

ECONOMIC AND FINANCIAL VIABILITY OF AN INVESTMENT PROJECT



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Grade in FINANCE AND ACCOUNTING COURSE 2016/2017

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Abstract

The work that follows is about the economic - financial analysis of an investment project. This analysis focuses on the decision to acquire two automatic dowels, to incorporate them in the end of the production process of a tile factory.

To carry out the project, there has been a constant communication between the author of the work and the company requesting the study. This study has been carried out with the purpose that the acquisition of the fixed assets is advantageous for the company, for it has been followed by an exhaustive study based on different situations seeing the different impacts that occurred in the company until giving with the one that The more it will conform to reality

1. Introduction

The aim of this thesis is to find out the economic and financial viability of a company whose activity is developed in the ceramic sector. The company is branched out in more than 50 countries and its economic situation is a healthy one due to the huge amount of profits that it have had during the last years. Despite the well known crisis that took place during the last years, the company maintained itself in the market and tried to search for new horizons of expansion. Although this business is not the most important compared with the other companies from the same industry, the finance manager predicts a good future perspective.

Two new automatic fit machines will be gathered to be incorporated at the end of the production process. This task has been done manually by the employees and it results a very slow and hard work for them. Even so, the demand can not be covered.

This thesis is divided in two parts: the theoretical part and the empirical one. Firstly, there is the theoretical frame where there are mentioned the most important points that have to be took in account in this project, like the NPV (Net Present Value), the IRR (Internal Rate of Return), the NICF (Net Investment Cash Flows) or the discount rate. Having looked to this terms, the second part treats about the empirical side where the mentioned concepts are going to be involved in practice, furthermore a sensitivity analysis of scenes is going to be explained and it will have different possibilities. Also, there are going to took place other sensitive analysis like the one related with the sales and expenses of the company. Talking about the financial method, the company is going to elaborate a financial plan to choose which is the right one for the company. Finally, the data obtained is going to be analyzed to find out the impact on the company.

Mentioning the academic aspect, stands out that is not easy to put in practice all the knowledge acquired during the university degree because there are some risks that must be took in account when we are doing predictions which generate uncertainty when are put in practice.

Before developing the study, I have had different meetings with the financial director who helped me to understand how the company works, which is its goal and also he explained me the historical evolution of the firm to be able to make predictions and know which its situation nowadays is. During the study, I have had access to dates which helped me to do the calculation.

For the accomplishment of this work the subjects that more are used are the one of Financial Direction carried in the 2^o course of the Degree, as well as the one of

Advanced Financial Direction course in 3^o. In addition, we also apply methods learned in the subject of Business Valuation of 3rd year, the different subjects of Accounting, Markets and Financial Institutions, Analysis of Financial Statements and Statistics.

2. Theoretical framework

2.1 Net Present Value (VNA) y Internal Rate Return (IRR)

There are two different models in order to assess investment's project.

Static models or approximated models.

These models are simplistic and do not take into account the moment when the Net Cash Flows (NCF) are produced, due to this fact, same value is imputed to all monetary units generated by the inversion's project.

The designed "Approximated models" are conditioned by static models which do not provide an exact measure from the project rentability, it's only approximated.

Dynamic models or classic models

These models take into account the moment when the NCF are produced, therefore the inversion's project is considered and that is the main reason why these models are more realistic.

On the other hand, these models consider that the subject prefers the money achieved today than the money that he could achieve in the future for that reason the NCF are from the actual period involve money available from immediately which can be inverted again and that allows getting rentability which couldn't get. Also, that amount of money is available without any risk.

Net Present Value (NPV) and Internal Rate Return (IRR) belong to dynamic models or classic models and are characterized by homogenize the NCF which get updating the NPV at the beginning. NPV measures profitability's projects are on absolute terms, in other words, on currency units.

Their purpose accomplishes updating the payments and charges of an inversion project and calculating the difference for that purpose, NCF are considered an interest type "k". Using NPV we get two decisions, on the one hand we get if achievable, on the other hand it allows choosing it which is one of the best inversion after having compared the different NPV got.

El Valor Actual Neto (VAN) y la Tasa Interna de Rendimiento (TI) pertenecen a los modelos dinámicos o clásicos y se caracterizan por la homogeneización de los FNC, que se consigue actualizando los mismo al momento inicial.

NPV formula is:

$$VAN = -A + \frac{Q_1}{(1+k)} + \frac{Q_2}{(1+k)^2} + \dots + \frac{Q_n}{(1+k)^n} = -A + \sum_{j=1}^n \frac{Q_j}{(1+k)^j}$$

Where:

-A: initial investment

Q_j: Net Cash Flows

k: financial cost

j: number of periods

The obtained result is analysed when NPV is applied:

- If the NPV is positive (NPV > 0): Inversion is accepted.

If the project is done the capital inverted could be recuperated as well.

- If the NPV is negative (NPV < 0): Inversion is not accepted

If the company makes the project, company's wealth will decrease, with a net loss as the amount got in the NPV.

- If the NPV is equal to zero (NPV=0). Inversion is not accepted.

Realizar el proyecto resulta indiferente para la empresa ya que no va a generar ni beneficios ni pérdidas.

Realising the project result indifferent for the company because it doesn't make loss or profit for the company. Financially it doesn't make inversions in which the company is not going to get earnings. (See Aragón, Balaguer, Cabedo, Matallín, Soler (2012) *Dirección financiera* pp.67-70).

To sum up, the company has like objective maximise its market value, that is the reason why when there are different inversion projects which are similar, distinguishing and positive, it will be chosen one which offers the biggest NPV.

Some advantages of using the NPV to value projects are:

We can get useful predictions about the impact which the inversion project will have a value's company.

Also, NPV calculation considers cash flow expiration, in other words, NFC are homogenised on time, minimizing to a unit measure amounts of money got in different moments.

Some disadvantages that NTV include are the following: the difficulty to determinate discount's rate, positive NFC are immediately reinvested to an equal rate to discount type, and negative NFC are financiered with resources whose financial cost is also at the discount rate.

IRR is the rentability or interest rate which provides an inversion, It's expressed on percentage of one unit of increasing, which is the reason why IRR is a relative measure. On the other hand, it is a brute measure because we have to discount financial cost from the capital inverted on the project (k), that is the reason why when a project is accepted or refused, IRR compares the brute relative rentability by monetary unit inverted, "r". The difference between both is a measure from the relative net rentability by unit inverted on the project.

$$R_n = r - k$$

IRR formula is:

$$TIR = r \rightarrow -A + \frac{Q_1}{(1+r)} + \frac{Q_2}{(1+r)^2} + \dots + \frac{Q_n}{(1+r)^n} = -A + \sum_{j=1}^n \frac{Q_j}{(1+r)^j} = 0$$

Where;

A: Initial investment

Qj: Net Cash Flows

j: Number of periods

The obtained result is analysed when IRR is applied:

- If $r > k$: The project is accepted

The internal performance's rate got will be bigger than the minimal rentability rate required to the inversion.

- If $r = k$ The project is not accepted

The inversion could be made in case of the competitive position from the company improved and there wasn't any alternative better.

- If $r < k$: The project is not accepted

The minimal rentability required is not got.

The main advantage is that as the rentability is expressed on relative terms the unitary money offers a better visualization than if it was on absolute terms. As well as, it values at the same time all the amount of money which makes the project.

On the other hand, an important disadvantage is its calculation because the equation sequence depends on the number of periods, that is the reason why it is said that the result is inconsistent and few real.

There is an important relation between both approaches. Also, when they are used correctly both provide the same outcome. Because the IRR is the rate discount which would provide to the project a VNP of zero. That is the reason why we could use this theory to calculate the rentability of a project with many cash flows, equalling the formula to zero and keeping as question "r".

When we compare IRR with the opportunity cost we know if the VNP is positive because it will decrease when the discount rate increases. On the other hand, if both parameters are compared, we have to considerate that both have limitations and sometimes their results are inconsistent.

If we analyse how IRR and VNP study the rentability, we can see that VNP study the rentability of unitary money while IRR makes a percentage. The same happens with NCF, on the one hand, NPV takes into account the different expirations, giving priority to the nearest on the time, reducing the risk and reinverting NFC to a discount rate "k" used in the same analyse. On the other hand, IRR doesn't study if NCF are reinverted periodically on a rate "k". It values a rentability "r", valuating the capacity of inversion from the project.

In relations with companies, when a project makes evaluation, it is usually used both measurement bases, because how we have mentioned if they are used correctly, they allow getting the same conclusion, but *Brealey, Myers, Marcus, Mateus (2010) Finanzas Corporativas pp.220-223* Say that IRR has some harmful defects, for example:

Defect 1: lend or borrow?

The theory explains that VNP increases at the same time that discount rate decreases in order to get a good result from the IRR. But if the company can lend that it will want that IRR was high. On the other hand, if the company borrows that it will want that IRR decreases. When VNP increases with interest rate, the IRR criterion is turned over. In this case, the project would be accepted only if "r" is smaller than "k".

Defect 2: Several rentability rate´s

In the case of cash flows, different sign changes can be made, in this case, the IRR does not work correctly since more or fewer IRRs may arise as sign changes have or even not find any IRRs, however the NPV gives a Good result always, without for him it is an inconvenience the number of existing sign changes.

Defect 3: Projects mutually exclusive

If there are several projects, all rentable and exclusive, when we have to choose one of them, we will choose that which offers the biggest VNP. On the other hand, when we

study IRR, it is not necessary to choose the biggest result because a big IRR is not a PRINCIPIO, it is necessary to analyse different points to understand that fact.

Defect 4: Projects mutually exclusive with different disbursements.

When projects with the same duration and different initial disbursement are compared, IRR can encourage mistakenly small projects with high rentability's rate but with small VAN.

2.2 Analyze of the Net Cash Flow and the problems on the application of its calculation

Before estimate cash flow, it is important to consider normality on the behaviour of an inversion project. The process has three stages.

Firstly, the start state, where is required inversions on floor, equipment and rolling fund because products and feedstock are necessities. The second stage is made at the middle project, when cash flow derivate from sold operations are got, therefore in this moment, we go on inverting on working capital.

The final phase would be given once the project has been liquidated, the equipment and plants that had been acquired can be used for sale or other activities, if it were the case of sale, the divestment of assets, entails inflow of Cash in addition to the sale of products and the collection of outstanding bills. With this, it can be seen that the cash flow of a project is the sum of the disinvestment of non-current assets, the net investment in working capital and the cash flow of operations. .

The following are various aspects to identify Net Cash Flows and different problems that arise when calculating:

- Cash Flow

As mentioned in the previous section, to find the profitability of a project, the current value is calculated by discounting the cash flows and not the result reflected in the Annual Accounts. This is because according to the accounting principle of accrual, the income and expenses are reflected in the real flow of goods and services and not when the monetary flow derived from them. In addition, you must take into account that the projects are financially attractive for the treasury they generate; therefore, the capital budget should be based on the cash flow and not on the results of the Annual Accounts

- Costs

There are different costs to consider making a correct valuation of the NCF, these are: incremental cash flows, unrecoverable costs, opportunity cost and overheads.

It begins by analyzing how to obtain the incremental flows; Is the difference between the cash flows derived from the investment and the cash flows that would have

occurred if the project had not been carried out. Similar to this situation is the opportunity costs, which refer to the amount of capital, labor and materials used in one project failing to make another.

With regard to the unrecoverable costs, they are past disbursements that will not be possible to recover and that will remain regardless of whether or not the project will be accepted, and will not affect its NPV.

Finally, when talking about general expenses refer, for example, to rentals, heating or electricity. The consumption of these expenditures may not be directly related to the project, although due to the principle of incremental cash flows only the extra costs imposed by the project will be included in the investment estimate.

- Working capital

The working capital or working capital is the difference between the current assets composed of, the treasury, stocks, debtors and accounts receivable and the current liabilities consisting of debit accounts payable.

Often mistakes are made in regard to working capital when cash flows are predicted; They are calculated but not taken into account that this can vary or simply, omit that it can be recovered at the end of the project, due to the entry of cash generated after the stocks are exhausted and charged to customers their Debts incurred.

- Discount of nominal cash flows at nominal cost of capital

The actual cash flows are discounted at the real discount rate and the nominal rates at nominal, both leading to the same updated result. It must be taken into account that the quantities cannot be combined or equated with the different discount rates, since this can constitute a serious error, due to the fact that the type Real interest rate on deposits depends on inflation, and if it were possible to mix discount rates, inflation would not be taken into account in predicting future cash flows, leading to an excessive reduction in the value of the Project.

- Separate investment and financing decisions

Regardless of how the project has been financed, it must be considered that it is financed with equity capital, considering all cash outflows as coming from shareholders and entries as if they were for them. This is done in order to separate the investment decision analysis from the financing decision.

- Investments in capital and working capital

Investments in fixed assets or working capital are components of cash flow, with respect to capital investment; negative cash flows involve cash outflows and initially exist in a project due to investment in non-current assets. On the other hand, when the

company divests, i.e. sells those assets, it generates positive cash flows. Yes, we are referring to the working capital, the additional investments that are made on this when the project is undertaken, for example, if you have to acquire raw material, it means cash outflows. In addition, the treasury decreases when customers do not pay their debts contracted with the company for the provision of services or receipt of merchandise or for the accumulation of stocks of raw material or finished products. When the project is finished, finished products have been sold and customers are charged outstanding debts. Investments in working capital are reduced as it becomes cash.

In summary, when investments are made, working capital increases and there are negative cash flows; however, when working capital is reduced, it means positive cash flows.

There are 3 methods for calculating the cash flows that derive from the operations.

METHOD 1. Monetary units that enter less leaving monetary units.

Only items in the income statement that represent cash flows are considered. The income obtained is subtracted from the cash outflows and taxes paid, not considering the amortization.

Cash flow from operations = Income - Cash out – Taxes

METHOD 2. Adjusted accounting benefits

This method starts with post-tax accounting benefits, plus deductions made for non-monetary expenses, such as depreciation. Non-monetary expenses reduce profit but do not affect cash flow.

Cash flow from operations = Profit after tax + Amortization

METHOD 3. Tax savings

The amortization deduction indirectly affects cash flows. This implies a method for calculating the cash flows of operations; the net profit is calculated first assuming that the amortization is zero remaining as follows:

(Income - cash flow) X (1-Tax rate).

Once this is done, the tax savings generated by the amortization are added. Next, the operating cash flow is calculated as follows:

Cash flow from operations = (Income - Cash flow) X (1- Tax rate) + (Amortization x Tax rate)

Finally, it is important to emphasize that investment projects are not only carried out with the objective of having benefits, but can also be done to improve operating cash flow and reduce costs.

2.3 Cost of capital, models for its calculation and problem in its application

According to Mascarenas (2015), companies continually have to decide where to invest the incomes they have, in order to achieve the highest return with minimum risk. To determine the acquisition of an asset that offers greater profitability, a set of possibilities with equal risk requires a benchmark, the required rate of return, which allows the investor to decide to make the concrete investment.

Each asset that is intended to be acquired will have an expected rate of return established, when it is lower than the required rate of return, the investment will not be realized, however, when higher will be accepted, since, it will increase the wealth of the Investor with that decision.

The rate of return required by the company is also called cost of capital. This rate shows, on the one hand, the cost of the resources of the company or others that are invested in the project and, on the other hand, the discount rate that updates the flow of cash flows that the company undertakes to generate. Therefore, when the risk is high will imply a high capital cost, i.e. a higher discount rate and as a consequence a low valuation of the company's securities and vice versa otherwise.

It is important that projects choose an appropriate rate of return required, since it allows evaluating the feasibility of these. If a fee is used May lead to inappropriate assessments.

The main problem that arises when determining the cost of capital is that, regardless of the theorem chosen to find it, the same criteria are used without differentiating the type of sector in which the company is located and without taking into account the inequality in receiving information from investors and managers.

Before proceeding, a distinction is made between two concepts that can lead to confusion; these are the cost of capital and the opportunity cost. The cost of capital is what is reimbursed to third parties for their financial funds, represented in Balance would be the liability, i.e. the cost of debt and in equity the cost of capital of shareholders. On the other hand, the opportunity cost is what is not perceived when investing the resources in the project.

Continuing with the cost of capital, the implicit factors that determine it are shown below:

1. Economic conditions

It determines the demand and supply of capital, as well as the expected level of inflation. This economic variable is reflected in the risk-free interest rate since it consists of the real interest rate paid by the State and the expected inflation rate.

When the demand for money varies and supply is held steady, investors increase their required rate of return, the same is true if inflation is expected to increase. On the other hand, if the money supply increases or the price level is expected to fall, a decrease in the yield required for each investment project will occur.

2. Market condition

At this point the concept of risk premium is introduced; it is the difference between the required performance of a risky project and that of a similar but risk-free project.

When the risk of the project is increased, the investor will demand a higher required rate of return; otherwise, if the risk decreases, the higher the risk the higher the risk premium and vice versa. Likewise, if the asset is difficult to sell because it is not liquid, the liquidity premium is much higher, making it increase even more the minimum required yield.

3. Financial and operational conditions of the company

The risk is divided into two types; Economic risk, depends on the investment decisions of the company and refers to the change in the return on assets and financial risk, which refers to the financing decision; Use of debt and preferred shares, refers to the variation of the yield obtained by the shareholders.

4. Amount of funding

When the company's financing needs increase, the cost of the company's capital varies due to a number of reasons:

- When issuing securities, the issuance costs, which in relative terms, will be lower, the higher the volume of the issuance, although the larger the volume of shares issued, the greater the decrease in its Price in the market, which will have an increase in the cost of capital.
- When the company requests a high volume of funding compared to its own size, investors will doubt the ability of the board to manage it efficiently which will increase its required performance. It is convenient to bear in mind that for all determinants, whenever the required return increases, the cost of capital also does so. With regard to risk, it can be divided into two parts, systematic and non-systematic. The systematic depends on the decisions of the company and can be eliminated through an efficient diversification of the money to be invested, while the unsystematic cannot be reduced beyond a certain value, since it depends on the market. This differentiation is important because, in certain cases, the risk premium of an investment project incorporates the systematic risk to which it is exposed and not its specific risk that has been appropriately eliminated through good diversification.

It is expensive and complicated to estimate the cost of capital, so to get an approximate value is based on basic assumptions that simplify the calculation, these are:

- The economic risk does not change; the cost of capital of the company will be adequate for those projects that have an economic risk equal to the assets in the company.
- The capital structure does not change; on average the structure remains constant, even if for a time varies, the goal is that in the long run it will remain unchanged.
- The dividend policy does not vary, assuming dividends increase indefinitely at a constant annual rate.

These hypotheses are limiting, therefore the model should be evaluated regularly in addition to talking about a range and not a specific value in determining the cost of capital, and then some models are shown for their calculation.

2.3.1 Determination of discount rate

There are different methodologies to determine the rate of profitability, in this section we will highlight three of them, especially the CAPM or asset valuation model, since according to the economist Damoran (2013) is one more methods used by financial analysts.

Capital Asset Pricing Model (CAPM)

The objective of the CAPM is to explain how a financial asset is governed by historical market behavior and also allows it to project its discount rate. Seeks to measure and compensate market risk; predicts the relationship between the return of the asset and its implied risk.

In order to understand this model we must first differentiate between two types of risk, systematic and non-systematic, the systematic is not controllable by the company and cannot be reduced through diversification as it depends on the market. In contrast, non-systematic risk corresponds to the risk of the company, and can be mitigated by the use of diversification, dispersing the capital between different assets.

It is assumed that the rate of return required by an investor is equal to the rate of risk-free return that can be achieved in the financial market, plus a premium for the assumption of the risks that arise when placing its capital in a Whose flows are less predictable. It also includes Beta, which states that the company is exposed to market risk, measures the sensitivity of the organization's profitability to the latter. When beta takes a value equal to one the asset varies in the same way as the stock market, inverse happens when beta is greater than one.

In order to harmonize the model, the following assumptions apply to the base theory:

- Investors are risk averse.
- All investors have the same time horizon.
- There is no capital limit borrowed at the risk free rate.
- Investments can be divided into unlimited shares and measures.
- There are no taxes, no inflation, no transaction costs.

These assumptions are not real when estimating a project, therefore they are inconvenient, for example: not all investors have the same level of profitability and expected risk, it is not studied the fact that there are investors who prefer to obtain a return Lower to higher risk or that not all investors have access to the same information. In addition, the model assumes that the market portfolio is efficient and this does not have to happen always, as provided by economist Damodaran (2013), the company beta may not be valid, because there is no single beta for all The investors. This results in sometimes the betas being calculated in relation to the historical dates, making mistakes, since they are not normalized to Because of not using the same time horizon in its calculation and at the same time use different yields, this has repercussions on the stock index taken as reference to carry out the calculation. The economist adds that using the beta calculated with historical dates is equivalent to valuing the company without analyzing the actions or the future perspective of the company, for the valuation of projects, this fact is very dangerous. Regarding the risk-free rate there are also some discrepancies, since in general the companies follow the recommendations that Mascareña (2015) sets out to define the rate of risk-free asset required in the equation that will be explained later, Using the 10-year State Bond interest rate because the duration of this issue is similar to that of the cash flows of the companies to be valued, the durability of the asset without risk is similar to the Of the stock market index used to calculate the market and beta performance, but it is not known with certainty if the state debt is indeed risk free since in some countries throughout economic history have not faced the Debts they had with their creditors. That is why Damodaran (2013) states that it does not really know what the risk-free rate would be.

With all of this, it is concluded that, despite its empirical importance, the CAPM model is fixed on parameters that question its validity. For them, it must be verified if the CAPM model is valid for the project to be analyzed.

Weighted Average Cost of Capital model (WACC)

This model estimates the sum of all sources of capital; The cost of indebtedness and the cost of investment of the shareholders of the company, weighted by their share in

the capital structure, with this, can determine how much interest a company has for each monetary unit it finances. When the company's WACC increases as the beta increases and the rate of return on capital increases, it means a decrease in valuation and an increase in risk.

The calculation of the WACC is divided into three parts, on the one hand the cost of capital, the amount that a company must spend to maintain a share price that satisfies its investors. On the other hand, the cost of debt, to determine it, uses the market rate that the company is currently paying on its debt. The last part to consider would be the taxes, since for those companies with debt, supposes a subsidy of the State.

The WACC is the minimum acceptable rate of return at which a company offers returns to its investors. To determine the personal returns of an investor on an investment, the WACC is subtracted from the percentage of performance of the company. On the other hand, if the return of the company is less than WACC, the company is losing value, meaning potential investors would be better off putting their money somewhere else.

The limitations to be considered on this model are: the difficulty in its calculation and although its use can help give a useful view of the company, it will always have to be used together with other metrics when deciding whether to invest or not .

After studying various methods, the one chosen to estimate the discount rate will be the CAPM, since according to someone is the one that comes closest to reality

Coste Medio Ponderado de Capital más una prima de riesgo.

This model presents significant difficulties in determining its performance for three reasons; In the first place, the market rate no longer includes a risk factor; second, subjective correction factors afflict the projects, because they arbitrarily add an opportunity cost and third, the determination of the risk premium is subjective since It is currently difficult to determine due to the existing turbulent environment, as would occur if historical data were used because of volatility in the market.

3. Viability study

To begin this point, an overview of the organization is presented, as well as an explanation of what the investment project will consist of. In the Annexes section, Annex 1 and 2 show the Balance Sheet and the Profit and Loss Account Respectively, for the 2014 and 2015 periods.

The company in which the investment project is to be developed is an SME whose corporate purpose is the manufacture of ceramic material of all kinds, especially tiles and pavements, as well as their distribution and commercialization, as well as complementary complementary activities for such purposes. Since 2013 the evolution of this company has been favorable, yielding over time positive results in 2013 of 36,742 euros in 2014 27 thousand euros and in 2015 of 399 thousand euros the jump from one benefit to another has been considerable, Which is why at first glance there should be no drawbacks in the investment since it shows a steady evolution.

Negative issues to highlight about the company are the energy consumption costs, since the evolution of the price of these costs, which are required for the operation of the company, specifically to carry out the production process, in recent years has gone increasing. For this reason they must continually look for different actions to reduce any type of cost existing in the company, this is the reason that has triggered to make the following investment project. This is to acquire two automatic dozers that would form part of the existing machinery in the final process of the production of the product, since currently the work of depositing in boxes the tiles were done manually by the employees. In addition, the embedding machines incorporate a technology that has as a purpose to consume less electrical energy, with all the mentioned aspects it is intended that the incorporation of the two automatic dozers will reduce costs.

According to the opinion of the financial director of the organization to study the investment project, we would be facing a company of sustained growth that in the long term, thanks to the quality of the product will enable them to consolidate their position in the market and maintain the path of profits.

At this point we will first proceed to the determination of the discount rate, in section 3.1 and then in section 3.2 we will calculate the Net Cash Flows obtained, these in point 3.3 can be observed by calculating The NPV and the IRR if the project is viable. If the previous results were positive and the IRR was greater than the discount rate calculated in accordance with the main objective of determining whether the project will be viable, different feasibility analysis procedures will be carried out, including The scenario analysis carried out in point 3.4 and the sensitivity analysis carried out in 3.5.

In order to do so, the company has provided data in addition to the annual accounts for 2014 and 2015.

3.1 Discount rate determination

In the following section, the discount rate is to be determined, using the CAPM, the asset valuation model, since, as mentioned in its explanation, it is one of the most used methods by financial analysts, Its simplicity and logic on which it is based, as well as being one of the closest to reality. With the CAPM you get the performance of the company that is correlated with the market. The general equation of the model is:

$$E [R_i] = R_f + E [\beta M - R_f] \beta_i$$

Where:

$E [R_i]$ = Expected return on investment.

R_f = Risk-free return on assets

BM = Expected market return over the considered period of time

$[BM - R_f]$ = Value of the risk premium

β_i = Volatility coefficient

It can be seen that the uncertainty of the equation is the expected profitability of the investment project and that the formula is composed of: a risk-free asset, the expected risk premium of the market and the beta of the market. Next we proceed to explain how the data were obtained, taking into account the different dilemmas that have been exposed previously.

First, to find the value of the risk-free asset, the recommendations of Mascarenas (2015) mentioned in the definition have been followed. Therefore, the profitability of a Spanish State Bond with a 10-year maturity has been taken into account, this has been found through the Public Treasury website on May 25, 2017, the average interest rate of said asset Risk free was 0.590%.

Second, in order to determine the expected risk premium we pay attention to its constitution, it is equal to the expected average market return minus the risk-free return of the asset. In the previous point we solved a part, to determine the second component, the average expected market yield, which according to authors Brealey, Myers, Marcus and Mateos-Aparici (2010) the market portfolio must contain all the assets of the world economy And not only shares but also bonds, foreign securities or real estate assets. But in practice, financial analysts use financial market indices and usually the Standard & Pool Composite Index (the S & P 500). Reason for which this

index was chosen, which on May 25, 2017 yielded a dividend yield of 8.23%. Therefore, the value of the expected risk premium will be 7.64%.

Third, to get the beta of the equation, it is convenient to know what kind of company we are in, this is a company that, like so many in Castellón, is dedicated to ceramics. It is true that, in times not too distant, shortly before the crisis broke out, ceramic companies had as clients large companies dedicated to construction and that during this period these companies became strong in addition to provoking a growth not only of the companies themselves Existing ones but those that were new to the sector, since there was so much presence of this type of companies in the market, to differentiate and acclaim more customers had to differentiate by launching new products or modifying existing ones. Which to this day also do? After the crisis, construction has declined in Spain and many of the ceramic companies had to close, remaining in the market those who have decided to export to other territories where construction is booming, especially countries like Saudi Arabia, United Arab Emirates, Qatar, Dubai and Bahrain. It can be observed that we are facing a sector that depends a lot on the economy, mainly for the construction and followed by if in general the population does not own any wealth nor will they make reforms that require tiles in their houses or companies. Consequently, and referring to the company in which the Investment project has a small size and its client portfolio is present in 55 countries, therefore, we are facing an organization that has been open to the market. Of the market at all times. The design of its products is aimed at companies as well as individuals.

As it has not been possible to obtain historical data of companies of the ceramics that are listed on the stock market, the market and the position of the company in it have been studied. Based on the study in the sector of Basic materials, industry and construction, because according to the institution stock exchanges and markets, the denomination of this sector encompasses the companies engaged in some economic activity related to the extraction and / or treatment of minerals, Metals and their transformation, manufacture and assembly of equipment goods and general construction activities and construction materials.

For all that, the beta that has been found after reading different articles of analysts, approaching as much as possible to the reality, since finding a beta of a sector is general and complicated to adjust to the company, therefore must have Considering that this value is subjective because it is not listed on the stock market and that a change in it would imply a change in the CAPM result. The value of beta is 1.31 because it is a sector that depends on other sectors, although not all of its products go

solely and exclusively to construction companies if it is true that most of them is directed to new constructions.

Obtaining the different factors that are included in the CAPM equation, we can already calculate the value of the expected return on investment:

$$[R_i]=0,59\%+ [7,64\%] \times 1,31=0,1060=10,60\%$$

Determining the expected return on investment, we obtain that the discount rate to be used for the study, this is 10.60%.

3.2 Calculation Net Cash Flows

In the following section, Net Cash Flows will be calculated, only the charges and payments or expenses and revenues caused or belonging to the investment to be made will be taken into account. Increases or decreases of each of the items will be used in order to differentiate the ones that the company has, from those that would have in the case of making the investment. The objective of calculating Net Cash Flows is to know if the company should carry out the project or to evaluate other aspects that lead to profitability.

As mentioned in the introduction of the point being developed, the investment to be made is the acquisition of two automatic cash dispensers, which would result in an increase in fixed assets of € 217,935, which would be located in the final process of the production chain, Work, is done by the staff of the company. The time horizon that is proposed to make the study of the feasibility of the project is 10 years, because it is the useful life of automatic dozers. The patrimonial masses that will be altered with the investment project are explained below; the results of the same ones are obtained realizing a future projection of the predictions.

SALES

The fact of incorporating the automatic dozers is related to an increase of sales, since, at the moment they cannot satisfy all the demand because the packaging do it of manual way, causing that the requested orders cannot be reached. For this reason, with the incorporation of automatic dozers, an increase in sales is anticipated by the inclusion of new customers that can be admitted. It should be taken into account that each customer has a different billing, and not knowing how much corresponds to each one, has divided the number of customers into three classes, according to the quality; High, medium and low. The company has provided me with information to be able to classify in the three blocks the 1,500 clients that it currently has. In addition, we also obtained the amount of the sales figure corresponding to the years 2013, 2014 and 2015 that has been divided by the volume invoiced by each type of customer. Assuming

that during the last 3 periods the number of clients has not varied, the figures obtained are shown in Tables 1 and 2.

Table 1. Historical sales.

	2013	2014	2015
SALES	10.922.112,00	11.433.828,00	10.999.421,62

This table shows sales figures for the last three periods of the company.

To take into account the movements made in each year, an average of the average turnover between each year has been made, depending on the type of customer.

After a study of the demand made by the company, they concluded that with the two automatic dozers they will be able to supply 1% more of the current demand in the first year, and from the second year, sales will increase in 2% annually over the 10-year time horizon of the investment.

After having all the data we proceed to estimate the average billing by type of customer that will have along the investment thanks to the two automatic dozers, the results are shown in table 3.

Table 2. Sales Estimation Approach

NUMBER OF TOTAL CUSTOMERS	2013			2014			2015		
	HIGH	HALF	LOW	HIGH	HALF	LOW	HIGH	HALF	LOW
CUSTOMER CLASSIFICATION	30%	45%	25%	30%	45%	25%	30%	45%	25%
% OF CLASSIFICATION	450	675	375	450	675	375	450	675	375
NUMBER OF CUSTOMERS	45%	25%	30%	45%	25%	30%	45%	25%	30%
% BILLING	4.914.950,40	2.730.528,00	3.276.633,60	5.145.222,60	2.858.457,00	3.430.148,40	4.949.739,73	2.749.855,41	3.299.826,49
SALES	10.922,11	4.045,23	8.737,69	11.433,83	4.234,75	9.147,06	10.999,42	4.073,86	8.799,54
AVERAGE SALES	AVERAGE BILLING								
	HIGH	11.118,45							
	HALF	4.117,95							
	LOW	8.894,76							

In this table we can observe the approach taken to estimate the sales of the investment project.

Table 3. Estimation sales

ESTIMATION SALES											
TEMPORARY SHAFT	0	1	2	3	4	5	6	7	8	9	10
NUMBER OF CUSTOMERS	1500	1515	1545	1576	1608	1640	1673	1706	1740	1775	1811
INCREASE CUSTOMERS		15	30	31	32	32	33	33	34	35	36
CUSTOMER TYPE											
HIGH		5	9	9	9	10	10	10	10	10	11
HALF		7	14	14	14	14	15	15	15	16	16
LOW		4	8	8	8	8	8	8	9	9	9
TOTAL INCREASE CUSTOMER SALES		15	30	31	32	32	33	33	34	35	36
SALES											
HIGH		50.033,04	101.066,75	103.088,08	105.149,84	107.252,84	109.397,90	111.585,85	113.817,57	116.093,92	118.415,80
HALF		27.796	56.148	57.271	58.417	59.585	60.777	61.992	63.232	64.497	65.787
LOW		33.355	67.378	68.725	70.100	71.502	72.932	74.391	75.878	77.396	78.944
TOTAL INCREASE SALES		111.184,54	224.592,77	229.084,62	233.666,32	238.339,64	243.106,44	247.968,56	252.927,94	257.986,49	263.146,22

This illustrates the final value of the sales estimate.

AMORTIZATION

The purchase of the two automatic dozers is an endowment of the annual amortization. The calculations will be made in a common way, without differentiating by fitters. The amortization percentage is obtained from the amortization tables of the Corporate Income Tax Law, using the straight-line method of amortization defined in article 12.1 of the Corporate Tax Law and article 4 of the Corporate Income Tax Regulations. In general, in order to make it easier for companies to determine the deductions for corporate tax, they determine the depreciation according to the tables set forth in the Corporate Income Tax Law, which is why the amortization calculation has been used This method as I believe it is closer to reality. According to this law you can choose both a period and amortization coefficient that lies between the limits defined below:

Linear coefficient maximum: 12%, is in the table

Minimum linear coefficient: $100 / \text{maximum amortization period} = 100/18 = 6\%$

Period of maximum years: 18 years, is in the table

Minimum period of years: $100 / \text{Maximum amortization coefficient} = 100/12 = 8.33 \text{ years}$

According to the data provided by the company, the packers have a useful life of 10, this period is between the values determined in the previous paragraph, and the resulting coefficient is 10%. After the following calculations, table 4 Increase of amortization that will be effected for each year or what is the same the amortization corresponding to the automatic dozers:

Table 4. Fit machines amortization

Period	1	2	3	4	5	6	7	8	9	10
Amortization	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54	21.793,54
Value packers	196.141,90	174.348,35	152.554,81	130.761,26	108.967,72	87.174,18	65.380,63	43.587,09	21.793,54	0,00

En la tabla se muestra la amortización total correspondiente a las encajadoras.

PERSONAL EXPENSES

Although the number of employees in this section will decrease with the automatic dozers, they will be relocated to other sections of the production process. In addition, as mentioned in the sales section, an increase is expected Of these due to the incorporation of the new fixed assets due to the fact of supplying a greater demand, therefore this will have an impact on an increase of the employees. The amount is estimated in a total of 5 more employees in the company, throughout the investment. These will be distributed as follows:El primer año:

- 1 technical engineer in charge of the section of packaging and 1 commercial whose function will be to establish relations with new clients.
- The second year will include 2 more workers in plant.

- The third year, will require 1 administrative due to the workload that is anticipated in these exercises.

According to convenio colectivo de 2017 para la Industria de Azulejos, Pavimentos y Baldosas Cerámicas de la Comunidad Valenciana The balances to be received depending on the job position is:

- Professional group. 2. Controls and technical first level.

Technician and head of production in plants of great dimension, technical director in plants of small dimension, head of maintenance, responsible of design.

- Professional group 3. Coordinators and technicians. Commercial
- Professional group 5. Second level professionals

Operators of grinding, spray drying, pressing or extrusion processes, polish preparation and application, polishing.

Horneros, classifiers, drivers of forklifts, electromechanical tasks of elementary level or laboratory auxiliary.

- Professional group 6. Professionals. General criteria. They will include: manual operations or simple machines that do not require training
- Professional group 4. Professionals first level. Manual operations or simple machines that do not require training. Administrative

The estimation of the salary including the extra payments that have been made through the collective agreement for the Tile, Paving and Ceramic Tile industry of the Valencian Community, taking into account that wages are not modified over time. It is shown in table 5.

Table 5. Monthly and annual salary

JOB	Grupo profesional	SALARIO MENSUAL Y PAGA EXTRA	SALARIO ANUAL
Technical engineer	2	1.131,80	13.581,60
Commercial	3	1.113,64	13.363,68
Administrative	4	1.082,73	12.992,76
Plant worker	5	1.041,92	12.503,04
Plant worker	6	1.015,39	12.184,68

The table shows the monthly and annual salary plus the extra pay to be received by the new employees who joined the company after the acquisition of the two casters.

By making the appropriate calculations, the increase in the wage and salary account can be seen in Table 6 below.

Table 6. Personnel expenditure estimate

Period	1	2	3	4	5	6	7	8	9	10
Personal expenses	26.945,28	51.633,00	64.625,76	64.625,76	64.625,76	64.625,76	64.625,76	64.625,76	64.625,76	64.625,76

The table shows the increase in estimated personnel expenses that would be obtained in the case of carrying out the investment.

SUPPLIES

To obtain the expected value of the increase in provisioning for each of the future years, historical values have been used, that is, considering the sales that proportion was allocated to supplies in each year analyzed.

Table 7. Historical average percentage of procurement with respect to sales

HISTORICAL		2015	2014	
	SALES	10.999.421,62	11.433.828,44	
	SUPPLIES	3.652.225,41	4062245,22	Promedio
Ratio		33%	36%	34%

In the table it is possible to be observed the percentage that exists between the value of the sales on the amount of provisioning, next an average of both years was obtained.

The average calculation indicates that the supply of sales volume is 34%, this value will be used to estimate how much supply will be necessary in relation to the increase in sales volume as a result of the incorporation of the two automatic dozers.

FIXED COSTS

The same thing happens with the fixed costs, adding the difference by the incorporation in the automatic dozers of a device whose function is the one of the energetic saving. This reduction, according to data provided by the company accounts for 5% of total fixed costs, therefore, to make the estimate; I will first calculate how many the fixed costs on sales, as I did with the estimate of the supply. Then make this difference of 5% on fixed costs, leaving these calculations as follows:

Table 8. Historical average percentage of sales figures over fixed costs

HISTORICAL		2015	2014	
	SALES	10.999.421,62	11.433.828,44	
	FIXED COSTS	2.493.838,20	2.336.828,84	Promedio
Ratio		23%	20%	22%

In the table you can see the percentage that exists between the value of sales over fixed costs, then an average of the result between both years was obtained.

According to the estimate obtained the fixed costs will be reduced up to 17% on the total value of sales. To know what proportion of fixed costs corresponds to the packers, simply multiply that 17% that has been obtained by the increase in sales.

Table 9. Estimated fixed cost percentag

Average fixed historical cost	22%	
Energy saving	5%	TOTAL
Fixed cost estimación	17%	1.869.901,68

The table shows the percentage obtained to evaluate the fixed costs based on the estimated sales figure for each period.

WORKING CAPITAL

The working capital or working capital is a magnitude to be taken into account as it shows the capacity to meet the payment commitments. Its calculation is the difference between current assets and current liabilities. Current assets consist of inventories, treasury, short-term receivables and any liquid assets. On the other hand, current liabilities include short-term payment obligations. Next, the working capital required by the investment project is calculated, in order to obtain a margin of guarantee of the correct operation of the production process, to attend to the purchases and expenses that it will generate.

The working capital for the year 2015 was obtained, this is 2,810,508, representing sales on a percentage of 26%. In order to estimate this working capital, that 26% will be multiplied by the total estimated annual sales.

Table 10. Working capital exercise year 2015

	2015
Working capital	2.810.507,73
Sales estimate	26%

The table shows the working capital for the year 2015.

You can see the results obtained from the estimation of the working capital in table 10, this is positive before starting the project and during, this means that it has a current high asset and that can meet its obligations of payment in the short term Without problems, although if it is too high may exist idle resources and with it loss of profitability.

After analyzing the items necessary for the NCF calculation, the following table shows the data obtained.

Table 11. Net Cash Flows

Net Cash Flows	-217.935	-2.624	19.396	39.959	41.566	43.206	44.879	46.585	48.325	50.100	51.911
----------------	----------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

In the annexes section, Annex 3 represents the estimation of all the characters necessary to obtain the net cash flows, in addition also appear these.

3.3 Cálculo VPN and IRR e interpretación del resultado

Net Present Value (VNA)

Con los resultados obtenidos en el cálculo de los FNC, se ha obtenido un VAN negativo de 12.709. Éste resultado significa que no se van a obtener los resultados que se esperaban pues, un VAN negativo sugiere la no realización del proyecto ya que de hacerlo las pérdidas que se obtendrán si se dan los supuestos mencionados generará unas pérdidas de un valor equivalente al VAN obtenido.

Internal Rate Return (IRR)

In relation to the IRR, the value obtained is 9%. If this result is compared with the discount rate, it is observed that it is lower resulting in non-completion of the project because the minimum profitability required by the project is not reached.

3.4 Análisis de sensibilidad

In the next section, a sensitivity analysis will be performed with the objective of determining the sensitivity of the NPV to changes in particular variables used for the calculation of the FNC, i.e. keeping everything else constant, as the NPV varies if Changes a variable.

The variables to be modified are chosen because they are important to take into account for the company can know what would happen in the event that these assumptions occurred. The variable to be modified and its impact are shown below.

1. Increase sales.

According to data provided by the company, with the incorporation of automated dozers, demand could be covered in the first year by 1% more than it was doing and in subsequent years by 2% per year. We assume that these expectations are exceeded by increasing sales to 2% in the first year and 4% to the remaining ones. The NPV becomes positive and the IRR exceeds the discount rate in excess. The table of results of the modification of this variable can be found in the section of annexes, Annex 4.

2. Increase provisioning

The percentage of supply in relation to sales, assuming that the prices of the materials

that make up the supply of the company skyrocketed and increased by 40%.

As one would expect, the results are devastating, it follows that if the price of the raw material increased to 40% it would not be possible to carry out the investment.

A negative NPV and a TIR is observed well below the discount rate. The result of the alteration can be seen in Annex 5.

2. Decrease in fixed costs.

The machinery incorporates an instrument that reduces the energy consumption, in the following situation it is observed that if these costs did not decrease as the company expected it and also increased even more than those that were being made without the realization of the project, approximately 10% more. With this variation the NPV remains negative and the IRR is far from the discount rate. Full details of the modification can be found in Annex 6.

3.5 Analysis of scenarios

This section deals with another method of visualizing the risk, to carry it out, it follows the assumption that the FNC calculated in point 3.2 are independent of each other, in order to apply the Central Limit Theorem and to be able to make statistical inference about the same. The analysis of scenarios will be developed through a triangular distribution of the FNC, so that a range of values with three data will be known: pessimistic value, optimistic value and normal value.

- Pessimistic scenario: this will be an unfortunate situation in which all aspects decline, ie, the calculated expectations are not met. We would find ourselves in a daunting atmosphere for the company.
- Normal scenario: it would be the situation that initially was shaped for the calculation of the NCF; this circumstance is the one that is thought that it will probably happen.
- Optimistic scenario: It is the situation in which the company would find results still más favorables que en el escenario normal, sería un ambiente ideal.

PESIMISTA SCENARIO

The assumption that has been given for this scenario has been; Due to circumstances beyond the company, the increase in the number of customers is not expected, but only increased by 0.5% in the first year, 1% in the following year and 1.5% in the years Remaining of the project in addition both the fixed expenses increase by 20% over that calculated in the forecast and the costs of the provisioning also do up to 45%. The result obtained in the different variations can be seen in Annex 7.

Table 11. Net Cash Flows in Pessimistic Scenario

Net Cash Flows	-217.935	-26.327	-32.750	5.585	19.824	19.741	19.647	19.543	19.426	19.299	19.159
----------------	----------	---------	---------	-------	--------	--------	--------	--------	--------	--------	--------

NORMAL SCENARIO

This situation is the one calculated initially in section 3.2 where, from the exposed predictions the NCF was obtained.

Table 12. Net Cash Flows in Normal Scenario

Net Cash Flows	-217.935	-2.624	19.396	39.959	41.566	43.206	44.879	46.585	48.325	50.100	51.911
----------------	----------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

OPTIMIST SCENARIO

In this scenario it is considered an ideal situation where the company obtains a considerable volume of profits. For this it is assumed that the level of sales increases by 2% in the first year and for the following by 3% per year. In addition, with regard to the technology that incorporates the machinery for the reduction of energy costs is going to assume that they are reduced even more, up to 10%. With these assumptions, the customer base is actually increased, thereby achieving a high income and resulting in a positive NPV, which would allow the company to recover the investment in addition to obtaining profits. The different results of the modified variables are found in Annex 8.

Table 13. Net Cash Flows in Optimistic Scenario

Net Cash Flows	-217.935	13.333	67.489	89.999	93.912	97.942	102.093	106.369	110.772	115.308	119.981
----------------	----------	--------	--------	--------	--------	--------	---------	---------	---------	---------	---------

3.6 Behavior of NPV in probability

After assessing the different scenarios, pessimistic, optimistic and normal, we will analyze the behavior in NPV probability, assuming different starting hypotheses that will be discussed below.

The expectation of the FNC and the expectation of the NPV and the variance of the NPV are calculated, using the discount rate of 10.60%.

The FNC's hope is calculated using the following formula:

$$E(Q_j) = \frac{Q_{j\text{optimista}} + Q_{j\text{probable}} + Q_{j\text{pesimista}}}{3}$$

Being a triangular distribution it is assumed that the three scenarios have the same probability of occurrence, which is why they have the same importance.

The calculation of the variance of the FNC is done in the hope of the FNC obtained in the previous paragraph, using the following formula:

$$\sigma^2(Q_j) = \frac{(Q_{jc} - Q_{ja})^2 - (Q_{jb} - Q_{ja})(Q_{jc} - Q_{jb})}{18}$$

And the NPV expectation as:

$$E(VAN) = E(-A) + \sum_{j=1}^n \frac{E(Q_j)}{(1+k)^j}$$

Assuming that the FNCs are independent, the NPV variance will be calculated as:

$$\sigma^2(VAN) = \sigma^2(-A) + \sum_{j=1}^n \frac{\sigma^2(Q_j)}{(1+k)^{2j}}$$

The NPV expected is -4,956.06 and the expectation of the TIR is approaching, but it still feels less than the discount rate, with a value of 10%.

Table 14. Calculation of NPV hope and NPV variance

E(VAN)	-4.956,06
E(TIR)	10%
VAR(VAN)	1.501.155.835
Desves(VAN)	38.744,75

The different probabilities of the value that the NPV could take are then calculated. The odds chosen are as follows:

- Probability that the NPV is less than 0
- Probability that the NPV is greater than 0
- Probability that the NPV is greater than 290,000
- Probability that VAN is between 0 and 290,000

The probability of 290,000 is sought since the maximum that has been obtained in the previous analyzes is 285,973. In addition, the discount rate of 10.60% previously calculated was used to calculate the data.

The results that have been obtained are shown below, in Annex 9 is the procedure carried out to obtain those results.

Table 15. NPV probability behavior

	z	PROBABILITY
P(E(VNP)>0)	0,13	45%
P(E(VNP)<0)		55,09%
P(E(VNP)>290.000)	7,61	0,00%
P(0<E(VNP)<290.000)		45%

Once the results were obtained, it is observed that the probability that the NPV is greater than 300,000 is zero; approximately 55% of the results indicate that a negative NPV is going to be obtained, against 45% of the possibility that it is positive with NPV Limit of 300,000. The NPV expectation obtained remains negative, although much less than that obtained in the calculation of Net Cash Flows, the fact that the NPV may have a lower value is positive. However, with the results obtained, it would be concluded that it would not be a good option to carry out the project since in all the analyzes carried out so far the result is negative.

4. Financial planning

4.1 Definition

Up to this point the feasibility of the investment project has been studied in order to know if it should be done. With all the calculations obtained it can be concluded that the realization of the project would be profitable for the company. Once the investment decision is made, financial planning should be developed with the aim of identifying how it would be better for the company to finance the investment project.

What is financial planning?

Financial planning is a business tool used for decision making. Its objective is to elaborate a financial plan detailing the financial tactics to be followed by the company that performs the project in addition to analyzing its liquidity through the future forecast of the financial statements.

The final result to be obtained from financial planning is the strategy to be followed, once the positive and negative effects that are given considering the decision taken in reference to the financing or investment has been studied.

Different ways of dealing with investment will also be studied in order that the company does not have liquidity problems, obtaining the sources of financing necessary to carry out the activity, without there being idle resources, i.e., that they are not specified and

are Have already claimed that it would lead to a decline in profitability.

In summary, the task to be performed at this point is the search for sources of financing that is optimal and sufficient so that there are no liquidity problems. To achieve these following requirements must be followed:

- It must be foreseen as probable and improbable, beneficial or harmful to the company
- Training Optimal Financing
- Determine if the path followed is feasible and if not modify it so that it is. Se van a formular diferentes estrategias basadas en supuestos futuros, determinado para ello la planificación mediante procesos de prueba y error.

In addition, the capital budget will be discussed to assess, identify and develop profitable investment opportunities for the company, checking whether the cash flows generated by the investment exceed the funding flows required to execute the project.

What would happen if a capital budget were wrongly developed?

The consequences would be extremely serious, since it can mean a success or failure for a company, for example, in those industrial enterprises that require a large disbursement in assets, if the decision on what type of Immobilized invest, would lead to great losses and can be translated into bankruptcy of the company.

4.2. Determination of the profit and loss account and the capital budget

The company's income statement and capital budget are then analyzed for a three-year period, whereby different financing channels and the effect they will have on the company will be studied.

It is important that the feasibility of the project be cost-effective to develop this section. Given that the results obtained were in all the analyzes have been negative except for the optimistic scenario, it will be the one used for the development of this point, since if such circumstances occurred the project could be viable. The net cash flows that were obtained can be seen in Annex 11.

To determine the provisional profit and loss account and the capital budget I have based myself on 4 proposals:

- ✓ Without external financing.
- ✓ Capital increase
- ✓ Long-term French loan.
- ✓ Capital increase + Long-term French loan.

Due to the situation in which the company is, sustained growth, it does not distribute

dividends since the benefits obtained are reinvested in society.

Without external financing.

In this case the company does not obtain financing from others; it deals with the investment with its own resources. The results obtained in the profit and loss account and capital budget are as follows:

Table 16. Profit and loss account without external financing

INCOME STATEMENT				
Moment	1	2	3	4
Sales and other incomes	222.369	340.225	350.431	360.944
Operating variable costs	106.331	173.093	189.730	193.483
Operating fixed costs	47.489	61.107	62.286	63.501
Amortization	21.794	21.794	21.794	21.794
Fixed costs	25.695	39.313	40.493	41.708
Other				
EBIT	68.549	106.024	98.415	103.960
Financial income	0	0	0	0
Financial expenses	0	0	0	0
EBT	68.549	106.024	98.415	103.960
Taxes	19.194	29.687	27.556	29.109
EAT	49.356	76.338	70.859	74.851
Distribución de resultados				
Dividends	0	0	0	0
Reserves	49.356	76.338	70.859	74.851
Self-funding (Amortization + Reserves)	71.149	98.131	92.653	96.645

Table 17. Capital budget without external financing

Moment	1	2	3	4
Investment budget	275.751	30.642	2.654	2.733
Investments	217.935	0	0	0
Variation of rolling fund	57.816	30.642	2.654	2.733
Financial amortization				
Other				
Financial budget	71.149	98.131	92.653	96.645
Self-funding by reserves	49.356	76.338	70.859	74.851
Self-funding by amortizations and provisions	21.794	21.794	21.794	21.794
Disinvestments (net book value)				
Extern financing				
Other				
Surplus of the period	-204.602	67.489	89.999	93.912
Surplus acumulated	-204.602	-137.114	-47.115	46.797

The company has obtained positive results for all periods in the profit and loss account, as there is no dividend distribution; the total result would be allocated to reserves that will be included in the value of the company's net worth.

In relation to the capital budget, an accumulated deficit is obtained during the first three years that triggers an unsustainable situation, it is possible that liquidity is required for those years, therefore this option would not be advisable since to realize the investment only With its own resources may not be advantageous even though the surplus per period of the last three years will supply the deficit so high due to the initial outlay that silk.

Capital increase

In this case, the shareholders of the company inject capital in order to make the investment. The results obtained are shown below:

Table 18. Pension income statement with capital increase

INCOME STATEMENT				
Moment	1	2	3	4
Sales and other incomes	222.369	340.225	350.431	360.944
Operating variable costs	106.331	173.093	189.730	193.483
Operating fixed costs	47.489	61.107	62.286	63.501
Amortization	21.794	21.794	21.794	21.794
Fixed costs	25.695	39.313	40.493	41.708
Other				
EBIT	68.549	106.024	98.415	103.960
Financial income	0	0	0	0
Financial expenses	0	0	0	0
EBT	68.549	106.024	98.415	103.960
Taxes	19.194	29.687	27.556	29.109
EAT	49.356	76.338	70.859	74.851
Distribución de resultados				
Dividends	0	0	0	0
Reserves	49.356	76.338	70.859	74.851
Self-funding (Amortization + Reserves)	71.149	98.131	92.653	96.645

Table 19. Capital budget with capital increase.

Moment	1	2	3	4
Investment budget	275.751	30.642	2.654	2.733
Investments	217.935	0	0	0
Variation of rolling fund	57.816	30.642	2.654	2.733
Financial amortization				
Other				
Financial budget	-146.786	98.131	92.653	96.645
Self-funding by reserves	49.356	76.338	70.859	74.851
Self-funding by amortizations and provisions	21.794	21.794	21.794	21.794
Disinvestments (net book value)				
Extern financing	-217.935			
Other				
Surplus of the period	-422.538	67.489	89.999	93.912
Surplus acumulated	-422.538	-355.049	-265.050	-171.139

With regard to the profit and loss account, profits are obtained for all periods, if reference is made to the capital budget, when a capital increase is made, there is a deficit in the first considerably elevated period that is dragged throughout the entire period. Forecast making the accumulated deficit, although in the last three years there is a surplus.

Long-term French loan

In this case, the company has the purpose of a loan, the characteristics of this are:

- Long-term French loan
- Interest Rate 2%
- Investment: € 217,395
- Duration: 10 years

Table 20. French Loan Repayment

Period	Amortizative term	Interests	Amortizin share	Total amortized	Outstanding capital
0					217.935,44
1	24.262,00	4.358,71	19.903,29	19.903,29	198.032,15
2	24.262,00	3.960,64	20.301,35	40.204,64	177.730,80
3	24.262,00	3.554,62	20.707,38	60.912,02	157.023,42
4	24.262,00	3.140,47	21.121,53	82.033,55	135.901,89
5	24.262,00	2.718,04	21.543,96	103.577,51	114.357,93
6	24.262,00	2.287,16	21.974,84	125.552,34	92.383,10
7	24.262,00	1.847,66	22.414,33	147.966,68	69.968,76
8	24.262,00	1.399,38	22.862,62	170.829,30	47.106,14
9	24.262,00	942,12	23.319,87	194.149,17	23.786,27
10	24.262,00	475,73	23.786,27	217.935,44	0,00

Table 21. Income statement with French loan

INCOME STATEMENT				
Moment	1	2	3	4
Sales and other incomes	222.369	340.225	350.431	360.944
Operating variable costs	106.331	173.093	189.730	193.483
Operating fixed costs	47.489	61.107	62.286	63.501
Amortization	21.794	21.794	21.794	21.794
Fixed costs	25.695	39.313	40.493	41.708
Other				
EBIT	68.549	106.024	98.415	103.960
Financial income	0	0	0	0
Financial expenses	4.359	3.961	3.555	3.140
EBT	64.191	102.064	94.861	100.820
Taxes	17.973	28.578	26.561	28.230
EAT	46.217	73.486	68.300	72.590
Distribución de resultados				
Dividends	0	0	0	0
Reserves	46.217	73.486	68.300	72.590
Self-funding (Amortization + Reserves)	68.011	95.279	90.093	94.384

Table 22. Capital budget is loan

Moment	1	2	3	4
Investment budget	295.655	50.944	23.361	23.855
Investments	217.935	0	0	0
Variation of rolling fund	57.816	30.642	2.654	2.733
Financial amortization	19.903	20.301	20.707	21.122
Other				
Financial budget	285.946	95.279	90.093	94.384
Self-funding by reserves	46.217	73.486	68.300	72.590
Self-funding by amortizations and provisions	21.794	21.794	21.794	21.794
Disinvestments (net book value)				
Extern financing	217.935			
Other				
Surplus of the period	-9.708	44.336	66.732	70.529
Surplus acumulated	-9.708	34.627	101.359	171.888

In the income statement it is observed that despite the payment of financial interest for the loan received to finance the investment, there are still benefits. It is considered as a good option, since if we look at the capital budget we only see a negative result accumulated in the first period, in addition this deficit is not very high and is solved in the short term.

Capital increase + loan

In this case, the company would borrow half of the value of the fixed assets to the partners and the other part is financed through a bank loan.

The characteristics of the loans are those mentioned in the previous section, with the difference that the loan amounts to € 108,968. The amortization table obtained is shown below.

Table 23. Loan Repayment Schedule

Period	Amortizative term	Interests	Amortizin share	Total amortized	Outstanding capital
0					108.967,72
1	12.131	2179,35	9.951,64	9.951,64	99.016,08
2	12.131	1980,32	10.150,68	20.102,32	88.865,40
3	12.131	1777,31	10.353,69	30.456,01	78.511,71
4	12.131	1570,23	10.560,76	41.016,77	67.950,95
5	12.131	1359,02	10.771,98	51.788,75	57.178,97
6	12.131	1143,58	10.987,42	62.776,17	46.191,55
7	12.131	923,831	11.207,17	73.983,34	34.984,38
8	12.131	699,688	11.431,31	85.414,65	23.553,07
9	12.131	471,061	11.659,94	97.074,58	11.893,14
10	12.131	237,863	11.893,14	108.967,72	0,00

Table 24. Allowance for loan losses with capital increase and loan

INCOME STATEMENT				
Moment	1	2	3	4
Sales and other incomes	222.369	340.225	350.431	360.944
Operating variable costs	106.331	173.093	189.730	193.483
Operating fixed costs	47.489	61.107	62.286	63.501
Amortization	21.794	21.794	21.794	21.794
Fixed costs	25.695	39.313	40.493	41.708
Other				
EBIT	68.549	106.024	98.415	103.960
Financial income	0	0	0	0
Financial expenses	2.179	1.980	1.777	1.570
EBT	66.370	104.044	96.638	102.390
Taxes	18.584	29.132	27.059	28.669
EAT	47.786	74.912	69.579	73.721
Distribución de resultados				
Dividends	0	0	0	0
Reserves	47.786	74.912	69.579	73.721
Self-funding (Amortization + Reserves)	69.580	96.705	91.373	95.514

Table 25. Capital budget with capital increase and loan

Moment	1	2	3	4
Investment budget	285.703	40.793	13.007	13.294
Investments	217.935	0	0	0
Variation of rolling fund	57.816	30.642	2.654	2.733
Financial amortization	9.952	10.151	10.354	10.561
Other				
Financial budget	287.515	96.705	91.373	95.514
Self-funding by reserves	47.786	74.912	69.579	73.721
Self-funding by amortizations and provisions	21.794	21.794	21.794	21.794
Disinvestments (net book value)				
Extern financing	217.935			
Other				
Surplus of the period	1.812	55.912	78.365	82.220
Surplus acumulated	1.812	57.725	136.090	218.310

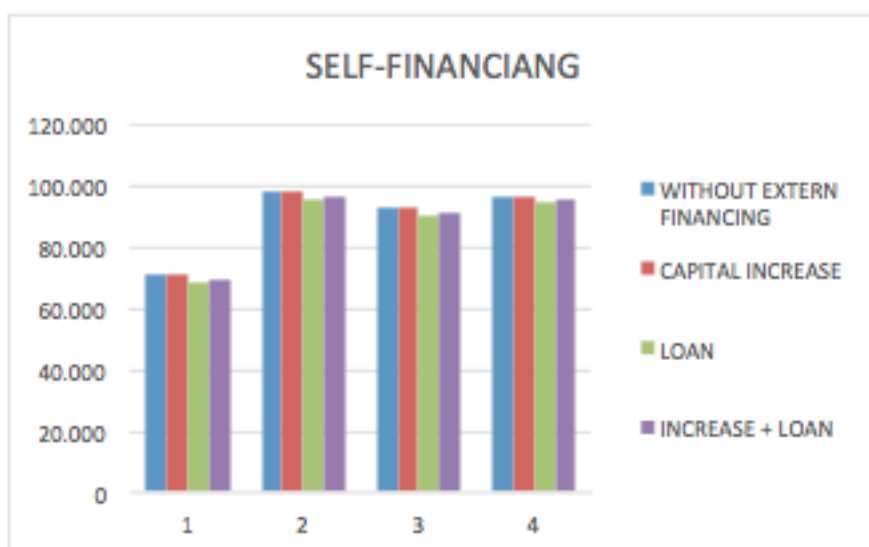
This case would also be a good option to consider since no deficit is observed neither accumulated nor per period. According to the data obtained would not have problems of liquidity being able to face, without apparent problems, the investment.

4.3 Choice of the best proposal

In order to know which method is most convenient, different graphs are then plotted to see the results obtained more clearly.

Self-financing is defined as the set of financial resources that the company obtains by itself without having to resort to sources of external financing. This external financing consists mainly of amortization and reserves, which are the retained earnings of previous years. The advantage in using this method is to reduce dependence on the outside.

Graphic 1. Self-financing

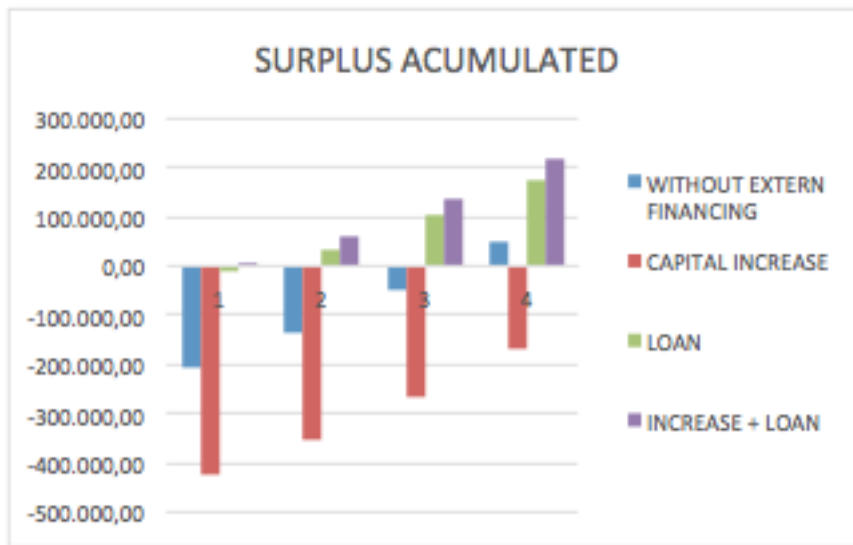


This graph presents the self-financing of each of the options explained above for each period studied.

Observing the graph it can be determined that for all cases in all periods have positive self-financing. The loan option has a lower self-financing than other cases; this is due to the payment of interest on the loan received. The highest self-financing occurs in the case of self-financing and capital increase; this is given for the reason that has already been explained, the payment of interest.

As for the accumulated surplus, this is obtained from the difference between the financing budget and the investment budget of the company, through the funding obtained, can cope with the investment made. The surplus (deficit) accumulated in the different periods in the cases studied is illustrated.

Graphic 2. Surplus acumulated



This graph shows the accumulated surplus in each period for the different Options previously studied.

Surplus is shown in all periods when capital increases occur, as in the case of no external financing, although the latter has a surplus in the last period, this means that the company cannot cope with the investment when you want to carry out with your own means. For both loan and loan plus capital increase there is a surplus in all periods, but for the last case mentioned the surplus is higher since the value of the loan is reduced by half.

To conclude this section, we will comment on the conclusions that have been reached after analyzing the different situations regarding financing.

Considering the option that the company wants to optimize the capital budget, so that all the financing obtained is directed to the project, the most convenient option, according to data obtained, would be the capital increase plus loan since it is observed a Surplus in all periods, although it must be taken into account that the fact of requiring a capital increase will mean offering shareholders a reward. And with respect to the negotiation of the loan with the bank, it can be supported by the strength that the company presents in terms of liquidity, as can be seen in the ratios obtained through the annual accounts.

Tabla 26. Liquidity ratio

LIQUIDITY ANALYSIS	
Working capital	2.810.508
Current ratio	1,74
Quick ratio	1,67

For instance, the Current ratio symbolizes the ability of the company to generate funds that allow it to meet its obligations in the future; this value must be close to 2 to meet the condition of the exposed. As you can see the current ratio offered by the company is 1'74, value close to 2.

All this shows that the company following this recommendation will be able to cope with the investment of the project.

5. Conclusion

Then, the different conclusions will be drawn according to the data that have been obtained throughout the investment project, as well as a personal opinion on the solution that it deems convenient.

If we focus attention on business activity, it has evolved favorably over time, this can be seen in the growth of profits of the income statement in the periods of 2013 to 2015 in addition to the ratios that have been obtained Favorable all of them. But the fact that a company evolves correctly does not mean that all the projects that it is going to realize are profitable must make a detailed study of each of them in order that the good results were not turned against.

For this reason, the company has decided to study the investment project of 2 automatic dozers, whose objective is to be able to take care of all the demand that is required to them since at the moment they cannot do it because this function, that of fitting the tile, they do it Of manual form, being this very expensive in time and physical effort on the part of the workers.

The main objective of this project is to be able to reach a greater number of applicants because they will be able to finish the production of the product in a faster and effective way, besides reducing the consumption of energetic costs since in the fit machines incorporates a device that minimizes this one.

The method of dynamic analysis has been the criterion selected for the study of the investment project; this method corresponds with the tools VAN and TIR. The use of these criteria allows knowing the result of an investment when the current values are reasonable.

For the application of the net present value criterion, a discount rate has been calculated using the CAPM. With this rate the Net Cash Flows that have been obtained through the difference between the expenses and the future revenues that the company estimates obtain are deducted.

Analyzed all mentioned aspects and obtained the corresponding results, it is observed that greater benefits are required to be able to cope with the expenses that the investment entails. In the situation where the estimated data were the real, the situation in which it was found is considered unprofitable since the IRR obtained despite being positive is lower than the discount rate, in addition not enough profits are obtained to be able to recover in the ten years that the project lasts, the initial investment.

One possible solution to increase this income would be to carry out an effective publicity campaign with the aim of attracting a larger number of applicants, since it is not enough to carry out the investment.

As for the financing of the machinery, it will be effective for the company, if it is made through external financing, shareholders and loan as mentioned in the conclusions of that point.

In my opinion the dynamic analysis method provides additional information to assess the risk of the assets to be acquired when it is really difficult to make a prediction about the rate of depreciation of the investment since the election will always be debatable. In addition, by homogenizing the net cash flows at the same moment of time, it reduces to the same unit of measure amounts of money generated at different times of time. I also consider positive the introduction of net cash flows with negative sign at different times of the time horizon of the investment without distorting the meaning of the final result.

Despite the results obtained, the company should move forward with the project since, if this company is currently well positioned in the market, and can do a good advertising program and reach with it, enough clients to be able to increase the Income, this project would be beneficial, in addition to contribute to the environment with the fact of wanting to reduce energy consumption.

6. Bibliography

Aragó Manzana, V., Balaguer Franch, M., Cabedo Semper, J., Matallín Sáez, J. and Soler Domínguez, A. (2012). Dirección financiera. Ed. Low cost books. Valencia.

Brealey, R.A., Myers, S.C., Marcus, A.J. and Mateos-Aparicio, P. (2010) Finanzas Corporativas. España: Mc Graw Hill.

Mascareñas, J. (2015): El coste del capital. *Monografías de Juan Mascareñas sobre Finanzas Corporativas* nº 26. ISSN: 1988-1878. Disponible en: <http://www.juanmascareñas.eu/monograf.htm>.

Damodaran, A. (2013) Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2013 Edition (March 23, 2013). Disponible en; SSRN: <http://ssrn.com/abstract=2238064> or <http://dx.doi.org/10.2139/ssrn.2238064>

Bolsas y mercados españoles. *Clasificación sectorial bursátil descripción general y especificaciones pos subsector*, 2015. Disponible en: <http://www.bolsamadrid.es/docs/Acciones/sect.pdf>

7. Attachements

Annex 1. Balance Sheet periods 2014 and 2015

ASSETS	2015	2014
A) NON-CURRENT ASSETS	1.086.690,25	588.643,02
I. Intangible assets	16.717,98	6.130,33
II. Property, plant and equipment	1.034.807,65	515.313,09
V. Non-current investments	12.187,00	41.668,92
VI. Deferred tax	22.977,62	25.530,68
B) CURRENT ASSETS	6.584.858,01	8.186.068,31
II. Inventories	2.287.664,70	2.112.970,36
1. Goods for resale	157.779,57	180.130,99
2. Raw materials and other supplies	139.034,51	144.373,68
4. Finished goods	1.990.850,62	1.788.465,69
III. Trade and other receivables	2.404.265,27	3.434.692,16
1. Trade receivables	2.206.722,51	3.205.171,67
5. Current tax assets	111,43	111,43
6. Public entities, other	197.431,33	229.409,06
V. Current investments	0,00	1.165.066,47
2. Loans to companies	0,00	933.683,72
5. Other financial assets	0,00	231.382,75
VII. Cash and cash equivalents	1.892.928,04	147.339,35
1. Cash	1.892.928,04	147.339,35
TOTAL ASSETS (A+B)	7.671.548,26	8.774.711,33

EQUIPTY AND LIABILITIES		
A) EQUIPTY	3.584.103,01	3.702.308,25
A-1) Capital and reserves without valuation adjustments	3.584.103,01	3.702.308,25
I. Capital	60.200,00	60.200,00
1. Registered capital	60.200,00	60.200,00
III. Reserves	3.642.108,25	3.615.426,81
1. Legal and statutory reserves	21.071,43	21.071,43
2. Other reserves	3.621.036,82	3.594.355,38
IV. (Own shares and equity holdings)	-517.025,00	0,00
VII. Profit/(loss) for the period	398.819,76	26.681,44
B) NON- CURRENT LIABILITIES	313.094,97	24.134,52
II. Non-current payables	301.565,27	14.051,08
2. Debts with financial institutions	0,00	14.051,08
3. Financial lease payables	224.325,77	0,00
5. Other financial liabilities	77.239,50	0,00
IV. Deferred tax liabilities	11.529,50	10.083,44
C) CURRENT LIABILITIES	3.774.350,28	5.048.268,56
III. Current payables	247.279,95	665.951,60
2. Debts with financial institutions	142.677,30	619.151,60
3. Finance lease payables	62.784,23	0,00
5. Other financial liabilities	41.818,42	46.800,00
V. Trade and other payables	3.527.070,33	4.382.316,96
1. Suppliers	3.047.443,35	4.043.588,24
4. Personnel (salaries payable)	233.472,24	229.036,69
5. Current tax liabilities	102.397,27	13.074,25
6. Public entities, other	143.757,47	96.617,78
TOTAL EQUIPTY AND LIABILITIES (A+B+C)	7.671.548,26	8.774.711,33

Annex 2. Profit and loss account for 2014 and 2015

	2015	2014
1. Revenue	10.999.421,62	11.433.828,44
a) Sales	10.999.421,62	11.433.828,44
2. Changes in inventories of finished goods and work in progress	202.384,93	287.327,34
4. Supplies	-3.652.225,41	-4.062.245,22
5. Other operating income	20.374,42	78.692,58
6. Personal expenses	-2.256.537,62	-2.085.156,39
7. Other operating expenses	-3.969.821,67	-4.574.313,64
a) External services	-3.839.692,36	-4.440.148,37
b) Taxes	-20.985,98	-18.573,51
c) Losses, impairment and changes in trade provisions	-109.143,33	-115.591,76
8. Amortisation and depreciation	-107.171,27	-117.507,18
11. Impairment and gains/(losses) on disposal of fixed assets	-6.130,32	0,00
Other results	-252,35	0,00
A) RESULTS FROM OPERATING ACTIVITIES	1.230.042,33	960.625,93
12. Finance income	971,07	2.985,77
b) Marketable securities and other financial instruments	971,07	2.985,77
13. Finance expenses	-14.012,60	-29.695,68
b) Other	-14.012,60	-29.695,68
14. Change in fair value of financial instruments	-29.481,92	0,00
b) Proceeds from available-for-sale financial assets	-29.481,92	0,00
15. Exchange gains/(losses)	2.034,12	-497,09
16. Impairment and gains/(losses) on disposal of financial instruments	-684.144,38	-901.827,00
a) Impairment and losses	-684.144,38	-901.827,00
B) NET FINANCE INCOME/(EXPENSES)	-724.633,71	-929.034,00
C) PROFIT/(LOSS) BEFORE INCOME TAX	505.408,62	31.591,93
17. Income tax expense	-106.588,86	-4.910,49
PROFIT/(LOSS) OF THE PERIOD	398.819,76	26.681,44

Annex 3. Net Cash Flows

	0	1	2	3	4	5	6	7	8	9	10	
Sales		111.185	224.593	229.085	233.666	238.340	243.106	247.969	252.928	257.986	263.146	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626	
Supplies	34%	37.803	76.362	77.889	79.447	81.035	82.656	84.309	85.995	87.715	89.470	
Fixed cost		18.407	37.182	37.925	38.684	39.457	40.247	41.052	41.873	42.710	43.564	
Taxable base		6.236	37.623	26.851	29.117	31.427	33.784	36.188	38.641	41.142	43.693	
Tax	28%	1.746	10.534	7.518	8.153	8.800	9.460	10.133	10.819	11.520	12.234	
Net profit		4.490	27.089	19.333	20.964	22.628	24.325	26.056	27.821	29.622	31.459	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Working capital	0,00	28.908	58.394	59.562	60.753	61.968	63.208	64.472	65.761	67.076	68.418	
DWorking capital	26%	28.908	29.486	1.168	1.191	1.215	1.239	1.264	1.289	1.315	1.342	
Net Cash Flows		-217.935	-2.624	19.396	39.959	41.566	43.206	44.879	46.585	48.325	50.100	51.911

Annex 4. Sales increases

	0	1	2	3	4	5	6	7	8	9	10
Sales		222.369	453.633	471.778	490.649	510.275	530.686	551.914	573.990	596.950	620.828
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626
Supplies	34%	75.605	154.235	160.405	166.821	173.494	180.433	187.651	195.157	202.963	211.082
Fixed cost		12.885	26.027	26.548	27.079	27.620	28.173	28.736	29.311	29.897	30.495
Taxable base		85.140	199.944	198.407	210.331	222.742	235.661	249.108	263.104	277.671	292.832
Tax	28%	23.839	55.984	55.554	58.893	62.368	65.985	69.750	73.669	77.748	81.993
Net profit		61.301	143.960	142.853	151.438	160.374	169.676	179.358	189.435	199.923	210.839
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794
Working capital	0,00	56.818	115.910	120.546	125.368	130.383	135.598	141.022	146.663	152.529	158.630
DWorking capital	26%	56.818	59.091	4.636	4.822	5.015	5.215	5.424	5.641	5.867	6.101
Net Cash Flows		-217.935	26.276	106.662	160.010	177.153	186.254	195.727	205.587	215.850	226.532

VAN	691.114
TIR	49,36%

Annex 5. Increase in supply

	0	1	2	3	4	5	6	7	8	9	10	
Sales		111.185	224.593	229.085	233.666	238.340	243.106	247.969	252.928	257.986	263.146	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626	
Supplies	48%	53.369	107.805	109.961	112.160	114.403	116.691	119.025	121.405	123.834	126.310	
Fixed cost		18.407	37.182	37.925	38.684	39.457	40.247	41.052	41.873	42.710	43.564	
Taxable base		-9.330	6.180	-5.221	-3.597	-1.940	-251	1.473	3.231	5.024	6.852	
Tax	28%	-2.612	1.730	-1.462	-1.007	-543	-70	412	905	1.407	1.919	
Net profit		-6.717	4.450	-3.759	-2.590	-1.397	-180	1.060	2.326	3.617	4.934	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Working capital	0,00	28.908	58.394	59.562	60.753	61.968	63.208	64.472	65.761	67.076	68.418	
DWorking capital	26%	28.908	29.486	1.168	1.191	1.215	1.239	1.264	1.289	1.315	1.342	
Net Cash Flows		-217.935	-13.832	-3.243	16.867	18.013	19.182	20.374	21.590	22.830	24.095	25.386

VNP	-145.996
IRR	-4,76%

Annex 6. Increase fixed costs

	0	1	2	3	4	5	6	7	8	9	10	
Sales		111.185	224.593	229.085	233.666	238.340	243.106	247.969	252.928	257.986	263.146	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626	
Supplies	34%	37.803	76.362	77.889	79.447	81.035	82.656	84.309	85.995	87.715	89.470	
Fixed cost		35.084	70.871	72.288	73.734	75.208	76.713	78.247	79.812	81.408	83.036	
Taxable base		-10.441	3.934	-7.511	-5.933	-4.324	-2.682	-1.007	701	2.444	4.221	
Tax	28%	-2.924	1.102	-2.103	-1.661	-1.211	-751	-282	196	684	1.182	
Net profit		-7.518	2.833	-5.408	-4.272	-3.113	-1.931	-725	505	1.760	3.039	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Working capital	0,00	28.908	58.394	59.562	60.753	61.968	63.208	64.472	65.761	67.076	68.418	
DWorking capital	26%	28.908	29.486	1.168	1.191	1.215	1.239	1.264	1.289	1.315	1.342	
Net Cash Flows		-217.935	-14.632	-4.860	15.217	16.330	17.466	18.623	19.804	21.009	22.238	23.491

VNP	-155.517
IRR	-6,09%

Annex 7. Pessimistic scenario

	0	1	2	3	4	5	6	7	8	9	10
Sales		55.592	111.740	169.287	171.826	174.403	177.020	179.675	182.370	185.106	187.882
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626
Supplies	45%	25.017	50.283	76.179	77.322	78.482	79.659	80.854	82.066	83.297	84.547
Fixed cost		35.084	70.871	72.288	73.734	75.208	76.713	78.247	79.812	81.408	83.036
Taxable base		-26.302	-31.207	-974	-1.023	-1.080	-1.145	-1.219	-1.302	-1.394	-1.495
Tax	28%	-7.365	-8.738	-273	-286	-302	-321	-341	-365	-390	-418
Net profit		-33.667	-39.945	-1.246	-1.309	-1.382	-1.466	-1.561	-1.666	-1.784	-1.913
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794
Working capital		14.454	29.053	44.015	44.675	45.345	46.025	46.715	47.416	48.127	48.849
DWorking capital	26%	14.454	14.599	14.962	660	670	680	690	701	711	722
Net Cash Flows		-217.935	-26.327	-32.750	5.585	19.824	19.741	19.647	19.543	19.426	19.299

VNP	-195.348
IRR	-9,49%

Annex 8. Optimistic scenario

	0	1	2	3	4	5	6	7	8	9	10	
Sales		222.369	340.225	350.431	360.944	371.773	382.926	394.414	406.246	418.433	430.986	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Personal expenses		26.945	51.633	64.626	64.626	64.626	64.626	64.626	64.626	64.626	64.626	
Supplies	36%	79.386	121.460	125.104	128.857	132.723	136.705	140.806	145.030	149.381	153.862	
Fixed cost		25.695	39.313	40.493	41.708	42.959	44.248	45.575	46.942	48.351	49.801	
Taxable base		68.549	106.024	98.415	103.960	109.672	115.554	121.614	127.855	134.283	140.904	
Tax	28%	19.194	29.687	27.556	29.109	30.708	32.355	34.052	35.799	37.599	39.453	
Net profit		49.356	76.338	70.859	74.851	78.964	83.199	87.562	92.055	96.684	101.451	
Amortization		21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	21.794	
Working capital		57.816	88.458	91.112	93.846	96.661	99.561	102.548	105.624	108.793	112.056	
DWorking capital	26%	57.816	30.642	2.654	2.733	2.815	2.900	2.987	3.076	3.169	3.264	
Net Cash Flows		-217.935	13.333	67.489	89.999	93.912	97.942	102.093	106.369	110.772	115.308	119.981

VNP	285.973
IRR	30,48%

Annex 9. Probability procedure

	0	1	2	3	4	5	6	7	8	9	10
OPTIMISTIC		13.333	67.489	89.999	93.912	97.942	102.093	106.369	110.772	115.308	119.981
NORMAL	-217.935	-2.624	19.396	39.959	41.566	43.206	44.879	46.585	48.325	50.100	51.911
PESSIMISTIC		-26.327	32.750	-5.585	-19.824	-19.741	-19.647	-19.543	-19.426	-19.299	-19.159

	0	1	2	3	4	5	6	7	8	9	10
E(Qj)	-217.935	-5.206	39.878	41.457	38.551	40.469	42.441	44.470	46.557	48.703	50.911
VAR(Qj)		66.372.948	102.722.942	380.958.341	540.126.680	577.987.461	618.270.139	661.125.393	706.713.356	755.204.216	806.778.850
Desves(Qj)		8.147	10.135	19.518	23.241	24.041	24.865	25.712	26.584	27.481	28.404

VAN	-12.709,44
TIR	9%
K	10,60%

E(VAN)	-4.956,06
E(TIR)	10%
VAR(VAN)	1.501.155.835
Desves(VAN)	38.744,75

	z	PROBABILIDAD
P(E(VNP)>0)	0,13	45%
P(E(VNP)<0)		55,09%
P(E(VNP)>290.000)	7,61	0,00%
P(0<E(VNP)<290.000)		45%