

DETERMINANTS OF PETROLEUM EXPLORATION IN KENYA**Stephen Wambugu**

Masters Students, Jomo Kenyatta University of Agriculture and Technology, Kenya

Dr. Makori Moronge

Lecturer, Jomo Kenyatta University of Agriculture and Technology, Kenya

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ABSTRACT

The decision to invest in petroleum exploration was driven by an assessment of the opportunities, the likely rewards and the risks involved. Assessing potential oil exploration investments is a complex process and it is one of the important steps that influence the success of the investments. In Kenya, the commercial discovery of hydrocarbon resources will have a profound impact on the domestic economy, particularly in addressing the trade imbalance, which the country has continued to experience over the last three decades. Despite the fact that many efforts and procedures have been laid down to enhance discovery and exploration of energy resources as laid down in the millennium development goals, the exploration prospects in the energy resources and particularly the petroleum has stagnated in many developing countries. This study is of great importance to the management of oil firms involved in petroleum exploration as well as the government of Kenya. The study has highlighted other important relationships that require further research to benefit the scholars and academicians. This study was designed to provide an analysis of the determinants and issues underlying the petroleum exploration in Kenya where the context of focus was the oil exploration firms in Kenya.

Key Words: *petroleum exploration, Kenya*

Introduction

The petroleum industry began over five thousand years ago. In the Middle East, petroleum seeping up through the ground was used in waterproofing boats and baskets, in paints, lighting and even for medication (Bede, 2006). In sub – Saharan Africa, petroleum products represents approximately 60% of all energy produced, with fuel wood still dominating the primary energy balance. High oil prices affect the rural poor in the region directly because about 70 percent of Sub-Saharan Africans do not yet have access to electricity (Favero & Pesaran, 1994), and, as noted above, most households use kerosene for lighting.

The importance of fuel prices is clearly reflected in their weight as a major source of revenue for the government. The Government taxes about 25% - 30% of the cost of petroleum products consumed in Kenya. This therefore makes the products more expensive. Petroleum products represent the most important energy source in Kenya (KNBS, 2011). Demand for petroleum in Kenya is quite small in global standards but the highest in East Africa making it a Key Market in the region for Petroleum Products.

The domestic demand for various petroleum fuels on average stands at 2.5 million tons per year, all of it imported from the Gulf region, either as crude petroleum for processing at the Kenya Petroleum Refineries Limited or as refined petroleum products (ERC Report, 2012).

The decision to invest in petroleum exploration is driven by an assessment of the opportunities, the likely rewards and the risks involved. For a petroleum company, assessing potential oil exploration investments is a complex process and it is one of the important steps that influence the success of the investments. The success of the oil and gas exploration investments will ultimately influence performance of the petroleum company. Investment decisions on oil and gas exploration demand thorough analysis of the economic and non-economic feasibility of embarking on such projects. According to Hailey et al., (1992) the importance of decision-making in oil exploration places a greater demand on decision-makers and the tools employed in their decision-making. Health and the ultimate survival among the firms within the industry require that the decision-making processes utilized match the global competitive pressure being placed upon the industry.

Statement of the Problem

Petroleum is Kenya's major source of commercial energy and has, over the years, accounted for about 80% of the country's commercial energy requirements (ROK, 2011). The oil industry contributes over 20% of the GNP (KNBS, 2012); the transport sector is the largest consumer of petroleum products at approximately 60% of the total volume followed by manufacturing 16% commercial establishment (11%) household use (9%) and agriculture (4%) (ROK, 2011).

Firms exploring petroleum must have competitive price to be able to compete in the international market. This calls for production costs to be as low as possible. On 26 March 2012, Tullow Oil discovered that Ngamia-1 had in excess of 20 metres of net oil pay. The well has now been deepened from 1,041 metres to 1,515 metres. Spending on exploration and drilling is estimated at US\$126-million. Although Tullow was taking a US\$671m write-down due to unsuccessful drilling, investors were pleased by encouraging flow test results at the group's Twiga South well in Kenya. The Royal Dutch Shell agreed to buy in cash-money the exploration interests of London based Cove Energy Plc, East Africa for USD 1.8 billion. Canadian explorer Taipan Resources raised \$3.1 million from a private placement to fund its operations in northern Kenya, joining a list of oil firms fundraising for crude oil and natural gas exploration activities. To make exploration feasible, the country would need at least 30,000 engineers. However, this is a real

challenge and poses a hurdle in achieving the Vision 2030. Towards this end, Kenya secured a Sh2.5 billion loan from the African Development Bank (AfDB) to help train more engineers.

The position on the current Legal Framework is that the Energy Bill would establish a sharing regime for petroleum revenues, with 80% accruing to the national government, 15% to the relevant county government, and 5% to the relevant local community (Energy Bill). A recent World Bank Report-2013 has compared the drilling costs in India and Kenya. While it costs between Ksh 5-8 billion to drill an oilwell in India, it close to Ksh 58 billion to drill the well at Ngamia in Lokichar.

A new Oil and Gas firm, Camac will invest Ksh 3 billion to explore four blocks in the Lamu basin. The opening of the company's offices in Kenya is a commitment in implementing the minimum work and obligations as stipulated in its four production sharing contract. Delonex Energy: a UK based firm, announced it had secured \$600 million from a private equity firm to finance oil and gas exploration in Kenya and the Region. The energy ministry is expected to gazette up to nine new oil blocks which will rise to above 50 from the current 46

It is however worth noting that as reserves are found and extracted over time, it becomes more difficult and more expensive to replace those reserves. Consequently, firms will try to find and produce the least costly and most profitable reserves first, and are likely to find the largest deposits first even by accident. Yet, to the best of the researcher's knowledge, there has not been sufficient studies to analyze the determinants of petroleum exploration in developing countries like Kenya hence the research gap. This study is designed to provide an analysis of the determinants and issues underlying the petroleum exploration in Kenya where the context of focus will be the oil exploration firms in Kenya.

Objectives of the Study

1. To analyze the success legislation on petroleum exploration in Kenya
2. To establish how investment funds influences petroleum exploration in Kenya
3. To establish how the staff competence affects petroleum exploration in Kenya
4. To investigate the influence of exploration blocks on petroleum exploration in Kenya.

Literature Review

.A theoretical framework is a collection of interrelated concepts, like a theory but not necessarily so well worked-out. Theoretical frameworks are obviously critical in deductive, theory-testing sorts of studies. A theoretical framework is used by scientists when performing research studies to formulate a theory. The theoretical framework is a foundation for the parameters, or boundaries, of a study. Once these themes are established, studies can seek answers to the topical questions they have developed on broad subjects. This study on the determinants of petroleum exploration is grounded on Agency Theory, Pecking Order Theory, Theory X and Theory Y and Social Network Theory.

Agency Theory

Agency theory is concerned with resolving two problems that can occur in agency relationships. The first is the prospect of conflict between the desires or goals of the principal and the desires or goals of the agent (Eisenhardt, 1989). Proponents of agency theory assume that each party acts in its own self-interest. This assumption gives rise to the so-called agency problem because the interests of the principal and agent may conflict. The agent may avoid fulfilling obligations or engage in self-serving behaviors, such as using work time and organizational resources for personal gains. The more autonomy and independence the agent enjoys and the greater the specialized knowledge required in performing the task, the more significant this “moral hazard” becomes (Holmstrom, 1979). According to agency theory, an agency relationship is in effect whenever one party, a principal, hires another person, an agent, who possesses specialized knowledge and skills (Eisenhardt, 1989).

The theory's main assumption is that human beings by nature are selfish, thus agents and principals will most probably have differences in interests and attitudes towards risk, leading to divergent decision-making preferences (Eisenhardt, 1989). To reduce the moral hazard inherent in agency relationships, principals develop mechanisms, or “rules of the game,” to monitor agents' actions and reward agents when they act in accordance with the principals' objectives (Jensen, 1983). When an agent has high autonomy, independence, and highly specialized knowledge, monitoring becomes challenging and expensive, leaving the principals to rely on incentives in order to reward agents for appropriate outcomes (Tosi & Gomez-Mejia, 1994). Lack of proper and accurate information flow from the agent makes it difficult for the principal to design and implement a contract that spells out how the agent should behave under various circumstances, making it impossible for the principal to ensure that the agent takes appropriate decisions.

This imbalance in the distribution of information between principals and agents is referred to as information asymmetry (Rutherford & Buchholtz, 2007). Hendry (2005) refers to adverse selection as the risk of selecting incompetent employees. Eisenhardt (1989) advocates monitoring the actions of agents and/or deploying incentive mechanisms, often in the form of outcome-based compensation, in order to overcome those problems. Thus, moral obligation in general comes from the idea of duty, the idea that a person may rightly be compelled to do something. This leads to the first specific objective: To assess the influence of legislation on petroleum exploration in Kenya.

Pecking Order Theory

Pecking order theory (or pecking order model) postulates that the cost of financing increases with asymmetric information. Financing comes from three sources, internal funds, debt and new equity. Companies prioritize their sources of financing, first preferring internal financing, and then debt, lastly raising equity as a “last resort”. Hence: internal financing is used first; when that is depleted, then debt is issued; and when it is no longer sensible to issue any more debt, equity is issued. This theory maintains that businesses adhere to a hierarchy of financing sources and

prefer internal financing when available, and debt is preferred over equity if external financing is required (equity would mean issuing shares which meant 'bringing external ownership' into the company). Thus, the form of debt a firm chooses can act as a signal of its need for external finance. The pecking order theory is popularized by Myers and Majluf (1984) when he argues that equity is a less preferred means to raise capital because when managers (who are assumed to know better about true condition of the firm than investors) issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this overvaluation. As a result, investors will place a lower value to the new equity issuance. When it comes to financing the operation, the business is likely to make use of its internal resources first, such as using funds in a savings or other interest bearing account to manage operational costs or to order more stock or raw materials for use in the operation. When this first line of financing is exhausted or not available for some reason, the business will then turn to lenders or investors as a means of generating the funds needed to keep the company going.

Business owners may tend to weigh all available options and then choose the one that is most likely to produce the result that will be in the best interests of the company over the long-term, rather than simply going with what appears to be the easiest solution at present. In general, each of the available funding methods imposes explicit and/or implicit costs on the firm. The theory of investment places emphasis on the importance of interest rates in investment decisions. A firm will only invest if the discounted yield exceeds the cost of the project. This theory therefore is relevant in investigating the second specific objective of the study: To find out how investment funds influences petroleum exploration in Kenya.

Theory X Theory Y

Theory X and Theory Y are theories of human motivation created and developed by Douglas McGregor at the MIT Sloan School of Management in the 1960s. They have been used in human resource management, organizational behavior, organizational communication and organizational development. They describe two contrasting models of workforce motivation. Theory X and Theory Y have to do with the perceptions managers hold on their employees, not the way they generally behave (Sahin, 2012). It is attitude not attributes. For McGregor, Theory X and Y are not different ends of the same continuum. Rather they are two different continua in themselves. McGregor had identified theory X and theory Y differently for the basic characteristics stated previously in the above sections of what these theories represent. *Theory X* assumptions are that these individuals dislike their careers. Theory X people have to be supervised. As for *Theory Y* assumptions are individuals like their careers and are willing to take part in responsibility. Theory Y people don't need supervision and can be expected to turn good productive value in their jobs.

Based on employees we take a closer look at the relationship between supervisors and “subordinates as some may call them or workers” (Sahin, 2012). The quality of the relationship between the two can be described by Sahin as a term called leader-member exchange (LMX) theory. What LMX theory basically points out against McGregor theory is that “leaders develop

unique relationships with different subordinates and that the quality of these relationships is a determinant of how each subordinate will be treated” (Sahin, 2012). With these two theories combined Sahin studies have shown that affective commitment can help the individual and the organization at the same time. In addition, workers (subordinates) develop feelings of affective commitment if they receive the importance from supervisors not just by overlooking them all the time but by also giving them importance (Sahin, 2012). In addition, look at external link for image that explains the function of the theory.

McGregor identified individuals based on two theories they can possibly have, theory X, or theory Y. But Sahin shows a different approach through his study of the LMX theory. He shows how different styles used upon by management can vary from both theories. When managers apply Theory Y principles, workers receive independence and responsibility for work. They receive opportunities to recognize problems and their job will be to find solutions to them. This results to high-quality relationships (Sahin, 2012, p.163). In contrast, theory X managers highlight the close supervision of workers and the chain of command and motivate subordinates using extrinsic rewards. Therefore, workers who are overseen by theory X managers tend not to have the most beneficial relationship with their supervisor. They maintain a distance and impersonal and low-quality exchange relationships (Sahin, 2012, p. 163). A competency has some components which are visible like knowledge and skills but other behavioural components like attitude, traits, thinking styles, self-image, organizational fit etc are hidden or are beneath the surface whose effects on the success of the exploration exercise is immense. This theory is therefore significant in the third objective of the study which is to establish the influence of staff competence on petroleum exploration in Kenya.

Social Network Theory

According to Scott (2000) social network theory views social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes. In its most simple form, a social network is a map of all of the relevant ties between the nodes being studied. The network can also be used to determine the social capital of individual actors. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines. The power of social network theory stems from its difference from traditional sociological studies, which assume that it is the attributes of individual actors -- whether they are friendly or unfriendly, smart or dumb, etc. -- that matter.

Research Methodology

The target population composed of all the staff employed at oil firms involved in the exploration of petroleum in Kenya in the Head offices in Kenya. Stratified random sampling technique was used to select the sample. This generated a sample of 42 respondents which the study sought information from. This makes it easier to get adequate and accurate information necessary for the research. Quantitative data collected were analyzed by the use of descriptive statistics using

SPSS and presented through percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs and pie charts and in prose-form.

Research Results

This study found that legislation affects exploration of petroleum among petroleum firms in Kenya to a moderate extent according to 57.6% of the respondents. The study further reckoned that disputes and agreements affect the exploration of petroleum in Kenya to great extents whereas licensing and legal frameworks affect the exploration of petroleum in Kenya to moderate extents. There was agreement that regulation of exploration and production of petroleum is based on the fact that all the natural resources, including petroleum, existing in their natural state, are vested in the Government, there is need to review the model contract to provide for more legal certainty as well as guarantee optimum exploration of the oil resources in country; the government's interest in regulating petroleum exploration is substantial and corresponds with a need to promote the vitality of the environment by protecting it from toxic substances; the strategy for success in attracting oil exploration companies is anchored on ensuring flexibility of the production-sharing model contract embedded in the Petroleum (Exploration and Production) Act and that exploration and production of petroleum poses great challenges for the state, investors local communities however the laws, policies and institutions do not adequately address the social, economic and environmental challenges facing the investor, the local community and the government and that there is need for legal and policy reforms on how the government relates with local and foreign investors especially in sectors requiring large capital outlay like petroleum exploration and production.

The study also established that investment funds affect the exploration of petroleum among petroleum firms in Kenya to a moderate extent (as indicated by 45.5% of the respondents). It was made clear that infrastructure and availability of funds affect the exploration of petroleum among petroleum firms in Kenya to great extents, while pipeline and refinery affect the exploration of petroleum among petroleum firms in Kenya to moderate extents. The respondents agreed that investment decisions on oil and gas exploration demand thorough analysis of the economic and non-economic feasibility of embarking on such projects and that assessing potential oil and gas exploration investments is a complex process and it is one of the important steps that influence the success of the investments.

The study further found that staff competency affects the exploration of petroleum among petroleum firms in Kenya to a great extent as indicated by 51.5% of the respondents. Majority of the respondents indicated that technological savvy, technical competencies and social competencies affect the exploration of petroleum among petroleum firms in Kenya to great extents, while intrapersonal competencies, knowledge management competencies, level of skills/knowledge, business competencies, leadership and supervisory competencies and training and development affect the exploration of petroleum among petroleum firms in Kenya to moderate extents. The study established that staff competence is used to redirect resources from exploration activities to greater focus in serving the customer and to have greater thrust on

market positioning to great extents. In addition, staff competence is applied to achieve greater focus on core business affect the exploration of petroleum among petroleum firms in Kenya to a moderate extent.

On exploration blocks, 39% of the respondents indicated that exploration blocks affect the exploration of petroleum among petroleum firms in Kenya to a great extent. In this regard, number of exploration blocks, market contribution and market/customer base affect the exploration of petroleum among petroleum firms in Kenya to great extents, while corporate governance, work force and target market affect the exploration of petroleum among petroleum firms in Kenya to moderate extents.

Conclusions

The study concludes that legislation issues surrounding the petroleum exploration affects the exercise among the petroleum firms involved in the exploration in Kenya. From the study, the focus of legislation and government policies are firmly focused on improvements in the microeconomics of the exploration of petroleum. As such, disputes, agreements, licensing and legal frameworks affect the exploration of petroleum in Kenya. On the same, regulations of natural resources and government stake on the exploration have an influence on the exploration of oil in Kenya. In addition, the exploration and production of petroleum poses great challenges for the state, investors and local communities as well as government relation with local and foreign investors' petroleum exploration and production.

The study also concludes that investment funds affect the exploration of petroleum among petroleum firms in Kenya. In regard to this, infrastructure, availability of funds, pipeline and refinery affect the exploration of petroleum among petroleum firms in Kenya. Accordingly, investment decisions on oil and gas exploration demand thorough analysis of the economic and non-economic feasibility of embarking on such projects and that assessing potential oil and gas exploration investments is a complex process and it is one of the important steps that influence the success of the investments.

The study deduces that staff competency also affects the exploration of petroleum among petroleum firms in Kenya. As such, technological savvy, technical competencies, social competencies, intrapersonal competencies, knowledge management competencies, level of skills/knowledge, business competencies, leadership and supervisory competencies and training and development affect the exploration of petroleum among petroleum firms in Kenya. The study confirms that staff competence is used to redirect resources from exploration activities to greater focus in serving the customer and to have greater thrust on market positioning and staff competence is applied to achieve greater focus on core business affect the exploration of petroleum among petroleum firms in Kenya.

The study finally concludes that exploration blocks affect the exploration of petroleum among petroleum firms in Kenya. From the findings, the number of exploration blocks, market contribution, market/customer base, corporate governance, work force and target market affect the exploration of petroleum among petroleum firms in Kenya.

Recommendations

From the foregoing, the study recommends that there is need to review the model contract to provide for more legal certainty as well as guarantee optimum exploration of the oil resources in country; the government's interest in regulating petroleum exploration is substantial and corresponds with a need to promote the vitality of the environment by protecting it from toxic substances; the strategy for success in attracting oil exploration companies is anchored on ensuring flexibility of the production-sharing model contract embedded in the Petroleum (Exploration and Production) Act.

The study also recommends that since investment funds affect the exploration of petroleum among petroleum firms, there is need to recast the financing strategies for enhancing the exploration of petroleum in Kenya. This would involve ensuring that there is proper refining and pipeline infrastructures as well as enough funds to facilitate the exploration. This in turn would increase efficient investment decisions to meet the demand for economically feasible and viable exploration process.

The study further recommends that, for the organizations to realize full benefits in the exploration of petroleum, the oil firms should employ exploration staffs who have attained professional qualifications in regard to technological advancements, technical competencies, social competencies, intrapersonal competencies, knowledge management competencies, level of skills/knowledge, business competencies, leadership and supervisory competencies. Workshops, seminars or short courses need to be offered to the staffs so as improve their knowledge and skills which will in turn enhance exploration efficiency frequently. The organizations further needs to undertake regular training for exploration department staff to enable them update their skills and knowledge. In addition, staff competence would help to redirect resources from exploration activities to greater focus in serving the customer and to have greater thrust on market positioning and staff competence is applied to achieve greater focus on core business affect the exploration of petroleum among petroleum firms.

The study also recommends that there is need to address the aspects of exploration blocks to support and appreciate the expansion process. The petroleum firms involved in exploration in Kenya should consider implementing expansion strategies upon confirmation that the market/customer base, governance, funding, work force as well as skills and knowledge are in abundance to enhance the expansion. At this point, it would also be important to address the expansion process as well as equipping the staff with the relevant skills and knowledge to enhance successful expansion. This would go a long way in ensuring that the number of exploration blocks, market contribution, market/customer base, corporate governance, work force and target market are sustainable and significant in ensuring successful exploration of petroleum among petroleum firms in Kenya.

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