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L'INTITULE DU MEMOIRE

FINANCIAL EVALUATION OF AN INVESTMENT PROJECT

A CASE STUDY OF A FOREX INSTITUTION IN GHANA

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Dedication

First and foremost, I humbly dedicate this research to God, whose boundless grace and guidance have illuminated my path. Through His unwavering presence, I found the strength, determination, and inspiration to embark on this journey of discovery. This work stands as a testament to His infinite wisdom and unending blessings. To myself, I offer heartfelt gratitude for the determination, perseverance, and countless hours invested in its creation. This journey has been a testament to my growth, resilience, and passion. May this work stand as a testament to my dedication and commitment to excellence, guided by God's grace every step of the way.

Isaac Osei Owusu

I dedicate this project to God almighty for being the pillar of this success.

I also dedicate this project to my beloved family for their support, love, care and encouragement.

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Abstract

This thesis explores the intricacies of investment project evaluation, offering a comprehensive examination of theoretical frameworks, empirical evidence, and practical applications pertinent to financial decision-making. Beginning with an in-depth literature review, the conceptual foundations of investment projects, risk assessment, feasibility studies, means of financing, and evaluation techniques are elucidated. The methodology chapter delineates the research design, data collection methods, and analytical tools employed, providing a robust framework for empirical investigation. A case study analysis of a start-up forex training institution exemplifies the application of theoretical principles to real-world scenarios, shedding light on the complexities and challenges inherent in investment decision-making. Through meticulous data collection, rigorous analysis, and the application of financial evaluation techniques, the case study offers valuable insights into project selection, risk mitigation, and strategic recommendations. Ultimately, this thesis contributes to the existing body of knowledge in investment project evaluation, offering both theoretical insights and practical implications for stakeholders across diverse sectors. It underscores the imperative for informed decision-making, strategic foresight, and adaptive resilience in navigating the dynamic landscape of finance.

Keywords: Financial evaluation, feasibility study, Net present value, profitability index, sensitivity analysis, Scenario analysis, risk assessment, monte simulation analysis.

Résumé

Cette thèse examine en profondeur l'évaluation des projets d'investissement, en abordant les cadres théoriques, les preuves empiriques et les applications pratiques essentielles à la prise de décision financière. Elle comprend une revue de la littérature sur les fondements conceptuels des projets d'investissement, l'évaluation des risques, les études de faisabilité, les moyens de financement et les techniques d'évaluation. La méthodologie décrit la conception de la recherche, les méthodes de collecte de données et les outils analytiques utilisés pour l'investigation empirique. Une étude de cas d'une start-up de formation au forex illustre l'application des principes théoriques, révélant les défis de la prise de décision en matière d'investissement. Grâce à une collecte de données rigoureuse et à l'application de techniques d'évaluation financière, cette étude de cas fournit des informations précieuses sur la sélection des projets, l'atténuation des risques et les recommandations stratégiques. Cette thèse contribue ainsi à l'enrichissement des connaissances en

matière d'évaluation des projets d'investissement, offrant des perspectives théoriques et des implications pratiques pour divers secteurs. Elle souligne l'importance d'une prise de décision éclairée, d'une vision stratégique et d'une résilience adaptative dans le domaine financier.

Mots-clés : Évaluation financière, étude de faisabilité, valeur actuelle nette, indice de rentabilité, analyse de sensibilité, analyse de scénario, évaluation des risques, analyse de simulation de Monte Carlo.

List of abbreviation

NPV: Net present value

IRR: Internal rate of return

PI: Profitability index

PPP: public-private partnership

R&D: Research and Development

CF: cash flow

CSR: Sustainability and Corporate Social Responsibility

PERT: Program Evaluation Review Technique

CPM: critical path method

GERT: Graphical Evaluation and Review Technique

IPO: initial public offering

FCF: Free Cash Flow

CFROI: Cash Flow Return on Investment

DCF: Discounted Cash Flow

SROI: Social Return on Investment

MCDA: Multi-Criteria Decision Analysis

CBA: Cost-Benefit analysis

PRA: Probabilistic Risk Assessment

ROI: Return on Investment

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Reference

CHAPTER 1: INTRODUCTION

Investment decisions are pivotal in shaping economic outcomes, yet navigating the complexities of project evaluation and decision-making demands a nuanced understanding. This chapter serves as a gateway, introducing the fundamental concepts and motivations behind the study of investment projects. It outlines the objectives, rationale, problematic statement, and scope of the research, providing a roadmap for the subsequent exploration of investment project management. Through this introduction, readers are primed to delve into the intricate dynamics of investment decision-making and project evaluation.

1.1 Background and Rationale

In today's dynamic and competitive business environment, organizations continually seek opportunities for growth and expansion. Investment in new projects, whether it involves launching innovative products, entering new markets, or upgrading existing infrastructure, is a common strategy employed by businesses to achieve their strategic objectives. However, the decision to invest resources in a particular project is not taken lightly, as it involves substantial financial commitments and risks. With the change of environment and market, the current investment project decision is facing a more complex environment, the competition of enterprises intensifies, the decision complexity increases, and the demand for scientific decision is increasing (Xiao, M. (2024).

The background of this study lies in the recognition of the importance of making informed investment decisions. While opportunities for growth abound, not all investment projects are guaranteed to yield favorable outcomes. Therefore, a robust evaluation process is essential to assess the potential risks and rewards associated with each investment opportunity

Rationale for Conducting Financial Evaluation:

Risk Mitigation: Investment projects inherently carry risks, ranging from market volatility to operational challenges. Financial evaluation allows stakeholders to identify and quantify these risks, enabling them to implement strategies to mitigate or manage them effectively.

Resource Allocation: Scarce resources, whether financial capital or human capital, must be allocated judiciously to projects that offer the highest returns. Financial evaluation provides a

systematic framework for comparing and prioritizing investment opportunities based on their potential financial benefits.

Performance Measurement: Effective evaluation of investment projects provides a basis for assessing their performance against predefined goals and benchmarks. This, in turn, facilitates accountability and enables organizations to refine their investment strategies over time.

Decision Making: Ultimately, the goal of financial evaluation is to support decision-making processes by providing decision-makers with the necessary information and insights to make informed choices. By evaluating the financial viability and feasibility of investment projects, stakeholders can make decisions aligned with their strategic objectives and risk tolerance.

In summary, the background and rationale for conducting financial evaluation of investment projects stem from the imperative to manage risks, allocate resources efficiently, measure performance, and support decision making. By undertaking a thorough financial evaluation, organizations can enhance their ability to identify and capitalize on lucrative investment opportunities while safeguarding against potential pitfalls.

1.2 Objectives and motivation of the Study

Objectives

The primary objectives of this study are designed to address the fundamental aspects of financial evaluation in investment decision-making processes. By delineating these objectives, the study aims to provide a structured framework for conducting a comprehensive analysis of investment projects. The objectives include:

Assessing Feasibility and Viability: The study aims to evaluate the feasibility and viability of the selected investment project through rigorous financial analysis. This involves examining key financial indicators such as projected cash flows, profitability, and return on investment to determine whether the project is financially sustainable and capable of generating returns in line with expectations.

Identifying and Mitigating Risks: Another objective is to identify potential risks and uncertainties associated with the investment project and develop strategies to mitigate them. Risk assessment is a critical component of financial evaluation, as it helps stakeholders understand the potential downside risks and implement measures to safeguard against adverse outcomes.

Applying Financial Evaluation Techniques: The study seeks to apply various financial evaluation techniques to assess the merits of the investment project. This includes

discounted cash flow analysis, net present value (NPV), internal rate of return (IRR), payback period, sensitivity analysis, and risk assessment. By employing these techniques, the study aims to provide a comprehensive analysis of the financial aspects of the investment project. Providing Recommendations for Decision Making: Based on the findings of the financial evaluation, the study aims to provide recommendations to stakeholders to facilitate informed decision-making processes. These recommendations may include whether to proceed with the investment project, modify certain aspects of the project, or explore alternative investment opportunities based on the analysis conducted. Enhancing Understanding of Financial Evaluation: Additionally, the study aims to contribute to the body of knowledge on financial evaluation by providing insights into best practices, methodologies, and challenges associated with evaluating investment projects. By enhancing understanding in this area, the study seeks to empower stakeholders with the knowledge and tools necessary to make sound financial decisions.

Overall, the objectives of the study are geared towards enabling stakeholders to make informed decisions regarding investment projects by conducting a rigorous and comprehensive financial evaluation. Through a systematic analysis of feasibility, risks, and potential returns, the study aims to provide valuable insights and recommendations that support effective decision making and maximize the likelihood of project success.

Motivation

The motivation behind this study stems from the pressing need to enhance the quality and effectiveness of investment decision-making processes in businesses, especially start-ups. Despite the availability of theoretical frameworks and analytical tools, businesses often face challenges in accurately assessing the financial feasibility and viability of investment projects. This study seeks to address these challenges by providing practical insights, guidelines, and recommendations derived from a thorough examination of relevant literature and empirical evidence. Moreover, the growing significance of start-up businesses in driving innovation, economic growth, and job creation underscores the importance of understanding the financial implications of investment decisions in this sector (Mason & Harrison, 2016). By elucidating the complexities of financial evaluation and risk management in the context of start-ups, this study aims to empower entrepreneurs and business leaders to make informed and strategic investment choices that align with their organizational objectives and aspirations.

1.3 Problematic Statement and Hypothesis

Problematic Statement:

The financial evaluation of investment projects poses significant challenges for businesses, particularly in the context of start-ups, due to inherent uncertainties, complexities, and risk factors associated with such endeavors. Despite the availability of various financial evaluation techniques, businesses often struggle to accurately assess the financial feasibility and viability of investment projects, leading to suboptimal decision-making and potential financial losses.

The aim of this research is to seek the answer to the following problem:

How can an enterprise accurately evaluate the comprehensive financial viability of an investment project?

From this main question arises a certain number of secondary questions

- a. What is the usefulness of an evaluation of an investment project?
- b. what are the criteria to take into consideration to validate its financing?
- c. Does the financial evaluation of projects allow for more thoughtful decision-making?

Hypothesis:

A comprehensive understanding of financial evaluation techniques, coupled with robust risk management strategies, influences positively investment decision outcomes, enhancing the likelihood of project success and financial sustainability for businesses, including start-ups.

This hypothesis suggests that by integrating sound financial evaluation practices with effective risk management measures, businesses can mitigate uncertainties and make more informed investment decisions, thereby maximizing returns and minimizing potential losses.

So many questions to which we will try to provide some answers.

It is in this context that these hypotheses were formulated:

Hypothesis 1: Effective utilization of advanced financial evaluation techniques, such as real options analysis and sensitivity analysis, significantly improves the accuracy of investment project valuation, leading to more precise decision-making outcomes.

Hypothesis 2: Enhanced integration of qualitative risk assessment methods, such as scenario analysis and expert judgment, alongside traditional quantitative techniques, enhances the robustness of investment project evaluation, particularly in uncertain and volatile business environments.

Hypothesis 3: To evaluate an investment project, it is necessary to make an estimate of the results, and of the risks to be incurred, and the acceptance or rejection of the project is then carried out by the use of different criteria to assess its profitability.

1.4 Scope and Limitations

The scope of this study delineates the boundaries within which the research will be conducted and highlights the constraints that may impact the findings and conclusions. Understanding the scope and limitations of the study is crucial for interpreting the results accurately and managing expectations.

Scope:

Financial Evaluation of Investment Projects: The primary focus of this study is on the financial evaluation of investment projects. It encompasses the analysis of key financial metrics such as cash flows, profitability measures, and risk indicators to assess the feasibility and viability of the selected investment project.

Application of Financial Evaluation Techniques: The study will apply various financial evaluation techniques, including discounted cash flow analysis, net present value (NPV), internal rate of return (IRR), payback period, sensitivity analysis, and risk assessment. These techniques will be used to provide a comprehensive analysis of the financial aspects of the investment project.

Single Case Study: The scope of the study involves the evaluation of a single investment project within a specific industry or sector. While the principles and methodologies discussed may have broader applicability, the focus remains on a detailed analysis of a particular case study.

Limitations:

Data Availability and Quality: The accuracy and availability of data related to the investment project may pose limitations on the study. The reliability of financial projections, historical data, and other relevant information can impact the accuracy of the analysis and conclusions drawn.

Assumptions and Estimates: The financial evaluation of investment projects often requires making assumptions and estimates about future events and outcomes. These assumptions are subject to uncertainty and may influence the results of the analysis. Therefore, the study will acknowledge and address the limitations inherent in the assumptions made.

Quantitative Focus: While financial evaluation provides valuable insights into the financial aspects of investment projects, it may overlook qualitative factors that can also impact project outcomes. The study will acknowledge the importance of qualitative considerations such as market dynamics, regulatory environment, and managerial expertise, while primarily focusing on quantitative analysis. The findings and conclusions of the study may be specific to the selected investment project and may not be directly generalizable to other projects or contexts. Therefore, stakeholders should exercise caution when applying the results of the study to different investment scenarios.

Despite these limitations, the study aims to provide a rigorous and comprehensive analysis of the financial aspects of the investment project within the defined scope. By acknowledging and addressing the limitations, the study seeks to enhance the validity and reliability of its findings and contribute to the understanding of financial evaluation in investment decision-making processes.

1.5 Structure of the Thesis

The structure of the thesis outlines the organization and flow of the research, providing a roadmap for readers to navigate through the various sections and chapters. Each component of the thesis serves a specific purpose, contributing to the overall objective of conducting a comprehensive financial evaluation of an investment project. The structure of the thesis is as follows:

Firstly, Literature Review which Explores existing literature on financial evaluation, including conceptual frameworks, evaluation techniques and empirical studies. Secondly, Methodology which Describes the research design, data collection methods, analytical tools, and assumptions utilized in the study. And at the end we have our case Study Analysis which presents the selected investment project, data collection and analysis process, application of financial evaluation techniques, and interpretation of results.

Each chapter serves a specific purpose within the thesis, contributing to the overall objective of conducting a comprehensive financial evaluation of the investment project. The structure ensures

a logical progression of ideas and analysis, guiding readers through the research process from introduction to conclusion. Through this structured approach, the thesis aims to provide valuable insights and recommendations for stakeholders involved in investment decision-making process.

In conclusion

the introductory chapter lays a sturdy foundation for the subsequent exploration into investment project management. By delineating the backdrop and rationale for the study, it establishes the contextual framework within which the research unfolds. The identified objectives and motivations serve as guiding beacons, directing the trajectory of inquiry towards a comprehensive understanding of investment decision-making processes. Moreover, the enunciation of problematic statements and hypotheses sparks curiosity and sets the stage for empirical validation and theoretical scrutiny. Within the defined scope and limitations, this chapter offers a tantalizing glimpse into the intricate world of investment projects, teasing out the complexities that underpin their evaluation and execution. As the reader traverses through the structured landscape of this thesis, they are invited to delve deeper into the realms of feasibility assessment, risk mitigation, and financial evaluation techniques. By adhering to this methodical approach, the study endeavors to unravel the multifaceted dimensions of investment projects, ultimately contributing valuable insights to the broader discourse on project management. As the introductory curtain draws to a close, it beckons the reader to embark on a journey of discovery and enlightenment. Armed with a comprehensive understanding of the foundational concepts and motivations, the reader is primed to navigate the intricate terrain of investment project management with astuteness and acumen. Thus, with anticipation and enthusiasm, we embark on this scholarly odyssey, poised to uncover the secrets that lie beneath the surface of investment decision-making and project evaluation.

CHAPTER 2: LITERATURE REVIEW

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The purpose of this chapter is to provide a comprehensive review of the existing literature related to investment projects. The literature review is structured to cover the conceptual framework of investment projects, the decision-making processes involved, the associated risks, and the feasibility studies including means of financing. Additionally, this chapter explores various evaluation techniques used in assessing investment projects and reviews empirical studies that highlight the financial evaluation methodologies in practice. By synthesizing these different strands of literature, this chapter aims to build a solid theoretical foundation for the research and identify gaps that the current study aims to address.

2.1 Conceptual Framework of an investment project

Investment projects are strategic initiatives undertaken by organizations to allocate resources towards ventures that are expected to generate returns over time. These projects could range from the establishment of new facilities, development of products or services, to strategic acquisitions or investments in financial assets. Understanding the conceptual framework of investment projects is essential for effective decision-making and resource allocation (Brealey, Myers, & Allen, 2016).

2.1.1. Definitions of an investment

Investment can have several definitions from different aspect

An investment is the current commitment of dollars for a period of time in order to derive future payments that will compensate the investor for (1) the time the funds are committed, (2) the expected rate of inflation, and (3) the uncertainty of the future payments. (Frank K Reilly 2012). *According to Cambridge dictionary*, investment can be defined as the act of putting money, effort, time etc. into something to make a profit or get an advantage. *According to accounting*, investments are assets held by an enterprise for earning income by way of dividends, interest, and rentals, for capital appreciation, or for other benefits to the investing enterprise. Assets held as stock-in-Trade are not 'Investments'. It consists of all assets: - Physical: constructions, materials, technical installations, etc.; - Intangible: patents, trademarks, operating licenses, etc.; - Financial: equity securities, investment securities. *According to economic concept*, it is about "any sacrifice of resources made today, in the hope of obtaining in the future, results, certainly spread over time

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but of a total amount greater than Initial Expense Investment is the action of investing, that is to say of acquiring new means production, improve their output or invest capital in an activity economic, In a company. The driving force behind investment is the prospect of profit, economists mean the production of goods that will be used to produce other goods. This definition differs from the popular usage, wherein decisions to purchase stocks are thought of as an investment. *According to the strategic aspect*, investing allows the company to position itself on a market competitive and adapt to its environment, increasing the value of the firm.

2.1.2. Definition of a project

A project has a definable goal or purpose, and well-defined end-items, deliverables, or results, usually specified in terms of cost, schedule, and performance requirements. A Project is a means of implementing the firm's plans. As a means of plan implementation, project involves a complex process. The term 'project' may be defined as a complex set of economic activities in which scarce resources are committed in expectation of benefits that exceed the costs of resources consumed. Thus, Projects require resources. They are also expected to derive benefits. Projects are said to be desirable if their benefits are greater than the costs incurred on them. A project can also be referred to as a non-repetitive activity. A project is viewed as a conversion process. This implies that a project involves a transformation of some form of inputs into an output. (John M. Nicholas, Herman Steyn). project is a conversion process which serves in transforming inputs into outputs. Inputs represent want or need whereas outputs represent satisfied need. Constraints consist of factors such as financial, legal, ethical, environmental, time, and quality. Mechanisms include people, knowledge of expertise, capital, tools and techniques, and technology. According to Cambridge dictionary, A project is a piece of planned work or an activity that is finished over a period of time and intended to achieve a particular purpose. The PMI's Guide to the Project Management Body of Knowledge (PMBOK 3rd Edition, 2004), defines a project as a temporary endeavor undertaken to create a unique product or science.

2.1.3. Classifications of an investment project

An investment project is a detailed proposal of an expenditure of liquid resources, with the objective of taking actions that will lead to future profits. An investment project is made before the investment itself. An investment implies an expenditure of resources, but it doesn't necessarily mean that those resources are our own resources: a lot of investments are carried out

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by borrowing money. There is a temporal difference between the expenditure and the procurement of the profits. The procurement of the profits is farther away in time. This is an important fact that must be taken into account during the capital budgeting. It is difficult to classify investments by type because the problem of investment is not the same depending on the sectors, size and structure of the company, the nature and expected lifespan of the projects. (Brealey, et al,2017). Classification of an investment project can be group into four main categories which are by scale, by purpose, by duration, and by ownership.

Investment projects can be classified based on their scale, such as small, medium, or large-scale projects. This classification helps in understanding the magnitude of resources and capital required for the project. *Small-Scale Investments* typically involve a relatively low amount of capital and resources. These projects may include small businesses, startups, local initiatives, and micro-enterprises. Small-scale investments are often characterized by lower barriers to entry and can be more accessible to individual investors. *Medium-Scale Investments* encompass projects that require a moderate amount of capital and resources. These could include expanding existing businesses, regional development projects, and mid-sized infrastructure initiatives. Medium-scale investments often involve a balance between risk and potential return. *Large-Scale Investments* are characterized by significant capital outlay and substantial resource requirements. These projects can include major infrastructure developments, industrial facilities, multinational corporations, and large real estate developments. Large-scale investments often involve complex financing structures and longer time horizons.

An investment Projects can also be classified based on their purpose, such as expansion projects, new product development, infrastructure development, research and development, and so on. Understanding the purpose helps in evaluating the potential returns and risks associated with the project. Expansion Project is a project involve in expanding existing business operations, facilities, or market presence. The purpose is to increase production capacity, market share, or geographical reach, often aiming to capitalize on existing strengths and opportunities. New Product Development aim to create and launch innovative products or services. These projects often involve research and development efforts, market testing, and commercialization activities. Infrastructure Development aimed at building or upgrading physical and organizational structures, such as transportation networks, utilities, communication systems, and public facilities. The

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purpose is to improve economic productivity, quality of life, and business environment. Research and Development (*R&D*) projects focus on scientific research, technological innovation, and product enhancement. The goal is to create new knowledge, technologies, or products that can lead to competitive advantages and market differentiation. Market Entry or Expansion project involve entering new markets or expanding operations into new geographical areas. The purpose is to capture new customer segments, diversify revenue streams, or benefit from emerging market opportunities.

Investment projects can also be classified based on their duration, which refers to the timeframe over which the project is expected to generate returns and achieve its objectives. Understanding the duration of an investment project is crucial for assessing the time horizon for potential returns, planning resource allocation, and managing risks. This classification divides investment projects based on their duration, such as short-term, medium-term, and long-term projects. The duration of the project impacts the investment horizon and the time it takes to realize returns. Short-term investment projects typically have a duration of one year or less. These projects are focused on achieving quick results, often involving activities such as inventory management, marketing campaigns, short-term market opportunities, or operational improvements. The primary goal is to generate immediate returns or address specific business needs within a short timeframe. Medium-term investment projects have a duration ranging from one to five years. These projects often involve activities such as capacity expansion, technology upgrades, product development, and market expansion. The timeframe allows for more substantial initiatives that require moderate planning and resource allocation, aiming to achieve growth and competitive advantages over a few years. Long-term investment projects extend beyond five years and are often associated with significant capital investments, infrastructure development, research and development, and market positioning strategies. These projects aim to create lasting value, sustainable competitive advantages, and enduring impact over an extended period. Examples include large-scale infrastructure projects, new product development with long lead times, and market entry strategies requiring substantial upfront investments. Continuous or Ongoing Projects: Some investment projects are ongoing and continuous in nature, without a fixed endpoint. These may include activities related to research and development, innovation, process improvement, and maintenance of competitive positioning. The goal is to continuously adapt, improve, and innovate to sustain competitiveness and relevance in the market.

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Investment projects can be classified based on ownership structures, which delineate the rights, responsibilities, and control associated with the investment. Understanding ownership classifications is important for investors, stakeholders, and decision-makers as it influences decision-making authority, profit distribution, and risk management. Here are common classifications of investment projects based on ownership

Public sector investment projects are owned and funded by government entities at the national, regional, or local levels. These projects often focus on public infrastructure, social welfare, education, healthcare, and other public goods. Ownership and financing typically come from public funds, and the projects are designed to serve the broader public interest. Private sector investment projects are owned and funded by private individuals, corporations, or non-governmental entities. These projects encompass a wide range of activities, including commercial ventures, industrial developments, real estate projects, and entrepreneurial initiatives. Ownership and financing are predominantly sourced from private capital, and the projects are driven by profit motives and market dynamics. Public-Private Partnership (*PPP*) *Projects* involve collaboration between public and private entities to develop and operate infrastructure or public service projects. Ownership and financing are shared between the public and private sectors, often through contractual arrangements. PPP projects aim to leverage the strengths of both sectors to deliver public infrastructure, utilities, and services while allocating risks and rewards between the public and private entities.

2.1.4. The objectives of an investment projects

The objective of an investment project is to achieve specific financial and strategic goals, often aligned with the broader mission and vision of the investing entity. Investment projects are undertaken by individuals, companies, governments, and organizations with the aim of generating returns, creating value, and achieving various long-term objectives. The primary objectives of an investment project can include financial objective, strategic objectives, social and environmental objectives. (Bodie et al., 2018).

The financial objectives of an investment project primarily revolve around the generation of returns, preservation of capital, and the achievement of specific financial goals. These objectives guide investors in making decisions regarding the allocation of funds and the management of their investment portfolios. The primary financial objective of many investment projects is to maximize

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returns on invested capital. This can be achieved through capital appreciation, dividend income, interest, or other forms of investment income. For some investors, especially those with a lower risk tolerance, the primary objective may be the preservation of capital. This involves seeking investments that provide stability and protection of the initial investment amount. Many investment projects aim to generate regular income streams to meet ongoing financial needs. This can include interest income from bonds, dividend income from stocks, or rental income from real estate investments. Long-term investors often seek to accumulate wealth over time through the appreciation of their investment portfolio. The objective is to grow the value of their investments to achieve specific financial milestones. Diversifying investments to spread risk and potentially enhance returns is another common financial objective. By investing across different asset classes, sectors, and geographies, investors aim to minimize the impact of underperformance in any single investment.

The strategic objectives of an investment project extend beyond purely financial considerations and encompass broader goals related to growth, sustainability, innovation, and competitive positioning. These objectives are aligned with the overarching strategic vision of the investing entity and are aimed at creating long-term value and impact. Some key strategic objectives of an investment project include market expansion, innovation and research, competitive advantages and long-term sustainability. One strategic objective is to expand into new markets, either geographically or within different industry sectors. This can involve investing in projects that enable access to new customer segments, distribution channels, or emerging economies. Strategic investment projects often focus on driving innovation and research to develop new products, services, or technologies. This can involve funding R&D initiatives, strategic partnerships with technology firms, or investments in disruptive innovations. Investment projects may be structured to enhance the investing entity's competitive position. This can include investments in technology, operational efficiency, human capital, or strategic acquisitions aimed at gaining a competitive edge. Many investment projects are designed to foster long-term sustainability by considering environmental, social, and governance (ESG) factors. This involves supporting projects that promote sustainable practices, environmental responsibility, and social impact.

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Social and environmental objectives within an investment project are centered on promoting positive societal impact and environmental sustainability alongside financial returns. These objectives reflect a growing emphasis on responsible and ethical investing, aiming to address social issues and environmental concerns. Some key social and environmental objectives of investment projects include community development, employment opportunities, diversity and inclusion, human right and labor standard, climate action, sustainable agriculture and forestry, education and healthcare and so on.

2.1.5. The characteristics of an investment projects

Every investment project, regardless of its objective or nature, has financial characteristics on which the decision to invest is based (Brealey, Myers & Allen, 2017). investment project can be characterized by investment expenditures, duration or time horizon, cash flows, working capital requirement and depreciation

a. Investment Expenditures

These expenses represent the capital invested at once or in several installments, depending on the nature and lifespan of the investment. The invested capital is measured by acquisition and construction expenses, including preliminary study and testing costs, as well as all related expenses.

Investment Cost: This is the purchase price of the assets constituting the investment (equipment, machinery, facilities, etc.). *Incidental Expenses:* These are expenses incurred at the start of the investment, such as study costs, installation costs, transportation costs, personnel training, and the acquisition of patents and licenses, provided they are not regular charges and are directly related to the investment. *Increase in Operating Financing Needs:* Every investment project generally increases the company's activity, resulting in an increase in operating working capital requirements. This new need calls for additional financing.

Therefore, "the invested capital identifies all the related flows, on one hand, to the act of investment (preliminary studies and research, purchase of land and equipment), and on the other hand, those resulting from the project's implementation (personnel training, cash requirements).

b. Duration or time horizon

The determination of the cash flows generated by an investment project is based on a forecast horizon (Westerfield & Jordan, 2018). Several possibilities exist: The physical lifespan of the

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asset, which can be very long. The technological lifespan, which requires knowledge of the speed of technical progress renewal. The economic lifespan representing the duration on which the company builds its strategic project. The fiscal lifespan representing the duration for which the tax administration allows the practice of depreciation.

c. The cash flows

The net cash flows, or cash flows (CF), generated by the investment project represent the net cash inflows (revenues - expenses) that the company anticipates from the investment. These cash flows are a fundamental indicator of the financial viability and potential profitability of the investment, reflecting the actual cash that is expected to be generated or utilized throughout the life of the project. Understanding and accurately projecting these cash flows is essential for evaluating the feasibility and returns of the investment.

d. Working capital requirement (WCR)

The need for working capital assesses the amount of capital required to finance the operating cycle, primarily for funding inventory and the mismatch between the disbursements and receipts related to the company's sales. It is determined by the difference between operating assets (such as inventory, work in progress, and receivables) and operating liabilities (current debts owed to suppliers). In essence, the need for working capital reflects the funds necessary to facilitate the day-to-day operations of a business, ensuring that it can effectively manage its short-term financial obligations and maintain smooth operational continuity. By evaluating the need for working capital, businesses can gain insights into their liquidity requirements, optimize cash flow management, and make informed decisions regarding financing strategies and operational efficiency.

e. The concept of depreciation

Depreciation involves the accounting recognition of the irreversible reduction in value of an asset, as its potential diminishes over time. Its calculation basis is the purchase price of the asset, augmented by any associated expenses essential for putting the asset into operation. Depreciation enables the allocation of resources to finance the eventual replacement of worn-out equipment. By systematically accounting for the decrease in value of assets over their useful life, depreciation allows businesses to prepare for the future renewal or replacement of these assets. This process ensures that sufficient funds are set aside to facilitate the acquisition of new equipment as existing

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assets become obsolete or worn out. Depreciation can be calculated using various techniques, including Straight-line method which calculates depreciation by allocating an equal amount of the asset's cost to each year of its useful life. Declining balance method, this technique applies a constant depreciation rate to the asset's book value, resulting in higher depreciation in the earlier years of the asset's life. Units of production method is determined based on the actual usage or output of the asset, with the cost allocated according to the units produced or hours of operation. The progressive depreciation method considers that an asset experiences minimal depreciation in the early years of its use and gradually becomes more significant in the later years. This approach reflects the idea that certain assets may have a slower decline in value initially, followed by a more rapid decrease in value as they near the end of their useful lives. This method acknowledges the changing pattern of an asset's depreciation over time and can be more reflective of the actual wear and tear experienced by certain types of assets.

Each method has its own advantages and is suited to different types of assets and business needs. The choice of depreciation method can impact financial statements, tax liabilities, and cash flow, so it's important for businesses to carefully consider which method aligns best with their operational and financial objectives.

2.2 The investment decision and the risks associated with the investment

The investment decision is a critical aspect of corporate finance and strategic management. It involves allocating resources to various investment opportunities with the aim of maximizing shareholder wealth. However, every investment carries inherent risks that must be carefully assessed and managed to optimize returns and minimize potential losses (Brealey, Myers, & Allen, 2017). Investment decisions play an integral role in the realm of business studies. They can shape the future and prosperity of a company. In this comprehensive guide, you'll not only learn about the definition and meaning of investment decisions but also the methods and strategies that are instrumental in making these decisions.

2.2.1. Definition of an investment Decisions

An investment decision refers to the process of allocating resources, typically financial capital, to different assets or projects with the expectation of generating future returns. This decision-making process involves evaluating various investment opportunities, analyzing their potential risks and rewards, and selecting the most suitable options based on predefined criteria

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and objectives. Investment decisions, sometimes referred to as capital budgeting decisions, involve determining where and how much capital should be allocated in order to generate maximum returns for the investors or shareholders. These decisions typically involve a large upfront investment in exchange for an anticipated flow of future gains. (Bodie, Z., Kane, A., & Marcus, A. J. (2014).

2.2.2. The stages of an investment decision

Investment project can pass through a different approaches and steps

According to World Bank, project cycle involves five stages; namely, project identification, project preparation, project appraisal, project implementation, and project evaluation (BAUM World Bank Approach, 1978). Investment project can pass through a different approaches and steps

The five phased project life cycle model- this project cycle model has six stages for project development like identification, initial formulation, evaluation or project appraisal, formulation, project implementation.

A. Identification: Development projects are expressly designed to solve the varied problems of the economics whether in the short or long run. Business projects can be initiated from problems/potential problems of stakeholders of a business entity. The surveys or in-depth studies would locate the problems and the project planner will have to identify the projects that would solve the problems most effectively. At this stage, we are concerned with the kind of action and type of project that would be required in rather broad term.

B. Initial Formulation: Identification is only the beginning in the lifecycle of a project. Having identified the prospective projects, the details of each project will have to be worked out and analyzed in order to determine which of them could be reckoned as suitable for inclusion in the surveys, and number of feasibility study group are set up, as the name implies to examine the possibility formulating suitable projects and to put concrete proposals in sufficient detail to enable authorities concerned to consider the feasibility of the proposal submitted.

C. Evaluation or Project Appraisal: After the business or socio –economic problems of an economy have been determined and development objectives and strategies agreed, concrete steps have to be taken. The main this takes is that of formulating appropriate development projects to achieve plan objectives and meet the development needs of the economy. Proposals relating to

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them are then put to the plan authorities for consideration and inclusion of the plan. These proposals as pointed out above take the following forms of feasibility studies: Commercial feasibility, Economic feasibility, Socio-economic feasibility, financial feasibility, technical feasibility

The scope for scrutiny under each of these five heads would necessarily render their careful assessment and the examination of all possible alternative approaches. The process almost invariably involves making decision relating to technology, scale, location, costs and benefits, time of completion (gestation period), degree of risk and uncertainty, financial viability, organization and management, availability of inputs, know-how, labor etc. The detail analysis is set d own in what is called a feasibility report.

D. Formulation: Once the project has been appraised and approved; next step would logically appear to that of implementation. This is, however, not necessarily true, is the approval is conditional to certain modifications being affected or for other reasons, such as availability of funds, etc. The implementation stage will be reached only after these pre-conditions have been fulfilled. Project formulation divides the process of the project development into eight distinct and sequential stages. These stages are: General Information, Project description, Market Potential, Capital cost, Source of finance, Assessment of working capital requirement, Other financial aspects, Economic and social variables Project Implementation:

Last but not least, every entrepreneur should draw an implementation time table for his project. The network has been prepared; the project authorities are now ready to embark on the main task of the implementation of the project. To begin with, successful implementations depend on how well the network has been designed. However, during the course of implementation, many factors arise which cannot be anticipated techniques have been developed for the project implementation. Some of them are PERT, CPM, GERT.

2.2.3. The factors influencing the making of an investment decision

The decision criteria for an investment project can vary depending on the specific circumstances and goals of the project, but some common criteria include

-Risk and its sensitivity criteria: When evaluating an investment project, it's important to consider risk criteria to assess the potential uncertainties and vulnerabilities associated with the

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project. Key risk criteria include Risk Assessment which consist Identification and evaluation of potential risks that could impact the project's financial performance, operational efficiency, or market competitiveness. This involves analyzing various types of risks such as market risk, credit risk, operational risk, and regulatory risk. Sensitivity Analysis involves testing the project's sensitivity to changes in key variables such as sales volume, costs, and interest rates. By conducting sensitivity analysis, investors can understand how the project's financial performance may be affected by different scenarios and external factors.

Assessing these risk criteria is essential for understanding the potential challenges and uncertainties that could impact the investment project, and for developing strategies to mitigate and manage these risks effectively.

-Financial criteria: The financial criteria for evaluating an investment project are crucial in determining its profitability and financial viability. These criteria include: Return on Investment (ROI) which Measures the gain or loss generated on an investment relative to the amount of money invested. It is expressed as a percentage and is a key indicator of the project's profitability. The potential return or profitability of an investment is a crucial factor influencing decision-making. Investors typically seek investments that offer attractive returns relative to the associated risks (Brealey, Myers, & Allen, 2017). Payback Period focuses on the time it takes for an investment to generate cash flows that cover the initial investment. A shorter payback period is generally more favorable as it indicates a quicker recovery of the initial investment. Net Present Value (NPV) where we Calculate the present value of expected future cash flows generated by an investment, minus the initial investment. A positive NPV indicates that the projected earnings exceed the anticipated costs, making the investment financially viable. Internal Rate of Return (IRR) represents the discount rate at which the net present value of all cash flows from a particular project equals zero. It is another important measure of investment profitability and is used to compare the profitability of different projects.

These financial criteria provide a quantitative basis for assessing the financial attractiveness and feasibility of an investment project.

-strategic and qualitative criteria: When evaluating an investment project, strategic and qualitative criteria play a significant role in analyzing non-financial aspects and long-term implications. These criteria encompass a range of considerations, including Market Opportunity,

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Assessing the attractiveness of the market where the investment will operate, including market size, growth potential, competitive landscape, and consumer trends (Johnson, Scholes, & Whittington, 2008). Strategic Fit, evaluating how well the investment aligns with the organization's strategic goals, core competencies, and long-term vision (Porter, 1985). Brand and Reputation, Considering the impact of the investment on the organization's brand image, reputation, and relationships with stakeholders (Keller, 1993). Technological Innovation which involves assessing the potential of the investment to leverage new technologies, enhance competitiveness, and drive innovation within the organization (Christensen, 1997). Management Quality: Evaluating the capabilities, experience, and track record of the management team responsible for executing the investment strategy (Collins & Porras, 1994). Regulatory and Legal Compliance: Ensuring compliance with relevant laws, regulations, and industry standards to mitigate legal risks and maintain ethical conduct (Hitt, Ireland, & Hoskisson, 2009). Sustainability and Corporate Social Responsibility (CSR): Considering environmental, social, and governance (ESG) factors to assess the sustainability and societal impact of the investment (Elkington, 1998).

These factors interact and influence each other, shaping the investment decision-making process and outcomes. Investors need to carefully evaluate and balance these factors to make informed investment decisions that align with their financial goals and risk preferences.

2.2.4. Risks associated with an investment Projects

Investment is one of the critical and tricky business to do, because its full of surprises, due to future uncertainty, an investor whether company or any entity should consider the following risk that can be associated with the project.

Market Risk which involves the fluctuations in market conditions, including changes in interest rates, exchange rates, commodity prices, and consumer demand, which can affect the profitability and viability of the investment. Credit Risk is the risk of loss due to the failure of counterparties to fulfill their financial obligations, such as defaulting on loans, bonds, or trade credit agreements (Saunders, A., & Cornett, M. M. (2014). Liquidity Risk is the risk of not being able to sell an investment quickly and at a fair price, leading to potential losses or difficulties in accessing funds (Campbell & Kracaw, 1980). Operational Risk Arises from internal processes, systems, and human errors that may disrupt business operations, lead to project delays, cost overruns, or quality issues (Hull, 2016). Political and Regulatory Risk Stemming from changes in government policies,

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regulations, or geopolitical events that may impact the investment environment, including tax policies, trade agreements, and political instability (Dixit & Pindyck, 1994). **Technological Risk:** The risk of technological obsolescence or disruptions that may render the investment obsolete or reduce its competitive advantage (Christensen, 1997). **Environmental and Social Risk:** Risks associated with environmental factors, such as climate change, natural disasters, and social factors, including labor disputes, community relations, and ethical considerations (Elkington, 1998).

2.3: Feasibility study and means of financing of an investment project

2.3.1. Feasibility study

A feasibility study serves as a pivotal phase in the initiation of any investment project, providing a comprehensive assessment of its potential success and viability across various dimensions. This section delves into the key components and considerations involved in conducting a feasibility study for an investment project.

Market research It's an in-depth analysis of the market in which a business wishes to operate. Market research consists of collecting information on the needs, preferences and behaviors of consumers, as well as on competition and the economic context in which a company operates. Market research is the process by which companies seek to collect data systematically to make better decisions. Still, its true value lies in the way in which all the data obtained is used to achieve a better knowledge of the market consumer (Paurav Shukla,2008), The process of market research can be done through deploying surveys, interacting with a group of people, also known as a sample, conducting interviews, and other similar processes. The information obtained from conducting market research can be used to tailor marketing/ advertising activities or determine consumers' feature priorities/service requirement (if any). The main objectives of market research are to understand the target market, identify opportunities and threats, determine the viability of a project or product, and make informed strategic decisions.

Technical Feasibility focuses on evaluating the project's compatibility with existing technology, infrastructure, and resources. This assessment determines whether the project can be realistically implemented given the available technical capabilities. Factors such as technological requirements, resource availability, and infrastructure adequacy are analyzed to ascertain the project's technical feasibility (Ahmed et al., 2018). Technical feasibility of an investment project can be the formal process of assessing whether it is technically possible to manufacture a product

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or service. Before launching a new offering or taking up a client project, it is essential to plan and prepare for every step of the operation (Sandeep Goel,2015). Technical feasibility helps determine the efficacy of the proposed plan by analyzing the process, including tools, technology, material, labor and logistics. It identifies the technical requirements of the proposed project. The technical requirements are then compared to the technical capability of the organization to find out whether the organization has the necessary technical know-how to undertake the project or not? The project is technically feasible if the internal technical expertise is sufficient for the project requirements.

Economic Feasibility includes a detailed analysis of the financial aspect and the potential profit that the project can bring. Cost-benefit analysis, incentive estimates, and financial pro forma are all part of an economic feasibility study (Fernando, (2020). Stakeholders can conduct a cost-benefit analysis of the project's envisaged costs and benefits over its useful life to determine if it is economically feasible based on whether the forecast returns on investment are viable. (Fernando et al., 2020).

Legal feasibility assesses the project's compliance with relevant laws, regulations, and legal requirements. This aspect of the feasibility study aims to identify potential legal risks and ensure that the project adheres to all applicable legal frameworks. Legal feasibility studies encompass a review of permits, licenses, contracts, and regulatory obligations to mitigate legal challenges that could impede the project's progress (Wickramasinghe et al., 2019). Legal feasibility refers to the examination of whether a proposed project or business can be conducted within the framework of existing legal requirements. It is an essential part of any feasibility study, as overlooking legal aspects can lead to significant financial and operational risks, as well as potential legal consequences. Legal feasibility studies might involve consultations with legal counsel to ensure that every potential legal issue is identified and addressed. It is an indispensable step that should align the business strategy with legal expectations to mitigate risks before any significant investment is made into the project. Operational feasibility evaluates the practicality and effectiveness of implementing the project within the existing organizational framework. This assessment considers factors such as project management, resource allocation, and operational processes to determine whether the project can be successfully executed. By assessing the project's alignment with organizational goals, operational feasibility studies help stakeholders identify potential challenges and motto strategies to address them (Hastings et al., 2017).

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In summary, a feasibility study plays a critical role in assessing the viability of an investment project by evaluating its technical, economic, legal, and operational feasibility. By conducting a thorough analysis across these dimensions, stakeholders can make informed decisions about the project's feasibility and determine the most appropriate course of action.

2.3.2. Means of financing

Financing is an important aspect when setting up a business project. There is currently a wide range of solutions allowing an entrepreneur to finance his activity. The choice must depend on the nature of the project and its need for financing. To function, a business needs financial investments. They contribute to its development and performance, both in terms of manufacturing, marketing and communication. Entrepreneurs raise money for start-ups by acquiring debt, selling stock, mixing the two, and crowdfunding. (Seth C Oranburg,2020)

First of all, it is important to know the amount of funds to be committed as well as the possible solutions to obtain them. A good evaluation will make it possible to secure the start of the activity, to anticipate future cash flow gaps, but also to give credit to the project vis-à-vis possible investors. (F.K. CRUNDWELL,2008).

a. Equity Financing

Equity Financing: Involves raising funds by selling ownership stakes in the company to investors, who become shareholders and have a claim on the company's profits and assets (Ross, Westerfield, & Jaffe, 2018). Equity financing is the process of raising capital through the sale of shares. Companies raise money because they might have a short-term need to pay bills or need funds for a long-term project that promotes growth. By selling shares, a business effectively sells ownership of its company in return for cash (Brav, et al. (2021). Equity financing comes from a variety of sources. For example, an entrepreneur's friends and family, professional investors, or an initial public offering (IPO) may provide needed capital. Equity financing can be different forms such as **individual Investors:** These are often friends, family members, and colleagues of business owners. Individual investors usually have less money to invest, so more are needed to reach financing goals. These investors may have no relevant industry experience, business skills, or guidance to contribute to a business. **Angel Investors:** Often, these are wealthy

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individuals or groups interested in funding businesses they believe will provide attractive returns. Angel investors can invest substantial amounts and provide needed insight, connections, and advice due to their industry experience. Typically, angels invest in the early stage of a business's development. **venture Capitalists:** Venture Capital: Involves raising capital from venture capitalists or private equity firms in exchange for equity stakes, typically used to finance high-growth startups or expansion projects (Gompers & Lerner, 2004). Venture capitalists are individuals or firms capable of making substantial investments in businesses that they view as having very high and rapid growth potential, competitive advantages, and solid prospects for success. They usually demand a noteworthy share of ownership in a business for their financial investment, resources, and connections. In fact, they may insist on significant involvement in managing a company's planning, operations, and daily activities to protect their investment. Venture capitalists typically get involved early and exit at the IPO stage, where they can reap enormous profits. **Initial Public Offerings:** A more well-established business can raise funds through IPOs, selling company stock shares to the public. Due to the expense, time, and effort that IPOs require; this type of equity financing occurs in a later stage of development after the company has grown. Investors in IPOs expect less control than venture capitalists and angel investors. **Crowdfunding:** Crowdfunding involves individual investors investing small amounts via an online platform (such as Kickstarter, Indiegogo, and Crowdfunder) to help a company reach particular financial goals. Such investors often share a common belief in the company's mission and goals. (Mollick, E. R. (2014).

Equity financing offers several advantages, including no repayment obligations, shared risk, access to expertise, and potential for high returns. However, it also has disadvantages such as ownership dilution, dividend expectations, higher cost of capital, and loss of confidentiality. Entrepreneurs must carefully consider these factors and evaluate their financing options based on the business's growth stage, financial needs, and strategic objectives (Matthias Fahn, et al, 2019).

b. Debt financing

Debt Financing: Involves borrowing funds from lenders, such as banks, financial institutions, or bondholders, with the obligation to repay the principal amount plus interest over a specified period (Brigham & Ehrhardt, 2013). It involves raising funds for a business or

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investment project by borrowing money, typically through loans, bonds, or other debt instruments. Debt financing occurs when a company raises money by selling debt instruments, most commonly in the form of bank loans or bonds. Such a type of financing is often referred to as financial leverage. As a result of taking on additional debt, the company makes the promise to repay the loan and incurs the cost of interest. It can then use the borrowed money to pay for large capital expenditures or fund its working capital. In general, well-established businesses that demonstrate constant sales, solid collateral, and are profitable will rely on debt financing. Debt financing can be group into loans, bonds, and etc.

Loans, Businesses can obtain loans from financial institutions such as banks, credit unions, or online lenders. These loans are repaid over time, often with interest. The terms of the loan, including interest rates, repayment schedules, and collateral requirements, vary based on the lender and the creditworthiness of the borrower. Bonds: Companies can issue bonds to raise capital. Bonds are debt securities that investors purchase, effectively lending money to the issuer. The issuer (the company) agrees to repay the bondholders the principal amount at a specified future date, along with periodic interest payments. Debt Securities: In addition to traditional loans and bonds, companies may issue other types of debt securities, such as commercial paper or convertible debt, to raise funds. Credit Rating: The terms of debt financing, including interest rates, are influenced by the credit rating of the borrowing entity. A higher credit rating generally leads to more favorable borrowing terms, while lower-rated entities may face higher interest costs. Collateral: Lenders often require collateral to secure the debt, which can include assets such as real estate, equipment, or inventory. Collateral provides lenders with a form of security in case the borrower defaults on the loan. Debt Servicing: Borrowers must make periodic interest payments and ultimately repay the principal amount borrowed. Managing debt servicing obligations is crucial to maintaining financial stability.

Debt financing offers several advantages, including retained ownership control, tax deductibility of interest payments, fixed repayment obligations, and leverage for growth. However, it also has disadvantages such as the risk of insolvency, interest expense burden, covenants and restrictions, and potential for financial distress. Entrepreneurs must carefully evaluate the costs and benefits of debt financing and consider their businesses' risk tolerance, financial capabilities, and growth objectives when making financing decisions.

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c. Self-Financing capacity

Self-financing, also known as internal financing, refers to a company's ability to generate enough cash flow from its operations to fund its growth and expansion. This means that the company does not need to rely on external sources of financing, such as loans or equity investments, to fund its operations. Internal Financing: Utilizing retained earnings or funds generated from the company's operations to finance investment projects without relying on external sources of capital (Damodaran, 2012). One of the primary forms of self-financing is the use of retained earnings, which are the accumulated profits that a company has not distributed to its shareholders as dividends. By reinvesting these earnings into the business, a company can fund its expansion, capital expenditures, or other initiatives without taking on external debt or diluting ownership through issuing additional shares. Retained Earnings (RE) are the accumulated portion of a business's profits that are not distributed as dividends to shareholders but instead are reserved for reinvestment back into the business. Normally, these funds are used for working capital and fixed asset purchases (capital expenditures) or allotted for paying off debt obligations.

$$RE = \text{Beginning Period RE} + \text{Net Income/Loss} - \text{Cash Dividends} - \text{Stock Dividends}$$

Another type of self-financing or internal financing is Cash Flow which is the increase or decrease in the amount of money a business, institution, or individual has. In finance, the term is used to describe the amount of cash (currency) that is generated or consumed in a given time period. When it comes to cash flow, there are several important formulas that are commonly used to analyze and assess a company's financial health and performance (Dinandus,2024). Here are some key cash flow formulas:

Operating Cash Flow (OCF): $OCF = \text{Net Income} + \text{Non-cash Expenses} + \text{Changes in Working Capital}$ This formula measures the cash generated from a company's core business operations. It takes into account the impact of non-cash expenses (such as depreciation) and changes in working capital.

Free Cash Flow (FCF): $FCF = \text{Operating Cash Flow} - \text{Capital Expenditures}$. FCF represents the cash that a company is able to generate after spending the money required to maintain or expand its asset base. It is a key indicator of a company's financial flexibility and ability to pursue growth opportunities.

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Cash Flow to Debt Ratio: $\text{Cash Flow to Debt Ratio} = \text{Operating Cash Flow} / \text{Total Debt}$. This ratio measures a company's ability to cover its total debt obligations with its operating cash flow. It provides insight into the company's debt repayment capacity.

Cash Flow Return on Investment (CFROI): $\text{CFROI} = (\text{Net Cash Flow} - \text{Initial Investment}) / \text{Initial Investment}$.

d. Quasi-equity financing

A type of financing that ranks between equity and debt, having a higher risk than senior debt and a lower risk than common equity. Quasi-equity investments can be structured as debt, typically unsecured and subordinated and in some cases convertible into equity, or as preferred equity. (Graham, J. R., & Harvey, C. R. (2001). Quasi-equity can be in different form like, convertible bonds, preference bonds, mezzanine financing, revenue-based financing and etc.

Convertible Bonds are debt instruments that can be converted into equity shares under certain conditions. This allows the investor to benefit from potential equity upside while initially receiving fixed income. A convertible bond is a fixed-income corporate debt security that yields interest payments, but can be converted into a predetermined number of common stock or equity shares. The conversion from the bond to stock can be done at certain times during the bond's life and is usually at the discretion of the bondholder. Preference Share entitle their holders to a fixed dividend, similar to debt instruments, but they may also offer additional rights and benefits, such as priority in receiving dividends or in the distribution of assets in case of liquidation. Preference shares, also known as preferred shares, are a type of security that offers characteristics similar to both common shares and a fixed-income security. The holders of preference shares are typically given priority when it comes to any dividends that the company pays. In exchange, preference shares often do not enjoy the same level of voting rights or upside participation as common shares. Mezzanine Financing is a hybrid of debt and equity financing often used in leveraged buyouts or growth capital investments, providing a mix of fixed interest payments and equity participation. It is a hybrid of debt and equity financing—similar to debt financing in that you need cash flow to repay the loan, but with repayment terms that are more flexible than conventional debt financing. (Kaplan, S. N., & Stromberg, P. (2009). Revenue-Based Financing: In this model, a company receives funding in exchange for a percentage of its future revenue. Investors participate in the company's growth by receiving a portion of its top-line revenue, similar to a profit-sharing

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arrangement. Royalty-Based Financing: involves investors providing funds in exchange for a share of future revenues or profits. It is structured as a form of reimbursement based on a percentage of the company's sales or revenue. Participating Loans provide lenders with a share of the profits of the borrowing company, in addition to interest payments. The lender participates in the success of the business beyond the regular interest income. A loan participation, also referred to as a participation loan, happens when multiple lenders work together to fund a single loan. (Kaplan, S. N., & Stromberg, P. (2009).

Each type of quasi-equity financing has its own characteristics and may appeal to different types of investors and companies based on their specific financing needs, risk tolerance, and growth objectives.

2.4. Evaluation of an investment project

Investment projects require rigorous evaluation to determine their financial feasibility and potential for generating returns. This section explores various evaluation techniques employed by businesses to assess investment opportunities, providing insights into their methodologies, strengths, and limitations.

2.4.1. Economic evaluation of an investment project

Economic Evaluation is a systematic approach used to assess the value or worth of an economic activity or project by comparing its costs and benefits. It involves analyzing the financial implications and outcomes of a decision to determine its economic viability and impact in the general economy. Economic evaluations are commonly used in various sectors such as healthcare, environmental projects, infrastructure development, and business investments to make informed decisions its primarily focuses on assessing the broader economic impact and overall efficiency of an investment or project. It considers both financial and non-financial factors such as social benefits, environmental impacts, and long-term sustainability, Considers the total economic value created by an investment, including externalities, intangible benefits, and long-term effects on society or the environment. It aims to capture the overall welfare implications of a decision. Often considers long-term implications and externalities that may not be captured in traditional financial evaluations. Economic evaluation of an investment project assessing its financial viability and potential economic impact.

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Cost-Benefit Analysis: Cost-benefit analysis (CBA) compares the total costs of an investment project to its total benefits, considering both monetary and non-monetary factors (Boardman et al., 2017). It helps decision-makers weigh the costs and benefits of different investment alternatives and identify projects that maximize social welfare. Generally speaking, cost-benefit analysis involves tallying up all costs of a project or decision and subtracting that amount from the total projected benefits of the project or decision. (Sometimes, this value is represented as a ratio.) If the projected benefits outweigh the costs, you could argue that the decision is a good one to make. If, on the other hand, the costs outweigh the benefits, then a company may want to rethink the decision or project. There are enormous economic benefits to running these kinds of analyses before making significant organizational decisions. By doing analyses, you can parse out critical information, such as your organization's value chain or a project's ROI. (Boardman, & Weimer, D. L. (2017). Cost-benefit analysis is a form of data-driven decision-making most often utilized in business, both at established companies and startups. The basic principles and framework can be applied to virtually any decision-making process, whether business-related or otherwise.

Social Return on Investment (SROI): SROI is a framework for measuring the social, environmental, and economic impact of investment projects (Emerson, 2003). It quantifies the social value generated by a project relative to the resources invested, providing insights into its overall effectiveness and contribution to society. Social Return on Investment (SROI) is a framework used to assess the social, environmental, and economic impact of an investment or project. It measures the value created for society relative to the resources invested, providing insights into the overall effectiveness and sustainability of the investment.

Key aspects of Social Return on Investment (SROI) include:

Social Value Creation: SROI focuses on quantifying the social value created by an investment beyond traditional financial metrics. It considers outcomes such as improved health and well-being, increased employment opportunities, enhanced education, and reduced environmental impact.

Stakeholder Involvement: SROI involves engaging stakeholders, including beneficiaries, investors, employees, and community members, in the evaluation process. Stakeholder input helps

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identify relevant social outcomes, define indicators of success, and assess the significance of impacts.

Multi-Criteria Decision Analysis (MCDA): MCDA is a decision-making tool that considers multiple criteria and objectives in evaluating investment projects (Belton & Stewart, 2002). It allows decision-makers to incorporate diverse stakeholder perspectives and preferences into the evaluation process, leading to more comprehensive and informed decisions.

Environmental Impact Assessment (EIA): EIA evaluates the potential environmental consequences of investment projects and identifies measures to mitigate adverse impacts (Therivel & Partidário, 1996). It helps ensure sustainable development and compliance with environmental regulations and standards. Environmental Impact Assessment (EIA) is a process used to evaluate the potential environmental consequences of proposed projects or developments. It is a systematic approach that helps decision-makers identify, predict, and mitigate the environmental impacts of their actions.

recognizes the dynamic nature of economic variables and their impact on project outcomes over time.

Risk Analysis: Risk analysis assesses the uncertainty and variability surrounding the financial and economic outcomes of investment projects (Hillson & Murray-Webster, 2007). It helps decision-makers identify, quantify, and manage risks, enhancing the reliability and robustness of economic evaluations. (Brealey, Myers, & Allen, 2017). Risk analysis is a process used to identify, assess, and mitigate risks associated with an investment project or decision. It involves systematically evaluating potential threats and opportunities, quantifying their likelihood and impact, and developing strategies to manage and respond to them effectively.

Key aspects of risk analysis include:

Risk Identification: Risk analysis begins with identifying potential risks that could impact the success of the investment project. This involves brainstorming sessions, stakeholder consultations, historical data analysis, and scenario planning to uncover a wide range of risks, including financial, operational, strategic, and external risks.

Risk Assessment: Once risks are identified, they are assessed in terms of their likelihood of occurrence and their potential impact on project objectives. Quantitative techniques such as

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probability analysis, sensitivity analysis, and scenario modeling may be used to evaluate risks and prioritize them based on their severity and significance.

Risk Mitigation: Risk mitigation involves developing strategies to reduce the likelihood or impact of identified risks. This may include implementing preventive controls, diversifying investments, hedging against financial risks, securing insurance coverage, or entering into contractual agreements to transfer risks to third parties.

Risk Monitoring and Control: Risk analysis is an ongoing process that requires continuous monitoring and control throughout the life cycle of the investment project. Regular risk assessments are conducted to track changes in risk exposure, evaluate the effectiveness of risk mitigation measures, and make adjustments to risk management strategies as needed.

Contingency Planning: Contingency planning involves preparing for unexpected events or adverse outcomes by developing contingency plans and response strategies. This may include setting aside reserve funds, establishing emergency procedures, and creating alternative courses of action to address unforeseen challenges.

Communication and Reporting: Effective communication of risk analysis findings is essential for informing decision-makers, stakeholders, and other relevant parties about potential risks and their implications. Risk reports should be clear, concise, and tailored to the needs of different audiences, facilitating informed decision-making and risk governance.

Risk analysis helps businesses identify and manage risks effectively, reducing the likelihood of negative outcomes and maximizing the likelihood of achieving project objectives. By systematically evaluating risks, implementing appropriate mitigation measures, and maintaining vigilant monitoring and control, businesses can enhance their resilience, adaptability, and overall success in dynamic and uncertain environments.

By employing a range of economic evaluation techniques, businesses can make more informed investment decisions, maximize returns, and contribute to sustainable economic development.

2.4.2. Financial evaluation of an investment project

Financial evaluation is “the phase of the study of a project which makes it possible to analyze whether its project is viable, and under what conditions, taking into account the standards and constraints that it is imposed, and based on technical and commercial studies already carried

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out. It consists of valorize the flows resulting from previous studies to determine the profitability and project financing. To do this, we generally construct several timelines to predict and quantify the revenues and expenses necessary to calculate the profitability of a project investment. Therefore, the financial evaluation constitutes the main level of synthesis of the study of the project, its purpose is to evaluate and compare the different financial flows of the project with a view to determine its level of profitability and the conditions of its viability. Thus, in the context of the financial study, it generally involves calculate the cost of project investments, Evaluate the forecast results, evaluate the intrinsic profitability of the project, to assess the level of risk incurred. to develop the project financing plan, to evaluate the profitability of equity.

2.4.2.1. Initial Capital

The initial capital, also known as initial investment or startup capital, refers to the total amount of money required to start or launch a business venture or investment project (Brigham & Houston, 2016). In the world of business, an initial investment refers to the capital that is injected into a venture during its inception or early stages. This financial commitment serves as the foundation on which a business can build and grow. Understanding the concept of initial investment is crucial for entrepreneurs, as it directly impacts their ability to launch and sustain their ventures successfully. When starting a business, the initial investment plays a pivotal role in providing the necessary resources to kick-start operations. It encompasses various financial requirements, including but not limited to equipment, inventory, marketing, salaries, and lease agreements. These costs are essential for getting the venture off the ground and establishing a solid base from which to operate. It encompasses all the expenses needed to get the business up and running, including but not limited to:

Acquisition of assets: This includes purchasing or leasing equipment, machinery, vehicles, office space, and other necessary assets to conduct business operations.

Working capital: Working capital is the funds required to cover day-to-day operational expenses such as inventory purchases, utilities, payroll, marketing, and rent until the business starts generating sufficient revenue to cover these expenses.

Initial inventory: For businesses that involve selling products, the initial capital may need to cover the cost of purchasing initial inventory or raw materials required for production.

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Legal and regulatory expenses: This includes costs associated with registering the business, obtaining permits and licenses, legal fees, and compliance with regulatory requirements.

Marketing and advertising: Initial capital may be allocated to marketing and advertising activities to promote the business and attract customers.

Professional services: Expenses related to hiring consultants, accountants, lawyers, and other professionals for advice and assistance in setting up the business.

Contingency fund: It is prudent to allocate a portion of the initial capital as a contingency fund to cover unexpected expenses or setbacks that may arise during the startup phase.

The amount of initial capital required varies depending on the nature and scale of the business venture, industry, location, and other factors (Pike et al., 2019). It is essential for entrepreneurs and investors to carefully estimate and plan for the initial capital needs to ensure the successful launch and sustainability of the business.

Once the business is operational, ongoing capital requirements may arise for expansion, growth, or to address unforeseen circumstances. Therefore, effective financial management and monitoring of cash flow are essential to ensure the business remains solvent and achieves its long-term objectives (Brealey et al., 2017).

2.4.2.2: Cash Flows Statement for a project

A cash flow statement for a project provides a detailed summary of the cash inflows and outflows associated with the project over a specific period. It helps stakeholders understand how cash is generated and used by the project, providing insights into its liquidity, solvency, and overall financial health (Brigham, E.F., & Houston, J.F. (2019). In project evaluation, the 'cash flows' of a proposed project refer to expected future cash flows of that project. The reference is not to past or historical data, but to future data expected from the proposed project. Perhaps the most critically important task in project appraisal is the forecasting of expected cash flows. The cash flows form the basis of project appraisal. If the cash flow estimates are not reliable, the detailed investment analyses can easily lead, regardless of the sophisticated project appraisal techniques used, to poor business decisions. Therefore, reliable estimates of cash flows by careful and diligent forecasting are critically important. The estimation of cash flows for project appraisal may be viewed as having

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four main stages: forecasting the capital outlays and operating cash inflows (e.g. cash proceeds from product sales) and outflows (e.g. expenses) of the proposed project; adjusting these estimates for tax factors, and calculating the after-tax cashflows; determining the variables which have the greatest impact on the project's net present value (sensitivity analysis); and allocating further resources, if necessary, to improve the reliability of the critical variables identified in the preceding stage. Assessing the amounts, timing, and uncertainty of cash flows, along with where they originate and where they go, is one of the most important objectives of financial reporting. It is essential for assessing a company's liquidity, flexibility, and overall financial performance (Dinandus,2024).

Investing Activities: The investing activities reports cash flows related to the acquisition or disposal of long-term assets and investments. It includes cash payments for the purchase of property, plant, and equipment, as well as cash receipts from the sale of assets or investments. Investing cash flows provide insights into the project's capital expenditure and asset management activities.

Financing Activities: The financing activities outlines cash flows related to the project's financing activities, including debt and equity transactions. It includes cash inflows from borrowing or issuing equity securities, as well as cash outflows from repaying debt or paying dividends to investors. Financing cash flows reflect the project's capital structure and financing decisions.

The cash flow statement reconciles the project's net income or loss reported on the income statement with the actual cash flows generated by the project. It provides a more accurate picture of the project's cash position and helps stakeholders assess its ability to generate sufficient cash to its financial obligations and support future growth (Pike, R., Neale, B., & Linsley, P. (2019).

2.4.3. The evaluation criteria for an investment project

The evaluation criteria for an investment project are used to assess the feasibility, profitability, and risk associated with the project. These criteria help decision-makers determine whether the project aligns with the organization's strategic objectives and whether it is worth pursuing. Some common evaluation criteria for investment projects include:

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2.4.3.1. Static Method (Non discounted cash-flow)

A characteristic feature of static methods in assessing the effectiveness of investment projects by defining the relationship of annual (medium or target) proceeds from investments and the total nominal expenditure required for its implementation. These methods do not take into account the effect of the time, which means that the individual values are not differentiated in the following years, and the calculation involves the sum of the expected costs and benefits, or average values selected from a specified period. These methods only approximate capture the project life cycle and the level of commitment of capital expenditures. There are four main static evaluation indicators: static investment payback period, return on investment, Investment interest and tax rate and differential investment payback period. A static method, also known as a non-discounted cash flow method, is a technique used to evaluate investment projects based on cash flows without considering the time value of money (Brigham & Houston, 2016). Unlike discounted cash flow methods such as net present value (NPV) and internal rate of return (IRR), which discount future cash flows to their present value, static methods evaluate cash flows in nominal terms without adjusting for the time value of money (Brigham & Houston, 2019).

One of the most common static methods for investment evaluation is the *payback period* (Brigham & Houston, 2016). The payback period calculates the time required for an investment to recover its initial cost through the cash flows it generates. It is calculated by dividing the initial investment by the average annual cash inflows generated by the project. The payback period is often expressed in years or months. The payback period is the traditional method of investment evaluation. The payback period for a project is the length of time (normally years) required for the initial outlay on the project to be repaid from the annual cash inflows of the project. It is defined as, “the time period required to recover the initial investment of the project (Ralph Tiffin pg4).” It is computed as:

$$PR = \text{Initial investment} / \text{Annual cash inflow}$$

Acceptance/Rejection rule:

If Payback period > Predetermined period/Cut-off rate, Reject, and vice-versa.

The Payback method is suitable for a firm which suffer from a liquidity crisis

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Another static method is the accounting rate of return (ARR), also known as the average rate of return (Brigham & Houston, 2019). ARR calculates the average annual accounting profit generated by the investment project as a percentage of the initial investment. It does not consider the timing of cash flows or the time value of money. *Accounting rate of return or return on investment (ROI)*: The average rate of return (ARR) is the ratio of the average net income from the project to the average book value of assets of the project. This is the ratio of the year-by-year accounting profit of a business divided by the capital employed or invested in the business and used to generate the profit. It is a measure of year by year past performance. It measures the rate of return on the project using accounting profit information. It is closely related to ROI performance measure. It is computed as:

$$\text{Average Profit after tax} / \text{Average Investment} \times 100$$

Here, Average Investment = (Original Investment + Salvage Value)/2

Acceptance/Rejection rule: If $ARR > \text{Required rate of return}$, Accept and vice-versa.

Non-discounted cash flow methods offer notable advantages, including simplicity, ease of calculation, quick assessment of investment viability, and a focus on cash flow management. These attributes make them useful tools for basic financial analysis and decision-making in small-scale projects. However, their significant drawbacks—such as ignoring the time value of money, not measuring overall profitability, lacking risk assessment, and overlooking long-term benefits—limit their effectiveness for comprehensive investment appraisal. Therefore, while non-discounted cash flow methods have their place in financial analysis, they should be supplemented with more sophisticated techniques to achieve a thorough evaluation of investment opportunities ((Brigham & Houston, 2019).

Despite their limitations, static methods can still be useful as quick and simple tools for preliminary investment screening or for comparing investment alternatives based on straightforward criteria such as payback period or accounting rate of return.

2.4.3.2. dynamic or discounted cash flow

Discounting cash flows is a fundamental concept in financial analysis, particularly in the context of investment appraisal using discounted cash flow (DCF) techniques. It involves adjusting

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the value of future cash flows to their present value by applying a discount rate, reflecting the time value of money and the risk associated with the investment

The DCF method values the company on basis of the net present value (NPV) of its future free cash flows which are discounted by an appropriate discount rate. The formula for determining the NPV of numerous future cash flows is shown below. It can be found in various sources, e.g. in “Financial Management – Theory and Practice” (Brigham & Gapenski, 1997, p. 254).

a. Net present value (NPV)

According to Arshad (2012), NPV is the net present value, which is the sum of all the future cash flows to determine the present value. When computing cash flows, both inflows and outflows are discounted at a certain rate. It's calculated by subtracting cash inflows from cash outflows or investment expenditures. A project's net present value is the sum of the present values of all its cash flows, including inflows and outflows, discounted at a rate that reflects the risk of the project. Net Present Value (NPV) is a financial modelling method for forecasting the value that would be added if an organization delivers a project and exploits its benefits. It is based on estimating project-related cash flows during a timespan covering both the project's delivery and benefits realization periods. If the project has significant disposal costs, the timespan should also include the disposal period. The project timespan is divided into time periods (usually years), with the net cash flow being calculated during each period.

- Benefits are modelled as being positive cash flows.
- Costs are modelled as being negative cash flows.
- The Net cash flow for each time period is calculated by subtracting the costs from the benefits.

Net Present Value (NPV) is the difference between present value of cash inflows and present value of outflows. It is calculated as: $NPV = PV \text{ of cash inflows} - \text{of cash outflows}$

$$Npv = \sum_{t=1}^n \frac{C_1}{(1+K)^t} - C_0 \dots \dots \dots (1)$$

Here,

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$C_1 \dots, C_n$ represent cash inflows

C_0 represent cash outflows or the initial capital

K is the discounting rate

The net present value is also the cash accumulated value that discounts the net cash flow for each year to the same time (usually the beginning of the period) at a certain discount rate

With NPV, there are three steps: Step 1. Identify the amount and timing of the cash flows required over the life of the investment. Step 2. Establish an appropriate interest rate to be used for evaluating the investment, typically called the required rate of return. (This rate is also called the discount rate or hurdle rate.) Step 3. Calculate and evaluate the NPV of the investment.

The net present value can reflect whether the investment project can make a profit and enable the company to make decisions. The net present value method based on the principle that the expected cash inflows are certainly achievable at the end of the year, and the original investment is considered to be borrowed at a predetermined discount rate. When the net present value is positive, the project is still repaid after the principal and interest are repaid. The remaining income, when the net present value is zero, is repaid after the principal and interest are repaid. When the net present value is negative, the income of the project is insufficient to repay the principal and interest.

b. Profitability index (PI)/Benefit-cost ratio (B/c ratio).

It is the ratio of present value of cash inflows and the present value of cash outflows at the required rate of return. Profitability Index (PI) shows the relationship between company projects future cash flows and initial investment by calculating the ratio and analyzing the project viability and it is calculated by one plus dividing the present value of cash flows by initial investment and it is also known as profit investment ratio as it analyses the profit of the project (F.K. CRUNDWELL 2008). The value of the profitability index varies widely. Hence, it is important for analysts to interpret the values properly. Let us see what the values obtained from the calculation signify:

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- **If the index is more than 1**, then the investment is worthy because then you may earn back more than you invest in. So, if you find any investment whose PI is more than 1, go ahead and invest in it.
- **If the index is less than 1**, then it's better to step back and look for other opportunities. Because when PI is less than 1, that means you would not get back the money you would invest. Why bother to invest at all?
- **If the index is equal to 1**, then it's an indifferent or neutral project. You shouldn't invest in the project until and unless you consider it better than other projects available during the period. If you find that the PI of all other projects to be negative, then consider investing in this project.

It is calculated as:

PI= Present value of cash inflows/ Present value of cash outflows.

c. Internal Return Rate (IRR)

Internal rate of return is one of the main methods used in profitability analysis. It is the discount rate when the total present value of the capital inflow is equal to the total value of the capital flow, that is, when the net present value is equal to zero. Internal rate of return is the rate of return that an investment is expected to achieve. It is the present value of the cash flow generated by an investment in the future, taking into account the value of time, just equal to the rate of return-on-investment costs. The internal rate of return (IRR) is the discount rate that forces the NPV of the project to zero (, Jack Broyles pg30).

$$C_0 = \sum_{t=1}^n \frac{C_1}{(1+r)^t} \dots\dots\dots (2)$$

Both the payback period and the accounting rate of return ignore the time value of money. Neither of these criteria gives an acceptable approach to the investment decision problem. Both the NPV and the IRR acknowledge the time value of money and are worthy of consideration. Of these, the IRR technique suffers from both conceptual and computational drawbacks, and should not be the primary decision criterion (Don Dayananda, pg. 106). Only the NPV method relates the time value

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of money to the cash flows, and measures the project's direct impact on the firm's goal of wealth maximization. It is the investment model of choice. The IRR method may be used in specialized and restricted cases. The free cash flow is the amount of "cash not required for operations or reinvestment" (Brealey, Myers, & Allen, 2006, p. 998). Another possibility to analyze a company's value using discounted cash flows is the adjusted present value (APV). The APV is the net present value of the company's free cash flows assuming pure equity financing and adding the present value of any financing side effect, like tax shield (Brealey, Myers, & Allen, 2006, p. 993) In general you can say, that the APV is based on the "principle of value additivity" (Luehrmann, 1997, S. 135). However, APV and NPV lead to the same result.

Discounted Cash Flow (DCF) method offers significant advantages, including its consideration of the time value of money, flexibility, comprehensiveness, and standardized approach to valuation. However, it also has notable disadvantages, such as sensitivity to assumptions, complexity, difficulty in estimating discount rates, and limited applicability for intangible assets. While DCF remains a powerful tool for investment analysis, practitioners should exercise caution and judgment in its application, recognizing its limitations and potential biases.

2.4.4. Risk and Uncertainty criteria

Risk and uncertainty are fundamental concepts in investment decision-making, influencing the feasibility, profitability, and overall success of investment projects. Risk refers to the probability of an adverse event occurring and its potential impact on achieving investment objectives. It encompasses both the likelihood of occurrence and the severity of consequences. Risks exhibit variability, unpredictability, and the potential for both positive and negative outcomes (Pike, Neale, & Linsley, 2019). They arise from internal and external factors, including market volatility, economic conditions, technological changes, regulatory requirements, and operational challenges. Nature of Uncertainty: Uncertainty arises from a lack of knowledge or information about future events, making outcomes unpredictable and difficult to quantify. (Brigham & Houston, 2019). The term risk, and the associated term hazard, have a lot of definitions, proposed by numerous experts and institutions. Hazards can be defined as threats to people and the things that they value. In the view of Carlsson et al. (2005), an uncertainty becomes a risk if a probability is assigned to it. Risk can be defined as the product of the probability and the eventual impact of a hazard (Smallman, 2000). In other words, risk is the product of the probability

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or likelihood of an undesired event and the consequences of that event. Indeed, it means that the uncertainty of the risk event is twofold. First, the uncertainty about the occurrence of the risk, which can be considered as the probability part. Second, when the event occurs, the uncertainty about the likely consequences, which can also be expressed in terms of probability. In the context of risk management, uncertain events are usually considered as hazards with the potential to have negative effects. While risk involves known probabilities and assessable outcomes, uncertainty involves unknown probabilities and unpredictable outcomes. Uncertainty amplifies the complexity and ambiguity of investment decision-making. Investment projects are exposed to various types of risks, including market risk, credit risk, operational risk, liquidity risk, regulatory risk, and strategic risk. (Pike, Neale, & Linsley, 2019)

Sources of Risk: Risks stem from internal and external sources, such as market dynamics, economic trends, technological disruptions, competitive pressures, regulatory changes, and project-specific factors.

Understanding risk and uncertainty is essential for investors to assess the potential threats and opportunities associated with investment projects accurately. By analyzing the nature, types, and sources of risk and uncertainty, investors can develop effective risk management strategies and make informed investment decisions.

2.4.4.1 Investment choice under absolute uncertainty

Investment decisions under absolute uncertainty often require a combination of qualitative analysis, expert judgment, and risk management strategies tailored to the specific context and characteristics of the investment opportunity (Berger, 1985). Without probabilistic information to guide decision-making, investors must rely on alternative approaches to assess the potential risks and rewards associated with investment options. One strategy is to focus on fundamental analysis and qualitative factors when evaluating investment opportunities. Fundamental analysis involves assessing the intrinsic value of assets, including company financials, industry dynamics, competitive positioning, and management quality (Graham & Dodd, 1934). By focusing on qualitative factors that drive long-term value creation, investors can make informed investment decisions under conditions of absolute uncertainty. Different scholars have tried to develop a criterion that can be used when there's absolute uncertainty. For example,

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The Laplace criterion suggests that when faced with uncertainty or lack of information about the probabilities of different outcomes, decision-makers should assign equal probabilities to all possible outcomes. In other words, if there is no reason to believe that one outcome is more likely than another, each outcome should be considered equally probable (Berger, J.O,1985).

The minimax (maximin) criterion is a decision-making principle used in game theory, decision theory, and optimization to minimize the maximum possible loss or risk associated with a decision. It involves selecting the alternative that maximizes the minimum possible payoff or outcome under conditions of uncertainty or risk. (Osborne, M. J., & Rubinstein, A. (1994)

Minimax Criterion: In the context of decision-making under uncertainty, the minimax criterion seeks to minimize the maximum potential loss or regret that could occur.

It involves evaluating each decision alternative based on the worst-case scenario or outcome associated with that alternative.

The decision-maker selects the alternative that offers the best outcome under the assumption of the worst possible conditions.

The minimax regret criterion, also known as Savage's regret criterion, is a decision-making principle used in decision theory and risk analysis to minimize the maximum regret associated with decision alternatives. It focuses on minimizing the potential loss or regret that would be experienced by selecting a particular alternative compared to the best possible alternative in hindsight. (Keeney, R.L., & Raiffa, H. (1993) The minimax regret criterion may lead to overly conservative decisions, as it focuses on avoiding worst-case outcomes rather than maximizing potential gains. It requires decision-makers to have a clear understanding of the possible outcomes and payoffs associated with each alternative, which may be challenging in complex decision-making contexts with high uncertainty. The criterion does not explicitly consider the probabilities of different outcomes, which can limit its applicability in situations where probabilistic information is available.

The Wald criterion, also known as the Wald's maximin model or the Wald's maximin criterion, is a decision-making principle used in decision theory and optimization to select the alternative that maximizes the minimum possible payoff or outcome under conditions of uncertainty or risk. (Wald, A. (1950).) *Maximin Model:* The maximin model seeks to maximize

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the minimum possible payoff or outcome associated with decision alternatives. It involves evaluating each decision alternative based on the worst-case scenario or outcome associated with that alternative. The decision-maker selects the alternative that offers the best outcome under the assumption of the worst possible conditions. *The Wald criterion* is commonly used in decision-making under uncertainty, where decision-makers lack complete information about the probabilities of different outcomes. It helps decision-makers identify robust strategies that perform well under adverse conditions and provide a level of protection against worst-case scenarios. The criterion is particularly useful in zero-sum games, where one player's gain is equivalent to another player's loss, and decisions must be made to minimize potential losses or maximize potential gains.

Wald's minimax rule involves selecting the alternative with the highest minimum payoff or outcome. Decision-makers compare the minimum payoffs associated with each alternative and choose the one that offers the highest level of protection or security against adverse outcomes.

The rationale behind this criterion is to ensure that the chosen alternative performs well under the worst possible conditions, providing a safety net against potential losses or setbacks.

2.4.4.2: Probabilistic Approaches in Investment Project Analysis

Probabilistic approaches provide a comprehensive review of probabilistic approaches used in investment project analysis (Bodie, et al, (2014). It examines various probabilistic techniques and methodologies employed by investors to assess and manage uncertainty in investment decision-making. The thesis explores key concepts such as probability distributions, Monte Carlo simulation, expected value and variance, risk-adjusted return measures, and Bayesian analysis in the context of investment projects. Through a systematic review of the literature, this thesis aims to enhance understanding of how probabilistic approaches can be applied to analyze and evaluate investment projects effectively.

Monte Carlo Simulation: This technique involves running numerous simulations using random variables to model different possible outcomes. By assigning probabilities to various input parameters, such as revenue, costs, and market conditions, Monte Carlo simulation can provide a distribution of possible project outcomes, helping investors understand the range of potential returns and risks (Simon Benninga,2000). At its core, MCS involves generating a large number of random samples from probability distributions representing uncertain variables in the investment

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project, such as cash flows, discount rates, and project durations. These samples are then used to simulate the performance of the project under different scenarios (Simon Benninga, 2019). Monte Carlo simulation is a powerful probabilistic technique used to model the behavior of investment portfolios under different market scenarios (Cornuejols & Tutuncu, 2006). Investors simulate thousands or millions of possible future scenarios by randomly sampling from probability distributions of asset returns, interest rates, and other relevant variables (Brandimarte, 2013).

Decision Trees: Decision trees are graphical representations of decision-making processes that incorporate probabilities and outcomes at different decision points. By assigning probabilities to different branches of the tree, investors can evaluate the expected value of various investment decisions and identify the most favorable course of action. Decision Tree Analysis involves creating a graphical representation of decision-making scenarios, where each branch represents a decision or event and leads to different outcomes. Probabilities are assigned to each branch to represent the likelihood of different outcomes occurring. (Barry de Ville and Paul D. Wenger, 2014).

Sensitivity Analysis: Sensitivity analysis involves examining how changes in key variables or assumptions affect the project's outcomes. By varying input parameters within a certain range and observing their impact on the project's net present value (NPV), internal rate of return (IRR), or other performance metrics, investors can identify the most critical factors driving uncertainty and risk. Sensitivity analysis is conducted to assess the impact of changes in key assumptions on the financial performance and viability of the investment project (Fenton, N., & Neil, M. (2019).

Sensitivity analysis is a method used to evaluate the influence of alternative assumptions or analyses on the pre-specified research questions proposed (Deeks et al., 2021). In other words, a sensitivity analysis is purposed to evaluate the validity and certainty of the primary methodological or analytic strategy. Sensitivity analyses are most informative when there is an array of reasonable and differing assumptions (Morris et al., 2014). Sensitivity analyses are conducted after the study's primary analyses are completed and conclusions have been made on the results of the primary analysis (Thabane et al., 2013). However, it is best to consider the use of sensitivity analyses during the protocol and study development stage to determine potential uncertainties in the study design after all variables and data analysis approaches have been selected (de Souza et al., 2016; Frey & Patil, 2002).

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The following scenarios can be considered:

Revenue Sensitivity: Sensitivity analysis is conducted to evaluate the impact of variations in revenue projections on the project's net present value (NPV), internal rate of return (IRR), and payback period. This analysis helps in assessing the project's sensitivity to changes in demand, pricing, and market conditions.

Operating Expenses Sensitivity: Sensitivity analysis is performed to assess the sensitivity of the project's financial metrics to changes in operating expenses, including salaries, rent, and marketing costs. This analysis helps in identifying cost-saving opportunities and optimizing resource allocation.

Discount Rate Sensitivity: Sensitivity analysis examines the effect of changes in the discount rate on the project's NPV and IRR. By varying the discount rate within a reasonable range, this analysis helps in evaluating the project's sensitivity to changes in the cost of capital and investor expectations.

Market Growth Sensitivity: Sensitivity analysis assesses the impact of variations in market growth rates on the project's financial performance. This analysis helps in evaluating the project's resilience to changes in market dynamics, competition, and economic conditions.

Risk Mitigation Strategies: Sensitivity analysis also explores potential risk mitigation strategies to address uncertainties and mitigate risks identified during the financial evaluation. This may include contingency planning, diversification strategies, and scenario analysis to assess the projects.

Scenario analysis: Scenario analysis is conducted, to analyze the impacts of possible future events on the system performance by taking into account several alternative outcomes, i.e., scenarios, and to present different options for future development paths resulting in varying outcomes and corresponding implications. Scenario analysis is the process of forecasting the expected value of a performance indicator, given a time period, occurrence of different situations, and related changes in the values of system parameters under an uncertain environment. Scenario analysis can be used to estimate the behavior of the system in response to an unexpected event, and may be utilized to explore the changes in system performance, in a theoretical best-case (optimistic) or worst-case (pessimistic) scenario. The occurrence probability and possible impact of a scenario should be considered in tandem to develop a strategic plan base on scenario analysis results. The

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major aim is, to analyze the results of the more extreme outcomes (with high probability and/or more severe impacts), to determine the investment strategy (Şebnem Yılmaz Balaman,2018).

Probability Distributions: Investors can use probability distributions, such as normal distributions, triangular distributions, or beta distributions, to represent uncertainty around key variables. By specifying the parameters of these distributions based on historical data, expert judgment, or market research, investors can quantify the uncertainty associated with each variable and assess its impact on project performance. (Hull, 2015).

Real Options Analysis: Real options analysis extends traditional discounted cash flow (DCF) methods by incorporating the value of flexibility and strategic decision-making. By treating investment decisions as options, investors can assess the value of delaying, expanding, or abandoning projects in response to changing market conditions, thereby better managing risk and maximizing potential returns. The RO analysis is an expansion of the DCF analysis pricing the value of managerial flexibility. From a practical perspective, a RO creates value and reduces the risk by giving the risk & investment holder the right, but not the obligation, to undertake some business decisions. RO can include the decision to make and/or to abandon and/or to expand and/or to contract a capital investment within or at a specific time (Locatelli,2020).

Probabilistic Risk Assessment (PRA): PRA involves systematically identifying, analyzing, and quantifying risks associated with investment projects. By considering the likelihood and potential impact of various risks, investors can develop risk mitigation strategies and incorporate risk-adjusted metrics into their decision-making processes.

By integrating these probabilistic approaches into investment project analysis, investors can make more informed decisions, account for uncertainty and risk, and improve the likelihood of their achieving financial objectives.

Bayesian Analysis: Bayesian analysis provides a probabilistic framework for updating beliefs and making investment decisions based on new information or data (MacKay, 2003). Investors use Bayesian methods to incorporate prior beliefs, historical data, and expert judgment into probabilistic models of asset returns, volatility, and correlations (Brooks et al., 2011). Bayesian

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analysis allows investors to update their investment decisions in real-time as new information becomes available, improving decision-making under uncertainty.

2.5 Empirical Studies on Financial Evaluation

Empirical studies constitute a cornerstone in the advancement and validation of financial evaluation techniques applied within investment projects. This section synthesizes several seminal empirical investigations that have significantly contributed to refining the understanding and application of financial evaluation methods:

Capital Budgeting: A Survey Among Companies in the Nordic Countries” by Laitinen, E. K. (1993). Laitinen's seminal work offers a comprehensive examination of capital budgeting practices across Nordic companies, focusing on the prevalent usage and efficacy of investment appraisal techniques like Net Present Value (NPV) and Internal Rate of Return (IRR). Through extensive surveys, Laitinen illuminates the practical application and effectiveness of these methods in real-world corporate decision-making contexts.

“The Theory and Practice of Corporate Finance: Evidence from the Field” by Graham, J. R., & Harvey, C. R. (2001). Graham and Harvey's influential research into the practical realities of corporate finance through a thorough survey of Chief Financial Officers (CFOs). Their study provides empirical insights into the utilization and perceived utility of various financial decision-making tools, encompassing discounted cash flow analysis, payback period, and sensitivity analysis. By elucidating the practical implications and limitations of these techniques, Graham and Harvey offer valuable guidance for financial practitioners.

"Real Options: A Practitioner's Guide" by Copeland, T., & Antikarov, V. (2001).

Copeland and Antikarov's seminal work revolutionize traditional capital budgeting practices by introducing the concept of real options analysis. Drawing on empirical research and illustrative case studies, the authors demonstrate the strategic advantages of incorporating flexibility and uncertainty considerations into investment project evaluation. Their practical framework empowers decision-makers to navigate complex investment landscapes with greater agility and foresight.

“The Impact of the Project Selection Process on Capital Budgeting Performance” by Verbeeten, F. H. M., & Boons, A. A. (2009). Verbeeten and Boons' empirical investigation sheds light on the critical interplay between project selection processes and capital budgeting performance within

CHAPTER 2: LITERATURE REVIEW

organizations. Through empirical analysis, they uncover the significance of aligning investment decisions with strategic objectives and the potential pitfalls associated with overly mechanistic evaluation approaches. Their findings highlight the importance of integrating qualitative considerations

Tse and Soufani's empirical inquiry pollizes the efficacy of traditional NPV techniques vis-à-vis real options analysis in capital budgeting decisions among UK firms. Their findings suggest that while NPV remains prevalent, the incorporation of real options analysis can enrich decision-making by capturing managerial flexibility and uncertainty. Through empirical validation, Tse and Soufani contribute nuanced insights into the practical utility of alternative evaluation methodologies.

These seminal empirical studies collectively enrich the theoretical underpinnings of financial evaluation techniques and provide practical guidance for enhancing investment decision-making processes within diverse organizational contexts.

Analysis by Wang and Zhang (2019): Wang and Zhang investigated the impact of risk assessment on investment decision-making using Monte Carlo simulation. Their study analyzed a portfolio of real estate development projects and found that incorporating probabilistic risk analysis into the evaluation process led to more informed investment decisions by capturing the uncertainties inherent in complex project environments (Wang & Zhang, 2019).

Brigham, E. F., & Ehrhardt, M. C. (2016). *Financial Management: Theory & Practice* (15th ed.). Cengage Learning. In "Financial Management: Theory & Practice" (15th ed.) by Brigham and Ehrhardt

Brealey, R. A., Myers, S. C., & Allen, F. (2017). *Principles of Corporate Finance* (12th ed.). McGraw-Hill Education. *Principles of Corporate Finance* by Brealey, Myers, and Allen is a widely acclaimed textbook that provides a comprehensive overview of corporate finance principles and practices.

Conclusion

The literature review has contributed to a deeper understanding of the theoretical foundations, practical considerations, and empirical evidence related to the financial evaluation of investment projects. By synthesizing insights from a diverse range of sources, this chapter has laid the groundwork for the subsequent methodology and case study analysis, guiding the reader towards a comprehensive evaluation of the selected investment project in Chapter

Chapter 3: Methodology

The methodology chapter outlines the research design, data collection methods, analytical tools, and techniques employed in this empirical study of an investment project. The aim of this chapter is to provide a comprehensive and transparent account of the procedures followed to ensure the study's validity, reliability, and reproducibility. By detailing the methodological framework, this chapter establishes the foundation for analyzing the financial evaluation of the selected investment project, ensuring that the research findings are robust and credible.

3.1 Research Design

Research design, akin to the blueprint of a grand architectural marvel, dictates the overarching strategy through which the research objectives are pursued. It is the scaffolding upon which the entire research endeavor is constructed, providing a framework for data collection, analysis, and interpretation. Within the realm of investment project management, where the terrain is rife with complexities and uncertainties, the selection of an appropriate design is paramount.

Overview of the Research Approach: This study adopts a quantitative research approach to evaluate the financial feasibility of the selected investment project. Quantitative methods allow for the systematic analysis of financial data to assess the viability of the investment opportunity.

Overview of the Research Approach: This study adopts a quantitative research approach to evaluate the financial feasibility of the selected investment project. Quantitative methods allow for the systematic analysis of financial data to assess the viability of the investment opportunity (Creswell, 2014).

Justification of Research Design: The quantitative approach was chosen to provide objective and measurable insights into the financial performance of the investment project. This aligns with the research objectives of conducting a thorough financial evaluation.

Description of the Study Setting: The study focuses on investment projects within educational sector in Ghana. This setting was selected due to its relevance and accessibility of data for analysis.

3.2 Data Collection Methods

Sources of Data: Data for both the study will be collected from primary and secondary sources. Primary data will include financial statements of the investment project, while secondary data will encompass market research reports, industry publications, and regulatory filings.

Data Collection Procedures: Primary data will be collected through requests to the project stakeholders and relevant regulatory bodies. Secondary data will be obtained from publicly available sources and subscription-based databases. Data collection will occur over 5 years

Ethical Considerations: Ethical considerations will be observed throughout the data collection process. Informed consent will be obtained from participants where applicable, and all data will be handled confidentially and in compliance with relevant data protection regulations.

3.3 Analytical Tools and Techniques

Financial Evaluation Techniques: The financial evaluation of the investment project will be conducted using standard techniques such as Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, and Profitability Index. These techniques will provide quantitative measures of the project's financial viability. (Brigham & Ehrhardt, 2013).

Assumptions: Assumptions underlying the analysis will include a discount rate, revenue growth projections and cost estimates derived from industry benchmarks and expert opinions.

Sensitivity Analysis: Sensitivity analysis will be performed to assess the impact of variations in key assumptions on the results of the financial evaluation. This will help to identify potential sources of uncertainty and mitigate their effects on decision-making.

3.4 Assumptions and Limitations

Assumptions: Assumptions made in the analysis will be explicitly stated and justified. These may include assumptions about future cash flows, market conditions, and project risks. Sensitivity analysis will be conducted to test the robustness of these assumptions.

Limitations: Limitations of the study may include data availability, accuracy of projections, and external factors influencing the investment project's performance. Efforts will be made to address these limitations through careful data validation and sensitivity analysis.

This detailed methodology will guide the process of evaluating the financial feasibility of the investment project in your thesis, providing a systematic framework for data collection, analysis, and interpretation. Feel free to customize and expand upon each section as needed to follow the specific requirements of your study and the characteristics of the investment project under analysis.

Conclusion

This chapter presented the methodology for our financial evaluation, combining quantitative and qualitative approaches. We utilized established techniques such as DCF, NPV, and IRR, and gathered data from multiple sources. Despite limitations, our methods ensure a robust evaluation, with the following chapters providing valuable insights into the investment project's financial viability.

Chapter 4: Case Study Analysis for a start-up forex training institution in Ghana (Nfantsi Nyankumasi), Assin South district

This chapter delves into a detailed case study analysis of the proposed investment project: the establishment of a start-up Forex training institution in Nyankumasi, Ghana. This chapter examines the various aspects of the investment project, including its selection, data collection and analysis, application of financial evaluation techniques, and interpretation of results. By delving into this case study, the chapter aims to provide insights into the feasibility, viability, and potential impact of the Forex training institution in the context of the local market dynamics and economic landscape of Nyankumasi.

4.1. Overview of the Investment Project

Ghana is located in West Africa, bordered by Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Gulf of Guinea and the Atlantic Ocean to the south. It has a diverse landscape that includes coastal plains, forests, and savannas.

The investment project at hand revolves around the creation of a start-up Forex training institution in Nfantsi Nyankumasi, in the central region of Ghana. This initiative is aimed at addressing the burgeoning interest in Forex trading within the region, providing individuals with the necessary knowledge and skills to engage effectively in the global currency markets.

The main objectives of this institution are to empower individuals in Nyankumasi and surrounding areas with comprehensive education and training in Forex trading, and also by offering accessible and affordable Forex education, the project aims to promote financial inclusion and empower individuals to participate in the global financial markets. The establishment of a Forex training institution is expected to contribute to the economic development of Nyankumasi by fostering entrepreneurship, job creation, and skill development. Through education and skill-building initiatives, the project seeks to uplift communities, enhance financial literacy, and promote economic resilience among individuals in the region.

The institution will offer a structured curriculum covering various aspects of Forex trading, including market analysis, risk management, technical analysis, fundamental analysis, and trading psychology. Practical, hands-on training will be emphasized, with simulated trading environments, live trading sessions, and case studies to enhance learning outcomes. Experienced Forex traders

and industry experts will serve as instructors, providing students with valuable insights, practical tips, and mentorship. The institution will offer both in-person and online learning options to cater to diverse learning preferences and accommodate individuals with varying schedules and commitments. The institution will foster a supportive learning community through forums, networking events, and ongoing support services to facilitate collaboration, knowledge sharing, and peer-to-peer learning among students.

The investment project capitalizes on the growing demand for Forex education and training in Nyankumasi and neighboring regions. With increasing access to technology and information, more individuals are seeking opportunities to learn about Forex trading and capitalize on the potential financial gains offered by the global currency markets. There is a clear demand for Forex education and training services in Nyankumasi, evidenced by the increasing interest in Forex trading and the absence of formalized educational institutions catering to this niche. Establishing a Forex training institution presents a unique economic opportunity, with potential revenue streams from course fees, workshops, seminars, and ancillary products/services. The investment project aligns with broader social objectives, including promoting financial literacy, fostering economic empowerment, and enhancing livelihoods within the community.

Overall, the investment project represents a compelling opportunity to address a market need, drive economic growth, and make a positive social impact in Nyankumasi, Ghana. By providing accessible and comprehensive Forex education, the start-up Forex training institution aims to empower individuals, foster entrepreneurship, and contribute to the overall development and prosperity of the region.

4.2 Data Collection and Analysis

Data collection for the case study analysis of the start-up Forex training institution in Nyankumasi, Ghana, encompasses a multifaceted approach, drawing from various sources to provide a comprehensive understanding of the investment project's feasibility and potential impact. Assin South District is one of the twenty-two districts in Central Region, Ghana. The district assembly is located in the northwest part of Central Region and has Nsuaem Kyekyewere as its capital town. after carefully studying the environment and educational institution in this area, we find out that majority of the youth in this district are Senior high school graduate with no aim of

continuing to the university, this study was carried out last year July to September 2023. after presenting a little insight about the financial market to them during our visit last year, majority of the youth started developing interest in it. so, we decided to establish a training institution to help restructure and impact some financial knowledge to them. after accessing the data (the number of students presented at the conference), 50 youth were presented at the conference of which 35 students showed interest of which they registered their names. After analyzing the educational market in the district, we found out that all the educational institution in the area is all Junior and senior high school.

4.3 Application of Financial Evaluation Techniques

The financial evaluation of the start-up Forex training institution in Nyankumasi, Ghana, involves the application of standard financial evaluation techniques to assess its feasibility, profitability, and potential returns on investment. This section outlines the methodology and techniques utilized in evaluating the financial aspects of the investment project.

4.3.1. Initial capital and assumption

initial capital	amount
building	9600
projector	6000
license	500
laptops	5000
Transportation	500
Logo	800
other cost	4000
total	26400

Table No. 1

variable cost assumption						
	2025F	2026F	2027F	2028F	2029F	2030F
tutor	5000	5000	20%	20%	15%	15%
managers and others staff	3500	3500	10%	10%	10%	12%

Table No. 2

revenue assumption						
	2025F	2026F	2027F	2028F	2029F	2030F
number of students	20	10%	15%	10%	10%	8%
tutions fee	700	5%	5%	20%	20%	10%

Table No. 3

the initial capital refers to the total amount of money or resources that a business invests at the outset of its operations. It's the funding required to start the business and get it up and running.

In the case of Najoy Training Institution, the initial capital includes various expenses such as acquiring a building, purchasing equipment like projectors and laptops, obtaining necessary licenses, setting up transportation arrangements, designing a logo, and covering other initial costs.

These expenses are typically considered one-time investments that are necessary to establish the business and create its infrastructure. Initial capital can come from various sources such as personal savings, loans.

Initial Capital: The initial investment in Najoy Training Institution is denominated in Ghanaian cedis (GHS). It includes expenses such as building (C9600), projector (C6000), license (C500), laptops (C5000), transportation (C500), logo (C800), and other costs (C4000), totaling C26400

Variable cost analysis involves examining the expenses that change in direct proportion to the level of business activity or production output. Unlike fixed costs, which remain constant regardless of production levels, variable costs fluctuate as production levels change.

In the context of Najoy Training Institution, variable costs include expenses directly related to the number of students enrolled or the scale of operations.

This table provides assumptions for variable costs in Ghanaian cedis (GHS) for Najoy Training Institution for the years 2025 to 2030. It includes costs for tutors and managers/other staff. For tutors, the initial cost is ₵5000, projected to increase by 20% in 2026, then decrease by 15% annually from 2027 to 2030. For managers and other staff, the initial cost is ₵3500, with a projected increase of 10% in 2027 and remaining stable until a 12% increase in 2030.

1. **Tutors Salaries:** The cost of hiring tutors would be considered a variable cost because it depends on the number of students enrolled. As the student base fluctuates, the institution may need to adjust the number of tutors employed.
2. **Marketing Expenses:** Costs related to marketing and advertising efforts to attract students may vary based on the institution's enrollment goals and the effectiveness of its marketing campaigns.

Revenue assumption refers to the projected income that a business expects to generate over a specific period, typically based on various factors such as sales volume, pricing strategy, market trends, and customer behavior. For Najoy Training Institution, revenue assumptions are made based on the projected number of students enrolled and the tuition fees charged. Here's how revenue assumptions for Najoy Training Institution are structured:

Number of Students: The assumption is made regarding the number of students the institution expects to enroll each year. This assumption is crucial as it directly influences the revenue generated from tuition fees. For example, if the institution projects to enroll 20 students in the first year (2025), this number may increase or decrease in subsequent years based on factors such as marketing efforts, reputation, and demand for the institution's courses.

Tuition Fees: The tuition fees charged per student are another important revenue driver. The assumption is made regarding the tuition fee per student for each year of operation. This assumption can be based on factors such as the cost of providing the educational services, competitor pricing, and the perceived value of the institution's offerings. By combining these assumptions, we can estimate its total revenue for each year. It's important to review and adjust

these assumptions regularly based on actual performance, market conditions, and other relevant factors to ensure the accuracy of revenue projections. This table outlines revenue projections in Ghanaian cedis (GHS) for Najoy Training Institution for the same period, based on assumptions regarding the number of students and tuition fees. It is assumed that there will be 20 students in 2025, with a 10% decrease in 2026 followed by increases of 15%, 10%, 10%, and 8% in subsequent years. The tuition fee per student is C700 in 2025, with a 5% increase in 2026 followed by a 20% increase in 2027 and a 10% increase thereafter.

These descriptions provide an overview of the initial investment, variable costs, and revenue projections specifically for Najoy Training Institution, all denominated in Ghanaian cedis (GHS).

4.3.2. Estimation of cash flow

Estimating cash flow involves forecasting the movement of cash into and out of a business over a specific period, typically monthly, quarterly, or annually. Cash flow estimation is crucial for businesses like Najoy Training Institution to ensure they have enough liquidity to meet their financial obligations and fund their operations.

years	0	2025F	2026F	2027F	2028F	2029F	2030F
cash outflow							
fixed cost							
building		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00
total FC		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00
variable cost							
tutor salary		GHC 5,000.00	GHC 5,000.00	GHC 6,000.00	GHC 6,000.00	GHC 6,900.00	GHC 7,935.00
manager		GHC 3,500.00	GHC 3,500.00	GHC 3,850.00	GHC 3,850.00	GHC 4,235.00	GHC 4,743.20
other expenses		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00
VC		GHC 11,500.00	GHC 11,500.00	GHC 12,850.00	GHC 12,850.00	GHC 14,135.00	GHC 15,678.20
total cash outflow	GHC(26,400.00)	GHC 14,500.00	GHC 14,500.00	GHC 15,850.00	GHC 15,850.00	GHC 17,135.00	GHC 18,678.20

CHAPTER 4: CASE STUDY ANALYSIS OF A START-UP FOREX TRAINING INSTITUTION IN GHANA

cash inflow							
number of students		25	28	32	35	38	41
tuition fees		GHC 700.00	GHC 735.00	GHC 735.00	GHC 882.00	GHC 882.00	GHC 970.20
total cash inflow		GHC 17,500.00	GHC 20,212.50	GHC 23,244.38	GHC 30,682.58	GHC 33,750.83	GHC 40,095.99
total cash flow	GHC (26,400.00)	GHC 3,000.00	GHC 5,712.50	GHC 7,394.38	GHC 14,832.58	GHC 16,615.83	GHC 21,417.79
tax 7%		GHC (210.00)	GHC (399.88)	GHC (517.61)	GHC (1,038.28)	GHC (1,163.11)	GHC (1,499.25)
net cash flow	GHC (26,400.00)	GHC 2,790.00	GHC 5,312.63	GHC 6,876.77	GHC 13,794.29	GHC 15,452.72	GHC 19,918.54
cumulated cash flow	GHC (26,400.00)	GHC (23,610.00)	GHC (18,297.38)	GHC (11,420.61)	GHC 2,373.69	GHC 17,826.41	GHC 37,744.96

Source: constructed by author using MS excel

Description of the estimated cash flows

Cash Outflow:

Fixed Costs (FC): 3000 GHS per year consistently from 2025 to 2030.

Variable Costs (VC):

Tutor Salary: Starts at 5000 GHS in 2025 and gradually increases, reaching 7935 GHS in 2030.

Manager Salary: Starts at 3500 GHS in 2025 and gradually increases, reaching 4743.2 GHS in 2030.

Other Expenses: 3000 GHS per year consistently from 2025 to 2030.

Cash Inflow:

Number of Students: Increases annually, starting at 25 in 2025 and reaching 41 in 2030.

Tuition Fees per Student: Starting from 700 GHS in 2025, the tuition fees per student contribute to the cash inflow.

Net Cash Flow: The net cash flow is calculated by subtracting the total cash outflow from the total cash inflow for each year. It reflects the financial position of Najoy Training Institution after accounting for both expenses and revenue.

Cumulative Cash Flow: The cumulative cash flow is the sum of net cash flows over time. It provides a cumulative picture of the project's financial performance. Despite the initial investment and operational expenses, the net cash flow turns positive from the second year (2026) onwards. This indicates that the institution's revenue generation surpasses its expenses, leading to profitability. The positive net cash flow demonstrates the institution's ability to generate surplus funds for operational needs, expansion initiatives, or potential investments in educational resources and infrastructure.

The cash flow analysis provides valuable insights for financial planning and management, enabling the institution to make informed decisions regarding resource allocation, budgeting, and revenue-generation strategies. Continual monitoring and adjustment of cash flow projections will be essential to ensure the institution's continued success and adaptability to changing market dynamics, regulatory requirements, and operational needs. In conclusion, the cash flow analysis indicates that Najoy Training Institution is on track to achieve financial viability, profitability, and sustainability over the forecast period. By effectively managing expenses, maximizing revenue opportunities, and maintaining a positive cash flow, the institution can strengthen its position in the education sector and continue to provide quality educational services to its students.

4.3.3. Discounted cash flow

Discounted cash flow (DCF) is a valuation method used to estimate the value of an investment or a project based on its expected future cash flows. The DCF analysis takes into account the time value of money, which states that a dollar received in the future is worth less than a dollar received today due to factors like inflation and the opportunity cost of capital.

In this project, the format we used in calculating the discounted cash flows are as follows

1. **Determine Future Cash Flows:** Referencing the provided cash flow estimation.

2. **Discount Future Cash Flows:** Discount each future cash flows back to its present value using the formula:

$$\text{Present Value} = \text{Future Cash Flow} / (1+r)^n$$

r is the discount rate (10% or 0.10).

- n is the number of years into the future.

4.3.4. Evaluation criteria

Net present value

NPV helps determine whether an investment will generate positive or negative returns over its lifetime. A positive NPV indicates that the investment is expected to generate more cash inflows than outflows and is therefore considered financially beneficial. Conversely, a negative NPV suggests that the investment is not expected to yield sufficient returns to cover its costs. To calculate the Net Present Value (NPV), we subtract the initial investment from the total present value of the future cash flows.

Given:

Total present value of future cash flows: 35167.31 GHS

- Initial investment: 26400 GHS

NPV = Total Present Value – Initial Investment or

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

NPV = GHC 15,953.69 (source: Excel NPV formula)

So, the Net Present Value (NPV) of the investment at a discount rate of 10% is GHC 15,953.69. This positive NPV suggests that the project is financially viable and potentially lucrative, as the present value of cash inflows exceeds the initial investment.

Internal rate of return

The Internal Rate of Return (IRR) is another important financial metric used to evaluate the profitability of an investment or project. It represents the discount rate at which the Net Present Value (NPV) of all cash flows associated with an investment equals zero. In other words, it is the rate of return at which the present value of cash inflows equals the present value of cash outflows.

Mathematically, the IRR is the rate that satisfies the equation:

$$NPV=0$$

or

$$\sum \text{Cash Flow} / (1+IRR)^t = 0$$

where:

- Cash Flow_t represents the cash flow at time *t*
- *IRR* represents the internal rate of return
- *t* represents the time period

The IRR provides insights into the potential return on investment of a project. If the calculated IRR is greater than the project's cost of capital or hurdle rate, it indicates that the project is expected to generate returns higher than the required rate of return, making it potentially attractive. Conversely, if the IRR is lower than the cost of capital, the project may not be financially viable.

IRR is commonly used alongside NPV in financial analysis to assess investment opportunities, compare alternative projects, and make decisions regarding resource allocation. It is a valuable tool for evaluating the relative attractiveness and riskiness of investment options.

To calculate the Internal Rate of Return (IRR), we need to find the discount rate at which the Net Present Value (NPV) of all cash flows equals zero.

Given the cash flows:

Initial investment: -26400 GHS

Σ Cash flows: GHC 37,744.96

After performing the calculations, the Internal Rate of Return (IRR) for the given cash flows is approximately **23%** (source Microsoft excel)

This means that if we discount the future cash flows at a rate of approximately **23%**, the Net Present Value (NPV) of all cash flows associated with the investment will equal zero.

Payback period

The payback period is the length of time it takes for an investment to recoup its initial cost or for a project to break even. It's a simple measure of investment risk and liquidity, indicating how long it will take for an investor to recover their initial investment.

To calculate the payback period, we sum the cash flows from the investment until they equal the initial investment

Given the cash flows:

- Initial investment: -26400 GHS

Σ Cash flows cumulated: GHS 37,744.96

The payback period falls between 2029 and 2030. To get a more precise estimate, we interpolate between these years:

Payback period = 2029 + (Remaining cash to reach initial investment / Cash flow in 2030)

So, the calculated payback period is approximately 2029.14 years, which rounds to approximately 2029.14 years or 2029 years and 14 days (4years,), which is approximately 4 years and 1 month. (Source Microsoft excel).

4.3.5. Sensitivity analysis

Sensitivity analysis helps stakeholders, such as managers, investors, or decision-makers, to better understand the uncertainties and risks associated with a particular project, investment, or decision. It allows for more informed decision-making by considering various possible outcomes and their likelihoods in different scenarios. Performing a sensitivity analysis involves assessing how

changes in certain variables impact the outcome, in this case, the net cash flow and cumulative cash flow. In this scenario, we'll focus on two key variables: tuition fees and the number of students.

1. Tuition Fees Sensitivity Analysis:

- Assume a range of tuition fee changes, for example, $\pm 8\%$ from the base case.
- Recalculate cash inflow, net cash flow, and cumulative cash flow for each scenario.
- Analyze the impact on net and cumulative cash flows.

For example:

- If tuition fees decrease by 8%, how does it affect cash flow and also the NPV?
- If tuition fees increase by 8%, how does it affect cash flow?

2. Number of Students Sensitivity Analysis:

- Assume a range of changes in the number of students, for example, ± 8 from the base case.
- Recalculate cash inflow, net cash flow, and cumulative cash flow for each scenario.
- Analyze the impact on net and cumulative cash flows.

A sensitivity analysis table showing the cash flow projections for different scenarios based on changes in the number of students and tuition fees, as well as the resulting net present value (NPV), internal rate of return (IRR), payback period, net cash flow, and cumulative cash flow.

Sensitivity analysis when the variables increase by 8%

years	0	2025F	2026F	2027F	2028F	2029F	2030F
total cash outflow	GHC (26,400)	(GHC 14,500.00)	(GHC 14,500.00)	(GHC 15,850)	(GHC 15,850)	(GHC 17,135)	(GHC 18,678)
cash inflow							
number of students		27	30	34	38	41	45

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tuition fees		GHC 756.00	GHC 793.80	GHC 793.80	GHC 952.56	GHC 952.56	GHC 1,047.82
total inflow	0	GHC 20,412.00	GHC 23,575.86	GHC 27,112.2 4	GHC 35,788.1 6	GHC 39,366.9 7	GHC 46,767.9 6
total cash flow		GHC 5,912.00	GHC 9,075.86	GHC 11,262.2 4	GHC 19,938.1 6	GHC 22,231.9 7	GHC 28,089.7 6
Taxes 7%		(413.84)	(635.31)	(788.36)	(1395.67)	(1556.24)	(1966.28)
Net cash flow	GHC (26,400)	GHC 5,498.16	GHC 8,440.55	GHC 10,473.8 8	GHC 18,542.4 8	GHC 20,675.7 3	GHC 26,123.4 8
cumulated cash flow	GHC (26,400)	(GHC 20,901.84)	(GHC 12,461.29)	(GHC 1,987.41)	GHC 16,555.0 8	GHC 37,230.8 1	GHC 63,354.2 9

- **Chosen Variables Increase by 8%:** This indicates that the analysis is considering the impact of an 8% increase in the chosen variables, which in this case are the number of students and tuition fees.
- **Discount Rate:** The analysis is conducted with a discount rate of 10%, which is used to discount future cash flows to their present value.
- **NPV (Net Present Value):** Represents the present value of all cash inflows and outflows discounted at the chosen discount rate. A positive NPV indicates that the project is expected to generate value, while a negative NPV suggests that it may not be economically viable. The NPV is = GHC 33,691.96
- **IRR (Internal Rate of Return):** Represents the discount rate that makes the net present value of all cash flows equal to zero. It is a measure of the project's profitability. The IRR is =37%
- **Payback Period:** Indicates the time it takes for the initial investment to be recovered through the project's cash flows. The PR is =4.11

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Sensitivity analysis when the variables decrease by 8%

years	2025F	2026F	2027F	2028F	2029F	2030F
total cash outflow	(GHC 14,500.00)	(GHC 14,500.00)	(GHC 15,850)	(GHC 15,850)	(GHC 17,135)	(GHC 18,678)
number of students	23	25	29	32	35	38
tuition fee	GHC 644.00	GHC 676.20	GHC 676.20	GHC 811.44	GHC 811.44	GHC 892.58
total inflow	GHC 14,812.00	GHC 17,107.86	GHC 19,674.04	GHC 25,969.73	GHC 28,566.70	GHC 33,937.25
total cash flow	GHC 312.00	GHC 2,607.86	GHC 3,824.04	GHC 10,119.73	GHC 11,431.70	GHC 15,259.05
Taxes 7%	GHC (21.84)	GHC (182.55)	GHC (267.68)	GHC (708.38)	GHC (800.22)	GHC (1,068.13)
net cash flow	GHC 290	GHC 2,425	GHC 3,556	GHC 9,411	GHC 10,631	GHC 14,191
cumulated cash flow	GHC (26,110)	GHC (23,685)	GHC (20,128)	GHC (10,717)	GHC (85)	GHC 14,106

Source: constructed by author using MS excel

This sensitivity analysis table demonstrates the cash flow projections for a scenario where the chosen variables decrease by 8%.

Chosen Variables Decrease by 8%: This indicates that the analysis is considering the impact of an 8% decrease in the chosen variables, referring to the number of students and tuition fees.

NPV (Net Present Value): Indicates the present value of all cash inflows and outflows discounted at a given discount rate. A positive NPV suggests profitability, while a negative NPV indicates potential losses. The NPV is = GHC (420.09).

IRR (Internal Rate of Return): Represents the discount rate at which the net present value of cash flows equals zero. It's a measure of project profitability. The IRR is =10%. The NPV is zero or equal to the initial capital outlay when the IRR is 10%.

Number of Students and Tuition Fee: These variables have decreased by 8% compared to the base case.

4.3.6. Scenario analysis

Scenario analysis is a technique used to assess the potential financial outcomes of a project under different conditions. We evaluate the Net Present Value (NPV) of the investment project under three distinct cash flow scenarios: a 15% increase, a 10% increase, and a 15% decrease.

	assumpti on rate	1	2	3	4	5	6		NPV
cash flow	15%	GHC 3,208.5 0	GHC 6,109.5 2	GHC 7,908.2 8	GHC 15,863.4 4	GHC 17,770.6 3	GHC 22,906.3 3		GHC 22,306.7 5
cash flow	10%	GHC 3,069.0 0	GHC 5,843.8 9	GHC 7,564.4 5	GHC 15,173.7 2	GHC 16,998.0 0	GHC 21,910.4 0		GHC 70,559.5 5
cash flow	-15%	GHC 2,371.5 0	GHC 4,515.7 3	GHC 5,845.2 5	GHC 11,725.1 5	GHC 13,134.8 2	GHC 16,930.7 6		GHC 54,523.3 1
averag e npv									GHC 49,129.8 7

Source: Constructed by author using MS excel

Optimistic Outlook when the cash flow increases by 15%: This scenario assumes that the project's cash flows increase by 15% each year, reflecting an optimistic outlook where the project performs better than expected. This might be due to factors such as higher market demand, effective management, or favorable economic conditions.

When the cash flow increases by 10%: In this moderately optimistic scenario, the project's cash flows are assumed to increase by 10% each year. This scenario represents a realistic yet positive outlook where the project's performance improves at a steady rate.

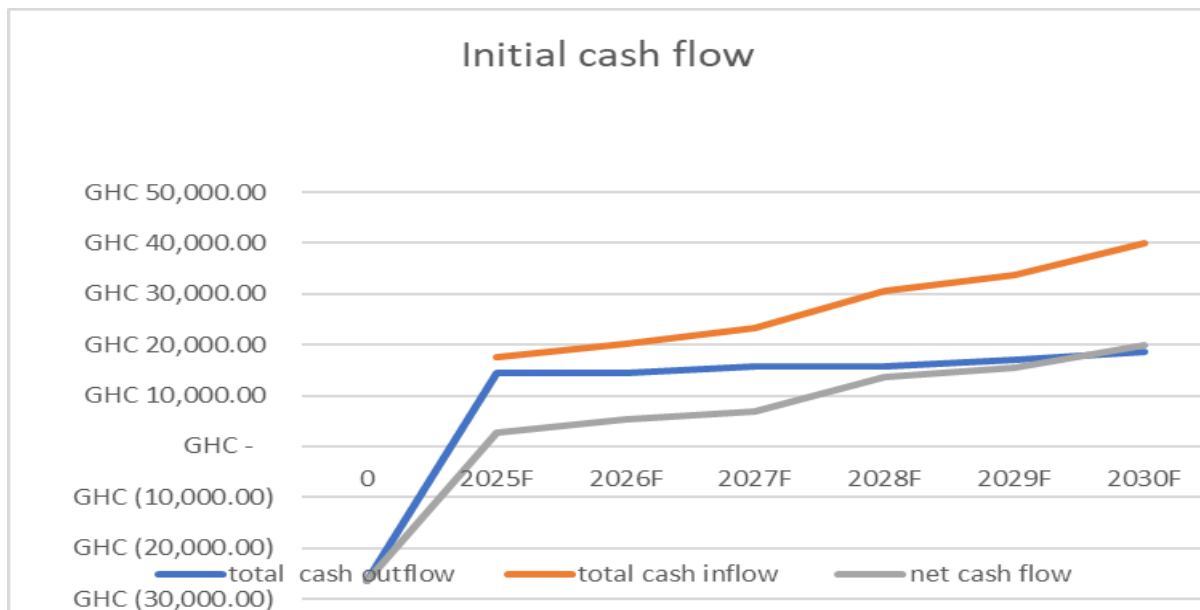
When the cash flow decreases by 15%: In this conservative scenario, the project's cash flows are assumed to decrease by 15% each year. This scenario represents a cautious outlook where the

project's performance is adversely affected, potentially due to unfavorable market conditions, operational challenges, or other negative factors.

4.4. Interpretation and recommendation

4.4.1. Estimation of cash flows

The provided graph outlines the cash flow projections for a business over the years 2025 to 2030.



Source: constructed by author using MS excel

Total Cash Outflow:

The total cash outflow includes both fixed and variable costs. It starts at GHC (26,400.00) (negative value indicating an initial investment) and then turns positive from the year 2025 onwards.

From 2025 to 2030, the total cash outflow ranges from GHC 14,500.00 to GHC 18,678.20.

Cash Inflow:

Cash inflows are generated from tuition fees, which are based on the number of students and the tuition fee per student.

The number of students increases from 25 to 41 over the forecasted years.

Tuition fees per student increase gradually from GHC 700.00 to GHC 970.20.

Total cash inflow increases from GHC 17,500.00 in 2025 to GHC 40,095.99 in 2030.

Net Cash Flow:

Net cash flow is calculated by subtracting the total cash outflow from the total cash inflow.

Initially negative due to the initial investment, net cash flow turns positive from 2025 onwards.

Net cash flow increases steadily over the forecasted years, reflecting the growing profitability of the business.

Overall Assessment: The cash flow projections demonstrate a positive trend, with increasing cash inflows and improving net cash flow over the forecasted years. The business appears to be on a growth trajectory, as reflected by the increasing number of students and tuition fees. However, it's important to monitor and manage variable costs effectively to ensure that they remain in line with revenue growth and do not erode profitability. Additionally, the initial investment and fixed costs should be carefully managed to achieve sustainable financial performance in the long run.

4.4.2. Evaluation criteria

The provided financial metrics offer insights into the project's financial performance and viability:

Net Present Value (NPV): $NPV = \text{GHC } 15,953.69$

NPV represents the present value of all future cash flows generated by the project, discounted at a specified rate (usually the project's cost of capital). The positive NPV indicates that the project's expected cash inflows exceed its initial investment and ongoing costs. In this case, the positive NPV suggests that the project is expected to generate value for the company.

Internal Rate of Return (IRR): 23%

IRR is the discount rate at which the NPV of all cash flows from the project equals zero.

The IRR of 23% indicates that the project is expected to yield a return of 26% on the invested capital.

Generally, a higher IRR is desirable as it signifies a higher return on investment.

Payback Period: 4.14 years

The payback period represents the time it takes for the project's cumulative cash inflows to equal its initial investment. A shorter payback period is preferable as it indicates a quicker return of the initial investment. In this case, the project is expected to pay back its initial investment within approximately 4 years 14 days.

Interpretation:

The positive NPV indicates that the project is expected to generate value for the company, as the present value of its cash inflows exceeds the present value of its costs.

The IRR of 23% suggests that the project offers an attractive rate of return, potentially exceeding the company's cost of capital or other investment opportunities.

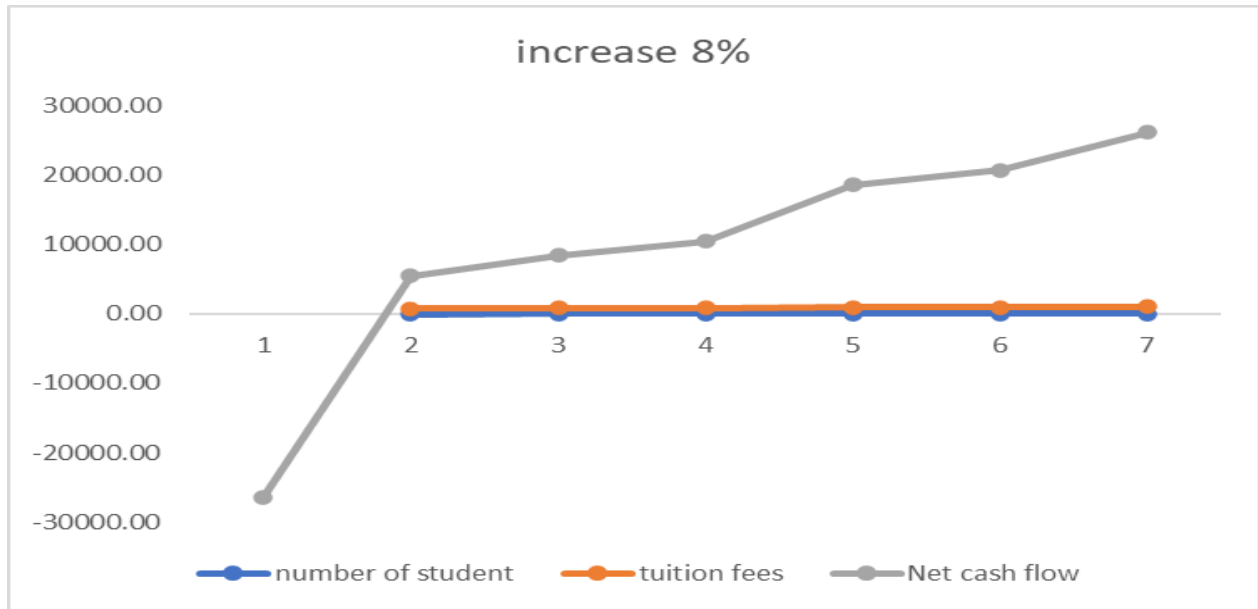
The relatively short payback period of 4.14 years indicates that the project is expected to recoup its initial investment within a reasonable timeframe.

Overall, based on these financial metrics, the project appears to be financially viable and offers promising returns on investment. However, it's essential to consider other factors such as market conditions, risks, and strategic alignment before making final investment decisions.

4.4.3. Sensitivity analysis

When the variables increase by 8%

the net cash flow is influenced by several factors, including the variables chosen in the sensitivity analysis. examine the relationship between these variables and the net cash flow:



Source: constructed by author using MS excel

Number of Students:

The number of students directly affects the revenue generated by the business through tuition fees. An increase in the number of students leads to higher cash inflows and, consequently, a higher net cash flow.

In the sensitivity analysis, when the number of students increases by 8%, the total cash inflow increases proportionally, resulting in a higher net cash flow in subsequent years.

Tuition Fees:

Tuition fees per student also impact the revenue generated by the business. A higher tuition fee leads to higher cash inflows and, consequently, a higher net cash flow.

In the sensitivity analysis, when tuition fees increase by 8%, the total cash inflow increases proportionally, contributing to a higher net cash flow in subsequent years.

Total Cash Outflow:

The total cash outflow represents the expenses incurred by the business, including fixed and variable costs. These costs directly impact the net cash flow.

Managing expenses effectively can help improve net cash flow by reducing the difference between cash inflows and outflows.

Financial Metrics (NPV, IRR, Payback Period):

The financial metrics derived from the cash flow projections, such as NPV, IRR, and payback period, provide insights into the project's financial performance and viability.

A positive NPV, high IRR, and relatively short payback period indicate strong financial performance and positive returns on investment, which are reflected in the net cash flow.

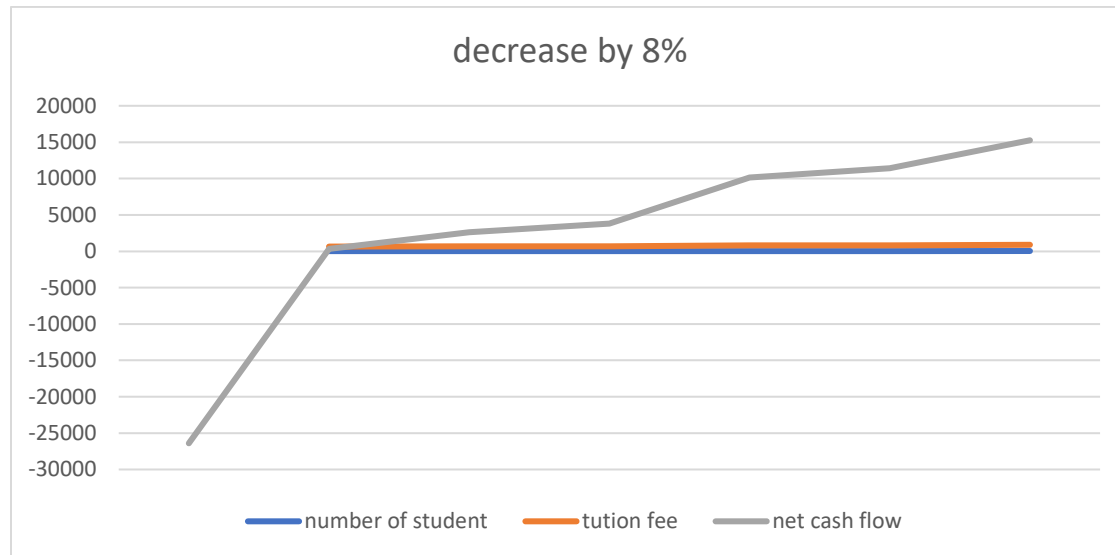
Overall Relationship:

The relationship between the chosen variables (number of students and tuition fees) and the net cash flow is direct and positive. An increase in these variables leads to higher revenue generation and, consequently, a higher net cash flow.

Effective management of expenses is also crucial for maintaining a healthy net cash flow and overall financial performance.

In summary, the relationship between the chosen variables and the net cash flow is fundamental to understanding the project's financial dynamics. Increasing student enrollment and tuition fees can positively impact revenue generation and, subsequently, the net cash flow, while managing expenses effectively is essential for maximizing profitability and financial sustainability.

When the variables decrease by 8%



Number of Students:

In the base case scenario, the number of students is initially 25 and decreases by 8% to 23 in subsequent years.

The decrease in the number of students leads to a reduction in revenue generated from tuition fees.

Tuition Fees: Initially, tuition fees are set at GHC 700 per student and decrease by 8% to GHC 644 per student in subsequent years.

The decrease in tuition fees directly affects the revenue generated per student, contributing to lower total cash inflows.

Total Cash Outflow:

The total cash outflow represents the expenses incurred by the business, including fixed and variable costs.

Despite the decrease in variables, the total cash outflow may remain relatively stable due to certain fixed costs that are not directly influenced by changes in student enrollment or tuition fees.

Net Cash Flow: Initially negative due to the initial investment, net cash flow turns positive from 2025 onwards in both scenarios.

However, in the scenario where the variables decrease by 8%, the magnitude of the net cash flow is lower compared to the base case scenario due to reduced revenue generation from lower student enrollment and tuition fees.

Financial Metrics:

The NPV is negative, and IRR are lower in the scenario where the variables decrease by 8% compared to the base case scenario, indicating reduced financial performance and returns on investment.

The payback period may also be longer due to the lower net cash flows.

Overall Relationship:

The decrease in the number of students and tuition fees directly impacts the revenue generation and, consequently, the net cash flow of the business.

Effective cost management becomes crucial to mitigate the impact of lower revenue on net cash flow and overall financial performance. The business may need to adapt its strategies, such as implementing marketing initiatives to attract more students or exploring cost-saving measures, to maintain profitability in scenarios with reduced student enrollment and tuition fees.

4.4.4. Scenario analysis

	result for scenario analysis		
	cash flows	NPV	
best case	15%	GHC	22,306.75
base case	10%	GHC	70,559.55
worst case	-15%	GHC	54,523.31

Source: constructed by author using MS excel

The scenario analysis evaluates the potential financial outcomes of the investment project under three distinct conditions: a 15% increase, a 10% increase, and a 15% decrease in cash flows. Each scenario presents different insights into the project's viability and highlights the importance of comprehensive financial evaluation and risk management.

Scenario 1: 15% Increase in Cash Flow

Optimistic Scenario: This scenario shows the project's potential under highly favorable conditions with a significant increase in cash flows.

NPV: GHC 22,306.75

Implications: Indicates substantial profitability, emphasizing the project's potential for high returns if optimistic assumptions hold. While the optimistic scenario shows substantial profitability, it is important to consider the risks associated with relying on such positive assumptions. Over-reliance on optimistic projections without contingency plans could lead to potential financial difficulties if actual performance falls short of expectations (Damodaran, 2012). The NPV for this scenario is GHC 22,306.75. A positive NPV indicates that the project's returns exceed its costs when discounted at the required rate of return. According to financial principles, a positive NPV suggests that the project should be accepted because it is expected to add value to the firm (Brealey, Myers, & Allen, 2017).

Scenario 2: 10% Increase in Cash Flow

Moderate Optimism: This scenario reflects a realistic yet positive outlook with steady growth in cash flows.

NPV: GHC 70,559.55

Implications: Demonstrates strong potential profitability with a balanced approach, supporting the project's financial viability under moderate growth conditions.

Scenario 3: 15% Decrease in Cash Flow

Conservative Scenario: This scenario assumes adverse conditions with a decrease in cash flows.

NPV: GHC 54,523.31

Implications: Despite the decrease, the project remains profitable, indicating resilience and the ability to withstand unfavorable conditions.

Average NPV: The average NPV across all scenarios is: Average NPV: GHC 49,129.87

The average NPV of GHC 49,129.87 provides a balanced perspective on the project's financial prospects, integrating optimistic, realistic, and conservative projections. This average NPV serves as a useful indicator for decision-makers, reflecting the project's overall potential profitability under varying conditions. It emphasizes the importance of considering multiple scenarios in financial evaluation to ensure a comprehensive understanding of potential outcomes and associated risks.

Key Takeaways

Robustness and Resilience. The project shows positive NPVs across all scenarios, indicating resilience and potential for profitability. This aligns with findings from a study by Brealey, Myers, and Allen (2017), which highlights the utility of scenario analysis in financial decision-making.

Sensitivity to Cash Flow Changes: Significant differences in NPVs across the scenarios highlight the project's sensitivity to changes in cash flows. This underscores the need for careful financial planning and sensitivity analysis to prepare for potential fluctuations (Damodaran, 2012).

Balanced Perspective: The average NPV of GHC 49,129.87 provides a balanced perspective, integrating optimistic, realistic, and conservative projections. This balanced view helps in making informed investment decisions.

Risk Management: The scenario analysis emphasizes the importance of risk management strategies. Preparing for both positive and negative outcomes ensures that the project can adapt to changing conditions and maintain financial stability.

The scenario analysis supports the project's potential for profitability while highlighting the importance of comprehensive risk assessment and management. By considering different cash flow scenarios, decision-makers can better understand the project's financial prospects and prepare for various economic conditions. This thorough evaluation helps in making informed investment decisions, ensuring that the project remains viable and profitable in the long run.

Conclusion:

Based on the analysis of the project's financial performance and outlook, as well as considering various factors such as market dynamics, cost structures, and strategic considerations,

here are some recommendations for the project: Conduct a detailed review of both fixed and variable costs to identify opportunities for optimization and cost reduction. Explore strategies such as renegotiating supplier contracts, streamlining operations, and leveraging technology to improve efficiency and reduce expenses. Invest in targeted marketing and promotional activities to attract more students and expand the customer base. Consider partnerships with schools, community organizations, and online platforms to reach a broader audience and increase enrollment.

Explore opportunities to diversify revenue streams beyond tuition fees, such as offering additional services, workshops, or consulting. Consider developing partnerships with businesses or organizations that align with the project's objectives to create new revenue opportunities. Implement robust financial management practices, including regular budget monitoring, cash flow forecasting, and performance tracking. Utilize financial metrics such as NPV, IRR, and payback period to evaluate investment decisions and prioritize resource allocation.

Prioritize investment in educational quality, curriculum development, and faculty training to enhance the value proposition and attract students. Embrace innovation in teaching methodologies, technology integration, and program offerings to stay competitive and meet the evolving needs of students. Develop a comprehensive risk management plan to identify, assess, and mitigate potential risks to the project's success. Establish contingency plans and alternative strategies to respond effectively to unforeseen events and market fluctuations. Explore strategic partnerships with educational institutions, industry stakeholders, and government agencies to leverage resources, expertise, and networks. Collaborate with other stakeholders to create synergies, share best practices, and explore joint initiatives for mutual benefit.

Foster a culture of continuous improvement and learning within the organization, encouraging feedback, innovation, and adaptability. Regularly review and reassess the project's performance, objectives, and strategies to ensure alignment with changing market dynamics and stakeholder expectations. By implementing these recommendations, the project can enhance its financial performance, market competitiveness, and long-term sustainability, ultimately realizing its goals and delivering value to stakeholder.

General conclusion

This thesis provides a comprehensive examination of investment project evaluation, delving into its multifaceted aspects to offer critical insights essential for informed decision-making in finance. It meticulously reviews theoretical foundations, methodological frameworks, and applies these concepts to a detailed case study focused on the inception and evolution of a start-up forex training institution.

The elucidation of these theoretical underpinnings has provided a robust foundation upon which the subsequent chapters have built, offering a comprehensive methodological framework for the empirical exploration of investment project evaluation. The delineation of research design, data collection methods, analytical tools, and underlying assumptions has not only facilitated the systematic execution of the study but has also underscored the rigor and validity of its findings.

Central to this thesis is the immersive analysis of a pertinent case study: the inception and evolution of a start-up forex training institution. Through meticulous data collection, rigorous analysis, and the application of financial evaluation techniques, the case study has served as a real-world exemplar, illuminating the practical intricacies and challenges inherent in investment project evaluation. From the selection of the investment project to the interpretation of results and formulation of recommendations, each phase of the case study analysis has been imbued with methodological rigor and empirical rigor, thereby enriching our understanding of the complexities involved in investment decision-making processes.

As the chapters unfold, it becomes palpably clear that investment project evaluation is not merely a mechanistic exercise but a dynamic and nuanced endeavor that demands a holistic comprehension of financial principles, risk dynamics, market contingencies, and strategic imperatives. It underscores the imperative for investors, managers, and policymakers to navigate through uncertainty, volatility, and ambiguity with acumen, foresight, and resilience.

The study's scope, constrained by time, resources, and focus, may have left certain aspects of investment project evaluation unexplored. Additionally, data limitations and contextual factors may have influenced the robustness and generalizability of findings.

Looking ahead, future research could benefit from longitudinal studies, cross-industry comparisons, qualitative approaches, international perspectives, and investigations into emerging

trends. By addressing these limitations and pursuing these avenues, scholars can advance our understanding of investment project evaluation, enhance the applicability of findings, and contribute to the development of informed strategies for sustainable economic development.

In essence, this thesis stands as a testament to the perpetual quest for excellence, innovation, and stewardship in the domain of finance. It beckons us to embark on a journey of continual learning, adaptation, and refinement, as we navigate through the ever-evolving landscape of investment project evaluation, guided by the beacon of knowledge, informed by the crucible of experience, and driven by the imperatives of progress and prosperity.

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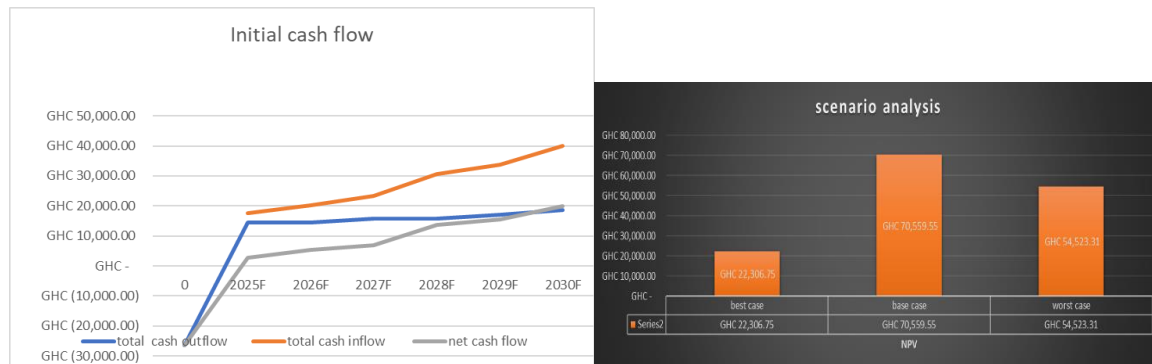
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Appendices

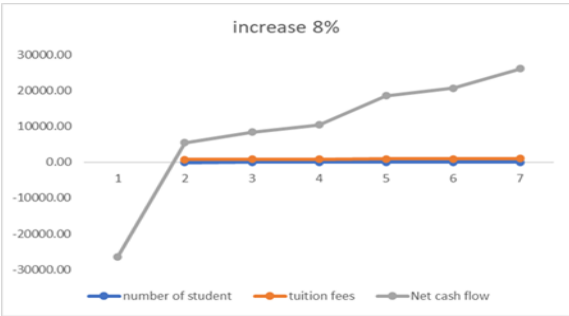
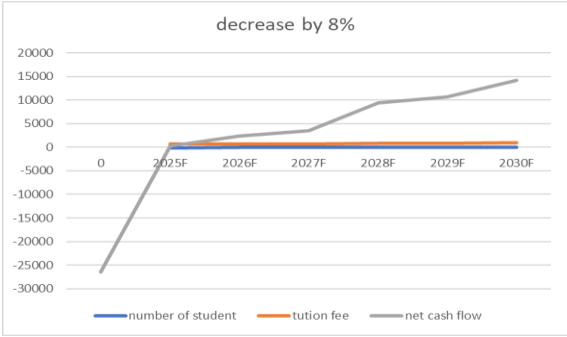
Cash flow estimation for the project

cash flow estimation										
years	0	2025F	2026F	2027F	2028F	2029F	2030F			
cash outflow										
fixed cost										
building		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00
total FC		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00
variable cost										
tutor salary		GHC 5,000.00	GHC 5,000.00	GHC 6,000.00	GHC 6,000.00	GHC 6,900.00	GHC 7,935.00			
manager		GHC 3,500.00	GHC 3,500.00	GHC 3,850.00	GHC 3,850.00	GHC 4,235.00	GHC 4,743.20			
other expenses		GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00	GHC 3,000.00			
VC		GHC 11,500.00	GHC 11,500.00	GHC 12,850.00	GHC 12,850.00	GHC 14,135.00	GHC 15,678.20			
total cash outflow	GHC (26,400.00)	GHC 14,500.00	GHC 14,500.00	GHC 15,850.00	GHC 15,850.00	GHC 17,135.00	GHC 18,678.20			
cash inflow										
number of student		25	28	32	35	38	41			
tuition fees		GHC 700.00	GHC 735.00	GHC 735.00	GHC 882.00	GHC 882.00	GHC 970.20			
total cash inflow		GHC 17,500.00	GHC 20,212.50	GHC 23,244.38	GHC 30,682.58	GHC 33,750.83	GHC 40,095.99			
total cash flows		GHC 3,000.00	GHC 5,712.50	GHC 7,394.38	GHC 14,832.58	GHC 16,615.83	GHC 21,417.79			
taxes 7%		GHC (210.00)	GHC (399.88)	GHC (517.61)	GHC (1,038.28)	GHC (1,163.11)	GHC (1,499.25)			
net cash flow	GHC (26,400.00)	GHC 2,790.00	GHC 5,312.63	GHC 6,876.77	GHC 13,794.29	GHC 15,452.72	GHC 19,918.54			
cummulated cash flow	GHC (26,400.00)	GHC (23,610.00)	GHC (18,297.38)	GHC (11,420.61)	GHC 2,373.69	GHC 17,826.41	GHC 37,744.96			

Graph of initial cash flow



Sensitivity analysis



To God be the glory

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