Chapter-2

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The topic for this research is *Strategic investment decisions in petrochemical sector: A comparative study of GCC countries*. Considering the coverage of this research, a detail review of literature has been conducted which not only covers the academic research in the field of investment decisions but also the research or investigation done by corporate and consulting firms in petroleum and petrochemical industry with specific reference to the Middle East region. In this chapter a review of the works done in the following areas are presented:

- Foreign investment
- Strategic investment decisions
- Petroleum & Petrochemical Industry
- GCC Economy

2.1 WORKS ON FOREIGN INVESTMENT

Overarching quantitative data on MNCs and foreign investment may seem a bit dry, but reviewing these materials is necessary as these analyses provide helpful insight into geographic trends of corporate investment, including shifts such as the recent major increase in foreign direct investment (FDI) to certain less-industrialized countries.

The most comprehensive information on FDI comes from the former United Nations Centre on Transnational Corporations (CTC), now called the *Division on Transnational Corporations and Investment* (part of the UN Conference on Trade and Development, or UNCTAD), which since the late 1980s has

produced the *World Investment Report* series [this series actually has three predecessors: *Multinational Corporations in World Development* (1973); *Transnational Corporations in World Development -- A Re-Examination* (1978); and *Transnational Corporations in World Development Third Survey* (1985)].

The *World Investment Reports*, published annually since 1991, are filled with data on the "universe" of transnational, with special attention to the top 100 TNCs ranked by foreign assets, as well as on global trends in foreign direct investment (and recently, portfolio equity investment and private loans by commercial banks), organized by geographic region and industrial sectors. In particular, these volumes chart the dramatic growth of FDI since the mid-1980s among the industrialized world's "Triad" (the US, Western Europe, and Japan) and to less-industrialised regions. They also discuss liberalisation of investment (and trade) rules nationally and internationally, and privatisation. The series includes sixteen reports that have been published annually since 1991.

2.2 WORKS ON STRATEGIC INVESTMENT DECISIONS

2.2.1 A brief history of the Strategic Investment Decisions

It has been suggested that academics in the field of finance take too narrow a view of capital budgeting (King, 1975). An example of this traditional or narrow view of finance might be Levy and Sarnat, who prefer not to deal with strategy at all, and continue to assume that decisions will be made based on economic evaluation alone. This is understandable where shareholder wealth maximization is assumed to be the primary objective of the firm (Levy and Sarnat, 1994). Likewise organizational behavioural issues are largely ignored as irrelevant to finance theory within this economic paradigm.

In the fifth edition of Lumby's book, he includes a chapter on 'strategic planning and the finance function' (Lumby, 1994, p25-37), which does recognize a link, but the strategic context for decisions does not permeate the rest of the text. The links between financial and strategic analysis have been emphasized by some academics within the finance field (e.g. Mills, 1994; Tomkins, 1991; Ward, 1993), but only relatively. Perhaps this is largely due to the development of business strategy as a newer discipline than accounting and finance (Mintzberg, 1994).

King offered a view which placed investment appraisal within a strategic decision making process. The process described by King was based on his analysis of a case involving the addition of extra capacity in the chemicals division of a diversified group. His process model therefore has an empirical basis (King, 1975).

He depicted the process as a sequence of six stages:

i. Triggering (recognition of opportunities)
ii. Screening (should the opportunity be pursued?)
iii. Definition (what form should the project take? and is it strategically acceptable?)
iv. Evaluation (search for information and financial analysis)
v. Transmission (build up of commitment)
vi. Decision (final check on worth of project and formalization of commitment)

Whether it is the case itself or the diagrammatic representation of the process, there appears to be no possible feedback loops. So, while it does encompass more than financial analysis shown as part of the evaluation stage, it is far from an ideal model. Nevertheless this represents one of the

first attempts to recognize investment appraisal in the organizational context of the enterprise.

Pike and Neale depict a simple capital budgeting system as a five stage process (Pike and Neale, 1996, p183) labelled as:

i. Determination of the budget
ii. Search and development
iii. Evaluation
iv. Authorization
v. Monitoring and control

This model allows a return from the evaluation stage to the search and development stage as one of four feedback loops, and allows for the possibility of an idea being generated out of the normal sequence at stage 2, which causes management to consider an increase in the budget by looping back to stage one. It does not stop at the decision point, but also includes a monitoring and control stage (post audit), which loops back to the evaluation stage in the process. This appears to be an improvement on earlier presentations of the process.

An alternative view is offered in another piece of strategic planning literature. Dyson, for example, sets out eleven elements in the strategic decision making process (Dyson, 1990, p7), which is also shown in diagrammatic form, with feedback loops. The book focuses on six of these, which are discussed in order (by contributing authors) and finally linked with analytical techniques (p308). The six key stages are:

i. Objective setting and review
ii. Strategic option formulation
iii. Assessment of uncertainty
iv. Corporate system model
v. Performance measurement
vi. Gap analysis and selection

Dyson provides a matrix which positions fourteen analytical techniques in terms of their primary and secondary impact at each stage. Capital investment appraisal is technique number eleven, and is shown as having primary impact at stages 5 and 6, and secondary impact at stages 1 and 3. Risk analysis (defined in the book by the inclusion of a paper by Hertz, 1964) is technique number 7 and is shown as having primary impact at stage 3 and secondary impact at stages 4 and 5 in the process.

This approach separates out the financial analysis (performance measurement) from the decision analysis (gap analysis and selection), which overcomes Jones and Dugdale's criticism of accountants confusing measures and criteria (Jones and Dugdale, 1994).

It also positions the techniques which are assumed to be in the accountants' domain as a minority of the fourteen techniques which may be applied in strategic analysis. This highlights one of the weaknesses of capital budgeting surveys (Drury et al., 1993; Ho and Pike, 1991; McIntyre and Coulthurst, 1986; Mills and Herbert, 1987; Pike, 1982; Pike, 1996; Sangster, 1993; Scapens et al., 1982), in that almost all questionnaires were targeted at accountants or finance directors.

2.2.2 Works on strategic investment decisions

There are myriad references in literature available on *strategic investment decision*. The classical school of strategy has evolved a number of sophisticated financial techniques for supporting the strategic decision making process. What these techniques share is an aspiration to approach strategic decision in a structural-rational manner that will finally produce a clear ranking of strategic options. The strategic option that promises the greatest net benefits, quantified in financial terms, should always be chosen.

Interest in studying the process of organizational decision-making can be seen to have originated from the path breaking book by Chester Barnard, *The Functions of the Executive* (1938). Barnard's argument was that organizations function through the communication of a common purpose between a numbers of people. Executive work is a matter of deciding and doing, an idea that was taken up by Simon (1947) in his book *Administrative Behavior* when he more explicitly outlined a theory of organizational decision-making. Capital investment decision-making is one in which objective must always emphasize maximizing returns. Simon opened up the idea that the highly rational image of business decision makers presented by economic theory is limited to a quite restricted set of conditions. As conditions get more complex a different type of decision process begins to take over.

Three industry specific studies (Collier and Gregory, 1995, Carr and Tomkins, 1996, and Harris, 1999) found that good industry knowledge was highly valued as a basis for managerial intuition, and provide evidence to support the use of *representative ness*, *availability* and *anchoring and adjustment* heuristics suggested by Tversky and Kahneman (1974). Smith and Murray (1997) also found managers operational sing heuristics in order to reduce the complexity and develop manageable coping mechanisms. Personal construct theory (Kelly, 1955) applied by Harris (1999) have a number of corollaries which fit with Tversky and Kahneman's theory on heuristics. Butler et al. (1993) and Smith and Murray (1997) both support the importance of the framing of decisions in terms of how project opportunities are described and presented, which analytical techniques are adopted and which factors have most influence on managerial judgment.

Nixon (1995) and Harris (1999) linked the framing of decisions with the nature or type of decision being made, and the risk analysis techniques adopted.

Several studies discovered the mix of intuitive and analytical information (Holloman's heart and head) and the importance of the information environment (Eisenhardt, 1989; Grundy and Johnson, 1993; Gup and Norwood, 1982; Hirst and Baxter, 1993; Morone and Paulson, 1991) in support of prospect theory.

The political processes identified by Bower, from his case analysis, whereby projects are sponsored up through the organizational hierarchy, having been chosen at an early stage, seem just as relevant today. Smith and Murray (1997) found evidence of aspects of group behaviour, such as checking and sharing of information, Nixon (1995) found evidence of companies sharing information for risk assessment with external parties such as customers and suppliers, and Harris (1999) described a process of managers sharing information within a multi-functional team.

Evidence from the study by Harris (1999) supports the description of practice put forward by Bower in 1971 (Bower, 1986) in terms of when, where and by whom decisions are actually made. Strategic options are often formulated within divisions and effectively screened at an early stage by managers at lower levels in large organizations, such that decisions are virtually taken well before the full discount cash flow (DCF) analysis and sensitivity analysis is presented at group board level.

It is argued here that this practice based approach to the development of an integrated theory of SIDs is more pervasive than the normative economic theories developed hitherto. The challenge is for researchers to work across discipline boundaries in developing theories and techniques which managers will use because they believe in them. Otherwise, organizations may adopt practices simply because society expects them to, or the accountants have only been trained in certain techniques such as DCF (Tyrall, 1998).

The major focus in Richard Butler, Leslie Davies, Richard Pike and John Sharp, *Strategic Investment Decisions: Theory, Practice and Process (1993)* is on the process by which investment decisions are made and the means by which this process can be made more effective. This work reports a study of seventeen actual investment decision made in twelve organizations. This work considers investment decision-making as both a formal rational process of trying to optimize financial returns to the organization and as an organizational behavioural process in which local interests, informal interactions, hunches and other aspects of human behaviour that may, to an outside observer, appears as non-rational, play a vital part. The organizations studied in this work cover a wide variety. The overall conclusion emphasizes the importance of finding the right pattern in the different decision strategies and other variables for effectiveness. The approach adopted here is to combine both the case study and a quantitative analysis of a larger number of cases.

Chris Carr, Cyril Tomkins and Brian Bayliss, *Strategic Investment Decisions: A comparison of UK and German practices in the motor components industry (1994).* This study examines strategic investment decisions carried out by forty-two vehicle component companies, split equally between the UK and Germany. In each company, a single major strategic investment decision was examined in depth. Fifteen case studies were presented to illustrate the general features, which emerged and their contextual influences. These cases were used to derive hypotheses to serve as a basis for analyzing the data for the rest of companies.

The most notable contrast discovered was the strong financial control styles exercised in most UK companies. These companies were generally a part of a diversified organisation. This style of control was rarely found in Germany, with the exception of UK and US subsidiaries operating in that country.

Strong financial control styles have increased in prevalence in the UK, but they do not appear to be sustaining higher profitability than German companies pursuing more strategic styles. German companies are performing better than the UK companies, particularly in the overseas markets.

Despite such styles in the UK, strategic investment decisions in both countries are ultimately determined more by strategic considerations emerging from informal decision-making processes, than by application of more formal capital budgeting techniques. The effect of formal capital budgeting procedures is mainly that their rate of return or pay back requirements is anticipated, though in fairly crude terms. Although some of the companies use more sophisticated approaches such as discounted cash flow methods.

The quality of informal strategic debate in German companies appeared much more than in the UK, which reflects that organisational structures and strategies were much more focused than in the UK. Strategic investments decisions in Germany were also much more pro-active, playing to positions of strength, although decision processes themselves were generally incremental. Strategic investment in the UK tended to be less ambitious, less timely, and were frequently put forward defensively on the grounds of "there is no alternative".

Studies on strategic investment decision focusing on oil and gas and petrochemical industry are negligible except some references made here and there on strategic investments.

2.3 WORKS ON PETROLEUM AND PETROCHEMCIAL INDUSTRY

Measured against the growing importance of oil and gas industry over the past four decades, the contribution from leading economists and

management researcher has been minimal. Despite the existence of the few powerful oil companies before the World War II, the fact is that they did not gain prominence as a major force in international economic relations until the post –war period.

The research from economics and business school faculties on oil and gas industry is extraordinarily heterogeneous, ranging from simple econometric tests of some narrow proposition of firm behaviour to richly elaborated case studies lacking a visible hypothesis. The problem often encountered by such research, however, is the extraordinary complicity and subtlety of the structures, motivations and strategies of multinational companies operating in oil industry. The data banks and the analytical tools at the disposal of researchers do not begin to measure up to the challenges of describing and analysing multinational characteristics of oil companies. By and large, the materials have come from governmental sources or other distant observation points and have been collected for purposes that have little to do with improving management of the firms involved.

Some of the selected studies on petroleum and petrochemical industry from business schools are reviewed in the succeeding paragraphs.

The research project by Stabell, 2001 has applied, tested and further developed a set of new models for the analysis of value creation and competitive advantage in the context of the global petroleum industry.

A paper by Fan, 1998 examines the effects of input price uncertainty on vertical integration. Based on plant level data for US producers of 49 petrochemical products, this study finds that producers' extent of vertical integration, measured by their degrees of input self-sufficiency, were positively related to input price volatility during the period of oil price shocks.

Shank, Spiegel & Escher's 1998 paper describes and illustrates a technique for assessing strategic positioning and for understanding strategic challenges, which has wide applicability across companies and across industries.
Hussain, Assavapokee & Khumawala's 2006 paper asserts that supply chain management in the petroleum industry contains various challenges, specifically in the logistics area, that are not present in most other industries. These logistical challenges are a major influence on the cost of oil and its derivatives. However, opportunities for cost savings in logistics still do exist.

Salisu & Yagudin's 2007 paper explores the possibilities of investment in the oil sector of a developing market and elaborates the advantage of vertical integration in a market where secondary raw materials are in shortage. The study argued that relevant business plans, based on vertical integration would create opportunity for FDI investment in Kuwait, where industrial development has always been faced by formidable obstacles including poor resources, which limits the manufacturing industries.

Among the prominent business schools, Harvard Business School took special interest in the petroleum and petrochemical industry and these studies have been published in HBR either in the form of articles or case studies. Some of the relevant research works of Harvard Business School are given below:

Reinhardt, Cassadesus-Masanell & Hanson (2006) study refers to the changes that have occurred within oil and gas industry since BP announced its merger with Amoco Corporation in August 1998. It also discusses the growth strategy of BP in a scenario where the major oil companies were competing for the rights to invest in Middle East region and manage the political risk in the region. The study tried to contemplate BP's strategic options for continued growth: acquisitions, internal growth, and divestiture and business diversification.

Esty & Kane (2003) work posits that oil industry is notorious for reserve, price, transportation and political risk. One of the major challenges facing the Finance Group after the BP/ Amoco merger in 1998 was restructuring the company's investment portfolio in Azerbaijani International Oil Consortium (AIOC). The study evaluates BP/Amoco investment options and also considered how the industry risks affected their current and future AIOC commitments.

Esty's (2003) case study is about Equate Petrochemical Co. (Equate), a joint venture between Union Carbide Corp. and Petrochemical Industries Co. (PIC) in Kuwait. The sponsors of the project began construction in August 1994, using a bridge loan, and were in search of permanent, no recourse finance. As part of the permanent financing, the sponsors wanted to use a tranche of Islamic finance--funds that are invested in accordance with Islamic religious principles known as Sharia. The sponsors hired Kuwait Finance House which, in turn, approached The International Investor (TII is a Kuwaiti investment bank) to assist in structuring and underwriting the Islamic tranche. This case was set in early December 1995, and the purpose was to decide which Islamic structure to use, how to resolve various conflicts between the Islamic and conventional tranches, and how large a commitment would be for the investors.

Vietor and Evans (2003) summarize world markets for oil and natural gas from 1980-2001 and examine the rise of OPEC, two oil shocks, Gulf War efforts, and the pricing issues facing Saudi Arabia.

Porter & Emmons (2006) explains that Acoplasticos was established in 1961 as a lobbying group for Colombia's major plastics manufacturing companies. In the early 1980s, the organization shifted its focus toward improving the productivity of the Colombian plastics and rubber cluster, which also included certain petrochemical, manmade fiber, paint, and ink industries. Despite

significant improvements in the performance of the Colombian plastics and rubber clusters during the 1990s, management was concerned about the challenging economic and political environment in 2002 and wondering what adjustments Acoplasticos would need to make in its strategy for going forward.

Crane & De Pinho (2006) explain how Brazilian petrochemical company is evaluating its options to participate in auction of shares of Copene (a "cracking" company that provides ethylene and other materials). If Ultra was successful with its bid it would provide a controlling position in Copene.

On the other hand, the oil and gas industry has been the topic interest for macro level analysis by several global institutions like *IMF, World Bank,* and *UNCTAD* as a part of their research and project funding for energy sector development.

Some of the leading IMF Working Papers that covered oil and gas issues are mentioned briefly here.

- *An Oil and Gas Model (2007)* formulated a short-run model, with an explicit role for monetary policy, for analyzing world oil and gas markets.
- *World Crude Oil Markets: Monetary Policy and the Recent Oil Shock (2006)* examines the relationship between monetary policy and oil prices within a world oil demand and supply model.
- *Fiscal Policy Formulation and Implementation in Oil-Producing Countries (2003)* aims at providing policy recommendations drawing on theory and country experience. The scope reflects the significant operational involvement of the IMF with oil producers, particularly in terms of surveillance, program work, and technical assistance.

- *The Impact of Higher Oil Prices on the Global Economy (2000)* reviews the causes oil price increase and the outlook for 2001 and discusses the potential impact of increase in the price of oil on the global economy, focusing on the key channels through which it operates, and the effects of differing policy responses.

- *Financing Oil and Gas Projects in Developing Countries (1996),* focus on current and future investment opportunities in the oil and gas sector which are likely to be concentrated in developing countries. The study finds that project financing is scarce because of the commercial and political risks. Attempt to find out what can be done to mitigate the risks and attract funding.

United Nations Conference on Trade & Development (UNCTAD) recent research focus on the emerging issues in petroleum and energy sector includes two of these works:

- *The Organization of Petroleum Exporting Countries Competition and the World Trade Organization (2004*), tries to find answers whether "a possible agreement on competition adopted by the World Trade Organization (WTO) constitute a threat to the Organization of Petroleum Exporting Countries (OPEC)". This is a fear continually being expressed by the countries concerned, particularly since the Ministerial Declaration adopted at the Doha Conference in 2001 included in its provisions on competition measures condemning "hardcore cartels".

- *Adjusting To Recent Changes in the Energy Sector: Challenges and Opportunities (2006)* notes that oil prices have increased sharply and the security of energy supplies are major concerns. The implications of these changes for economic growth and development are potentially serious. However, the new situation also offers opportunities for developing countries in terms of accessing new markets and reducing

poverty. Therefore, this work focuses on the adjustment to higher and more volatile oil prices, and the opportunities offered by bio-fuels production and exports.

The World Bank is actively involved in the oil and gas sector and general energy sector projects mostly, in Africa, Asia and Russia. The successful development and implementation of these projects have been highlighted and formed the basis of World Bank's research in this area.

The leading management and strategy consultancy firms like McKinsey, PricewaterhouseCoopers , The Boston Consulting Group, Booz Allen Hamilton, and Deloitte have shown much interest in petroleum and petrochemical industry. Some of their studies offer valuable insights as mentioned below.

McKinsey & Company has conducted number of studies related to petroleum and petrochemical industry. Some of the relevant studies for this project are:

- *Curbing the Growth of Global energy Demand (2007),* shows that the growth in worldwide energy demand can be cut in half or more over the next 15 years without reducing the benefits end users enjoy. The key is a concerted global effort to boost energy productivity.
- *Meeting China's Energy needs through Liberalization (2006)* explains that China's thirst for imported oil has the government concerned about securing enough energy to keep economic growth on track. This study claims that a better alternative is liberalizing China's energy sector and open it to investment from international companies.
- *Capital Discipline for Big Oil (2005),* examines how the oil and gas industry has enjoyed its longest period of value creation in 40 years. It states that oil companies that invest on the assumption of a permanent structural change in the industry's economics run the risk of driving down prices and precipitating a market collapse. It suggests

that oil companies make their plans on the basis of capital discipline, focused M&A, and divestitures. In addition, they should shift their focus away from volume-based metrics and toward measures of true value creation.

- *National Oil Companies: the Right way to go abroad (2005)* ,observes that petroleum-rich countries and their national oil companies have long been striving to expand abroad. Success has eluded many of them, largely because they have failed to define clear economic objectives for their international ventures. It suggests that to manage national resources and establish a presence abroad in today's energy industry, these companies should fully evaluate all alternatives, including partnerships with multinational oil companies.

- *What's next for Big Oil? (2005),* observes that the petroleum industry's prosperity masks a growing uncertainty about the long-term ability of big international oil companies to replenish their energy reserves. This study suggests oil companies to be more attractive as partners to the national governments controlling oil and natural-gas reserves and that the major international oil companies need to build capabilities that give them a clear advantage over their rivals.

- *Petroleum: After the Mega Mergers (1999)* examines the historic mergers—between Exxon and Mobil, and BP and Amoco which rocked the global petroleum industry and *Alliances in Upstream Oil and Gas (1997)* attempted to bring a new perspective to Oil and gas alliances.

McKinsey Global Institute (MGI) has also studied the chemical industry very closely. Some of the relevant studies are: *Global Chemicals: China Remakes an Industry (2004),* and *Multiple Choices for the Chemical Industry (2003).*

PricewaterhouseCoopers (PwC) has conducted number of studies related to petroleum and petrochemical industry. Some of the relevant studies for this project are:

- *Value and Growth in the Liquefied Natural Gas Market (2006)* noted that the hype around LNG is intense. It makes a significant point that LNG is a means of delivery not a new energy source. LNG technology and infrastructure provide a means of monetizing otherwise stranded gas reserves and bringing them to market. It is certain that LNG will play a growing part in the future gas market. However, the development of LNG projects and businesses presents considerable new challenges for companies, whether they are upstream national or smaller oil and gas companies looking to find new markets, super majors developing integrated LNG chains or utility companies aiming to secure and diversify primary fuel supply sources. This study looks at the challenges for the various players and tries to map out the nature of these challenges – from handling geopolitical and trading risk to determining the best commercial and tax structuring – and the different strategies that need to be considered. The study further looks at how the LNG market is evolving and changing from a previously concentrated market to a future where it will take on more of the characteristics of the global oil market.

- *O&G Deals (2006 Annual Review)* is a new companion publication to PricewaterhouseCoopers' well established *Power Deals series* which reviews deals' activity in the electricity and gas utilities sector each year. Together, the two publications provide a comprehensive analysis of M&A activity in the energy sector as a whole. *O&G Deals* reviews deal activity in the oil and gas industry. This study examines both the rationale behind the overall trends and look at the key individual deals. It also looks both at the year under review and ahead to the future direction of deal-making in the sector.

Drawing on their global experience as an adviser to oil and gas players, PwC commentary addresses all key markets in the sector. PwC has also studied the chemical industry very closely. Two of the relevant studies are: *Chemical compounds: Mergers and acquisitions activity in the global chemicals industry, (2006);* and *Bulk and speciality chemicals in China: China risks and rewards (2005).*

The Boston Consulting Group (BCG) has conducted a number of studies related to oil and gas industry. Some of the relevant studies for this project are:

- *Maximizing Value in Upstream Oil and Gas (2007),* looks at two levers for driving value creation: improving recovery efficiency and reducing controllable costs. It outlines the questions and steps companies need to traverse to identify how to best optimize these two value levers, specifically in the areas related to recovery efficiency, workload, productivity, and human and capital resources.

- *Unlocking China's Energy Potential (2006), notes that* China's industrial development has created an insatiable appetite for energy. To continue this growth, China must increase its energy imports and make capacity additions. Study suggests that it must balance demands for security of supply, foreign investment and technology, energy affordability and efficiency, and environmental protection. Companies that have evaluated opportunities in China on the basis of the economics of a single project have had disappointing outcomes. This research suggests that a comprehensive energy partnership will yield better results.

- *Preparing for Fundamental Shifts in Energy: Strategies for a Changing Industry (2005),* explains that new trends in geopolitics, industry behaviour, cost structures, resource quality, and technology are causing tectonic shifts in the energy landscape. For industry players,

these shifts pose both significant threats and major opportunities. In this changing environment, energy companies must continue to make enormous long-term investments and necessary short-term commitments. This study provides recommendations in four areas: Integrate value and risk in portfolio strategy; create a winning strategy for refining; stake out a winning position in the global gas market; and take aim to hit utility cost reduction targets.

- *Integrated Value and Risk in Portfolio Strategy for Energy Companies (2005)* explores that in the next few years, global forces and demand shifts will affect gas markets to an unprecedented degree. Oil majors, national oil companies, and utilities must stake out their places in this increasingly global LNG market, taking into account new competitive and geopolitical factors. New opportunities and threats are emerging as a result of the intersection of the forces explored in this study. Market participants across all sectors must re-evaluate their positions and sources of advantage.

- *Create a Winning Strategy for Refining (2005),* explains that several factors have recently come together to create higher refining margins and are likely to extend the profitability cycle over the next few years. Tempted by this favourable margin environment, refiners may over-invest, creating a capacity overhang. Creating a winning, global refining strategy is tricky because the issues and opportunities differ by geographic region. The study suggests that insightful analysis of each region is required, and a bias for action advantage of key structured shifts and timing.

Booz Allen Hamilton has conducted number of studies related to oil and gas industry. Some of the relevant studies for this project are:

- *Oil and Gas Industry - End-of-Year Overview (2006),* observes that for the last several years, the oil and gas industry has been plagued by shortages: in the supply of oil, in refining capacity, in talent, and in the capacity of service and supply companies. Coupled with the unabated increase in demand in the United States and Europe, as well as new demands by emerging nations, especially China and India there could be severe shortages ahead. The study suggests four strategies that can accomplish that goal: a heightened emphasis on unconventional, alternative, and renewable energy sources; effective strategies for managing human capital; implementation of the digital oilfield; and a strategic approach to sourcing. These approaches represent steps that companies can take on their own to deal with a challenging environment.

- *Building the E&P Factory - Lessons from Leaders in Other Manufacturing-Based Industries (2007)* explores the emphasis on scale, midstream infrastructure ownership, and "mass customization" of key technologies such as skid-mounted rigs and completion designs that have helped some E&P companies unlock the unconventional reserves.

- *International Gas Market: Growth Forecast Too Optimistic (2007),* explains that due to the widely divergent forecasts regarding the sale of gas, questions are being asked about the 400 billion euros worth of long-term investments in the European gas infrastructure in the coming 25 years. The study suggests that gas producers and consumers, however, have a common interest and can work together more closely to realize another spread of risk.

- *Toward a Flexible Energy Future (2007)* notes that governments must adopt flexible, market-based approaches to energy investments. This will help establish a framework for energy prices and protect governments from over reliance on any single source of energy.

Booz Allen has also studied the chemical industry very closely. Two of the representative studies are: *Getting Customer Segmentation Right in the Chemical Industry (2005)* and *The Future of Brazil's Chemical Industry (2003).*

Deloitte Touche Tohmatsu, in their Energy & Resources research, *Deloitte Research* claim to deliver innovative, practical knowledge that companies can use to improve their overall business performance which covers a range of topics including utility retailing, regulation, technology, geo-politics, oil and gas reserves, and globalization. Some of their relevant studies are mentioned below.

- *Regime Change in the Oil and Gas Industry (2006),* explains that over the last century, the oil and gas industry has witnessed its share of change and transformation. The break-up of Standard Oil in the U.S. resulted in the formation of large and vertically integrated "oil majors." These firms have dominated the international landscape for many years while recent industry consolidation has given rise to a handful of "super majors." Widespread nationalization of oil assets, largely in Arab nations in the middle part of the century, and most recently in Latin America, has created state-owned oil companies that by some measures, are larger than their private sector counterparts. This study explores the concept of disruption—a specific kind of innovation that has historically threatened the end of even the most powerful incumbent organizations—and the impact it may have on three segments of the oil and gas value chain: retail, refining, and exploration and production (E&P). The purpose of this study is to demonstrate at least three areas of the industry that are currently at risk in ways that could result in a significant shift in the relative profitability and even dominance of today's leading firms. By applying disruption theory to their industry, incumbent oil and gas firms may be able to capitalize on changes in market dynamics and become one of

the few populations of dominant companies to exploit and even profit from disruption rather than be victimized by it.

- *Globalization & Energy Supply: Strategic Risk in the 21st Century (2004), suggests that* supplying enough energy on a reliable basis at prices that won't hobble world economic growth is emerging is a challenge with repercussions that are hard to predict. For oil and gas companies, pipelines, generators, utilities and others in the energy business mean new opportunities but also serious risks. Meanwhile, massive infrastructure additions are required. The cost will be huge — US$16 trillion between now and 2030. Among the most critical needs are new production and transport facilities in the Middle East, Africa and Russia, but they don't have the necessary capital. Decision-makers in the energy industry, government, and international agencies thus face difficult decisions. *Deloitte Research* suggests that Strategic Flexibility is the answer — a set of insights about effective planning. Strategic Flexibility involves defining scenarios as to how the marketplace might evolve, moving forward with steps that would be appropriate under any circumstances and making contingent arrangements to address conditions that are specific to just one scenario. Strategic Flexibility thus offers energy companies the new options that are needed given the uncertainties that accompany growing dependence upon international energy trade.

Independent primary research firms serving business and investment firms like *Gerson Lehman Group;* energy industry consulting firms like *Purvin & Gertz,* have worked extensively to solve the business problem and offered management solutions to the problems faced by oil and gas industry. Similarly, the petrochemical consultancy firms like *Chemical Market Associates Inc, Nexant Chem System* and *SRI Consulting* work regularly with their clients in petrochemical industry and provide new insight on a regular basis. As these researches and consultancy groups' offer customized

solutions to their client, therefore, their studies are confidential in nature and not available for the academic references.

Most of the major oil and non-oil companies have their own research teams in their corporate planning department which work exclusively on business strategy and forecasting on regular basis. Some of the major integrated oil companies publish their industry outlook and share the industry forecast with public and use those forecasts to justify their business decisions and try to influence the stock prices. *BP Statistical Review of World Energy and ExxonMobil Energy Outlook* are some of the publications that fall into this category.

Investment bankers, other leading financial institutions also have keen interest in petroleum and petrochemical industry and regularly publish the industry reports for the investors.

2.4 WORKS ON THE GCC ECONOMY

Academic and business interest in the GCC economies is not new. While the six-nation GCC was specifically created as a political and economic block in 1981, it is only in recent years that it has been gaining acceptance as a trading coalition comparable to other countries and regions with high GDP rates, economic growth, population growth and per capita income. Business players say the GCC has been attracting the attention of other countries because of its high liquidity and strategic location, which makes it an ideal gateway to the rest of the Arab world and other parts of Africa, and even to India and China. Some of the relevant works on GCC economy and GCC petroleum and petrochemical sector are discussed below:

- *The GCC—An Emerging Center of Political and Economic Power in the Middle East (Global Insight, 2007)* notes that a combination of strong oil revenues, political stability, and sound economic policy has resulted

in noticeable economic development in GCC countries. It finds that the income and development gap between GCC and other Arab countries is significant and is expected to widen in the short term. The study also noted that the positive economic and legal reforms of the last decade have also played an important role in attracting increasing amounts of foreign expenditure. Saudi Arabia, for example, has significantly reduced the list of economic sectors that are closed to foreign investment. Another positive step in some GCC states was the reform of foreign-ownership laws that allowed for majority foreign ownership and, in some cases, allowed for 100% foreign ownership in real estate and financial services. This study suggests that although, GCC countries face a number of political and security risks but their overall economic outlook remains positive.

- *GCC Countries: From Oil Dependence to Diversification (IMF, 2003)* observes that over the past three decades the member countries of the GCC have witnessed an unprecedented economic and social transformation. Oil proceeds have been used to modernize infrastructure, create employment, and improve social indicators. The study takes into account the structural reforms in the member states. The study concludes that GCC countries have come a long way since concerted attempts at economic transformation were initiated more than two decades ago. Their standard of living has continued to rise despite heavy dependence on volatile oil revenues and rapid population growth. The study suggests that reduction in vulnerability to volatile oil receipts requires a prudent fiscal policy and strengthened structural reform to spur diversification.

- *The Oil Supply and Demand Context for Security of Oil Supply to the EU from the GCC Countries (Oxford Institute for Energy Studies, 2005)* points out the growing dependence of this region on what are considered strategic commodities. The study poses the question: does

this dependence constitute a concern in terms of security of energy supply to Europe and what forms of partnerships can bolster security of supply? It examines the prospects for and implications of the growing contribution of oil and natural gas from the GCC countries and concludes that the prospects for supply from the GCC and therefore its economic prospects and potential for diversification depend largely on developments outside the region and how they affect the markets for hydrocarbons.

- *Beyond Oil: Reappraising the Gulf States (McKinsey, 2007)* the study critically examines the GCC states economic development. It notes that the rapid increase in oil-export revenues and the growth oriented economic policies of GCC nations have led to an unprecedented economic boom. The study suggests that the GCC's political and business leaders must take the advantage of the opportunity to build a vibrant private sector focused on creating value rather than on merely extracting it from oil and gas reserves. How they manage that opportunity has far reaching implications not only for their own population but also for the entire global economy.

- *Moving Energy-intensive Industries to the Gulf (McKinsey, 2004)* notes that soaring energy prices in the West have made the GCC region an attractive location for multinational producers of energy intensive commodities such as aluminium, petrochemicals and steel. The study also observes that that most of the GCC companies have improved their skills and technology and the GCC governments are seeking business partners that can help them develop the economy and create jobs. The study suggests that to succeed in GCC region, multinational companies must understand clearly the needs of governments and other stakeholders in the region and structure broad deals that offer value for government and business partners involved.

After review of the above mentioned works done in the area of foreign investment, strategic investment decisions, petroleum and petrochemical industry and GCC economy, it is clear that no significant attempt has been made so far to explore the strategic investment decisions in petrochemical industry in general and in GCC petrochemical industry in particular.

The growing importance of GCC region in the world economy and the increasing influence of petrochemical industry on global manufacturing industry , jointly offers a very interesting area of research, which successfully guided to my research topic: *Strategic investment decisions in petrochemical sector: A comparative study of GCC countries* .

This research will seek to explore the strategic investment decisions in GCC petrochemical industry and present comparative case studies of six GCC countries - Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE and will carry out the comparison of petrochemical investment environment, cost competitiveness, structural changes and strategic investment decisions. Finally, this study will present the strategies for petrochemical investments in the GCC region.