Enterprise Risk Management in the Oil and Gas Industry: (Evidence from World and Iran as a Developing oil-export based Economy)

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ABSTRACT: In this paper I attempt analyze key concepts about risk management, oil and gas industry and how risk management effect on petroleum industry. First, Expensive equipment items like drilling rigs, offshore platforms, oil tankers, refineries, pipelines, petroleum depots and transport equipment are critical to this industry. The petroleum supply chain appears as a significant risk and high impact industry at the micro and macroeconomic level. Although, risk management bears prime importance for this industry, there is notorious absence of quantitative modeling. So, Risk management refers to an interactive process consisting of steps, which when undertaken in sequence, enable continual improvement in decision making. The aim of risk management is to obtain understanding by all parties and agreement around what the risks really are and how they will be managed to improve performance, increase the value of firms and reduce financial distress. In other hand, Iran’s oil and gas sector remains critical to the country’s economic prospects. Its future depends not only on whether, and how quickly, sanctions are removed, but also on the terms that Iran is prepared to offer to the international oil companies. So, Iran has struggled to attract investors.

Key Words: Risk management; Oil and gas industry in world, oil and gas industry in Iran.

INTRODUCTION

Traditional Risk Management

Traditionally, risk management fell within corporate accounting or financial departments and only indirectly required input from corporate counsel. The days of delegating risk management to an outside broker or to the financial department are numbered as today’s risk management involves complex legal concepts, cuts across corporate departments, traditional risk management tools are adequate for routine risks such as labor, fire, fleet coverage (auto), and flooding. Because these risks are widespread and numerous, insurance brokers and insurers are able to capably predict what coverage will be appropriate given the risk. Black swan events are different. In most companies, this function historically has been largely the domain of the CFO and finance – based on the notion that most risk is financial and can be mitigated through controls. In certain industries, such as banking, financial markets and insurance, trading risk is the actual business, so the enterprise is focused on creating, selling, managing and servicing risk. But even in these companies, many lack a full appreciation for the broader scope of ERM that extends beyond their functional domain or the business they are in. Prior to ERM, traditional risk management addressed risk in organizational silos (e.g. health and safety, insurance, internal audit) from a threat perspective. Driven primarily by increasing regulations and compliance requirements, additional functions, departments and business areas were created to manage the risks associated with compliance obligations. With this increase in risk oversight came fragmented risk and control activities, resulting in increased demands on the business, and “risk fatigue” as business units were asked for the same or similar information from different departments for different purposes. Understanding and defining a clear organization wide risk picture became close to impossible, with duplication of effort and potential gaps in risk coverage. The resulting struggle of executives and boards to determine the adequacy of risk and control efforts led to the birth of ERM.

Risk overview

Dragon Oil’s business is potentially exposed to different risks, oil & gas industry-specific risks as well as business-specific risks. However, some business risks can be accepted by the Group provided that acceptance of such risks creates value and that the risks are properly managed. We recognize that the effective management of the business risks is crucial to our continued growth and success. In 2012, we adopted an Enterprise Risk Management (ERM) framework. ERM consists of policies, procedures and the
Group’s organizational structure with clear roles, responsibilities and accountabilities aimed at risk identification, risk assessment, risk treatment and risk monitoring and reporting.

**The key objectives of the group’s ERM are:**

To ensure that the significant business risks to which Dragon Oil is exposed are systematically identified, assessed and managed to acceptable levels based on risk tolerance and appetite levels as approved by the Board; to achieve an optimal risk-reward balance; and to ensure that risk management is embedded in all decision-making processes. Our approach to risk management the Board is ultimately responsible for risk management within the Group in accordance with corporate governance requirements and provides an oversight of the strategic direction of the business. The business planning process extends over a five-year period and provides the principal parameters against which the performance of the Group is measured. These include annual objectives and targets covering production, development, exploration, HSE and financial performance. Business plans are approved by the Board together with defined operational targets and risks to delivery.

**Enterprise Risk Management process at Dragon Oil**

Establish context:
- Establish strategic, organizational and risk management process context by considering the environment within which the risks are present

Risk management
- Quarterly exercise

**Risk Identification**

Identifying and characterizing Dragon Oil risks (corporate and department levels) to objectives and agreeing appropriate risk ownership

**Risk Assessment**

Assessing risk severity through establishing the impact and likelihood (gross, net and target basis) and the effectiveness of existing controls and mitigates in order to priorities risks

**Risk Treatment**

Consideration for further risk mitigating actions or treatment alternatives.

Oversight of risk management at corporate level takes place through reporting to the Audit Committee and the Board annually. Risk Owners at department level assess the risks and evaluate the mitigation factors and progress of planned improvements quarterly while reporting to the Executive Committee semi-annually. To manage risks and embed these into business activities and processes a Corporate Risk Register, comprising key Group level risks, and the Department Risk Registers, dealing with key activity risks, are created and reviewed periodically (Pollock, Jeffery, 2012).

**ENTERPRISE RISK MANAGEMENT (“ERM”)**

ERM is qualitatively distinct from traditional risk management.

**ERM’s objectives**

Enterprise risk management encompasses:
- Aligning risk appetite and strategy – Management considers the entity’s risk appetite in evaluating strategic alternatives, setting related objectives, and developing mechanisms to manage related risks.
- Enhancing risk response decisions – Enterprise risk management provides the rigor to identify and select among alternative risk responses – risk avoidance, reduction, sharing, and acceptance.
- Reducing operational surprises and losses – Entities gain enhanced capability to identify potential events and establish responses, reducing surprises and associated costs or losses.
- Identifying and managing multiple and cross-enterprise risks – Every enterprise faces a myriad of risks affecting different parts of the organization, and enterprise risk management facilitates effective response to the interrelated impacts, and integrated responses to multiple risks.
- Seizing opportunities – By considering a full range of potential events, management is positioned to identify and proactively realize opportunities.
- Improving deployment of capital – Obtaining robust risk information allows management to effectively assess overall capital needs and enhance capital allocation. (Steinberg, Everson, Martens and Nottingham, 2004).
Risk management refers to an interactive process consisting of steps, which when undertaken in sequence, enable continual improvement in decision making. The aim of risk management is to obtain understanding by all parties and agreement around what the risks really are and how they will be managed to improve performance, increase the value of firms and reduce financial distress. We used primary and secondary data in our analysis. The study identified risks confronting Tema Oil Refinery (TOR) as instability in global oil prices, depreciation of the cedi against major currencies, health and safety, political interference, environmental pollution, brain drain, shortage of crude oil, huge debts as a result of subsidizing of petroleum products by government and default on the part of oil marketing companies to pay for products and high operational risks. Other challenges as apathy on the part of staff to abide by safety rules was identified. TOR incorporates risk management in their strategic plan and have operations and Audit risk department but have been battling with effective implementation. Made recommendations to government and management of TOR on how to overcome the problems in implementing risk management in order to achieve the goals of the only refinery in Ghana.

The objective of the research was to identify major risks confronting Tema oil refinery. To examine if Tema oil refinery incorporates risk management in their strategic plan and to also identify the challenges they face in the implementation of risk management. After computing and decomposing Risk indicator, it became clear that the most crucial Risks which the refinery is still battling with are foreign exchange exposure resulting in huge debt to the Refinery. Top management of TOR formulate and incorporate risk management policies in their strategic plan. The refinery provide training in risk management to employees and develops standard guidelines and controls in implementing and managing risks as well as regular review of such policies. The major problems and challenges facing TOR in implementing risk management policies are lack of cooperation from staff because they do not understand risk policies adopted by management. There are some risks which are beyond the scope of management hence they only offer pieces of advice to the government on how to mitigate them. Despite all these challenges and problems most employees of TOR expressed satisfaction on how management manages most of these risks. The company should embark on the use of derivatives like futures, forwards, options and swaps to mitigate its financial risks. They should learn how refineries in the United States have successfully used such derivatives to reduce losses. Strategies such as currency swap for financing its operations to reduce the likelihood of TOR experiencing serious financial problem from unexpected exchange rate movement. Managing currency risk may encourage credit suppliers to supply more crude oil because of the ability exhibited by debtors-TOR to withstand financial difficulties. The improvement in TOR’s financial position as a result of risk management will lead to improved terms of transaction. For instance with proper risk management practices, Nigeria may increase the days credit from 90days to about 120days. Casual workers and contract workers engaged by TOR must go through thorough training in risk management prior to their engagement. This has become necessary because management see no need to spend scare resources on casual workers who are always blamed for failing to observe basic safety rules in the refinery. TOR should step up its educational campaigns on safety for workers to understand the relevance of risk management. This will reduce the bad attitude of workers towards risk management. Management should also be committed to enforcing risk management policies. A well-defined reporting guideline should be in place and punitive action should be fairly enforced on workers who flout risk and safety rules. For TOR to fulfill its constitutional mandate, government should be seen to be playing its oversight responsibilities freely and fairly. Conflict of interest should be avoided. For TOR to reduce the huge unpaid debt from oil marketing companies (OMC’s) who are given credit facilities, proper credit rating should be carried out on such OMC’s. Those with high credit rating should be given credit facility secured by assets. OMC’s with poor credit rating should not be given credit facility, transactions should be strictly on the basis of cash sales. This will help reduce the huge debt facing the refinery. If government continues to pay TOR’s debt, they will continue to interfere in the management of TOR. TOR should therefore have the financial authority to avoid governmental interference. Borrowing to pay TOR’s debt cannot be sustained. Private sector participation in TOR will be a panacea to its predicament. The operations and risk audit department should be well resourced to discharge its duties with professionalism. The refinery should invest in state of the art equipment to avoid frequent breakdowns and fire outbreak due to the use of outmoded equipment in the refinery. The use of modern facilities could reduce operational risks. Shortage of crude is a critical risk facing the refinery and if not addressed can collapse the refinery. There
should be a long term contract for the regular and reliable supply of crude oil from oil producing countries. Being an oil producing country, TOR should be resourced to refine our own crude oil for the local market. The high turnover rate of experts from the refinery is alarming and calls for urgent attention. Incentive packages like bonuses, professional allowance, share of excess profit and special promotion should be instituted to motivate these experts to remain with the refinery. (Osabutey, Agbodohu, Kumi, 2013)

A Hierarchical Framework

Literature on PSC risk management is mainly confined to qualitative approaches concerning the process of risk analysis and assessment, thereby exposing an absence of quantitative modeling. This lack of risk structuring and breakdown methodology provides the motivation to develop a framework that could provide a structured method for the risk identification, quantification and mitigation process. Research on SCRM and PSC literature and investigation on PSC risk management has led to the development of a simple framework that assists in capturing and building quantitative data through a well-defined risk management process. Fig. 1 presents a new risk management hierarchical framework. The framework builds an information model using two processes: Risk identification process and the Risk mitigation process. The risk identification process utilizes the framework to identify and hierarchically relate first the risk agents, second the risk sources, the risk objects and finally the risk events. Risk elements are identified by asking the following questions: Who initiates the risk? Risk agent; what are the causes of the risk? Risk source; which resources are affected? Risk object; and How does the risk manifest? Risk event. More specifically, risk agents are the drivers of organizational risks, for example the finance area or the transport activity. Risk sources are the causes of risks, which provide a negative impetus to the risk objects thereby generating a risk. An example of a risk source is the increase in value added tax. Risk objects are resources of an organization, whose malfunctioning would originate a consequence. An example of risk objects is the country tax structure. Risk events are the factual occurrence of the risk thereby resulting in the effective loss, for instance reduced profits. In a nutshell, the framework indicates that the risk agent (financial area) includes a risk source (value added tax) which can affect the risk object (tax structure) thereby generating a risk event (reduced profit).

The above risk identification process culminates into the identification or computation of the consequence estimated for each risk agent/source/object/event combination. The framework follows the risk mitigation process to complete the risk information. Each risk agent initiates a hierarchical identification of a planning level and an appropriate mitigation strategy that could reduce the potential risks of the risk sources. Planning level provides a timeframe for the mitigation activity, which could be Strategic or long-term, Tactical in the case of mid-term, Operational or short-term planning and Contingencies or post-occurrence planning. Mitigation strategies are counter measures that could reduce the likelihood and the consequences of the risk events triggered by the risk sources. Expected payoff estimates should be computed for the combination risk source/mitigation strategy to provide the quantitative data. (Fernandes Barbosa-Póvoa, Relvas, 2010)
Oil and Gas Industry in Iran

Iran’s oil and gas sector remains critical to the country’s economic prospects. Its future depends not only on whether, and how quickly, sanctions are removed, but also on the terms that Iran is prepared to offer to the international oil companies (IOCs). Latterly, the low oil-price environment may mean that the sector’s appeal to investors is diminished, even if sanctions are revoked. Iran has struggled to attract investors. In the 1990s attempts to secure international investment were ineffective because of the unfavorable terms on offer to IOCs and the operational Problems that arose as the sector became increasingly politicized and less well organized. The current administration under President Hassan Rohan is echoing opinions from that era on the need to increase the involvement of the private sector in the economy, although it is unclear how seriously such statements should be taken. Iran is in severe need of the technology and capital that would be available from IOCs for its oil and gas sector. Yet, while there has been much hype about the high level of interest, the IOCs are only likely to be interested if the terms are advantageous. Iran has indicated that it could help Europe move away from over-reliance on Russian gas through the export of liquefied natural gas, and has proposed various pipeline routes. However, the drop in world oil prices from the latter part of 2014 reinforces Western countries’ reluctance to commit to investment of this scale and complexity. Iran’s own need for domestic gas and for gas for reinjection into oilfields, as well as the export deals planned with Oman, Iraq and Pakistan, would also reduce the volumes available for export to Europe. In this context, Western countries may well not consider such offers as anything other than a prospect for a decade’s time.

Operational problems

A further problem began to develop as the sector became increasingly politicized and less well organized. Iran began to restructure the oil sector in the late 1990s, with a view to a programmer of privatization. However, the decision to appoint a separate head of NIOC and split the company into more than 100 operating units confused lines of responsibility. This impeded the operation of the oil sector. At the same time, different political institutions were at odds over policy towards the oil sector. While elements within both the oil ministry and NIOC favored foreign investment and privatization, they met stiff resistance from economic conservatives in the Majlis and the Council of Guardians. Despite the existence of three groups that had responsibility for examining and monitoring buy-back agreements, the energy commission of the Majlis expressed its concern over a ‘lack of transparency’. As a consequence, the commission demanded greater influence over the operation of the contracts. Oil company officials became reluctant to take decisions, knowing they would be scrutinized and targeted by parliamentary investigations. In this political context, the few buy-back deals that were struck were with Iranian firms or with other state-owned oil companies, rather than with IOCs. Problems with political interference reached a peak following the election of Mahmoud Ahmadinejad in 2005. The considerable expertise that had kept the hydrocarbons sector in operation during revolution and war was effectively ebbing away at this time, as significant numbers of senior technical, engineering and commercial staff departed from both NIOC and the oil ministry.

Domestic oil consumption

A further problem for the sector has been the rise in domestic oil consumption. As can be seen from figure 1, this eats inexorably into the amount of oil available for export. Serious efforts were begun in 2007 to slow this expansion in the rate of consumption. Initially, rationing of petrol and diesel was introduced via smart cards, coupled with a 25% increase in price that was partially offset by direct cash payments to low-income groups. Then some three months later, motorists were allowed to buy more than the ration if they were willing to pay even higher prices. The real reform came at the end of 2010, when the state provided direct payments to families to compensate for the removal of subsidies more generally. The programmer proved to be effective initially, and oil consumption for transportation fell markedly. The National Iranian Oil Products Distribution Company stated in July of that year that rationing had resulted in savings on gasoline consumption amounting to some $11 billion. As early as mid-2008, however, concerns were being raised about the effectiveness of the programmer, specifically with regard to the very large numbers of exemptions to the scheme. Furthermore, the plan to scrap 1.2 million old, fuel-inefficient cars by 2010 was abandoned. Meanwhile, Iran also began to change its domestic energy mix from oil to gas, leading to a considerable expansion of gas infrastructure and consumption.

Sanctions

The difficulties within the oil and gas sector were aggravated as the European Union (EU) began to introduce financial sanctions against Iran. As previously noted, ILSA had been fairly ineffective, reflecting of its relatively lax application. However, once the EU began to impose financial sanctions in 2011, these had a seriously negative effect on the Iranian economy generally and on the oil sector in particular – it being very difficult to trade oil without access to letters of credit. Then, at the start of 2012, the EU introduced an embargo
against imports of crude oil from Iran. This compounded the impact of the existing embargo imposed by the United States, coupled with the EU’s tightening of financial sanctions. Inevitably, the result was a significant fall in Iranian exports – the US government, for example, has claimed that Iran’s oil exports have fallen by 60 per cent since the introduction of the EU embargo – although the precise numbers are, unsurprisingly, somewhat open to dispute. Clearly, however, the overall decline in export revenues will have been greater than the decline in physical export volumes, because Iran has had to offer considerable discounts on crude prices in order to induce consumers to buy the crude. There is, meanwhile, uncertainty as to the technical impact of shutting in wells on the level of Iranian capacity. It seems likely that closing wells does nothing to improve the recovery factor, and that it may actually reduce it significantly, adding to the problems likely to confront the sector in the future. Iran desperately needs the technology and capital for its oil and gas sector that would be available from the IOCs. There has been much hype from the Iranian side about the high level of interest from IOCs – and certainly since the election of Rouhani there have been many unofficial ‘side meetings’ between oil ministry officials and the IOCs (notably both in New York during Rouhani’s visit for the UN General Assembly in September 2013, and in Vienna during the OPEC meeting in December that year). The IOCs are of course interested in getting access to Iran’s hydrocarbons, but most definitely not at any price. Iran has also indicated that it could help Europe to diversify away from over-reliance on Russian gas. Zanganeh stated in May 2014 that Iran was ‘always willing’ to export gas or liquefied natural gas to Europe. In the same month the Iranian deputy oil minister for international and trade affairs, Ali Majedi, suggested that Europe could import Iranian natural gas in volumes of between 4 million cu m and 50 million cu m per day via pipeline through Turkey; alternative pipeline routes, he proposed, could run via Iraq, Syria and Lebanon, or via Armenia, Georgia and the Black Sea. As yet – and given the absence of infrastructure for exports to Europe, and the likely difficulty of raising the very large sums in domestic and foreign investment that would be needed for such development – there has been no formal response from Western countries to these offers. The drop in world oil prices from the latter part of 2014 reinforces their reluctance to commit to investment of this kind. Iran’s own need for domestic gas and for gas for reinjection into oilfields, as well as the export deals planned with Oman, Iraq and Pakistan, would also reduce the amounts available for export to Europe. In this context, Western countries may well not consider such offers as anything other than a prospect for 10 years’ time. (Paul Stevens, 2015)

CONCLUSIONS

In this paper, the framework is demonstrated using typical risk and mitigation scenarios from the petroleum supply chain. As business in emerging markets continues to grow for the oil and gas sector, companies will become increasingly challenged by bribery and corruption risks. Potential modeling directions are considered for the quantitative risk management model. The work of oil and gas companies is as socially and politically complex as it is technically complex. Oil and gas companies serve a strong and constant worldwide demand for their products. The development of better and more sophisticated CSR programs, fed and nurtured by a more transparent, receptive approach to stakeholder engagement, represents their response to the changing expectations of governments, NGOs and neighbors over the last several decades. This is, it seems, a logical response to the absence of effective government regulation and legal dispute resolution mechanisms. Some, however, remain dubious about the ability of CSR to fill the regulatory and legal void. In such contexts, both governments and society may demand that companies step into the breach. In the oil and gas sector, CSR activities represent an attempt to fill that void.

REFERENCES


