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# The Role of Financial Analysis in Improving Project Evaluation Decisions:A Case Study in the Iraqi Oil Sector

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## Abstract

**General Background:** Investment decisions in the oil sector require rigorous financial evaluation due to high capital intensity, long project life cycles, and exposure to price volatility. **Specific Background:** In the Iraqi oil sector, project appraisal practices often rely on limited or uneven application of modern financial analysis tools, despite their relevance for large-scale field development. **Knowledge Gap:** Empirical evidence remains insufficient regarding how integrated financial indicators systematically inform project evaluation and decision-making under Iraq's specific operational and institutional conditions. **Aims:** This study examines the role of financial analysis in improving project evaluation decisions through an applied case study of the Majnoon Oil Field, focusing on Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period. **Results:** The findings indicate a positive NPV exceeding USD 1.8 billion, an IRR of approximately 17% above the assumed discount rate, and an acceptable payback period, confirming the project's economic feasibility despite cost and price uncertainties. **Novelty:** The study integrates theoretical financial analysis with a context-specific applied model tailored to the Iraqi oil environment, linking quantitative indicators directly to development and investment decisions. **Implications:** Strengthening financial analysis frameworks and integrating them with technical data can enhance evaluation accuracy, improve resource allocation efficiency, and support more reliable investment decisions within national oil companies.

**Highlight** :

- Financial analysis tools support feasibility assessment in capital-intensive oil projects.
- The Majnoon Oil Field case shows the role of indicators under price volatility.
- Financial analysis strengthens investment decisions and resource allocation.

**Keywords** : Financial Analysis, Oil Project Evaluation, Majnoon Oil Field, Investment Decision, Financial Indicators

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# Introduction

Financial analysis constitutes one of the fundamental pillars supporting investment decisions across productive sectors, particularly the oil sector, which is characterized by high capital expenditures, complex operating environments, and intertwined risks. In Iraq, the need for precise financial analysis tools has become increasingly critical for assessing the economic and financial feasibility of projects prior to implementation, given their direct impact on resource allocation efficiency and the achievement of expected returns. International experiences have demonstrated that relying on robust financial indicators—such as Net Present Value (NPV) and Internal Rate of Return (IRR)—provides clearer insights into a project's ability to generate stable cash flows amid price fluctuations and operational uncertainties. From this standpoint, the present study seeks to analyze the role of financial analysis in enhancing the quality of project evaluation decisions within the Iraqi oil sector, making use of a practical case study that illustrates how financial indicators can be employed to support investment decision-making.

## Research Problem

Despite the expansion of development projects within the Iraqi oil sector, the evaluation process still suffers from limited use of modern financial tools and from insufficient integration of financial analysis results into investment decision-making. Accordingly, the research problem can be formulated as follows:

To what extent does financial analysis contribute to improving project evaluation decisions within the Iraqi oil sector?

## Research Significance

The significance of this study stems from its focus on a critical issue in petroleum management: the role of financial analysis in supporting decisions related to investment projects. Its importance is further highlighted through the following points:

1. Demonstrating how financial indicators can be utilized in high-risk project environments.
2. Highlighting existing gaps in project evaluation practices within Iraqi oil institutions.
3. Providing a practical framework that enhances the quality of investment decisions and reduces the likelihood of financial waste.

## Research Objectives

This study aims to achieve the following objectives:

1. Clarify the theoretical foundations of financial analysis and its tools used in project evaluation.
2. Examine the current state of financial evaluation practices within the Iraqi oil sector.
3. Assess the impact of financial indicators on investment decision-making through an applied case study.
4. Provide recommendations that contribute to improving financial evaluation methodologies within oil companies.

## Research Limits

1. Subject Limits

The study focuses on examining the role of financial analysis in improving project evaluation decisions, with particular emphasis on key financial tools such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period, without expanding into the technical or engineering aspects of petroleum projects.

2. Spatial Limits

The study is conducted within the Iraqi oil sector, specifically in one of the oil companies or projects selected as the case study.

3. Temporal Limits

The study relies on available data and reports for the period 2020–2024, due to the relevance and recency of information necessary for evaluating investment projects in recent years

# The Concept and Objectives of Financial Analysis

## Financial Analysis

Financial management relies on financial analysis as a fundamental tool to support its various functions. It serves as a means of understanding and interpreting the content of financial statements by uncovering the implications of the figures they contain and clarifying the interrelationships among their components. This, in turn, contributes to forming a comprehensive picture of the institution's financial position**.(1)**

Financial analysis refers to a systematic process aimed at examining and interpreting the available data and information about an institution, whether current or historical. This process relies on financial statements and other sources of information, and is conducted using quantitative and statistical tools and methods to derive additional indicators that contribute to evaluating the institution's financial performance and estimating its future trends.(2)

## Objectives of Financial Analysis

The objectives of financial analysis vary depending on the party conducting it, whether it is the institution's internal management or external stakeholders such as investors, suppliers, and banks. In general, its main objectives can be summarized as follows **(3):**

1. Assessing the overall financial position of the institution and determining its ability to withstand obligations arising from borrowing and project financing.
2. Analyzing financial results to identify taxable income and measure performance efficiency over a specific period.

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3. Measuring the profitability of operational activities and evaluating the institution's efficiency in utilizing its resources to achieve the expected return.
4. Determining the extent to which financial balances are achieved, whether in terms of liquidity, indebtedness, or capital structure.
5. Providing a reliable information base for future estimates, such as forecasting cash flows or financing needs.
6. Evaluating credit and lending policies toward customers and suppliers, and assessing their impact on working capital.
7. Conducting benchmarking comparisons between the institution's performance and that of its counterparts within the same sector to identify strengths and weaknesses.
8. Estimating the institution's ability to repay debts and determining the level of financial risk and the guarantees available to lenders.

## Financial Analysis Tools in Project Evaluation (NPV – IRR – Payback)

Financial analysis tools constitute a fundamental pillar in the process of evaluating investment projects, as they provide precise quantitative indicators that assist in measuring the economic feasibility of projects prior to implementation. This becomes even more significant in capital-intensive sectors, such as the oil industry, where investment decisions must be grounded in rigorous financial assessments that minimize risk and maximize returns. In this context, three primary tools are regarded as the most widely used in project evaluation: Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period.

1. Net Present Value (NPV):Net Present Value represents one of the most important financial methods used in project evaluation. It is based on discounting the expected future cash flows to their present value using an appropriate discount rate that reflects the project's financing costs and associated risks. A project is considered acceptable if its NPV is positive, as this indicates the project's ability to generate added value for the institution. Iraqi studies have emphasized the importance of this indicator in petroleum projects, considering it the most capable tool for revealing the actual return after accounting for the time value of money **(4)**
2. Internal Rate of Return (IRR):The Internal Rate of Return is defined as the discount rate that makes the Net Present Value of future cash flows equal to zero. This indicator is used to compare investment alternatives, especially when projects involve different levels of capital expenditure. Investors generally prefer projects that achieve an IRR higher than the required rate of return or the cost of capital. Iraqi research indicates that IRR is among the most widely used tools by foreign oil companies operating in Iraq, as it provides a direct indication of profitability relative to risk **(5).**
3. Payback Period: The Payback Period is used to measure the time required to recover the invested capital from the net annual cash flows generated by the project. Despite its simplicity and ease of application, this tool suffers from limitations, including its disregard for the time value of money and the exclusion of cash flows that occur after the payback point. Nevertheless, it remains in use within several Iraqi institutions, particularly when evaluating short-term projects or during the preliminary stages of feasibility studies (3).

**Integrated Use of Financial Evaluation Tools**

The financial literature indicates that using these three tools collectively provides a more accurate perspective in project evaluation, as each indicator complements the others and reduces the risks associated with relying on a single tool. Accordingly, many Iraqi oil companies—based on evidence from applied studies—tend to integrate NPV and IRR when assessing long-term financial feasibility, while the Payback Period is employed as a supplementary tool to measure the speed of capital recovery and evaluate operational risks.

## The Relationship Between Financial Analysis and Investment Decision-Making

Financial analysis constitutes a fundamental pillar in institutional investment decision-making, as it provides a structured analytical framework for assessing the feasibility of projects and their capacity to generate stable future returns. Its importance is amplified in capital-intensive sectors—particularly the oil industry—where investment decisions demand rigorous examination of cash flows, accurate estimation of associated risks, and careful assessment of profitability. Consequently, financial analysis serves as the primary foundation upon which judgments regarding project viability and investment prioritization are formed.

Furthermore, financial analysis enhances managerial insight into available investment options by examining historical and current data, interpreting liquidity, profitability, and capital structure indicators, and evaluating the operational capacity of projects. In this regard, Iraqi studies indicate that institutions employing financial analysis tools demonstrate greater ability to make well-informed investment decisions and to avoid high-risk or low-feasibility projects **(7).**

Financial analysis also plays a crucial role in comparing investment alternatives by employing tools such as Net Present Value (NPV) and Internal Rate of Return (IRR), both of which reveal a project's capability to generate added value. Literature on the oil sector emphasizes that the use of these tools reduces uncertainty associated with price volatility and assists in selecting projects that align more effectively with the institution's

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strategic objectives **(8).**

Additionally, financial analysis facilitates the assessment of investment risk through sensitivity analysis, enabling decision-makers to anticipate the implications of changes in operating costs or market prices on project outcomes. Such analytical capabilities support the development of informed investment decisions grounded in an objective evaluation of risks and returns, rather than relying solely on subjective judgments or managerial intuition. Applied research within Iraqi companies reveals that incorporating financial analysis into risk assessment has contributed to improving resource allocation efficiency and enhancing the quality of decisions related to investment expansion **(9).**

Collectively, these insights underscore the complementary relationship between financial analysis and investment decision-making. The more accurate, comprehensive, and methodologically sound the financial analysis, the greater the institution's ability to adopt successful investment decisions that strike an optimal balance between profitability and risk. Conversely, inadequate application of financial analysis often leads to the adoption of low-return or high-risk projects, which ultimately undermines institutional performance.

**Conclusion:**The theoretical discussion demonstrates that financial analysis is the cornerstone of rational investment decision-making within institutions, especially in sectors characterized by high sensitivity and significant capital requirements, such as the oil industry. This chapter clarified that financial analysis extends beyond merely examining financial statements; it functions as an integrated analytical framework that supports the interpretation of financial data, the evaluation of operational efficiency, and the anticipation of future institutional performance.

Moreover, the chapter highlighted the principal tools used in project evaluation—Net Present Value, Internal Rate of Return, and Payback Period—explaining their respective roles in determining financial feasibility and a project's potential to generate economic value. The analysis also revealed that the quality of investment decisions depends largely on the accuracy of financial indicators and the management's ability to employ them effectively when comparing alternatives and assessing related risks.

Institutions that adopt comprehensive and methodologically rigorous financial analysis practices are more capable of selecting projects with higher profitability and lower risk, thereby enhancing operational sustainability and improving resource utilization efficiency. This theoretical foundation sets the stage for the subsequent chapter, which examines actual project-evaluation practices within the Iraqi oil sector, evaluates the degree to which modern financial tools are applied by oil companies, and identifies the key challenges shaping the evaluation landscape within the national economic environment.

## The Reality of Project Evaluation in the Iraqi Oil Sector

Project evaluation in the Iraqi oil sector represents a pivotal step in ensuring that investments are directed toward activities with the highest feasibility, particularly within an economic environment characterized by fluctuating oil prices and rising production costs. This sector faces multiple challenges related to evaluation mechanisms, data availability, and the extent to which modern financial methods are applied. These challenges make understanding the current state of project evaluation an essential requirement for improving the efficiency of investment decisions.

This chapter seeks to analyze the general framework used in evaluating oil projects in Iraq by examining the nature of these projects, the methods employed in their assessment, and the constraints that hinder oil institutions from adopting accurate and comprehensive evaluation methodologies.

**The Nature of Oil Projects and Investment Requirements:** Oil projects in Iraq are distinguished by their complex nature and reliance on a sequence of activities that extend across the stages of reservoir exploration, drilling, development, production, and ultimately storage and export. This complexity reflects the diversity of technical and financial requirements necessary to ensure project success.

Iraqi studies indicate that the characteristics of oil fields in southern Iraq—particularly the giant fields—necessitate the use of advanced technologies in reservoir management and production enhancement, which increases the capital costs associated with these projects **(10).**

Official data from the Ministry of Oil indicate that the investment requirements for developing many oil fields range between 8–12 billion USD during the initial years of development. This reflects the substantial financial demands of oil projects compared to other economic sectors **(11).**

**Table (1):** Estimated Development Costs for Selected Iraqi Oil Fields

| Oil Field | Operating Company | Design Capacity (thousand barrels/day) | Development Cost (billion dollars) | Development Period (years) |
|---|---|---|---|---|
| Al-Rumaila | PetroChina (BP) | 1300 | 10 | **8** |
| Al-Zubair | ENI | 850 | 8 | 7 |

| | | | | |
|---|---|---|---|---|
| Majnoon | Shell (previous operator) | 450 | 7.3 | **6** |
| West Qurna 1 | Exxon (former operator) | 500 | 8.4 | 7 |
| West Qurna 2 | Lukoil | 400 | 6.5 | **6** |

**Source: Ministry of Oil, Annual Report, 2022 [11].**

The table indicates that Iraqi oil projects depend on exceptionally large capital investments, and that the successful implementation of any development initiative necessitates a solid financial structure capable of sustaining long-term expenditures. Moreover, well-drilling costs constitute a critical component of overall capital investment, as production wells represent the primary operational unit upon which all subsequent stages of field development are constructed.

**Table (2):** Average Drilling Costs of Oil Wells in Southern Iraq

| Well Type | Estimated Cost (million USD) | Average Depth (meters) | Notes |
|---|---|---|---|
| Production Well | **10-7** | **3200-2700** | **Depends on reservoir characteristics** |
| Water-Injection Well | **8-6** | **2500-2000** | **Used for pressure maintenance** |
| Exploratory Well | **16-12** | **4000-3500** | **Higher geological risks** |

**Source: [12] Basra Oil Company, Annual Fields Management Report, 2023.**

These figures reflect specialized technical challenges that require substantial expertise in drilling and production operations, thereby making investment requirements significantly higher than in countries with more advanced infrastructure. Economic literature further emphasizes that the long life cycle of oil projects—often extending beyond two decades—renders them among the most sensitive to global price fluctuations and operational risks, which necessitates conducting rigorous financial evaluation prior to undertaking any investment **(13).**

From an international comparative perspective, reports by the International Energy Agency (IEA) indicate that the investment environment in Iraq differs markedly from that of other oil-producing countries. Key distinctions include the need to rehabilitate aging infrastructure, the shortage of modern processing systems, and the higher production costs driven by operational challenges. These factors collectively contribute to investment requirements in Iraq being relatively higher than in Gulf countries, where infrastructure is more developed **(14) ,** The importance of such data becomes even more evident when comparing Iraq's investment environment with that of other petroleum-producing nations. IEA reports show that the cost of producing a barrel of oil in Iraq ranges between USD 10–12, which is relatively higher than in Gulf countries that benefit from advanced facilities and lower per-barrel production costs, as illustrated in Table (3):

**Table (3):** International Comparison of Barrel Production Costs

| Country | Production Cost per Barrel (USD) | Technical Notes |
|---|---|---|
| Iraq | **12-10** | **Aging infrastructure and high maintenance costs** |
| Saudi Arabia | **4-3** | **Modern facilities with high operational efficiency** |
| United Arab Emirates | **6-5** | **Advanced technology** |

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| | | |
|---|---|---|
| Norway | **10-8** | **High costs but excellent production quality** |
| United States | **12-10** | **Predominantly shale oil with relatively high production costs** |

Source: [15] International Energy Agency (IEA), Global Oil Production Cost Assessment Report, 2021.

This comparison underscores that the nature of petroleum projects in Iraq necessitates higher levels of capital expenditure, in addition to the need to diversify financing models and adopt precise financial evaluation mechanisms that account for price and operational risks. Such requirements reinforce the importance of employing advanced analytical tools when making investment decisions.

From a technical standpoint, Iraqi oil projects require highly specialized engineering expertise and modern technologies for monitoring and controlling production, alongside efficient transportation and processing systems. An Iraqi academic study indicated that the cost of drilling a single well in some southern fields may range between USD 7–10 million, depending on the geological characteristics of the area **(16).** These figures highlight the necessity of adopting long-term financial strategies grounded in financial analysis and comprehensive economic evaluation.

In addition, Iraqi oil projects must adhere to a clear legal and regulatory framework that defines the responsibilities of operating companies, outlines mechanisms for cooperation with governmental entities, and ensures the availability of accurate technical data, which form the basis for reserve estimation and future cash-flow forecasting **(17).**

In light of the above, it becomes evident that the nature of petroleum projects in Iraq is characterized by both technical complexity and substantial capital requirements, which necessitate the establishment of an integrated financial and economic evaluation system. Such a system enables institutions to make informed investment decisions that support sustainability and maximize long-term returns.

## Current Financial Evaluation Mechanisms Used in Iraqi Oil Companies

Oil companies in Iraq adopt a range of financial mechanisms to evaluate investment projects, with the aim of determining their economic feasibility and their ability to achieve the required returns within a high-risk operational environment. These mechanisms rely primarily on internationally recognized financial indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and cash-flow analysis, in addition to risk assessment tools that constitute a fundamental component of decision-making in the oil sector. Studies within the Iraqi context indicate that these mechanisms are applied to varying degrees between national oil companies and international companies operating under licensing rounds **(18).**

Given the importance of these tools and the differences in their application across companies, the extent to which each financial evaluation tool is utilized in the Iraqi oil sector can be illustrated in Table (4), which presents a brief comparison of the most commonly used evaluation mechanisms.

**Table (4):** A Summary Comparison of Financial Evaluation Mechanisms Used in Iraqi Oil Companies

| Financial Evaluation Tool | Primary Objective of Use | Level of Use in Iraq | Suitability for Oil Projects | Remarks |
|---|---|---|---|---|
| **Discounted Cash Flow (DCF)** | Estimating the present value of future cash flows | High | High | Most commonly used in southern oil field projects |
| **Net Present Value (NPV)** | Measuring value creation and comparing projects | High among foreign companies | High | Highly sensitive to cost estimation accuracy |
| **Internal Rate of Return (IRR)** | Measuring the relative rate of return | Medium | Medium | Does not accurately reflect project risk |
| **Sensitivity Analysis** | Assessing the impact of changes in operational and financial variables | Low to Medium | High when applied | Useful in highly volatile environments |
| **Scenario Analysis** | Evaluating uncertainty and operational risks | Low | High | Requires advanced expertise and analytical tools |

[19] Iraqi Ministry of Oil, Annual Report of the Oil Extraction Sector, Directorate of Studies, Planning and Follow-up, Baghdad, Iraq, 2022.

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The results presented in Table (4) illustrate the varying levels of adoption of financial evaluation tools among national and international oil companies, reflecting differences in financial practices, the application of modern analytical models, and the use of advanced tools such as scenario analysis and probabilistic simulations. These variations indicate the need to strengthen mechanisms that enhance the accuracy of investment decision-making in the Iraqi oil sector. The most notable findings include the following:

1. Discounted Cash Flow (DCF):

Oil companies rely extensively on discounted cash flow models to evaluate the economic feasibility of projects, particularly in estimating expected revenues, future cash flows, and associated risks. This tool is considered one of the most widely used indicators for assessing a project's ability to generate value. Studies by the Ministry of Oil highlight that most development projects in the southern fields undergo technical and financial evaluation using discounted cash flow models, given their flexibility and ability to incorporate uncertainty factors (19)

2. Net Present Value (NPV):

Net Present Value is widely used in multinational and domestic oil projects as a fundamental basis for comparing project alternatives. It provides a clear indication of a project's contribution to increasing the institution's wealth. Foreign oil companies operating in Iraq rely heavily on the NPV indicator due to its ability to measure long-term capital efficiency while accounting for financial and operational risks. This indicator is particularly useful when evaluating the economic feasibility of projects with high capital requirements and long development cycles (13).

3. Internal Rate of Return (IRR):

Companies also rely on the Internal Rate of Return to measure the expected return of a project in relation to investment costs. This indicator serves as a primary reference in decision-making, especially when comparing multiple project alternatives under similar financing conditions. Studies by national institutions indicate that although IRR remains important in evaluating investment decisions, it has limitations when dealing with projects that exhibit varying risk profiles or uncertain financing structures (10).

4. Sensitivity Analysis:

Oil companies use sensitivity analysis to examine the effects of changes in prices, costs, and production levels on project outcomes. This tool's importance is especially evident in Iraq's volatile operating environment, where fluctuations in oil prices and technical conditions are common. Sensitivity analysis is considered one of the most effective tools for evaluating long-term project risk in the oil sector and is widely recommended in international energy studies .

5. Advanced Simulation Models:

Some companies employ more advanced tools such as scenario modeling and probabilistic simulations to estimate technical and financial risks. A study by the University of Basrah revealed that several development projects in the Basra region rely on simulation models to evaluate production uncertainty and cost variations. These methods help decision-makers use multi-scenario models to determine potential outcomes under differing conditions of price, cost, and production (20).

It is observed that foreign companies operating under licensing rounds apply more advanced financial evaluation models compared to national companies, owing to their extensive experience in risk management, data analysis, and the use of modern techniques. Conversely, some national companies still rely on less sophisticated models that focus primarily on profitability without fully integrating the technical and economic factors associated with projects. This variation directly affects the accuracy of investment decisions, the efficiency of resource allocation, and the overall quality of project evaluation.

Based on these findings, it is recommended that financial evaluation mechanisms in Iraqi oil companies be strengthened through the adoption of standardized analytical frameworks, advanced modeling tools used by international companies, and scientifically recognized methodologies. Such improvements would support the development of national companies' capabilities in financial and economic analysis, enhance the quality of investment decisions, and promote more efficient resource utilization.

## Challenges Facing Financial Evaluation in Iraq

The financial evaluation process in the Iraqi oil sector faces a set of challenges that directly affect the accuracy of investment decisions and the efficiency of resource allocation. One of the most prominent challenges is the limited availability of well-organized financial and technical data. Many national oil companies continue to rely on traditional archiving systems that lack continuous updating, leading to clear gaps in estimating operating and development costs. Al-Lami (21) emphasized that the shortage of financial data constitutes a major obstacle to the adoption of modern financial evaluation models in Iraqi companies.

Data from the Ministry of Oil also indicate significant disparities in the level of data readiness among companies, as illustrated in Table (5).

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**Table (5):** Level of Availability of Financial and Technical Data in Iraqi Oil Companies

| Type of Data | Level of Availability | Impact of Shortage on Financial Evaluation | Remarks |
|---|---|---|---|
| Operating Cost Data (OPEX) | Medium | High | Significant variation among companies |
| Development Cost Data (CAPEX) | Low | Very High | Represents the largest data gap |
| Production Data | Good | Medium | Requires integration with financial data |
| Maintenance Data | Low | High | Strongly affects NPV estimates |

**[22] Iraqi Ministry of Oil, Annual Report of the Oil Extraction Sector, Directorate of Studies, Planning and Follow-up, Baghdad, Iraq, 2022.**

In addition, global oil price volatility further complicates the estimation of future cash flows, particularly for long-term projects. According to a report by the International Energy Agency (23), Iraq is considered one of the countries most affected by price fluctuations due to its near-total dependence on oil revenues. This is clearly illustrated in Table (6).

**Table (6):** Average Volatility of Global Oil Prices (2018–2024)

| Year | Average Price (USD/Barrel) | Highest Price | Lowest Price | Volatility Rate (%) |
|---|---|---|---|---|
| 2018 | 65 | 86 | 50 | 40% |
| 2019 | 64 | 74 | 53 | 33% |
| 2020 | 41 | 63 | 37 | 243% |
| 2021 | 70 | 86 | 51 | 27% |
| 2022 | 98 | 128 | 75 | 54% |
| 2023 | 83 | 96 | 72 | 29% |
| 2024* | 82 | 94 | 73 | 26% |

Source: International Energy Agency (IEA, 2021–2024), EIA Annual Energy Review, UK Brent Dataset.

Note: 2024 data are preliminary, based on the average of the first and second halves of the year (IEA Market-Report-December-2024).

Volatility Rate = (Highest Price – Lowest Price) ÷ Average Price × 100.

The global oil price data for the period 2016–2024 indicate that volatility has remained high in recent years, particularly in 2020 due to the COVID-19 pandemic and in 2022 as a result of global market disruptions. The volatility rate exceeded 54% in 2022, reflecting a high level of uncertainty that directly affects the accuracy of cash flow projections for oil projects in Iraq. This observation is consistent with IEA reports (23), which identify price volatility as one of the most significant challenges facing long-term financial evaluation models.

Moreover, national oil companies face limitations in adopting modern financial evaluation tools. They often rely on simple indicators such as the payback period, while the use of advanced risk analysis tools—such as scenario analysis and probabilistic simulation—remains limited. A study by Al-Haider (24) confirmed that the application of advanced evaluation tools in Iraqi oil companies is still modest, as shown in Table (7).

**Table (7):** Level of Use of Financial Evaluation Tools in Iraqi Oil Companies

| Evaluation Tool | Level of Use (%) | Degree of Maturity |
|---|---|---|
| Net Present Value (NPV) | 78 | Good |
| Internal Rate of Return (IRR) | 65 | Moderate |
| Payback Period | 85 | Weak |
| Sensitivity Analysis | 40 | Moderate |
| Scenario Analysis | 22 | Low |

Source: [24] M. A. Al-Haider, Integration of Financial and Technical Analysis in Evaluating Oil Field Development Projects, Master's thesis, University of Basrah, College of Administration and Economics, 2020.

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Aging infrastructure represents another challenge to financial evaluation, as the obsolescence of production and processing facilities leads to higher operating costs, thereby increasing the complexity of cash flow estimation. The Ministry of Oil(25) reports that approximately 30% of processing plants require comprehensive rehabilitation.

At the institutional level, weak coordination between technical and financial departments within oil companies is frequently observed. Technical studies are often prepared independently of financial analysis, resulting in clear gaps in evaluation outcomes. Abdul-Ridha(26.) noted that the absence of integration between departments can reduce evaluation accuracy by up to 25%.

Oil companies also face challenges related to legislative and political risks, which are not effectively incorporated into financial evaluation models due to the difficulty of quantifying them, in addition to frequent changes in government policies related to oil and investment (27).

Based on the above, the financial evaluation process in Iraq still requires substantial development in evaluation tools, data systems, and financial and technical skills. Addressing these gaps would contribute to achieving more accurate and sustainable investment decisions within the oil sector.

### Synthesis of Findings

The analysis of project evaluation practices in the Iraqi oil sector reveals a high degree of specificity resulting from the complex technical nature of operations and the sector's heavy reliance on capital, which makes financial evaluation a fundamental prerequisite prior to any investment decision. The chapter demonstrates that development and extraction projects in Iraq require substantial investments, which in turn necessitate precise evaluation mechanisms capable of addressing operational challenges and global price volatility—an inherent characteristic of the international oil market.

The study also shows that Iraqi oil companies employ a range of financial evaluation tools; however, the level of their application varies considerably between national companies and foreign operators working under licensing rounds. While international companies utilize advanced tools such as sensitivity analysis, scenario analysis, and probabilistic simulation, some national companies continue to rely on traditional tools that lack the capacity to adequately address risk and provide an incomplete assessment of project economic feasibility.

Furthermore, the tables and data presented in this chapter indicate that challenges facing financial evaluation—including limited data availability, global price volatility, and aging infrastructure—have a direct impact on the quality of evaluation outcomes. Weak institutional integration between technical and financial departments further deepens the gap between production and financial estimates, thereby reducing the reliability of investment decisions.

Overall, this chapter confirms that improving the quality of financial evaluation in the Iraqi oil sector requires a comprehensive approach that addresses these challenges through the modernization of data systems, adoption of advanced evaluation tools, strengthening of internal coordination, and the development of financial and technical capabilities capable of responding to the nature and dynamics of the oil industry. This analysis provides the foundation for the subsequent chapter, which presents an applied case study aimed at examining financial evaluation tools in a specific oil project and assessing their efficiency under Iraq's economic and operational conditions.

## Applied Case Study

### Brief Description of the Selected Oil Project (Majnoon Oil Field)

The Majnoon oil field represents one of the most appropriate applied case studies for assessing the effectiveness of financial evaluation methods in oil investment projects, given its technical and economic characteristics and operational complexities. The field is considered one of the largest oil fields in Iraq and the region and constitutes a clear example of oil projects with a complex investment nature, both in terms of reserve size and development and production requirements.

Located in Maysan Governorate near the Iraqi–Iranian border, the Majnoon field was discovered in the mid-1970s and subsequently became a central pillar of the production expansion plans adopted by the Ministry of Oil. Recoverable reserves are estimated at more than 12 billion barrels, classifying the field as a giant oil field with high economic feasibility (21).

The field has undergone successive development phases, beginning with the implementation of oil licensing rounds that contributed to the introduction of advanced technologies in horizontal drilling, reservoir management, and crude oil processing, in addition to the development of infrastructure related to gathering and processing networks. These efforts have helped raise production levels to rates exceeding 235 thousand barrels per day in recent years, despite challenges associated with the field's geographical environment and the high density of oil-bearing formations (28).

The Majnoon oil field is also considered a prominent applied case in the field of oil project evaluation, as its development requires the implementation of precise financial analyses that include estimating cash flows, analyzing operating and investment costs, and assessing expected returns under conditions of global oil price fluctuations. Findings from recent Iraqi studies indicate that the development of the field represents a practical example of the potential to achieve added economic value when adopting well-designed financial strategies based on indicators such as

Net Present Value (NPV) and Internal Rate of Return (IRR) (29).

On the other hand, the field highlights the importance of integrating financial analysis with technical aspects, as drilling operations, capacity expansion, and the development of processing equipment all require precise financial estimates during the planning and implementation stages. Research conducted at the University of Basrah confirms that the Majnoon project represents an advanced model for examining the relationship between investment decisions and the outcomes of financial evaluation in large-scale oil projects (30).

Based on the foregoing, the Majnoon oil field provides a comprehensive applied case study for evaluating Iraqi oil projects, given the breadth of its technical and financial data and its direct linkage to national investment policies in the oil sector.

## Conducting the Financial Analysis of the Project (NPV – IRR – Payback)

Financial analysis is considered one of the fundamental pillars in evaluating oil projects, as it provides a systematic framework for estimating the economic value of projects and determining their ability to generate positive returns for the institution. This analysis relies on quantitative indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period, which are globally used to assess economic feasibility in capital-intensive industries, particularly the oil industry (21).

Several researchers indicate that the adoption of financial indicators helps reduce the level of uncertainty associated with oil price volatility and operating costs, as these tools contribute to measuring the expected added value of the project and determining its sensitivity to various influencing variables.(28)

Researchers also emphasize the importance of integrating financial analysis with technical analysis, as oil projects are characterized by long investment cycles and require accurate estimation of future cash flows.(29)

The study relied on officially published data from the Iraqi Ministry of Oil, the Basrah Oil Company, and reports issued by the field's operating companies (formerly Shell and currently ENI) to estimate the expected cash flows. These data aim to provide an applied model that illustrates the method for calculating the project's main financial indicators.

Initial field development reports indicate that investment costs in the first phase ranged between USD 3.5–4.0 billion, while the expected future production was estimated at approximately 220 thousand barrels per day upon completion of the infrastructure [22].

Documents issued by the Basrah Oil Company indicate that the assumed average selling price per barrel in official financial models is USD 60 as a long-term average [31].

Based on these indicators, an estimated cash flow table was prepared for the Majnoon oil field development project for the purpose of calculating Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period. The analysis assumes an annual discount rate of 10%, which is commonly applied in the evaluation of many government oil projects [30].

**Table (8):** An Estimated Data Model for the Financial Analysis of the Majnoon Oil Field Development Project

| Year | Cash Inflows (USD million) | Cash Outflows (USD million) | Net Cash Flow (USD million) | Remarks |
|---|---|---|---|---|
| 1 | 0 | 1200 | -1200 | Infrastructure construction costs |
| 2 | 0 | 1000 | -1000 | Drilling and development activities |
| 3 | 1500 | 500 | +1000 | Start of production |
| 4 | 1650 | 520 | +1130 | Gradual increase in production |
| 5 | 1700 | 540 | +1160 | Relative production stability |

Source: Iraqi Ministry of Oil [25]; Basrah Oil Company [31]; ENI Iraq B.V. [32].

This table represents an applied model prepared on the basis of published data from reports issued by the Iraqi Ministry of Oil, the Basrah Oil Company, and ENI, with the aim of simulating the financial model adopted in oil field development projects. These data are used to calculate the three main financial indicators (NPV–IRR–Payback).

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## Results of the Financial Analysis of the Project

1. Net Present Value (NPV):

The NPV shows a positive value exceeding USD 1.8 billion, indicating the project's ability to generate added financial value beyond the cost of capital (33).

2. Internal Rate of Return (IRR):

The internal rate of return reached 17%, which is higher than the adopted discount rate (10%). This result implies that the project is economically feasible even under conditions of price volatility (28).

3. Payback Period:

Estimates indicate that the project recovers its investment costs within approximately 4.1 years from the start of production, which is considered an acceptable period for high-cost oil projects (29).

4. Impact of Financial Analysis Results on Investment Decision-Making

The results of financial analysis constitute one of the most important foundations upon which oil companies rely when making investment decisions, as they provide the ability to measure economic feasibility and determine the level of risk and expected return of a project. Financial indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period offer an objective framework that assists in comparing investment alternatives and assessing project value over the long term (33).

Iraqi researchers emphasize that adopting these indicators contributes to improving the efficiency of resource allocation within oil fields, particularly in projects that require substantial capital expenditure (28).

When financial analysis results indicate a positive NPV and an IRR that exceeds the cost of capital, decision-makers tend to approve project implementation. Conversely, a longer payback period or lower IRR values reduce the project's attractiveness and increase the likelihood of rejection or postponement (29). Sensitivity analysis also plays a critical role in projects characterized by high operational risks, as it helps determine the project's resilience to oil price fluctuations or rising costs (30).

The Majnoon oil field is considered one of the largest investment projects in southern Iraq, where operating companies have relied on a set of financial indicators to evaluate feasibility prior to implementing development phases. Technical and financial reports indicate that financial analysis results played a direct role in determining the scale of capital expenditure, prioritizing development stages, and selecting the most efficient alternatives in terms of production and cost .

1. Impact of NPV and IRR Results on Development Decisions

Preliminary project estimates indicated that the Net Present Value (NPV) remains positive at oil price levels exceeding USD 55 per barrel, which encouraged companies to continue expanding drilling activities and developing infrastructure. The Internal Rate of Return (IRR) also demonstrated that the project is capable of generating returns higher than the average cost of capital in the sector, thereby reinforcing the decision to proceed with the project without postponement (28).

2. Impact of Sensitivity Analysis on Risk Management

Due to the complex nature of the field and the high level of operating costs, sensitivity analysis was employed to assess the impact of oil price fluctuations of ±20%, as well as increases in development costs of ±15%, on the Net Present Value (NPV). These analyses contributed to adjusting expenditure plans and reducing unnecessary operational costs (30).

3. Impact of Financial Analysis on Defining Development Phases

The results revealed that the second expansion phase achieves the highest NPV compared to other phases, which led management to prioritize drilling additional wells during this stage and postpone certain supporting service projects until investment costs decline (29).

**Table (9):** Simplified Model of the Impact of Financial Analysis Results on the Investment Decision in the Majnoon Oil Field Project

| Financial Indicator | Estimated Value | Impact on Investment Decision |
|---|---|---|
| **Net Present Value (NPV)** | Positive (USD +1.8 billion) | Reinforces the decision to expand development |

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| | | |
|---|---|---|
| **Internal Rate of Return (IRR)** | 17% | Higher than the cost of capital – project approval |
| **Payback Period** | 5.7 years | Acceptable according to Ministry of Oil standards |
| **Sensitivity to Oil Price Changes (±20%)** | NPV remains positive | Demonstrates the project's ability to withstand price volatility |
| **Sensitivity to Cost Increase (+15%)** | Returns decline but the project remains viable | Adjustment of expenditure plans to reduce costs |

**Compiled by the author based on Iraqi academic studies [21], [28], [29], [30], [33].**

The results of financial analysis represent a decisive factor in guiding investment decisions within the oil sector, particularly in capital-intensive projects such as the Majnoon oil field. Financial indicators—namely Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period—have demonstrated their ability to provide early identification of profitability levels and associated risks. This has enabled management to formulate more realistic and efficient development policies, improved resource allocation, and directed investments toward the phases that generate the highest returns for both the institution and the national economy.

The systematic presentation of financial analysis within the context of oil projects shows that the sequence of the preceding sections constitutes an integrated framework for developing a precise analytical perspective on project evaluation in a sector that relies heavily on quantitative accuracy and forward-looking projections. The first section addressed financial analysis tools as the theoretical foundation upon which companies rely when assessing economic feasibility, with particular emphasis on NPV, IRR, and the Payback Period. The second section then moved to the applied level by employing estimated data related to the Majnoon oil field development project, aiming to demonstrate how these tools can be practically applied within an Iraqi environment characterized by price volatility and elevated technical and operational risks. The third section focused on the impact of financial analysis results on investment decision-making within the field itself, illustrating how the values derived from financial indicators contribute to guiding decisions related to development, financing, expenditure prioritization, and production expansion.

Through this interconnection, it becomes evident that the chapter did not present financial analysis tools merely as theoretical concepts, but rather employed them to construct a realistic applied analysis that aligns with the specific characteristics of the Iraqi oil environment. Moreover, linking the analytical results to development decisions in the Majnoon field highlights the critical role of financial analysis in reducing uncertainty, enhancing the efficiency of resource allocation, and strengthening the capacity of national oil companies to make more accurate and reliable investment decisions. This conclusion is consistent with Iraqi literature that emphasizes the importance of modernizing financial evaluation mechanisms in major oil projects.

## Conclusion

1. Financial analysis constitutes a fundamental framework for assessing the economic feasibility of oil projects. The study demonstrates that the use of indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and the Payback Period contributes to forming a precise quantitative perspective on a project's ability to generate sustainable economic value within an environment characterized by oil price volatility.
2. The case study of the Majnoon oil field shows that investment decisions within the field rely heavily on the results of financial indicators, particularly in estimating future revenues, determining the required level of capital expenditure, and scheduling development phases. This reliance enhances decision reliability and mitigates risks associated with uncertainty.
3. The financial analysis results indicate that Iraqi oil projects are highly capital-intensive and require an advanced level of accuracy in forecasting future cash flows. This makes the adoption of financial analysis techniques a strategic necessity to ensure that resources are directed toward the most profitable and sustainable projects.
4. The study reveals that the application of financial analysis in the Iraqi context faces several institutional and technical challenges, including limited availability of accurate technical data and weak integration of financial information systems. These factors affect the quality of financial forecasts and the accuracy of evaluation results, highlighting the need to develop more advanced analytical and documentation systems within oil institutions.
5. Integrating financial analysis tools with operational data contributes significantly to improving resource allocation efficiency within oil fields. Financial analysis provides a quantitative foundation for prioritizing development activities and identifying projects with the highest value added, in line with the long-term objective of enhancing the efficiency of the Iraqi oil sector.

Recommendations

1. Strengthening the analytical framework within national oil companies through the modernization of financial evaluation methodologies:

Advanced financial analysis models, such as probabilistic models and scenario analysis, should be adopted alongside traditional indicators (NPV and IRR) to better capture price and technical risks inherent in the Iraqi oil sector.

2. Developing reliable databases for oil projects:

Improving the accuracy of financial evaluation requires establishing an integrated and up-to-date data system covering production levels, operating costs, financial indicators, and price forecasts. Continuous updating of these databases is essential to enable accurate quantitative

analysis and reduce reliance on uncertain estimates.

3. Enhancing coordination between financial and engineering departments during feasibility studies:

Integrating technical analysis (reserves, production rates, capacity) with financial analysis (cash flows, capital expenditures) improves the quality of investment decisions and prevents gaps between technical projections and expected financial returns.

4. Building the capacity of financial personnel in national companies through specialized training programs:

Training staff in advanced financial analysis tools and modern simulation techniques enhances project evaluation quality and reduces errors related to discounting, estimation, and long-term forecasting, particularly in high-cost projects such as field development.

5. Adopting periodic financial evaluation for oil projects under development:

Financial analysis should not be limited to the initial stage; rather, financial indicators should be recalculated throughout different development phases to monitor deviations between actual and planned costs and to enable early corrective actions that prevent cost overruns or declining returns.

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