 2016), (Carvalho das Neves, 2005) Note: Working capital needs
	com que frequência usa?	usage scale	
	usa este instrumento? GAF	2 = sim ; 3 = não	
	Com que frequência o usa?	usage scale	Font: (brealey et al; 2016), (Damodaran, 2014), (Lourenço, S. et al 2009), (JORDAN, H. et al 2008), (Vieira, A. et al 2006), (Carvalho das Neves, 2005) Note: financial leverage degree
	Onde é que aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	usa este instrumento? GAO	2 = sim ; 3 = não	
	Com que frequência o usa?	usage scale	Font: (Graham, J. R. 2017), (Devashish, M. K. 2017), (brealey et al; 2016), (Damodaran, 2014), (Carvalho das Neves, 2005) Note: operational leverage degree
	Onde é que aprendeu?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	Com que frequência usa cada um dos rácios [liquidez geral= (activo circulante)/(passivo circulante)]		
Liquidity ratios	Com que frequência usa cada um dos rácios [liquidez imediata= (depósitos bancários+caixa+titulos negociáveis)/(passivo circulante)]		Font: (brealey et al; 2016), (Ismaïl, R. 2016), (Mrša, J. et al 2016), (Jubaedah, J. et al 2016), (Raifur, L. et al 2015), (Damodaran, 2014), (Copeland et al; 2013), (Carvalho das Neves, 2005)
	Com que frequência usa cada um dos rácios [endividamento= (capitais alheios)/(capitais totais)]		
	Com que frequência usa cada um dos rácios [debt to equity ratio= (capitais próprios)/(capitais próprios)]		
	Com que frequência usa cada um dos rácios [cobertura dos encargos financeiros= (resultados operacionais)/(encargos financeiros)]		
Leverage ratios	Com que frequência usa cada um dos rácios [variabilidade dos resultados operacionais = [ROt - RO(t-1)]/(media dos RO)]		
	Com que frequência usa cada um dos rácios [rendibilidade operacional de vendas= (resultado operacional)/(volume de negocios)]		
	Com que frequência usa cada um dos rácios [rendibilidade do capital próprio= (resultados líquidos)/(capital próprio)]		
	Com que frequência usa cada um dos rácios [rendibilidade do activo= (resultado operacional)/active]	0=não conheço ; 1=nunca usei ; 2=usei mas não profissionalmente ; 3=uso mas não regularmente ; 4=uso regularmente ; 5=uso diariamente	
Rentability ratios	Com que frequência usa cada um dos rácios [rendibilidade do capital investido= (resultado operacional)/(capital investido)]		
	Com que frequência usa cada um dos rácios [rotação do capital investido= (volume de negócios)/(capital investido)]		
	Com que frequência usa cada um dos rácios [permanencia media das mercadorias em armazen= (extencia media de mercadorias)/(custo das mercadorias vendidas)*365]		
	Com que frequência usa cada um dos rácios [prazo medio de recebimentos= (saldo medio de clientes)/vendas e prestação de serviços*(1+1/Ax)]*365]		
Operational ratios	Com que frequência usa cada um dos rácios [prazo medio de pagamentos= (saldo medio de fornecedores)/(compras e fornecedores*(1+1/Ax))*365]		
	Com que frequência usa cada um dos rácios [PER= (preço de cotação)/(resultados por acção)]		
	Com que frequência usa cada um dos rácios [PO=Div/(r-g)]		
	Com que frequência usa cada um dos rácios [PCE= (preço de cotação)/(cash earnings por acção)]		
Market ratios	Com que frequência usa cada um dos rácios [market to book ratio = (preço de cotação)/(valor contabilístico por acção)]		
	conhece este método?	2 = sim ; 3 = não	Font: (Fiorelli, A. et al 2018), (brealey et al; 2016), (Damodaran, 2014) Note: The cost of capital method
	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência utiliza?	usage scale	
Investment financing models	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Hrdý, M. 2018), (Damodaran, 2014) Note: The operating income method
	com que frequência utiliza?	usage scale	
	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência utiliza?	usage scale	Font: (Obuya, D. O. 2017), (Damodaran, 2014), (Copeland et al; 2013) Note: The leverage and the return differential
	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência utiliza?	usage scale	
	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Christofi, A. 2017), (Damodaran, 2014) Note: The adjusted present value
	com que frequência utiliza?	usage scale	
	De onde conhece esta fórmula?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência utiliza?	usage scale	Font: (brealey et al; 2016), (Damodaran, 2014) Note: The comparative analysis
	De onde conhece esta fórmula?	1=sim ; 2=não ; 3=não conheço	
	Usa este método	usage scale	
	Com que frequência o utiliza?		

dimension	indicators	Scale	Observations / procedures
Investment analysis	De onde conhece estas fórmulas? [NPV]	0=não conheço ; 1=nunca usei ; 2=usei mas não profissionalmente ; 3=uso mas não regularmente ; 4=uso regularmente ; 5=uso diariamente	Font: (Willigers, B. J. et al 2017), (Brealey et al; 2016), (Decker, F. 2016), (Gharani, R., et al 2015), (Damodaran, 2014), (Copeland et al; 2013) Note: NPV and IRR
	De onde conhece estas fórmulas? [IRR]		
	Com que frequência as utiliza? [NPV]	usage scale	
present value	Com que frequência as utiliza? [IRR]		Font: (Brealey et al; 2016), (Damodaran, 2014), (Copeland et al; 2013)
	Com que frequência utiliza cada uma das taxas? [custo de capital]	usage scale	
	Com que frequência utiliza cada uma das taxas? [tabelas ou calculadora financeira]		
	De onde aprendeu cada um dos métodos [custo de capital]	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	De onde aprendeu cada um dos métodos [tabelas ou calculadora financeira]		
	Ao aplicar o custo de capital como taxa de desconto por vezes cometemos o erro de aplicar o custo de capital aos retornos sobre os capitais próprios, ou vice versa. Quando é que considera que ocorreram os "cashflows"	1 to 5 1=Início do ano ; 2=fim do ano	
dividends	conhece esta teoria	2 = sim ; 3 = não	Font: (Angulo-Ruiz, F. et al; 2018), (Eldomiaty, T. et al 2015), (Copeland et al; 2013) Note: dividends are irrelevant principal
	Onde aprendeu esta teoria?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência a utiliza	usage scale	Font: (Brealey et al; 2016), (Ivanovski, Z. et al 2015), (Damodaran, 2014), (Copeland et al; 2013) Note: dividends are bad principal
	conhece esta teoria?	2 = sim ; 3 = não	
	Onde aprendeu esta teoria?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	Font: (Brealey et al; 2016), (Varma, U. et al 2016), (Damodaran, 2014) Note: dividends are good principal
	com que frequência a utiliza	usage scale	
	conhece esta teoria?	2 = sim ; 3 = não	Font: (Brealey et al; 2016), (Damodaran, 2014), (Copeland et al; 2013) Note: dividends ratios
	Onde aprendeu esta teoria?	0=Licenciatura ; 1=Trabalho ; 2=Auto-aprendizagem ; 3=Mestrado	
	com que frequência a utiliza	usage scale	Font: (Brealey et al; 2016), (Damodaran, 2014), (Copeland et al; 2013) Note: dividends ratios
	De onde conhece estes rácios? [dividend payout ratio]	0=não conheço ; 1=Licenciatura ; 2=Trabalho ; 3=Auto-aprendizagem ; 4=Mestrado	
options	De onde conhece estes rácios? [dividend yield]	usage scale	Font: (Brealey et al; 2016), (Chang, K. P. 2015), (Damodaran, 2014), (Copeland et al; 2013)
	com que frequência usa o dividend payout ratio		
	Conhece o modelo?	2 = sim ; 3 = não	
	Utiliza o modelo com esta perspectiva?	5 = sim ; 0 = não ; 3 = em parte	
	Para que situação(ões) usa este método para valorizar uma opção?	1 = Expandir um negócio ; 2 = desinvestir num negócio ; 3 = adiar um investimento vs fazer o investimento no presente	

Font: author elaboration

4.2 - Analysis model

The analysis model (table 3) is constructed with the combination of theoretical concepts and hypotheses analysed in a systematic process that make up a coherent analysis that is gone be developed (Sampieri *et al.*, 2013). Considering that this is a descriptive study; a theoretical model was developed in which is shown the relation between all the dimensions and variables present in this study (table 2).

4.2.1 - Empirical field

For the accomplishment of the present study a process of exploratory nature was used through a sample for convenience (Vilelas, 2009). In this context, the criteria for verification and demonstration of what is stated in terms of the research, regarding the purposes that support it, implied an exploratory nature with the obtaining of answers by the alumni of the two institutions, from the marketing, management and Finance areas, working in the most diverse functions, with special focus on the financial sector.

4.2.2 - Non-probabilistic sample

The method of investigation is a logical process that focus its study on the scientific method (Sampieri *et al.*, 2013). We can conclude that it is a combination of practices used and approved by the scientific community as valid to test and confirm any theory.

4.2.3 - Data collection method

The method of collecting data is a logical process of the empirical investigation, that requires the use of collecting and treatment of data that are suited to such investigation, as well as controlling its use for a predetermined end (Vilelas, 2009). Therefore, these techniques are used according to the information needed for this investigation and are essentially a series of well-defined procedures of data collection and treatment of information.

Our data collection was done using two techniques of investigation; a survey done with a questionnaire, applied to the entire universe being studied, that was composed by closed and open questions (Sampieri *et al.*, 2013) and a Documentary analysis. The closed questions were used to facilitate the completion of the questionnaire and the data analysis, the open questions were used to allow the collection of more information (Vilelas, 2009)

The survey through a questionnaire as a way of obtaining information is one of the most frequently used tools to obtain data focused in the essential aspects needed to verify the research question previously formulated (Barañano, 2008). This is the most used method in management and the one with the greatest advantages in reducing costs, greater probability of data processing and reduction of error (Vilelas, 2009).

The questionnaires were sent throw email, with a detailed explanation of the objectives of the thesis with a direct link to the questionnaire. Using the same method, after a certain period, a reminder was sent to all the alumni to improve the percentage of completed questionnaires.

The questionnaire was built using the Google Forms application associated with a Link to make it possible to use it via the Internet. After completing the survey, the data were imported via excel, proceeding to the analysis and consequent elaboration of results through the outputs necessary for the composition of the present work.

4.3 – Research questions

After the literature review and the empirical work done the following research question were formulated to be tested:

Research questions 1 - Is there a difference of efficiency in teaching finance between UP1 and UP2? - RQ1

Research question 2 - Is there a difference of knowledge of financial instruments between the students from managing, finance and marketing? - RQ2

Research question 3 - Are the students working in the financial area ready to work, or are they lacking any knowledge? - RQ3

Cap V - Sample characterization

5.1 - Analysis method

With the help of UP1 and the work of the supervisors it was possible to obtain a diverse and transversal group of data in order to proceed with the analysis and verify the proposed research question, that required a substantial number of alumni from UP1 and UP2, as well as from other universities, from both Financial and managing courses and from alumni working in the financial sector. The information obtained through the questionnaire was then analyzed using informatics software, more specifically EXCEL.

At first, an analysis was made to all the variables that statistically could objectively characterize the data, more specifically according with the academics and actual job of each alumni. This process was done with the objective of analyzing the sample at hands according to the nature of the courses taken by the alumni and the professional experience, considering the main area of said experience.

After this phase, it was intended to know the sample as to its identification, as to factors that may cause relation or knowledge to the reality under study (Freitas, 2013)

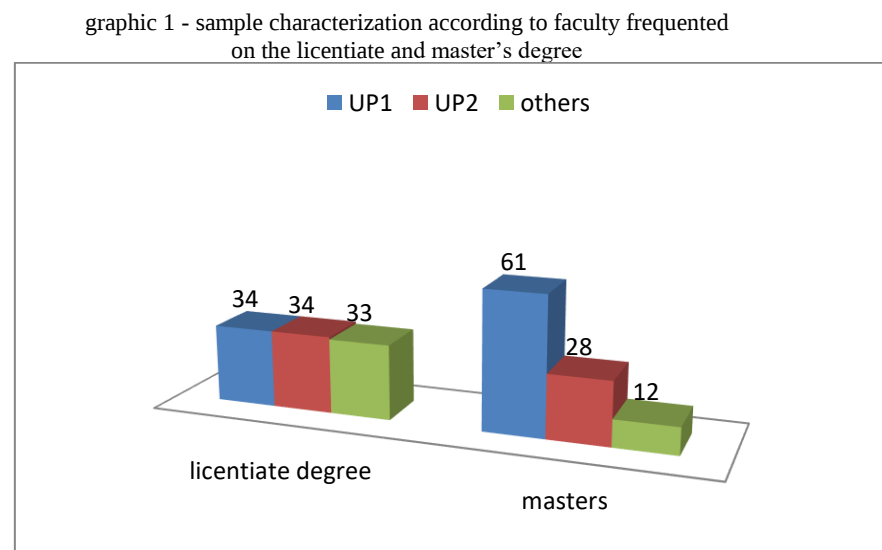
Throughout the analysis, some statistical comparisons about the elements and information collected were highlighted, highlighting only those that showed the greatest interest for the theoretical and practical knowledge of the study, fundamental for the characterization of the problem in question, without any conditionality or creation of corruption in the analysis

Lastly, the data was processed to construct the several median and deviation of each question, separate what was needed to test each of the research question and obtain analytical data that could be used to obtain theoretical and empirically relevant conclusions. The questionnaire was built with this in mind, so that it could obtain every answer to each financial instrument discriminated per what we were testing.

5.2 - General description of the sample

It is important to first describe our sample in the descriptive characteristics present in the questionnaire, the courses taken by the alumni and the university where they took them, for either the licentiate degree and for the master's degree, plus the job area they are working on.

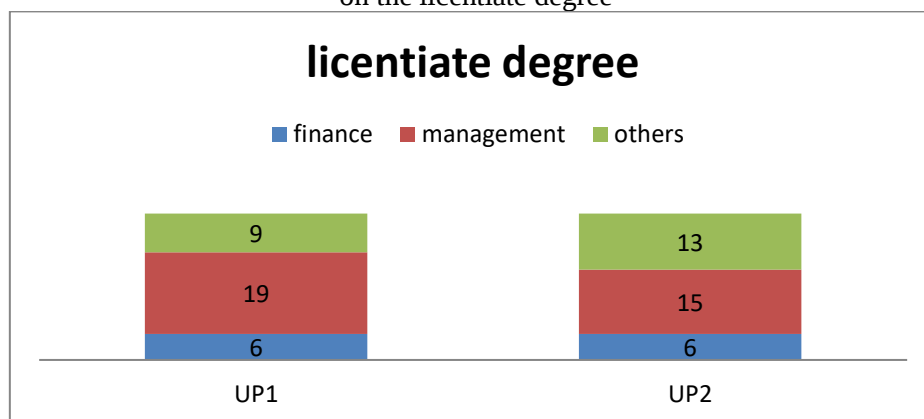
As we can see in graph 1 the distribution of students on the licentiate degree is mostly equal with 34 students from UP1 and 34 from UP2 with the only difference being the 33 students from other faculties. In the masters, we see a different situation where most of the students come from UP1, 60 percent of the total, and only 28 from UP2, which represents only 27,7 %. This difference in the master's students comes with no shock because the master's department from UP1 sent the questionnaire to its alumni and the UP2 department did not collaborate as much.



font - author elaboration

After looking to the distribution of the students between the two institutions, in the licentiate degree and masters, it is important to determine which courses the ex-students took in each institution, and for this graphic 2 gives us a picture of this.

graphic 2 - sample characterization according to faculty and course frequented on the licentiate degree

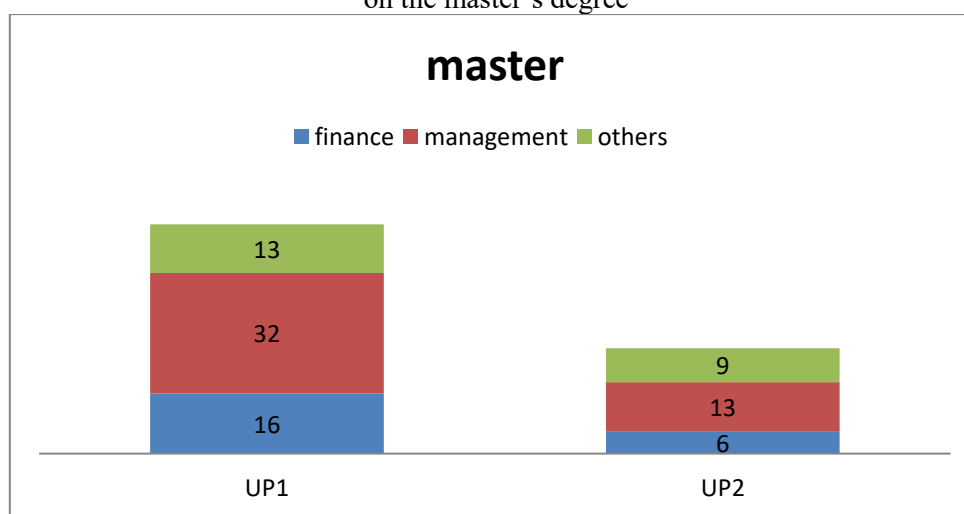


font - author elaboration

From UP1 and UP2 the main course taken is management with respectfully 55,9 % from UP1 and 44,1 % from UP2. More alumni from UP2 come from a finance background in licentiate degree with 38,2 % than from UP1 with 24.5 %.

Graph 3 shows that the course the alumni take the most as the master's degree is as well as in the licentiate degree the management course with 50,8% for the UP1 alumni and 46,4 % for the UP1 alumni. The Masters students from UP1 show a little decrease in the financial area with only 26,2 % of them taking the master's in finance, were the UP2 students percentage that chose finance as their masters also decrease to 21,4 %. The other courses change from the licentiate degree to the masters for UP1 from 17,6% to 21,3% and for UP2 from 17,6% to 21,4%. The number of alumni that reach the work market with a management background is no surprise due to the diversity of options it provides for work areas, and the high percentage of employability that it has.

graphic 3 - sample characterization according to faculty and course frequented on the master's degree



font - author elaboration

It is also important to look at the combination between the licentiate degree and master's universities and courses taken by the alumni, shown in table 4. For the cross between faculty most of the students that take the licentiate degree at either UP1 and UP2 will take the masters at the same faculty with 88,2% for UP1 students and 79,4% for the UP2 students. As for the students that come from other universities 87,9% frequent the masters in UP1. The high percentage of students continuing their learning in the same university between the two degrees is normal due to familiarity factor and easiness for the students to continuo from the licentiate to the masters, with the only difference resting with the students from other universities that is

easily explained by the higher quantity of master's alumni from UP1, already explained previously.

Table 4 – distribution of UP1, UP2 and others students, between masters and licentiate.

		master school		
		UP1	UP2	others
licentiate degree school	UP1	30	1	3
	UP2	2	27	5
	others	29	0	4

font - author elaboration

Finally, table 5 shows that for the courses taken the alumni that frequent the finance course in the licentiate degree 72,2% continuo with the same area on the masters. For the management course, the case is different, although 52,9 % which represents the majority still maintains the same area from one degree to the other, the percentage of alumni that change the courses increases with 31,5 % changing into finance and 15,6% changing into other areas

Table 5 – distribution of finance, management and others students, between masters and licentiate.

		masters course		
		finance	management	others
licentiate degree course	finance	16	3	3
	management	10	27	14
	others	6	9	13

font - author elaboration

5.3 - Presentation of the data for the research question.

Through the online questionnaire, the number of answers obtained were 101 and from them only some of the data was used to answer each research question according with what was needed.

5.3.1 - RQ1 - Is there a difference of efficiency in teaching finance between UP1 and UP2?

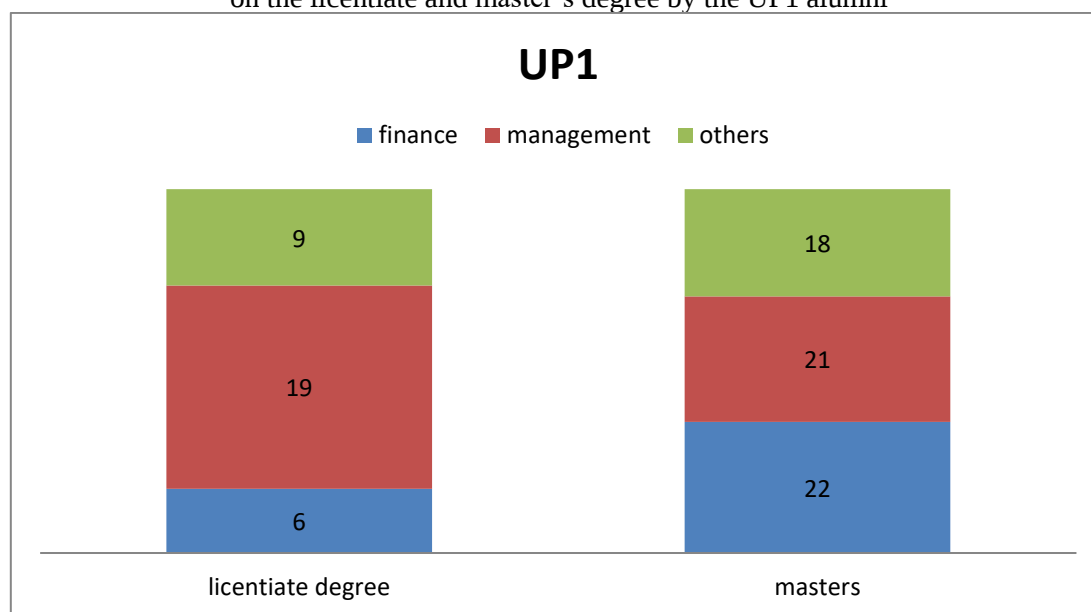
The data considered for this research question is all the answers present in the sample due to all of them being relevant to answer it. All the data is already presented previously and therefore will not be presented here. There is, although, an important aspect to be mentioned, regarding the four alumni that don't come from UP1 and UP2 either from the licentiate degree and the

master's degree and because of it the data coming from this answer will not be considered, in a question to question basis.

5.3.2 - RQ 2 - Is there a difference of knowledge of financial instruments between the students from managing and finance?

For the RQ 2 the data considered only the alumni from UP1 to have the ability to directly compare each course without considering some general aspects that could affect the results regarding the faculty, the facilities, the staff and the main values the vary from one university to the other. Also, for the answers analysed, all the alumni that came from social communication, marketing and other courses were all considered a whole and labelled with other courses.

graphic 4 - sample characterization according to course frequented on the licentiate and master's degree by the UP1 alumni



font - author elaboration

Only 45,5 % were valid answer for this research option, with the licentiate degree courses having again a majority of management, 55,8%, with the finance course gathering 17,6%. In the other hand the masters courses majority is for the finance area with 36% coming from master's in finance and 34,4% from management masters.

Table 6 – distribution of finance, management and others students, between masters and licentiate degree, of ISCTE students.

Licentiate/masters	finance	management	others
Finance	11	3	3
management	7	18	10
others	4	2	7

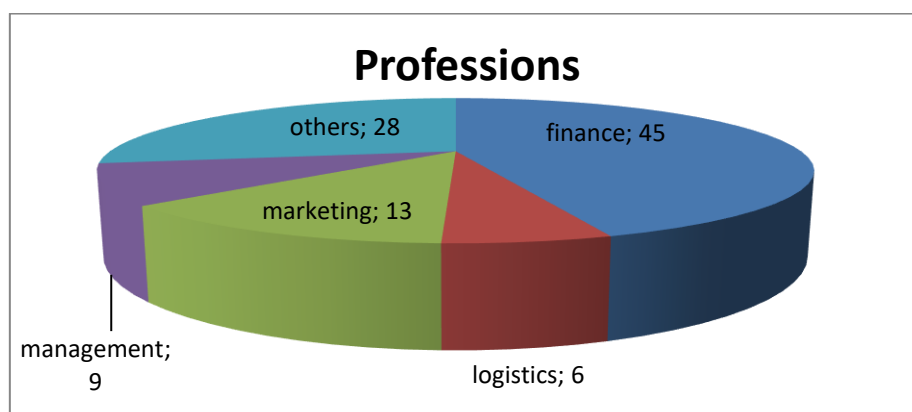
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Looking at the cross data between the courses taken in the licentiate degree and in the masters, we see that there is a preference to maintain the same area from on to the other in this sample, with 64,7% maintaining the finance area and 51,4% maintaining the management area.

5.3.3 - RQ 3 - Are the students working in the financial area ready to work, or are they lacking any knowledge?

For the RQ 3 the decision made was to only consider the alumni working on the financial area because the objective of this question is primarily to understand if the students arrive at the market knowing all that they need. After processing the data it's possible to determine that much of our sample works in the finance area with 44,6% working in that area, with the rest working in management 8,9 %, in logistics 5,9%, in marketing 12,8 % and other areas 27,7%.

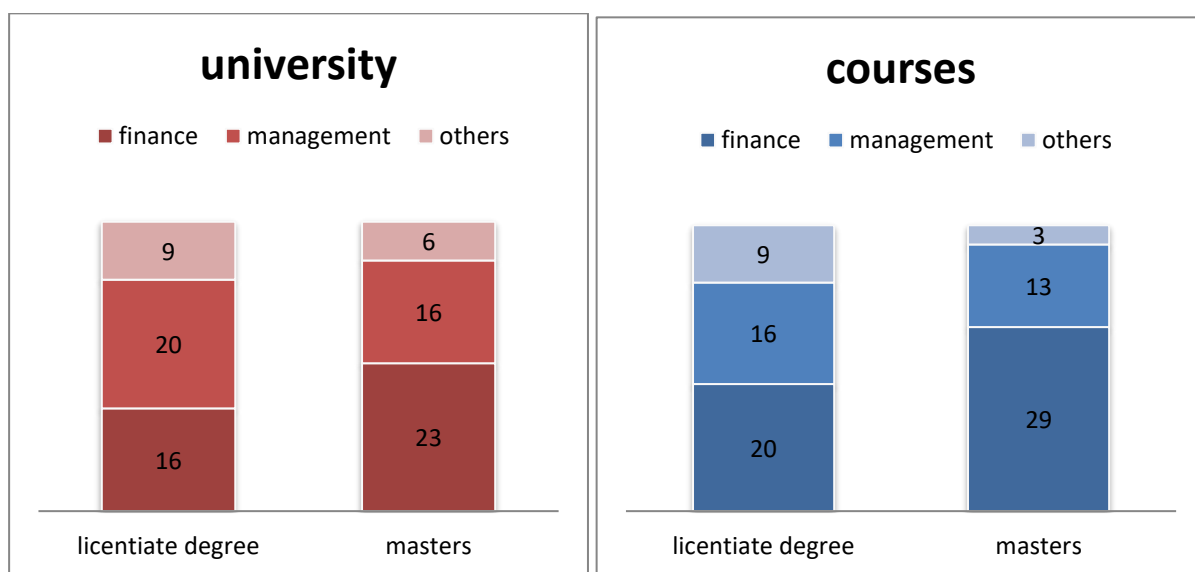
graphic 5 - sample characterization according to work area



Font - author elaboration

From those that work in finance as it is showed in the graphics below, 44,4 % took the licentiate degree in UP2, which represents the majority for the licentiate students, and 51,1% % took the masters in UP1 which is the majority for the master's students. It comes with no surprise that both in the licentiate degree and in the master's degree the course most taken is finance with 44,4 % for the licentiate and 64,4 for the masters.

graphic 6 & 7 - sample characterization according to university frequented on the licentiate and master's degree by the alumni working in finance (graph 6);
sample characterization according to course frequented on the licentiate and master's degree by the alumni working in finance (graph 7)



Font - author elaboration

Cap. VI – Empirical research presentation

6.1 - Data treatment

This study presents the challenge of determining first how efficient is the teaching of finance in these two universities, making a direct comparison between the two universities and between the course of finance and management. Secondly it will try to determine how much of this knowledge is then used at the work, focusing on the alumni that area working on the financial area. Because of this there is a lot of interest in knowing the dimension of the sample regarding these two aspects.

The data will be presented in three tables, one that shows where the instrument was learned with a column for the mode of the sample regarding the university/course of the alumni, a column for the percentage of the mode in the sample and a column for the percentage of alumni that know the instrument. The second table will show the percentage of alumni that don't know the instrument divided by the two faculties/courses. The third table will present the frequency of utilization by the alumni of the instruments professionally.

Some notes regarding the way the information is presented and considered. For the where they learned the instruments, for every answer that had the place where the alumni learned the instrument has the licentiate and master's degree, the answer was changed to the university/course the answering alumni came from. For the no answer the percentage of answers was calculated individually considering the percentage of the alumni that come from UP1 or UP2 that don't know the instrument. The total of students for the university/course origin was calculated by adding the masters university/course and the same university/course at the licentiate degree that did not have the masters in the same university, for example, if a student took the masters and the licentiate degree in UP1 it would only count as one student from UP1.

6.2 - Characterization of the results

6.2.1 - Characterizations of the results for RQ 1

So, that all the data is presented in a clear way and easy to read in this chapter it will be divided into the different financial areas present in the questionnaire and presented according to the

divide on the "no" answers to each instrument, between the UP1 and UP2 alumni, and the mode of the "yes" answers, and the percentage of the mode and "yes" answers.

6.2.1.1 - Risk models

Considering the first questions, about the risk analysis, the risk model that most of the students know is the CAPM, with 76% of the sample knowing it, as it is shown in the next table 7. While the beta most known is the historical beta with 71 % of the sample answering that they know this method. The average place where the alumni learned the risk models is UP1, representing 43% of the data, and precisely 50% of the students know something about risk models. For the betas, the average "where" is the same, representing 40 % of the sample, and 59 % of the alumni know how to calculate a beta. The risk model alumni know the least is a tie between the multivariable and the proxy model with only 28 % of them knowing both, and the lesser known beta is the accounting beta with still a high percentage of 50.

Table 7 – RQ 1 data yes answers and mode for the risk models;

where	mode	% mode	% yes
CAPM	ISCTE	43%	76%
APM model	ISCTE	38%	67%
multifactor model	ISCTE	43%	28%
proxy model	ISCTE	46%	28%
Historical beta	ISCTE	42%	71%
service beta	ISCTE	34%	55%
contabilistic beta	ISCTE	46%	50%
fundamental beta	ISCTE	39%	60%
average risk models	ISCTE	43%	50%
average beta	ISCTE	40%	59%

Font - author elaboration

Looking now at the origin of the students answering the data shows that 33% of the students that come from UP1 don't know about all the risk models, with the highest percentage occurring in the multifactor model with 54%. For the UP2 students 46% don't know about all the risk models and the model least known is a tie between the multifactor and the proxy model with 65%. For the betas, only 18% of the UP1 alumni don't know about all the betas and the beta least known is the accounting beta with 33% of the alumni not recognizing it. Of the UP2 alumni

35% don't know on average about all the betas and the beta least known is the accounting beta with 40% of students not knowing it.

Table 8 - RQ 1 data no answers, distributed between UP1 and UP2 for risk models;

no	ISCTE	ISEG
CAPM	21%	25%
APM model	17%	30%
multifactor model	54%	65%
proxy model	42%	65%
Historical beta	8%	30%
service beta	17%	35%
contabilistic beta	33%	40%
fundamental beta	13%	35%
average risk models	33%	46%
average beta	18%	35%

Font - author elaboration

6.2.1.2 - Financial internal analysis

For the next set of questions about the working capital the data in the next table 9 shows that almost everyone knows these two instruments, with 96% for the working capital and 89% for the working capital needs. The university that is represented the most in the place where they learned the instrument is UP1 with 32% for both instruments, which shows a great balance throughout the data. For the degree of financial leverage 60 % of the alumni know the instrument with again a balanced distribution with 33% of the alumni learning the instrument in the two universities; for the degree of operational leverage we can see that less alumni know the instrument, with only 49% knowing it, and the learning place most common is UP1 that represents 37% of the data. The average for these two ratios shows that 35% of the alumni learned the instrument in UP1, representing the majority, and 54% know the ratios

Table 9 - RQ 1 data yes answers and mode for the financial internal analysis

where	mode	% mode	% yes
working capital	ISCTE	32%	96%
working capital needs	ISCTE	32%	89%
degree of financial leverage	ISCTE/ISEG	33%	60%
degree of operational leverage	ISCTE	37%	49%
average for working capital	ISCTE	32%	93%
average for leverages	ISCTE	35%	54%

Font - author elaboration

Looking at the division of the alumni, in table 10, that don't know about these instruments the data shows that the ones that know more about the instruments for the internal financial analysis are the UP1 with all of them knowing all of the working capital instruments and only 21% not knowing about the two leverages degree ratios; on the other the UP2 students have a higher percentage for the two instruments with 3% not knowing about all of the working capital instruments and 33% not knowing about the leverage degrees ratios.

Table 10 – RQ 1 data no answers, distributed between UP1 and UP2 for financial internal analysis;

no	ISCTE	ISEG
working capital	0%	0%
working capital needs	0%	5%
degree of financial leverage	21%	35%
degree of operational leverage	21%	30%
average for working capital	0%	3%
average for financing degree	21%	33%

Font - author elaboration

6.2.1.3 - Financial Ratios

With a low percentage of no answers of 4% for UP1 and 0% for UP2 there is not much to gain by presenting the data due to lack of relevance

6.2.1.4 - Optimal financial mix methods

Looking at the answers for the optimal financial mix methods the data reveals that the method with the highest percentage of positive answers are the cost of capital method and the differential method with 68% of the alumni knowing what they are, and with most those alumni,

44 % for the two methods, learning it in UP1. The lesser known instrument is the operational profit method with a high value of 53% of alumni that know it, with the most represented, with 24%, being UP1. For the average the data shows that at least 63% of the alumni know most of the instruments and place they learned them from is UP1, representing 39% of the alumni.

Table 11 - RQ 1 data yes answers and mode for the Optimal financial mix methods

where	mode	% mode	% yes
operational porfit method 1° step	ISCTE	26%	53%
operational porfit method 2° step	ISCTE	22%	53%
Cost of capital method 1° step	ISCTE	43%	68%
Cost of capital method 2° step	ISCTE	46%	68%
Cost of capital method 3° step	ISCTE	0%	68%
diferential method 1° step	ISCTE	36%	52%
diferential method 2° step	ISCTE	36%	52%
presente value method 1° step	ISCTE	44%	63%
presente value method 2° step	ISCTE	42%	63%
presente value method 3° step	ISCTE	41%	63%
comparative method	ISCTE	38%	49%
average operational porfit method	ISCTE	24%	53%
average Cost of capital method	ISCTE	30%	68%
average diferential method	ISCTE	30%	68%
average presente value method	ISCTE	42%	63%
average financing methods	ISCTE	32%	63%

Font - author elaboration

For the alumni answering no to this part of the questionnaire the university that has the highest percentage of no answers is UP2 with 35% of the students not knowing all the methods, as the UP1 percentage is of 15%. For the UP1 students the least known method is the present value added method, with 18% of the students not knowing it, while the UP2 alumni known the operational profit method the least with 65% of them not knowing the method.

Table 11 – RQ 1 data no answers, distributed between UP1 and UP2 for Optimal financial mix methods

no	ISCTE	ISEG
operational porfit method 1º step	21%	60%
operational porfit method 2º step	4%	70%
Cost of capital method 1º step	17%	25%
Cost of capital method 2º step	13%	25%
Cost of capital method 3º step	17%	20%
diferential method 1º step	17%	40%
diferential method 2º step	8%	45%
presente value method 1º step	25%	30%
presente value method 2º step	17%	30%
presente value method 3º step	13%	30%
comparative method	0%	45%
operational porfit method	13%	65%
Cost of capital method	15%	23%
diferential method	15%	23%
presente value method	18%	30%
average financing methods	15%	35%

Font - author elaboration

6.2.1.5 - Investment analysis tools and discount rates

At the next question, about the investment analysis tools, the average determines that 80 % of the alumni know most of the instruments with 33% of them learning said instruments in UP1. The numbers for the instruments are similar with 80 % of the students knowing the IRR and the NPV, with a majority of 35% learning the NPV in UP1 and a tie in IRR with 32% of the students learning the instrument in UP1 and UP2.

For the discount rate both the methods are known by all the students, with the same percentage of alumni, 33%, learning the instruments in UP1.

Table 12 – RQ 1 data yes answers and mode for the Investment analysis tools and discount rates

where	mode	% mode	% yes
NPV	ISCTE	35%	80%
IRR	ISCTE/ISEG	32%	80%
financial tables	ISCTE	33%	100%
CoC	ISCTE	33%	100%
average financemete analysis	ISCTE	33%	80%

Font - author elaboration

Presenting now the percentage of the alumni from UP1 and UP2 that did not know about these instruments the data shows that only 4% of the UP1 students and 10% of the UP2 students did not remember anything about the two instruments. This question was not presented for the discount rates due to failure to include it in the questionnaire.

Table 13 - RQ 1 data no answers, distributed between UP1 and UP2 for Investment analysis tools and discount rates;

no	ISCTE	ISEG
NPV	4%	10%
IRR	4%	10%
average financemete analysis	4%	10%

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6.2.1.6 - Dividends theories and ratios

The dividends theory questions show that 41% of the alumni know most of the dividends theories and that 68% know about the dividends ratios. UP1 is again the place where the alumni learned about the dividends theories and the dividends ratios, with respectfully 51% and 34% of the students learning it there. The dividends theory most known is the dividends are good, known by 53% of the alumni and 44% of them learning the theory at UP1. The dividends yield is the dividends ratio that more students know with 67% knowing it and with 37% having learned it in UP1. Looking at the bigger picture the data shows that 55% of the students know about the dividends and the preferred place of learning is UP1 with 43% learning the instrument there

Table 14 - RQ 1 data yes answers and mode for the Dividends theories and ratios;

where	mode	% mode	% yes
Dividends are irrelevante	ISCTE	53%	36%
Dividends are bad	ISCTE	56%	34%
Dividends are good	ISCTE	44%	53%
Dividend yield	ISCTE	31%	69%
Dividend payout ratio	ISCTE	37%	67%
average dividend models	ISCTE	51%	41%
average dividends ratio	ISCTE	34%	68%
average dividends	ISCTE	43%	55%

Font - author elaboration

For the dividend theory, the sample reveals that from UP1 the theory least known is a tie at 33% between the dividends are bad and dividends are irrelevant theories; and the ratio least known is the dividend pay-out ratio with 13%. On average 29% of the UP1 students know nothing about any of the dividend theories and 8% know nothing of the ratios. For the UP2 alumni the least known theory is the dividends are irrelevant theory with 55% of the alumni not knowing it and the ratio least known is the dividend yield. On average 42% of the UP2 alumni don't know anything about dividend theories and 8% don't know dividends ratios.

Table 15 – RQ 1 data no answers, distributed between UP1 and UP2 for Dividends theories and ratio

no	ISCTE	ISEG
Dividends are irrelevante	33%	55%
Dividends are bad	33%	45%
Dividends are good	21%	25%
Dividend yield	4%	10%
Dividend payout ratio	13%	5%
average dividend models	29%	42%
average dividends ratio	8%	8%
average dividends	19%	25%

Font - author elaboration

6.2.1.7 - Options

Lastly the questions about the options the sample determines presents that only 39% of the alumni know about the financial instrument, with 40% of them learning it in UP1 which represents the primary learning place.

For the students that don't known about dividends 29% of them come from UP1 and 45% come from UP2.

Table 16 and 17 – RQ 1 data no answers, distributed between UP1 and UP2 for options; RQ 1 data yes answers and mode for options

where	mode	% mode	% yes
options	ISCTE	40%	39%

no	ISCTE	ISEG
options	29%	45%

Font - author elaboration

6.2.2 - Characterizations of the results for ROH 2

In this research question, the data will be presented in the same way as in the research question before with the divide on the "no" answers to each instrument, now between the management

and financing alumni, and the mode of the "yes" answers, and the percentage of the mode and "yes" answers.

6.2.2.1 - Risk models

Considering the first questions, about the risk analysis, the risk model that most of the students know is the CAPM, with 82% of the sample knowing it, while the beta most known is the historical beta with 75% of the sample answering that they know this method. The average course where the alumni know the risk models is management, representing 52% of the data, and 63% of the students know something about risk models. For the betas, the average "where" is the same, representing 48% of the sample, and 61% of the alumni know how to calculate a beta. The risk model alumni know the least is the multivariable with only 28% of the students knowing it, and the lesser known beta is the accounting beta with still a high percentage of 49.

Table 18 - RQ 2 data yes answers and mode for risk models;

where	mode	% mode	% yes
CAPM	management	55%	82%
APM model	management	49%	72%
multifactor model	management	56%	28%
proxy model	management	49%	72%
Historical beta	management	51%	75%
service beta	management	42%	55%
contabilistic beta	management	47%	49%
fundamental beta	management	54%	63%
average risk models	management	52%	63%
average beta	management	48%	61%

Font - author elaboration

Looking now at the origin of the students answering the data shows that 27% of the students that come from finance don't know about all the risk models, with the highest percentage occurring in the multifactor model with 62%. For the management students 20% don't know about all the risk models and the model least known is again the multifactor model with 43%. For the betas, only 22% of the finance alumni don't know about all the betas and the beta least known is the accounting beta with 35% of the alumni not recognizing it. Of the management alumni 22% don't know on average about all the betas and the beta least known is the accounting beta with 26% of students not knowing it.

Table 19 – RQ 2 data no answers, distributed between finance and management for risk models;

no	finance	management
CAPM	8%	11%
APM model	19%	13%
multifactor model	62%	43%
proxy model	19%	13%
Historical beta	12%	13%
service beta	23%	24%
contabilistic beta	35%	26%
fundamental beta	19%	24%
average risk models	27%	20%
average beta	22%	22%

Font - author elaboration

6.2.2.2 - Financial internal analysis

For the next question about the working capital, the data shows that almost everyone knows these two instruments, with 95% for the working capital and 91% for the working capital needs. The course that is represented the most in which students learned the instrument is management with 48% for the working capital and 49% for the working capital needs. For the degree of financial leverage 63 % of the alumni know the instrument with 54% of the alumni learning the instrument in the management course; for the degree of operational leverage we can see that the same number of alumni know the instrument, with 51% knowing it, and the course most common is management that represents 52% of the data. The average for these two ratios shows that 53% of the alumni learned the instrument in the management course, representing the majority, and 57% know the ratios.

Table 20 - RQ 2 data yes answers and mode for Financial internal analysis

where	mode	% mode	% yes
working capital	management	48%	95%
working capital needs	management	49%	91%
degree of financial leverage	management	54%	63%
degree of operational leverage	management	52%	51%
average for working capital	management	49%	93%
average for financing degree	management	53%	57%

Font - author elaboration

Looking at the division of the alumni that don't know about these instruments the data shows that the ones that know more about the instruments for the internal financial analysis come from

the course of finance with all of them knowing all of the working capital instruments and only 25% not knowing about the two leverages degree ratios; on the other the management students have a higher percentage for the working capital instruments with 3% and about the same percentage with 24% not knowing about the leverage degrees ratios.

Table 21 – RQ 2 data no answers, distributed between finance and management for Financial internal analysis;

no	finance	management
working capital	0%	2%
working capital needs	0%	4%
degree of financial leverage	19%	22%
degree of operational leverage	31%	26%
average for working capital	0%	3%
average for financing degree	25%	24%

Font - author elaboration

6.2.2.3 - Financial Ratios

With a low percentage of no answers of 4% for finance students and 0% for management students there is not much to gain by presenting the data due to lack of relevance

6.2.2.4 - Optimal financial mix methods

Looking at the answers for the optimal financial mix methods the data reveals that the method with the highest percentage of positive answers are the cost of capital method and the average present value method with 63% of the alumni knowing what they are, and with most of those alumni, 46% for the first method and 44% for the second one, learning it in the management course. The least known instrument is the operational profit method with still a high value of 42% of the alumni knowing it, and most of them, 39%, coming from the management course. For the average the data shows that at least 55% of the alumni know most of the instruments and the course they learned them from is management, representing 44% of the alumni.

Table 22 - RQ 2 data yes answers and mode for Optimal financial mix methods;

where	mode	% mode	% yes
operational porfit method 1º step	management	40%	46%
operational porfit method 2º step	finance	38%	37%
Cost of capital method 1º step	management	49%	66%
Cost of capital method 2º step	finance/management	41%	57%
Cost of capital method 3º step	management	50%	65%
diferential method 1º step	management	44%	55%
diferential method 2º step	management	45%	51%
presente value method 1º step	management	48%	65%
presente value method 2º step	management	41%	63%
presente value method 3º step	management	43%	62%
comparative method	management	46%	48%
average operational porfit method	management	39%	42%
average Cost of capital method	management	46%	63%
average diferential method	management	45%	53%
average presente value method	management	44%	63%
average financing methods	management	44%	55%

Font - author elaboration

For the alumni answering no to this part of the questionnaire the course that has the highest percentage of no answers is management with 36% of the students not knowing all the methods, with finance having a percentage of 24%. For the finance students, the least known method is the differential method, with 29% of the students not knowing it, while the management alumni have the same least known method with 43% rate of "no" answers.

Table 23 – RQ 2 data no answers, distributed between finance and management for Optimal financial mix methods;

no	finance	management
operational porfit method 1º step	23%	39%
operational porfit method 2º step	31%	46%
Cost of capital method 1º step	15%	43%
Cost of capital method 2º step	23%	24%
Cost of capital method 3º step	15%	30%
diferential method 1º step	23%	30%
diferential method 2º step	35%	57%
presente value method 1º step	23%	20%
presente value method 2º step	23%	20%
presente value method 3º step	19%	39%
comparative method	31%	28%
operational porfit method	27%	42%
Cost of capital method	18%	33%
diferential method	29%	43%
presente value method	22%	26%
average financing methods	24%	36%

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6.2.2.5 - Investment analysis tools and discount rates

At the next question, about the investment analysis tools, the average determines that 91 % of the alumni know most of the instruments with 50% of them learning said instruments in the management course. The numbers for the instruments are similar with 82% of the students knowing the IRR and the NPV, with a majority of 55% learning the NPV and the IRR in the management course.

For the discount rate both the methods are known by all the students, with the same percentage of alumni, 46%, learning the instruments in the management course.

Table 24 - RQ 2 data yes answers and mode for Investment analysis tools and discount rates

where	mode	% mode	% yes
NPV	management	55%	82%
IRR	management	55%	82%
financial tables	management	46%	100%
CoC	management	46%	100%
average financemete analysis	management	50%	91%

Font - author elaboration

Presenting now the percentage of the alumni from UP1 and UP2 that did not know about these instruments the data shows that only 8% of the finance students and 11% of the management students did not remember anything about the two instruments. This question was not presented for the discount rates due to failure to include it in the questionnaire.

Table 25 - RQ 2 data no answers, distributed between finance and management for Investment analysis tools and discount rates;

no	finance	management
NPV	8%	11%
IRR	8%	11%
average financemete analysis	15%	21%

Font - author elaboration

6.2.2.6 - Dividends theories and ratios

The dividends theory questions show that 38% of the alumni know most of the dividends theories and that 66% know about the dividends ratios. Management is again the course where the alumni learned about the dividends theories and the dividends ratios, with 40% of the students, for the two instruments, learning it in the management course. The dividends theory most known is the dividends are good, known by 54% of the alumni and 46% of them learning the theory at the management course. The dividends yield is the dividends ratio that more students know with 68% knowing it and with 39% having learned it in the course of

management. Looking at the bigger picture the data shows that 52% of the students know about the dividends and the preferred course to learn it is management with 40% learning the instrument there.

Table 26 - RQ 2 data yes answers and mode for Dividends theories and ratios

where	mode	% mode	% yes
Dividends are irrelevante	management	36%	34%
Dividends are bad	finance/management	39%	28%
Dividends are good	management	46%	54%
Dividend yield	management	39%	68%
Dividend payout ratio	management	40%	65%
average dividend models	management	40%	38%
average dividends ratio	management	40%	66%
average dividends	management	40%	52%

Font - author elaboration

For the dividend theory, the sample reveals that from UP1 the theory least known is a tie at 33% between the dividends are bad and dividends are irrelevant theories; and the ratio least known is the dividend pay-out ratio with 13%. On average 29% of the UP1 students know nothing about any of the dividend theories and 8% know nothing of the ratios. For the UP2 alumni the least known theory is the dividends are irrelevant theory with 55% of the alumni not knowing it and the ratio least known is the dividend yield. On average 42% of the UP2 alumni don't know anything about dividend theories and 8% don't know dividends ratios.

Table 27 – RQ 2 data no answers, distributed between finance and management for Dividends theories and ratios;

no	finance	management
Dividends are irrelevante	42%	43%
Dividends are bad	50%	41%
Dividends are good	31%	26%
Dividend yield	12%	22%
Dividend payout ratio	19%	22%
average dividend models	41%	37%
average dividends ratio	15%	22%
average dividends	28%	29%

Font - author elaboration

6.2.2.7 - Options

Lastly the questions about the options the sample determines presents that only 26% of the alumni know about the financial instrument, with 53% of them learning it in management which represents the primary learning place.

For the students that don't know about dividends 38% of them come from finance and 46% come from management.

Table 28 and 29 – RQ 2 data no answers, distributed between finance and management for options; RQ 2 data yes answers and mode for options

where	mode	% mode	% yes
options	management	53%	26%

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no	finance	management
options	38%	46%

Font - author elaboration

6.2.3 - Characterizations of the results for ROH 3

To test this research question the data used were all the answers from the alumni working in Finance and the frequency of usage of each instrument. Taking it into consideration the following points must be presented, some of the instruments have some additional questions made specifically for this research question because they focus primarily on how the instruments are used. The answers to these new types of questions are presented at each instrument. Due to the number of alumni answering that they never used the instrument and acknowledging that these answers are supposed to represent the average use, the data is analyzed in two ways, the first one is a normal average and standard deviation and the second one is an average without the never used answers.

6.2.3.1 - Risk models

Looking at the risk models answers the model most used is the CAPM risk model with a usage of 2,38 and a standard deviation of 1,2 and the least known one is the APM model with a usage of 2,25 and a standard deviation of 1,1. For the average use without the never used answers the data changes with the most used model becoming the multifactor model with 3,3 and the least used one is the APM model with 2,8 of usage. The average for the first data shows that the alumni use the risk models with an average rating of 2,34 and for the other set of data the average usage increases dramatically to 3,0.

For the beta calculation method, the one most used is the service beta with an average use of 2,37 and a standard deviation of 1,3, and the one least used is the accounting beta with an

average use of 2,27 and a standard deviation of 1. For the data without the never used answers the most used and least used are still the same with higher usage of 3,2 and 2,8 for the service beta and the accounting beta respectfully. The average usage of betas is 2,47 for the data with the never used answers and 2,9 without those answers.

Table 30 – RQ 3 data and altered data, average usage and standard deviation for risk models instruments

frequency	average	standard deviation	average without the never used
CAPM	2,38	1,21	2,96
APM model	2,25	1,14	2,82
multifactor model	2,38	1,39	3,25
proxy model	2,33	1,11	3,00
Historical beta	2,49	1,17	2,86
service beta	2,57	1,32	3,20
contabilistic beta	2,27	1,03	2,75
fundamental beta	2,54	1,14	2,95
average risk models	2,34	1,21	3,01
average beta	2,47	1,16	2,94

Font - author elaboration

6.2.3.2 - Financial internal analysis

For the financial internal analysis, looking at table 31, the instrument most used is the working capital with a usage of 2,96 and a standard deviation of 1,4 and the least used one is the working capital needs with a usage of 2,76 and a standard deviation of 1,4. For the average use without the never used answers the data does not change for the most used instrument with 3,3 of usage for the working capital, but the least used changes to the degree of financial leverage with 3,08 of usage. The average for the first data shows that the alumni use the working capital instruments and the leverage degree instruments with the same frequency, 2,86, but for the other set of data the average usage increases a lot for the working capital instruments, having a usage of 3,31, and the leverage degree instruments having a usage of 2,94.

Table 31 – RQ 3 data and altered data, average usage and standard deviation for Financial internal analysis instruments

frequency	average	standard deviation	average without the never used
working capital	2,96	1,41	3,38
working capital needs	2,76	1,45	3,23
degree of financial leverage	2,80	1,13	3,08
degree of operational leverage	2,91	1,08	3,10
average for working capital	2,86	1,43	3,31
average for financing degree	2,86	1,10	3,09

Font - author elaboration

6.2.3.3 - Financial Ratios

The financial ratios are ,as explained before, one of the most known tools of finance so there was no need to ask where the alumni had learned the instruments due to how difficult it would be for the alumni to remember where they had. They are divided through multiple disciplines so there was no easy and quick way of describing each instrument and therefore the presentation of this questionnaire is different from the rest lacking an introductory explanation to each ratio. For these reasons the questionnaire only focused if the alumni knew the instrument or not and how frequently they use it at work, and this information is on the following table

Table 32 – RQ 3 data and altered data, average usage and standard deviation for Financial Ratios instruments

frequency	count	median	standard deviation
general liquidity	44	2,38	1,13
immediately liquidity	43	2,29	1,14
debt degree	42	2,51	1,36
debt to equity ratio	43	2,40	1,36
debt coverage	45	2,40	1,18
operational results variability	44	2,11	1,25
sales rentability	41	2,24	1,33
equity rentability	42	2,38	1,19
activity rentability	45	2,27	1,29
equity invested rentability	44	2,16	1,22
equity invested rotation	42	2,07	1,37
average goods rotation	43	1,96	1,09
average receiving deadline	43	2,27	1,34
average payment deadline	43	2,44	1,25
PER	43	2,09	1,20
P0	42	2,02	1,20
PCE	44	2,09	1,22
Market to book ratio	43	2,22	1,36
average liquidity ratios	43,50	2,33	1,14
average leverage degree ratios	43,50	2,36	1,28
average rentability ratios	43,00	2,26	1,26
average functional ratios	42,75	2,18	1,26
average market ratios	43,00	2,11	1,25
average ratios	43,15	2,25	1,24

Font - author elaboration

The rates of usage show that the set of ratios most used are the leverage degree ratios with 2,36 of average usage and 1,28 standard deviation, and the least used are the market ratios with 2,11 of average usage and 1,25 of standard deviation. Looking at all the ratios individually the most used one is the 1º leverage ratio which is the "debt degree" ratio, with a usage on average of 2,51, and 1,36 of standard deviation, and the least used one is the 2º function ratio, the "average goods rotation" ratio, with a usage of 1,96 and a standard deviation of 1,09.

The results change a bit when focusing at the ratio most used overall is the 2° leverage ratio with 3,10 of average usage. The average usage for the maximum and the minimum for the average ratios is still the same.

Between the different classifications the most used ratio amongst the liquidity ratios it's the 1° with 2,38 of usage and standard deviation of 1,13; amongst the leverage degree ratios it's the 1° with 2,51 of usage and standard deviation of 1,36; amongst the rentability ratios it's the 2° with 2,38 of usage and standard deviation of 1,19; amongst the functional ratios it's the 4° with 2,44 of usage and standard deviation of 1,25 and amongst the market ratios it's the 4° with 2,22 of usage and standard deviation of 1,36.

For the results for the never used answers, they change a lot for the most used and the least used at each ratio classification. For the leverage ratios, the most used is now the 2° ratio with 3,10; for the rentability ratio the order changes with the 4° rentability ratio now being the most used with 2,89; for the rest of the ratios the most used is still the same.

6.2.3.4 - Optimal financial mix methods

For the Optimal financial mix methods, the instrument most used is the present value method 3° step, with a usage of 2,72 and a standard deviation of 1,33 and the least used one is the operational profit method 1° step, with a usage of 1,83 and a standard deviation of 1,01. For each method the step least used are for the operational profit method, the one mentioned above; for the cost of capital method it's the 1° step, with an average usage of 2,41 and a standard deviation of 1,16; for the differential method it's the 2° step, with an average usage of 2,41 and a standard deviation of 1,10; for the present value method it's the 2° step with an average usage of 2,34 and a standard deviation of 1,08 and for the comparative method the usage average is of 1,89 with a standard deviation of 1,19.

Looking now at the methods the most used method is a tie between the Cost of capital method and the differential method with both having an average usage of 2,49 and a standard deviation of 1,26. The least used method is the operational profit method with an average usage of 2,02 and a standard deviation of 1,21.

For the data without the never used answers we see that the only big change happens in the operational profit method where the two steps now have the same amount of usage with 3,23

of average. The method averages for this data also change comparatively with now the most used model becoming the operational profit method with 3,23 of average usage.

Table 33 – RQ 3 data and altered data, average usage and standard deviation for Optimal financial mix methods instruments

frequency	average	standard deviation	average without the never used
operational porfit method 1º step	1,83	1,01	3,23
operational porfit method 2º step	2,21	1,41	3,23
Cost of capital method 1º step	2,41	1,16	2,88
Cost of capital method 2º step	2,59	1,36	3,22
Cost of capital method 3º step	2,47	1,24	3,08
diferential method 1º step	2,55	1,26	3,00
diferential method 2º step	2,41	1,10	2,94
presente value method 1º step	2,38	1,12	2,82
presente value method 2º step	2,34	1,08	2,77
presente value method 3º step	2,72	1,33	3,17
comparative method	1,89	1,19	3,11
operational porfit method	2,02	1,21	3,23
Cost of capital method	2,49	1,26	3,06
diferential method	2,49	1,26	3,06
presente value method	2,48	1,18	2,92
average financing methods	2,37	1,22	3,07

Font - author elaboration

6.2.3.5 - Investment analysis tools and discount rates

For the investment analysis tools lets look to the table 34. The instrument most used is the NPV with an usage of 2,92 and a standard deviation of 1,42 and the least used one is the IRR with an usage of 2,53 and a standard deviation of 1,13. For the discount rates the method most used is the COC with an usage of 2,38 and a standard deviation of 1,28 and the least used one is the financial tables with an usage of 2,16 and a standard deviation of 1,22. The average use for the investment analysis tools is 2,72 with a standard deviation of 1,28 and for the discount rates the average usage is 2,27 with a standard deviation of 1,25. Looking at the data without the never used answers, the highlight goes only to the increase in general of all the average usage, because the most used and the least used for all the comparisons stays the same.

Table 34 – RQ 3 data and altered data, average usage and standard deviation for Investment analysis tools and discount rates instruments

frequency	average	standard deviation	average without the never used
NPV	2,92	1,42	3,23
IRR	2,53	1,13	2,83
financial tables	2,16	1,22	2,86
CoC	2,38	1,28	3,00
error	2,07	1,16	2,85
average financemete analysis	2,72	1,28	2,95
average discount rate	2,27	1,25	3,10

Font - author elaboration

6.2.3.6 - Dividends theories and ratios

For the dividend theories, looking at table 35, the theory most used is the Dividends are bad with a usage of 2,38 and a standard deviation of 1,26 and the least used one is the dividends are good with a usage of 2,08 and a standard deviation of 1,02. For the dividend ratio, the questionnaire focused only in one of the ratios which is the dividend payout ratio that has a usage of 2,59 and a standard deviation of 1,24. The average use for the dividend theories is 2,22 with a standard deviation of 1,27. Looking at the data without the never used answers the picture changes a lot, the most used theory is the dividend are irrelevant with an average of 3 and the least used is the dividends are bad, now with a usage of 2,65. The ratio with the new data has an average usage of 2,93.

Table 35 – RQ 3 data and altered data, average usage and standard deviation for Dividends theories and ratios instruments

frequency	average	standard deviation	average without the never used
Dividends are irrelevante	2,21	1,30	3,00
Dividends are bad	2,38	1,26	2,65
Dividends are good	2,08	1,02	2,96
Dividend payout ratio	2,59	1,24	2,93
average dividend models	2,22	1,27	2,9
average dividends	2,31	1,20	4,4

Font - author elaboration

6.2.3.7 - Options

For the options the table 37 shows that the usage is 4,8 and a standard deviation of 1,78. For the data without the never used answers the average increases to 4,4.

Table 36 – RQ 3 data and altered data, average usage and standard deviation for options instruments

frequency	average	standard deviation	average without the never used
options	3,93	1,49	4,4

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CAP VII – Data analysis

7.1 – Analysis of the general data.

This investigation has the objective of determining if the finance teaching is efficient and if it is matched by what companies use in the financial area. To do it the focus was on understanding how efficient the teaching was of a specific group of financial instruments, gathered from the main financial minds in the world, (Brealey et al; 1992), (Copeland et al; 1999), (Damodaran, 2004), (Carvalho das Neves, 2005). The efficiency was measured in a simple way by directly determining whether the university students knew these instruments and if they used them or not at the workplace. The measurement was achieved using a questionnaire that had two main forms of questioning, one that was a direct question about the knowledge of the instrument being asked, and the other a scale from 1-5 of how much they used the instrument.

It's important to re-enforce the point that the scale created for this questionnaire had a focus more on an academics point of view than on the workplace, therefore there may exist some divergence from the truth about the usage of each instrument and what the results show us, due to a misconception of what was important to ask on the questionnaire, resulting on the first and the second parameters, used at the scale, asking a similar thing of the non-usage of the instrument; the first one gives the answer of “never used the instrument” and the second on gives the answer “used the instrument but not professionally”. This problem will be further explored at the third research question.

To create a basis for which all the data will be compared to, it's fundamental to first explain some of the expectation for the results of this study. These expectations were first that the alumni with a finance background would score better at the questionnaire, at least in knowing the instruments, then the alumni with a management course. The second expectation was that the alumni currently working at finance would score better at the frequency of usage for the instruments, independently of their background. The last expectation was that the two universities would score well in the more basic instruments but average at the more complex instruments, due to how hard it is for some students to understand the basic concept of the more complex instruments and therefore how much harder it is to teach these instruments. This base expectation is related to each research question and therefore its relation to reality will be further explored at the research question result discussion.

The instruments that are expected to have a worst score are the multifactor and proxy risk model, the present value method and the comparative method for the financial mix and the dividends models.

One of the key measures of this questionnaire is the percentage of alumni that did not know the instrument being asked in this table, it's clear that the percentages of instruments not known by the students is diverse and not representative of the average. This table will be recalled in the research question result presentation to explain the results obtained for some of the financial instruments and looking at it now the data shows that there are some instruments that are relatively unknown, which are the risk models, the dividend models and the option instruments that have a 50% or higher rating.

This percentage on its own has little capacity of originating a conclusion so to help give it meaning, a maximum for the percentage of “no answers” that is acceptable must first be determined. The table below shows the process taken to determine this maximum, using the data from all the answers to the questionnaire, and knowing that its true value comes by comparing one percentage to the previous. To determine this value the initial point is the 50%, considering as not acceptable that less than half of the students knows the instrument, and the variation is measured every 5%

Table 37 – No answers percentage for all instruments types, by the margin acceptable in each column

instrument	> 50%	> 45%	> 40%	> 35%	> 30%	> 25%	> 20%
average risk models	+	-	-	-	-	-	-
average beta	+	+	+	-	-	-	-
average for working capital	+	+	+	+	+	+	+
average for financing degree	+	+	-	-	-	-	-
average financing methods	+	+	-	-	-	-	-
average financemete analysis	+	+	+	+	+	+	-
average dividend models	-	-	-	-	-	-	-
average dividends ratio	+	+	+	+	-	-	-
options	-	-	-	-	-	-	-
total	+	+	-	-	-	-	-

Font - author elaboration

Looking at the board we can see that the difference starts to become more obvious only at the 40% and looks the least useful at 20% when all but one class of instruments become negative. Considering that this data is for the general student taking the questionnaire and knowing that more than (65 %) are not from financial and management backgrounds the percentage chosen will be the immediately before the instruments become all negative, the 25%, which will be applied to the analysis of the research question 1 and 2.

The frequency of usage is only considered for the research question 3 and therefore the presentation of the data used for this research question was only focused on the answers from this group of students that worked in finance, as it was presented in the previous chapter, the next table shows the average usage for each group of instruments.

Table 38 – Average usage for each instrument type for the full data

instrument	full data
average risk models	2,34
average beta	2,47
average for working capital	2,86
average for financing degree	2,86
average financing methods	2,25
average financemente analysis	2,37
average dividends	2,27
options	3,93
total	2,67

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The table shows the first signs that the scale may be of with only one of the instruments groups having a usage higher than 3, the option instruments, and with most of them having a usage of less than 2,5 which means that the alumni don't use these instruments at all in the workplace, which may be wrong, considering that these instruments are common amongst the workplace, according to the research and the authors studied to this thesis. This point will be further explored in the research question 3 chapter.

7.2 – Discussion of the research question results

In this chapter the objective of the discussion will be to present possible reasons that can explain the differences between what was expected and what the data shows, and also present some possible actions to take so that some of these numbers may improve. The conclusion is reserved to the professors of UP1 and UP2 that have the power to change the finance teaching, rather than that a course of action will be presented, for each case, with suggestions on how to determine the true reasons behind the questionnaire results.

Before entering this discussion, it is important to focus on the mode of where the students learned the instrument, to see how relevant the answers are given by students that learned the instrument by themselves or in the workplace. The first table below average of these students and the second table reveals the average mode of all the instruments.

Table 39 e 40 – Average number and percentage for the self-learning and workplace teaching origins; mode and mode percentage for the RQ 1 data and RQ 2 data

Learning origin/university	#	%
Self-learning	4	4%
Workplace	5	2%
total	9	6%
mode %mode		
university	UP1	37%
course	manageme	47%

Font - author elaboration

The conclusion to take from here are clear, the workplace and the self-learning environments are not relevant enough to be considered as a focus of this study but will however be considered when justifying some of the little deviations from the expectations. The other conclusion is that this study has a good distribution between the for the variable faculty efficiency study, due to the mode not overpowering the rest of the samples and being close to the second result, but with the second research question this is no longer the case with the mode accounting for 48%, which must be considered when analyzing the final data.

7.2.1 – Results analysis for research question 1 – Is there a difference of efficiency in teaching finance between UP1 and UP2?

In this research question, the objective was to understand how efficient is the teaching of finance in UP1 and UP2. The data comes to confirm the expectation of this study where the least known instruments are in fact the instruments described previously, but the difference from these instruments to the rest isn't that big and the following table shows just that, by using the average of the lesser known instruments and comparing it with the rest of the instruments:

Table 41 – Yes answers difference between most known instruments and the least known instruments

instrument	% Yes	>30%	>25%	>20%	>15%	> 10%
CAPM	76%	+	+	+	+	+
APM model	67%	-	-	-	+	+
average risk models	50%	-	-	-	-	+
Historical beta	71%	-	+	+	+	+
fundamental beta	60%	-	-	-	"+/-"	+
average beta	59%	-	-	-	"+/-"	+
working capital	96%	+	+	+	+	+
working capital needs	89%	+	+	+	+	+
average for financing degree	93%	+	+	+	+	+
Cost of capital method	68%	-	-	+	+	+
presente value method	63%	-	-	-	+	+
average financing methods	63%	-	-	-	+	+
NPV	80%	+	+	+	+	+
IRR	80%	+	+	+	+	+
average financemete analysis	80%	+	+	+	+	+
Dividend yield	69%	-	-	+	+	+
Dividend payout ratio	67%	-	-	+	+	+
average dividends ratio	68%	-	-	+	+	+
Average of lesser known instruments		46%				

Font - author elaboration

As the data shows the difference is big for some cases and smaller for others, with almost half of the instruments having a difference only higher than 15%, except for the average of model risks that has a difference of 4%. So, the difference of 15% on most of the instruments towards the least known instruments reflects that these instruments are fairly understood by the students and are apprehended effectively, considering, as said before, the higher degree of complexity they have.

Comparing now the two University's the table 44 shows that the alumni from UP1 have a better understanding of finance than the alumni of UP2.

Table 42 – RQ 1 data no answers comparison between UP1 and UP2, for each instruments type, with the maximum of 50% and 25%

Instrument	UP1		UP2	
	>50%	>25%	>50%	>25%
average risk models	+	-	+	-
average beta	+	+	+	-
average for working capital	+	+	+	+
average for financing degree	+	+	+	-
average financing methods	+	+	+	-
average financing analysis	+	+	+	+
average dividend models	+	-	+	-
average dividends ratio	+	+	+	+
options	+	+	+	-
total	+	+	+	-

Font - author elaboration

This may come from the fact, as shown before, that there is a higher percentage of students that took the masters in UP1 which could implicate a higher degree of knowledge coming from this group of students not related to the efficiency of the teaching at UP1 or the learning capacities of UP1 students. This fact becomes evident with the following table:

Table 43 – distribution of average yes answers between UP1, UP2 and licentiate, master's degree, for all data

% sim	licentiate	masters
UP1	29%	32%
UP2	22%	17%

Font - author elaboration

This shows the course where the students learned the instruments and as the data shows the highest percentage of yes answers comes from the master's degree for the UP1 students, while the higher percentage for the UP2 students comes from the licentiate degree, revealing that in fact the efficiency of UP1 can be explained. There is another factor that needs to be considered which is the separation of the students with a background in finance, between the two universities. This data is shown in the following table:

Table 44 – distribution of average yes answers between UP1, UP2 and licentiate, master's degree, for the finance students

finance students	licentiate degree	masters
UP1	22%	30%
UP2	19%	30%

Font - author elaboration

The data can be determined as inconclusive because, although there is a difference that favors UP1 at the licentiate degree level, this difference is minimal and therefore irrelevant when paired to the fact that at a licentiate degree level both universities had similar numbers. The combination of the two tables leads to the conclusion that the fact that UP1 has more affirmative answers from the master's level, but the same percentage of finance students from the master's level as UP2, that at the master's level UP1 is more efficient than UP2.

Concentrating on the efficiency of learning at the instruments level, the table below shows that the UP2 students have a bad comprehension of all the finance instruments, with only having three instruments with a percentage of students not knowing the instrument lower than 25%, whilst the UP1 students have a higher number of 7 instruments in the same situation. Both universities are still not perfect do, with neither of the two groups of students scoring well enough at the risk models instruments and at the dividends models, which is normal because these two instruments are only relevant in an evolved and diversified stock market, which is not the case in Portugal.

Table 45 – Full data no answers, for each instrument type, distributed between UP1 and UP2

Instrument	UP1	UP2
average risk models	33%	46%
average beta	18%	35%
average for working capital	0%	3%
average for financing degree	21%	33%
average financing methods	15%	35%
average financing analysis	4%	10%
average dividend models	29%	42%
average dividends ratio	8%	8%
options	29%	45%
total	18%	28%

Font - author elaboration

7.2.1 – Results analysis for research question 2 – Is there a difference of knowledge of financial instruments between the students from managing, finance and marketing?

In this research question, the objective was to understand if there is a difference in efficiency between the management and financial courses. As stated before, the sample chosen for this analysis were only the students from UP1 so that the results were not influenced by the university, only by the course taken. The process to analyze the data is the same as the previous research question and it resulted in the following table:

Table 46 – RQ 2 data no answers comparison between finance and management courses, for each instruments type, with the maximum of 50% and 25%

Instrument	Finance		Management	
	>50%	>25%	>50%	>25%
average risk models	+	-	+	+
average beta	+	+	+	+
average for working capital	+	+	+	+
average for financing degree	+	+	+	+
average financing methods	+	+	+	-
average financing analysis	+	+	+	+
average dividend models	+	-	+	-
average dividends ratio	+	+	+	+
options	+	-	+	-
total	+	+	+	-

Font - author elaboration

In this table the average total of the finance students is positive and of the management students is negative, considering the 25 % limit, but looking at the actual numbers the management students are close to the 25% mark with an average percentage of 26, and a difference to the finance students of only 3%. As the table show the results are not what was expected but this difference may come from two factors, the division of the master's area, i.e., the course taken in the masters; or the course from where the alumni learned the instrument, divided between the masters and the licentiate degree. The next two tables refer to these two factors:

Table 47 and 48 – Distribution of average yes answers between finance, management courses and licentiate, master's degree, for the finance students of RQ 2 data (table 47) and for RQ 2 data (table 48)

finance students	licentiate degree	masters	% sim	licentiate degree	masters
finance	14%	18%	finance	21%	18%
Management	38%	30%	management	18%	22%

Font - author elaboration

By looking at the finance students the data shows that either the licentiate degree and the master's degree alumni coming from this course have a higher percentage of knowing the instrument, than the management students, whilst the other table shows that there are more students taking the management course than the finance course, at both degree levels. The second table shows that there are in fact more management students in this study but they are evenly distributed between the two degrees so it is impossible to take any conclusion, but combining this to the mode percentage, presented before, it can explain the small but regarding the first table it shows that the highest percentage of yes answers for the finance students comes at the licentiate degree, while for the management students it comes at the master's degree, which leads to the conclusion that in fact the financial instruments chosen are the basis of finance, and so are thought at any of the courses.

This may have influenced the result because the management students have the instruments fresher in their minds and may have only learned the bases of each instrument, which is what is being asked in the questionnaire, so they may be keener to remember the instruments and the finance students may have already forgotten the bases and only remember the more advanced instruments.

Focusing more at each instrument group separately the expectations are confirmed with the instruments less known having a higher percentage of no answers than the rest of the models as showed in the table 49. The course with the lowest percentage varies amongst the instruments with the management course having a lower percentage in the risk model's instruments, the financing degree instruments and the dividend model's instruments. The table also shows the percentage of the mode for these instruments is higher than 50%, except for the dividend models, which can explain the deviation from the expectations.

Table 49 – Distribution of RQ 2 data no answer, between finance and management courses, and mode, for each instrument type

Instrument	finance	management	% Mode
average risk models	27%	20%	52%
average beta	22%	22%	48%
average for working capital	0%	3%	49%
average for financing degree	25%	24%	53%
average financing methods	24%	36%	44%
average financing analysis	15%	21%	50%
average dividend models	41%	37%	40%
average dividends ratio	15%	22%	40%
options	38%	46%	53%
total	23%	26%	47%

Font - author elaboration

7.2.1 – Results analysis for research question 3 – Are the students working in the financial area ready to work, or are they lacking any knowledge?

In this research question, the objective was to study the usage of each instrument, more specifically if the alumni working in finance use the instruments more than every other student and how much they use the instrument. After looking at the data, a problem was detected, which was already discussed in the beginning of this chapter, and the correction made to mitigate the problem was to take out all the “never used” answers of the data and analyzing it to see if it changed a lot. This is present in the table below:

Table 50 – Standard deviation for the usage of each instrument type, for RQ 3 data and for RQ 3 corrected data, and the difference between the two

instrument	stdev full data	st dev corrected data	difereça in st.deviation
average risk models	1,21	1,40	0,19
average beta	1,16	1,38	0,21
average for working capital	1,43	1,47	0,03
average for financing degree	1,10	0,97	-0,14
average financing methods	1,24	1,53	0,29
average financing analysis	1,22	1,50	0,27
average discount rate	1,42	1,74	0,32
average dividends	1,20	1,46	0,26
options	1,49	1,68	0,19
total	1,28	1,46	0,18

Font - author elaboration

As the table shows the data changes a lot to more realistic numbers of usage but at the same time the standard deviation of the increases a lot, which brings more uncertainty to the conclusions taken from this data. This uncertainty is relevant and because of it the conclusion taken for this research question were made with the whole data. Focusing now on the comparison between the usage rate for the alumni working in finance and the rest of the alumni the table below shows exactly what was expected with the first group of students having a higher rating in all the instruments than the second group. On the other hand, the difference is not big and therefore finance as a course should still be a big part of any business-related course.

Table 51 – Comparison of the average usage, of each instrument type, between the RQ 3 data and the rest of the data

instrument	Finance	others	comparisson
average risk models	2,34	1,85	>
average beta	2,47	1,89	>
average for working capital	2,86	1,98	>
average for financing degree	2,86	2,27	>
average financing methods	2,25	1,91	>
average financing analysis	2,37	1,96	>
average discount rate	2,72	1,88	>
average dividends	2,27	1,84	>
options	3,93	3,00	>
total	2,67	2,06	>

Font - author elaboration

Lastly the rating itself and what it can mean, all the ratings have been presented in the previous chapter but to make it easier to analyze it is shown in the table below the average ratings of each group of instruments:

Table 52 – Relation RQ 3 data instruments average usage and yes answers

instrument	full data	Yes %
average risk models	2,34	54%
average beta	2,47	63%
average for working capital	2,86	94%
average for financing degree	2,86	59%
average financing methods	2,25	65%
average financing analysis	2,37	90%
average dividends	2,27	58%
options	3,93	33%
total	2,67	64%

Font - author elaboration

This table shows that most of the instruments don't have a rating higher than 3 which leads to the conclusion that none of the instruments is used regularly. The instruments that have a rounded-up rating of three are the working capital, the financing degree instruments and the beta instruments, with the first one having a high percentage of yes answers, indicating that its teaching is on par to what the finance job requires. The other two reveal a smaller rating for yes which indicates that they should have a teaching reinforcement. There is one instrument that based on this study should also be adjusted, the financing analysis instruments, because it has a high yes percentage but has a low usage rating of 2,4 indicating that it has a usage slightly above "used, but not professionally".

The rest of the instruments also have a usage rating slightly above the "used, but not professionally" but also have a small percentage of yes answers so there is no immediate conclusion to take from the results regarding the teaching of the instruments. It comes to reinforce the idea that the instruments chosen for this study are really the bases for finance and are not often used, at least with this form, at the working level, but they could be used with different formats. The options instrument is the exception because its usage rating is close to 4 which means that it is used regularly, but it is also the least known instrument amongst this group of students. It is also a lesser known instrument so the conclusion is that if you know this instrument it's because you use it often, but most of the students don't know it and have no use for it at the work level.

Cap VIII – Conclusions

8.1 – Conclusion of the Results analyses

The study aims to reinforce and above all enhance the role of universities on the students that go through them, with a specific aim at the financial area of teaching and learning. By the beginning of the decade of 1950, the financial aspect of any business was ensured to the accountants that would only process the gains and losses and keep a record of them but, as the world markets started to grow, the financial sector also started to develop. Finance has changed a lot since then and it keeps on developing, and so should our teaching of finance.

The reality of the markets today shows that the most basic financial instruments are used daily at any position and because of it in the actual market it's obvious that universities should invest more into preparing and introducing these instruments to their courses, so that their students are equipped to deal with what they may find in their jobs.

The courses of management have always focused more on topics related more with humanitarian questions, plan development, market study, marketing and less focused on finance as a discipline, but as the study as shown this focus has changed, with the management students scoring almost identically to the finance students, still worse but with a higher rating than what was expected. This is a common trend that must be continued to make the alumni from these two universities more prepared to the work necessities.

As discussed before this data does not mean that the finance course is underperforming. To test this a more specific and exhaustive questionnaire would have to be used, with more instruments and a bigger variety of financial areas. It can be used, although, to determine which areas are more important to develop in a future questionnaire.

There is also a trend in the workplace to focus more on training their new and younger employs, with this becoming apparent in the wider possibilities of trainee programs offered by the companies. This is visible in this questionnaire, as referred before, with 2% of alumni learning something in the workplace, but it is seen with the agreement of all that this percentage is probably higher. Another topic of interest is the self-learning percentage, that is higher than what was expected, showing perhaps that there is some space to teach more finance in the university from the point of view of the interest students have on the topic.

Of course, this is an exploratory study with a non-representative sample, but it allows to obtain a clear vision, in a certain context, that the financial area, if well integrated and implemented, can be taught in a bigger array of courses and with more depth in the ones that is already taught.

Yet, and although the limitations the study has, the sample appears to demonstrate that finance is a more prevalent subject in the management course, suggesting that the universities are starting to make a change on their programs, to incorporate what the market values on an alumnus from management.

A conclusion can also be taken from the average of the instrument usage on the work place, that revealed to be lower than what was expected, implicating that the instruments used on this stage are different than what is usually taught at these universities, this difference coming from a higher complexity of the instruments or the use of instruments adapted to a specific market or to a specific company.

8.2 – Final considerations

Considering all the content aspects of this thesis, it seems perfectly perceptible, that the universities are doing a fairly good job of adapting the program courses to include more financial instruments, specifically in the management courses, but the market may be evolving at a faster pace. This comes from the low usage rating of most of the instruments, which in some degree has been attributed to the scale used, but it can be considered to introduce the question of how complex should the instruments taught be.

Most of the instruments are learned in the licentiate degree level, and not at the master's levels. This may come from the simplicity of the instruments being asked but the results are not conclusive on this part (there are some instruments that are learned more in the masters than in the licentiate degree) and become more inconclusive when looking at each course individually, separated by university and by nature, so this is not a problem. The conclusion is that the master's degree has some space to further explore the financial instruments learned in the licentiate degree.

The 2008 real estate market financial crisis and the 2010 EU financial crisis have shown that if management is done without the full knowledge of financial markets, it can go terribly wrong. This new demand on more knowledge of finance comes from these two events and supported

by the results of the questionnaire the conclusion is that although a lot is being done, it's necessary to do more.

8.3 – implications to the universities

This thesis has little intention to determine any concrete aspects to change on the universities studied. It should be considered as only a picture of how efficient the teaching is and is used to formulate some questions about the different possibilities for the universities to evolve the courses programs, that are to be explored in a future study if real or not.

There are some aspects that allied to the believes of the authors studied and the recent history of the world economy, should be considered with greater interest. This first topic that fulfils these restrictions is the low usage of the instruments, also referred above, implicating that the universities should further explore the different variations each instrument have. The proposition of what could be done by the universities is to divide the financial disciplines into more specific disciplines, leading to a bigger focus in deep diving in the more complex instruments.

The second topic is the already identified space that the master's degrees has for more financial instruments. An alumnus that enters this degree does it to further his education and so because most of the instruments are learned in the licentiate degree, there should be a bigger focus on exploring the different variations of these instruments at this educational level. Because this is the last degree most students take before entering the job market, the proposition is to partner up with different companies, more specifically banks or investment funds or big financial groups, to explore what variation of the instruments they use and why. This point is particularly important so that the students really get to learn the instruments the job market needs them to know, which isn't happening by the results of this thesis, that shows learning percentage of 76 % and usage rating of 2,67 on the average instruments, and crucial to make the universities attractive to the students and to the companies hiring these students.

8.4 – Suggestions for future investigations

First, this study was initiated in this master's thesis and should be considered as a beginning to study this topic of teaching efficiency, which has brought a lot of interesting conclusions and results debate about how to evolve the finance program to make it more efficient. These conclusions aloud to open way to future investigation to understand the reasons behind some of the conclusions and to verify other discussions that ended open at the end of the results analysis.

To perfect this study and to advance it, the most important aspect is to change the questionnaire, in two specific parts. The first change is on the scale used, that has a small flaw and should not be considered individually as a result because it's heavily influenced by the students that do not know the instrument. The suggestion is to consider using a likert scale (Likert 2010), from one to seven with one representing “the never used” and the 7 representing “the daily usage”, because it's a proven scale to measure numerical usage or preference around different studies based on a questionnaire.

The second change to the questionnaire is to include more financial instruments, that are more advanced than the ones used. These new instruments are necessary to understand if the more complex instruments are learned by the students in their courses and what usage do they have in the workplace. Due to this the application would only be presented to the students from the course of finance.

There is another suggestion for the next investigation on the topic which is to include for faculties and create a comparison between them to access which one is more efficient. This could be then summed up into a metric or coefficient that would be helpful not only to the students, when selecting their university, but to the companies when hiring newly degreed students. It was an initial idea for this thesis but due to the amount of time, how complex it is to reach students from every faculty in Portugal and lack of full grasp of how truthful the answers would be by the alumni, the idea was dropped, but it's still seen as a helpful and an important tool to create.

8.5 – Experience acquired

One of the particularities in the interest of this study is its origin in academic terms and the personal and professional interest that the theme arouses.

The books studied and the financial instruments that I have learned are one of the strengths I take away from this study, more specifically the acquisition of knowledge around a theme that is constantly changing with the world economy.

On the other hand, although there is already a very comprehensive literature on this subject, I note that this theory focuses very much on the particularity of the study population. The teaching efficient is one of the topics that originates from looking at the universities teaching methods and the financial aspect of it is becoming a larger more important part of every course, forcing the approach of this study to be serious and focused on the essence and objectives to be addressed. For this reason, I have learned that the topics analyzed should be carefully filtered, otherwise the study approach will be confused.

8.6 – Study limitations

Inevitably, this study suffers from a number of limitations because it focuses specific population of two given universities. Although the validity of this study can be ascertained by the set of methodological assumptions, its applicability may be conditioned by a set of similar circumstances to the context of the study.

The instruments used to determine the full knowledge of each instrument can be outdated in some shape or form may not represent the fields on their totality so there is this limitation to determine a number of instruments that represent a specific field of finance.

On the other hand, the methodological choice of a convenience sample is not representative and only allows you to analyze and reflect your results in a given context. Nevertheless, the use of this study to a qualitative analysis using interviews, would allow us to understand the strategic criteria adopted by the finance direction of each university in the processes and what the importance of this direction has on the university. This positioning qualitative methodology would add information and deepen the analyzes to be carried out in the future.

Another of the limitations applies to the conditionality of the theme itself, to study finance as a whole, which could be considered impossible to determine its teaching efficiency. The identification of the alumni finance knowledge it's a derivative of these limitation, and its lack of success could imply some mistaken results. Direct questionnaires or short interviews to the alumni are a way of reducing this risk but are time consuming and impossible to get, so this could always be a limitation of this study.

These are the limitations that must be taken, even though they do not undermine the thesis and the main conclusions of this study in view of the specific objectives implicit to its conclusion.

Appendix

Questionnaire:

eficiência do ensino de finanças no ISCTE e ISEG

este questionário visa apreender os conceitos financeiros que os alunos do ISCTE e ISEG conhecem, de onde os conhecem e se os aplicam no dia-a-dia ou não

***Obrigatório**

1. Onde concluiu a licenciatura? *

Marcar apenas uma oval.

- ☐ ISCTE
- ☐ ISEG
- ☐ outra

2. Onde concluiu a mestrado? *

Marcar apenas uma oval.

- ☐ ISCTE
- ☐ ISEG
- ☐ outra

3. Qual a área científica da sua licenciatura? *

Marcar apenas uma oval.

- ☐ gestão Após a última pergunta desta secção, passe para "Instruções."
- ☐ finanças Após a última pergunta desta secção, passe para "Instruções."
- ☐ marketing Após a última pergunta desta secção, passe para "Instruções."
- ☐ comunicação social Após a última pergunta desta secção, passe para "Instruções."
- ☐ outras Após a última pergunta desta secção, passe para a pergunta 6.

4. Qual a área científica do seu mestrado? *

Marcar apenas uma oval.

- ☐ gestão Após a última pergunta desta secção, passe para "Instruções."
- ☐ finanças Após a última pergunta desta secção, passe para "Instruções."
- ☐ marketing Após a última pergunta desta secção, passe para "Instruções."
- ☐ comunicação social Após a última pergunta desta secção, passe para "Instruções."
- ☐ outras Após a última pergunta desta secção, passe para a pergunta 6.

5. Em que área trabalha? *

Marcar apenas uma oval.

- ☐ finanças Passe para "Instruções."
- ☐ marketing Passe para "Instruções."
- ☐ logística Passe para "Instruções."
- ☐ outra Passe para a pergunta 6.

Passe para "Instruções."

De que área?

escreva só o que está em falta

6. área da licenciatura

7. área do mestrado

8. área de trabalho

Passe para "Instruções."

Instruções

neste questionário em cada pergunta vai ser exposto um instrumento financeiro tendo, caso necessário, uma pequena introdução sobre para que é que o respectivo instrumento é utilizado.

Em cada uma dessas perguntas serão abordadas as mesmas questões que são se conhece o instrumento, onde é que o aprendeu e com que frequência o utiliza

Em alguns dos casos existirão sub-perguntas que vão explorar como alcançar os diferentes dados que formam esse instrumento financeiro

Modelos de Análise de Risco de Mercado

9. Sabe o que são modelos de análise de risco de mercado? *

Marcar apenas uma oval.

☐

Sim

Passe para a pergunta 10.

☐

Não

Passe para "Introdução."

Introdução

Ao fazer um investimento é necessário calcular o risco associado, isto é, a possibilidade de perder o dinheiro que foi investido. Tendo em conta que o investidor tem uma pasta de investimentos diversificada e que apenas o risco associado ao mercado é não diversificável, temos que calcular esse risco de mercado e para tal existem 4 modelos para o fazer: o CAPM, o Modelo APV, o Modelo Multivariável e o Modelo Proxy

CAPM

O modelo CAPM é o mais simples pois considera que todo o risco do mercado está compreendido dentro de um único Beta

fórmula

$$E(R_i) = R_f + \beta * [E(R_m) - R_f]$$

índice

$E(R_i)$ - retorno esperado no investimento em estudo

R_f - retorno esperado num investimento sem risco

β - beta

$E(R_m)$ - retorno esperado num investimento com base no risco do dossier do mercado (ex: S&P 500)

10. Conhece este modelo? *

Marcar apenas uma oval.

☐

Sim

☐

Não

Passe para a pergunta 13.

CAPM

11. Onde é que o aprendeu? *

Marcar apenas uma oval.

☐

licenciatura

☐

Trabalho

☐

auto-aprendizagem

☐

mestrado

12. Com que frequência usa o modelo? *

Marcar apenas uma oval.

1

2

3

4

5

nunca usei

☐
☐
☐
☐
☐

uso diariamente

O modelo APV

este modelo é mais complexo pois separa o risco de mercado em vários factores cada um com o seu respectivo beta

fórmula

$$E(R) = R_f + \beta_1 [E(R_1) - R_f] + (\dots) + \beta_n [E(R_n) - R_f]$$

índice

$E(R)$ - retorno esperado no investimento em estudo

R_f - retorno esperado num investimento sem risco

β_n - beta do factor n

$E(R_n)$ - retorno esperado num investimento com base o risco do factor n

13. conhece este modelo? *

Marcar apenas uma oval.

☐

Sim

☐

Não

Passe para a pergunta 16.

modelo APV

14. Onde é que o aprendeu? **Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ trabalho
- ☐ auto-aprendizagem
- ☐ mestrado

15. com que frequencia usa o modelo? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

O modelo multivariável

O modelo multivariável tenta pegar na teoria do modelo APV e selecciona uma quantidade específica de factores que pensa influenciarem o risco de mercado e, utilizando dados históricos calcula os betas associados a esse factor

fórmula

$$E(R) = R_f + \beta_{GNP} (E(R_{GNP}) - R_f) + \beta_I (E(R_I) - R_f) + \dots$$

Índice

β_{GNP} - beta relativo a mudanças na produção industrial

β_I - beta relativo a mudanças na inflação

$E(R_{GNP})$ - retorno esperado num portefólio com o β_{GNP} igual a um e os restantes a zero

$E(R_I)$ - retorno esperado num portefólio com o β_I igual a um e os restantes a zero

16. conhece este modelo? **Marcar apenas uma oval.*

- ☐ Sim
- ☐ Não *Passe para a pergunta 19.*

modelo multifactor**17. Onde é que o aprendeu? ****Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ trabalho
- ☐ auto-aprendizagem
- ☐ mestrado

18. com que frequência usa este modelo? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

O modelo proxy

Este é um modelo mais específico na medida em que pode não ser aplicável a todas as empresas. Resulta de uma tentativa de tornar os modelos de cálculo do risco de mercado menos dependentes de dados históricos através do uso de valores contabilísticos

exemplo de fórmula

$$R_t = 1.77\% - 0.11 * \ln(MV) + 0.35 * \ln(BV/MV)$$

Índice

R_t - retorno no investimento no ano t

MV - valor de mercado do investimento

BV - valor contabilístico do investimento

19. conhece este modelo? *

Marcar apenas uma oval.

☐

Sim

☐

Não

Passe para a pergunta 22.

modelo proxy

20. Onde é que o aprendeu? *

Marcar apenas uma oval.

☐

licenciatura

☐

trabalho

☐

auto-aprendizagem

☐

mestrado

21. com que frequência usa este modelo *

Marcar apenas uma oval.

1

2

3

4

5

nunca usei

☐☐☐☐☐

uso diariamente

Cálculo dos Betas

Para cada um dos modelos temos que calcular o respectivo Beta, que avalia o quão exposta está a empresa ao risco associado a um respectivo investimento. Para o calcular usamos 3 diferentes métodos:

beta histórico

O beta histórico é o valor do declive da regressão feita entre os retornos num investimento e os retornos num investimento feito no portefólio do mercado (S&P500).

Índice

R_j - retorno no investimento

R_f - retorno num investimento sem risco

β - beta

R_m - retorno esperado num investimento com base no risco do dossier do mercado (ex: S&P 500)

22. fórmula: $R_j = R_f + \beta * (R_m - R_f) \Leftrightarrow R_j = R_f (1-\beta) + \beta * R_m$ *

Marcar apenas uma oval.

- ☐ conheço Passe para a pergunta 23.
- ☐ não conheço Passe para a pergunta 25.

beta histórico

23. Onde é que o aprendeu? *

Marcar apenas uma oval.

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

24. Com que frequência usa este beta *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
frequência	☐	☐	☐	☐	☐

beta "de serviço"

É o nome dado aos betas que são retirados de serviços de análise de mercado como por exemplo bloomberg, merrill lynch, etc..

25. conhece este tipo de betas?

Marcar apenas uma oval.

- ☐ Sim
- ☐ Não

beta "de serviço"

26. Onde é que o aprendeu? *

Marcar apenas uma oval.

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

27. Com que frequência usa este beta *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
frequência	☐	☐	☐	☐	☐

beta contabilístico

O beta contabilístico é como o nome sugere, calculado com os lucros contabilísticos em vez de usar os lucros do mercado.

28. conhece este beta? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 29.*
- ☐ Não *Passe para a pergunta 31.*

beta contabilístico

29. Onde é que o aprendeu? *

Marcar apenas uma oval.

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

30. Com que frequência usa este beta *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
frequência	☐	☐	☐	☐	☐

beta fundamental

O beta fundamental considera os dados considerados fundamentais de uma empresa como o tipo de negócio que efectua, os resultados operacionais e a alavancagem financeira. Seguem se respectivamente as fórmulas base para o beta com os resultados operacionais e a alavancagem financeira:

$$\text{GAO} = (\% \text{change in EBIT}) / (\% \text{ change in sales})$$

EBIT -resultados antes dos juros e impostos

$$\beta_u = \beta_l / [1 + (1-t) * (D/E)]$$

β_u - beta sem divida

β_l - beta com divida

D - divida da empresa

E - capital próprio da empresa

t - taxa de juro

31. conhece este beta? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 32.*
- ☐ Não *Passe para a pergunta 34.*

beta fundamental

32. Onde é que o aprendeu? **Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

33. Com que frequência usa este beta **Marcar apenas uma oval por linha.*

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
frequência	☐	☐	☐	☐	☐

fundo de maneoio**34. conhece a defenição de fundo de maneoio? ****Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 35.*
- ☐ Não *Passe para "introdução."*

introdução

determina a quantidade de dinheiro disponível a qualquer momento para pagar as dividas correntes, em toda a quantia esperada nesse ano.

fundo de maneoio = activo circulante - passivo circulante**fundo de maneoio****35. Onde é que aprendeu? ****Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

36. com que frequência usa este modelo **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

necessidades em fundo de maneoio**37. sabe o que é as necessidades em fundo de maneoio ****Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 38.*
- ☐ Não *Passe para "introdução."*

introdução

Calcula as necessidades financeiras que uma empresa tem para produzir em cada ciclo de exploração

NFM = necessidades cíclicas - recursos cíclicos

NFM (Necessidades em Fundo de Maneio)

38. Onde aprendeu este instrumento? *

Marcar apenas uma oval.

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

39. com que frequência usa?

Marcar apenas uma oval.

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

Grau de alavanca financeira

Serve como instrumento de análise do risco associado ao uso de capitais alheios por parte da empresa, para financiar os seus investimentos, isto é, se a empresa é capaz de suportar a quantidade de dívida que tem.

grau de alavanca financeira = resultados operacionais / resultados correntes

40. usa este instrumento? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 41.*
- ☐ Não *Passe para a pergunta 43.*

Grau de alavanca financeira

41. Com que frequência o usa? *

Marcar apenas uma oval.

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ única que uso

42. Onde é que aprendeu? **Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

Grau de alavanca operacional

analisa o quão exposta esta uma empresa para a sua estrutura de custos, isto é, quanto é afectada pelos seus custos fixos

$$\text{grau de alavanca operacional} = \frac{\text{margem de contribuição}}{\text{resultado operacional}}$$

43. usa este instrumento? **Marcar apenas uma oval.*

- ☐ sim *Passe para a pergunta 44.*
- ☐ não *Passe para "rácios."*

Grau de alavanca operacional**44. Com que frequência o usa? ****Marcar apenas uma oval.*

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ única que uso

45. Onde é que aprendeu? **Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

rácios

Ao comparar duas empresas diferentes, de forma a fazer uma decisão imparcial, é necessário recorrer a um instrumento financeiro chamado de rácios.

Estes rácios podem ser utilizados para comparar a empresa como um todo ou para analisar diferentes aspectos da empresa, tendo em conta isto aqui estão uma série de instrumentos, divididos em diferentes tipos consoante aquilo que analisam, sobre os quais gostaríamos de saber se conhece e com que frequência utiliza.

rácios de liquidez

46. Com que frequência usa cada um dos rácios **Marcar apenas uma oval por linha.*

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente	não conheço
liquidez geral= (activo circulante)/(passivo circulante)	☐	☐	☐	☐	☐	☐
liquidez imediata= (depósitos bancários+caixa+títulos negociáveis)/(passivo circulante)	☐	☐	☐	☐	☐	☐

rácios de alavanca financeira e risco**47. Com que frequência usa cada um dos rácios ****Marcar apenas uma oval por linha.*

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente	não conheço
endividamento= (capitais alheios)/(capitais totais)	☐	☐	☐	☐	☐	☐
debt to equity ratio= (capitais próprios)/(capitais próprios)	☐	☐	☐	☐	☐	☐
cobertura dos encargos financeiros= (resultados operacionais)/(encargos financeiros)	☐	☐	☐	☐	☐	☐
variabilidade dos resultados operacionais = $[RO_t - RO_{(t-1)}]/(\text{média dos RO})$	☐	☐	☐	☐	☐	☐

rácios de rentabilidade**48. Com que frequência usa cada um dos rácios ****Marcar apenas uma oval por linha.*

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente	não conheço
rendibilidade operacional de vendas= (resultado operacional)/(volume de negócios)	☐	☐	☐	☐	☐	☐
rendibilidade do capital próprio= (resultados líquidos)/(capital próprio)	☐	☐	☐	☐	☐	☐
rendibilidade do activo= (resultado operacional)/activo	☐	☐	☐	☐	☐	☐
rendibilidade do capital investido= (resultado operacional)/(capital investido)	☐	☐	☐	☐	☐	☐
Linha 5	☐	☐	☐	☐	☐	☐

rácios de funcionamento

49. Com que frequência usa cada um dos rácios *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente	não conheço
rotação do capital investido= (volume de negócios)/(capital investido)	☐	☐	☐	☐	☐	☐
permanencia media das mercadorias em armazem=(extencia media de mercadorias)/(custo das mercadorias vendidas)*365	☐	☐	☐	☐	☐	☐
prazo medio de recebimentos= (saldo medio de clientes)/(vendas e prestação de serviços* (1+IVAv))*365	☐	☐	☐	☐	☐	☐
prazo medio de pagamentos= (saldo medio de fornecedores)/(compras e fornecedores* (1+IVAv))*365	☐	☐	☐	☐	☐	☐

rácios baseados no mercado

50. Com que frequência usa cada um dos rácios *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente	não conheço
PER= (preço de cotação)/(resultados por acção)	☐	☐	☐	☐	☐	☐
$P_0 = \text{Div}/(r-g)$	☐	☐	☐	☐	☐	☐
PCE= (preço de cotação)/(cash earnings por acção)	☐	☐	☐	☐	☐	☐
market to book ratio = (preço de cotação)/(valor contabilístico por acção)	☐	☐	☐	☐	☐	☐

51. Com que frequência utiliza cada uma das fórmulas *

Marcar apenas uma oval por linha.

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
NPV	☐	☐	☐	☐	☐
IRR	☐	☐	☐	☐	☐

Financiamento de investimentos

Ao investir num novo negócio temos que decidir como vamos financiar esse investimento, se com capitais alheios ou capitais próprios. Para fazer essa decisão cada empresa tem que ter em conta a

sua presente situação financeira e a quantidade optima de dívida. O primeiro é um dado obtido pela própria empresa mas o outro é necessário calcular e para tal existem vários métodos possíveis.

método do lucro operacional

Este método é baseado na possibilidade de uma empresa entrar em falência porque não tem resultados operacionais suficientes para pagar a sua dívida. Os resultados operacionais futuros são calculados fazendo uma distribuição normal, que tem por base os dados actuais e passados para os resultados operacionais.

Para atingir a quantidade de dívida óptima a empresa define a probabilidade de entrar a falência que esta disposto a alcançar e calcula com a distribuição dos resultados operacionais a dívida associada a esse máximo de risco de falência.

52. conhece este método? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 53.*
- ☐ Não *Passe para a pergunta 57.*

método do lucro operacional

Este método tem dois passos para a sua execução

1º passo

no primeiro calcula se os pagamentos da dívida quando se usa a quantidade de capitais alheios máxima antes de entrarmos em falência

fórmula

$$t \text{ statistic}_D = \frac{\text{current EBITDA} - \text{Debt payments}_D}{\sigma \text{OI} * \text{current operating income}} \Rightarrow$$

$$\text{Debt payments}_D =$$

$$= \text{current EBITDA} - t \text{ statistic}_D * (\sigma \text{OI} * \text{current operating income})$$

t statisticd - o valor tabelado, para nível de dívida D, associado à distribuição normal dos resultados operacionais

σOI - desvio padrão dos resultados operacionais

Debt payments D - pagamentos associados ao nível de dívida D

53. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

54. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

2º passo

No segundo passo usamos o valor obtido para os pagamentos da dívida e calculamos o nível ótimo de dívida com a seguinte fórmula

fórmula

$$\text{Optimal debt level} = \frac{\text{Debt payments}_D}{\text{interest rate} + \text{sinking fund rate}}$$

55. De onde conhece esta fórmula? **Marcar apenas uma oval.*

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

56. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

método do custo de capital

No método do custo de capital temos que calcular primeiro o valor da empresa para o custo capital presente. Depois aumentamos o nível de dívida e calculamos o custo de capital e associado valor da empresa, para cada nível de dívida. Alcançamos o nível ótimo de dívida quando o valor da empresa começa a diminuir.

57. conhece este método? **Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 58.*
- ☐ Não *Passe para a pergunta 64.*

método do custo de capital

neste método temos varios passos a seguir aos quais tem que se recorrer quando se testa cada nivel de dívida.

1º passo

temos que calcular o custo dos capitais próprios e o beta correspondente ao nivel de dívida em estudo

fórmula

$$\beta_l = \beta_u * [1 + (1-t) * (D/E)]$$

$$COE = \text{riskfree rate} + \beta_l * \text{risk premium}$$

índice

COE -- custo dos capitais próprios

D -divida

E - capitais próprios

β_l - beta com alavanca financeira

β_u - beta sem divida

58. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

59. com que frequência utiliza? *

Marcar apenas uma oval.

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

2º passo

temos que calcular o custo dos capitais alheios, utilizando o hipotético rating que a empresa teria com o nível de divida em estudo. Utilizamos para medir esse nível o ratio interest coverage ratio.

fórmula

$$\text{Interest coverage ratio} = \text{EBIT} / (\text{interest expense})$$

60. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

61. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

3º passo

por último calculamos o custo médio ponderado do capital e usamos este valor para calcular o valor da empresa com o nível de dívida em estudo

fórmulas

$$WACC = COE * (E / (E + D)) + COD * (D / (D + E))$$

$$\text{Firm value} = (FCFF * (1 + g)) / (WACC - g)$$

índice

WACC - custo médio ponderado do capital

COE -- custo dos capitais próprios

COD - custo dos capitais alheios

FCFF - "free cash flow" para a empresa

D - dívida

E - capitais próprios

62. De onde conhece esta fórmula? **Marcar apenas uma oval.*

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

63. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

método do diferencial custo e retorno sobre o investimento

Este método é fundamentalmente calcular o retorno sobre os capitais próprios a cada diferente nível de dívida e o respectivo custo de capital próprio. Quando o diferencial entre estes dois dados chegar ao seu máximo o nível de dívida associado é o nível óptimo.

64. Conhece este método? **Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 65.*
- ☐ Não *Passe para a pergunta 69.*

método do diferencial custo e retorno sobre o investimento

Neste método temos apenas que utilizar duas fórmulas fazendo iterações entre as duas até alcançar o nível ótimo de dívida

1º passo

Calcular o retorno sobre os capitais próprios com o nível de dívida escolhido

fórmula

$$ROE = ROC + (D/E) * [ROC - i * (1-t)]$$

índice

ROE - retorno sobre os capitais próprios

ROC - retorno sobre os capitais totais

i - taxa de juro

t - taxa de imposto

D - dívida

E - capitais próprios

65. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

66. com que frequência utiliza? *

Marcar apenas uma oval.

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

2º passo

temos que calcular o custo dos capitais próprios e o beta correspondente ao nível de dívida em estudo

fórmula

$$\beta_l = \beta_u * [1 + (1-t) * (D/E)]$$

$$COE = \text{riskfree rate} + \beta_l * \text{risk premium}$$

índice

COE -- custo dos capitais próprios
D -divida
E - capitais próprios
 β_l - beta com alavanca financeira
 β_u - beta sem divida

67. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
☐ licenciatura
☐ mestrado
☐ trabalho
☐ auto-aprendizagem

68. com que frequência utiliza? *

Marcar apenas uma oval.

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

o método do APV (valor presente ajustado)

The adjusted present value approach takes into account the benefits and costs of borrowing. o valor ótimo de dívida é alcançado quando o valor da empresa endividada é maximizado

69. Conheça este método? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 70.*
☐ Não *Passe para a pergunta 76.*

o método do APV (valor presente ajustado)

para executar este método voltamos a precisar de fazer tudo por passos:

1º passo

Temos que calcular primeiro o valor da empresa sem divida:

fórmula

Value of unlevered firm = Current value of firm - PV of tax benefits + Expected bankruptcy costs

70. De onde conhece esta fórmula? *

Marcar apenas uma oval.

- ☐ não conheço
☐ licenciatura
☐ mestrado
☐ trabalho
☐ auto-aprendizagem

71. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

2º passo

Temos que então calcular os custos associados a ter uma dívida que são os benefícios fiscais e o custo esperado de falência

fórmula

Value of tax benefits = tax rate * Debt

Expected Bankruptcy costs = probability of bankruptcy * Bankruptcy costs

72. De onde conhece esta fórmula? **Marcar apenas uma oval.*

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

73. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

3º passo

por último calculamos o valor da empresa com o nível de dívida escolhido.

fórmulas

Value of levered firm = Value of unlevered firm + value of tax benefit - expected bankruptcy costs

74. De onde conhece esta fórmula? **Marcar apenas uma oval.*

- ☐ não conheço
- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

75. com que frequência utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

método comparativo

Pode também fazer uma análise comparativa comparando as empresas dentro da mesma industria com a empresa em estudo e analisando se os niveis de divida da empresa estão de acordo aos niveis de divida da industria

76. Usa este método **Marcar apenas uma oval.*

- ☐ sim
- ☐ não
- ☐ não conheço

77. Com que frequência o utiliza? **Marcar apenas uma oval.*

	1	2	3	4	5	
nunca usei	☐	☐	☐	☐	☐	uso diariamente

Análise do investimento

Cada empresa tem um mínimos esperado de custo de capital que um investimento pode ter mas quando este requisito é cumprido não se pode fazer o investimentos sim primeiro analisar se vai trazer valor para a empresa.

NPV e IRR - net present value e Internal rate of return

Estes são os dois instrumentos de eleição para definir se um investimento é positivo ou não.

fórmulas

$$NPV = \sum_{t=1}^t \frac{C_t}{(1+r)^t} - C_0$$

$$IRR \text{ Is when } NPV = 0 \Leftrightarrow \sum_{t=1}^t \frac{C_t}{(1+IRR)^t} - C_0 = 0$$

Indice

Ct - retorno no ano t
 Co - investimento inicial
 t - ano
 r - taxa de desconto

78. De onde conhece estas fórmulas? **Marcar apenas uma oval por linha.*

	Não conheço	Trabalho	licenciatura	mestrado	auto-aprendizagem
NPV	☐	☐	☐	☐	☐
IRR	☐	☐	☐	☐	☐

79. Com que frequência as utiliza? **Marcar apenas uma oval por linha.*

	Nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
NPV	☐	☐	☐	☐	☐
IRR	☐	☐	☐	☐	☐

Valor presente

Ao aplicar as duas fórmulas atrás temos que utilizar os valores presentes dos "cash flows". Para tal temos que recorrer a uma taxa de desconto que pode ser alcançada de duas maneiras, calculando o Custo de Capital ou recorrendo a tabelas de valor temporal do dinheiro e calculadoras financeiras

80. Com que frequência utiliza cada uma das taxas? **Marcar apenas uma oval por linha.*

	nunca usei	usei mas não profissionalmente	uso mas não regularmente	uso regularmente	uso diariamente
custo de capital	☐	☐	☐	☐	☐
tabelas ou calculadora financeira	☐	☐	☐	☐	☐

81. De onde aprendeu cada um dos métodos **Marcar apenas uma oval por linha.*

	trabalho	licenciatura	mestrado	auto-aprendizagem
custo de capital	☐	☐	☐	☐
tabelas ou calculadora financeira	☐	☐	☐	☐

82. Ao aplicar o custo de capital como taxa de desconto por vezes cometemos o erro de aplicar o custo de capital aos retornos sobre os capitais próprios, ou vice versa. *

Numa escala de 0-5 com que frequência faz este erro?

Marcar apenas uma oval.

1	2	3	4	5
☐	☐	☐	☐	☐

Ao somar os "cashflows" de cada ano podemos considerar que eles ocorreram no início ou no fim do ano

83. Quando é que considera que ocorreram os "cashflows" **Marcar apenas uma oval.*

- ☐ início do ano
- ☐ fim do ano

Política de dividendos

Cada empresa que se encontra cotada na bolsa chega a um momento em que tem que decidir se vai ou não pagar dividendos aos seus stock-holders.

3 teorias diferentes

dividendos são irrelevantes

que diz que pagar dividendos não tem impacto no valor da empresa

84. conhece esta teoria *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 85.*
- ☐ Não *Passe para a pergunta 87.*

dividendos são irrelevantes

85. Onde aprendeu esta teoria? *

Marcar apenas uma oval.

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

86. com que frequência a utiliza *

Marcar apenas uma oval.

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ uso diariamente

dividendos são maus

que defende que como pagar dividendos trás uma desvantagem nos impostos pois temos que pagar mais, retirando assim valor à empresa

87. conhece esta teoria? *

Marcar apenas uma oval.

- ☐ Sim *Passe para a pergunta 88.*
- ☐ Não *Passe para a pergunta 90.*

dividendos são maus

88. Onde aprendeu esta teoria? **Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

89. com que frequência a utiliza **Marcar apenas uma oval.*

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ uso diariamente

dividendos são bons

que defende que, apesar de existir de facto uma desvantagem nos impostos, pagar dividendos aumenta o interesse dos investidores e pode ser um sinal positivo para o mercado de crescimento ou estabilidade

90. conhece esta teoria **Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 91.*
- ☐ Não *Passe para a pergunta 93.*

dividendos são bons**91. Onde aprendeu esta teoria? ****Marcar apenas uma oval.*

- ☐ licenciatura
- ☐ mestrado
- ☐ trabalho
- ☐ auto-aprendizagem

92. com que frequência a utiliza **Marcar apenas uma oval.*

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ uso diariamente

Rácios dos dividendos

quando uma empresa paga dividendos ela esta ao mesmo tempo a informar o mercado da sua capacidade para os pagar e subsequente saúde financeira. Esta informação é analisada sobre a forma de dois racios:

dividend yield

dividend yield = (annual dividends per share) / (price per share)

dividend payout ratio

dividend payout ratio = (dividends per common share) / (earnings per share)

93. De onde conhece estes rácios? *

Marcar apenas uma oval por linha.

	não conheço	licenciatura	mestrado	trabalho	auto-aprendizagem
dividend payout ratio	☐	☐	☐	☐	☐
dividend yield	☐	☐	☐	☐	☐

94. com que frequência usa o dividend payout ratio *

Marcar apenas uma oval.

- ☐ nunca usei
- ☐ usei mas não profissionalmente
- ☐ uso mas não regularmente
- ☐ uso regularmente
- ☐ uso diariamente

Put e call options

When making a decision on where to invest there are a lot of different options to consider in a company. This options can be valued using a method known as derivatives and can be used to a variety of decision, but they all use different methods of the same fórmula named the Black-Scholes model.

modelo para uma posição call

$$C = S * e^{-yt} * N(d_1) - K * e^{-rt} * N(d_2)$$

modelo para uma posição put

$$P = K * e^{-rt} * (1 - N(d_2)) - S * e^{-yt} * (1 - N(d_1))$$

fórmulas para d1 e d2

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

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

95. Conhece o modelo? **Marcar apenas uma oval.*

- ☐ Sim *Passe para a pergunta 96.*
- ☐ Não *Pare de preencher este formulário.*

Decisões de investimento

Este modelo pode ser utilizado para dar um valor há hipótese de num negócio de expandir o negócio ou desinvestir, e a hipótese de quando se vai investir num novo negócio de atrasar ou não um investimento. Estes valores depois podem ser utilizados para calcular o valor de uma empresa quando têm a forma de patentes ou de concursos de construção

96. Utiliza o modelo com esta perspectiva? **Marcar apenas uma oval.*

- ☐ Sim
- ☐ Não *Passe para "final."*
- ☐ Em parte

Decisões de investimento**97. Para que situação(ões) usa este método para valorizar uma opção? ****Marcar tudo o que for aplicável.*

- ☐ expandir um negócio
- ☐ desinvestir num negócio
- ☐ adiar um investimento vs fazer o investimento no presente

final

agradecemos a disponibilidade para fazer este inquérito e desejamos o resto de um bom dia.

Com tecnologia



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