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Strategic Judgment under Pervasive Uncertainty

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Abstract

Strategic decision making under uncertainty has been typified as an uncertainty mitigation activity. However, this hypothesis breaks down under conditions of very high uncertainty as it demands judgment on the part of managers. Research on this topic is sparse. To decode the black box of judgment under very high uncertainty, this paper uses an unconventional qualitative technique of examining managerial judgment under four anticipation-outcome scenarios. The findings suggest that judgment in a confirmatory scenario is influenced by internal factors such as organizational capabilities. In contrast, judgment in a contradictory scenario is influenced by external factors such as strategy of competitors.

Introduction

The concept of strategic decision making encompasses several other concepts like strategy (as an agglomeration and patter of decisions), strategic change, and capabilities (as manifestation of abilities to solve complex problems reliably over time). The significance of strategic judgment in oil & gas exploration can be gauged from the fact that while big oil companies like ExxonMobil and Chevron continue to post bumper profits due to high oil prices, their inability to replace reserves with new finds is causing concern. Oil companies have to consistently acquire blocks and find new discoveries to replace oil & gas reserves lost due to production. Acquiring blocks require strategic judgment. Current year's oil and gas production of Exxon's fell by one percent and that of Chevron by two percent. More importantly Chevron's addition to replace its reserves is likely to be only 10-15% of its last year's oil and gas production. In fact international oil companies have failed to create any new core areas through exploration. Moreover it is getting increasingly difficult for them to acquire new areas as more and more resource rich countries are seeking to exert control over their reserves. Companies have to win whatever few opportunities are likely to be available to them. In this paper, we analyze the judgment exercised by oil and gas exploration companies in bidding for oil and gas exploration blocks. These decisions qualify to be strategic as they require approval from the top management, have high financial implications, and also are rare in frequency. Oil & Gas exploration bidding activity is known for its extreme conditions of uncertainty, risk, and knowledge associated with it.

Literature on resource-based view suggests that firms compete in a 'strategic factor market' to purchase a scarce resource whose value is unknown and differs across firms. In fact more accurate expectations about the firm-specific value of resources could allow firms to generate rents. Since research into decision making must deal with many plausible causes and many possible effects, controlling for context is a useful research strategy. The unique

characteristic of the oil & gas bidding activity offers interesting empirical settings for a study on managerial judgment. In bidding for oil & gas blocks, firms are required to assess the potential of a block and bid based on anticipation of future benefits. This process has two components. The first component is assessment on potential of an opportunity which is scientific and purely rational process. The other component relates to anticipating behaviour of other companies in fray. However at the time of bidding, information available to firms is partial and the real worth of opportunity is not known due to high degree of uncertainty. Furthermore, there are multiple contenders for the same pie, and the opportunities are rare.

Essentially, this paper focuses on determinants of managerial judgment under scenarios four scenarios. The first two are confirmatory, wherein managers' hypothesis gets confirmed. The other two are conceptualized as contradictory scenarios wherein managers' hypothesis gets refuted. A thematic examination of the managerial thinking suggests that judgement under confirmatory scenario is influenced by internal organizational factors, whereas under contradictory scenario, it is influenced by external strategic factors.

Theoretical Context of the Study: Strategic Judgment in Uncertain and Risky Situations

Strategic judgment falls in the realm of decision making research. Decision making research is very old and popular (Simon, 1957; Cyert & March, 1967; Mintzberg et.al., 1976; Fredrickson, 1984). Decisions which are important in terms of the action taken, the resources committed, the precedents set, have organization wide implications and are infrequent have been defined as strategic decisions (Eisenhardt & Zbaracki, 1992). Decision making is influenced by situations, context, decision maker attributes, and organizational features or even process (Nutt, 1984; Dean and Sharfman, 1992).

The context of decision identifies domains of action (Nutt, 2002). The focus of this paper i.e. strategic judgment to anticipate the outcome of a process correctly is a specific context for decision making. Strategic judgment has been described in terms of needs to achieve an outcome or in terms of characteristics. The need based view describes it as an essential requirement to take decisions (Simon, 1989) or to gather information and recognize risks and uncertainties (Penrose, 1959). The characteristics based view describes it in terms of intuition and therefore more in terms of effect rather than analysis (Bernard, 1938). Preim and Cicyota (2001) define Judgment is the process of forming of an opinion, estimate, notion or conclusion from the circumstances presented to the mind. These situations can be particularistic or unique with its own set of variables and analysis In fact given the challenges of operationalizing judgment and accessing top management, extant research on strategic judgment has taken the approach of studying the process through proxies of strategy content (Fahey and Christensen, 1986), cognition of top management (Eisenhardt and Schoonhoven, 1990), and knowledge-based view (Kogut and Zander, 1996). While this has provided both description and prescription for improved leadership, it has not addressed the issue of improved organizations. An approach to achieve the objective of providing business prescription would involve deconstructing the construct of strategic judgment across alternative concepts and developing them under field testing. Firms' coping responses to uncertainty depend upon the characteristics of the uncertainty source. Task (Thompson, 1967) and environment (Ansoff, 1971; Lawrence and Lorsch, 1967) have been identified as two important sources of uncertainty. Furthermore uncertainty / risks are relative to the organization's capabilities (Embelmswag and Kjolswad, 2006).

Researchers have studied competitive auctions/bidding process from different perspectives: different types of auctions and equivalence among them (Milgrom and Weber, 1982), decision theory models (Oren and Williams, 1975), and game theory models

(Rothkopf and Harstad, 1994). In fact those who are interested in the general topic of decision making in the face of both competition and uncertainty have found auctions / bidding a fruitful area of study. However, field studies have revealed a mismatch between behavioural assumptions made in modelling focused bidding theory and actual decisions of managers in the field (Rothkopf and Harstad, 1994).

As mentioned before, this study focuses on anticipation. The concept of anticipation in some sense is akin to the concept of screens used by Fiske and Taylor (1991). The ability to anticipate the outcome of a process correctly in the face of uncertainty and risk is a unique organizational capability. It denotes use of subjective information to compare a current position with perceptions about future needs and benefits and take a position based on this analysis. Based on the above review, we formulate our research questions as follows: How do managers exercise judgment under conditions of high uncertainty and risk? What are the determinants of managerial judgment?

Practice context of the study: Bidding for Oil and Gas Exploration

Oil exploring companies face large risks and uncertainties (Mckie, 1960). However, most of the uncertainty about the size of the field is resolved after completion of exploration process (Amran and Kulatilaka, 1999). An exploration process involves use of sophisticated technology (3D seismic surveys, computer software), Multidisciplinary team efforts (successful integration of geophysics, geology, geochemistry), and risk minimization techniques (source. [www. spe.org](http://www.spe.org), [www. gasoilgeochem.com](http://www.gasoilgeochem.com)). In layman terms, oil exploration can be described as a process to determine and establish the presence of oil and gas in a sub-surface structure (on land or offshore). For a firm engaged in the activity of finding oil, success in exploration means three things. First, it has to acquire a block through a process of competitive bidding. Next, it has to carry out seismic surveys to collect data and

then interpret it to identify a location where chances of finding oil are highest. Finally, it has to drill a well at the identified location without causing irreparable damage to the well to establish oil beneath the surface. Each process contains several activities and involves use of several resources and skills. Once the presence of hydrocarbon is established, infrastructure like platforms, processing equipment, and pipelines is created to produce, process, and transport hydrocarbons. Activities subsequent to exploration are called production activities. Thus the three processes of bidding, seismic data interpretation and drilling are the most crucial for any E&P company.

Bidding for oil & gas exploration is regarded as highly risky and uncertain. Uncertainty gives rise to risk. Uncertainty arises from task and environment. Firms have to make choices due to inherent uncertain nature of activity and outcome. However, despite being highly strategic in nature, surprisingly, there are very few studies in oil sector dealing with issues of strategic management. Most of the studies done in the context of upstream oil sector have overly relied on a pure economics approach (Keefer et.al., 1991). The focus of these studies is on risk minimization and choice modeling (Dyer et.al., 1990). The differences in success rate of winning bids across different participants point towards differences in strategic judgment capabilities. For this study we will study two leading Indian firms, one state controlled and another private enterprise, engaged in oil and gas exploration. In addition we will also build cases based on secondary information for two international firms like Shell, BP, Chevron etc. We now provide brief profile of the two Indian companies.

The first company in our study is an Indian Private company. This organization discovered in 2002, the biggest gas discovery in the world in deep sea. The company is also the leading business house in India with presence in Petrochemicals, crude refining, retail and other businesses. The second company in our study is State owned Petroleum Corporation. This company discovered oil and gas in many onshore blocks and also in deep sea operations.

Its biggest discovery came in 2006 when it found huge quantity of gas in rocks which were thought not to hold hydrocarbons. The firm has series of successful findings.

Methodology

Strategic decision making is a complex process. Either of the two methodologies- qualitative or quantitative – to study the phenomenon has its own set of inadequacies. Preim and Harrison (1994) have suggested composition methods and decomposition methods for studying strategic judgments. Of the two, we follow composition method to study bidding activity for oil & gas exploration. In composition method, an executive is presented with a series of decision scenarios and asked to verbalize his thinking. Composition methods include verbal protocol analysis, information search and cause mapping (Preim and Cychota, 2001) and for each of these methods, judgment is determined by following along the decision. The issue whether strategic judgment is an outcome of individual brilliance or organizational processes further complicates any attempts to systematically study the process.

In line with the above thinking, we follow an interpretive, interview based methodology to identify sources of knowledge required for strategic decision making. Our focus is on organizational capabilities to arrive at sound strategic judgments. However, the objective of scenarios in this study was to capture strategic judgment required for anticipation in a field setting investigating real judgments made by people in the organizations. Therefore, instead of creating descriptive scenarios which are more suitable for an experimental setup, we created the following four scenarios based on outcomes of the situation

Positive-Positive Scenario: Firm anticipated that it will win the bid and it went on to win the bid.

Positive-Negative Scenario: Firm anticipated that it will win the bid but eventually ended up losing it.

Negative-Positive Scenario: Firm anticipated they it won't be able to win the bid but ended up winning the bid.

Negative-Negative Scenario: Firm anticipated that it won't be able to win the bid and ended up losing it.

Apparently, the first and the last scenario are confirmatory scenarios and the middle two are contradictory scenarios. In the former, the hypothesis or the belief about the strategic judgment gets confirmed whereas in the latter it gets contradicted. The executives' narrations of these outcomes are representative of organizational processes and not of specific instances. Focusing on successful firms has been criticized for being tautological. We therefore focus on successful as well as unsuccessful outcomes.

Data and finding

The interview data was coded for finding out managers' bidding behavior corresponding to the each scenario.

Anticipation	Outcome	Explanation
Favourable	Favourable	Repetitive bidding for a block; Proprietary information about a block; Aggressive bidding
Favourable	Unfavourable	In this scenario, while firms adopt same strategy as in the first scenario, a new entrant looking for market entry disrupts the bid market
Unfavourable	Favourable	Usually an unfavourable-favourable combination happens when all players bid based on techno-economic evaluation only. However other firms have some negative information about the block because of which they discount their bid and underbid. In this scenario, a firm that doesn't have access to private information emerges winner.
Unfavourable	Unfavourable	The combination of unfavourable-unfavourable happens when the bidding firm is absolutely clear that it doesn't want the block. However, it still bids for such block because of competitive or regulatory consideration. This kind of decision making is seen in public sector undertaking.

Discussion

The purpose of conducting this study in field setting is to identify generic organizational capabilities required for correctly anticipating the outcome of a resource acquisition attempt under conditions of high uncertainty and risk. While a prescription at this stage may be overambitious a description of firms' response to stimuli emanating from the resource and the

environment could in itself be very insightful. This study will discover the activities and organizational processes involved in strategic judgment to anticipate. The rich description of such activities would reveal the set of capabilities required for effective strategic decision making. Earlier research on capabilities has identified capabilities at different levels and for different contexts, viz. individual, team, firm, industry. But there is hardly any study which identifies capabilities for strategic decision making. This study aims to contribute to academic literature by making an attempt to identify capabilities associated with strategic decision (judgment to anticipate) making having characteristics of knowledge intensive, highly risky and uncertainty. Managers engaged in oil & gas exploration face lot of uncertainty and risk. The findings of this study would help them by providing them with a structural framework to match capabilities with risk and uncertainty, identify capabilities associated with bidding for oil & gas exploration and guidelines for building capabilities for strategic decision making.

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