

THE IMPORTANCE OF FINANCIAL DECISIONS IN PETROLEUM FIRMS

Mustafa Mohamed Aghedr¹ & Yavuz Demirel²

Research Scholar, Department of Management, Faculty of Economics Administration, Kastamonu University,
Kastamonu, Turkey

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ABSTRACT

It is a well-accepted truth that the only difference between success and a disaster is a good decision or a bad decision. Particularly, the decision making in the petroleum industry determine the direction and course of billions of dollars every year. The decision making in oil and gas industries ranges from very simple to the complex; as to whether to drill or not to drill. Moreover, the process of decision making goes from bidding for a lease, the development process of an asset, expansion of the capacity and relative timing, signing of contracts, decision of pursuing short-term or long-term contracts, and the priorities of the petroleum industry in terms of exploration and drilling opportunities.

KEYWORDS: *Decision Making, Exploration and Drilling Opportunities*

INTRODUCTION

In line with the argument, Robert S. Pindyck, a well-known economist stated:

“Despite its importance to economic growth and market structure, the investment behavior of firms, industries, and countries remains poorly understood. Economic models have had limited success in explaining and predicting changes in investment spending.” (Pindyck & Rubinfeld, 1991).

The argument is equally true even today, particularly, the “price foresight” in the process of decision making in the petroleum industry. Moreover, the problems of a similar nature can be analyzed through quick calculations, and on the other hand, complex decisions can take up to years of preparation. For example, the development of deep-water prospects is one of the major challenging dilemmas for petroleum companies; sometimes the development of subsea is best and sometimes tethered floating structure is perfect. This changing perception of decision analysis is also emphasized:

“decision theory has now evolved from the somewhat abstract mathematical discipline which when applied was used to help individual decision-makers arrive at optimal decisions, to a framework for thinking that enables different perspectives on a problem to be brought together with the result that new intuitions and higher level perspectives are generated.” (Goodwin and Wright, 1993, p4)

Characteristically, the companies in petroleum industry take up to 18 months in the decision process, starting from gathering information, analysis of the collected data, analysis of risk, and uncertainty and contingency planning—all this happens before selection of every production system. During the process, the importance of decision making is directly related to the expected profits, if a company can shorten the time of decision making then

it is expected to get more profits as:

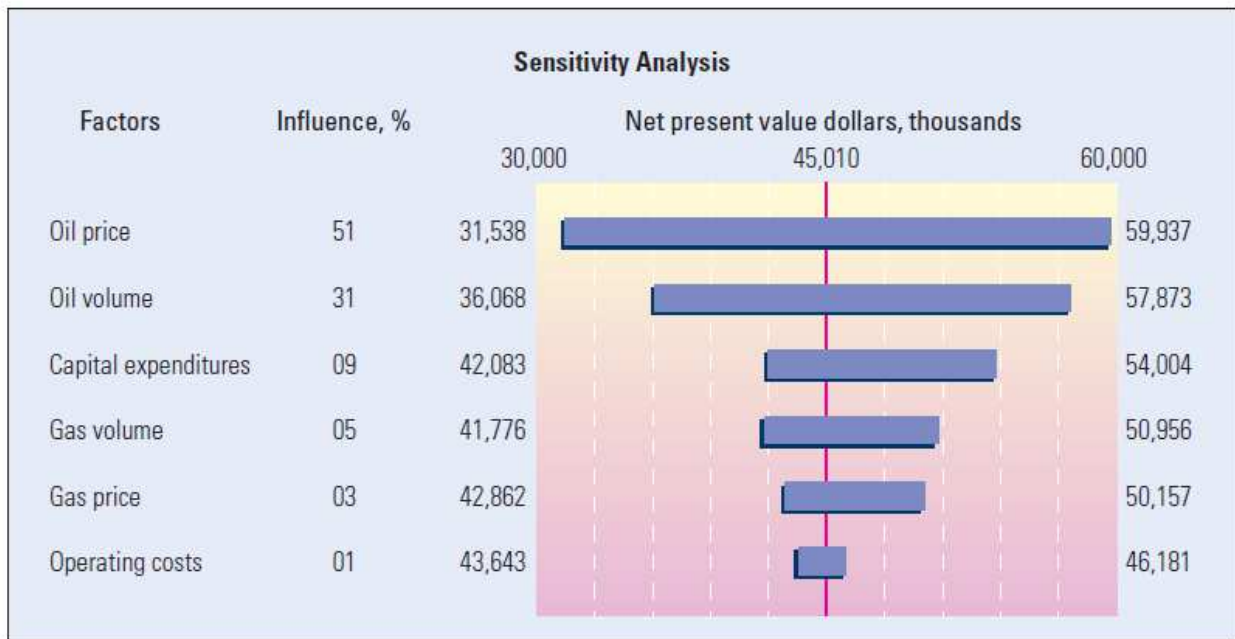
“Decision analysis will not solve problems, nor is it intended to do so. Its purpose is to produce insight and promote creativity to help decision-makers make better decisions.” (Goodwin and Wright, 1993 p4)

Referring to the decision theory and its evolution over time, the following exert is important:

“By this theory, we learn to appreciate precisely what a sound mind feels through a kind of intuition often without realizing it. The theory leaves nothing arbitrary in choosing opinions or in making decisions, and we can always select, with the help of this theory, the most advantageous choice on our own. It is a refreshing supplement to the ignorance and febleness of the human mind.

If we consider the analytic methods brought out by this theory, the truth of its basic principles, the fine and delicate logic called for in solving problems, the establishments of public utility that rest on this theory, and its extension in the past and future by its application to the most important problems of natural philosophy and moral science, and if we observe that even when dealing with things that cannot be subjected to this calculus, the theory gives the surest insight that can guide us in our judgment and teaches us to keep ourselves from the illusions that often mislead us, we will then realize that there is no other science that is more worthy of our meditation.” (Howard, 1988, p679)

For the purpose of decisions in the petroleum industry, there are several methods available to evaluate the uncertainty, risk reduction, and selection of the best possible way of doing things. Moreover, these methods include Net Present Value (NPV) calculations, discounted cash flow analysis, decision tree analysis, and preference theory (Mahoney, 1993). It is pertinent to mention here that most of the elementary situations are solved through the basic information computations, and the more complex cases involve greater information from multiple sources and disciplines, and evaluate from several aspects and choose the most appropriate project.



^ Tornado plot showing factors that most influence a decision. Of the six factors selected for analysis, oil price and oil volume have the highest range in net present value (NPV), making the outcome most sensitive to those factors.

Figure 1

The Petroleum Industry

Before going into the detail of the industry, it is necessary to mention here that this report considers the oil and gas industry as a petroleum industry. The most common characteristic of the petroleum companies is their heterogeneity, and the sizes of the companies vary from large companies such as Exxon-Mobil and Royal Dutch Shell to the small companies involved in exploration and energy. Interestingly, the challenges of these companies are the same across the industry, particularly, the financial considerations. However, despite the common challenge of finance, these companies also face specific challenges of location and sector of the industry. For example, Shell deals with financial considerations on a daily basis on a global scale, however, Cairn Energy deals with international financial challenges because of its focus on the regional geography.

Furthermore, national level companies face a different level of challenges, and on the other hand companies, that deals in the specific sector like Centrica which is integrated to Exxon, and produce and sells gas. Therefore, the examination of the supply chain of the petroleum industry is important to examine the clear picture of differences between companies (Hu & Zeng, 2013).

The explanation of the segregation the industry operations may not be accurate from the engineering point of view, but these differences are perfectly relevant to from the business perspective and decision making of finances. The below-given description in the picture tries to segregate the industry into components of business activities:

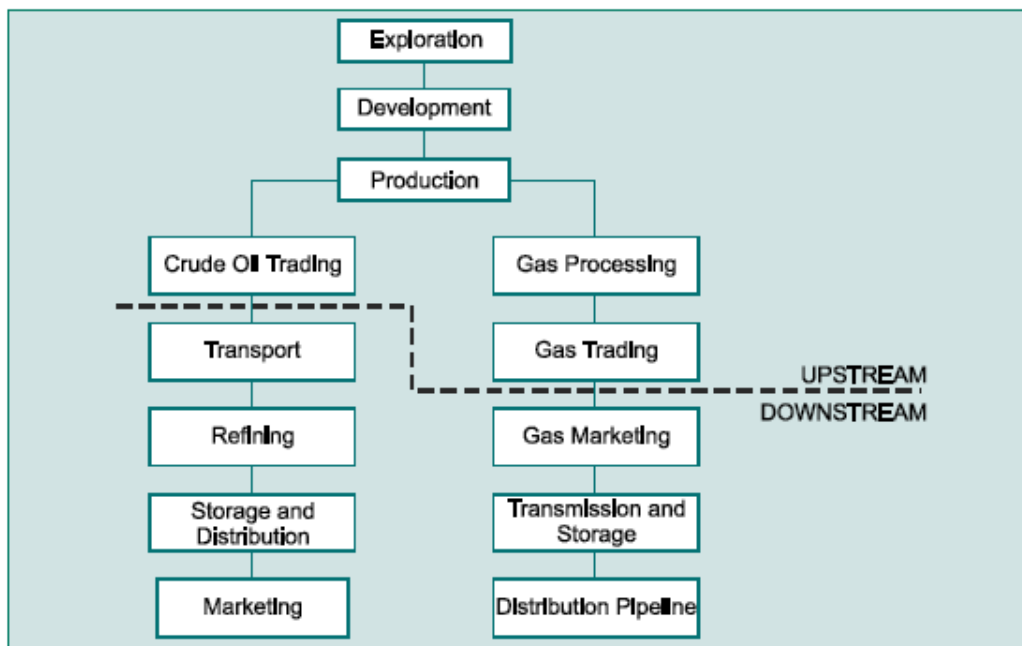


Figure 2: The Oil and Gas Industry Supply Chain

The Upstream Industry

The petroleum industry can be divided into two sections, the upstream and downstream. Moreover, the “midstream” industry refers to some oil and gas companies that involve storing and transporting (Fisher, 2015). This section discusses the sections of the upstream supply chain in terms of financial management:

- **Exploration:** the activity of exploration involves the highest risk of investment and considered speculative. Moreover, the companies that solely involve in the rendering services to other companies for services face a high degree of commodity price risk and the downturn in the price of oil and gas, particularly the cyclical downturn, severely affect the level of activity and the research and development level in the petroleum industry.
- **Development:** the development of the new oil and gas filed requires greater upfront investment and directly affected by the high commodity price risk. For example, if the company has started to develop a new filed with the financial appraisal of \$70 per barrel, and the price falls to \$50 per barrel and stayed at this new level over the life span of the project, then the particular investment will not have positive Net Present Value (NPV). This situation raises several questions such as: Does Company has any type of hedging against price? Did they have contracted to lock the price of the project? Or do the company is open to the prices? Thus, the sensitivity analysis and the correct appraisals of the project are very important in such situations.
- **Production:** this stage involves the actually get the oil out of the ground and there are several points needs to be considered which are very important; should the company will carry on the production based on the secondary recovery technology? Should the company carry on the production? Or should the company abandon the project? Does it valuable to abandon the project or does it valuable to continue the project? All these questions are very important and must be answered with the appropriate financial tools (Adner & Helfat, 2003). Therefore, at this stage, the supply chain of the petroleum industry split into oil and natural gas.

- **Crude Trading:** crude trading involves the trading of crude oil on the commodity exchange of the world. This is the stage where the entire struggle is converted into cash. It is very important to understand that this stage must be handled with the appropriate working knowledge of the derivatives products.
- As with the given details of the upstream industry segments, it is very clear that the upstream industry segments are more risky than the downstream industry segments, and these are subject to the greater risk of commodity prices at all levels. The reason behind this situation and the question: why it is so? The answer is obvious that upstream segments involved in the production of the raw materials, and this part of the supply chain is depended on the revenue generation involving the operating activities.

Furthermore, there is one more factor which is not explicitly a financial consideration but directly impact the financial decision making in the petroleum industry, particularly, the upstream activities. The factor is the location of the company's headquarters which are usually located far from these activities and falls in the politically risky locations. Therefore, this also poses a great risk and pushes the effective risk management activities of the petroleum industry. Moreover, the decisions of the upstream activities of the industry directly affect the financing and the dividend policy of the company (Hu & Zeng, 2013).

The Downstream Industry

As it has been described in the above section that the upstream industry is distinguished from the downstream industry, this section will provide the details of how the downstream industry is different from the upstream industry in terms of financial decisions. It is also important to mention here that the downstream industry is usually divided into distinct parts of oil chains and the gas chains, and for the purpose of this report, we only discuss the oil chain in the perspective of finance (Fisher, 2015).

Oil

The activities in this section take the crude oil from the upstream industry activities and convert it to the marketable products. These products are finally sold to customers such as industries, businesses, and retail customers through several channels.

- **Transport:** as the name suggests, the transportation involves different methods of the operations. The most common ways of transporting oil are through the pipelines and ships, and the financial aspects of these activities depend on the type of the transportation system used. Moreover, there are other ways of transporting the oil such as through tankers, and tankers are the most vulnerable to the risk of a reputation as if the oil spoils then it will have immediate effects on the local environment. Moreover, the decision to transport oil through tankers is a huge investment in terms of the development of the 32000 DWT vessel to carry the oil, and it involves critical decision to invest such a huge amount of money on the development of the vessel. Furthermore, the risk of the commodity price is high in the tanker market as the rates in the shipping market vary with the season, and these carry the cyclical risk of crude oil price.

- Refining: it is involved in the mass production embedded in a very complex engineering process. The price of the refinery output is directly influenced by the input price of the refinery and crude oil. These prices are very uncertain in the oil market, for example, in 2007 the price of the oil was \$45, and in 2008, the price of oil was \$108 per barrel and went to \$147. Moreover, the margins are also seasonal and subject to the changing prices of oil prices.
- Storage and Distribution: this section involves the storage and distribution activities and the companies have to consider the cost of holding supplies. The storage and distribution activities are not revenue generating but involve import financial considerations. The financial considerations involve the decision of buying the fleet of oil tankers or renting the oil tankers and the decisions related to the storage facilities. Therefore, the proper management of working capital is also very important.
- Marketing: probably, the last step in the oil chain decisions is the marketing of the refined petroleum products to the end customers. The most important financial decisions that must be made at this point are the investment appraisal, lease vs. buying decisions of the sites, and the expansion of the markets. Moreover, the decisions of the customers in the chain have diverse decision-making mechanisms, and the aspects of the market must be considered in strategic planning in the petroleum industry.

After explaining the downstream oil segments, it is clear that the downstream oil industry is less risky compared to the upstream oil industry in terms of financial decision making. Moreover, the most crucial decisions of dividend policy and financing involve several different considerations in the upstream industry.

Financial Decision Making in the Oil Industry

The major financial decisions in the oil industry can be divided into three main areas, and these financial decisions are equally important for all types of firms, whether shape or size. The three main areas of decision making are elaborated as:

The Investment Decision

The investment decision involves the assessment of how much money to invest? What to invest? This is the most crucial and difficult decision as it involves major investments, and there is a greater risk in the oil industry. Moreover, these decisions take years of work in collecting data, analysis of the data, and evaluation of the prospect projects. Moreover, the investment decisions are more difficult in the upstream industry as it involves greater investments with greater risk of the investment compared to the downstream industry. The cash flows are more risky in the upstream industry, and therefore, the correct data collection, analysis, and the sensitivity analysis with sound capital rationing, complied with the appropriate appraisal technique are imperative (Fisher, 2015).

The Financing Decision

The financial decision involves fetching cash and the sources of the cash are very important to decide. As far as the companies concerned, they have three options: retained earnings, capital markets, and equity selling. There are several factors that affect the choice of these methods, but the managers of the oil companies must be fully aware and conversant in the capital structure theory and the advantages and disadvantages of each type of financing option. For example, the big companies usually have little debt level in their balance sheets, and in this situation how the managers

of these companies decide on the financing options (Adner & Helfat, 2013).

The Payout Decision

The payout decision is related to the return of cash to shareholders/dividends, and how much the company will give in dividends. This decision is directly related to the previous decisions of investment and the source of the funds for those investments. It is very much possible that company go for the excess cash to fund a new project in the petroleum industry and pay little to the shareholders in terms of dividends. Moreover, the shareholders of the company may show happiness over the decision to invest in the new project because it will provide them an opportunity to get even better returns in the future. The most important factor to mention here is that it is the responsibility of the managers of the oil industry to know about the available options of the funds, and the payout policy of the firm, and how these decisions affect the shareholder's wealth (Adner & Helfat, 2013).

These are the decisions that companies have to make in the oil industry, and there is no exception in the chain of activities and sector of their operations. A good working knowledge of the financial concepts related to the decision-making process, therefore, is very significant to the managers of the oil industry.

REFERENCES

1. Adner, R., & Helfat, C. E. (2003). *Corporate effects and dynamic managerial capabilities*. *Strategic Management Journal*, 24(10), 1011-1025.
2. Fisher, F. M. (2015). *Supply and Costs in the US Petroleum Industry (Routledge Revivals): Two Econometric Studies*: Routledge.
3. Goodwin, P., & Wright, G. (1993). *Improving judgmental time series forecasting: A review of the guidance provided by research*. *International Journal of Forecasting*, 9(2), 147-161.
4. Howard, R. A. (1988). *Decision analysis: practice and promise*. *Management science*, 34(6), 679-695.
5. Hu, G, Li, J., & Zeng, G. (2013). *Recent development in the treatment of oily sludge from petroleum industry: a review*. *Journal of hazardous materials*, 261, 470-490.
6. Mahoney, J. T. (1992). *The choice of organizational form: vertical financial ownership versus other methods of vertical integration*. *Strategic Management Journal*, 13(8), 559-584.
7. Pindyck, R. S., & Rubinfeld, D. L. (1991). *Econometric models*. *Economic Forecasts*, 3.

