

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

ECOLE SUPERIEURE DE COMMERCE

Kolea

**A Dissertation submitted in partial fulfilment of the requirements for Master's
degree in Financial Sciences and Accounting**

Major: CORPORATE FINANCE

TOPIC:

**The Importance of Financial Evaluation in an
investment decision making**

Case Study: Eurl TECHNITUBE

Submitted by :

Abdelbassit KADDECHE

Supervised by:

DR. SELOUGHA Fayrouz

Place of training: Fond de garantie des crédits aux PME

Period of training: From 11/02/2019 to 25/04/2019.

June 2019

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Dedication

*To My Dear Parents Who Have Always
Supported Me*

Acknowledgements

My first thanks are to “ALLAH” Glorified and Sublime be He, who gave me the strength, courage and determination to carry out this work.

I would like to express my deepest gratitude to Dr Fayrouz SELOUGHA, who supervised this work and whose remarks, advices and encouragements were crucial for the accomplishment of this work. I express to her all my gratitude and my most sincere thanks for the trust and privilege granted me by accepting to be my supervisor.

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List of abbreviations

Abbreviation	Signification
ANDI	Agence Nationale de Developpement de L'Investissement
HP	Hire Purchase
IRR	Internal rate of Revenue
NPV	Net Present Value
PAT	Paid After Taxes
PBP	Payback Period
PI	Profitability Index
VAT	Value Added Tax

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Abstract

Investment is a primordial factor for the increase of the benefit of the company in particular and the economy in general. To invest is undoubtedly the most important decision a company can make and on which position and continuity in the market depend. Hence, it is a complex financial decision because investment requires adequate financial funding, including a substantial freeze on financial resources.

The aim of business is growth which can be reached only through investment requiring important financial resources, that is why corporate finance is all about value creation and wealth maximization. In this context, investments should be subject to careful analysis of their variables such as the interest rate because these variables are among the elements involved in the financial decisions.

With regard to its importance and the consequences that can result from a bad investment, many tools have been established to help in decision-making process and that lead to a careful selection of the most appropriate investment

In this context, the financial evaluation of a project is considered as an important phase allowing the decision maker to have a rational vision on its profitability and also acquire a commitment to achieve it.

Keywords: Investment, Project, Financial decision, Financial evaluation, Profitability.

Résumé

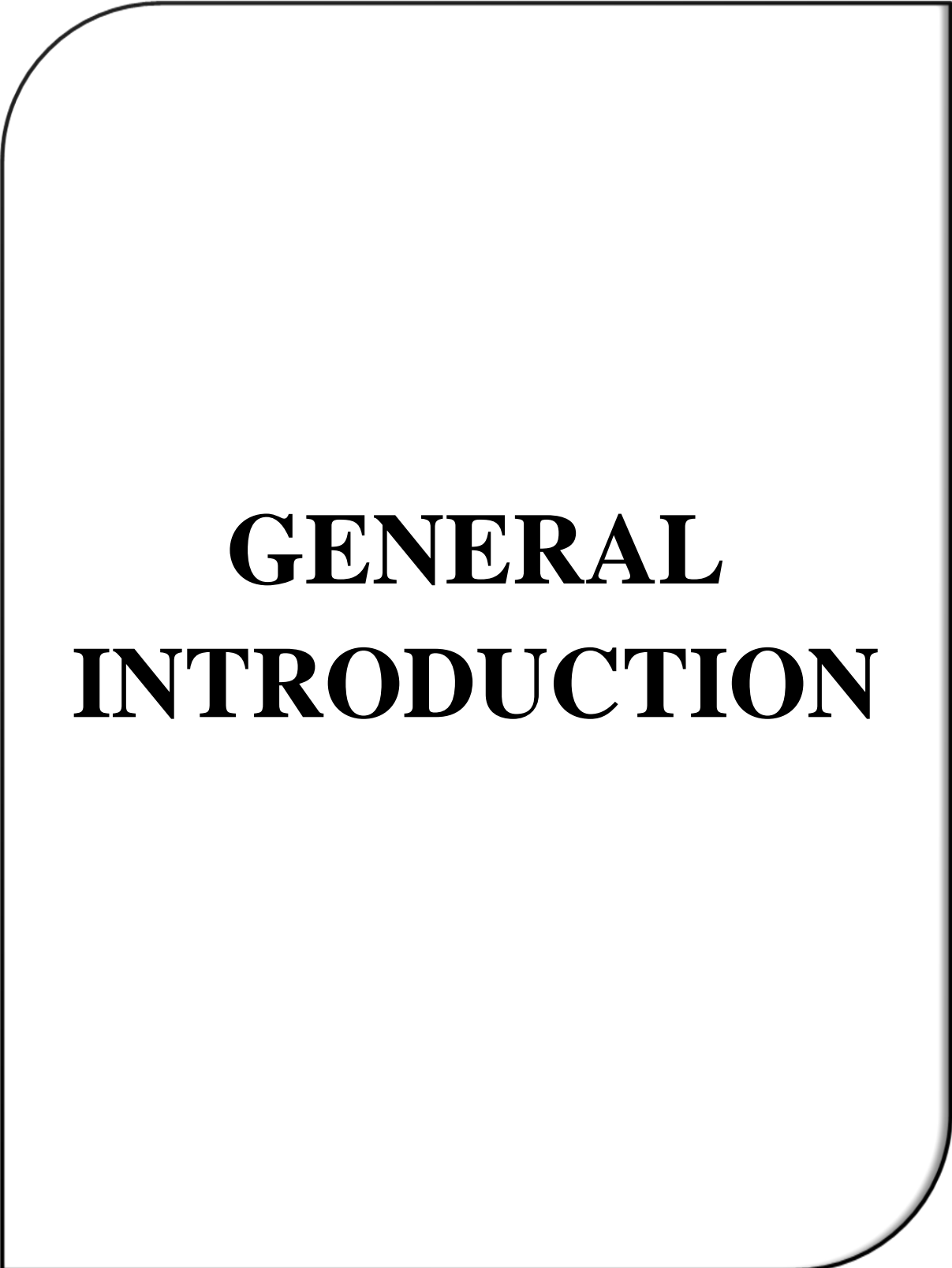
L'investissement est un facteur primordial pour l'augmentation des bénéfices de l'entreprise et de l'économie en général. Investir est sans aucun doute la décision la plus importante qu'une entreprise puisse prendre et dont dépendent sa position et sa continuité sur le marché. Il s'agit donc d'une décision financière complexe, car l'investissement exige un financement adéquat, y compris un gel substantiel des ressources financières.

L'objectif de l'entreprise est la croissance qui ne peut être atteinte que par des investissements nécessitant des ressources financières importantes, c'est pourquoi le financement des entreprises est une question de création de valeur et de maximisation de la richesse. dans ce contexte, les investissements doivent être soumis à une analyse attentive de leurs variables telles que le taux d'intérêt car ces variables sont parmi les éléments impliqués dans les décisions financières.

En ce qui concerne son importance et les conséquences qui peuvent résulter d'un mauvais investissement, de nombreux outils ont été mis en place pour aider à la prise de décision et qui conduisent à une sélection rigoureuse de l'investissement le plus approprié

Dans ce contexte, l'évaluation financière d'un projet est considérée comme une phase importante permettant au décideur d'avoir une vision rationnelle de sa rentabilité et d'acquiescer un engagement pour la réaliser.

Mots-clés : Investissement, Projet, Décision financière, Evaluation financière, Rentabilité.



**GENERAL
INTRODUCTION**

In its development process, the company seeks to maximize its profit regardless of its sector of activity (agriculture, industry or service). It invests in new ideas that will strengthen the country's economic growth and the prosperity of its citizens, Hence the importance of the investment decision.

The decision to invest in any project is mainly based on the assessment of its economic interest and therefore the calculation of its profitability, which depends on the costs and gains it generates. If the sum of the gains is greater than the investment costs, the project is profitable. However, an entrepreneur must make his decision in a context of uncertainty: an investment generates costs that are not precisely known, interest rates are variable and economic or technological conditions are constantly changing.

Thus, the investment decision can be analyzed as the choice of allocating resources to an industrial, or commercial or financial project in order to obtain an additional profit. It is a bet on the future, reflecting both a risk and a certain confidence that leads to certain current expenses and uncertain future gains.

Indeed, the investment decision is essential to the sustainability and growth of the company. It must be the subject of a prior, exhaustive, rigorous and effective analysis on which the success or failure of an investment project depends.

To carry out an investment project, it is necessary to use financial resources that are essential to cover its expenses. Methods and tools to support decision-making should be also based on the application of quantitative and qualitative techniques.

The objective of my work is to develop my knowledge concerning the evaluation of investment projects to collect as much information as possible on the mean need for the evaluation of an investment project. It also aims to show the approach followed by FGAR in the study of an investment project in order to reach the final decision, which is to adopt a project or reject based on an assessment of its profitability and the degree of risk associated with it.

Problematic:

The problematic of the research is as follows:

What is the impact of the financial evaluation on an investment decision making?

To answer this problematic we set the following sub-questions:

1. What is Investment?
2. What are the criteria used in the financial evaluation of any investment?
3. What is the economic impact of an investment?

Hypotheses:

H1: Decision-making depends on the results of the financial evaluation..

H2: The financial evaluation methods (NPV, Cash Flow...) are sufficient for the evaluation of an investment project.

H3: Investments can have both a positive or negative economic impact.

Research structure

To demonstrate the impact of financial evaluation on an investment decision making, our study will be structured in three chapters. The first and the second chapter, will discuss our three principal variables which are: Investments, decision making and financial evaluation, and the third chapter will apply the financial criteria illustrated in the second chapter.

Chapter 1: General overview on investment.

We will illustrate the different concepts related to the concept of investment through two sections:

- General concepts on investment projects : in this section we will explain its definitions, classification and characteristics.
 - Funding sources of investments: this second section consists also of some definitions, classification and characteristics.

Chapter 2: Decision Making and Financial Evaluation Criteria

This chapter will study the decision making process and the financial criteria through two sections:

- Investment decision making process: treats related definitions, process and investment decision making.

-
- Project financial evaluation tools: it explains the different financial evaluation tools.

Chapter 3: Financial Evaluation of an Investment Project

In this third chapter, we apply the financial tools presented in the previous chapter on our study case project. This chapter will be subdivided into two sections that will be:

- Presentation of training place and the case study company: it presents its history, products, organizational chart and its missions.
- Case study: Which is consists in evaluating an extension production line project .

CHAPTER I:
General
Overview on
Investment

Introduction

In order for any business to survive and prosper, it is required to improve the development methods of its means of production and plans of marketing. This results in the need for more or less important investments to be made on all levels; technical, commercial, financial, human...etc...

It is widely known and shared that whenever the company decides to increase its productive capital, the process is referred to as investment.

Investment is a critical business area that refreshes the economy and strengthens human and economic interactions between companies and corporations.

In this chapter, we have divided our work into 2 sections. The first section deals with all concepts related to investment and projects, the second provides an overview of the different financing options.

Section 01: General concepts on investments

1.1. Definitions of an Investment

Pranakusuma defines the term Investment as: “*is an asset or item that is purchased with the hope that it will generate income or appreciate in the future. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create wealth.*”¹

1.1.1. Accounting definition of investment

Investment is the set of goods and services acquired by economic agents over a given period to subsequently produce other goods and services. It includes durable goods in the fixed asset register²:

- Intangible assets (goodwill, patents...),
- Tangible fixed assets (buildings, technical equipment and tools...),
- Financial fixed assets (equity investments, loans...etc.)

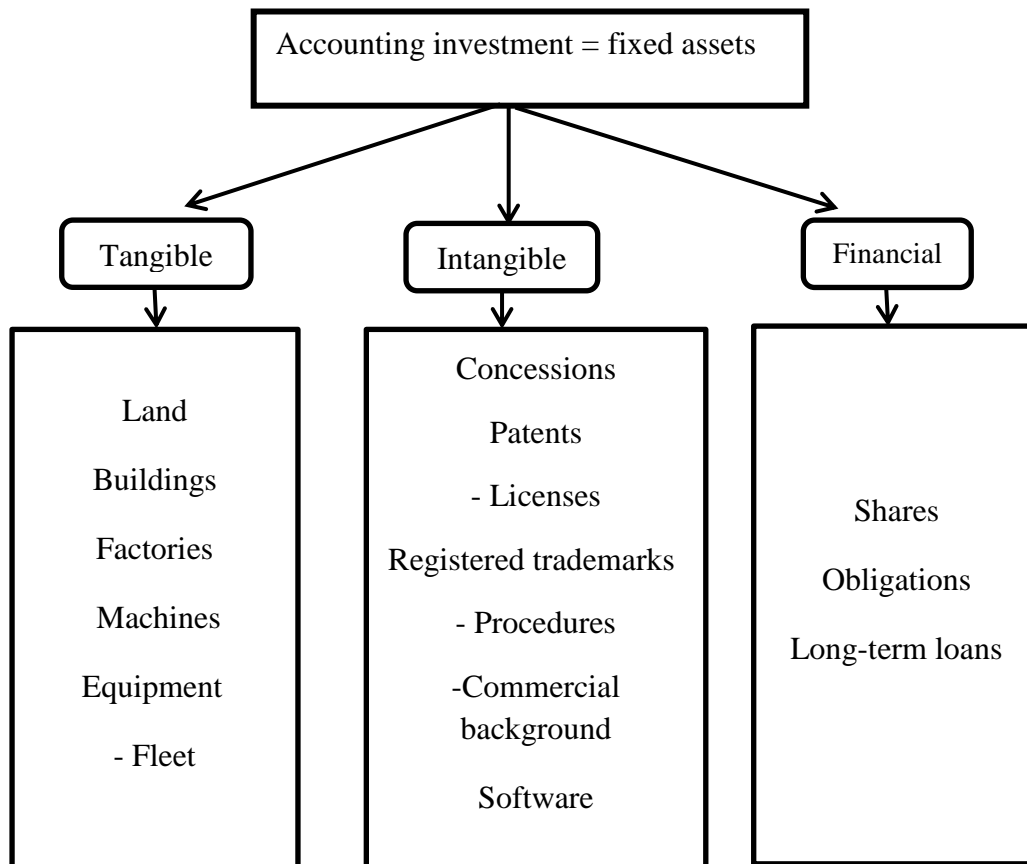
In addition to this restrictive definition, other forms of investments that are not recorded at the top of the balance sheet, include:

- Production assets that are leased under a movable or immovable lease,
- Some intangible investments such as staff training, research that will increase the company's future potential,
- The financing requirement of the operation which, from a financial point of view, constitutes a requirement permanent.)

¹ PRANAKUSUMA (S): ANALYSIS OF INVESTMENT DECISION MAKING OF A BUDGET HOTEL CASE STUDY, magister thesis in commercial sciences, Indonesian European University ,2016,p.19

² BOUGHABA (A), ANALYSE ET EVALUATION DE PROJET, éd. Berti, Paris, 2005, P1

Figure I-1 : Accounting investment



Source : BOUGHABA (A), op.cit, p.1.

1.1.2. Financial definition of investment

According to Investopedia¹, the largest financial education website in the world, in finance, an investment is a monetary asset purchased with the idea that the asset will provide income in the future or will later be sold at a higher price for a profit.

The idea is that investing cash in a project will provide the investor with a return of liquidity in the future. This implies that the gains generated will be greater than the capital invested in this project.

An investment also commits the company in the medium and long term. If the expected profits are not carried out, the company that has committed significant funds to a project risk of serious financial difficulties: on the one hand, the capital invested will not be remunerated at the desired level, but in addition, the shortfall in revenue can lead to the company to a state of suspension of payments (loan maturities...).

¹ <https://www.investopedia.com/terms/i/investment.asp> (26/02/2019,18H)

1.1.3. Economic definition of investment

“Any sacrifice of resources made today, in the hope of obtaining in the future, results, which are certainly spread over time but for a total amount greater than the initial expenditure”¹

This implies that investment is an exchange of immediate and certain satisfaction, which is renounced, for an expectation that is acquired and for which the good invested is the support. Economists thus mark the dual characteristic of investment: the exchange of certainty for anticipation and its inter-temporal dimension. In practice, they define investment as a flow that increases the capital stock².

So, investment takes several forms depending on whether it is on the side of an accountant, a financier, or an economist.

It is rare for an investment to result in an isolated expense. In general, investors come to add other expenses (implementation investment, training, etc.) related to the first expenditure, it is because of these characteristics that we use instead of the term investment that of an investment project.

1.2. Definition of a Project

As stated in the PMBOK® Guide, Fifth Edition, a project is a temporary endeavor undertaken to create a unique product, service, or result. A project can create³:

- A product that can be a component of another item, an enhanced item, or an end item in itself
- A service or a capability to perform a service
- A result, such as an outcome or document

A project is a set of activities (or tasks) conducted to achieve a set of objectives, using predetermined human, material and financial resources⁴.

1.2.1. Definition of an Investment project

From a financial point of view, an investment project represents the acquisition of a set of fixed assets, making it possible to carry out or develop a given activity, as a common aspect, it represents an immediate expense for which future benefits are expected⁵, is a set of means implemented in a

¹ BOUGHABA (A), « ANALYSE ET EVALUATION DE PROJET » COURS, ETUDE DE CAS CORRIGÉES, SIMULATION, éd BERTI, Alger 2005.p1

² KOEHL (J), LES CHOIX D'INVESTISSEMENT, Edition DUNOD, Paris, 2003, p11-p12.

³ PROJECT MANAGEMENT BODY OF KNOWLEDGE, 5th Edition.

⁴ 50MINUTES.COM, EFFECTIVE PROJECT MANAGEMENT: LEAD YOUR TEAM TO SUCCESS ON EVERY PROJECT, 2015, p3

⁵ HOUDAYER (R), EVALUATION FINANCIERE DES PROJETS, 2^{ème} édition. ECONOMICA, Paris, 1999, P.13.

coordinated manner and all of which contribute to the achievement of a single, measurable objective¹

1.2.2. Types of Projects

Projects may be categorized as one of three types:²

- a) **Market-driven:** Producing a new product in response to market needs. For example, a software company sells products and maintains market share by creating quality programs that meet consumer needs
- b) **Crisis-driven:** solving a specific problem. For instance, in response to defective automobile tires, a manufacturer may quickly organize a project to manage their recall and replacement, and create a public relations campaign to address the issue.
- c) **Change-driven:** Changing operations to match the current environment or to be more effective. For example, projects may be driven by regulatory needs, be defined by

1.2.3. Characteristics of a Project

A project has three distinct characteristics³:

- a) **Temporary** in that it has a beginning and an end. It has a defined start and end date. The project begins with a statement of work or some form of description of the product, service, or result to be supplied by the project, and it ends when the objectives are complete or it is determined that the objectives cannot be met and the project is canceled.
- b) **Unique** in that the product, service, or result created as a result of the project is different in some distinguishing way from all similar products, services, or results. It also indicates that although a project might appear to be similar to another project because it produces the same type of deliverable, but in reality it is not. In both projects the investor is creating something that did not exist before. Even a revision to an existing deliverable is considered unique because the revised product did not exist before.
- c) **Progressive elaboration.** This means that the project develops in steps and grows in detail. Progressive elaboration is continually improving and detailing a plan as more detailed and specific information and more accurate estimates become available as the project progresses. When the

¹ BUSSERY (A), GUIDE PRATIQUE D'ANALYSE DE PROJETS, 4 ème edition revue et complétée, 2000, p.2.

² RICHMAN (L), SUCCESSFUL PROJECT MANAGEMENT 3RD EDITION, AMACOM,2011,USA,p 48

³ ROWE (S), PROJECT MANAGEMENT FOR SMALL PROJECTS,Second Edition,2018..

investor is first is gift of a project, he has limited information to work with, usually in the form of a high-level project description, the project's objective, and some assumptions and constraints. The scope might need to be further defined, and the work activities for the project need will have to be planned in detail as more specific information becomes available. Progressive elaboration allows the investor to manage to a greater amount of detail as the project evolves.

1.2.4. Classification of Project

According to Sufian (J) and Samuel (O) there are several classification¹:

a) First classification: The projects are basically defined in two aspects or categories: one is defensive project and other is aggressive project:

- **Defensive Project :** It is the initiated to stabilize and sustain the current business situation.
- **Aggressive Project :** It is initiated to enter into new business in a commercial manner and majorly depends upon the future prospective rather than the current scenario.

b) Second classification: There is other classification of projects as well which is based on the need of execution and time, these can be categorized as follows:

- **Normal Project:** Where the time limits are set and adequate.
- **Brash Project:** Where additional costs are involved to gain time.
- **Disaster Project:** Anything is allowed to gain time.

c) Third classification : This kind of projects are categorized on the basis of geographical location. According to this criterion, projects can be categorized into:

- **International Projects:** When one country tries to build projects with another foreign country. Such projects are referred to as International projects
- **National Projects:** when a project is done in one's own country it is said to be a domestic or national project.

d)Fourth classification: Here we distinguish two types of projects;

- **Industrial Projects:** The projects initiate in one's own country with an objective to make money and for commercialization, are called industrial projects. For example, a car manufacturing is a industrial project.
- **Non-Industrial Projects:** Project which are done for the upliftment of the society and majorly done with social welfare objectives, are called non-industrial projects. For example

¹ SUFIAN (J) and SAMUEL (O), *PROJECT EVALUTION, COURSE GUIDE*, National open university of Nigeria, 2017, p10-11

Building of a canal, agricultural development comes under non-industrial projects; these are mainly carried up by the government.

e) Fifth classification: This classification is based on ownership. Projects are classified as public sector project, private sector project and joint sector project.

- **Public Sector Projects:** Projects which belong to the state are known as public sector projects.
- **Private Sector Projects:** Projects with a complete ownership of promoters and investors is known as private sector projects. Owners may be an individual, partnership firm or a company. These projects are mostly done with an objective to earn profit and thus have a commercial nature.
- **Joint Sector Projects:** In these projects, there exist a partnership between the entrepreneurs and the government. It may be from state government or the central government. These types of partnership occur on the grounds of expertise and liaisoning work and government arranges for the fund in large amounts. For example, Project of Metro Train, Dams, Information technology parks, Electricity plants and other similar natured projects.

f) Sixth classification: Projects are basically driven by certain needs of the organization and these needs further forms the basis of these project categorization:

- **Balancing Project:** Augmenting or strengthening the capacity of particular area within a chain of entire production plant with a purpose of scaling to the capacity in order to have optimum utilization, is balancing project.
- **Modernization Project:** Upgrading the technology to increase the productivity and inevitable approach of technology is called modernization project.
- **Expansion Project:** When the production capacity of goods and services is to be increased, the project that is undertaken is known as expansion project.
- **Diversification Project:** Project undertaken by the organization to completely divert from its core business is called diversification project. For example, if a Petroleum company decides to enter into Information Technology business, then the project will be known as diversification project.
- **Rehabilitation Project:** a project which aims to revive a loss bearing company, is known as rehabilitation project.
- **Plant Relocation Project:** When an organization decides to shift its plant from one location to another, the project started will be known as relocation project.

Section 02: Funding sources of investments

In certain cases, investors are forced to reduce the size of their projects, or opt for projects that consume fewer funds, due to lack of financial resources, then the financing becomes a very important factor.

Faced with financial difficulties, the investment is obliged to use its financial environment to meet its needs. Therefore The company must explore all the financial options it can use. In this section, we will present the different funding sources of investment and their classifications.

2.1. Different Source of Funding

To finance its investments, a company has at its disposal a variety of funding sources that must be studied carefully before making any decision in order to explore the best among them and choose the right mixt, here we will identify several funding sources and see the different characteristics of each one of them:¹

2.1.1. Share Capital or Equity Shares

Equity share is the main source of finance for any company giving investors rights to vote, share profits and claim on assets. Various types of equity share capital are authorized, issued, subscribed, paid up, rights, bonus, sweat equity etc. The expression of the value of equity shares are in terms of face value or par value, issue price, book value, market value, intrinsic value, stock market value etc.² There are various class of shares (equity). In the financial statements of a company, the equity shares are on the liability side of the balance sheet. Their classification into various categories is as follows:³

- **Authorized share capital**

It is the maximum amount of capital which a company can issue. Companies can increase it from time to time. For that we need to comply with some formalities with the payment of some fees to the legal bodies.

- **Issued share capital**

It is that part of authorized capital which the company offers to investors.

- **Subscribed share capital**

It is that part of issued capital which an investor accepts and agrees upon.

¹ NOMAN (A), EFFICIENCY, FINANCE, AND VARIETIES OF INDUSTRIAL POLICY : GUIDING RESOURCES, LEARNING, AND TECHNOLOGY FOR SUSTAINED GROWTH, Columbia University Press, 2016, p.34.

² <https://efinancemanagement.com/sources-of-finance/equity-share-and-its-types> (28/02/2019, 18H)

³ Idem

- **Paid up capital**

It is the part of the subscribed capital, which the investors pay. Normally, all companies accept complete money in one shot and therefore issued, subscribed and paid capital becomes one and the same. Conceptually, paid-up capital is the amount of money which a company actually invests in the business.

Apart from the above, there are other types of shares (equity).

- **Rights shares**

These shares are those which a company issues to its existing shareholders. It issues such kind of shares in order to protect the ownership rights of the existing investors.

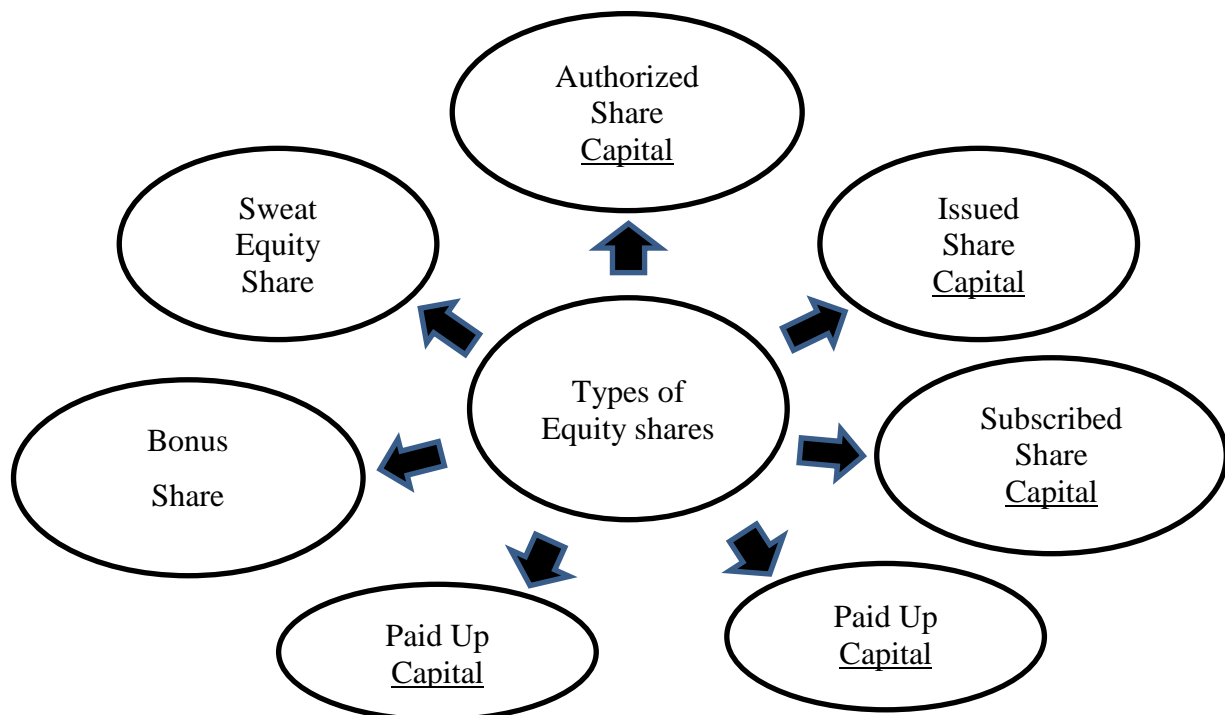
- **Bonus shares**

When the company issues shares to its shareholders in the form of a dividend, these are referred to as bonus shares. There are various advantages and disadvantages of bonus shares like dividend, capital gain, limited liability, high risk, fluctuation in the market, etc.

- **Sweat equity share**

Sweat equity shares are issued to exceptional employees or directors of the company for their merited job in terms of providing know-how or intellectual property rights to the company.

FigureI-2: Different types of equity shares



Source: www.efianacemanagement.com(28/02/2019,20H)

2.1.2. Preferences share

Preference shares can be considered a sort of hybrid. They give holders similar rights over a company's affairs as ordinary shares (equities), but commonly holders do not have a vote at meetings, like bonds they get specified payments at predetermined dates. The name spells out their privileged status, since holders are entitled to a dividend whether there is a profit or not, which makes them attractive to investors who want an income¹.

In exchange for their capital, purchasers of preferred stock receive dividends at a fixed or adjustable rate of return (similar to a debt instrument), with priority over dividends distributed to the holders of the common stock and a preference in the distribution of assets in the event of liquidation. The preferred stock may or may not have certain rights with respect to voting convertibility into common stock, anti-dilution rights, or redemption privileges that may be exercised either by the company or by the holder.²

As mentioned in the definition preferences shares are considered hybrid, that means they have features similar to both debt and equity. These features are presented as follows:³

a) Features of preference shares similar to debt

- **Fixed dividends:** Like debt carries a fixed interest rate, preference shares have fixed dividends attached to them but the obligation of paying a dividend is not as rigid as debt. Non-payment of a dividend would not amount to bankruptcy in case of preference share.
- **Preferences over equity:** As the word preference suggests, these type of shares get preference over equity shares in sharing the income as well as claims on assets. Alternatively, preference share dividend has to be paid before any dividend payment to ordinary equity shares. Similarly, at the time of liquidation also, these shares would be paid before equity shares.
- **No voting rights:** Preference share capital is not allotted any voting rights normally. They are similar to debenture holders and do not have any say in the management of the company
- **No share in earning:** Preference shareholders can only claim two things. One agreed on percentage of dividend and second the amount of capital invested. Equity shares are entitled to share the residual earnings and residual assets in case of liquidation which preference shares are not entitled to.
- **Fixed maturity:** Just like debt, preference shares also have fixed maturity date. On the date of maturity, the preference capital will have to be repaid to the preference shareholders. A special

¹BECKET (M), How the Stock Market Works : A Beginner's Guide to Investment, Sixth Edition, Kogan Page,2018,p10

² SHERMAN(J),Mergers and acquisitions from A to Z, Fourth Edition,AMACAOM,2018,p 195

³ <https://efinancemanagement.com/sources-of-finance/benefits-and-disadvantages-of-debentures> (05/03/2019,11H)

type of shares i.e. irredeemable preference shares is an exception to this. They do not have any fixed maturity.

b) Features of preferences shares similar to Equity shares

- **Dividend from PAT:** Equity share dividend is paid out of the profits left after all expenses and even taxes and same is the case with preference shares. The preference dividend is paid out of the divisible profits of the company. Out of the divisible profits, the preference dividend would be paid first and the remaining profits can be utilized for paying any dividend to equity shareholders.
- **Management discretion over dividend payment:** The payment of preference dividend is not compulsory and is a decision of the management. Equity shareholders also do not have any right to ask for dividends, the dividends are paid at the discretion of the management of the company. Unlike debt, the nonpayment of a dividend of preference shares does not amount to bankruptcy.
- **No fixed maturity:** The maturity of a special variant of preference share is not fixed just like equity shares. This variant is popularly known as irredeemable preference shares. There are some advantages and disadvantages of preference shares like no legal obligation for dividend payment, improves borrowing capacity, no dilution on control, costly source of finance etc.

2.1.3. Retained Earnings

Retained earnings refer to that part of corporate's net profit after tax which is not distributed to the shareholders as dividend but is reinvested in the business. Retained earnings is a technique of financial management under which all profit after tax is not distributed amongst the shareholders as dividend but a part of profits is retained or reinvested in the company.¹

The formula for retained earnings is:

$$\text{Beginning retained earnings} + \text{Profits/losses} - \text{Dividends} = \text{retained earnings}$$

2.1.3.1. Advantages of Retained Earnings

Retained earnings benefits companies in the following ways: ²

- Companies which retain their earnings can face unforeseen contingencies, capital market crisis and other downturns.

¹ SOHAIB Masood, DETERMINANTS OF RETAINED EARNINGS IN PROFITABLE COMPANIES IN INDIA: A COMPARATIVE STUDY OF SELECTED SECTORS, doctor of Philosoph in business administration, ALIGARH MUSLIM UNIVERSITY, 2013, p 2

² Ibid, p4

-
- Retained earnings help to stabilize the dividend policy of companies, improves companies relation with its shareholders.
 - Appreciates the value of a company's share.
 - Retained earnings are the most convenient and economical method of finance and involve no legal formalities.
 - Retained earnings helps to keep the financial structure of company's fully flexible and increase the credit worthiness of company's.
 - Due to retention of earnings the growth and modernization plans of companies don't suffer due to lack of finance.

Though, retained earnings constitute an important and cheap source of finance as compared to external sources of finance available to companies and gives benefits and advantages to companies, shareholders and society yet they also carry some dangers with it like the heavy reinvestments of such profits year after year by a company may cause dissatisfaction among shareholders as they may get lower dividends.

2.1.3.2. Disadvantages of Retained Earnings

Retention of earnings may tempt the management to raise bonus shares to the equity shareholders leading to over capitalization, the companies may not always use the retained earnings to promote the interests of shareholders. Instead, it may be invested in unprofitable avenues or misused by locking up them in those business concerns which are against the interests of shareholders, retained earnings can be used to manipulate the share prices of stock exchange. The company may keep the dividend rate very low so as to purchase the shares at very lower prices and later by increasing dividends rates, it may reap benefits from higher share prices.

2.1.4 Debenture / Bonds

Large companies sometimes may want to borrow money for a long-term from the public to finance some capital expenditure project or to fund their regular operations. They can raise such funds through the capital market. In this case, the company would issue a debenture in which the public could invest. The debenture essentially is a bond (i.e., a debt instrument) acknowledging the company's indebtedness to the investors. Thus, a debenture is an official document detailing terms on which a company has borrowed money from the public. The company issues it in acknowledgement of its indebtedness to an investor in its bond (i.e., debt instrument). Two of the

terms of a debenture long-term and fixed rate of interest—stand out. The debenture holders simply are creditors to not part owners of the company.¹

As a debenture is one of the most used funding sources, it represents some characteristics, those are shown in the table below :

Table I-1 : Characteristics of Debenture

Characteristics	Explanation
Common seal	The debenture is a certificate that the company issues under its seal (debenture deed). It shows the amount and date of repayment of the debt along with the rate of interest.
Borrowed funds	The debentures are the part of the borrowed fund capital. The holders of debentures are the creditors of the company.
Written promise	A debenture is a written document that the company issues to the lender. It acknowledges a loan or a debt.
Maturity period	The debentures are the long term source of finance, These are generally issued for the period of 10 to 20 years
Claim in income	The debenture holders are eligible to get a fixed rate of interest at the end of every financial year. They have a priority over the shareholders in respect of their claim on assets.
Other characteristics	Power of control, A fixed interest rate and appointment on trustee

Source: ONYIRIUBA (L), op.cit, p.525.

2.1.5. Term Loans from Financial Institutes

Loan finance is money that is borrowed on behalf of the business. It could be repayable as a lump sum. More commonly, loans are repaid in a series of instalments, usually monthly by a specific date. When negotiating loan finance for a new business, you should request a repayment holiday. This means that for an agreed period, say the first three to four months, you make interest payments only. Most commercial banks know that the cash flow of a new business will be weak and will therefore agree to this request.²

¹ ONYIRIUBA (L), Bank Risk Management in Developing Economies Addressing the Unique Challenges of Domestic Banks through Risk Management, Elsevier Edition, Uk ,2016,P 525

²PARKER (E), Finance in your own business, Bookstorm edition,South Africa 2011, p 14

Term loan finance and the previous financing options have one thing in common: They provide short-term finance. To raise funds for longer periods, an investor need, to take out a term loan. Term loans are usually offered for periods of between 36 and 60 months. They are repayable in monthly installments to which interest will be added.

On approval of the investor's application, the bank will enter into a written loan agreement with you that will contain the agreed terms and conditions. Loan capital can be used to finance the purchase of equipment, furniture and initial stock, or even as working capital¹

2.1.6. Venture Funding

Venture capital, also called risk capital or start-up capital, is financing that investors provide to start-up companies and small businesses that evidence long-term growth potential. Venture capital generally comes from well-off investors, investment banks and any other financial institutions. However, it does not always take just a monetary form; it can be provided in the form of technical or managerial expertise. Though it can be risky for the investors who put up the funds, the potential for above-average returns is an attractive payoff. For new companies that have a limited operating history, capital funding is increasingly becoming a popular source for raising capital, especially if they lack access to capital markets, bank loans or other debt instruments.²

2.1.7. Venture Funding Stages

There are five stages of venture funding. These are as follows:³

Stage 1: Seed Capital: In this first stage of venture funding, the venture or the startup company in need of the funds contacts the venture capital firm or the investor. The venture firm shall share its idea of business with the investors and convince them to invest in the project. The investor or venture capital firm shall then conduct research on the business idea and analyze its future potential. If the expected returns in future are good, the investor (Venture capitalist) shall invest in the business.

Stage 2: Startup Capital : Startup capital is the second stage of venture funding. If the venture is able to attract the investor, the idea of the business of the venture is brought into reality. A prototype product is developed and fully tested to know the actual potential of the product. Generally, a person from the venture capital firm takes a seat in the management of the business to monitor the operations regularly and keep a check that every activity is done as per the framed plan.

¹ Ibid,p 24

² MULLER (E), ANGLAIS DES AFFAIRES, Foucher,2018,p45

³ CASELI (S) and NEGRI (G),PRIVATE EQUITY AND VENTURE CAPITAL IN EUROPE MARKETS, TECHNIQUES, AND DEALS, Elsevier, Uk, 2018.,p 176-177

If the idea of business meets the requirement of the investor and has sufficient market in the trail run, the investor agrees to participate in the future course of the business.

Stage 3: Early stage / Second Stage Capital: After the startup capital stage comes the early/first/second stage capital. In this stage, the investor significantly increases the capital invested in the venture business. The capital increase is mainly towards increasing the production of goods, marketing or other expansion say building a network etc. The company with higher capital inflow moves towards profitability as it is able to reach a wide range of customers.

Stage 4: Expansion Stage: This is the fourth stage of venture funding. In this stage, the company expands its business by way of diversification and differentiation of its products. This is possible only if the company is earning good profits and revenue. To reach up to this stage the company needs to be operational for at least 2 to 3 years. The expansion gives the venture new wings to enter into untapped markets.

Stage 5: Bridge : This is the last stage of venture funding. When the company has developed substantial share in the market with its products, it may opt for going public. One main reason for going public is that the investors can exit out of the company after earning profits for the risks they have taken all the years.

2.1.8. Lease Finance

Viewed in a broad perspective, a lease is construed as a contract or transaction between two parties in which a party owning the asset, called the 'lessor' or landlord' or 'owner', provides the asset for use over a certain period of time to the other party, called the 'lessee' or the 'tenant', for consideration in the form of periodic payments (called 'rent') with or without a further down payment. The international Accounting Standard No. 17 defines leasing as "an agreement whereby the lessor conveys to the lessee in return for rent the right to use an asset for an agreed period of time".¹

There are two main types of conventional leases: operating leases and financial leases²

a) Operating leases:

An operating lease is an agreement between:

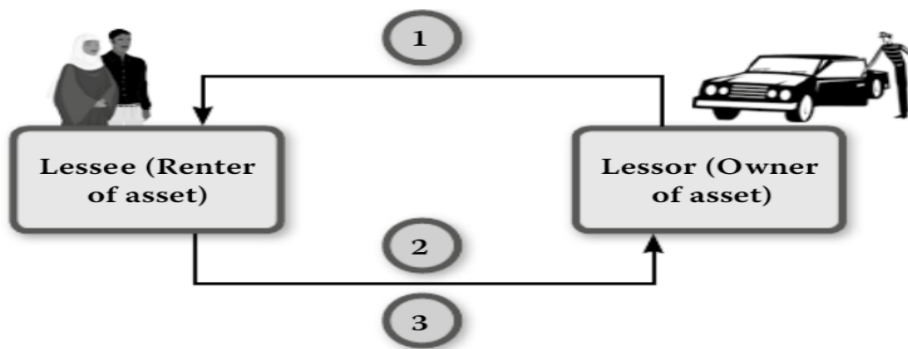
- A lessor who owns an asset and who wants to earn a return without losing ownership; and
- A lessee who needs to use the asset and who cannot afford to buy it or does not want to own it.

¹ VINOD (K), LEASE FINANCING & HIRE-PURCHASE, Wadhwa and Company, Nagpur, 1991, P-4.

² DAUD (A) and CHEFF (K), ISLAMIC FINANCE: WHY IT MAKE SENSE FOR YOU, Marshall Cavendish International, Singapore, 2013., P 146

It is a very straightforward agreement as we can see in this example. Let us suppose that Isra has just begun a two-year MBA program in the US. She finds a part-time job to help pay for tuition and looks for a car to drive to work every day. A car dealer offers her a new Ford Escort on a two-year lease term. She pays two months' instalment as deposit and drives the car off the lot the same day. The dealer agrees to arrange for insurance and take care of maintenance. At the end of two years, the car is to be returned to the dealer, and the leasing agreement would end for both parties. A summary is shown in Figure .

Figure I-3: Lease Finance Steps



Source : DAUD (A) and CHEFF (K),idem,P 146

- The dealer transfers possession of the car to Isra but retains ownership of the car throughout the lease period.
- Financing (based on leasing)
- Over the lease period, Isra makes monthly payments.

At the end of two years, Isra returns the car to the dealer.

b) Financial lease

A financial lease is the other major type of lease. The main difference between this and the operating lease is that the lessee has the option to purchase the asset at the end of the lease. This means that If Isra agrees instead to a financial lease, then the third step will be different.

At the end of two years, Isra decides to purchase the car. The dealer then transfers ownership of the car to Isra.

Leasing provides several advantages to lessees:

-
- Leasing ready-to-use equipment can be more attractive if the asset requires lengthy preparation and setting up. Specialized computer and telecommunications financing (based on leasing) are popular assets used in leasing.
 - Leasing avoids having to own the asset that will be required only for a season or temporary period.
 - Leasing for short periods protects against obsolescence. But of course, lease payments are accordingly higher.
 - Lease payments can provide up to 100 per cent financing, whereas there are usually down payment requirements when buying.
 - Leasing often comes with tax advantages and is employed by governments to encourage the use of certain assets. For example, if the government of a country is keen to promote computer literacy, it would provide generous tax deductions for computer leases.

2.1.9. Hire Purchase Finance

Hire Purchase is defined as an agreement in which the owner of the assets lets them on hire for regular installments paid by the hirer. The hirer has the option to purchase and own the asset once all the agreed payments have been made.

The term 'Hire-Purchase' is a UK term and is synonymous to 'rent-to-own' or 'installment plan' in various other countries. Owning goods through hire and purchase lets companies improve their earnings performance. Not just beneficial to the hirer, this system is also the most effective and secure form of credit sales for the current owner of the asset¹.

Hire purchase is a method of purchasing or financing capital goods whereby the goods are accessible for use almost instantaneously but the payment is made in smaller parts over an agreed period. The ownership is transferred only after the paying all installments. Technically speaking, it is an agreement between the buyer (or user) of the asset and the financing company whereby the financing company purchases the asset on behalf of the buyer and the buyer utilized it for business purpose and pays back to the financing company in small installments called hire charges.

In other words, hire purchase can be defined as an option of financing or acquiring an asset for use whereby the financing company let the goods on hire to the buyer against small installments called hire charges and the buyer gets the right to use the asset with an option to purchase the asset by paying all such installments spread over a period of time. Hire purchase was

¹ VINOD (K)op.cit,p 21

very prominent for vehicle financing whether that is a personal car, commercial vehicle etc. but now equipment, machinery etc are also financed with hire purchase method.

2.1.9.1. Features and characteristics of HP

Hire purchase is a typical transaction in which the assets are allowed to be hired and the hirer is provided an option to later purchase the same assets.¹

Following are the characteristics of a regular hire purchase transaction:

- Rental payments are paid in installments over the period of the agreement.
- Each rental payment is considered as a charge for hiring the asset. This means that, if the hirer defaults on any payment, the seller has all the rights to take back the assets.
- All the required terms and conditions between both the parties involved are documented in a contract called Hire-Purchase agreement.
- The frequency of the installments may be annual, half-yearly, quarterly, monthly, etc. according to the terms of the agreement.
- Assets are instantly delivered to the hirer as soon as the agreement is signed.
- If the hirer uses the option to purchase, the assets are passed to him after the last installment is paid.
- If the hirer does not want to own the asset, he can return the assets any time and is not required to pay any installment that falls due after the return.
- However, once the hirer returns the assets, he cannot claim back any payments already paid as they are the charges towards the hire and use of the assets.
- The hirer cannot pledge, sell or mortgage the assets as he is not the owner of the assets till the last payment is made.
- The hirer, usually, pays a certain amount as an initial deposit / down payment while signing the agreement.
- Generally, the hirer can terminate the hire purchase agreement any time before the ownership rights pass to him.

2.1.8.2. Process of HP

The hire purchase is one of the most used financing techniques especially when the need is in the medium term, as the finance lease, it has some steps to follow, we simply this process in the figure bellow:

¹ VINOD (K)op.cit,p 22.

Figure I-4 : Hire purchase process

Source: VINOD (K),op.cit,p7

a) Advantages of HP

Hire Purchase has the following advantages:

- Immediate use of assets without paying the entire amount.
- Expensive assets can be utilized as the payment is spread over a period of time.
- Fixed rental payments make budgeting easier as all the expenditures are known in advance.
- Easy accessibility as it is a secured financing.
- No need to worry about the asset depreciating quickly in value as there is no obligation to buy the asset.

b) Disadvantages of HP

Hire Purchase suffers from the following disadvantages:

- Total amount paid towards the asset could be much higher than the cost of the asset due to substantially high-interest rates.
- The long duration of the rental payments.
- Ownership only at the end of the agreement. The hirer cannot modify the asset till then.
- The addition of any covenants increases the cost.
- If the hired asset is no longer needed because of any change in the business strategy, there may be a resulting penalty.

c) Difference between Lease Finance and Hire Purchase:

From the two above definitions of these two funding sources it seems they are similar, in the table below are will show some basic points of distinction:

Table I-2 : differences between hire purchase and Lease Finance

Point of distinction	Lease Finance	Hire Purchase
Ownership of asset	Lies with the lessor, lessee has the right to use the equipment and not have the option to purchase	The hirer has the option to purchase the asset immediately after the last instalment is paid.
Depreciation	Claimed as the expense in the books	Allowed to the hirer.
Rental Payments	Covers the cost of asset	Instalment is inclusive of the principal and interest amount for the period of use.
Duration	Longer duration for bigger assets.	Shorter duration and cheaper assets
Tax Impact	Total lease payments are shown as an expense by the lessee	Hirer claims the depreciation on the asset as an expense.
Repair and Maintenance	Responsibility of the lessee in the case of financial lease and of the lessor in case of operating lease	Responsibility lies with the hirer
Extent of financing	It is a complete financing option in which no down payments are required	Normally an amount of margin money is required to be upfront by the hirer

Source: [www.efianacemanagement.com\(01/03/2019,23H\)](http://www.efianacemanagement.com(01/03/2019,23H))

2.1.10. Trade credit

Trade credit refers to the credit extended by the suppliers of goods in the normal course of business. As present day commerce is built upon credit, the trade credit arrangement of a firm with its suppliers is an important source of short-term finance. The credit-worthiness of a firm and the confidence of its suppliers are the main basis of securing trade credit.

It is mostly granted on an open account basis whereby supplier sends goods to the buyer for the payment to be received in future as per terms of the sales invoice. It may also take the form of bills payable whereby the buyer signs a bill of exchange payable on a specified future date.

When a firm delays the payment beyond the due date as per the terms of sales invoice, it is called stretching accounts payable. A firm may generate additional short-term finances by stretching accounts payable, but it may have to pay penal interest charges as well as to forgo cash discount.

If a firm delays the payment frequently, it adversely affects the creditworthiness of the firm and it may not be allowed such credit facilities in the future¹.

2.1.11. Factoring

A firm's accounts receivables are sold at a discount to a factor, freeing up cash. Factoring receivables on a no-recourse basis means the factor assumes collection responsibility. This kind of funding requires no financial information and is usually quick, but fees charged by most factoring companies are higher than interest on loans.²

Factoring corresponds to a financial technique by which a person called a subscriber transfers his trade receivables to a financial institution called a factor, which is responsible for collecting them, in return for a certain remuneration (Factoring commission subject to VAT + Financing commission) and guarantees their successful completion, even if they are unpaid.³

The operation is carried out in 2 steps

Step1: Transfer of receivables to the factor: the factor sends the company a purchase notice.

Step2: Provision of funds by the factor.

Angel Investors: An angel investor (also known as a business angel, informal investor, angel funder, private investor, or seed investor) is an affluent (rich, wealthy) individual who provides capital for a business start-up, usually in exchange for convertible debt or ownership equity. A small but increasing number of angel investors invest online through equity crowd funding or

¹ <http://www.accountingnotes.net/financial-management/finance-sources/10-main-sources-of-short-term-fund/8090> (15/03/2019,9H)

² GILANTZ (M), NAVIGATING THE BUSINESS LOAN : GUIDELINES FOR FINANCIERS, SMALL-BUSINESS OWNERS, AND ENTREPRENEURS, Elsevier, 2014, p12

³ GRANDGUILLOT (B) et (F), L'ESSENTIEL DE LA COMPTABILITE GENERALE 2015-2016 : MODELISATION COMPTABLE, OPERATIONS COURANTES, Fifth Edition, Gualino, 2015, p 110

organize themselves into angel groups or angel networks to share research and pool their investment capital, as well as to provide advice to their portfolio companies.¹

2.2 Classification of funding sources

It is very important for any company to know the classification of the funding sources to choose the most suitable source for its needs, in general, according to efinancemanagement², sources of financing are classified based on two criteria:

- Time period
- Source of generation

2.2.1. Based on Time Period

Sources of financing a business are classified based on the time period for which the money is required. The time period is commonly classified into the following three:

- Long term sources of funds
- Medium term sources of funds
- Short term sources of funds

a) Long Term sources of funds: Long term sources fulfill the financial requirements of a business for a period more than 5 years. It includes sources such as:

- Equity Shares (Share capital)
- Preference Shares
- Retained Earnings
- Debenture
- Term Loans from (Financial Institutes, Government, and Commercial Banks)
- Venture Funding

b) Medium Term sources of funds:

Medium term financing means financing for a period of 3 to 5 years and is used generally for two reasons. One, when long-term capital is not available for the time being and second when deferred revenue expenditures like advertisements are made which are to be written off over a period of 3 to 5 years. Medium term financing sources can be in the form of one of them:

- Preference Capital or Preference Shares
- Debenture / Bonds

¹ MULLER (E),op.cit,p46

² <https://efinancemanagement.com/sources-of-finance> (02/03/2019, 10:40h)

- Medium Term Loans from
- Lease Finance
- Hire Purchase Finance

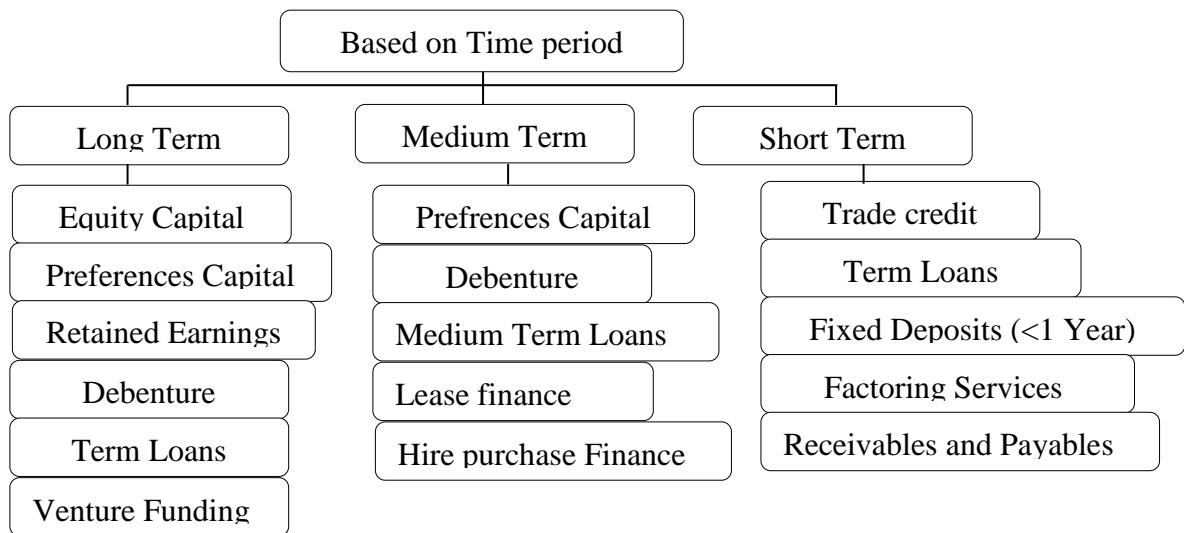
Short Term sources of funds:

Funds which are required for a period not exceeding one year are called short-term sources.

- Trade credit
- Working Capital Loans from Commercial Banks
- Fixed Deposits for a period of 1 year or less
- Advances received from customers
- Creditors
- Payables
- Factoring Services
- Bill Discounting etc.

We summarize the classification according to this criterion in the figure below

Figure I-5 : Source of Fund Based on Time Period



Source: Made by the student based on the explication above

2.2.2. Based on source of generation:

According to this classification basis, the source chosen by the company to fulfil its investment needs is generated by this latter or outside it, there are two types;

a) Internal sources: The internal source is the one which is generated internally by the business, it is an important source that any company should focus on, it provides financial independency, these are as follows;

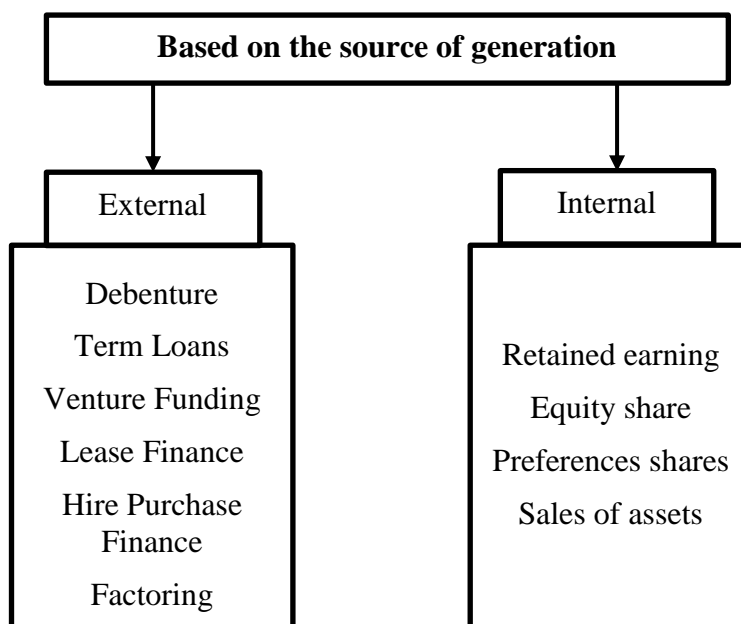
- Equity share
- Preferences shares
- Retained earnings
- Sales of assets (it is a simple financing technique, it consists in selling assets that re no more needed in the company, for example: selling a truck, old equipment, machine..)

b) External sources: If the company's internal sources do not appear to be sufficient to cover its financing expenses, it then seeks external to support the lack of liquidity it has at its disposal. These sources include the following:

- Debenture
- Term Loans from (Financial Institutes, Government, and Commercial Banks)
- Venture Funding
- Lease Finance
- Hire Purchase Finance
- Factoring

A summary of this classification is showed in the figure below

Figure I-6 : Source of Fund Based on Source of Generation



Source: Made by the student based on the explication above

Conclusion

As we have noticed, investment is linked to a wide area of diverse and interesting topics of knowledge.

Therefore, in this chapter, we have precisely dealt with investment and projects. In short, we have defined them and explored their various criteria, typologies and classifications. We have also examined the different available resources that the company can use to finance its investment.

Since investment is mainly and before anything, a decision to be made, the company is expected to not only be aware of but also to master the different steps and components of the decision-making process and use different project evaluation tools in order to make that decision right, because investment is a primordial factor for a company' sustainability.

CHAPTER II:
Decision Making
and Financial
Evaluation
Criteria

Introduction

It is very likely for any company to find itself in front of many investment opportunities at the same time. Each of these investments consists of a choice. It is up to the personnel to choose between these opportunities. They, hence, have to make the decision whether any given investment will be beneficial and profitable for the business or not.

In this chapter, The first section will be devoted to define the investment decision-making process with its phases and types.

The second section will be about the different tools and techniques that can be used to carry out an effective assessment for any given investment project.

Section 1: Investment Decision Making Process

Decision Making is the essence of the management process. Decisions are made to solve problems, tackling the situations, handling crises and resolving conflicts that are inevitable.

Investment decisions are critically important in the life of the company because they are irreversible and involve enormous amounts of capital and require a strategy that is well adapted to the needs and environmental requirements of the company.

In this section, we will identify this concept, its classification and its different phases.

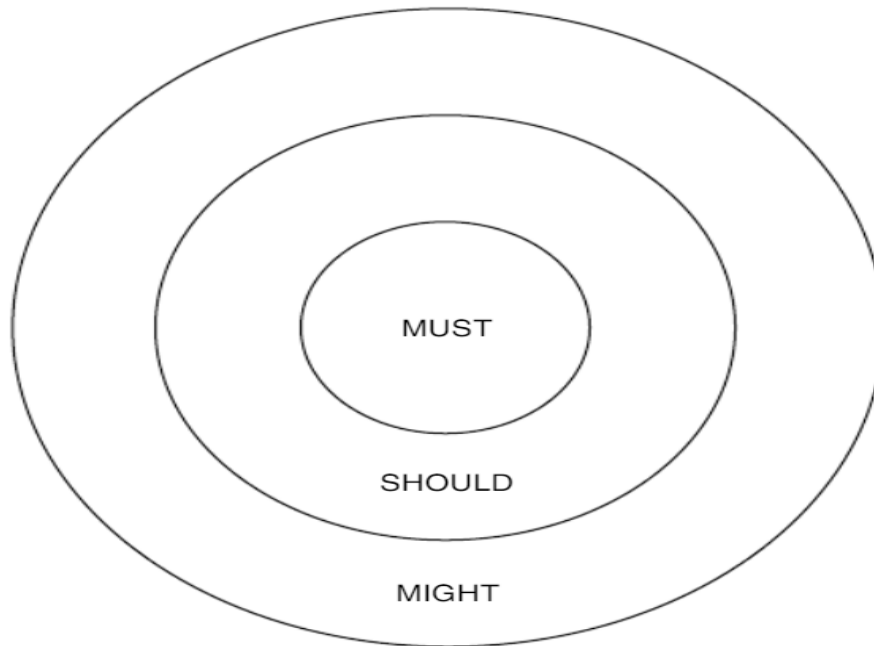
1.1.How to Make a decision?

The critical preliminary activity here is to establish the selection criteria. It is worth dividing them into different levels of priority. Unless an option meets the MUST requirements it should be discarded.

But after the essentials have been satisfied, the list of desirables – highly desirable SHOULDs or pleasant addition MIGHTs – comes into play. Choosing a car is a relatively simple case, because there is a finite number of models to choose from and a relatively simple list of criteria. In order to help you choose in more complex cases, re-member that a decision can be made: ¹

- listing the advantages and disadvantages;
- examining the consequences of each course;
- testing the proposed course against the yardstick of your aim or objective;
- weighing the risks against the expected gains.

¹ ADAIR (J),DECISION MAKING AND PROBLEM SOLVING ED. 3, Kogan Page,2016,p24

Figure II.1 : Decision Making Criteria

Source: ADAIR (J),op.cit ,p24

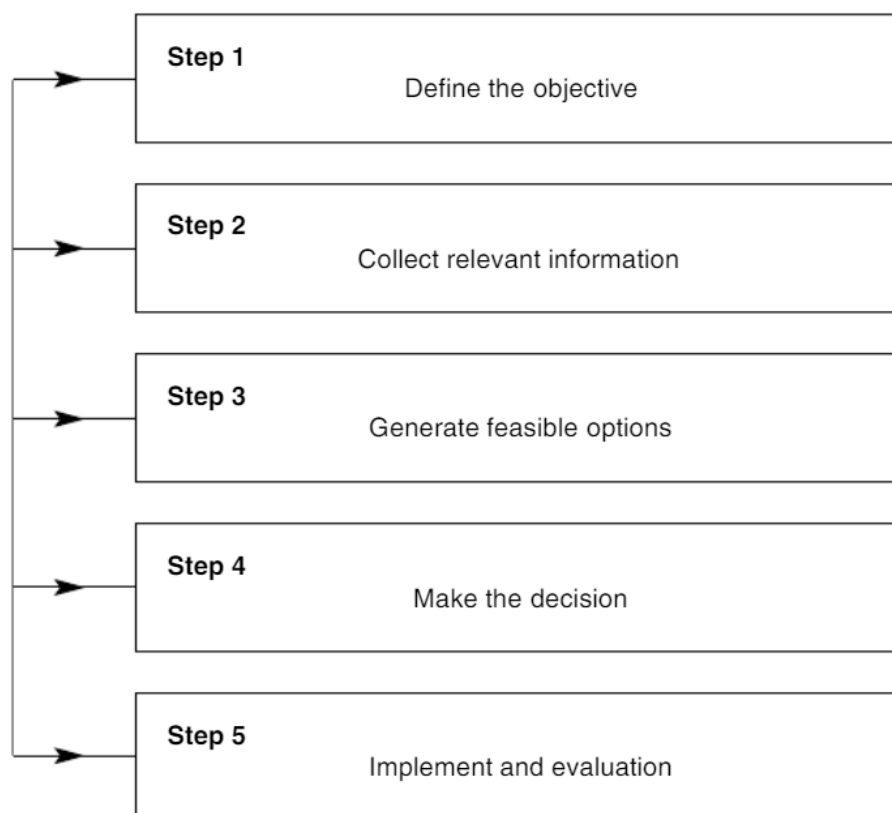
1.2. Decision making

Decision making is a selection method. It is daily used in a personal and professional contexts. There are large number of times where DM is carried out, Decision can require weeks, even months in order to reach the correct alternative.

The research of identifying and choosing alternatives based on the decision-maker's weighs/values and preferences. All be possible alternatives must be identified for making a decision. Then the best alternative is chosen regarding to the goals, constraints, etc¹

There is a time when a company firmly chooses the course to be followed, or the relentless drift of events will make the decision. Everyone makes decisions whether it's a company or an individual. In general there is a classical decision making approach that can be helpful to guide us toward our goal, these approach is showed on the figure below.

¹ MARUGAN (P),MARQUEZ(P),DECISION MAKING MANAGEMENT: A TUTORIAL AND APPLICATIONS,Elsevier,2017,p2

Figure II.2: The classic approach to decision making

Source: ADAIR (J), OP.CIT, P 19

1.3. Definition of Investment Decision

Investment decisions are the most risky in business economics. A first approach can be defined as the investment decision, the judgment to transform financial means into goods (tangible or intangible) with the capacity to produce services for a certain period of time, a sacrifice of resources that is being made today in the hope of a series of revenues whose total will exceed the initial disbursements corresponding to the investment cost¹

In a commercial context, decision making means finding new ways to grow revenues and minimize costs so profits are increased, the long term value of the business is enhanced, and the competitive position of the business is strengthened. These priorities should constantly guide management decisions, influencing the choices that are made throughout the organization.²

¹ GARDES (N), « FINANCE D'ENTREPRISE », rapport de stage du 26/06/2006, p37

² KOURDI (J), EFFECTIVE DECISION MAKING : 10 STEPS TO BETTER DECISION MAKING AND PROBLEM SOLVING, Marshall Cavendish Editions, 2011, p 2

Investment decisions refer to capital budgeting decisions as decisions to acquire assets. An investment process describes how investment projects are being carried out in companies and organizations.

In their study, Niskanen and Niskanen (2007, 299) stated that even though the decision making at every company may not be the same due to differences in cultural and organizational behavior, it can be observed that there are similarities in the process which consist of at least 6 phases as given in the figure below .¹

Figure II.3 : Investment Process Phases

INVESTMENT PROCESS PHASES	
Recognition phase	Determinations of investment projects, which are necessary to achieve company's goals.
Search phase	Search for the investment projects and targets that are in line with company's strategy and a development of those projects into concrete investment proposals.
Information retrieval phase	Qualitative and quantitative data retrieval of the investment projects. Information retrieval of the income and cost estimates and risks.
Selection phase	Ranking investment projects based on the investment calculations and qualitative factors (i.e. environmental factors). Selection of the projects that fulfil the investment criteria.
Funding phase	Decisions of the funding methods. (e.g. how much of the acquisition costs will be covered with incomes and how much with own or foreign capital)
Investment project implementation and monitoring phase	Implementation and monitoring of the incomes. Investment income monitoring and comparison to budgets.

Source: PRANAKUSUMA (S).op.cit,p 22

¹ PRANAKUSUMA (S).op.cit,p 21

Comment: This process is usually followed when the company has more than two projects to select from, and due to the lack of financing sources, that puts the company in the obligation to choose the most urgent, the most needed and the most beneficial project, the one that leads the company to prosperity and growth. To enter the company's portfolio, the project must meet some profitability conditions and pass through many phases to reach the final phase which is the implementation and beginning of production (services and goods).

1.3.1.Steps of Investment Decision:

Each project will go through different stages before reaching its completion ¹:

a) First Phase: Identification

This is the most important phase. It exists for a very specific purpose, such as, the study of the investment idea, to see if it is economically, financially and technically. The assurance of continuing to collect and reasonably devote others resources to the project under study.

b) Second Phase: Preparation

This is a phase that affects all the company's functions, whose objectives are diversified:

- Development and confirmation of the estimated parameters during the first phase ;
- Estimation of investment and operating costs;
- Carry out financial and economic analysis.

The preparation of each project will be able to follow this process:

A market study: It consists of an evaluation of the demand in order to determine the quantity that will be produced, and also, the study of the valid offer on this market, this type of study will also be able to diagnose competition in the sector.

A technical study: It is an analytical study of the technical conditions of project implementation (duration of the work, geographical location, needs of the consumption, labour requirements, type of technology retained...).

c)Estimated capital costs, operating expenses and revenues of the project: It will be necessary to make estimates or forecasts of the total cost of the project envisaged, its flows

¹ AIS (F) a et BENNOUCHEN (R), EVALUATION FINANCIERE D'UN PROJET D'INVESTISSEMENT, Université de Bejaia,2016,p13

and their evolution, of course by taking into account consideration of the various legal, tax and financial conditions.

d) Third Phase: Evaluation

It is a phase of measuring the different components of the project, and making choices of those that best meet the requirements and objectives of the company concerned. This the latter takes into account the highest profitability.

e) Fourth Phase: decision-making

Those in charge will have three options:

- Rejection of the project: perhaps due to a lack of cash flow;
- Continuation of studies: if new variants of the project appear, we must deepen the analyses and studies of the latter; Project acceptance: if the project is advantageous, it is accepted and moved on to the next step.

f) Fifth phase: Execution: It is the realization or concretization of the project and by making the necessary funds available for this operation.

g) Sixth phases: Control: This phase will make it possible to monitor and observe the progress of work on the grounds. It will be useful to establish a set of comparisons of the achievements and forecasts made previously for this investment project.

1.3.2. Investment Decision Making Analysis:

According to Pranakusuma,(S)¹, investment analysis is the process of evaluating an investment for profitability and risk. Investment analysis can range from a single bond in a personal portfolio, to the investment of a startup business, and even large scale corporate projects. Investment analysis methods generally evaluate three factors: risk, cash flows, and resale value. The first factor evaluated in any investment analysis is risk. The reason for this is simple; if the risk of the investment is too great then loss is quite likely. Although risk the first being evaluated, it is not a definite factor. All other factors related to the investment should be evaluated as well: market, industry, governmental, company, and more. The second factor is cash flows which are one of the methods of repayment on an investment. The third factor of investment analysis is resale value. Profit from resale is made through a gain in the market

¹ PRANAKUSUMA (S), op.cit,p 23

value of the asset. When the asset is sold to another investor for a value higher than the original purchase price, profit from resale value has occurred.

Pranakusuma,(S),details five analyses to be done before investing in a project: ¹

1.3.2.1. Economic analyses

This includes cash flows, Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), Return on Investment (ROI) and Payback time.

1.3.2.2. Strategic analyses

Strategic analyses of investments require holistic view and understanding of the industry. One of the key sources of the company's competitive advantage is company's position in its markets. Identifying positional advantages company must understand the industry it operates in. This is called as "industry analysis".

1.3.2.3. Risk analyses

Recognizing the potential risks is the key for risk management. Risk could be mapped as low, medium and high scale so that they can be dealt with in terms of priority and control. Next, risk can be roughly categorized into political, economical, social and technical (PEST). Risk has to be continuously monitored throughout the investment process. The analyses have six stages that flow in the following order: decision of making the risk analyses, risk recognition and evaluation, reporting of possible risks, risk consequence measurements evaluation, recommendations of actions and implementation and monitoring.

1.3.2.4. Location attractiveness analyses

Pranakusuma(S) pointed out that investors need to understand the local characteristics such as labor, tax climate, amenities, higher education, schools, regulations, energy, communication, and business

1.3.2.5. Other factors analyses

There are other factors such as location, economic situation, segmentation and relationships.

¹ PRANAKUSUMA (S), op.cit,p 24

1.3.3. Classification of investment decisions

The types of decisions are structured according to a number of criteria, which are as follows:¹

1.3.3.1. Classification of Decisions according to the degree of risk

From the point of view of the degree of risk attached to decision-making, we speak of certain decisions, random decisions, and uncertain decisions.

Certain decisions: they are characterized by virtually no risk, because all the data necessary to make the decision is known accurately and the consequences are predictable.

Random decisions: a decision is said to be random when certain variables are not fully controlled by the company but the decision-maker knows the different possible situations and their probability of occurrence.

Uncertain decisions: a decision is said to be uncertain when certain variables are neither controlled nor probable, due to the great complexity of the environment and the conditions of market evolution.

1.3.3.2. Classification according to their Importance:

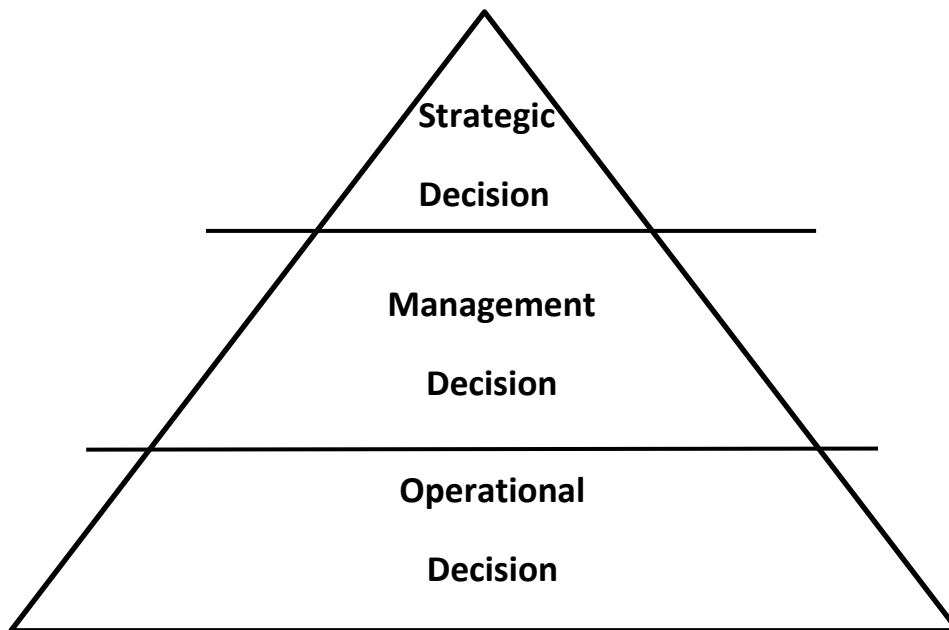
Three types of decisions can be distinguished, as follows:

Strategic decision: These are the most important decisions because they determine the general direction of the company, they are at the top of the hierarchy.

Management decision: Also called steering decisions, they extend strategic decisions and control operational decisions.

Operational decisions: These are day-to-day management decisions that correspond to less important decisions than previous ones.

¹¹ AIS (F) a et BENNOUCHEN (R),op.cit, p15

Figure II.4 : Decisions according to importance

Source: Made by the student based on the classification above

1.3.3.3. Classification of decisions according to their time frame

Depending on the time required for each decision, there are three types:

Short-term decisions

Short-term decisions are common decisions that have a short-term effect and can be easily modified in the event of errors.

Medium-term decisions

Short-term decisions commit the company over a period of 1 to 5 years, they are reversible but at a higher cost than in a short-term decision.

Long-term decisions

Long-term decisions (more than 5 years) provide guidance on the company's activity in the long term, they are difficult to reverse.

1.4. Factors influencing the investment decision

The investment decision-making process is influenced by different factors :¹

1.4.1.External business environment

This external environment (national and international) is constituted by all economic, social and political conditions existing at some point in time. This environment can be positive or negative, depending on the degree of stability that characterizes all the above conditions.

1.4.2. The company's internal environment

These are all factors related to the size, growth rate of the company, factors that are due to the structure organizational, the system and method of communicating in the company.

1.4.3. The personality of the leader

The aim is to study the degree of influence on the process decision-making process that depends on the characteristics of the leader's personality; intelligence, competence, experience, attitude to risk, and moral integrity are determining factors in the behavior of executives.

1.5 .Decision-making Conditions

In the case of simple and stable conditions, the manager has no difficulty in make decisions, inversely in cases where conditions are stable but complex and variable and complex conditions, for example when it comes to increasing the production in a market where the company has a monopoly there is not much risk of losing, but in a market where there is strong competition, it is difficult to predict the different variations.

Usually decision making is related to risk, essentially the decision making is the art of choosing the right alternative under uncertainty and taking in consideration the possible risks that can affect the objective of our decision making especially when it comes to investment decision making which the existence of the company relies on.

1.6. Definition of risk

Risk is defined as the possibility that a project may not be carried out in accordance with the expected completion dates, costs and specifications, such deviations from the expected dates being considered difficult to accept.²

¹ BALAHOUANE (K), EVALUATION D'UN PROJET D'INVESTISSEMENT : CAS DE L'EXTENSION DE LA RAFFINERIE DE SUCRE DE CEVITAL SPA,2014,University de Bejaia,p 30.

² VENIMMEN (P), FINANCE D'ENTREPRISE,Edition Dalloz, Paris ,2014, p.411

The risk occurs when¹:

- There is an error in the estimation of project parameters (forgotten costs, underestimation)
- Failure to realize the assumptions made about the project environment (economic situation)
- Endogenous reasons (poor project management)

Why is an investment risky?²

An investment is made to achieve an objective in the future (more or less close). There is a certain amount of uncertainty in the present (even if the exact amount is not known a priori) but there is a risk that the objective will not be fully achieved. The expected results are random variables that depend on variables internal and external to the project. External variables are the context or environment of the project. When making the investment decision, the compensation must be assessed according to the risks incurred if there is a degree of uncertainty about the amount of funds to be invested (inaccuracies in investment costs), the financial flows related to the operating period (and liquidation) are even more uncertain because they are more distant and influenced by many random parameters (or variables)

1.6.1 Typology of the risk

We can mention several types of risks that can affect the decision-making process

1.6.2. Investment risks: Investment risk relates to cost excesses, lags and technological risks. They are generally only sensitive for projects that take a relatively long time to complete. For example, cost excesses, time lags and technological risks.

1.6.3. Supply risks:

they are sensitive when we have a large external supply (raw material).

1.6.4. Market risks:

The risk that the bond market as a whole will decline, causing the value of individual securities, regardless of their particular characteristics, to decline. This is due to changes in price and market volume that may put the project in difficulty.

¹ TAVERDET-POPIOLEK (N), GUIDE DU CHOIX D'INVESTISSEMENT, Edition Dunod, 2008, p.63

² Idem, p.17

1.6.5. Operational risk:

controlling operating costs is difficult and is therefore linked to the uncertainty of operating returns.

1.6.6. Financial and treasury risk:

financial risk is the risk of default related to the financing method used by the company, it takes into account the uncertainties of the financial charges on the company's net income, therefore, and treasury risk concerns the company's lack of liquidity.

1.6.7. Reputation risk

risk resulting from a negative perception on the part of customers, counterparties, shareholders, investors or regulators that may adversely affect a bank's ability to maintain or initiate business relationships and continuity of access to sources of financing

1.6.8. Strategic risk:

Risk inherent in the chosen strategy or result of the inability to implement the strategy;

1.6.9. Structural interest rate and currency risk:

risk of loss or impairment on assets in the event of a change in interest rates and exchange rates.

1.6.10. Technical risk:

Due to equipment failures and obsolescence.

1.6.11. Environmental risk:

The Environmental Risk is Linked to the effects of factors related to the company's activity (politics, competition).

Section 2: Project Financial Evaluation Tools

Project evaluation criteria are profitability indicators, providing investors with the means to evaluate and compare investment resources. The validity of the result depends above all on the quality of the forecasts, activity and operating expenses of the cash flow estimate, as well as the assumptions adopted (lifetime, residual value, etc.).

2.1. Definition of Financial Evaluation:

Financial evaluation is the phase of the study of a project that makes it possible to analyse whether it is viable, and under what conditions, taking into account the standards and constraints imposed on it, and on the basis of the technical and commercial studies already carried out. It consists in valuing the flows resulting from previous studies to determine profitability and a sensitivity analysis conducted on the basis of the various risks incurred by the project and making it possible to define implementation strategies¹

2.2. Criteria for Evaluating Investments in the certain future

Different criteria for evaluating the investments in the certain future are:

2.2.1. Static methods (atemporal)

These are the criteria that do not take into account the time factor. We can consider two criteria:

2.2.1.1 The average rate of return (ARR):

The Average Rate of Return can be defined as the measure consists of directly comparing the average flows generated by the investment with the average amount of the investment. According to JackyKOEHL, the MRT is defined as "the average annual after-tax profit divided by the average investment amount over the life of the project".²

$$ARR = \frac{\text{Average operating profit}}{\text{Average investment}} = \frac{\sum_{t=1}^n Pt/n}{I+RV/2}$$

Pt: Net accounting profit generated in period t.

I: Initial investment.

¹ YVES (S), EVALUATION FINANCIERE DES PROJETS (INGENIERIE DES PROJETS ET DECISION D'INVESTISSEMENT), 2eme Ed paris, P254.

² KOEHL (J), Les choix d'investissement, Edition DUNOD, Paris, 2003, P. 37.

N: Project duration in years.

RV: Residual value.

The average rate of return method is used as a basis for:

- **Rejection criterion:** any project with an average rate of return below the standard set by the company is rejected.
- **Selection criterion:** between two projects, the one with the highest average rate of return will be preferred.

The ARR has the following advantages and limitations:

Advantages:

It is easy and quick to calculate because it refers to available accounting data;

Disadvantages:

-It does not take into account the recovery of flows;

-It is calculated on the basis of the result after depreciation and tax, excluding the result does not correspond to a cash flow;

The choice of reference rate for judging the calculated rate of return of a project is rather arbitrary; this rate cannot be set according to precise rules.

In conclusion, the average rate of return is a poor criterion for selecting a project because its contribution of information is rather low.

2.2.1.2. The payback period (BP):

A project's payback period is the number of periods (usually measured in years) required for the sum of the project's expected cash flows to equal its initial cash outlay. In other words, the payback period is the time it for a firm to recover its initial investment¹.. It is represented by the following formula:²

$$I_0 = \sum_{t=1}^{PBP} CF_t$$

¹HAWAWINI (G), VIALLET (C), FINANCE FOR EXECUTIVES : MANAGING FOR VALUE CREATION, Second Edition, Thomson,2001,p222.

² RIVET (A), GESTION FINANCIERE : ANALYSE ET POLITIQUE FINANCIERE DE L'ENTREPRISE, Edition Ellipses Marketing S. A, Paris, 2003, P. 138.

Where: **IO**: Initial investment; **PBP**: Payback period. **CF**: Cash flows generated in period t ;

This criterion is based on the idea that the faster the recovery of committed capital, the more interesting the project is.

According to the payback period rule, a project is acceptable if its payback period is shorter than or equal to a specified number of periods, known as the cutoff period. If the choice is between several mutually exclusive projects, the one with the short-est payback period should be selected¹

The advantages and limitations are as follows:

Advantages:

- If the use of this criterion is simple, the preferred investments are those that allow the company to find the amount of capital invested as quickly as possible;
- The DR promotes liquidity.

Disadvantages:

The limits of this criterion are important:

- It does not take into account the time value of money.
- It does not take into account flows after the date of equalization of the flows.
- It does not measure the real return on investment.
- It disadvantages long-term projects such as research and development and new projects and favours projects with a limited horizon.

Criteria without discounting have a certain limit because they do not give interest to the time factor, so other criteria should be presented on the basis of the time factor.

2.2.2. Dynamic (temporal) methods:

Unlike static methods, dynamic methods take into account the time factor, they are based on discounting, which consists in determining the immediate value of future flows generated by the investment. The interest of these methods lies in the consideration of time, which is

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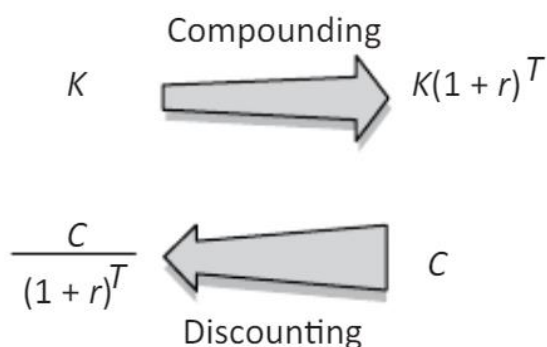
one of the essential parameters of the decision to invest. These are criteria that take into consideration the value of money over time. Before developing the criteria with discounting, it is important to define the discount rate, which is considered a common denominator of these criteria.

2.2.2.1. Notion of Discounting:

is the process of computing the present value of various future cash flows. It is a key concept in finance which brings all future amounts to their equivalent value as of today. Figure below shows how discounting and compounding are reciprocal processes.¹

Discounting is the technique that allows us to compare flows that do not occur at the same time today, in other words, discounting is "determining the immediate value of the future flows that the project will generate. It is based on a discount rate that expresses the price of time or in another way, it makes it possible to compare cash flows occurring at different times".²

Figure II.5 : Compounding and Discounting



Source: Bossu(S), Henrotte (P),op.cit,p 7

Thus, discounting makes it possible to compare between two sums occurring at different dates, an amount available at one time being not equivalent to the same amount available at another date. The discount rate corresponds in the first approach to the weighted average cost of the company's capital. Indeed, the profitability of the project must make it possible to cover

¹ BOSSU (S), HENROTTE (P), AN INTRODUCTION TO EQUITY DERIVATIVES : THEORY AND PRACTICE, Second Edition, , John Wiley & Sons, 2012,p7

² HUTIN (H), Toute la finance d'entreprise, Edition d'organisation, Third Edition, France, 2004., P 324

the cost of the resources mobilised to finance it. But this rule is not acceptable only for a project whose risk is comparable to the company's average risk.

For a riskier project, a discount rate including a risk premium should be used. Conversely, in the absence of uncertainty, the discount rate to be used is the risk-free rate. The discount rate is therefore the minimum rate of return required by the company; using this criterion, we can arrive at a study of the four (4) valuation methods:

- The net present value (NPV);
- The profitability index (PI);
- The internal rate of return (IRR);
- The Discounted payback period (DPB)

2.2.2.2. Net Present Value (NPV):

One of most popular financial cost models or measurement is net present value (NPV). The formula for net present value looks similar to IRR, it includes the time value of money. It compares the value of money today to the value of that same amount of money in the future because of inflation rate, capital cost, etc. We often use NPV for capital budgeting, where we estimate the investment profitability for a cloud project within a certain period of time. It discounts the future cash flow income or revenue with a specified interest rate. Normally, this rate is the capital cost or borrowing cost:¹

$$NPV = -I_0 + \sum_{t=0}^n CF_t * (1 + i)^{-t}$$

I₀: initial investment.

CF_t: Net cash flow.

n: project life duration.

i: discount rate or cost of capital that will be used to finance the project, this is the risk-free rate because cash flows are considered as certain flows.

Its significance:

A positive NPV signifies that the project creates value. It is profitable because:

¹ WU (C), BUYYA (R), Cloud Data Centers and Cost Modeling : A Complete Guide To Planning, Designing and Building a Cloud Data Center, Elsevier Science, 2015, p 642.

- The invested capital has been fully recovered;
- This capital was remunerated during the life of the project at the discount rate;
- The project generates a surplus of cash for the company as measured by NPV.

A negative NPV means that the project's expected rate of return is insufficient, so the project must be rejected.

A zero NPV: in this case the rate of return is equal to that of the market and its expected economic result is strictly equal to the return on capital employed, so the project will be accepted.

The decision rules relating to the NPV criterion are simple to apply:

- If we are faced with two independent projects, we implement the one with a positive NPV.
- And for projects of the same size and that are mutually exclusive, the one with the highest and positive NPV is selected.

The advantages and Disadvantages of the NPV are:

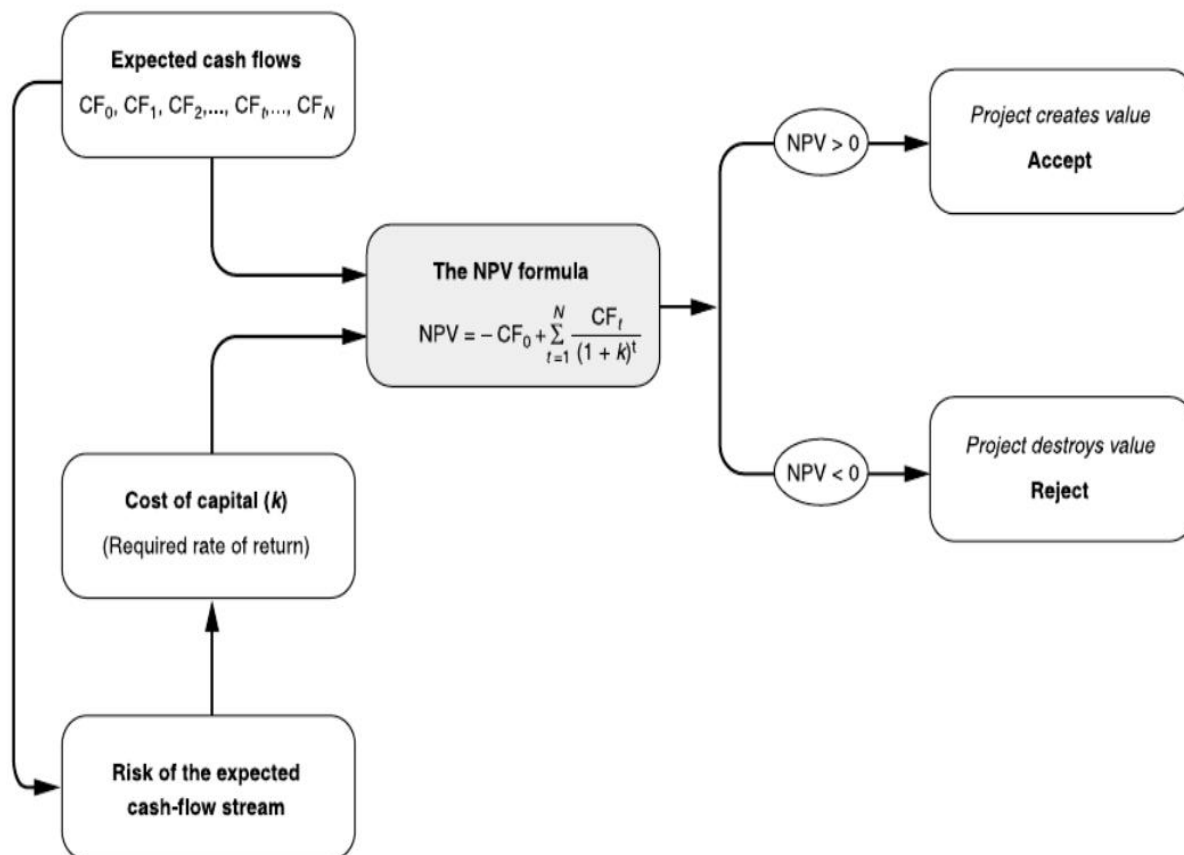
The advantages:

- The NPV shows the contribution of investments to the creation of the company's value, but it has the following strengths.
- NPV is the preferred benchmark for choosing between mutually exclusive projects.
- The NPV takes into account the time factor.
- It also takes into account the risk factor through the discount rate.

Disadvantages

- This criterion has a limit derived from the discount rate used. Indeed, the method assumes that the cash flows obtained from investments are reinvested in subsequent periods at the discount rate, or the investment rate may change from one year to the next.
- Thus, this criterion can only be applied if the opportunity cost of capital is known in a relatively satisfactory way.

Figure II.6: Steps Involved in Applying the Net Present Value Rule



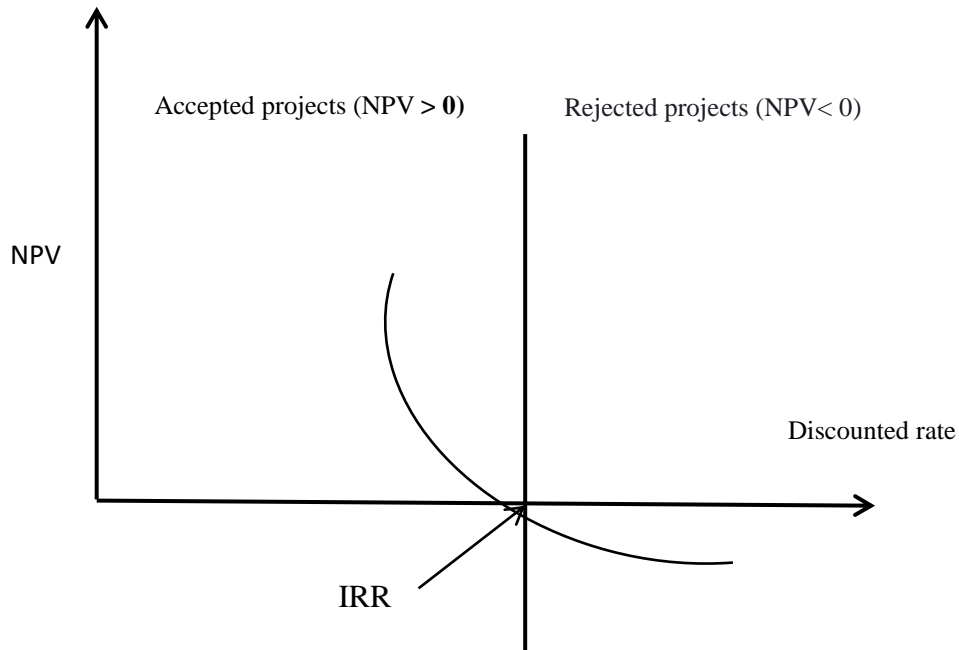
Source: GABRIEL (H), CLAUDE (V), op.cit,p 213

2.2.2.3. Internal Rate of Return (IRR):

The internal rate of return is the discount rate for which the net present value is zero. In other words, it is the rate that makes the amount of the investment and the cash flows generated by the same investment equal. In other words, it is simply the discount rate that would discount a cash flow to give a zero net present value. It can be calculated by interpolation. Choose a discount rate that gives a cash flow a small positive value. Then choose another discount rate that gives a small negative value. Then the rate that gives a zero value must lie between these two rates and can be found by interpolating.¹

As shown in the following graph:

¹MARSH (C), Business and Financial Models, Kogan Page, Hong kong ,2013,p24

FigureII.7: Relation between IRR and NPV

Source LASARY, « EVALUATION ET FINANCEMENT DE PROJETS », Ed. Distribution, El Dar El Outhmnia, 2007, p 120

In general, if the IRR of the project is referred to as "r", then the value of the project will be the solution of the following equation:

$$\sum_{t=0}^n CF * (1 + r)^{-t} = I0$$

Where:

F: cash flows. **r:** the IRR of the project. **I0:** Initial investment

Decision rule:

For independent projects, those with a IRR greater than or equal to an acceptance rate set by the firm are used.

For projects of the same size and mutually exclusive, the one with the highest TIR is selected.

The advantages and disadvantages of the IRR are:

Advantages:

- It makes it easy to compare several exclusive projects by directly comparing their rates of return.
- It is easy to understand and apply.
- It is closely linked to NPV and generally leads to the same decisions with conventional cash flows.

Disadvantages:

The IRR has some limitations, including the following:

- In the context of ranking mutually exclusive projects (conflict with other decision criteria).
- The cash flows generated are reinvested in the following periods in the IRR.

When a project generates successive positive and negative cash flows throughout its lifetime, several IRR values are obtained depending on the number of sign changes (The Multiple IRR Problem).

2.2.2.4. Profitability Index (P.I.):

The profitability index (PI) is another way of representing the net present value (NPV) model. The difference is that the NPV measures the absolute value, but the PI shows a relative value in a ratio format. The PI is calculated by dividing the present value of future income of a project or business by the initial investment capital of the project as follows:¹

$$PI = \frac{NPV}{I_0} + 1$$

The profitability index (PI) is an eligibility criterion, it is compared to 1:

- If the PI is greater than 1: the project is profitable.
- If the PI is less than 1: the project is not profitable.
- If the PI is equal to 1: there is indifference between the investment and a financial investment at the rate equal to the discount rate.

In the case of several possible projects, the one with the highest IP is used.

¹ WU (C), BUYYA (R), op.cit,644.

The advantages and disadvantages are

The advantages:

- This indicator has the advantage of reporting the increase in project-related wealth based on the calculation of the NPV to the discounted amounts invested to generate it.
- It allows you to compare projects with different investment amounts.
- It allows you to choose between projects that are not exclusive to each other in a situation of capital rationing.

The disadvantages:

The profitability index does not really solve the problem of size difference, in fact in the case where the smallest project (which initially had the lowest NPV value) gets the best index, choosing it assumes that one is able to reinvest the difference in capital expenditure over the same lifetime and that it yields a higher return than the difference in NPV.

2.2.2.5. Discounted Payback Period (DPB):

A project's discounted payback period, also known as the economic payback period, is the number of periods—usually measured in years—required for the sum of the present values of the project's expected cash flows to equal its initial cash outlay.

The discounted payback periods are longer than the ordinary payback periods. This is not surprising because the discounted payback periods are measured with discounted cash flows that are smaller than the undiscounted cash flows used to calculate the ordinary payback periods¹. It is represented by the following formula:

$$I_0 = \sum_{t=0}^{DBB} CF_t (1 + i)^{-t}$$

I_0 : Initial investment;

i : The discount rate;

t : Year order;

DPB: Discounted payback time.

¹ GABRIEL (H), CLAUDE (V), op.cit,p 226

The decision rule is to adopt a project if the payback period is less than the limit set by the company; between two projects, the company chooses the one with the shortest payback period.

The advantages and disadvantages are:

Advantages:

- It is easy to understand;
- It takes into consideration the time value of money;
- It provides an important indication if the liquidity concern is dominant (promotes liquidity);
- It excludes investments for which the NPV has a negative estimate.

The disadvantages:

- It disadvantages long-term projects such as research and development;
- It ignores the liquidity flows occurring after the recovery period;
- It requires the establishment of an arbitrary limited period of time.

2.2.3. Integrated methods (global criteria):

The figures presented so far are based only on the discount rate. They assume that the company raises financing resources from outside at the cost of capital and lends them to these projects at the same rate. They make it possible to take into account the existence of reinvestment opportunities, their calculation consists in first determining the acquired value, then we calculate the global criteria (NPV_G , IRR_G , PI_G)

The reinvestment rate:

This is an average rate at which the cash flows generated by the company are actually reinvested.

The acquired value:

At the end of the period under consideration, it is obtained by capitalizing and then summing all the elements of the series.

2.2.3.1. The global net present value (NPV_G):

The aggregate net present value is the difference between the present value of the acquired value of cash flows and the amount of the investment. (NPV_G) measures the overall benefit of the package: initial investment plus reinvestment of cash flows. It is represented by the following formula:

$$NVP_G = A(1 + i)^{-n} - I_0$$

Where:

A: Acquired value;

I₀: Value of the initial investment;

i : Discount rate ;

n : Life of the investment.

2.2.3.2. Overall internal rate of return (IRR_G)

IRR_G is the discount rate that equates the acquired value of cash flows "A" to the initial investment and is represented by the following formula¹:

$$\text{We have: } I_0 = A(1 + IRR_G)^{-n}$$

$$\text{And : } \frac{A}{I_0} = (1 + IRR_G)^n$$

So that :

$$IRR_G = \left(\frac{A}{I_0}\right)^{1/n} - 1$$

2.2.3.3. Global profitability index (PI_G)

The overall profitability index is the ratio between the present value of the value acquired by cash flows and the initial amount of the investment. It is represented by the following formula

$$PI_G = \left(\frac{A}{I_0}\right) (1 + i)^{-n}$$

Such as:

A: Discount annuity;

i : Discount rate ;

n: Year order;

I₀ : Invested capital.

¹ PIGET (G), GESTION FINANCIERE DE L'ENTREPRISE, éd. ECONOMICA, Second Edition, Paris, 2005, P. 224

Advantages and disadvantages of the global criteria are:

The global criteria have the advantage of highlighting the implicit reinvestment assumption that exists when calculating the NPV or IRR. But their main disadvantage is the choice of the reinvestment rate.

2.3.Criteria for evaluating investments in uncertain futures

All the criteria presented previously are mainly used in the case of the absence of uncertainty, Uncertainty refers to situations where the economic agent must make decisions whose consequences depend on exogenous random factors. In terms of investment choices, the uncertainty weighing on future cash flows can have very varied origins, such as changes in selling prices, production costs, the company's market share compared to that of its competitors, etc.

Uncertainty is transformed into risk when it is possible to quantify it, in particular by assigning a probability distribution to the various possible events.

The aim is to highlight evaluation methods in an uncertain future. There are methods based on probability and other methods based on game theory.¹

2.3.1.Probable methods:

These methods based on probability consideration include the scenario method, Hertz method, decision tree method:

2.3.1.1.The Scenario Method:

The general approach consists in constructing scenarios that are assigned a probability of occurrence. This method is applied according to three (03) "pessimistic, reasonable, optimistic" scenarios on a single variable or several variables.

For each variable, the mathematical expectation of the NPV is determined, and the project with a positive mathematical expectation is then selected. It is calculated as follows:²

$$E(\text{NPV}) = \sum_{t=0}^n \frac{E(\text{CF}_t)}{(1+i)^t}$$

Such as:

E (NPV): the expectation of NPV;

E(CF_t): the cash flow expectation at period t ;

¹ HACHICHA (A) : CHOIX D'INVESTISSEMENT ET DE FINANCEMENT, édition septembre 2013, P 24

² CHRISSOS (J), et GILLET (R) : DECISION D'INVESTISSEMENT, 3 e Edition Dareios et Pearson, Paris, 2012, P.205.

i: the discount rate;

n: the lifetime of the investment

When the mathematical expectation of two projects is identical, the variance of the random variable and its standard deviation, which takes into account the risk, must be calculated. Thus the standard deviation is given by the following relationship:¹

$$\text{VAR}(\text{NPV}) = -I_0 + \sum_{t=0}^n \frac{\text{VAR}(CF_t)}{(1+i)^t}$$

Such as:

VAR(NPV): the variance of the NPV ;

VAR (CF_t) : the cash-flow variance at period t ;

2.3.1.2. The HERTZ method :

The foundations of the Hertz method, better known as the Monte Carlo method, are close to the scenario method. It differs in the way probability coefficients are taken into account. The Hertz method consists in assigning each cash flow generating event of a probability law, then by drawing lots, calculating the NPV of a project characterized by a random value and thus proceeding a large number of times².

This accumulation of NPVs will then make it possible to construct the probability distribution law of the criterion. If the NPV is characterized by a positive mathematical expectation, then the project will be evaluated positively.

Hertz identifies nine factors that are likely to change in an uncertain way for an investment project: the size of the market, the expected market growth rate, the company's market share, the amount of the investment expenditure, the lifetime of the investment, the residual value, the selling price of the products or services, the operating costs and the fixed costs.

The operational implementation of this model requires the use of IT. Its interest lies more in the preliminary reflection on the variables and their variability than in the results.

¹ Idem, P 205.

² KOEHL (J), Op.cit, P 52.

2.3.1.3. The Decision Tree Method:

The decision tree is an oriented graph that represents the succession of decisions and events. Among the vertices of the graph (or nodes), we can distinguish decision nodes and event nodes.¹

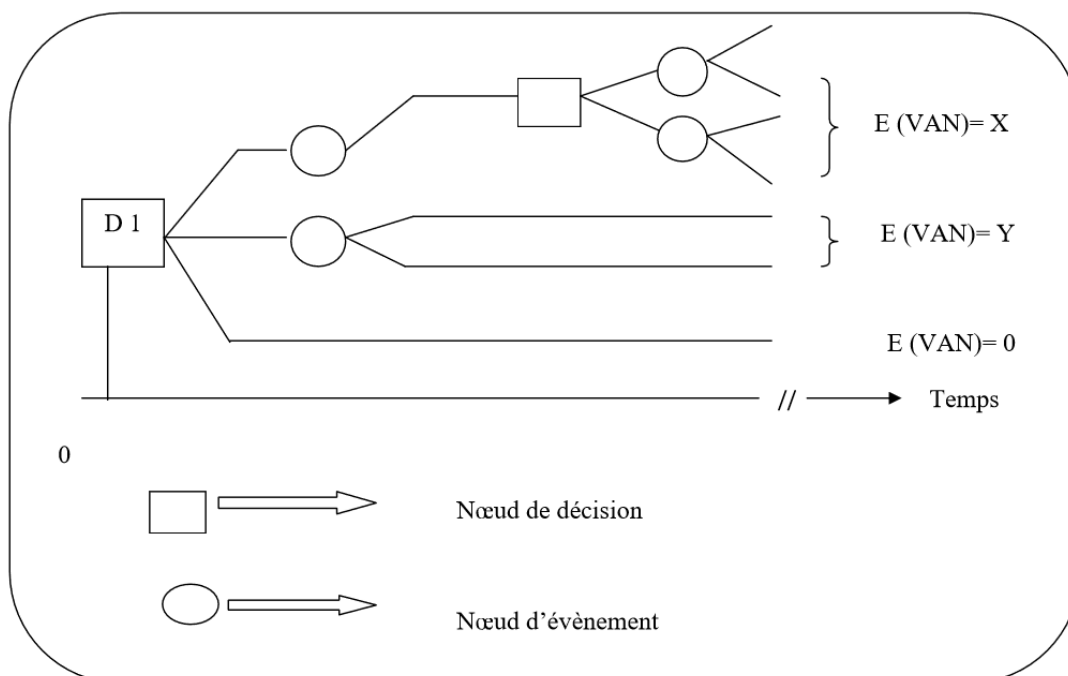
A decision node represents a choice between several decisions. It is represented by a square. Each decision leads to an event node. The root of the decision tree is always a decision node.²

An event node represents an alternative between several events. It is represented by a circle. Each event has an NPV and a probability attached to it. The sum of the probabilities assigned to the events of a node equals 1. For each node, the mathematical expectation of the NPV (and, possibly, the variance) is calculated.

At each decision node, the decision that is preferred is the one that leads to the event node for which E(VPV) is maximum.

The calculation is done by going back time from the end to the beginning. The tree is gradually modified by eliminating, at each decision node, the branches of the dominated decisions.

Figure II.8 :Schematic representation of the decision tree



Source : BARREAU (J) et al, Gestion financière, Ed. Dunod, Paris, 2004, P. 352.

¹ KOEHL (J), Op.cit, P 51

² Idem, P 52

2.3.2. Non-probabil methods:

In many cases, the future is not certain. However, the decision to invest must take into account each potential future event. The decision-maker then enters the field of strategic risk behaviour. We present below some decision criteria in a nonprobable space:

2.3.2.1. The WALD criterion (Maximin):

This criterion recommends choosing the best of the worst solutions, i.e. the least bad, so the aim is to minimize the maximum cost to be covered. In other words, we consider the worst state of nature and choose the decision α which, in this case, gives the best result. "The minimax is established to ensure that the maximum loss of the decision-maker will be kept to a minimum based on the assumption that the opponent is smart and will choose his strategy to maximize the other player's losses.

If it is a question of profit rather than cost, we seek to maximize the minimum profit and the criterion is then called Maximin.

2.3.2.2. Laplace's criterion:

The different states of nature are considered to be equally probable. For each decision, the arithmetic mean of the different results corresponding to each of the states of nature will be calculated. The decision giving the highest arithmetic mean will be chosen.

2.3.2.3. The Savage criterion (Minimax):

Savage's criterion proposes to identify the most favourable strategy for each state of nature. Then, the revenue loss of each decision is determined in relation to each most favourable strategy chosen (the maximum regret for each decision). Finally, we retain the strategy with the lowest of the maximums of regret.

2.3.2.4. The Hurwitz criterion:

"The Hurwitz criterion identifies the decision that maximizes the average score. The average score is the weighted average of the minimum and maximum values of the "decisions

Finally, in this section, any investment policy must be based on complex criteria and methods, taking into account the challenges associated with the projects it implements.

Among these criteria and methods are those that provide a precise, clear but partial indication. It must be compared with other qualitative or quantitative indicators developed by the company in order to serve as a basis for decision-making on an investment project.

Conclusion

The reality of our economic world emphasizes the importance of investment. If it cares to stand out while remaining in the competition and ensuring its survival, the company is obliged to make investments. The company is required to recognize the importance and the significance of knowledge about the decision-making process and its phases in making effective and successful investment decisions.

In this chapter, we have noticed that the aim of the financial evaluation is to determine the profitability of any potential investment. It allows us to classify projects and select among them, even if they are not similar in duration and size, using various tools and methods of assessment.

To carry out the financial evaluation of an investment project, the company uses two types of tools, called selection criteria, the first type characterizing the certain universe in which the investor bases his decision on probable values estimating the parameters of the investment projects, and the second which is considered the most significant, takes into account the risk criterion (which is the essential specificity of investments).

The choice between these criteria is left to the decision-maker, who chooses those he considers most relevant and likely to allow him to make a credible decision about the launch or rejection of the investment project.

CHAPTER III:

Financial

Evaluation of an

Investment

project

Introduction

It has been made in clear, the previous chapters of this dissertation that we have devoted to a theoretical tackle the study of an investment project, taking into consideration all of its different aspects. In the first chapter, we have explored the concept of investment and several related notions.

Similarly, the second chapter was devoted to discussing the various components of the decision-making process and to highlighting its importance in investment.

Consequently, the following chapter will deal with the practical aspect of the study. We will attempt in what follows to apply the methods and techniques of financial evaluation on a project that consists of a new line of pipe production to decide whether or not the given project is profitable. Since my internship has taken place in FGAR, examining this project will also help me to decide whether or not the line of production is guarantee-worthy.

Therefore, the present chapter will follow the subsequent outline:

- A general overview and presentation of both, FGAR, the guarantee fund where I interned, and TECHNITUBE, the company working on the new line of pipe production, the project that I will assess financially, in the first section.
- In the second section, we will apply financial evaluation methods to the project of a fresh line of pipe manufacturing to determine whether or not the project is lucrative and worthy of guarantee.

Section 1: Presentation of the company

1.1. Presentation of FGAR

1.1.1. Legal structure and status

Le Fonds de garantie des Crédits aux Petites et moyennes entreprises known as (FGAR), was created by Executive Decree No. 02-373 of 6 Ramadhan 1423 corresponding to 11 November 2002 creating and fixing the statutes of the FGAR, modified by the Executive Decree No 17-193 of 16 Ramadhan 1438 corresponding to 11 June 2017 adjusting the statutes of the FGAR, this decree sets out the statutes of the Guarantee Fund. Placed under the supervision of the Ministry of Industry and Mines, FGAR has legal personality and financial autonomy.

1.1.2. The objectives of FGAR

The main objective of the FGAR is to facilitate access to medium-term bank financing in order to support the start-up and expansion of SMEs, by providing credit guarantees to commercial banks and financial institutions, in order to complete the credit guarantee arrangement for financing viable business projects oriented towards the creation and/or development of companies.

The FGAR also provides advice and accompaniment to SMEs in the creation of their projects.

1.1.3. The missions of FGAR

According to the Executive Decree No 17-193 of 16 Ramadhan 1438 corresponding to 11 June 2017 adjusting the statutes of the guarantee fund for credits to small and medium-sized enterprises, Article 5. FGAR's missions are to:

- To guarantee the loans contracted by SMEs with banks and financial institutions, in terms of:
 - Creation of companies.
 - Renovation of equipment
 - Extension of companies
 - Participation in companies
 - Assistance for export operations.
- Manage, in accordance with the legislation and regulations in force, the resources at its disposal.

-
- Manage the funds made available to it by the government or any other financial backer, intended to guarantee the credits contracted by SMEs
 - Issue guarantee certificates to cover all types of financing
 - Monitor the collection of litigious debts by banks and financial institutions
 - Monitor commitments with banks and financial institutions covered by its guarantee, and may request any document it considers useful from them and take any decision in the interests of the Fund
 - Ensure the relays of the programs set up for SMEs by national and international institutions.
 - Provide advice and technical assistance to SMEs requesting the Fund Guarantee

1.1.4. Eligible companies

All manufacturing and related service companies are eligible for the FGAR guarantee; priority will be given to SMEs with projects that meet one or more of the following criteria:

- Projects ensuring high job and wealth creation
- Projects aimed at reducing the isolation of regions lagging behind in terms of development
- Projects with high added value, involving manufacturing production and non-existent services in Algeria
- Projects that directly result in a reduction in imports or consolidation of non-hydrocarbon exports.

1.1.5. Non-eligible companies

Company projects that do not meet the definitions of an SME as described in Law No. 01-18 of 12 December 2001.

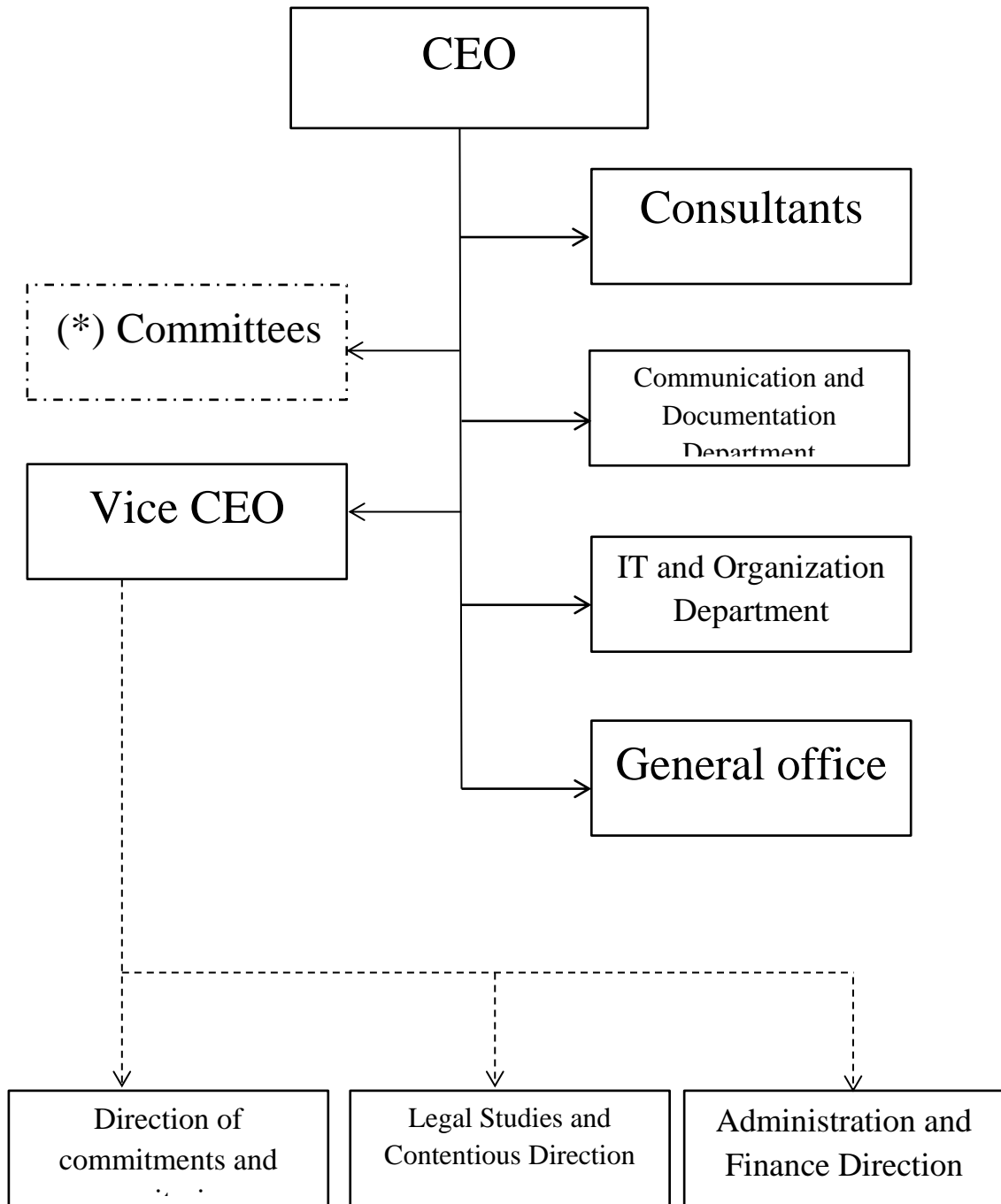
1.1.6. Coverage terms and conditions

- The guarantee rate is between 10 and 80% of the amount of the bank loan.
- The minimum amount of the guarantee is four million dinars (4,000,000 DA), and the maximum guarantee is fifty million dinars (100,000,000 DA)
- The duration of the guarantee is linked to the duration of the bank credit

1.1.7. The Organigram of FGAR:

The FGAR's organigram is presented in the figure below:

Figure III-1 : The organigram of FGAR



(*)

- Coordination Committee
- Commitments Committee
- Indemnities Validation Committee

----- Hierarchy / Functional authority

Source: company document

1.1.7. FGAR collaborators

In order to fulfill its missions and achieving its objectives, the FGAR works in collaboration with a variety of banks and financial institutions, they are as follows:

- Banque de Développement Local (BDL)
- Housing Bank
- Banque de l'Agriculture et Développement Rurale (BADR)
- CNEP banque
- Société Générale
- BNP Paribas
- Banque Nationale Agricole (BNA)
- Baraka Bank Algérie
- NATIXIS Algérie
- Banque Extérieure d'Algérie (BEA)
- Arab Leasing Corporation
- Gulf Bank Alegria (AGB)
- Société Nationale de Leasing
- El Djazair Idjar
- Sofinance Spa
- Crédit Populaire d'Algérie (CPA)
- FRANSABANK
- Ijar Leasing Algérie
- Al Salam Bank
- Maghreb Leasing Algérie (MLA leasing)

Also FGAR is present on 5 Wilayas: Algiers, Oran, Annaba, Ourgla, Biskra, so it can ensure that any investor in all Algeria can get benefits from FGAR's offers.

1.1.8. Credits covered

- medium term investment credit
- Leasing credit

1.1.9. FGAR guarantee process

Investors willing to obtain the guarantee certificate of FGAR have to pass by the following procedures

- Meeting of the promoter with the analyst and presentation of the project
- Delivery report of the file
- Summary analysis of the business plan
- Detailed analysis and recommendation (business plan and other documents)
- Commitments Committee
- Letter of guarantee offer to the SME
- Bank's credit agreement with the SME
- FGAR guarantee certificate to the bank

1.1.10. Guarantee File

- Request for coverage, accompanied by a national identity card of the manager
- Copy of the extract from the commercial register
- Status of the company's creation
- Copy of the property titles or the rental contract, justifying the occupation of the premises
- Technical and economic analysis (presentation of the promoter, pro-forma invoice and contracts)
- Last fiscal reports, for extension projects.
- (03)Tax and parafiscal certificates less than 03 months old.

1.2. Presentation of the Company: EURL TECHNITUBE

EURL TECHNITUBE was founded in 1996 as a SARL named IRRIPLAS SARL by Mr NEHARI Ahmed and Mrs LATRACHE Nabia in Oran, with an initial share capital of 500,000.00 DA. On 16/10/2013, the company was modified to become "SARL TECHNITUBE", initially with a share capital of 54,000,000,000.00 DA, distributed among the shareholders, namely:

- Mr NEHARI Ahmed: 48,780,000
- Mrs. LATRACHE Nebya: 5,420,000

On 31/11/2017, the transfer of Mrs. LATRACHE's shares to Mr. NEHARI and a change of legal form to a single-person company called "EURL TECHNITUBE" followed by an increase in share capital of 84,400 KDA.

The company specializes in the manufacture of pipes for different applications (spiral pipes, polyethylene pipes, PVC pipes and tubes for industrial purposes).

In the plastic pipe market for twenty years, and perfectly aware of the needs expressed by its traditional customers, the Nehari Group wants to complete its production range with a product that it imports today to satisfy its customers.

1.2.1. Raw material suppliers

Table III-1: Raw material suppliers

Nature de Biens importés	Suppliers	Country
Stabilisant	BETAQUIMICA	Spain
PVC RESINE	SNETOR CHIMIE	France
CRAIE	NUOVA SIMA	Italy
FIL POLYSTER	BRILEN	Spain
CHEMGUM	OMNOVA	France
DOP	SNETOR CHIMIE	France

Source: Document Company

Steel spiral tube is a special tube that is manufactured in a different way than normal plastic tube. It is a complementary technology to that of normal plastic tube.

TECHNITUBE aims at limiting, or even ceasing to import Steel spiral tube and to start the local production of this product.

This tube is used for both suction and discharge. In addition to its use in traditional fields (drinking water supply, irrigation, RIA...etc.), it is perfectly suited to production equipment using compressed air and the most chemically aggressive fluids (sludge, dust, oxygen etc.). Its production will therefore boost subcontracting and help equipment manufacturers in the design and manufacture of equipment. To make this extension, it is sufficient to acquire a production line and take advantage of the utilities already installed in the group's units.

1.2.2. TECHNITUBE products

TECHNITUBE manufactures four (04) Main product categories:

- Spiral pipes (unarmed)
- Polyethylene pipes::
- High Density Polyethylene
- Low Density Polyethylene
- PVC pipes
- Pipes of industrial and domestic use.
- Compressed air pipes
- Pipes for Acetylene
- Oxygen pipes
- Butane Gas Pipes
- Pipes for Argon
- Hoses for Spraying
- RIA pipe
- Hoses for Watering

All these tubes and pipes are manufactured in small and medium sizes standardized for market needs and are packaged in standard length rolls.

The Spiral pipes currently produced by the group were not reinforced, they are not suitable for suction (they flatten in this case). To reach the segment of customers who need this use, you need a pipe that remains open if you create a vacuum to suck up a product. It is therefore necessary to have a pipe reinforced with a steel wire that allows it to remain perfectly round and to facilitate the passage of the products sucked in as much as possible. This tube, the need for which is well felt in the Algerian market, is now totally imported.

1.2.3. Financial situation of EURL TECHNITUBE

Table III-2 : Intermediate operating balance

KDA	2016	2017		2018	
			Variation		Variation
Turnover	182433	149185	-18%	126388	-15%
Added value	58573	48010	-18%	45252	-6%
Va %	32,11%	32,18%		35,80%	
Resultat net	7531	4589	-39%	4047	-12%
CAF	17900	16401	-8%	16263	-1%

Source: Company documentation

Comment:

Significant decrease in turnover from 182433 KDA to 149185 KDA, a decrease of 18% in 2017 due to the strong competition in the company's sector of activity.

The value added logically fell by 18% in 2017 for the same reasons.

Also, according to the attached provisional balance sheet for the year 2018 shows a turnover of 126388 KDA a decrease of 16% compared to the year 2017.

Analysis of the case's balance sheets reveals the following observations:

The importance of stocks observed in 2017 representing 78% of the balance sheet total for a stock of raw materials (103988) and final products.

The importance of the raw material stock encouraged Mr. Nehari to provide a solution by expanding production capacity through the installation of a new production line with a production capacity of 1346 tons.

The prospects of this case are based on the new production line which will ensure a rate of 65% of the overall production capacity. The maximum turnover that the company can achieve is 417431 KDA including a total of 86% of the marketing capacity.

Clearly, the project seems to meet the required conditions that contribute to its financial viability and the market research developed and the quality of the product provided.

1.2.4. The Plastic market

According to the press and all the analysts who took part, the plastics industry is expected to grow strongly in Algeria but also in the world, as shown by the employment figures in the sector.

Unfortunately, the available figures on the consumption of plastic products date back to 2004 and 2005. Thus, the plastics industry in Algeria represents some 580 companies, all applications combined, employing nearly 10,000 people. In recent years, there has been an increase in the plastic processing activity, mainly driven by the production of packaging but also by the manufacture of water supply or gas connection tubes. Production indices between the first half of 2004, compared to the same period in the current year, show an increase of 1.1% in the public sector and 7.5% in the private sector.

In other words, it is an activity that tends to be totally taken over by the private sector through small and medium-sized family-type companies.

As for national consumption, it is estimated at 275 million tons processed in 2005. Globally, the growth rate is around 8%, a sector that is flourishing at the expense of other activities involving materials such as steel, aluminum and wood.

Algeria is constantly evolving in the production of plastic materials. According to ONS figures, there was a 9.2% increase in the second half of 2004 and a 3.1% growth in the first half of 2005.

This is also an undeniably expanding sector in Algeria if we take into account our imports in these sectors, which increased by no less than 25% in 2004 compared to 2003, for example.

1.2.5. The steel spiral tube

This type of tube has different characteristics than the normal tube. The fact that it is reinforced opens up the possibility of its use in suction with a thickness lower than that of the non-reinforced tube. This generates a reduction in the cost per kg. Moreover, since it is a product that has been imported to date, its production will lead to a strong foreign exchange economy in the country. Equipment assembly companies use it even in solid form (compressed air, sludge, granulated waste, water, chemicals). Its use has been widespread since 2001 in all areas of development: drinking water supply, town gas distribution, sanitation networks, irrigation.

1.2.6.Competition

580 companies share the plastics industry in Algeria. But the vast majority of these companies operate in the packaging sector, which is easier and does not require a large investment. The field of tubes and pipes is much more reserved for real professionals as the products must meet strict quality standards.¹

The steel spiral tube is not manufactured in Algeria, all the demand is only satisfied from imports. With a good pricing and quality strategy, TECHNITUBE will have no trouble placing this new product.²

¹ Documents presented to FGAR by TECHNITUBE

² Idem.

Section 2: Case study

The case study will include the presentation of the project

2.1. Presentation of project

The present project consists of the extension of TECHNITUBE's capacities through the acquisition of a production line for plastic pipes reinforced with steel wire (steel spiral pipe).

This is the processing of plastic material. Two types of plastics can be distinguished: thermosetting and thermoplastic. The project will use thermoplastics. The transformation of the latter is generally carried out by various processes such as injection, blowing, stamping, and extrusion. It is the latter process that is used by the project. The production line is actually composed of two extrusion lines, a galvanized steel wire spiral forming line and the pipe assembly device. The steel spiral machine is placed between the two extrusion lines.

The line is composed of the following equipment:

- An extruder tr 50 r 1.25 motor ca 19.5 kw
- An extruder tr 75 r 1.25 motor ca 45 kw
- An undercoat extrusion head
- A cover extrusion head
- Production tools and mandrels
Ø10,12,14,16,20,25,25,30,35,35,38,40,50,50,60,63,70,75,76,80,100mm
- A mandrel table
- A steel wire spiral machine
- A coil unwinder with flanges
- A small initial cooling tank m4
- A cooling tank m28
- Fine crown alarm sensors
- A control panel
- A thermoregulatory and control frame TR 75
- A thermoregulatory and control frame TR 50
- A spun rail
- A balance for the adjustment of the wire tension
- An ELCA electrical panel

- A Moretto granule vacuum cleaner
- A vertical knitting machine

2.2. Production capacity

It was calculated on the basis of the equipment supplier's data and the choice of work regime made by the promoter. The capacity is estimated at 1346 tonnes for 272 workdays.

2.3. Implementation planning

Table III-3: Implementation planning

Steps	Begining	End	délais en mois
Applying for and obtaining credi	02/01/2019	03/03/2019	2 mois
Equipment order	26/02/2019	26/07/2019	5 mois
Installation of equipment	10/08/2019	09/09/2019	1 moi
Testing and commissioning	11/09/2019	06/10/2019	25 jours
Market test operation	06/10/2019	02/01/2020	3 mois
Official start of operation		02/01/2020	

Source: Company document

2.3. The project parameters

They are as follows:

2.3.1. The total amount of the investment

The entire investment concerns the acquisition of a steel spiral pipe production line at a cost of 37.4 million DA, the project does not require land, construction or layout, it complements the facilities of the existing production unit and benefits from its organization (human resources support) and infrastructure.

The overall investment cost = basic investment cost + working capital requirement

2.3.2. Calculation of working capital requirement (WCR)

The calculation of the working capital requirement is based on the assumptions shown in the table, given that a working year of 272 days, considering a week of five days and 11 official national and international holidays:

Table III-4 : The Assumptions for the working capital requirement calculation

Receivables	30 days of turnover
Material inventory	60 days of production
Final product inventory	30 days of production
Material Supplier	30 days of material consumption
Service provider	15 days of service consumption

Source: Company document

Table III-5 : Calculation of Working capital requirement

	2020	2021	2022	2023	2024	2025	2026
Receivables	14705,625	39395,183 8	43459,9632	44668,566 2	45903,639 7	47165,735 3	48455,404 4
Variation Receivables		24689,558 8	4064,77941	1208,6029 4	1235,0735 3	1262,0955 9	1289,6691 2
Material inventory	30228,75	848104,41 2	87181,3235	89604,485 3	92080,367 6	94610,514 7	97196,029 4
Final product inventory	15114,375	424052,20 6	43590,6618	44802,242 6	46040,183 8	47305,257 4	48598,014 7
Total inventory	45343,125	1272156,6 2	130771,985	134406,72 8	138120,55 1	141915,77 2	145794,04 4
Variation inventory		1226813,4 9	- 1141384,63	3634,7426 5	3713,8235 3	3795,2205 9	3878,2720 6
Material suppliers	29501,139 7	30234,816 2	30980,4044	31738,125	32508,308 8	33290,845 6	34086,066 2
Service provider	229,90808 8	240,66176 5	247,996324	255,66176 5	263,76838 2	272,31617 6	281,30514 7
Total Suppliers	29731,047 8	30475,477 9	31228,4007	31993,786 8	32772,077 2	33563,161 8	34367,371 3
Variation Suppliers		744,43014 7	752,922794	765,38602 9	778,29044 1	791,08455 9	804,20955 9
Total WCR	30317,702 2	1281076,3 2	143003,548	147081,50 7	151252,11 4	155518,34 6	159882,07 7
Variation WCR		1250758,6 2	- 1138072,78	4077,9595 6	4170,6066 2	4266,2316 2	4363,7316 2

Source: Made by the student based on company document

2.3.3. Financing structure

For the financing of the project, a bank credit will be granted by the NATIXIS bank under the following conditions:

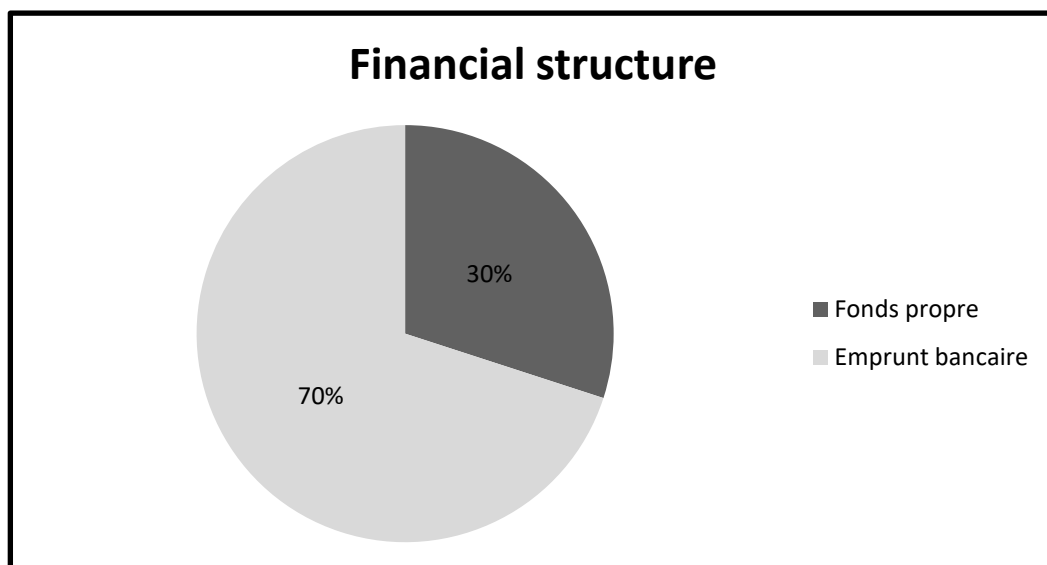
- Credit period: 7 years
- Interest rate: 5.75% per year
- Deferred term: 24 months
- Quarterly repayment

Table III-6: Financial structure

Investment cost	Montant	%
Equity capital	11220	30%
Bank loan	26180	70%
Total	37400	100%

Source : Company document

Figure III-4: Financial structure of the project



Source: Made by the student based on the data on the table above

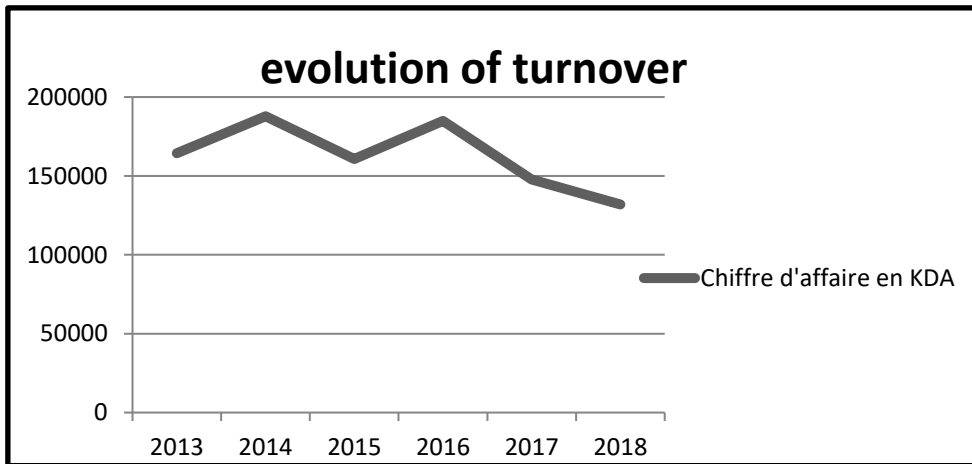
2.3.4.The Turnover

Table III-7 : Turnover between 2013 and 2018 (real)

	2013	2014	2015	2016	2017	2018
Production (tons)	531241	689756	656856	675801	546315	508015
Turnover (KDA)	164401	187817	160689	184802	147745	131909

Source: Company document

Figure : Evolution of Turnover between 2013 and 2018

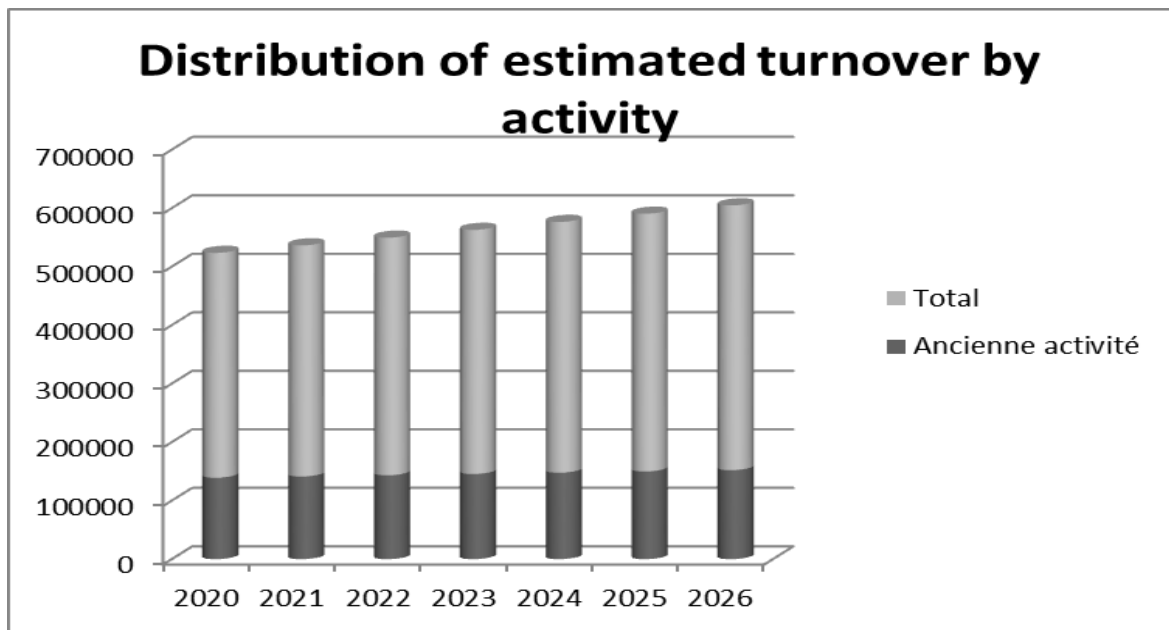


Source : Made by the student based on data in the above table

Table III-8 : Estimated turnover

Product					2020	2021	2022	2023	2024	2025	2026
Steel spiral tube	245381	254043	262910	271985	281274	290780		300508			
Old activity	139092	141179	143296	145446	147628	149842		152090			
Total	384473	395222	406206	417431	428902	440622		452598			

Source : Company document

Figure : Distribution of provisional turnover by activity

Source: Made by the student based on data in table above

2.3.5. Estimated annual operating expenses:

These expenses represent the expenses necessary for the commissioning of the new production line

Table III-9: Material consumption

	2020	2021	2022	2023	2024	2025	2026
Compound	149955	154484	159088	163769	168528	173365	178282
Steel wire	24069	24796	25535	26287	27051	27827	28616
total new activity	174024	179280	184623	190056	195579	201192	206898
total old activity	86479	87776	89093	90429	91786	93163	94560
Total	260503	267056	273716	280485	287365	294355	301458

Source: Company document

Table III-10 : Supplies consumption

	2020	2021	2022	2023	2024	2025	2026
Supplies new activity	1140	1151	1163	1175	1186	1198	1210
Supplies old activity	5833	5921	6010	6100	6191	6284	6378
Total	6973	7072	7173	7275	7377	7482	7588

Source : Company document

Table III-11: Service consumption

	2020	2021	2022	2023	2024	2025	2026
Care and maintenance	187	206	226	249	274	301	331
PIT and Internet	0	17	17	18	18	18	18
Insurance	60	54	48	42	36	30	24
Transportation	870	896	923	950	978	1006	1034
Various	19	21	23	25	27	30	33
Total new activity	1136	1194	1237	1284	1333	1385	1440
Total old activity	2084	2182	2248	2318	2392	2469	2551
Total	3220	3376	3485	3602	3725	3854	3991

Source : Company document

2.3.6. Taxes

The project benefits from ANDI advantages and will not pay TAP or IBS during the first three years of operation for the extension activity, which will only be covered by TAP and IBS after the fourth year. Since the old activity is not exempt, it will normally pay TAP and IBS, as shown in the following table, which shows that TAP increases significantly after the ANDI benefits are due:

Table III-12 : Taxes

	2020	2021	2022	2023	2024	2025	2026
Taxes	1333	2660	2934	3016	4162	4276	4393

Source : Company document

2.3.7. Personnel expenses

Personal expenses are calculated, for all employees, on the basis of an employee retention policy, taking into account the 26% social security contribution rate currently in use.

Table III-13: Personnel expenses

	2020	2021	2022	2023	2024	2025	2026
Total new activity	0	3447	3482	3517	3552	3587	3623
Total old activity	26022	26413	26809	27211	27619	28033	28454
Total	26022	29860	30291	30728	31171	31620	32077

Source: Made by the student based on company document

2.3.8. Depreciation of investments

The depreciation used in our case is linear depreciation. It should be remembered that the latter consists in distributing the amount of the investment over the tax period equally over the years. This factor is essential for determining the cash flow generated by this project.

The life of this production line is **10 years**.

So the depreciation rate (linear) is: $t = 1/10 = 10\%$

Table III-14 : Depreciation table of the investment

	Investment	Annuity payment	cumulative annuity	Net book value
2020	37400	3740	3740	33660
2021	37400	3740	7480	29920
2022	37400	3740	11220	26180
2023	37400	3740	14960	22440
2024	37400	3740	18700	18700
2025	37400	3740	22440	14960
2026	37400	3740	26180	11220
2027	37400	3740	29920	7480
2028	37400	3740	33660	3740
2029	37400	3740	37400	0

Source : Made by the student

2.3.9. Financial expenses:

Are related to the bank loan, and are calculated on the basis of the following data

- Amount of credit: 26 180 KDA
- Credit period: 7 years
- Annual interest rate: 5.75%.
- Quarterly interest rate: 1.375%.
- Deferred term: 24 months
- Quarterly repayment

The repayment period was defined on the basis of negotiations between TECHNITUBE and the bank. We calculate its repayment, the method used is constant depreciation. The results are displayed as follows:

Table-15 : Calculation of credit repayment

Trimestre	Principal	Intérêt	Amortissement	Principal restant du	Interet/an
T1-2019	26180	376,00		26180	
T2-2019		376,00		26180	
T3-2019		376,00		26180	
T4-2019		376,00		26180	1504,00
T1-2020		376,00		26180	
T2-2020		376,00		26180	
T3-2020		376,00		26180	
T4-2020		376,00		26180	1504,00
T1-2021		376	1309	24871	
T2-2021		357	1309	23562	
T3-2021		338	1309	22253	
T4-2021		320	1309	20944	1391
T1-2022		301	1309	19635	
T2-2022		282	1309	18326	
T3-2022		263	1309	17017	
T4-2022		244	1309	15708	1090
T1-2023		226	1309	14399	
T2-2023		207	1309	13090	
T3-2023		188	1309	11781	
T4-2023		169	1309	10472	790
T1-2024		150	1309	9163	
T2-2024		132	1309	7854	
T3-2024		113	1309	6545	
T4-2024		94	1309	5236	489
T1-2025		75	1309	3927	
T2-2025		56	1309	2618	
T3-2025		38	1309	1309	
T4-2025		19	1309	0	188

Source : Made by the student based on data in company document

2.3.10. The income statement

Table III-16 : The income statement

	2020	2020	2021	2022	2023	2024	2025
steel spiral pipes turnover		245381	254043	262910	271985	281274	290780
Old activity		139092	141179	143296	145446	147628	149842
1/Production for the financial year		384473	395222	406206	417431	428902	440622
purchases consumed		267477	274129	280889	287759	294742	301837
Foreign services		4351	4458	4450	4646	4746	4849
2/Consumption for the year		271828	278587	285339	292405	299488	306686
3/Operating added value		112645	116635	120867	125026	129414	133936
Personnel expenses		29860	30291	30728	31171	31620	32077
Taxes, duties and similar payments		5060	5334	5416	6562	6676	6793
4/Gross operating surplus		77725	81010	84723	87293	91118	95066
Depreciation and amortization		3740	3740	3740	3740	3740	3740
5/Operating income		73985	77270	80983	83553	87378	91326
Financial revenues		0	0	0	0	0	0
Financial expense		1505	1392	1091	790	489	188
6/Financial income		-1505	-1392	-1091	-790	-489	-188
7/Ordinary income before taxes		72480	75878	79892	82763	86889	91138

Taxes rate		0,171	0,171	0,171	0,23	0,23	0,23
Taxes		12394,08	12975,138	13661,53 2	19035,49	19984,47	20961,74
Ordinary net income		60085,92	62902,862	66230,46 8	63727,51	66904,53	70176,26
Depreciation and amortization		3740	3740	3740	3740	3740	3740
Cash earnings		63825,92	66642,862	69970,46 8	67467,51	70644,53	73916,26
Variation in WCR	- 30317,7 0	1250758,62	- 1138072,78	4077,96	4170,61	4266,23	4363,73
Initial investissement	-37400						
Cash-Flow	- 7082,30	- 1186932,70 1	1204715,63 8	65892,50 8	63296,90 3	66378,29 8	69552,52 8

Source : Made by the student

2.4. Financial evaluation

The determination of the discount rate:

Discount rate = Risk premium + Investment rate

Of which:

- The placement rate is equal to 5.75%.
- Risk premium = market risk (1%) + operational risk (1%) + liquidity risk (1%)

In our case, the discount rate used is equal to : 8,75%

After having determined the parameters of the project, we proceed to assess its profitability by calculating the main selection criteria, which are:

- Net present value
- Internal rate of return
- Profitability Index
- Payback period

2.4.1. Net present value

Table III-17: NPV (KDA)

	Disbursement	Cash flow	$(1+i)^n$	Discounted Cash flow	Cumulative discounted cash flow
Initial investment	-7082,30				Cumulative discounted cash flow
2020		-1186932,70	1,0875	-1091432,369	-1098514,67
2021		1204715,64	1,18265625	1018652,409	-79862,26
2022		65892,51	1,28613867	51232,81796	-28629,44
2023		63296,90	1,39867581	45254,87831	16625,44
2024		66378,30	1,52105994	43639,5021	60264,94
2025		69552,53	1,65415268	42047,22399	102312,16

Source : Made by the student

So : NPV = 102312,16 KDA

Interpretation :

By discounting the net operating cash flow at a discount rate of 8.75%, we obtain a NPV greater than 0 in the order of **102312.16 KDA**, which means that the project is extremely profitable (3 times the initial investment)

The positive NPV of the proposed acquisition of this new line means that all cash flows expected in the future and discounted to date cover the initial investment and generate a surplus of **102312.16 KDA** considered as enrichment.

2.4.2. Internal rate of return (IRR)

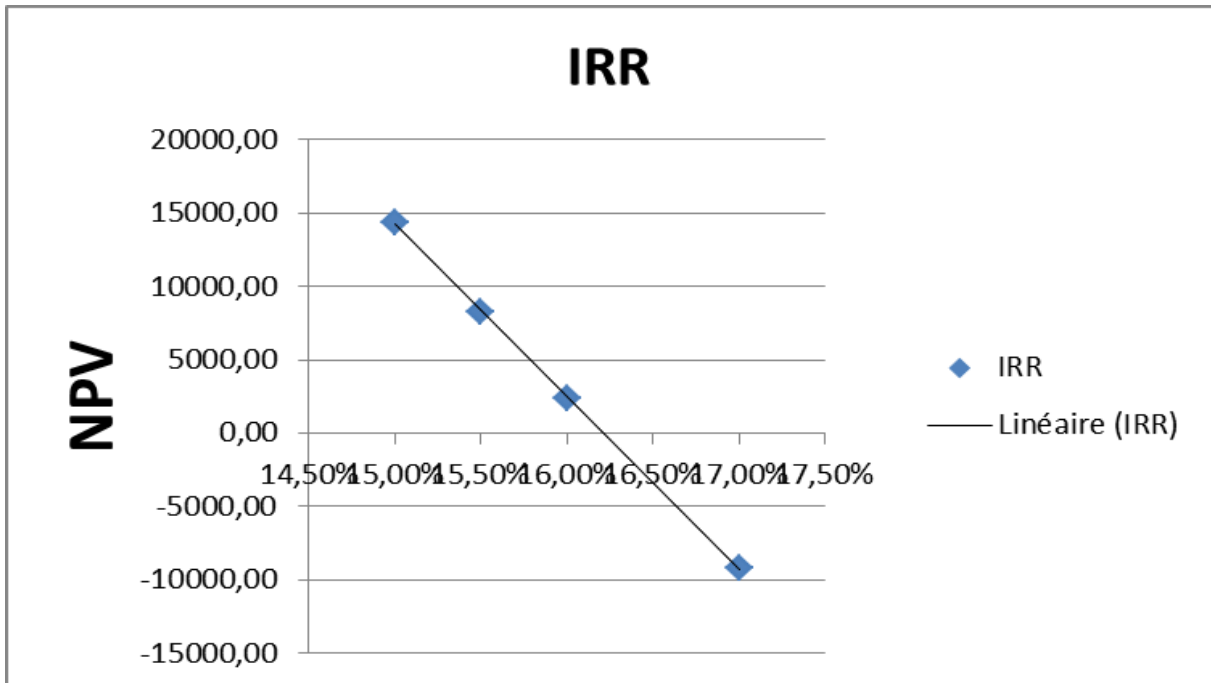
$$\sum_{t=0}^n CF * (1 + IRR)^{-t} = I0$$

16% —————> NPV=2323,55 KDA

16,5% —————> NPV=-3490,61 KDA

IRR = 16,2 %

Figure : Internal rate of return



Source: Made by the student

Interpretation:

The IRR is 16.20%, well above the minimum acceptable rate of return imposed by the company (discount rate) 8.75%, which means that the investment project is acceptable since it will contribute to improving the company's overall profitability.

2.4.3. Payback période

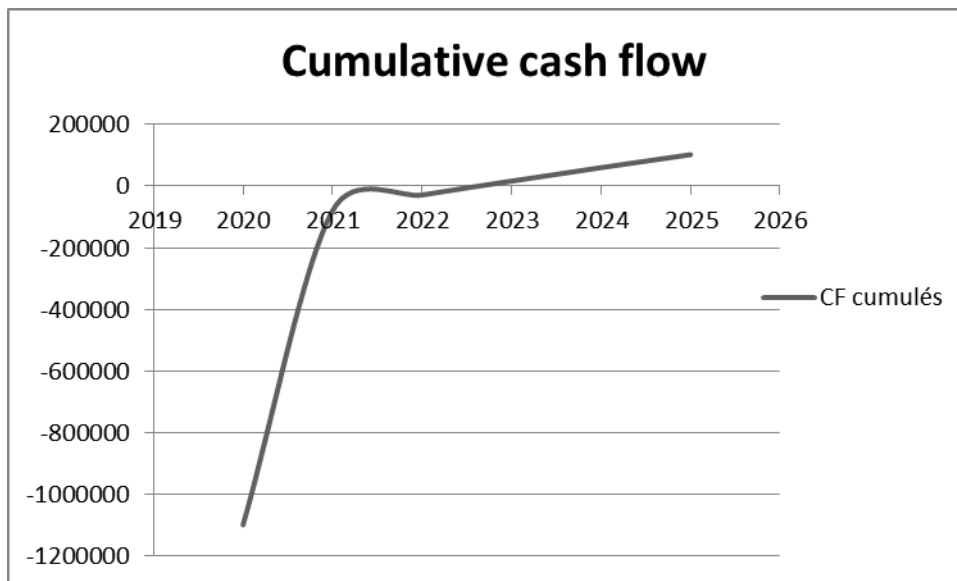
$$I_0 = \sum_{t=0}^{PBP} CF_t (1 + i)^{-t}$$

$$PBP : 28629,44 / 45254,88 = 0,63$$

$$0,63 * 12 = 7,56 \text{ (month)}$$

$$0,56 * 30 = 17 \text{ (day)}$$

According to the previous cash flow table, the PBP is equal to: 3 years + 7 months + 17 days

Figure : Cumulative cash flow

Source : Made by the student

Intrepretations

The current investment represents a payback period of 3 years + 7 months + 17 days.

This means that the project accepts an average return of liquidity

We note that the payback period for the investment is between the 3rd and 4th year, which corresponds to the point at which the year axis intersects the cumulative net cash flow curve of the project. At this point the flows become positive.

2.4.4.Profitability Index :

$$IP= 1 + \frac{NPV}{I_0}$$

$$IP= 1+(102312,16 / 37400)= 3,73$$

$$PI= 3,73$$

Interpretations

The profitability index of 3.73 explains that for every 1KDA invested, 3.73KDA is recovered.

The project has an IP of 3.73 which is greater than 1, so the project is financially profitable.

This confirms the previous results of the project's financial profitability.

Table III-18: Summary of the results of the financial evaluation

Indicators	Results
NPV	102312.16 KDA
IRR	16,2%
PBP	3 years + 7 months + 17 days.
PI	3,73

Source: Made by the student based on the results of financial evaluation

As shown in the table above, we carried out a financial evaluation to examine the profitability of the new production line; we applied the tools presented in the second chapter.

Conclusion

After this practical part, we can say that project evaluation has a very important role for any institution, in order to reflect the financial health of companies, and also remains a key tool in investment choices.

The profitability assessment allowed us to conclude that the proposed project is capable of generating a certain profitability and consequently an enrichment for the company.

The project is economically viable and financially profitable.

We evaluated the project over six years. From this perspective, and in the light of the results obtained from the evaluation of the project using traditional criteria, the project is considered profitable, its net present value being positive(102312.16 KDA), with an internal rate of return of 16.20%, This means that the project allows to recover its initial capital in 3 years + 7 months + 17 days.

**GENERAL
CONCLUSION**

This research aimed to provide a better understanding of the the importance of financial evaluation of investments and its impact on whether we accept a project or refuse it, in other words, the study aimed to answer the following question: "What is the impact of financial evaluation on an investment decision making". To handle this research in depth, this paper aim to explore the different investment decision making phases and the place of the financial evaluation through this process.

In this work, we have relied on classic financial evaluation tools, simple and easy to use to asses an investment project . We have adapted and applied them to our particular subject and study context. A literature review in Investment and decision making in general and investment decision making in particular, combined with a set of financial assessment tools, allowed us to prouve the importance of financial evaluation and its great impact on the decision-making process

That being said, the results of our research are as follow:

The observation of the economic reality, surrounding environment and decision complexity; has been very informative and allowed us to highlight the main concepts of investment decision making. To this end we found that the investment decision making is the most important element that any company should really focus on.

On the second level, the findings obtained from this case study and the practical training in FGAR helped us to understand the role of financial evaluation, the utility of its techniques and the wide field of its application .Indeed, the results revealed that financial evaluation occupies sensitive position when it comes to selecting a project . This latter provides a clear vision on the future of investments which helps to avoid and minimize the risks that faces the prosperity of any business

In view of these findings, we can confirm our first hypothesis: Decision-making depends on the results of the financial evaluation. Although our study focused on one project , but the results were conformed with FGAR decision which is a guarantee certificate to EURL TECHNITUBE .

Furthermore, on studying each and every evaluation criteria presented in this research, we find that although they are easy and simple to use, they are very helpful to assess any project and every decision maker even if one who has not a bit of knowledge in finance can easily understand and apply those criteria, plus, we showed that the wide application of those criteria (Banks, companies, Financial institutions, Lease institutions and our case a Guarantee fund ..etc)

In accordance with these findings, we can confirm our second hypothesis, which postulates that The financial evaluation methods (NPV, IRR, PI...) are sufficient for investment project evaluation. Although they have some advantages and sometimes they give opposite results they remain the most used criteria worldwide. This confirmation comes also to answer our second sub questions which consists on determining the criteria used to evaluate an investment. .

Finally, on the economic level, the study of the impact of financial evaluation on investment decision in our case deciding whether the project is guarantee worthy or not, we found after discussions with the financial analysts in charge of the clients files in FGAR that even though the main objective of any business is to create value which is translated in money creation and providing more financial resources for upcoming investment but it is not the only criteria that acceptance or rejection of a client file, also, FGAR's policy first objective is to promote investments, which leads to economic development therefore in order for a promoter to get a confirmation for his file deposited in FGAR, the project must have an economic impact, which will promote business and create new sources of finance.

The project in case, which is a an extension project by acquisition of a new production line designed to manufacture a very special type of tube (Steel spiral tube) that is totally imported, present the following evaluation criteria, a positive Net Present Value of 102312.16 KDA which makes this project very profitable, also an internal rate of revenue of 16,20 % which according to the promoter is very sufficient for his company, a Profitability index of 3,73, and after calculating the Payback Period we found that this project is expected to recover its initial expenditure within 3 years + 7 months + 17 days.

The guarantee certificate was given to TECHNITUBE, not only based on the results of the financial evaluation presented which shows that the project is profitable but also based on its economic impact, after analyzing this project, we found that The economic impact of the project is very significant because:

1. It offers a product necessary for the development of agriculture.
2. It offers a product necessary for drinking water and gas supply as well as for its wastewater network
3. For industry by offering piping to the transport of process products (compressed air, gas, liquid, and even solid)
4. The project will eliminate foreign exchange depreciation to the extent that it produces a product that is currently imported. It may even contribute in the near future to the export of products.
5. It creates employment opportunities (project requires 8 employee)

In view of these findings, we can confirm the third hypothesis Investments have an economic impact. Which match perfectly our third sub question 3. What is the economic impact of an investment?

Based on the results of our study, as well as our findings in the field, we have compiled a list of recommendations on various points, including:

1. Given the important role of Financial evaluation, although its tools are sufficient, Investors should find a new methods and tools to achieve a better evaluation, this latter would provide them better vision on the investment future.
2. Given the importance of investment decisions, it would be interesting to study all the impacts a projects can have and not relying only on Financial evaluation (In our case, studying the economic impact). Banks and financial institutions should also take into consideration the economic impact before granting any loan.
3. We suggest that FGAR should evaluate projects on a period of time higher than only five years which is going to help to ameliorate the study and provide better information on the project's profitability.

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Appendixes

Annex n°1: Guarantee Certificate

الجمهورية الجزائرية الديمقراطية الشعبية
 وزارة الصناعة والمعادن
 صندوق ضمان القروض والمستثمرات الصغيرة والمتوسطة

République Algérienne Démocratique et Populaire
 Ministère de l'Industrie et des Mines
 Fonds de garantie des crédits aux Petites et Moyennes Entreprises

FGAR
 FOND DE GARANTIE
 DES CREDITS AUX PME

CERTIFICAT DE GARANTIE CREDIT CMT
 Réf CG : 4462/2019 du 13/01/2019

Conditions particulières

Le présent Certificat de Garantie répond aux dispositions de la Convention de Partenariat FGAR/ NATIXIS ALGERIE du 16/10/2017, de l'offre de garantie N°102/2019 du 24/02/2018 ainsi que la Convention de Crédit du 05/05/2019.

Identification de la PME bénéficiaire du crédit garanti
 Dénomination : EURL TECHNITUBE Représenté par : M. NAHARI Ahmed
 siège social : Lot n°02, Zone 06, En Nedjma Chtibou Zone Industrielle de Sidi Chahmi, wilaya d'Oran. Immatriculation RC : 31/00 0102277 B 98 u 19/12/2017

Identification du crédit garanti
 Identifiant Banque/ Agence : NATIXIS/ Oran-4 Période de différé : /
 Nature du crédit : CMT Durée de remboursement : 05 ans
 Montant du crédit : 20.000.000DA Périodicité : Trimestrielle
 Objet du crédit : Acquisition des équipements de fabrication de pompes & motopompes.

Projet	Montant	Financement	Montant
- Machine de Fabrication de tuyaux	29.920.000	Apport personnel :	16.758.000
		Crédit bancaire	20.000.000
Total	29.920.000	Total	29.920.000

Conditions de couverture
 Le FGAR s'engage à partager le risque encouru avec la banque/ l'établissement financier dans les conditions suivantes :

Fond d'adossment	Quotité garantie (%)	Taux de la commission	Montant de la commission DA/TTC
MEDA	60%	0,5% / an	187.425,00

Sous peine de déchéance de la garantie, la couverture FGAR est subordonnée au respect des conditions de réalisation des conditions reprises dans la convention de crédit sus référencée à savoir :

Garanties bloquantes :
 - Convention de crédit d'investissement faisant référence de la LC équipements d'une valeur de 25.000.000DA
 - Caution solidaire de M.NEHARI avec descriptif de son patrimoine d'une valeur de 75 206 000 DA.

Conditions bloquantes :
 - Transmettre Echancier provisoire approuvé par le client, du prêt n° 94368.

Garanties Non Bloquantes :
 - Nantissements de l'équipement objet du CMT.
 - Nantissements des équipements financés.
 - Délégation de police d'Assurance multi risques professionnelle + Avenant de subrogation au profit de la NATIXIS Algérie à hauteur de 8.260.000 DA.

Durée de la garantie : La garantie FGAR prend effet à compter de la date d'utilisation du crédit et prend fin automatiquement à l'expiration de la durée contractuelle du remboursement.

Suivi de la garantie : la banque est tenue de respecter le délai de **45 jours** prévu par la convention de partenariat, pour transmettre au FGAR tout incident de paiement des échéances des crédits garantis.

La maison de l'entreprise (Ex- Ferme douzi), El Mouhamadia – ALGER
 Tél : 023.75.08.60 / Fax 023.75.09.18
 www.fgar.dz

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