Analysing the Impact of the World Trade Organisation (WTO) on the Sustainability of Competitiveness of the Petrochemical Industry in Saudi Arabia

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Analysing the Impact of the World Trade Organisation (WTO) on the Sustainability of Competitiveness of the Petrochemical Industry in Saudi Arabia

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A Doctoral Thesis submitted in fulfilment of the requirement for the award of Doctor of Philosophy at Durham University

2010

School of Government and International Affairs
Durham University


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DECLARATION

The work presented in this thesis entitled “Analysing the Impact of the World Trade Organisation (WTO) on the Sustainability of Competitiveness of the Petrochemical Industry in Saudi Arabia” is entirely my own and was carried out between October 2006 and December 2009 at Durham University. This material has not been previously submitted to any other institute or university for a degree or qualification.

DEDICATION

In the name of Allah, most merciful, most gracious

I would like to dedicate this work to my dear beloved parents, may Allah preserve them.

This work is also dedicated to the spirit of my grandfather (God have mercy), who was the first encourager and supporter to me in continuing my education.

I would like also to dedicate this work to the memory of my beloved grandmother, who was praying Allah to me until the last time I saw her.

I dedicate this work also to all my brothers and sisters, who have always encouraged and supported me for further study.

I would also like to dedicate this work to my beloved wife, who provides me with unlimited care, support and encouragement that I need to achieve my goal and success.

Lastly, I dedicate this work to my dearest children Omar, Mohammed, Mohannad and Leena who were patient and endured living in foreignness and suffered as a result of not spending sufficient time with them during the period of my study.

ACKNOWLEDGMENTS

All the praise goes to Allah for his generous blessings, without which I would not have completed this work.

My utmost deep and sincere gratitude goes to my PhD supervisor, Dr. Mehmet Asutay, for his enthusiasm, inspiration, encouragement, knowledge, support and constructive comments throughout this work. Thank you very much Dr. Mehmet for one-of-a-kind supervision.

I like to express my gratitude to my second supervisor, Professor Rodney Wilson, for his help and support.

I gratefully acknowledge to all the participants in the study, led by his highness prince Saud Bin Abdullah Bin Thunyan Al-Saud the chairman of Royal Commission for Jubail and yanbu, who generously gave me some of their valuable time.

I would like to express my deep appreciation and gratitude to Professor Abdulwahab Al-Sadoun, the director-general of the Energy Sector at Saudi Arabian General Investment Authority (SAGIA) and the Secretary General at Gulf Petrochemicals and chemicals association (GPCA).

I am deeply grateful to my parents whose love is boundless; “the” thank you world that they deserve has not been created yet.

I would like also to thank my parents-in-law, my brothers and sisters for their continuous love, encouragement and support.

Finally, I would like to thank my small family, my wife and my children, for giving me love, happiness and joy; and for their endless support, encouragement and patience.

ABSTRACT

Analysing the Impact of the World Trade Organisation (WTO) on the Sustainability of Competitiveness of the Petrochemical Industry in Saudi Arabia

Abdulaziz M. Aljarallah

Saudi Arabia undertook measures to liberalize its economy in order to be a part of the WTO, which were carried out in a gradual manner long before the country was accepted as a member of the organization. The reform measures are still being implemented and the economy opening up to foreign investors. The WTO accession has enhanced the optimism of the investors towards the benefits that are expected to be achieved from this membership. The stock market has already responded to these changes through a positive signal and a higher level of foreign direct investment (FDI) is expected in the coming years. This flow of investment will provide an opportunity for diversification of the oil rich economy of Saudi Arabia. Saudi Arabia has been gradually growing into a centre for production of petrochemicals in the world. Owing to the competitive and none fluctuating price of natural gas, investments in olefins and derivatives have increased, which also bring high returns.

The aim of this research, hence, is to analyse the impact of Saudi Arabia's accession to the WTO on the petrochemical industry, and to analyse whether the competitiveness of the industry is sustainable under these new circumstances. In doing so, this study also analysis the strengths, weaknesses, opportunities and threats of the industry with the objective of identifying the competitive advantage of Saudi Arabian petrochemical industry by utilizing Porter's model. The study also provides a discussion on the possible steps that the government might take towards establishing an economy conducive to foreign investment, competition for the growth of the petrochemicals industry.

In responding to the aims and objectives of the study, both the qualitative and quantitative approaches were used. The qualitative analysis includes an analysis of expert opinions collected through elite interviews using semi-structured questionnaires. All these are structured to obtain the opinions of 20 participants regarding the trends and developments of the petrochemical industry and the related policies undertaken by the government. The quantitative analysis includes collecting secondary data for exports and imports of products of the industry along with relevant secondary data analysis of some of the leading petrochemical companies.

The results of the analyses at various levels demonstrate that the petrochemicals industry has the potential to contribute to the gross output, diversification of the economy and the sources of earnings, and hence reducing the dependency on oil as the only source of income. In addition, the analysis shows that the industry has potential for the creation of jobs, new openings for investments in businesses, opening up the domestic markets towards certain new products and at the same time bringing down the reliance on imports. Furthermore, the qualitative analysis shows that government has already taken steps towards promotion and encouragement of FDI inflow in the industry but several other measures related to infrastructure and security factors need to be adopted. The nation already enjoys competitive advantages and benefits of location advantages apart from the cost advantage in oil extraction and petrochemicals production. Accession of Saudi Arabia to the WTO as a member country has opened the economy to the outside competition and the petrochemical industry was supposed to be getting the gains from trade and open economy. The global investors have demonstrated their optimism about investment in Saudi Arabia. The existing opportunities in the petrochemical sector will receive a boost apart from diversification of the oil-based economy. The country is gradually becoming a booming centre of petrochemical industry and the growth is exponential. Technological barriers are gradually broken and the industry is moving towards sustainable development. Owing to the competitive pricing of the natural gas sector and cheap availability of feedstock have made it a lucrative place for investment in petrochemical production. However, it will take some more years to realize the full benefit of the accession to the WTO as complementary sectors are also being developed. The membership has however opened the strengths as well as the weaknesses of Saudi's petrochemical industry to the entire world. Thus, the membership brings on greater transparency, enabling easier and faster assessment and remedies.

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ABBREVIATIONS

ARAMCO: Saudi Arabian Oil Company

bbl/d: Million Barrels Per Day

BCF: Billion Cubic Feet

BCM: Billion Cubic Meters

CDSI: Central Department of Statistics and Information

CTHA: Chemical Tariff Harmonization Agreement

DDA: Doha Development Agenda

DWT: Dead Weight Tonnage

GATS: General Agreement on Trade in Services

GATT: General Agreement on Tariffs and Trade

GCC: Gulf Cooperation Council

GDP: Gross Domestic Product

GOSP: Gas-Oil Separation Plants

GPCA: Gulf Petrochemicals and Chemical Association

ICCA: International Council of Chemical Associations

ITO: International Trade Organisation

KAYAN: Saudi Kayan Petrochemical Co.

LPG: Liquefied Petroleum Gas

MENA: Middle East and North Africa

NGL: Natural Gas Liquid

NPC: National Petrochemical Company

NSCSA: The National Shipping Co. of Saudi Arabia

OPEC: Organization of the Petroleum Exporting Countries

Petroline: East-West Crude Oil Pipeline

PETRORabigh: Rabigh Refining and Petrochemical joint venture

PIC: Kuwait's Petrochemical Industries Company

PVC: Polyvinyl Chloride

QPFDP: Qalif Producing Facilities Development Program

SABIC: Saudi Arabia Basic Industries Corporation

SAMA: Saudi Arabia Monetary Agency

Samba: Saudi American Bank

Saudization Program: is Striving to Increase Workforce Participation of Saudi Nationals in the Kingdom of Saudi Arabia

SBUs: Strategic Business Units

SCCI: Saudi Chamber of Commerce and Industry

SCCIC: Saudi Council of Commercial and Industrial Chambers

Scfd: Standard Cubic Feet per Day

Sipchem: Saudi International Petrochemical Company

SWOT analysis: (Strengths, Weaknesses, Opportunities and Threats)

t/y: Tons/Year

Tasnee: National Industrialization Company

TCF: Trillion Cubic Feet

TNC: Trade Negotiations Committee

TRIPS: Trade Related Intellectual Property' Rights

TRIPS: Trade-Related Aspects of Intellectual Property Rights

ULCCSs: Ultra Large Crude Carriers

VLCCs: Very Large Crude Carriers

WTO: World Trade Organization

Chapter 1

INTRODUCTION

1.1. OVERVIEW

The Kingdom of Saudi Arabia is located in the southwest corner of Asia; between Asia and Africa, with a land area of 2,000,000 square kilometres (1,242,742 square miles). It is surrounded by the Kuwait, Jordan and Iraq from the North, Oman and Yemen from the South, Red Sea from the West, the Arabian Gulf, Qatar and the United Arab Emirates from the East (Central Department of Statistics and Information, 2009).

The estimated population of the Kingdom in 2008 amounted to 24.81million (including 6.69 million non-Saudis). 78.2 percent of Saudi Arabia population is below 40 years of age, and 32.3 percent are below 15 years of age. During 2008 the total force working in the Kingdom is about 8.45 million, 49.3 percent of them Saudis and 50.7 percent are non-Saudis. The workers in the government sector account for 899.7 thousand, Saudis workers represent 92 percent and the remaining 8 percent represents the non-Saudis labour. The workers in the private sector are 6.2 million, the Saudis account for 13.3 percent, while the remaining 86.7 percent constitute non-Saudis labour (Saudi Arabian Monetary Agency, 2009).

The first real opportunity for Saudi Arabia to carry out vast social, economic and political reforms was after discovering the oil in 1938, which happened after five years of exploration work in the Eastern Province of the Kingdom by the Standard Oil of California (SOCAL and today Chevron). Such concession to SOCAL explore and produce oil in that Province was granted by Saudi Arabia government, and developed during the past 75 years to become the Saudi Arabian Oil Company (Saudi Aramco), the petroleum company number one in the world. The first shipment of the Saudi oil to the global market was exported in May 1939. Today, the fields discovered are around 110 fields; most of them are oil fields while some are both oil and gas or only gas (Saudi Arabia Ministry of Petroleum and Mineral Resources, 2009).

According to OPEC-Annual Report (2008) the Kingdom has the largest proven oil reserves in the world; it is the first oil exporter and second world producer after Russia. The proven oil reserves by the end of 2008 reached about 264 billion barrels, which is about 21 percent of the total world's proven oil reserves. The Kingdom's proven oil production in 2008 achieved an average of 9.2 million b/d, which is about 12.7% of the world's proven oil production. The oil exports of the country in the same year reached about 7.3 million b/d *i.e.* 18% of the total global oil exports. (OPEC - Annual Report, 2008; OPEC-Annual Statistical Bulletin, 2009).

Saudi Arabia has the world's fourth largest gas reserves. The Kingdom's natural gas estimate reserve is about 263 trillion cubic feet (TCF) which is about 744 billion cubic meters (BCM). The average gas production has grown in the past two decades as a result of large global demand for natural gas, so in 2008 the production increased to reach 8.3 billion cubic feet per day, which is 3.0 trillion cubic feet annually. The Kingdom's production of natural gas liquid in the same year was about 402 million barrels, around 71% of it was exported (Aramco Annual Review, 2008).

Saudi Arabian economy continued its growth during 2008 benefited from the increased international oil demand, continuous structural and organizing reforms' efforts of the government to attain better economic growth rates together with the general price level stability, as well as diversifying of sources of income and creation of more jobs. In 2008 the Kingdom's economy generated a Gross Domestic Product (GDP) of $468.8 billion, at a GDP per capita of $18,896. The preliminary data shows that the total value of the country's goods exported in 2008 reached $314.3 billion compared to $233.8 billion in the previous year, representing a rise of 34.4 percent. Oil exports, including crude oil and refined products, represented 89.7 percent of the total Kingdom's exports. Non-oil Exports represented 10.3 percent of the total Kingdom's exports, which is $32.5 billion. During 2008 petrochemical exports witnessed a rise of 16 percent, which stood at $16.7 billion by constituting 51.4 percent of the total non-oil exports of the country. Table 1.1 shows the main components of the Kingdom merchandise exports from 2005 to 2008.

Table 1.1: Saudi Merchandise Exports *(Million Riyals)* [1]

	2005	2006	2007*	2008**	Annual Change%
Oil Exports	**605,881**	**705,811**	**769,935**	**1,053,732**	**36.9**
Crude oil	513,939	607,509	668,564	926,613	38.6
Refined products	91,942	98,302	101,371	127,119	25.4
Non-oil Exports	**71,263**	**85,528**	**104,468**	**121,622**	**16.4**
Petrochemicals	42,055	45,936	53,847	62,464	16.0
Construction materials	6,154	7,908	10,778	12,679	17.6
Agricultural, animal and food products	4,361	5,228	7,442	8,875	19.3
Other goods***	18,693	26,456	32,401	37,604	16.1
Total	**677,144**	**791,339**	**874,403**	**1,175,354**	**34.4**

[1]: US Dollar = 3.75 Saudi Riyal
* Revised figures. ** Preliminary data. *** Including re-exports.
Source: Central Department of Statistics and Information, 2009; Saudi Arabian Monetary Agency, 2009)

According to a preliminary data from the Saudi Arabian Monetary Agency (SAMA) in 2008, the Kingdom's total imports of goods was $115.5 billion, increased by 27.7 percent compared to the previous year (Saudi Arabian Monetary Agency, 2009).

Aside from encouraging companies to hire more Saudi nationals, a policy called Saudization , the Saudi government continues to encourage private sector growth with economic sectoral diversification policies to lessen the nation's dependence on oil revenues and increase employment opportunities in service sectors such as construction, tourism, banking, and finance. It also encourages private and foreign participation in power generation, natural gas, telecommunications, and in the petrochemical industries. As a consequence of economic diversification policies, the government established six 'economic cities' in different regions to promote economic development and diversification.

An important move in economic reform to attract foreign investment and diversify the economy is Saudi Arabia's accession to the World Trade Organisation (WTO) in December 2005, after more than ten years of negotiations. WTO membership signals to the world Saudi Arabia's willingness to open up its economy to global competition,

to adapt its legal systems to the demands of world trade, and to face modernisation that would have an impact on Saudi's society and politics (Clatanoff *et al*., 2006).

As the world's biggest exporter of crude oil, the country has the potential to be the world's biggest petrochemical producer, a position that is currently held (surprisingly) by Germany (Glass, 2007; Clatanoff *et al*., 2006; Al-Ghamdi and Sohail, 2006). This study, therefore, focuses on the influence of the WTO on the continuity of competitiveness of the petrochemical industry in Saudi Arabia.

Saudi Arabia is one of the most important and largest petrochemical producers in the world. It has also huge reserves of natural gas, which is the most important source of ethane, which, in turn, is the most important feedstock of petrochemical industry (GOIC, 2002; Al-Ghamdi and Sohail, 2006). The petrochemical industry was established prior to mid eighties, and it was completely under government control. The main aim of the government at that time was to build the infrastructure for the industry. However, at the late eighties and beginning of the nineties the government opened its upstream petrochemical sector to both domestic and foreign investors. However, foreign investors were subjected to a number of restrictions (Al-Sa'doun, 2006a). Although Saudi Arabia has joined the WTO in 2005, the period between 2000 and 2005 has shown serious of initiatives that have been undertaken to move towards globalise production. The petrochemical producing firms of the Kingdom stared to acquire foreign firms during this phase (Samba, 2009b).

Since 1985 to 2006, the petrochemical industry production capacity had increased by around ten times (Al-Sa'doun, 2006a). This growth is expected to continue following the WTO accession. Although Saudi petrochemical industry is facing international and domestic competition from foreign companies, it is still being expected that the production capacity of the country would reach to a level as high as 70 million tons per year by 2010 (Al-Sa'doun, 2006b).

In spite of the challenges the industry is going through (discussed in chapter 3); the industry is still now maintaining its growth momentum. Thus in the post WTO accession regime the petrochemical industry is being expected to a positive, and even exponential growth trend countering all challenges.

1.2. AIM AND OBJECTIVES OF THE STUDY

This study aims to assess the strategic or long-term impact of WTO membership on Saudi Arabia's petrochemical industry by directly evaluating the country's competitiveness and comparative advantage and their sustainability in petrochemical industry. In doing so, the study attempts to correlate directly the developments and trends in Saudi Arabia's petrochemical industry with the impact of the WTO. This study also aims to enumerate a set of recommendations that would assist in overcoming the potential difficulties and sustain its competitive advantage in the sector.

In reaching its aim, the following specific objectives are developed:

(1) to evaluate the trends and developments in the petrochemical industry in Saudi Arabia over the years;

(2) to discuss and critically analyse the WTO's impact on Saudi Arabia by making particular reference to its rules, policies, and procedures in terms of their impact on Saudi Arabian petrochemical industry;

(3) to conduct a strategic analysis of Saudi Arabia's petrochemical industry;

(4) to utilise a theoretical framework in explaining the competitiveness of Saudi Arabia in petrochemical production and export;

(5) to conduct a SWOT analysis to assess the competitiveness of the country;

(6) Recommend a detailed course of action that would lead to the sustainable competitiveness of Saudi Arabia's petrochemical industry.

1.3. RESEARCH QUESTIONS

This study attempts to answer the following questions:

(i) What impact has the WTO membership have on Saudi Arabia's petrochemical industry? Considering that Saudi Arabia is the world's biggest petroleum exporter and a key player in the high value-added petrochemical industry, how would WTO membership benefit or create disadvantages for Saudi Arabia's petrochemical industry and allow it to realise its full potential?

(ii) How would WTO membership help the Kingdom add value to its oil exports? This study describes the strategies that Saudi Arabia could utilise in order to maximise the value-added component of petrochemicals to its huge petroleum exports.

(iii) How would WTO membership provide an impetus to reduce production costs in the petrochemical industries? Since the WTO's goal is to reduce barriers to competition, its members would be motivated to improve its cost and operating structures to be more competitive with the more efficient global petrochemical industry players.

(iv) How would WTO membership, as a consequence, help to sustain the competitiveness of the petrochemical industry and increase its profitability and diversification? One of the claims of WTO for encouraging membership is that it levels the playing field for companies in various industry sectors. By 'helping' countries adopt competitive global trade policies, the WTO claims that it would help these countries to sustain the competitiveness of their industries, increase profitability and allow its economy to diversify its source of revenues and growth. This will be verified in the Saudi Arabia case.

(v) How could the national competitiveness of Saudi Arabia's petrochemical industry be sustained institutionally and operationally after WTO membership? WTO opens Saudi Arabia's to opportunities for world trade and technology transfer, factors that strengthen the petrochemical industry's competitiveness and over-all contribution to the Saudi economy. The question is whether Saudi Arabia is ready for it?

1.4. SIGNIFICANCE OF THE RESEARCH

The significance of this study lies in the fact that after the negotiations for the membership of WTO is complete it is now time for the Saudi government to reap the benefits of the terms and facilities as far as the petrochemical industry is concerned. Being an oil rich economy and with competitive prices of natural gas, the nation is a lucrative destination for investors. However several aspects need to be ensured and the study points out what and where improvements are necessary. A SWOT analysis strips the economic scenario with respect to the petrochemical sector. The literature

studied shows the trends of growth in the petrochemical sector of Saudi Arabia and the terms and conditions of the WTO accession of the nation. A goal was set to liberalize the economy in order to gain stability. This study fills the gap between the stage of accession and the final goal to be reached. This gap is filled with the help of a rigorous analysis of the problems and opportunities along with recommendations for the government in order to make investment conducive for the petrochemical sector.

1.5. METHODOLOGY: COMPETITIVE STRATEGY ANALYSIS FRAMEWORKS

Two forms of research data were gathered to guide the research investigation in this study. Quantitative, or secondary, data were in the form of economic and financial reports and studies, government statistics and other forms of quantified data on the petrochemical industries in Saudi Arabia. Qualitative, or primary, data were in the form of semi-structured purposive interviews of experts and opinion leaders in the petrochemical industry as well as petrochemical experts employed in academic organizations. A purposive (or judgemental) sampling technique was used to select the interviewees based on the expertise they possessed. Such a technique allows an objective observation of the important events from various related angles. This interview technique is often used with small and informative sample group (Neuman, 2000; Saunders *et al.*, 2002).

Interviews allowed the acquisition of first-hand information from actual sources using a combination of correspondence and personal narrative techniques that are amongst the best forms of primary sources in research (Moser and Kalton, 1971; Chisnall, 2001).

1.6. OVERVIEW OF THE RESEARCH

The thesis is consisted of nine chapters.

Chapter 1 provides an overview of the entire study, the issues researched and analysed, the research philosophies, processes, and data gathering and analysis methodologies used.

Chapter 2 is an in-depth critical analysis of the WTO and the consequences of membership for nations in general and to Saudi Arabia in particular.

Chapter 3 focuses on the Saudi Arabian petrochemical industry, its history, past developments and future prospects, as Saudi Arabia is one of the world's largest players in the sector.

Chapter 4 presents some WTO rules on chemical tariffs and other related agreements. It also presents the results of Saudi Arabia accession to the WTO in terms of petrochemical tariffs; and WTO and performance of Saudi's petrochemical exports.

Chapter 5 discusses the methodology related issues in particular by focusing on the interview question design, sampling technique, the interview process and how the interviews were conducted and methods of data analysis.

Chapter 6 summarises the transcripts of the interviews and provides analysis of the data using coding and content analysis methods. The interviewees feel that challenges are faced from external competitions but most of them also believe that the current structure of firms is adequate to encounter and deal with global challenges. They have identified three main areas that the government needs to look into – trained manpower, support and encouragement and increase of productive capacity in the petrochemical sector.

Chapter 7, as the second empirical chapter, discusses the issues related to competitive advantage focusing on the results of the competitive advantage strategic analysis framework developed by Porter. As the nation began to liberalize and privatise its economy after its accession of WTO, the massive oil industry stimulated the petrochemical sector and made it more competitive. Using Porter's Diamond Model some aspects were identified as the determinants of competitive advantage. The healthy growth of GDP ensures a strong demand side. In the context of firm strategy and rivalry one may say that nation's position is quite competitive, but the factors which support competitive advantage need to be strengthened. Some of the recommended steps are further skill generation, research and development, increase feedstock production and development of stock market to address the financial problem.

Chapter 8 performs a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) of the Saudi Arabian petrochemical industry. The strengths and weaknesses are analysed based on the industry's internal resources, while the opportunities and the threats are studied on the basis of the external factors that are confronted by the industry.

An overall SWOT analysis shows that the economy, and especially the industry, has adequate strengths and opportunities to explore but some relative moderate degree of concerns come as threats and weaknesses too. Abundance of petroleum products, large feedstock production at competitive prices and growing demand for petroleum products all support foreign investments and increased competition.

The weakness lies in the fact that the nation is too much dependent on natural resources for its GDP growth. A crisis in the same would therefore lead to negative impact on the economy. Again security issue is a major threat and steps are taken to improve the scenario in this respect. Energy intensive sectors need to be concentrated upon in order to avoid over dependency of the economy on the oil sector.

Chapter 9 is a brief conclusion containing key recommendations for Saudi Arabia's government planners and petrochemical industry leaders based on the study findings.

Chapter 2

WTO AND MEMBERSHIP OF SAUDI ARABIA

2.1. INTRODUCTION

This chapter provides an in-depth critical analysis of the World Trade Organisation (WTO) and the consequences of membership for nations in general. The chapter also looks at a brief history of Saudi Arabia's accession to the WTO, the arguments that went into its negotiations prior to the decision to push through with its membership, and takes a critical look at the pros and cons of such a step.

2.2. BRIEF HISTORY OF THE WTO

The WTO is an international organization; members are not sovereign States, but economies. The WTO's central offices is locates in Geneva, Switzerland. The WTO was founded in 1995 upon the conclusion of the General Agreements on Tariffs and Trade (GATT), Uruguay Round. This process consumed eight years to reach such conclusion (1986-1994) (WTO, 2006a).

The WTO has around 153 members, who meet on a regular basis to discuss and approve trade policies, as well as conduct rounds of negotiations. Doha Round, which began in 2001 during the WTO meeting in Doha, Qatar, which has not concluded yet (WTO, 2006a).

The history of The WTO presented a controversy for this basic reason: The WTO is a forum where business deals and agreements amongst nations are negotiated, rejected, or agreed upon. As in any business deal, there are necessary consequences, some of which may not be agreeable to one party or a large portion of a nation's (or region's) population. Besides, anyone who enters into a business deal would want to get the best terms (maximise profits and gains and minimise costs), but real-life experience has shown that this is not always possible. Such an internal trade dilemma can best be seen in a country case that wants to protect its farmers for political and social reasons may raise tariffs that act as barriers to imports from other countries, and if the same

country wants to export goods, it argues for lowering tariffs in other countries which, in turn, may want to protect its own industries. Thus, mutual terms of trade must be established to facilitate the trade between countries (WTO, 2006a).

If both countries want to trade with each other, thus, both have to negotiate equitable terms of trade; which would translate into decreasing tariffs and subsidies, as well as allowing exports. In some cases, this leads to absurd situations, which is the source of most of its conflicted image (WTO, 2006a).

Such controversies seem to be part of the colourful history of the WTO, which began right after the Second World War with the establishment of International Trade Organization or ITO, a trade body within the UN. The ITO was supposed to open up trade between the devastated losers and winners of the War, but this initiative was shot down by big business groups in the USA and by the Senate on the ground that free trade was a threat to American sovereignty. Since then, a continuous series of General Agreement on Tariffs and Trade (GATT) Rounds have been negotiated over the last fifty years until the WTO was established in 1995 as a forum for trade negotiations to take place (WTO, 2006a)

Prior to the GATT Uruguay Round (1984-1994) and the WTO Doha Development Agenda (or DDA, which began in 2001), there have been seven rounds of negotiations in the last sixty years. The Geneva 1 (1947), Annecy (1949), Torquay (1950-1951), Geneva 2 (1956), and Geneva 3 (also known as 'The Dillon Round', 1960-1961) resulted in tariff reductions. The Geneva 4 (also known as 'The Kennedy Round', 1964-1967) agreement saw world industrial tariffs reduced by a third and anti-dumping measures adopted by several trading countries. The Geneva 5 (also known as 'The Tokyo Round', 1973-1979) agreement resulted in several tariff, non-tariff measures, and framework agreements that further boosted world trade. The Uruguay Round, the last completed negotiating round, was the largest ever package of market access concessions and included agreements on trade in services and intellectual property and created the WTO System (WTO, 2006a). Table 2.1 provides summary information about the eight GATT trade rounds.

Table 2.1: GATT Trade Negotiations Rounds.

Year	Place/Name	Subjects Covered	Countries
1947	Geneva	Tariffs	23
1949	Annecy	Tariffs	13
1951	Torquay	Tariffs	38
1956	Geneva	Tariffs	26
1960-1961	Geneva (Dillon Round)	Tariffs	26
1964-1967	Geneva Kennedy Round	Tariffs and anti-dumping measures	62
1973-1979	Geneva (Tokyo Round)	Tariffs, non-tariff measures, 'framework' agreements	102
1986-1994	Geneva (Uruguay Round)	Tariffs, non-tariff measures, rules, services, intellectual properties, dispute settlement, textiles, agriculture, creation of WTO,	123

Source: WTO, 2006a

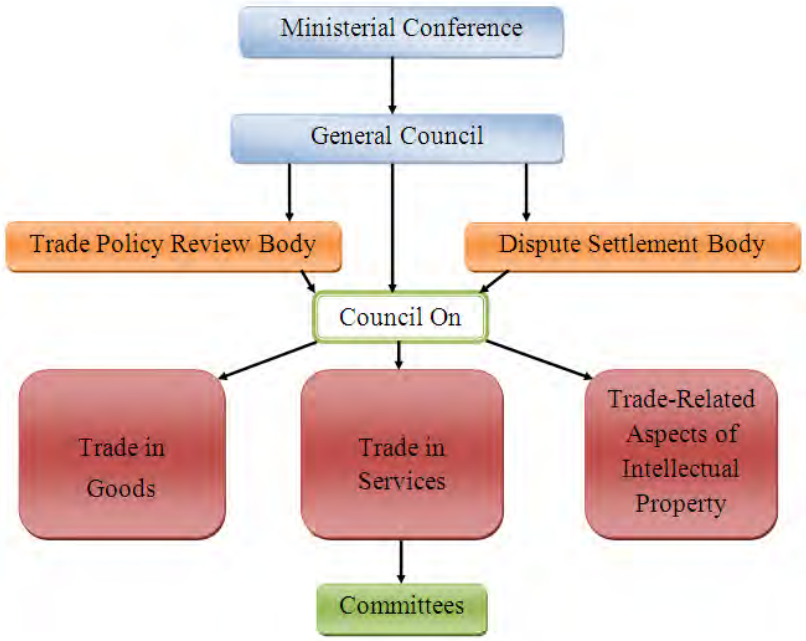
2.3. THE WTO SYSTEM

The WTO is the international organisation responsible for global rules and regulations that govern trade amongst countries; with the principal role of guaranteeing the smooth and free flow of trade. Following it predecessor, the GATT, the WTO is a forum for continuous multilateral trade negotiations with the aim of liberalising world trade and administration that are the result of trade agreements. WTO trade agreements are reached based upon a consensus of participating members and are ratified domestically by each member country, which are responsible for monitoring compliance with these far reaching trade agreements and setting the organisation's course. The WTO has also developed a system to settle any dispute with the objective of reducing trade friction that could occur through different interpretations of the agreements and commitments (WTO, 2006a).

The WTO was created on January 1, 1995, as the result of the Uruguay Round trade negotiations and is one of the world's leading international economic institutions. The establishment of the WTO completed the three pillar system envisaged at Bretton Woods, alongside the World Bank and International Monetary Fund. The WTO has a cooperative relationship with the United Nations, but it is not a UN's specialised agency (WTO, 2006a).

The WTO's top level decision-making body is the Ministerial Conference which meets at least once every two years. Ministerial Conferences have been held in Singapore (1996), Geneva (1998), Seattle (1999), Doha (2001) Cancun (2003), Hong Kong (2005) and Geneva (2009). The General Council is the main implementer of the day-to-day work at the WTO, which conducts work on behalf of the Ministerial Conference and reports to the Conference. Firstly, the Council conducts work on behalf of the Ministerial Conference and reports to the Conference. Secondly, the General Council has subsidiary bodies: the Councils for Trade in Goods, Trade in Services (GATS), and Trade-Related Aspects of Intellectual Property Rights (TRIPS) which oversee the implementation of their respective WTO agreements. It delegates and approves the technical implementation of the mentioned bodies. Thirdly, the General Council convenes as the Dispute Settlement Body and as the Trade Policy Review Body. Finally, the Council oversees the Trade Negotiations Committee (TNC) (WTO, 2006b; American National Standards Institute, n.d.). The structure of the WTO is shown in the chart below (figure 2.1).

Figure 2.1: Structure of WTO.



Source of Information: WTO

2.3.1. GATT: Tariff Reductions and Liberalization of Trade in Goods

The WTO is the result of more than fifty years of experience along with the multilateral trading system, which was originally set up in 1947 under the GATT. The system was built up through a number of GATT negotiation rounds that initially contended with liberalising the trade of goods by using agreements to reduce customs tariffs, and through the development of rules and regulations to tackle other trade barriers (WTO, 2006d).

The most fundamental WTO rules of goods trade involve non-discrimination, both in the form of national treatment (prohibiting discrimination on the basis of nationality) and most-favoured nation treatment (the principle of providing to all trading partners the same customs and tariff treatment given to the so-called 'most favoured nation'). There are also many other technical rules designed to ensure market predictability. As a consequence of the Uruguay Round, as well as through years of experience, the applied rules of goods trade have been developed to improve the coverage of particular sectors such as textiles and agriculture. Furthermore, there are agreements that specifically address technical issues, for example customs valuation, trade remedies, product standards, sanitary and phyto-sanitary standards, subsidy disciplines, trade-related investment measures, import licensing procedures, rules of origin, pre-shipment inspection, and activities by state trading enterprises(WTO, 2006d; Bhuiyan, 2007).

2.3.2. GATT: Reform of Trade in Agricultural Products

Under GATT, agricultural negotiators developed an initial framework for the reform of agriculture with the Uruguay Round Agreement on Agriculture. This Agreement has first, set up the current regulations for agricultural trade. Second, it offered the framework for 'tariffication' of all trade barriers; and finally, it provided quantification of domestic support and export subsidies. It provided reduction commitments and implementation periods for all three of these 'pillars' of interest. The Uruguay Round also mandates continued negotiations to further reform agricultural trade (WTO, 2006d).

2.3.3. GATS: Trade in Services

Through the General Agreement on Trade in Services (GATS), the Uruguay Round stretched out the capacity of the multilateral trading system to include trade in services. The GATS comprises trade in significant sectors, such as financial services, tourism and telecommunications as well as others. By establishing a multilateral framework and a legal basis for future negotiations, GATS had the aim of removing barriers that discriminate against foreign services providers and renounce their market accessibility. The GATS framework not only includes what is known as the most-favoured nation treatment and national treatment principles, but also, it encompasses disciplines on domestic regulations. These rules give special attention to dealing with situations of particular services sectors, such as, financial services, air transport, telecommunications, and movement of labour (WTO, 2006d).

The mentioned framework is accompanied by national schedules that specifically include binding commitments to access the market and national treatment in individual service sectors. Moreover, the Uruguay Round mandates had continued negotiations with the objective of further reforming services trade in the agricultural sector. Furthermore, a number of seventy WTO members built upon their GATS sectoral commitments in 1997 and agreed to market access and national treatment commitments, which covered 93 % of world telecommunications revenue (WTO, 2006d).

These commitments include wider range of basic telecommunications services, including local and long distance, and international services by using both wire-line and wireless technologies. Moreover, in the same year (i.e. 1997), the seventy members had agreed on opening up their financial services sectors. This agreement covered more than 95 % of trade in banking, insurance, securities and financial information (WTO, 2006d).

2.3.4. TRIPS: Intellectual Property Agreements

One of the significant achievements of the Uruguay Round was the development of the WTO Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS).TRIPS was designed to guarantee effective protection for copyrights, sound recordings, trademarks, geographical indications, which include appellations of

origin, patents, industrial designs, integrated circuit layout designs (semiconductor chips), and undisclosed information, such as trade secrets and data submitted to obtain market approval of pharmaceutical or agricultural chemical products. It is safe to argue that TRPIS developed standards for the protection of intellectual property. It was also the first to highlight procedures and remedies in international laws that governments ought to provide under their domestic law, in order to effectively enforce these rights (WTO, 2006c).

2.3.5. Integration of Developing Countries

Large percentage of WTO members is developing and least-developed countries. WTO rules have been changed to suit and provide 'special and differential treatment' in addressing specific needs of the mentioned members in a pragmatic way. The special and differential treatment takes many structures; but it is generally directed towards the increased provision of trading opportunities as well as longer periods of time to implement agreements. Moreover, the WTO provides technical assistance to developing countries through training courses, missions to individual countries, and regional seminars (WTO, 2006e).

2.3.6. TPR: Trade Policy Reviews

One of the benefits of WTO membership is the ability of members to obtain a better understanding of their counter-parts' trade practices by using trade policy reviews. To encourage transparency and measure its impact, the Trade Policy Review Mechanism includes detailed periodic reviews of each member's trade regime. The reviews are based on a policy report that a country submits under examination and a report prepared by a group of WTO Secretariat economists. Over time, these trade policy reviews have approved to be useful in identifying technical assistance needs (WTO, 2006d).

2.3.7. DSU: Resolution of Trade Disputes

One of the functions of the WTO is to resolve the trade disputes that arise among its members. The Dispute Settlement Understanding (DSU), which is another product of the Uruguay Round, had created a better-built and more efficient system for resolving such disputes. The DSU performs its tasks by establishing procedures for consultations, legal arguments before a panel of experts and the opportunity to acquire

appellate reassessment. The Dispute Settlement Body (DSB) assumes the responsibility of settling disputes. It also has the sole authority of establishing the mentioned panels to arbitrate the disputes that arise between members as well as to either accept or reject the findings of panels and the Appellate Body – a standing appeals body of seven independent experts. Moreover, the DSB scrutinizes the implementation of the panel and Appellate Body findings. It also has the supremacy to authorise retaliation when a member does not comply with DSB recommendations and rulings (WTO, 2006d).

It takes the DSU approximately one year to provide for the settlement of trade disputes, and in the case of appeals, it takes the DSU approximately one and a half year. Unless there is an agreement not to adopt panel and Appellate Body report, the process of adoption is an automatic one. Once a panel report in a dispute situation is circulated to members, they are entitled to request the Appellate Body to examine and correct the report, if necessary, with three members serving on any one dispute. In case of having one member that does not comply with the obligations after settling the dispute, trade actions by the injured party are then authorised without risk of counter-retaliation (WTO, 2006d).

2.3.8. DDA: The Doha Agenda

At its Fourth Ministerial Conference, held in Doha, Qatar, in November 2001, the WTO embarked on an ambitious new round of trade negotiations — the Doha Development Agenda (DDA). According to the Ministerial Declaration, negotiations should be completed by January 2005. The Doha mandate focused on the interests of developing countries at the centre of the new negotiations, which now make-up more than two-thirds of the WTO's members. Because developing countries are faced with a number of challenges, the WTO members have largely expanded technical assistance and trade capacity building efforts directed towards these countries (WTO, 2001).

As a result of the Doha Declaration, the Trade Negotiations Committee (TNC) was created placed under the authority of the General Council. The role of TNC is to supervise the overall conduct of the negotiations. In early 2002, WTO members established a number of negotiating bodies with assigned chairpersons with the WTO

Director General serving as TNC chairman for the purpose of leading the different groups and managing the agenda. Assisted by the preparations of the WTO's built-in agenda on agriculture and services in October 2003, members were engaged in substantive issues of negotiations. All topics of negotiation would be conducted in the same time, except for the work of DSU review and negotiations on the registration system for geographical indications (WTO, 2001).

2.4. MISINTERPRETATIONS OF WTO RULES

2.4.1. The Non-existence of Enforcement Power of the WTO

As a result of being a 'member-driven' organisation, the WTO does not dictate to governments the ways of conducting their trade policies. Consequently, the rules of the WTO system are agreements that are the results of negotiations among member governments. The regulations are endorsed by members of parliaments (or their respective governments); furthermore, the WTO decisions are accountable and democratic as they are made by consensus among all its members (WTO, 2006f).

The only situation that requires a WTO body to directly impact government's policies is the one when a dispute is brought to the WTO and leads to a ruling by the DSB (which consists of all the members). Normally the DSB makes its judgement through the adoption of findings of a panel of experts or an appeal report. It is important to note that even then the scope of the ruling is narrow: it is merely a judgement or interpretation of whether a government has broken one of the WTO's agreements that it had accepted; then a government has to conform when it broke a commitment (WTO, 2006f).

It is important to note that the WTO does not decree governments to adopt or drop certain policies. Furthermore, the WTO Secretariat provides administrative and technical support for the organization and its members. In fact, it is quite the contrary where governments are the ones who dictate certain policies to the WTO (WTO, 2006f).

2.4.2. The WTO and Free Trade

It is important to note that negotiations between countries aim of looking at what is to be bargained over, what is to be given, taken and offered. Among the WTO's principles is to decrease the trade barriers as well as smoothen the flow of trade between countries, the reason for that being the benefits that countries get from the free flow of trade. However, the question of how much should these barriers be decreased still stands. The countries' negotiating positions largely depend upon their readiness to lower the barriers, as well as on what they want to obtain from other members in return (WTO, 2006f).

The commitment of a country is the right of another. The WTO secures the forum for negotiating liberalisation; it also provides the rules for how liberalisation can proceed. The rules written into the agreements give the required space to gradually decrease barriers in order to adjust domestic producers. Special provisions exist to take into account the situations facing developing countries. Moreover, they include when and how governments can protect their domestic producers. An example of such is considering imports to have unfairly low prices because of subsidies or 'dumping' (WTO, 2006f).

Fair trade is the goal. Just as significant as freer trade, are other principles of the WTO system; for instance, the principle of non-discrimination and making sure the conditions for trade are stable, predictable and transparent. This very much depends on what countries are willing to bargain (WTO, 2006f).

2.4.3. The WTO beyond Commercial Interests

It is crucial to note that commercial interests are not a priority over development. In fact, the WTO agreements are full of provisions that consider the interests of social and economic development. The fact that freer trade boosts economic growth and supports development underlies the WTO's trading system. In that sense, commerce and development complement one another. At the same time, the degree to which developing countries benefit from the system is a matter of continuing debate in the WTO. Nevertheless, this does not imply that the system is not offering anything for these countries; far from it. In fact, the agreements include a number of significant provisions that specifically address the interests of developing. Developing countries

are allowed more time to apply numerous provisions of the WTO agreements; moreover, least-developed countries receive special treatments that include exemption from many provisions (WTO, 2006f).

In addition, the need for development can be used to justify actions that are normally banned under the agreements, for example, specific subsidies provided by governments. The negotiations and the outcomes launched at the Doha Ministerial Conference in November 2001 include a number of pressing issues to developing countries. One principal objective that the WTO is determined to achieve is sustainable development (WTO, 2006f).

2.4.4. The Priorities of the WTO: Commercial Interests and Environmental Protection

Environmental concerns are specifically taken into account by many provisions. The preamble of the Marrakech Agreement that established the WTO includes the maximum use of the world's resources, sustainable development and environmental protection as some of its objectives; which are supported by a number of concrete provisions in the WTO's rules. Among the most important provisions are the umbrella clauses (Article 20, GATT) that give countries the necessary space to protect human, animal or plant life or health, and to conserve exhaustible natural resources (WTO, 2006f).

In addition, there are specific agreements that consider environmental concerns, and subsidies are allowed for environmental protection. The environmental objectives that are specifically recognised in the WTO agreements concern product standards, food safety, intellectual property protection, etc. Moreover, the system can help countries in the allocation of scarce resources in a more efficient and less wasteful manner (WTO, 2006f).

It is important to highlight that the measure of environmental protection at the WTO must be fair and just; for instance, they should not have a discriminatory nature. Furthermore, a country cannot be flexible with its own producers on the one hand and strict with foreign goods and services on the other; nor can a country discriminates between different trading partners. Equally important to note is that protecting the

environment is not the WTO's job; however, it belongs to environmental agencies and conventions (WTO, 2006f).

The WTO agreements on trade actions, such as sanctions or other import restrictions taken to enforce an agreement overlap with environmental agreements. So far, no evidence has proven that conflict between the WTO's agreements and the International Environmental Agreements Exists (WTO, 2006f)

2.4.5. The Scope of WTO: No Involvement in the Food Safety, and Human Health and Safety

Commercial interests do not dominate the negotiated agreements by WTO member governments, which reflect their respective concerns. Major clauses in the agreements such as GATT Art 20 specifically allow governments necessarily act to protect human, animal or plant life or health. But these actions are disciplined in such a manner that does not allow their use as an excuse to protect domestic producers; in other words, these actions prevent the protectionism in disguise (WTO, 2006f).

A number of the agreements handle in detail product standards, and food safety and health among other products made from animals and/or plants; with the purpose of defending governments' rights to guarantee the citizens' safety. For instance, a WTO dispute ruling justified a ban on asbestos products on the grounds that WTO agreements prioritise health and safety over trade (WTO, 2006f).

One of the many criterions to meet these objectives is to base regulations on scientific evidence and/or internationally recognised standards. It is worth noting that the WTO does not set the standards itself. In some cases, other international agreements are identified within the WTO's agreements. For example, the *Codex Alimentarius* that sets recommended standards for food safety, and which comes under the United Nations Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO) (WTO, 2006f).

Nevertheless, there is no impulse to comply with the internationally negotiated standards such as those of Codex Alimentarius. Governments are free to set their own standards provided they are coherent in first, avoiding risks over the full range of products, second in being logical, and third in being tolerant and non-discriminatory.

These safety concerns are built and integrated into the WTO agreements (WTO, 2006f).

2.4.6. The WTO and Economic Impact: Job Creation and Poverty Reduction

This claim is inaccurate and simplistic. Trade can be a powerful incentive and force to creating jobs and, by consequence, reduce poverty. However, it can be complicate to make the required adjustments that handle job losses. In contrast to what many studies have shown, the alternative of protectionism is not the solution. Equally complex is the relationship between trade and employment, as is the case with the relationship between trade and equality (WTO, 2006f).

Economic growth is enhanced and boosted by freer-flowing and stable trade; with the potential of creating more job opportunities. It can also assist in the reduction of poverty; and frequently it achieves both ends. The country that decreases its own trade barriers is the one that benefits most. The exporting countries exporting also benefit, yet to a lesser extent. In a number of cases, export sectors employees enjoy higher pay and greater job security; however, previously protected producers and their workers face new competition when trade barriers are decreased where some survive by becoming more competitive and quickly adapting, for example by finding new employment, while others do not (WTO, 2006f).

In particular, some countries are better at making the adjustments than others, which is partly due to the effective policy adjustments that those countries experience. Ineffective polices lead to missing on opportunities because the boost that trade creates, pushes the economy to use the resources that facilitate the adjustment process. The WTO tackles these problems in a number of ways, where liberalisation is gradual, which allows countries the required time to make the necessary adjustments. Moreover, the provisions in the agreements permit countries to take necessary actions against imports that are particularly damaging, but under strict disciplines (WTO, 2006f).

Liberalisation under the umbrella of the WTO is the result of negotiations. When countries believe that the necessary adjustments are not constructed, they resist demands to open the relevant sections of their markets. This is not the only factor that

led to recent changes in wage levels; in addition, there are a number of other external features that result in the altering of wage levels as well (WTO, 2006f).

The question that is raised at this point is why for instance is there a widening gap in developed countries between the wages of skilled versus unskilled workers? According to the Organization for Economic Co-operation and Development (OECD), imports from low-wage countries account for approximately 10–20% of wage changes in developed countries; the remaining is attributed to 'skill-based technological change'. In other words, developed economies are adopting more technologies that require higher skilled labour (WTO, 2006f).

The alternative to trade protection is expensive as it raises the costs and promotes inefficiency. An OECD calculation argues that imposing a 30% duty on imports from developing countries would actually reduce US unskilled wages by 1% and skilled wages by 5%. Protectionism can partly cause the damage of lower wages in the protectionist country (WTO, 2006f).

At the same time, focusing on imports of goods ruins the picture to an extent. It is estimated that the share of the service sector in the developed countries is 70% of the economic activities, where the effect of foreign competition on jobs is different. An example of such a case is where a foreign telecommunications company sets up business in a country and employs local people. It is also estimated that around 1.15 billion people are still in poverty. World Bank research has shown that trade liberalisation since World War II has contributed to alleviating billions of people out of poverty. It has also proved that it is wrong to claim that liberalisation has increases inequality (Hertel *et al*., 2006).

2.4.7. Developing Countries and the WTO Membership

There is a good chance that smaller countries would have been less strong without the WTO, because the WTO increases their bargaining power. It is recently noticed that developing countries have become to a large extent more active in WTO negotiations. The evidence is that developing countries started in recent years to submit an exceptional number of proposals in the agriculture talks, and be actively involved with the ministerial declarations and decisions issued in Doha, Qatar, in November 2001.

They expressed satisfaction with the process leading to the Doha declarations; which can be evidence to their trust in the system as a whole (WTO, 2006f).

Simultaneously, the set of rules includes negotiations involving GATT members and WTO's predecessor are the results of the multilateral negotiations. The Uruguay Round (1986-1994), which was the most recent round of negotiations, was only possible as a result of an agreement between developed countries to reform textiles and agriculture trade that are considered as the major issues for developing countries (WTO, 2006f).

To sum up, all the members of the WTO trading system are bound to follow the same set of rules. Consequently, developing countries have succeeded in challenging some actions taken by developed countries in the WTO's dispute settlement procedure. If it had not been for the WTO, the smaller countries would have been powerless to act against partners with more powerful trading system. The WTO is determined to level the playing field so that all members can follow the same rules (WTO, 2006f)

2.4.8. The WTO as an Organization of Governments

The system at the WTO provides governments with means to decrease the narrow vested interests' influences. This is an automatic consequence of the 'rounds' type of negotiation (i.e. negotiations that include a wide range of sectors). One of the trade round's outcome has to be a balance of interests. It is easier for governments to discard pressure from certain lobbying groups. They argue that the overall package has to be accepted in favour of the interests of the country as a whole (WTO, 2006f).

The WTO is an organisation of governments. The private sector, non-governmental organisations and other lobbying groups do not participate in WTO activities except in particular events, for example seminars and symposiums. Their influences over the WTO can only be witnesses through their governments (WTO, 2006f).

2.4.9. The WTO Membership and Weak Economies

Several countries try to be under the WTO umbrella, prestige is clearly one of the reasons behind that, as counties applying for membership want "to be at the table with the big boys" (Martin, 1997). Furthermore, most countries believe that it is more

beneficial to be part of the WTO system. This is the reason behind the inclusion of large and small trading nations in the list of countries negotiating membership. The reason is that they will all be under the WTO's key principle, which is 'non-discrimination and transparency'. In addition to that, a small country would enjoy the benefits that all WTO members grant to each other by joining the WTO. Moreover, small countries have won dispute cases against rich countries, such a situation would not have occurred if smaller countries were not member of the WTO (WTO, 2006f).

The alternative would be to negotiate bilateral trade agreements with each partner; which could include regular negotiations to renew the commitments that equally work with trading partners. For this specific issue in mind, governments would need more resources which in many cases present a serious problem for small countries; moreover, smaller countries are weaker when it comes to bilateral negotiations (WTO, 2006f).

As a result of joining the WTO, smaller countries have the ability to increase their bargaining power and starting alliances and cooperative relationships with others sharing the same interests (WTO, 2006f).

2.4.10. Democratic Nature of the WTO

In the WTO, the decisions are taken by consensus. In principle, no decision is taken unless all members are in agreement; this is the reason why this process is a democratic one. However, it is quite often that countries are persuaded into agreements by being offering something in return. Agreements are then ratified in parliaments. The WTO's trade rules that resulted from the Uruguay Round trade talks were negotiated by member governments and ratified in their parliaments (WTO, 2006f).

2.5. CRITICAL VIEWS ON THE WTO

Given the WTO's history of managing the world trade for the past twelve years, and despite the clarifications to these misinterpretations, some sectors continue to view the WTO with suspicion. The blame was laid on the WTO for the Asian Financial Crisis (1997-1998), as well as the global warming problem (Forrer *et al*, 2002).

The Global-Exchange, which is a U.S.-based non-governmental organisation, is one of the most critical groups of the WTO. It cited (2002) twelve reasons to oppose the WTO, arguing that the WTO is writing a global constitution, and that the trade ministers and corporate Chief Executive Officers (CEOs) controlling the WTO wants the world to believe that its purpose is to inspire growth and prosperity for all. However, in reality the WTO has been the major tool for removing democratic control of resources from communities, and putting it into the hands of corporations. As a result, an international movement is growing to oppose the corporate rule of the WTO to replace it with a democratic global economy that benefits people and sustains communities (Global Exchange, 2008). Following are these are the arguments enumerated in more detail.

2.5.1. Criticism over Democracy Deficit in the WTO

The policies of the WTO impact all aspects of society and the planet, but it is not a democratic, transparent institution. The WTO rules are written by and for corporations with inside access to the negotiations. For instance, 17 'Industry Sector Advisory Committees' provide the US Trade Representative their heavy input for negotiations. While the inputs provided by input by consumer, environmental, human rights and labour organisations Citizen are consistently ignored. In addition to that, any request for even simple information is rejected or denied, and the proceedings are held secretly. The WTO is seen as a secret global government that is non-elected and without accountability (Global Exchange, 2008).

2.5.2. Criticism over the Consequences of WTO: A Less Safe World

The idea of the WTO tends to promote the belief that by creating a world of 'free trade', global understanding and peace will prevail. It is in fact the exact opposite, where the domination of international trade by rich countries to benefit their individual interests increases the feeling of anger and resentment, resulting in a less safe developed world. Taking the incidence of September 11th as an example, the developed countries believe that the poorer ones are getting more desperate at the increasing power of the rich developed world. The proponents of this criticism argue that building real global security, there is a need for international agreements that

respect people's rights to democracy and trade systems that promote global justice (Global Exchange, 2008).

2.5.3. The WTO and Labour and Human Rights

WTO rules prioritise the 'rights' of corporations to profit over human and labour rights. Instead of promoting labour standards that are internationally recognized, the WTO encourages workers to pit against each other by what is called 'race to the bottom' in wages. The WTO has declared and ruled the illegality to ban the production of a commodity based on the way it is produced; an example of such is using child labour. In addition, It has also ruled that governments should not consider the 'non commercial value' when making purchasing decision. Such values include human rights, or the behaviour of companies that follow a vicious dictatorships attitude such as Myanmar. It is important to note that the WTO has more power when it comes to punishing countries that violate its rules; even more power than the United Nations has to sanction violators of international human rights standards (Global Exchange, 2008).

2.5.4. The WTO Support for the Privatisation of Primary Services

The WTO tries to privatise fundamental public services such as education, health care, energy and water. Privatisation means selling public assets, like radio airwaves or schools, to private corporations (usually foreign corporations) with the aim of making profit and destroying their nature of being public goods. The WTO is seeking to privatise the most important public services like education, health care, energy and water. The WTO's General Agreement on Trade in Services (GATS) contain a list of about 160 threatened services such as elder and child care, sewage, garbage, park maintenance, telecommunications, construction, banking, insurance, transportation, shipping, postal services, and tourism. Some countries have already started the process of privatisation. The ones that would suffer the most from privatisation are those that are unable to pay for the previously public goods and services such as the working class and marginalized communities (Global Exchange, 2008).

2.5.5. The WTO's Adverse Impact on the Environment

Few corporations have used WTO to take apart the hard-won local and national environmental protections which are attacked as 'barriers to trade'. According to the first WTO panel, the provision of the US Clean Air Act was illegal; the provision required not only the domestic but also the foreign producers to generate cleaner gasoline. The Endangered Species Act was declared by the WTO, because this act required US sold shrimp to be caught with a cheap device that endangered sea turtles. Few attempts has been done by the WTO to deregulate industries such as logging, fishing, water utilities, and energy distribution, these attempts might lead to more exploitation of natural resources (Global Exchange, 2008).

2.5.6. Criticism over WTO's Negative Effects on Human's Health and Lives

The 'Trade Related Intellectual Property' rights (TRIPS), which deals with patents, copyrights and trademarks are strongly defended by WTO. WTO defends to these rights has a negative effects on health and human lives. For instance, the pharmaceutical companies' has been given 'right to profit' from the WTO, while on the other hand, few governments are trying to protect their citizens' health by providing lifesaving medications in areas such as sub-Saharan Africa where thousands of people die daily as result of HIV/AIDS. By affirming their right to produce generic drugs (or import them if they lacked production capacity), developing countries achieved a significant victory in 2001; as a result, they had the means to provide essential lifesaving medicines to their populations with less expensive prices (Global Exchange, 2008).

Unfortunately, the production of those drugs has become more difficult ever since the new conditions placed in September 2003.Clearly, the WTO demonstrates its preference for corporate profit over saving human lives (Global Exchange, 2008).

2.5.7. The WTO and the Escalation of Inequality

Free trade is not working in favour of the majority of the world. It is clearly noticed that inequality increased on both the international front and within countries during the most recent period of rapid growth in global trade and investment (1960 to 1998). The United Nations Development Program (UNDP) reports that the richest 20 percent of the world's population consume 86 percent of the resources, on the other hand, the

poorest 80 percent consume 14 percent. The WTO rules have accelerated these trends through opening up countries to foreign investment; consequently, smoothening the movement of modes of production where labour is cheaper and easily exploited, and where environmental costs are low (Global Exchange, 2008).

2.5.8. The WTO and the Rising Hunger

In spite of the fact that, on the global level, farmers produce enough food for everyone, yet the corporate control of food distribution results in chronic malnutrition for almost 800 million people worldwide. Food is a human right according to the Universal Declaration of Human Rights. In developing countries, agriculture is the major source of living to the majority of people. WTO's Agreement on Agriculture states that market forces should control agricultural policies rather than a national commitment to ensure food security and preserve decent incomes for farmers' households. WTO policies have allowed dumping of heavily subsidised food into poor countries; as a result, local production decreased and hunger began to grow (Global Exchange, 2008).

2.5.9. The WTO's Support for Rich and Powerful Nations Against Small and Poor Nations

In theory, it supposed that the WTO operates on a basis of consensus, with equal decision-making power for all. In practice, a large number of significant decisions are made whereby poorer countries' negotiators are ignored and not even invited to closed door meetings. Consequently, the less rich countries had been ignorant of the 'agreements' discussed and announced. Many countries do not have a sufficient number of trade personnel to participate in all the negotiations nor to have a permanent representative at the WTO. As a result, the poorer countries are heavily disadvantaged from presenting their interests. Likewise, many countries are not strong or rich enough to defend and protect themselves from the challenges of the WTO raised by the rich countries, and change their laws rather than pay for their own defence (Global Exchange, 2008).

2.5.10. The WTO's Rejection of Local Level Decision-Making and National Control

The WTO's 'most favoured nation' provision requires equality between countries, in other words, all WTO member countries interact and cooperate equally regardless of their track record. WTO considers any local policies that aim at rewarding companies that hire local residents, use domestic materials, or adopt environmentally sound practices illegal. Strangely, developing countries are not allowed to issue local laws that have been adopted by developed countries, such as protecting new domestic industries until they can be internationally competitive. Gray Davis, California Governor, stood against 'Buy California' project which would have granted a small preference to local businesses. His rejection was because this project was WTO-illegal. In addition, conformance to the WTO entailed rewriting entire sections of US laws. What is more interesting is that a number of countries are changing their laws and constitutions with the potential of aspiration of future WTO rulings and negotiations (Global Exchange, 2008).

2.5.11. The Presence of WTO Substitutes

Civil society organisations (CSOs) or non-governmental organizations (NGOs) have developed alternatives to the corporate-dominated system of global economic governance. Together, these organizations meant to build a nurturing, democratic political space to serve global economy, promote jobs, protect and guarantee right to food, water, education, and health care, promote freedom and security, and finally to preserve the world's shared environment for future generations (Global Exchange, 2008).

2.6. SAUDI ARABIA AND THE WTO

Saudi Arabia applied for WTO membership as early as in 1993; however, it joined the WTO in December 11, 2005 as the 149th member nation. The reason behind this delay in being part of the WTO is returns to the fact that the complicated deliberations that took place among the leaders and policy-makers of Saudi Arabia's government, society, economy, politics, and religion were very time-consuming. Unlike most of the WTO's member nations, Saudi Arabia faced daunting challenges that interpret the factors that effectively made it one of the unique powerful nations in the world.

Alternatively, Saudi Arabia was one of the founding members of the Gulf Cooperation Council (GCC) in 1981, nevertheless, it was the last to join the WTO following the members of the GCC: Kuwait and Bahrain (1995), Qatar and the United Arab Emirates (1996), and Oman (2000). On the other hand, Saudi Arabia's WTO membership is potentially enormous in terms of the global impact, in spite of that fact that it was the last to join the WTO (Clatanoff *et al*., 2006).

It is important to note that Saudi Arabia was never penetrated by Western missionaries, armies, or merchants. After the discovery of Saudi Arabian oil, the West started their encounters with the Kingdom. Its history as the seat of Islam and its tremendous oil wealth makes it *de facto* a real world power at the level of Europe or America. The Kingdom has been exercising its power in a unique way by creating, following, or violating its own rules for investment and foreign trade, following America and the West (Clatanoff *et al*., 2006).

However, by becoming a member at the WTO, Saudi Arabia implies a major shift in its attitude towards the world. By embracing international norms for the first time in its history and willingly opening borders to world trade, Saudi faces greater western influence that subject its culture and society to the external and internal pressures of change. Saudi Arabia wants progress and development for the sake of its citizens internally; and to be acknowledged as a unique world power, externally. The desire to achieve these twin objectives in a stable and peaceful manner was the core of the deliberations prior to joining the WTO (Clatanoff *et al*., 2006).

The twin objectives are reflected in the concessions that the Kingdom has obtained as prerequisites to joining the WTO (Zahid, 2006):

(1) No import of alcohol, pork or other products banned in Islam.

(2) 75% Saudization even in foreign companies.

(3) Crude oil outside the WTO's jurisdiction.

(4) Zakat for local companies and income tax for foreign ones.

(5) Bounds tariffs higher than existing rates in a number of goods.

(6) Bound tariffs to be phased in by 2008, 2010 or even 2015 in some cases.

(7) 10 years grace period on agricultural subsidies.

(8) Other domestic subsidies in place, e.g., cheap utilities, free land in industrial cities…etc

(9) Foreign investors need Saudi Arabian General Investment Authority (SAGIA) license, unlike locals who do not.

(10) Only GCC citizens can invest directly in Saudi shares and real estate.

These concessions are not distinctive exemptions, but legally accepted and allowed conditions by the WTO's rules; the reason being that member countries could benefit from loopholes that exist with the assistance of highly experienced lawyers and trade ministry officials. Being able to gain these concessions as requirements for WTO membership proves that Saudi Arabia's trade and legal experts have done their part well, giving the Western members nations a dose of their own medicine. In addition, it also demonstrates that by studying and defending its own position, any member nation could gain concessions from the WTO, following the Saudi model (Zahid, 2006).

For example, the ban on food imports as per Islam, such as alcohol or pork. It is interesting to note that by establishing this fact as a trading condition, a number of countries argued that it entailed a form of discrimination, arguing that free trade by nature, should allow all products inside its borders. However, Saudi lawyers have argued that since the production, sale, and consumption of these products are not allowed in the country, as a result their demand does not exist in principle. Therefore, discrimination does not exist in this particular case since there are no domestic producers that the country could favour over potential foreign suppliers. On the other hand, discrimination would require that the country allows domestic companies to produce and sell pork and alcohol, but bans their foreign imports. On a different front, the agricultural subsidies provided by governments are another issue that needs closer analysis. Because, the Kingdom of Saudi Arabia has no competitive advantage compared to its neighbouring other Arab countries like Egypt and other smaller Gulf countries whose population is much smaller, and where the economy could be sustained by limited agricultural activities and imports. Saudi Arabia is concerned with food security as are other countries with relatively large populations. It would not be unusual for Saudi to ensure the safety of its agricultural sector, which comprises 12% of the labour force and 3.3% of Gross Domestic Product (GDP) (CIA,

2007). The 10-year grace period granted for agricultural subsidies is perceived as a beneficial deal; however, this would not be considered discriminatory because the agricultural subsidies are only granted for food products consumed domestically such as dates, long-life milk, and tobacco. Subsidies for food exports are non-existent. It is also interesting to note that the Islamic religion classifies food into clean and unclean or lawful and unlawful; as a result, it has to ensure that food standards. Moreover, it was to guarantee that the transition of cheap locally-produced subsidised food into cheaper foreign-produced food imports would be sensitive to Saudi's cultural standards and norms. Another important consideration is Saudization. This notion necessitates that 75% of the employees in any corporation should be of Saudi nationals unless exempted by the Labour Ministry, this is a condition that is applied to foreign companies that operate in Saudi Arabia. The aim of this policy is to put an end to discrimination of labour; the reason is that under GATS, companies from WTO member nations are capable of buying and selling manpower services as per free market forces. Nevertheless, Saudi Arabia like a number of developing countries was able to receive labour market concessions in view of its high unemployment rate amongst Saudi males that is estimated to range from 13% to 25% (CIA, 2007). The Saudi Ministry of Labour perceives the process of Saudization policy as a key factor in developing and maintaining social stability, moreover, and the process helps to control the increasing involvement by Saudi nationals in global terrorism. Another issue that was of dispute before Saudi Arabia became a member at the WTO was the matter of trade with Israel. It is worth noting that Saudi Arabia is one of the leading countries to support trade boycott with Israel; in addition, it was concerned about undermining its leadership position as the WTO membership requires non-discrimination. This in return would entail trade between Israel and Saudi markets. Auspiciously, no such provision exists and fact is that businessmen are aware that Israeli products do not have a chance of doing well and competing in Arab markets. Due to the fact that businessmen are practical, they make use of permissible techniques, for example that of raising pigs in cages suspended from the ground in Israel where pork is prohibited, to sell them to non-Jews in Israel. Besides, the trade of clandestine trade between Israel and Arabs has existed for centuries (Clatanoff *et al.*, 2006).

The close relationship between The Kingdom's religious, cultural, political, economic, and legal systems endorsed the process of adjusting for identifying what the Saudis are ready to sacrifice in terms of privileges and habits, which were seen as in need of change. For example, subsidies to certain sectors the protection of bad business practices, and the attitude of complacency that is slowly permeating business, society, and politics. It is also important to note that the described link in Saudi Arabia did not prevent its membership. Saudi Arabia belongs to one of the oldest civilisations in the world. Through collective knowledge, Saudi is very aware of the effects of westernisation from Europe to the United States on the rest of the globe, crossing the oceans to Asia and parts of the Middle East and Africa. Moreover, it recognizes that previously strong empires and nations, such as the Roman, Spanish, and British Empires that were historically fought and conquered on the field by Arabs, have weakened morally and culturally and gone through radical business cycles. With the mentioned changes, these empires were forced to engage in bloody civil or world wars. Saudi Arabia aspires to exploit and discover great future opportunities depending on learning from the past experiences (Clatanoff *et al.,* 2006).

As a consequence of its preparation of decades of gradual economic openness to progress and development, and its the newfound wealth and power gained with the latest round of oil price increase, Saudi Arabia was strong enough to join the WTO, to bargain for a set of strict conditions, as well as to maximize its benefits using oil as its bargaining power tool (Ramady and Mansour, 2006).

2.7. CONCLUSION

The expiry of the General Agreements on Tariffs and Trade (GATT) after the Uruguay round created the need for another international trade regulation body to fill the vacuum left by GATT. This is what precipitated the birth of the World Trade Organization in January 1995. The primary reason of the new body was to ensure smooth trading among member economies. The WTO continued the tradition of multilateral trade negotiations and agreements that its predecessor had employed to bring down trade barriers among members states. WTO however instituted rules that suited and encouraged developing countries to join and take part in the international trade negotiations.

The rise and growth of the WTO was a rocky one as the trade body was often challenged for its obvious weaknesses and flaws which member states could use to rubbish decisions made by the organization. This is because the organization lacked the power to enforce trade policies or decisions on member states which implied that its success was hinged on the goodwill of the members. Members noted that lowering trade barriers would expose local industries to external competition which could threaten the existence of the local producers. This was a particularly major concern among the developing countries.

Saudi Arabia joined the WTO on December 11, 2005 and is one of the youngest members of the organization from the Gulf region. However, Saudi Arabia's late entry was not by chance. Instead, its leadership spent over a decade studying the implications and consequences of joining the organization given Saudi Arabia's wealth and importance in the international trade matters because of its massive oil wealth.

Right from the start, Saudi Arabia made it clear to the other members that it would play by its own rules whenever there arose conflicts between it and the WTO. To begin with, Saudi Arabia came with demands it wanted met before it joined the trade body. It did not escape the mind of other member states that the demands were thin-screened measures meant to protect its local industries from outside competition, especially from the capitalist west which would jump at the opportunity to dip its hands in the oil wealth.

High oil demand and high oil prices have given Saudi Arabia a powerful standing in the world trade matters. Through the WTO, Saudi Arabia is poised to explore trade opportunities in other countries. As long as Saudi Arabia remains powerful, it is likely to benefit from its membership to the WTO.

The next chapter looks in greater detail at Saudi Arabia's petroleum and petrochemical industries, its primary role in the country's economy, the challenges that it faced, and the developments, trends, and opportunities that prevailed prior to its WTO membership.

Chapter 3

PETROCHEMICAL INDUSTRIES IN SAUDI ARABIA: DEVELOPMENTS AND TRENDS

3.1. OVERVIEW OF SAUDI ARABIA'S ECONOMY

The Kingdom of Saudi Arabia has the world's largest oil reserves. By the end of 2008 the oil reserve was approximately 264 billion barrels, which is about one-fifth of the proven oil reserves in the world. The Kingdom is also considered the world's first oil exporter. Its production in 2008 reached an average of 9.198 million b/d, which is about 12.7% of the world production, while the oil exports were about 7.3 million b/d i.e. 18% of the world's oil exports (OPEC - Annual Statistical Bulletin, 2008).

Between mid-2003 and mid-2006, Saudi Arabia's economy grew because of high oil prices, increased oil production and export earnings, and good economic management that were founded on structural reforms, financial diversification, and steady macroeconomic policymaking (EIU, 2007).

To date, Saudi Arabia depends immensely on its oil and petroleum-related industries that include petrochemicals and petroleum refining. The Saudi's oil export revenues accounted for around 90% of the total exports revenue, 80% of the country's revenues, and around 30% of its GDP. In order to protect their most important source of economic growth, national oil company, Saudi Aramco, is increasing its oil production capacity to 12 million barrels per day (bbl/d) by 2012 (OPEC - Annual Statistical Bulletin, 2008).

Economic reform in Saudi Arabia has been rising progressively ever since the recovery of oil prices in the late 1990's. Twelve years after its application, Saudi Arabia's access to the WTO in 2005 was made easier due to these reforms (EIU, 2007).

Saudi Arabia's oil exports reached $160 billion in 2005 causing the economy to immensely progress. The expected increase in consumer inflation did not occur because of good economic management (Timewell, 2007; Gavin and Marks, 2006).

However, Saudi Arabia continues to face economic difficulties, as it learned from the lessons of the 1970s and 1980s when its oil revenues were poorly invested (Gavin and Marks, 2006). Fortunately, structural adjustments policies initiated by twenty years ago, and the shift to use high technology in the oil industry were the reasons behind the diversification of Saudi's national economy, and consequently, the efficiency grew and the dependency on one product only (petroleum) decreased. Saudi Arabia also invested in petrochemicals and other industries, and more importantly, the government formed a more disciplined and competent team to manage the economy. Combining these factors, Saudi Arabia experienced its latest cycle of wealth creation and economic growth, leading to its membership in the WTO and an economic advancement (Rodenbeck, 2006; EIU, 2007).

According to Timewell (2007) and Gavin and Marks (2006), the financial system is sensibly investing in productive businesses and industries, proving that the banking system has become more disciplined and is capable of generating large profits from 2004. Petrochemical, steel and industrial groups like SABIC and Sipchem are all playing a part in Saudi's economic growth. A number of Saudi Arabian firms are expanding and non-oil exports are experiencing an increase by at least 10% per year.

Moreover, efficient policies and laws were adopted and laws that rationalized commerce removed inefficient rules that protected Saudi economic sectors favouring connections and acquaintances, which at the end, changed the landscape of business. Industrial standards, telecommunications, and capital markets are now governed by more specialized and qualified entities. Saudi government grants office was fundamentally reformed, and the Saudi Arabia Government Investment Agency (SAGIA) became more effective in the promotion of private and foreign investments as well as joint ventures to increase the Kingdom's natural resources. Taxes decreased, in addition, custom duties became more competitive and the process of licensing for a business became easier, taking less time and hence it is more efficient (Rodenbeck, 2006; EIU, 2007).

Being one of the largest economies in the Middle East and integrated into the global economy, Saudi Arabia has stressed on regional unity with its neighbouring Gulf countries in terms of economy, politics and military. Aiming at abolishing tariffs and having a common external tariff among the Gulf Cooperation Council (GCC)

countries that include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates, a custom union was developed and agreed upon in December 1999 and implemented in 2003 (EIU/RSC, 2002; EIU, 2007).

3.1.1. Economic and Political Forecasts and Trends

Looking at the oil output, the average for the period from 1997 until 2002 was 7,800 barrel per day (b/d) annually, while it was about 9000 b/d from 2003 until 2008. Taking together, Saudi Arabia raised its oil output to more than one million b/d in the last six years (OPEC - Annual Statistical Bulletin, 2008).

According to Samba, (2009a) forecasting, the oil production will decrease in 2009 and 2010, in accordance with its obligations to OPEC. Moreover, the oil prices witnessed an increase in the beginning of 2008 as the price was $92 p/b, then started rising to $141 p/b, in early July of the same year. However, at the end of 2008 the prices collapsed to $33 p/b. Therefore, the year recorded average of $94.45 p/b. In the beginning of 2009, and as recorded in June, the prices showed an increase to reach $68 p/b (OPEC - World Oil Outlook, 2009). It is expected that in late 2009, the supply constraints will be alleviated while the capacity rises, and accordingly, prices will decline to reach no less than $54/bbl (Aramco, 2007; EIU, 2007; SAMA, 2006).

According to OPEC forecasting, the reduction for OPEC crude oil occurred in 2009, as a result of contraction of the global economy, will be followed by a medium-term slow rise to reach its level identified in 2008 by 2013 (OPEC - World Oil Outlook, 2009).

As a consequence of the fluctuation in oil prices, the Kingdom's GDP growth in 2007 was 3.4%, while it increased to 4.5% in 2008. Moreover, in the first 6 months of 2009 the Saudi's economic performance was slow as a result of the disruption occurred to the global financial market and reduction of the export demand, as both depend heavily on private investment. Therefore, the forecasting for the GDP growth in 2009 is -1.2%, but expected to rise until 4.4% in 2010 (Samba, 2009a).

The Kingdom's gas reserve is about 263 trillion cubic feet as of January 2009, which gives it the fourth place in the world in terms of gas reserve. Its production in 2008 was 3.0 trillion cubic feet; about 75% of the production is for domestic uses, while the

remaining is for export. The Kingdom also produces Natural Gas Liquid (NGL). Its production in 2008 was 402.2 million barrels, 66% of the production is for export, which is 266 million barrels, and the 34% is for domestic uses (OPEC - Annual Statistical Bulletin, 2008; Aramco, 2008, Saudi Ministry of Petroleum and Mineral Resources, 2009).

In order for more local nationals to be part of the workforce, Saudi government needs to take a closer look at its human resources for supplementary development, the reason being the great importance of human resources to the growth of Saudi's economy (Al-Mady, 2005). The Saudi Arabian government started to increase spending on manpower training and education, infrastructure, and improved salaries for skilled government workers (SAMA, 2006; Al-Mady, 2005; EIU, 2007). The previously mentioned investments would affect the competitiveness of the country's petrochemical industries that would translate into improved workers, higher consumption of goods as well as enhanced implementation of both business and government plans.

SABIC is one example of a company that proves what Saudi aspires as well as good business partnership. SABIC was nominated as the Best Petrochemical Company in 2006 (SABIC, 2007a). It is also important to note that in its 2007 annual report, SABIC proves to achieve a great deal of success in international markets that consequently benefit the local one. SABIC is also an inspiration to other companies. The strategy of diversification of downstream into intermediates, polymers, metals and fertilizers has demonstrated SABIC's success and growth in 2006 (SABIC, 2007a).

3.1.2. Petroleum and Petrochemicals Industries in Saudi Arabia

As the preceding section indicates, petrochemical and petroleum industries play crucial role in the functioning and growth of the Saudi economy. This section, therefore, briefly describes and puts into perspective two different but very closely related industries and its development in Saudi Arabia.

The first industry is the petroleum industry which relates to exploration, discovery, refining and sales of different kinds of fuels and petroleum refining by-products, for example olefins and aromatics. The second industry is the petrochemical industry,

which by its turn, related to processing of petroleum refining by-products olefins and aromatics, transferring them into a large set of chemicals and other raw materials to be used in solvents, detergents, adhesive and monomers industries. It is clear that the two are very much linked as the petroleum by-products are the major input of the petrochemical industry as explained (Zawya, 2007).

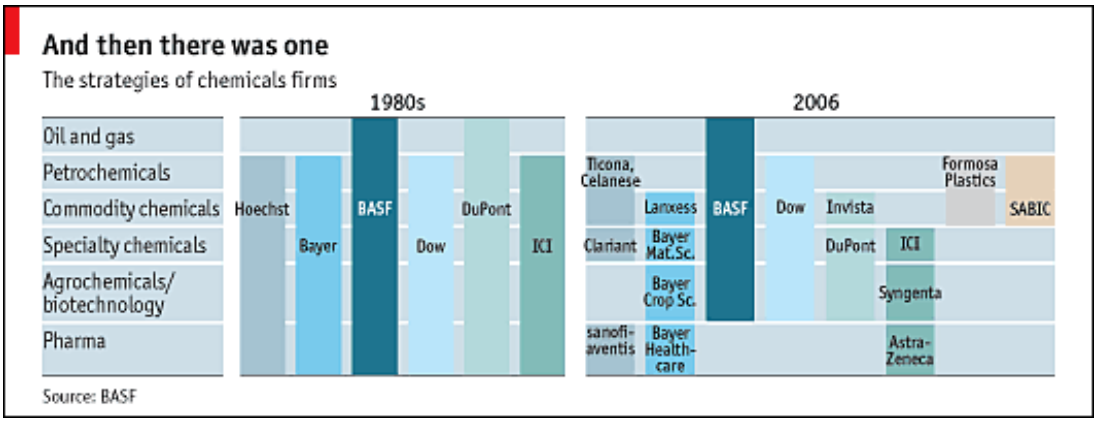
Having petroleum and gas reserves can increase a country's value-added petrochemical industry. However, a country like Saudi Arabia, instead of supplying to countries with no petroleum reserves that are industrially and technologically more advanced such as Germany, can develop its own petrochemical industry and increase its revenues from natural resources. This also applies to other oil-producing countries (Zawya, 2007).

The first type of the two basic elements of olefins is ethylene. It can be manufactured into polyethylene (for plastics), ethanol (alcohol, engine coolants, and polyester fabrics), vinyl acetate, polyvinyl chloride (PVC) for plastics, as well as tetrachloroethylene which is a dry cleaning solvent degreaser. The second type is propylene. This is used as a chemical feedstock to produce isopropyl alcohol, polypropylene, coolants, synthetic rubber, lubricants, and epoxy resins, as well as other products. Turning to aromatics, the first processed element is benzene, which by its turn can be processed into acetone, solvents, and different types of alcohol, plastics, detergents and other raw materials. The second type is toluene, which is a solvent or a precursor for other chemicals. By its turn, toluene can be processed into nylon and polymers. The third and final type of aromatics is mixed xylene. This acts as a solvent and can also be transferred into acids and polyesters (Mercier *et al.,* 1996; Zawya, 2007).

Statistics shows that the world's production of petrochemical every year is 110 million tonnes of ethylene, 65 million tonnes of propylene, and 70 million tonnes of aromatics. It is estimated that the global capacity of ethylene will reach 142 million tons by 2010. Middle East and Asia are the world's largest producer of ethylene and have the fastest production growth capacity. 87% of the produced ethylene is consumed by Asia-Pacific, Europe and North America (Jose, 2008).

Figure 3.1 demonstrates the change of the make-up and strategies of the major players in the petrochemical industry from 1980 until 2006.

Figure 3.1: **The world's petrochemical giants in 1980 and 2006**



Source: Economist, 2006b

Hoechst, Bayer, and BASF of Germany, Du Pont and Dow Chemicals of the U.S.A. and ICI of the U.K. were known as the largest petrochemical firms back in the 1980s. However, in 2006 BASF of Germany, Ticona-Celanese of the U.S.A., Formosa Plastics of China-Taipei, and the Saudi Arabian Basic Industries Corporation (SABIC) became the new leaders in the industry (Economist, 2006b). Al-Ghamdi and Sohail (2006) analyse that Exxon-Mobil and Shell are the globally two largest companies in the petrochemical industry, accounting for around 20% of the world's production. Following those two are BASF, BO, Dow, Philips Petroleum, Enichem, Mitsubishi, Methanex and Union Carbide (Zawya, 2007).

Tables 3.1 to 3.3 summarize the distribution of petrochemical companies ranked according to output in the world as well as the Middle East and North Africa. As for tables 3.4 and 3.5, these illustrate the petrochemical products and the production breakdown in relation to GCC countries.

Table 3.1: **Petrochemical Companies in MENA Ranked According to Owned Capacity**

Rank	Company	Country	Current Owned Capacity of Petrochemicals (t/y)
1.	Saudi Basic Industries Corporation	Saudi Arabia	22,934,645
2.	National Petrochemical Company	Iran	17,145,038
3.	Industries Qatar	Qatar	5,065,500
4.	Qatar Petroleum	Qatar	4,519,680
5.	National Oil Corporation	Libya	3,441,024
6.	Petrochemical Industries Company	Kuwait	1,915,470
7.	Chemical Industries Holding Company	Egypt	1,722,000
8.	Oman Oil Company	Oman	1,624,000
9.	Abu Dhabi National Oil Company	UAE	1,441,370
10.	Egyptian General Petroleum Corporation	Egypt	1,225,827

Note: t/y = tons/year output
Source: Zawya, 2009

Table 3.2: **Petrochemical Companies in MENA Ranked According to Total Capacity**

Rank	Company	Country	Total Production Capacity (t/y)
1.	Yemen LNG Company	Yemen	6,700,000
2.	Arabian Petrochemical Company	Saudi Arabia	5,316,000
3.	Saudi Yanbu Petrochemical Company	Saudi Arabia	4,840,000
4.	Qatar Fertiliser Company	Qatar	4,800,000
5.	Saudi Petrochemical Company	Saudi Arabia	4,615,000
6.	Abu Qir Fertilisers Company	Egypt	3,997,000
7.	Razi Petrochemical Company	Iran	3,720,000
8.	Saudi Methanol Company	Saudi Arabia	3,300,000
9.	Maroon Petrochemical Company	Iran	2,945,000
10.	Bandar Imam Petrochemical Company	Iran	2,911,000
11.	Saudi Arabian Fertiliser Company	Saudi Arabia	2,850,000

Note: t/y = tons/year output
Source: Zawya, 2009

Table 3.3: **Global Companies Ranked According to MENA Petrochemical Capacity**

Rank	Company	Country	Total Owned Petrochemical Capacity in MENA (t/y)
1.	Spanish Egyptian Gas Company	Egypt	4,800,000
2.	ExxonMobil Chemical	Region-wide	3,404,000
3.	Royal Dutch Shell Group	Region-wide	2,307,500
4.	Yara International	Overseas	1,200,000
5.	Chevron Phillips Chemical Company	Region-wide	1,091,000
6.	Total	Region-wide	699,400
7.	Dow Chemical Company	Region-wide	616,250
8.	Borealis	Overseas	472,000

Note: t/y = tons/year
Source: Zawya, 2009

Table 3.4: **Top Ten Petrochemical Products Produced by MENA (in '000 tons/year)**

Products	1000 t/year
Ethylene	13,114
Methanol	10,732
Polyethylene	7,414
Ethylene Glycol	4,303
BTX	3,001
Polypropylene	2,390
Propylene	2,249
Styrene	1,145
Urea	15,345
Ammonia	12,087
Top 10 Products	71,779
All products	94,386
Top 10/Total	76%

Source: Jordinvest, 2007

Table 3.5: **Breakdown of Petrochemical Capacity in MENA by GCC Countries**

Country	Capacity ('000 t/y)	Share %
Saudi Arabia	40,162	43
Iran	22,583	24
Qatar	9,547	10
Egypt	9,011	10
Libya	3,441	4
Oman	3,180	3
UAE	2,405	3
Kuwait	2,274	2
Bahrain	1,400	1
Algeria	385	<1
MENA Total	94,386	100
GCC Share	58,967	62

Source: Jordinvest, 2007

3.2. PETROLEUM INDUSTRY IN SAUDI ARABIA: DEVELOPMENTS AND TRENDS

For a better understanding of Saudi Arabia's petrochemical industry, it would be useful to have an overview of the country's key basis of petrochemical raw material inputs, that being the petroleum industry. The Kingdom of Saudi Arabia is the largest source of oil in the world as it holds around 260 billion barrels of proven oil reserves, which includes 2.5 billion barrels on the neutral zone on Kuwaiti borders. Saudi Aramco boarded on an energy investment worth US$ 70 billion, of which US$ 18 billion was used to increase upstream petroleum capacity from 10.5 to 11 million bbl/d in 2007 , around 12.5 million bbl/d in 2009 and 15 million by 2020 (Pennwell, 2005; Samba, 2008).

3.2.1. Oil Production Capacity

The Kingdom of Saudi Arabia has more than 110 of oil and natural gas fields and over 1,500 wells. However, among all these fields, only eight oil fields contain more than half of the total oil reserves of Saudi Arabia. Among these fields are Al-Ghawar, which is the world's largest onshore oil field with approximately 70 billion barrels of remaining reserves; and the Safaniya, which is the largest offshore oil filed in the world, estimated to provide about 25-35 billion barrels of reserves. In addition to being the world's largest onshore oil field, Al-Ghawar accounts for around 50% of the

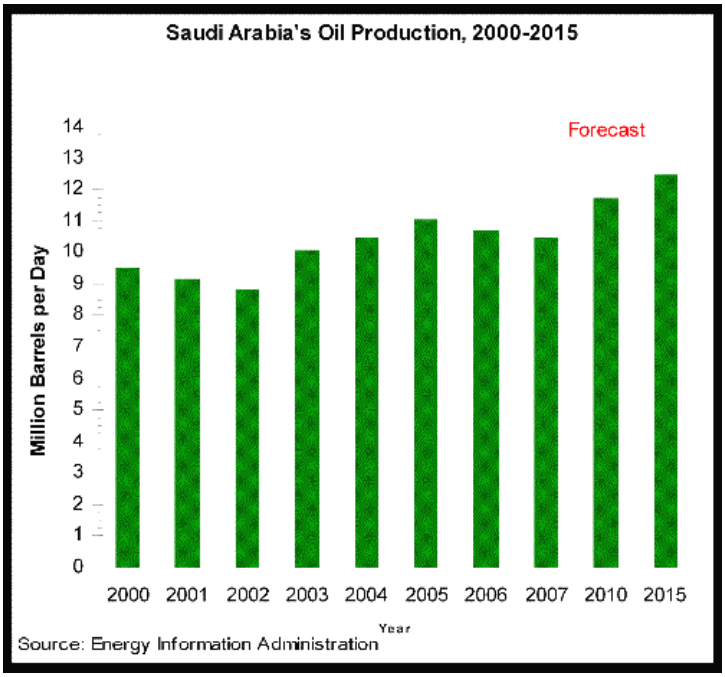
Kingdom's total oil production capacity (Aramco, 2008; Saudi Ministry of Petroleum and Mineral Resources, 2009).

The one challenge standing before Saudi Arabia to achieve its strategic vision to increase the capacity of production is Saudi's existing fields, where they sustain, on average, 6 to 8% annual 'decline rates'. Analysing Saudi's vision and the challenge it faces means that it needs around 700,000 bbl/d in additional capacity yearly to simply balance the natural decline. Saudi Arabia is capable of adding up to 200 billion barrels of oil to its proven reserves after extending the period of investment and investigation. Moreover, Saudi Arabia is also capable of slowing the decline whereas reservoir management of wells and remedying projects would start using "smart well" technologies (Aramco, 2007).

Saudi Arabia does not just produce oil, it is also involved in the production of natural gas liquids (NGLs), reaching about 1.5 million bbl/d. Moreover, Saudi Arabia also produces other liquids that are not subject to OPEC quotas. The Qalif Producing Facilities Development Program (QPFDP), which is worth US$ 4 billion, will add two Gas-Oil Separation Plants (GOSPs), gas treatment and oil stabilisation facilities for the Qatif and Abu Saafa (50% is owned by Bahrain) oil fields. Saudi productions elsewhere are to be replaced by additional production, not to enhance overall capacity (Aramco, 2007; OPEC, 2007).

Regardless of recent OPEC cuts, Saudi Aramco is still increasing capacity. Additional drilling at existing fields aims at, first, helping in the compensation of natural declines from more mature fields, and second, maintaining Saudi Arabia's reputation in terms of having the lowest production cost in the world (Aramco, 2007). Figure 3.2 further illustrates the anticipated capacity of oil production up to the year 2015. As shown in figure 3.2, although the Kingdom's production capacity in the period from 2000 to 2007 varied from 8.5 to 11 million barrels per day, the oil production capacity has been estimated to show further increase to 11.5 and 12.5 million barrels per day in 2010 and 1015 respectively.

Figure 3.2: **Saudi Arabia's Oil Production Productions up to 2015**



Source: EIA, 2008

3.2.2. Oil Refining and Petrochemicals

According to OPEC - Annual Statistical Bulletin, (2008), Saudi Arabia has nine operating refineries containing combined crude throughout capacity of 2.14 million bbl/d and an additional overseas refining capacity worth approximately 1.75 million bbl/d, which makes the Kingdom the sixth largest oil refiner in the world. Saudi Aramco plans an investment of $20 billion to increase Saudi's local refining capacity and international holdings by 3 million bbl/d and at least 1 to 2 million bbl/d respectively by the year 2011. This aims at increasing the demands of the rapidly-growing Asian markets (Aramco, 2007, 2008; OPEC, 2006; OPEC - Annual Statistical Bulletin, 2008; Pennwell, 2005).

Saudi Aramco is encouraging private investment through joint ventures in downstream petroleum activities with Total of France, Conoco-Philips of the U.S.A, as well as Sumitomo Chemical of Japan. The later had recently broke ground on the $9.8 billion Rabigh Refining and Petrochemical joint venture (PETRORabigh). Compaired to other projects in the industry PETRORabigh is considered the biggest. PETRORabigh will upgrade its production from 400,000 bbl/d to reach 825,000 bbl/d.

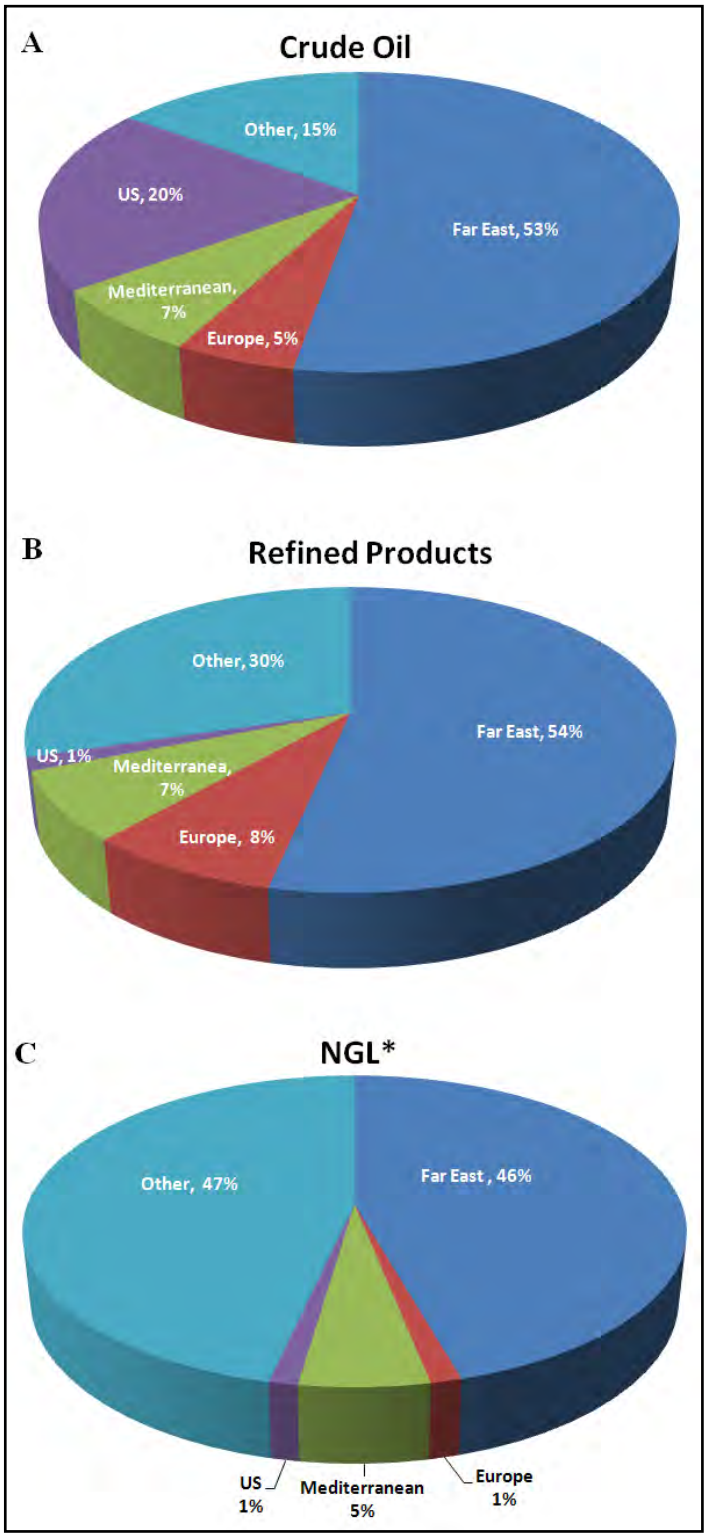
Meanwhile, the product mix will move from low-value heavy products towards gasoline and kerosene (Aramco, 2007).

Saudi Arabia has interests in a number of refineries in the U.S.A., South Korea, Japan and the Philippines. In July 2005, a joint venture between Sinopec (50%), ExxonMobil (25%), and Saudi Aramco (25%) worth $3.6 billion, a 160,000 bbl/d refinery and petrochemical plant complex was inaugurated in Fujian, China. Saudi Arabia will be the supplier of crude oil for the new plant. The agreement is long-term and was effective in 2008 (Aramco, 2007).

3.2.3. Oil Exports, Pipelines and Shipping

As previously noted, Saudi Arabia is the world's largest exporter of oil; moreover, it is one of the major suppliers to the United States, Europe and Asia. Figure 3.3 A, B and C illustrates the percentage of the Kingdom's exports of crude oil, refined products and NGL to different regions in 2008. It can be seen from the figure 3.3(A) that Saudi Arabia's major importer of crude oil is the Far East (53%), followed by US with 20%. The percentages of crude oil exported to Europe and the Mediterranean are 5% and 7% respectively. The remaining 15% is exported to other countries. The Kingdom's refined products are mainly exported to the Far East (54%), Europe (8%), and Mediterranean (7%), while only 1% of them are being exported to US. As shown in the figure 3.3 (B), 30 % of the refined products are consumed by other undefined countries. It has been documented that the Far East is still the major importer of NGL (46%) figure 3.3 (C), while it is being exported in very small percentage to US (1%), Europe (1%) and Mediterranean (5%). The remaining 47% of NGL is exported to other countries.

Figure 3.3: **Saudi Arabia Export of Crude oil (A), Refine Products (B) and NGL (C) in 2008 by Region.**



* includes sales on behalf of SAMREF & SASREF
Source of data: Aramco, 2008

In the medium-term, Saudi Aramco plans to increase oil production capacity. However, this plane depends on petroleum pipeline network in terms of their maintenance and expansion. The plan also depends on the export facilities and shipping capacity.

The Kingdom enjoys an extended inventory of crude oil ships that navigate over the world delivering the output. Moreover, the Kingdom also enjoys a complex network of local pipelines with the aim of carrying the crude oil from the wells to refineries and petrochemical plants. Previously, it used to manoeuvre a number of international pipelines that used to carry the oil to Lebanon and Jordan. However, as a result of political conflicts in the Middle East, these pipelines are either temporarily non-operational or permanently mothballed. They are specifically manufactured to carry either oil or gas (UNCTAD, 2006).

The latest statistics provided by OPEC - Annual Statistical Bulletin (2008) shows that the Kingdom has exported petroleum liquids of worth 8.4 million bbl/d. The statistics also show that 7.3 million bbl/d of the total were exported in the form of crude oil, 1.1 million bbl/d were refined products, and 778,000 bbl/d were in the form of natural gas. Over half of the oil exports were exported to Asia, Saudi's biggest customer, where 1.5 million bbl/d, 700,000 bbl/d and 510,000 bbl/d were the shares of Japan, South Korea and China respectively. It is worth mentioning that Saudi Arabia is the third biggest crude oil exporter to the U.S.A. where it exports 1.41 bbl/d after Canada and Mexico. Moreover, India is also becoming one of the major importers of Saudi oil products (Aramco, 2008; OPEC, 2007). See figures 3.3 which represent the percentages of crude oil, refined products and natural gas exported in 2008 by region.

Saudi Arabia has three key oil export terminals. The first is located at the Ras Tanura complex having 6 million bbl/d capacity and is considered to be the world's largest offshore oil loading facility. The second terminal is Ras al-Ju'aymah facility located on the Arabian Gulf (3.6 million bbl/d). The third and final key terminal is The Yanbu terminal located on the Red Sea with 4.5 million bbl/d crude oil shipping facility and 2 million bbl/d of Natural Gas Liquid (NGL) among other products. The Yanbu terminal is not yet being used at its maximum capacity (Aramco, 2007). Aramco (2007) estimates that these three main terminals and other smaller ones around the Kingdom enjoy a total export capacity of 14-15 million bbl/d of crude and refined

products, in other words, 3.5 million bbl/d higher than Saudi Arabia's crude oil production capacity.

The Saudi Arabian company, Aramco owns over 9,000 miles of pipelines in the Kingdom, including the 745-mile 5-million bbl/d East-West Crude Oil Pipeline (Petroline). Petroline has been functioning since the year 1984, which was used to carry Arabian Light and Super Light crude from Abqaiq refineries to the Yanbu Red Sea terminal, before shipping them to European markets. The 290,000 bbl/d Abqaiq-Yanbu NGL pipeline is parallel to the Petroline. It feeds Yanbu's petrochemical plants. Aramco also has plans to build more than 830 miles of new oil, natural gas, and NGL pipelines until the year 2009. It is certain that these plans, once in action, would include a 500-mile network to Khurais and a 221 mile line for gas and crude/condensate to Manifa (Armco, 2007).

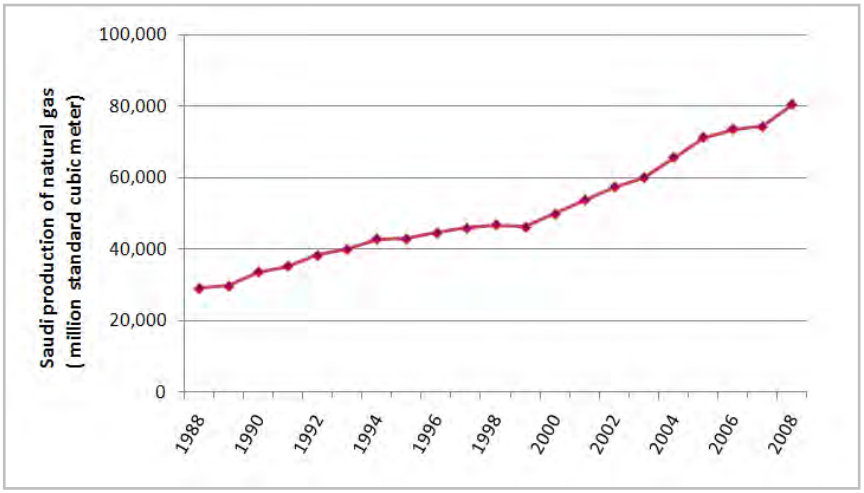
Aramco owns one of the biggest supertanker fleets worldwide operated by Vela International Marine. These include 20 Very Large Crude Carriers (VLCCs), and Ultra Large Crude Carriers (ULCCSs) with a carrying capacity of up to 3 million barrels of crude oil, and over 24 carriers for refined products and Liquefied Petroleum Gas (LPG). By the end of 2009 Saudi Arabia is will add 12 VLCCs with a capacity of 200,000 to 320,000 dead weight tonnage (dwt) to its fleet, which account for around 2 million barrels of crude oil. The National Shipping Co. of Saudi Arabia, or NSCSA, is one other important shipping company that has nine VLCCs. NSCSA owns 14 chemical tankers and four container vessels through its subsidiaries from the National Chemical Carriers and Arabian Chemical Carriers. Not only does Aramco has tankers, but it also owns or hires oil storage facilities worldwide including the Netherlands, Egypt, South Korea, the Philippines, the Caribbean, and the U.S (Aramco, 2008; EIA, 2008; UNCTAD, 2006).

3.2.4. Natural Gas

Based on the latest Armco's Annual report (2008), Saudi Arabia proven to have the fourth largest gas reserves worldwide with an estimate of 263 trillion cubic feet (Tcf), with an average daily production of about 8.3 billion standard cubic feet per day (scfd). OPEC - Annual Statistical Bulletin (2008) estimated the Kingdom's natural gas reserves to be 7,570 billion cubic meter, while the marketed production is 80.44

million standard cubic meter. Al-Ghawar oil field alone holds around one-third of the Kingdom's natural gas reserves. Figure 3.4 illustrates the Kingdom's production of natural gas from 1988 until 2008. It shows a steady increase throughout the years.

Figure 3.4: **Saudi Arabia's Natural Gas Production Capacity in Million Standard Cubic Meters From 1988-2008**



Source of data: OPEC - Annual Statistical Bulletin, 2008.

Natural gas in both forms, the associated and non-associated, has been discovered in the north-west, at Midyan, and the south-east, Al Rub al Khali, regions of Saudi Arabia. Although Al Rub al Khali has not been fully explored, it is known to potentially have natural gas reserves reaching as high as 300 Tcf. Currently Aramco is working on massive projects to increase the processing capacity for natural gas from 9.3 billion scfd to 12.5 billion scfd (Aramco, 2008).

It is traditionally known that petrochemicals, steel and more recently, the upstream oil sector, all constitute the majority of demand for natural gas in Saudi Arabia. It is important to know that the consumer demand for natural gas is fostering (Al-Na'imi, 2006). The situation is getting worse though because the majority of gas fields in Saudi Arabia are 'associated' with petroleum deposits, or are even found in the same wells as the crude oil. The strategy to increase production of this type of gas is still associated with an increase in oil production. According to Saudi Aramco, Saudi Arabia has only adequately explored the 15% of its gas reserves (Al-Na'imi, 2006; OPEC, 2007). However, in order to produce natural gas without the dependency on the production of oil, the Kingdom increased its effort to produce it from non-

associated natural gas fields found in four sites in Al-Rub Al-Khali, 27 exploration wells will have been drilled by end of 2009 at these sites. Aramco also found few wells close to present oil fields, which are expected to begin production soon such as the Karan natural gas project which by 2012 will estimate to produce 1.8 billion cubic feet per day (EIA, 2008).

Appendices I and II provide summary of Saudi oil and natural gas in terms of production, proven reserve, export and Saudi's share of world production

3.3. PETROCHEMICAL INDUSTRY: DEVELOPMENTS AND TRENDS

The history of Middle Eastern petrochemical industry dates back to the late 1940s when the first Egyptian ammonia plant was founded. Later, in 1963 Kuwait's Petrochemical Industries Company (PIC) started, followed by the establishment of Iran's state-held National Petrochemical Company (NPC) in 1964. As for Saudi Arabia's Basic Industries Company SABIC, it had not begun production until 1976 (Zawya, 2007).

Because the Middle East and North Africa (MENA) region has large oil and gas reserves, it is now witnessing a petrochemical rush, speeding up the industry's development at an exceptional rate. The capacity increase announced by the stakeholders of the petrochemical industry as of December 2006 until 2011 is equivalent to the total capacity accumulated in the past six decades in MENA's petrochemical industry (Zawya, 2007).

It is obvious that the MENA region is capable of producing 94 million tons per year (t/y) of petrochemical products and major chemical fertilisers (ammonia and urea) in 2006. The six GCC countries as well as Iran represent 86% of the MENA's total petrochemical production capacity in 2006. On the other hand, Egypt, Libya and Algeria which are North African, have a production share of the remaining 14%. Coming to the biggest share of the region's total production, 43% are produced in Saudi Arabia, followed by Iran with 24%, whilst Qatar and Egypt contributed 10% each (Jordinvest, 2007). The GCC countries contribute with a growing share of the world's petrochemical production, which is considered to be the third largest contributor to economic growth and employment in the region. A hundred and twenty

one petrochemical companies were operating in MENA by 2006, employing 60,000 workers (Jordinvest, 2007), which is a clear indication of the contribution of the industry to the national economies in the region.

3.3.1. Saudi Arabia's Petrochemical Industry

One of the most important constituents of Saudi Arabian government's economic strategy is industrial diversification, which aims to decrease dependence of the Saudi economy on oil revenues. To achieve this, the government encouraged the development of a variety of manufacturing industries through a variety of incentive programme to promote the private sector's participation in Saudi's industrialisation. The private Saudi manufacturing companies are provided with the required infrastructure and services at low costs by eight industrial estates. In addition, the credit facilities are readily accessible for those enterprises on a very reasonable term (Saudi Arabia Ministry of Culture and Information, 2009).

As a result of the adoption of a free market economic model, all three of the financial, industrial and trade sectors of the economy showed a remarkable progress, which by its turn, enabled the private sector to play a growingly significant role in the development and diversification of the economy, especially in the petrochemical industry (Saudi Arabia Ministry of Culture and Information, 2009).

A number of Saudi Arabian companies involved in the chemicals and petroleum manufacturing as well as coal, rubber, and plastic has grown from 116 in 1981 to 941 in 2008 (Ministry of Economy and Planning, 2009). This is due to the fact that in the first twenty years, Saudi Arabia has passed the National Industries Protection and Encouragement Law and the Foreign Capital Investment Law in 1981. SABIC was established in 1976 to provide a venue for technology transfer and to make sure that Saudi Arabia is independent from foreign companies. Sipchem is one of the industry's latest ventures, which is a joint stock company established in 1999 (SABIC, 2007a; Sipchem, 2005).

Saudi Arabia accounted for approximately 75% of the GCC's petrochemical production, which is about 7% of global production (TAIB Bank, 2007). It is expected that output would rise from 40 million metric tonnes per year (t/y) in 2005 to 75 million metric t/y by 2010, in global terms it will mean increase in the Saudi share to

13%. Saudi Arabia produces 40 million tonnes of energy-based products, that include five million tonnes of steel and fertilisers each, and twenty million tonnes of ethylene and propylene products. Currently, Saudi Arabia is the world's second largest producer of ethylene glycol as well as methanol. It ranks the third largest producer of polyethylene, and the sixth largest producer of polypropylene. The chemical sector's growth is ranked the second to the Kingdom's oil sector (Al-Mady, 2004).

The development and expansion of the Kingdom's chemical industry is related to the raw materials availability and inexpensive energy, besides infrastructure investments in Al-Jubail and Yanbu that are worth approximately $50 billion. According to SABIC (2007) around 600 conversion units operate in the Kingdom, which use petrochemical feedstock as inputs for the production of the downstream products such as storage products, insulation materials, and home goods. During the next five years, Saudi producers are expected to increase their total capacity to the double and become one of the top four global producers (TAIB Bank, 2007).

3.3.1.1. SABIC: Saudi Arabia's giant

The Saudi Arabian Basic Industries Corporation SABIC, is one of the Kingdom's successful initiatives in industrialisation. It is one of unique examples of a successful long-term planning, investment and wise use of private and public financial sources.

SABIC was established by Royal Decree in 1976 (1396/97 AH), with an objective of setting up and operating hydrocarbon and mineral-based industries in Saudi Arabia. The government of Saudi Arabia holds around 70 percent shares of this firm while the remaining 30 percent shares are held by Saudi and GCC private equity owners (SABIC, 2008).

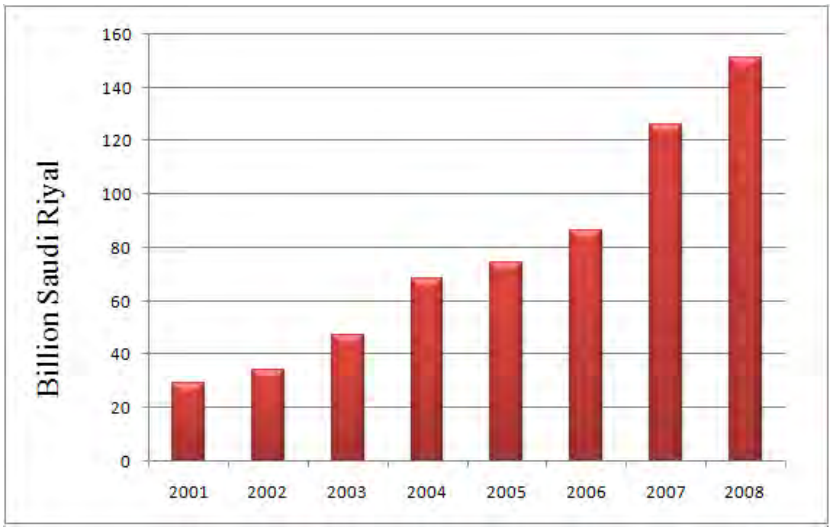
The Public Investment Fund granted SABIC with long-term loans on highly concessional terms. SABIC's capital requirements were provided by its joint venture partners. Moreover, SABIC used commercial loans for infrastructure investments. With such financial resources, In addition to its own authorised capital of Saudi Riyals (SAR) 10 billion (US$ 2.66 billion), SABIC had been obligated to industrial projects (SABIC, 2007a).

In its first phase of development, SABIC has established these assets:

- Five complexes of ethylene based petrochemical, which produces 1.6 million tons of ethylene annually.
- Two plants of chemical-grade methanol, which produces 1.25 million tons of methanol annually.
- One plant of urea, which produces 500,000 tons of urea annually.
- One plant of iron and steel, which produces 800,000 tons of iron and steel annually.
- Jiddah Steel Rolling Mill Expansion with total production capacity of 140,000 tons annually (SABIC, 1999)

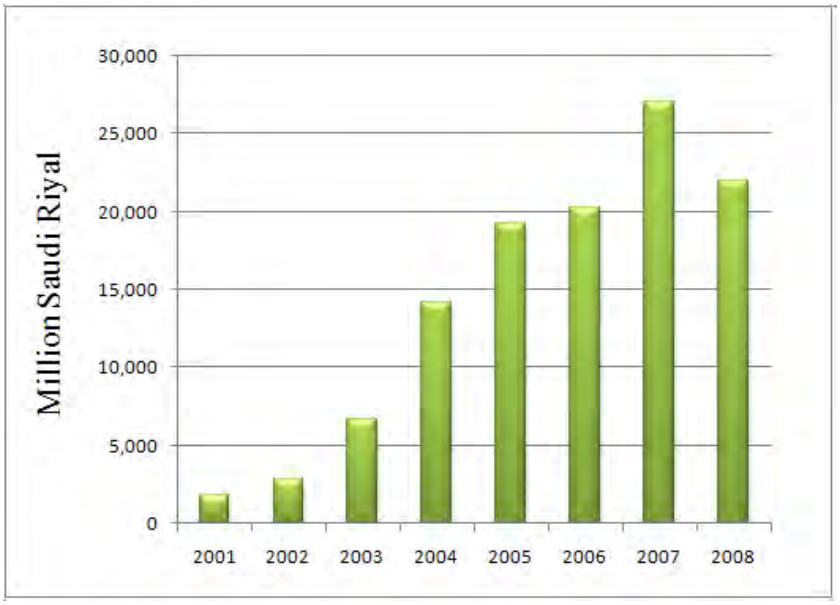
SABIC has 18 key industrial plants that operate in Al-Jubail, Yanbu and Dammam (SABIC, 2005). Its annual production is 13 million tons of chemicals, plastics, industrial gases, steel and other metals. SABIC has an important role in the Kingdom's economic growth, which occur due to its role in the development of petrochemical and mineral-based industries in the Kingdom and in the encouragement of the private sector for participation. Moreover, SABIC has a role in providing a mechanism to Saudi citizens to obtain the necessary administrative, professional and technological skills to control and expands industrialised economy (SABIC, 2007b). Figure 3.5 shows the sale revenues and figure 3.6 shows the net profit of SABIC from 2001 until 2008. These figures illustrate the remarkable achievement of SABIC as an organization that plays a major role in the Kingdom's industrial diversification.

Figure 3.5: **SABIC's Sale Revenues in Billion Saudi Riyals from 2001 until 2008.**



Source of data: SABIC 2001-2008

Figure 3.6: **SABIC's Net Profit in Million Saudi Riyals from 2001 until 2008.**



Source of data: SABIC 2001-2008

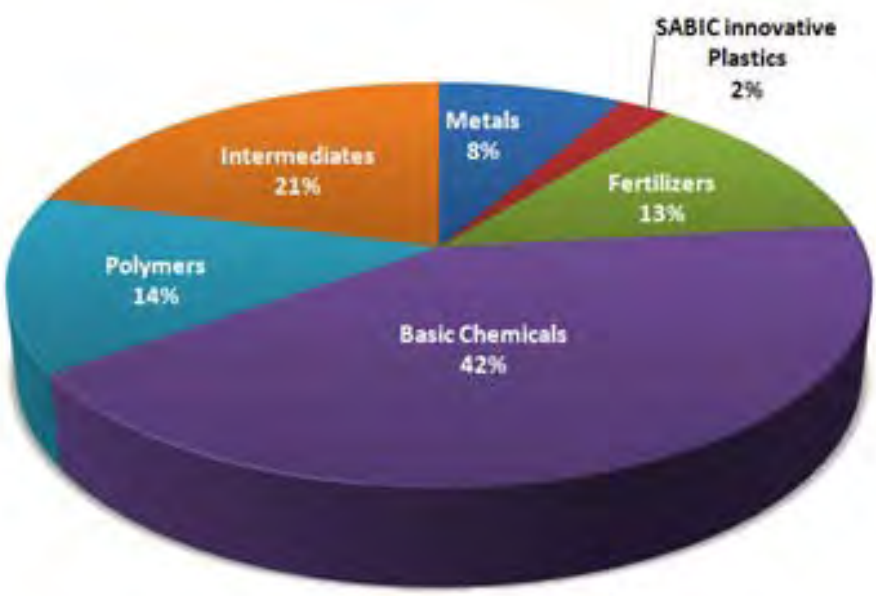
Today, SABIC is one of the leading international petrochemical companies in terms of both sales and product diversity. Its businesses sectors are grouped as follows:

- Basic Chemicals such as ethylene, methanol and propylene
- Intermediates like industrial gases
- Polymers such as polypropylene and polyesters

- Specialty products which includes specialist automotive, catalyst, oilfield and rubber chemicals, specialty polymers and polymer additives
- Fertilisers and Metals, (SABIC, 2006; 2007a).

Each sector comprises a number of Strategic Business Units (SBUs) totally dedicated to meet the specific needs of customers. The company's current overall production in 2008 was 56 million metric tons and forecasted to achieve annual production capacity of over 130 million metric ton by 2020 (SABIC, 2009). Figure 3.7 represent the percentages of SABIC's total production by business unit as of 2008. 42% of SABIC production is basic chemicals followed by polymers and fertilizers with 14 % and 13% respectively. The metal and the innovative plastics are produced in small percentages. According to SABIC latest report the specialty products yet to start production (SABIC, 2008).

Figure 3.7: **The Percentages of SABIC Total Production by Business Unit as Of 2008**



Source of data: SABIC, 2008

SABIC is the fourth largest manufacturer of polyolefins, the third largest manufacturer of polyethylene, and the fourth largest producer of polypropylene in the world. It also occupies the top most position as a producer in the world in terms of the production of mono-ethylene glycol, MTBE, polyether, and granular urea (Al-Mady,

2004). At presents the operation of SABIC is not confined in the land of Saudi Arabia only. Today SABIC operates in over 40 nations across the world. It has 60 plants situated across the Middle East, Europe, America and Asia. All of these plants are of world class level (SABIC, 2009). After entering into the new millennium SABIC including its all subsidiaries has become the third largest petrochemical producer. At present it is one of the world's five biggest petrochemical producers (SABIC, 2008).

3.3.1.2. SIPCHEM: Young and growing fast

Saudi International Petrochemical Company (Sipchem) is a Saudi joint stock company established on December 22, 1999 with an initial capital of SAR 500 million (US$ 133.3 million). Sipchem is owned by Saudi and other GCC countries' private sector with a paid up capital of SAR 3.3 billion (US$ 0.88 billion) as of 2008 (Sipchem, 2008). The provision of competitive and quality petrochemical products is the company's mission. Therefore, Sipchem has developed and made adequate investments in the petrochemical and chemical industries of the Kingdom. It has concentrated in the production of both basic and intermediate petrochemical and chemical products which are mainly used for the production of those goods which are used to improve the quality of lives of the people all over the world (Sipchem, 2008).

It has two affiliates – International Methanol Company and International Diol Company. Through these two affiliates Sipchem at present manufactures more than one million metric ton of methanol and around 75 thousands metric tons butanediol annually. The company aims at increasing its production level substantially in near future. In order to fulfill this aim, the company has been following a very special strategy that connects the performance in the present time with that of future. The company is continuously exploring the prospects of growth. It is also undertaking several renovation projects in order to attain desired level of growth. In 2006, Sipchem started to build Acetyls Complex which is comprised of "Acetic Acid plant (460 thousand mtpa), Vinyl Acetate Monomer plant (330 thousand mtpa) and Carbon Monoxide plant (345 thousand mtpa)". The commercial production started in 2009. Apart from this Sipchem has also invested huge sum of money in the development of olefins derivatives complex. This complex is comprised of nine plants and will produce value added as well as performance chemicals. The company expects to build around 800,000 metric tons production capacity per year for this complex. It is now

being expected that the complex will start its operation from 2013 (Sipchem in Brief, 2009).

The Sipchem is currently at its third phase of development. At this phase launching of so many additional facilities simply implies that the company has undertaken an aggressive development strategy. The company aims at making itself one of the largest and fully integrated petrochemical privately owned and operated complexes of the Middle East. An interesting feature about the company is that it has been strictly following the strategy of maintaining high quality level as well as maintaining its commitment to the protection of environment (Sipchem in Brief, 2009).

Comparing it to SABIC, Sipchem is much smaller. However, as a result of the ownership of the company's stocks by the private sector of the GCC as well as its citizens, Sipchem is blazing a new track in Saudi Arabia's industrial development. It is also receiving support and cooperation from other countries to establish a business stake in guaranteeing Saudi's business prospects of the future (Sipchem, 2005).

3.3.1.3. Other petrochemical companies

Besides SABIC and Sipchem, some of the smaller players in the Saudi Arabian petrochemical industry are as follow:

1) **Saudi Arabian Fertilizer Company (SAFCO)** was established in 1965 as joint venture between Saudi government and private sector. The objective of the company is to manufacture, produce, and process and market fertilizers in all its kinds inside as well as outside the Kingdom. The company also produce, manufacture and market Ammonia, Urea, Melamine and Sulfuric Acid. SAFCO aims also at expanding their activity by establishing and operating chemical and non-chemical plants. The net profit of SAFCO showed a 60% reduction in the second quarter of 2009 compared to the same quarter of 2008(SAR 480 million (US$ = 3.75 SAR) 2Q of 2009 compared to SAR 1.191 billion in 2Q of 2008), and only 9% reduction (SAR 525 million) compared with the first quarter of 2009 (SAFCO, 2009).

2) **National Industrialization Company (Tasnee)** was established in June 1985. Tasnee is the first Saudi company that is totally owned by private sector. They

operate in chemicals, petrochemicals, plastic, paper, engineering and other industrial services. The net loss of the company in the first quarter of this year (i.e. 2009) was SAR 25.80 million (US$ = 3.75 SAR), in comparison with the net profit register for the same quarter of 2008 which was SAR 148.02 million. One of the company's future plans is to market its product globally, which was taken as a result of Saudi Arabia joining the WTO. The company has few subsidiaries, associates and joint ventures such as Al-Rowad National Plastic Co. (Rowad), Bemax Resources NL Company (BEMAX), International Titanium Powder, National Gulf Company for Petrochemical Technology, National Industrialization Company for Industrial Investment, National Industrialization Petrochemical Company, National Industrialization Petrochemical Marketing Company, National Worldwide Industrial Advancement Company, Saudi Makaseb Int'l Company for Trading & Industry and Al Rowad International Packaging Company (Tasnee, 2009).

3) **NAMA Chemicals Co.** is a joint stock corporation, which was established in 1992. The company produces Epoxy, Caustic Soda, Epichlorohydrin, Calcium Chloride, Hydrochloric Acid and Sodium Hypochlorite. In the first quarter of 2009 the company announced a net loss of SAR 35.7 million (US$ = 3.75 SAR) in comparison to the net profit recorded for the same quarter of 2008 which reached SAR 17.55 million. NAMA has few affiliates:

   1- Jubail Chemical Industries Company (JANA) which is located in Al-Jubail and as of today it is capable of producing more than 60,000 metric tons of epoxy resin yearly.

   2- Arabian Alkali Company (SODA) which is also located in Al-Jubail and considered one of the largest producers of chlor-alkali in the Middle East. The current annual production capacity of SODA is 55,000 metric tons per year (Arabian Alkali Company, 2009).

   3- NAMA industrial Investment is a young company that was established in Al-Jubail in 2007. The company's aim is to invest in development, management and operation of petrochemical sector, and in oil and gas projects. The company also invests in developing industrial projects

related to generation and distribution of electrical energy as well as implantation of mechanical and industrial projects.

4- NAMA Europe is located in Bern, Switzerland (Nama, 2009).

4) Sahara Petrochemical Company is a joint stock company that was established in Al-Jubail in 2004. The objective of Sahara is to develop, own, build and operate, in collaboration with other companies, industries specialized in the production of Propylene, Polypropylene, Ethylene and mixed Polyethylene. As with other petrochemical companies, Sahara net loss in the first quarter of 2009 was SAR 21.1 million (US$ = 3.75 SAR). However, in the first quarter of 2008 the net loss was only SAR 15.44 million. The affiliates and subsidiaries of Sahara are:

1- Al-Waha Petrochemical Company, located in Al-Jubail, is a joint venture between Lyondell Basell industries (25%) and Sahara petrochemical company (75%). Even though it is a new company, established in 2006, it operates Spherizone Polypropylene plant which is considered the largest in the world. It produces 460.000 tons of propylene, which is a feedstock for the production of 450.000 tons of polypropylene (Al-Waha, 2009).

2- Arabian Chlorovinyl Company, which is a (50:50) joint venture between Sahara and Saudi mining company. The aim of the company is to build, operate and possess an ethylene dichloride project with an integrated caustic/chlorine industrial complex (Arabian Chlorovinyl Company, 2009).

3- Tasnee and Sahara Olefins Company. It is a closed joint stock company, Sahara own 32.55% of its capital (Sahara, 2009).

5) Yanbu National Petrochemical Company (Yansab) is a Joint Stock Company that was established in 2005. 51% of the company is owned by SABIC, 4% by SaudiIndustrial Investment Company (which is an affiliate that is totally owned by SABIC), 10% by 17private companies and 35% by Saudi citizens. The aim of Yansab is to be involved in the manufacturing of some petrochemical products such as ethylene, ethylene glycol, high density polyethylene, low linear density polyethylene, polypropylene, butene 1, butene

2, MTBE and BTX. Recently the company announced that the eight factories comprising Yansab will add a total annual capacity exceeding four million metric tons of petrochemical products, including (1.3) million tons of ethylene, (400) tons of propylene, (800) thousand tons of polyethylene (both low and high density), (400) thousand tons of polypropylene, (770) thousand tons of ethylene glycol, in addition to (250) tons of gasoline The combination Zailin and toluene, and (100) tons of (butane-1) and (butane-2), (25) tons of TNT (tert-butyl unprecedented Alither. Unfortunately, the net loss of the company for the first quarter of 2009 was SAR 14.9 million (US$ = 3.75 SAR), compared to SAR 13.06 million loss for the same quarter of 2008 (Yansab, 2009).

6) **Rabigh Refining and Petrochemical Company (PETRORABIGH)** is a (50:50) joint venture between Saudi Aramco and Japan's Sumitomo Chemical. It was established in 2005 with the objective of constructing and operating an integrated refining and petrochemical complex with a production capacity of 2.4 million tons annually of petrochemical products like polyethylene, polypropylene, mono ethylene glycol, and propylene oxide; and production capacity of 130 million bbl annually of refined products like naphtha, gasoline, jet fuel and diesel fuel oil. PETRORABIGH plant consists of 23 plants with a production capacity of 18.4 million tons per annum (mpta) of petroleum-based products and 2.4 mpta of ethylene and propylene-based derivatives. Recently PETRORABIGH's has engaged into a marketing agreement with Saudi Aramco to sell its refined products. PETRORABIGH petrochemical products will be marketed in the Middle East by the company itself, while Sumitomo Chemical Asia will sell the company's petrochemical products outside the Middle East. (PETRORABIGH, 2009). On May 2009 PETRORABIGH announced its first shipment and export of the first batch of products from petrochemical material to China. The shipment contained 19,200 metric tons of pure Mono ethylene glycol, a substance widely used in refrigeration and anti-freeze (Al-Eqtisadiah, 2009). As of the company's profit, PETRORABIGH announced a net loss of SAR 265 million (US$ = 3.75 SAR) in the first quarter of 2009 compared to a net loss of SAR 179.56 million for the same quarter of 2008. (PETRORABIGH, 2009).

7) **Saudi Kayan Petrochemical Co. (KAYAN)** is a public stock company that was established in 2006. It was established as a result of partnership agreement between SABIC (35 %), KAYAN (20%) and 45% is owned by Saudi citizens. The annual production capacity of the petrochemical and chemical products such as ethylene, propylene, polypropylene, polyethylene, ethylene glycol, aminomethyls, dimethylformamide, choline chloride, amino Ethyl, ethoxylates is expected to exceed 4 million metric tons. Furthermore the production capacity of polycarbonate is expected to be 2.6 million tons per annum. Kayan will be also specialized in the production of specialized chemicals that will be produced for the first time in Saudi Arabia such as aminoethanols, aminomethyls, dimethylformamide, choline chloride, dimethylethanol, dimethylethanolamine, ethoxylates, phenol, cumene and polycarbonate. Table 3.6 shows the main products of the company with the annual production capacity of each product and its use and application. The net loss of the company in the first half of 2009 was SAR 12.7 million (US$ = 3.75 SAR) in comparison to net profit of SAR 155.3 million in the first half of 2008 (KAYAN, 2009).

Table 3.6: **KAYAN's Products, Annual Production Capacity and Their Use or Application.**

Product Name	Annual Production (KMT)	Uses / Applications
Ethylene	1478	Feed stock for the polyethylene units.
Propylene	630	Feed stock for the polypropylene units.
Benzene	109	Feed stock for cumene plant.
Polyethylene	700	Automotive gasoline tanks, pipes bottles & containers
Polypropylene	350	Automotive industry, electric appliances, hot water pipe systems fibers (such as diapers), film wrap. +Injection Molding + Fiber Raffia
Ethylene Glycols	537	Polyester fiber for textile industry & others or PET for soft drinks package.
Polycarbonate	260	Optical Media (CD & DVD), Construction & Housing, Automotive, Electronic, Medical.
Ethanolamines	100	Gas Sweetening, Surfactants, Ethylene Amine
Acetone	133	Solvents, BPA manufacturing, Methyl Methacrylate Manufacturing
Dimethyl Formamide	50	Used in manmade fibers, leather, pharmaceuticals, solvent, PU (poly urethane) coatings
Ethoxylates	40	Detergent, paint, leather industry
Choline Chloride	20	Poultry Feed, plant growth regulators & pharmaceutical
Bisphenol A	240	Poly Carbonate (CD disks, glazing & automotive Industry), Epoxy resins (adhesives, flexible packaging, laminates…etc).

Source: KAYAN, 2009

8) Methanol Chemicals Co.: is a joint stock company, which was founded in 1989 and it produces formaldehyde and formaldehyde derivatives in Al-Jubail. The current production of the company is 382,000 metric tons annually and the current annual revenues are in the level of $100 million (CHEMANOL, 2009).

In addition to the above:

- Alujain Corporation: joint venture with Indian Petrochemical Corp. produceing acrylnitrate. Alujain plans to build a large plant to produce environmentally friendly gasoline additive, methyl-tertio-butyl-ether (MTBE).

- Saudi Urethane: it owns a polyoils plant in Al-Jubail that has been operating since 1986. It is a joint project between Saudi Al-babtain Group with shares worth 65% and Synthesis Español and Upjohn Polymer.
- Arabian Chemical Co.: it produces extruded polystyrene. Arabian Chemical Co. was established in 1986 as a joint venture of E.A. Jaffali of Saudi Arabia and Dow Chemical.
- Latex Corp.: it produces latex for a number of uses such as carpets, construction materials, and paint. Eighty percent of production is consumed locally, and the remaining twenty percent is exported.
- Saudi Venture Capital Group (SVCG): joint venture with Chevron that produces benzene and cyclohexane.
- Compagnie Polyisoprene Synthetique (CPS): it is a private sector venture that produces butadiene and isoprene, components for rubber products.
- Anchem: joint venture with a Finnish company that produces polyester resin.
- Al-Bilad: joint venture with a Kuwaiti and a French company. It has a medium servicing plant. In addition, it is the first of its kind in the Middle East to provide off-site services for the regeneration of catalysts for the region's refining and petrochemical industries (Al-Ghamdi and Sohail, 2006).

3.4. ISSUES AND CHALLENGES FOR GLOBAL COMPETITIVENESS

It has been mentioned earlier that Saudi Arabia enjoys competitive advantages for its petrochemical products in the international market, but analysts fear about the sustainability of this competitive advantages. To examine how far Saudi Arabia will be able to sustain its competitive advantages, it is necessary to look into the important issues and challenges that the petrochemical industry of Saudi Arabia is facing or may face in future.

3.4.1. Feedstock Availability

Feed stock availability has become one of the major concerns for Saudi Arabia's petrochemical industry. One important factor that has been giving significant competitive advantages to the petrochemical industry of Middle East including that of Saudi Arabia is the availability of cheap feedstock which results in reducing costs of

production. Very often economies of scale that the industry of petrochemicals of the Kingdom enjoys is said to be based on cheap feedstock. The concern is that Saudi Arabia is not completely immune to the challenges relating to availability and pricing of feedstock (Al-Mady, 2007).

The Kingdom's petrochemical industry is expanding at a rapid pace. Sometimes it is argued that the rate of growth of the industry will outpace the ability of the industry to meet the requirement of ethane which is one of the cheapest and easily available feedstock that the industry uses. Apart from this, the government owned oil companies, like Aramco, is planning to charge more for feedstock to ensure its availability to it, this will increase the price of feedstock. Not only that, other industries are also competing severely for the feedstock of conventional types. Since the feedstock is limited, this increases huge concerns for the petrochemical industry of Saudi Arabia. Managers of the industry have one important supply chain inquiry: where should new petrochemical investments be located? In the Middle East where the closeness to available feedstock becomes an advantage, or in the Far East, closer to the end user market and where other advantages can be accomplished? (Al-Mady, 2007).

Petrochemical companies, like SABIC, approach these challenges differently. First of all, the company must investigate outside its region to look for its competitive advantage in terms of cost and market responsiveness. Buying DSM's and Huntman's petrochemical assets was SABIC's main reason to acquire a worldwide reach (Short, 2002). The goal of this strategy is to avoid over-exposure to a manufacturing site built in one geographical location, and at the same time provides a well platform for additional organic growth through improved operational efficiencies (Al-Mady, 2007).

Second, the petrochemical company must look for alternatives to traditional feedstocks as part of the need for diversification. The reason for that is to be dependent on a number of sources. This means that petrochemical companies need to explore new sources and acquire the knowledge of using technology better to get the most output from existing sources (Al-Mady, 2007).

Taken together, if these challenges regarding the availability and pricing of feedstock are not addressed in proper way, in near future the Kingdom's petrochemical industry will face serious problem, which might deteriorate its competitive advantage in the international market of petrochemical products.

3.4.2. Overcapacity

Overcapacity is another major issue of the petrochemical industry of Saudi Arabia. As mentioned earlier in this chapter, the country has launched a number of projects regarding expansion of the existing companies as well as establishment of new firms in the sector of petrochemical. In the next two or three years there will be a huge rush for the start up of the new facilities in this industrial sector of the Kingdom. The chemical and petrochemical industry of Saudi Arabia has a history of over production. Looking at this type of history some analysts are now predicting that there could be a downturn in the level of production which will result in nothing but spare capacity of the industry. It could be that the new projects that are being expected to start up their operation between 2010 and 2013 will not operate at their full capacity. Therefore, there is now arising a huge concern regarding the reduction in the level of lower rate of operation of the Kingdom's petrochemical industry (Al-Mady, 2007).

This challenge of overcapacity facing the Saudi petrochemical industry seems to be very acute. This is mainly because most of the new capacity that will be generated in this sector is mainly intended to cater to the lucrative market of Far East. To be more specific, most of the new projects have been undertaken to capture the market of China, but the problem here is that the production of petrochemical products in Far East nations, particularly in China is increasing quite rapidly. Hence it can well be expected that most of the demand for petrochemical products in the Chinese market will be meet domestically resulting in reduction in the level of imports from countries like Saudi Arabia. If the demand for the products declines, there will be no requirement to use the new capacity at their full potential (Al-Mady, 2007).

To address this issue effectively, the necessary step would be to look for additional market for the petrochemical products so that the surplus capacity gets absorbed. The time has come to look for non-conventional market. Realizing the need for additional market for its petrochemical products, the government owned petrochemical company

SABIC is now devising a plan of opening up its market in African countries (Al-Mady, 2007).

3.4.3. Shortage of Qualified Manpower

Lack of qualified manpower is another serious issue that the petrochemical industry is dealing with. Looking at the state of skills of the labours in the labour market of Saudi Arabia, serious concern has been raised regarding whether these labourers will be appropriate for the Saudi's petrochemical industry. The industry is dubious about the existing marketing, engineering as well as technical skills of the domestic manpower of Saudi Arabia (Al-Mady, 2007).

To improve the skills of manpower it is necessary to provide them with adequate training. Realizing this need, the government owned petrochemical company SABIC is extensively working on skill development projects. SABIC is trying to provide their existing as well as potential workers with adequate training and educational programs so that their skills get enhanced. However, the efforts of SABIC are not sufficient enough to augment the skill of entire labour force. Apart from this, providing only scholarships or job training after recruitment is not enough at the present scenario where the recruitment process itself exposed to fierce competition for the skilled resources (Al-Mady, 2007).

SABIC has been able to realize this issue and trying to address it by making some serious efforts to become a learning organization. SABIC is trying to convert itself into such an organization where individual leaders as well as teams, as a whole, will be able to effectively understand the process of learning and will be able to create an environment, which will be helpful in encouraging and enabling learning at all levels. Therefore, as part of its initiative to provide a learning organization, SABIC has set up a learning centre. This centre aims at providing the highest possible standard of training to its employees (Al-Mady, 2007).

3.4.4. Contractor Constraints

The petrochemical industry is also facing a major challenge concerning the availability of good contractors. One major problem of this industry is that it is not being able to access adequate capabilities in the areas of construction, management as

well as engineering procurement. Easy access to these factors is very essential for meeting current as well as future expansion requirements of the petrochemical sector (Al-Mady, 2007).

It is now being found that the growing number and size of the industry has led to increased fewer contractors with higher costs. Not only that, but there is also lack of skill and capacity among the existing contractors for meeting the increasing demand (Al-Mady, 2007).

Huge surge in the level of global demand for Saudi's petrochemical products has resulted in increase in prices of construction materials. Today, the industry is in great need of multi-source contractors. The problem associated with multi-source contractor is that for the purpose of the multi-sourcing to be effective the contractors need to generate skills in the process of management. However, the existing contractors seriously lack these skills which have raised the level of risks associated with the issues of construction (Al-Mady, 2007).

For the purpose of addressing this issue, SABIC, for instance, has developed a very dedicated engineering and procurement system which has adequate experience in the areas of managing big projects.

3.4.5. Finance

Under current economic scenario, the lenders are increasingly becoming risk averse and adopting a more strict view regarding market risk. As a result, gathering finance for petrochemical projects is becoming more difficult. Under such situation, the immediate need to solve the problem of financing is to look for other sources of financing. Looking at the difficulties associating with lending issue, SABIC is considering other options. It has undertaken the method of Initial Public Offerings (IPO), which is what SABIC had recently done for its subsidiary Yanbu National Petrochemical Company (YANSAB). Not only that, the company has also been utilizing Islamic lending options (Al-Mady, 2007).

3.4.6. Formation of GPCA

The problems that have been just discussed are not unique to the petrochemical industry of Saudi Arabia only all the Middle East countries are facing these problems. In order to address these issues, the countries in the Middle East have taken an initiative to form an association that will help to reach some solutions regarding the increasing problems in relation to their petrochemical industry. These solutions are being expected to be helpful for countries in the region. The Gulf countries have formed Gulf Petrochemicals and Chemical Association (GPCA). This is basically a trade bloc of Middle East nations which provides the industry with a tool for communicating with and reaching out to other regional trade associations in all parts of the world. It creates a well-established network providing global advocacy strategy for the industry, while at the same time having the means of execution through strong regional trade associations. Through conferences and meetings, the GPCA increases the awareness and emphasize on the importance of the Gulf region as a major player in the petrochemical industry worldwide (Al-Mady, 2007).

3.5. MAJOR CHALLENGES FOR THE PETROCHEMICALS INDUSTRY

It is necessary to look at the major challenges that are being faced by all the petrochemical industries across the world. However, before moving on to analyse the challenges that global petrochemical industry is facing at present, it would be a better option to look first at the opportunities of the petrochemical industry under current economic situation as well as the factors that will be helpful in achieving success.

3.5.1. Industry Opportunities: ExxonMobil Perspective

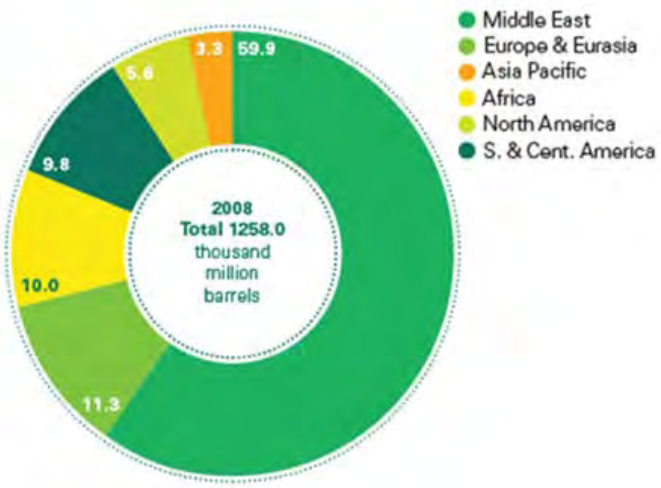
According to a speech at a petrochemical industry conference, delivered by ExxonMobil Chemical's Sherman J. Glass Jr. (Glass, 2007), there are a set of future challenges that ExxonMobil foresees for the industry. Glass, representing one of the largest petrochemical companies in the world, with operations in a number of countries, specified the unique global and industrial view based on the company's experience.

ExxonMobil Chemical is a leader in seven of the twelve chemical business segments they operate in and ranks the second in four others. More known as a key player in the petroleum industry, ExxonMobil Chemical had a long-term commitment with the petrochemical business. By turn, this helped in the creation of the industry in 1920 with the commercialisation of isopropyl alcohol that is considered to be the first chemical product made from petroleum. It also invented butyl rubber, which makes it a leader of the industry in that specific business, as well as developed the process of steam cracking that is regarded by many as the engine of petrochemicals (Glass, 2007).

According to Glass (2007) the chemical industry is facing positive opportunities that must be exploited in the coming years in line with global economic and political developments.

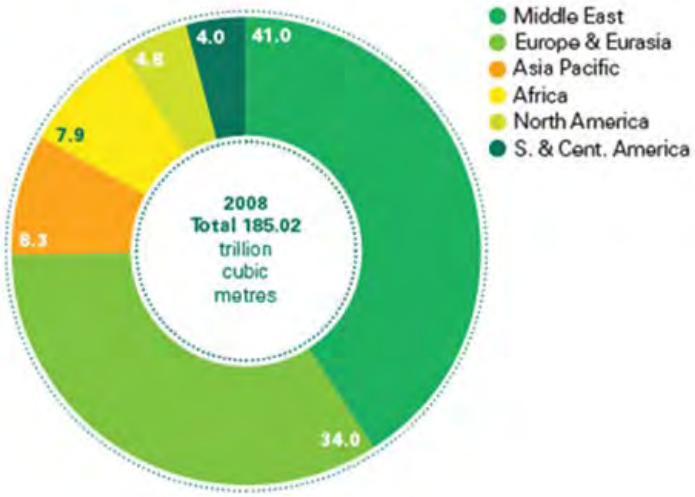
ExxonMobile has made a survey regarding the opportunities of the petrochemical industry in future and has predicted that although various analysts fear about the rapid depletion of oil resources in future, the world still possess three times more oil for future use than what have already been used (Glass, 2007). This huge reserve of oil and gas (as presented in figures 3.8 and 3.9) is being thought to be a good news for the global petrochemical industry, as it is very much relied on them. According to Glass (2007) 99 percent of the feedstocks of the petrochemical industry are provided by oil and natural gas. Consequently, huge availability of oil and natural gas will substantially decrease the threat regarding the unavailability of feedstocks in near future (Glass, 2007).

Figure 3.8: **World's Proven Oil Reserve by Region as of 2008**



Source: BP, 2009

Figure 3.9: **World's Proven Natural Gas Reserve by Region as of 2008**



Source: BP, 2009

ExxonMobile believed that the petrochemical industry possess a number of strong opportunities, specifically in the area of growth of market in Asia Pacific region. According to the forecasts of this company, the demand of petrochemical products will grow at a rate of 2-3 percent of the world Growth Domestic Product (GDP) in the world market. The demand for petrochemical products is currently being driven most

by the emerging markets of Asia, specifically China, and this growth will continue in future, as ExxonMobile is expecting about 60 percent increase in the global demand for petrochemicals in the next 10 years. According to its estimate, China will account for as high as 40 percent of this growth in demand. By 2015, Asia is expected to account for almost half of the global demand for petrochemicals. The major factors working behind the increase in demand in Asian markets are the increase in the purchasing power of the middle class people and their interest in adopting some applications that have been being enjoyed by American and European people since long. Finally, the company has made a forecast that high-end technological innovation will give an edge to the petrochemical industry in meeting the huge demand (Glass, 2007).

3.5.2. Industry Success Factors

Petrochemical companies have identified the following important success factors to long-term success in the petrochemical business (Glass, 2007):

1) ***Flexibility of capitalising differences in the feedstocks in terms of its availability, quality and cost.*** The petrochemical companies meticulously focus on feedstock management. In steam cracking, feedstocks present almost 50% of operating costs. This is the reason behind the ongoing expansion programmes of feedstock flexibility by Petrochem companies through setting up new technologies that enable the effective process heavier, lower quality but lower cost feeds (Al-Na'imi, 2006; Jordinvest, 2007).

   For instance, in 2006, ExxonMobil qualified over a 100 new steam-cracking feedstocks of different qualities from all over the world to use in its plants. Processing liquid and gas feedstocks from different sources allows petrochemical companies to rapidly respond and adapt to changes in the cost and availability of the feedstock. Furthermore, flexibility of the feedstock adds more value for the shareholders, as it supports them in reliably meeting their customers' needs in any economic environment (Glass, 2007).

2) ***Gradual reduction and more efficient use of energy, which might results in decline of emissions.*** For instance, ExxonMobile is trying to steadily reduce the use of energy through the application of new methods to recover and reuse

heat, reduce heat loss and enhance the efficiency of energy, as more than 33% of the operating costs are for fuel (Glass, 2007). Based on ExxonMobile's experience olefins are produced through the use of the company's furnace technology. The same technology is also used to process variety of feedstock, and that to efficiently decrease energy use and increase production. Steam crackers are the most energy consumption technology in any petrochemical plant. However, companies like ExxonMobil have shown that in the last 10 years they were able to reduce the energy from their steam crackers by 10% which is twice as much as the average for the industry (Glass, 2007). Moreover, energy initiatives at Petrochemical operations are also working on reducing the consumed energy per unit of output. A number of other plants have learned to use co-generation, which is a technology used to simultaneous produce electrical power and steam (Glass, 2007).

ExxonMobil, among others, has interests in implementing around 100 co-generation installations at various plants such as chemical (30 plants) and other refineries and natural gas processing plants. The primary fuel of these plants is the clean-burning natural gas, which has massively decreased the greenhouse gas emissions by more than 10.5 million metric tons annually compared to conventional power generation (Glass, 2007). As a result of such technology and other more advanced technological methods, air, land and water around Petrochemical plants have become cleaner than before.

3) ***Focus on costs, efficiency, reliability and safety.*** Petrochemical industry is constantly facing margin pressure; therefore, effective cost management is a crucial factor in its success. A focus on operating costs must be sustained throughout business cycles (Al-Ghamdi and Sohail, 2006; Mohitpour et al., 2003). Petrochemical companies have to meet the cost targets and understand their role in reducing costs on a sustainable basis. Safer and lower operations costs enable Petrochemical companies to increase manufacturing capacity at almost no additional capital, which is a natural consequence of running plants at their full capacity with fewer outages (Glass, 2007).

4) ***Utilize state-of-the-art technologies to increase competitiveness and reliability, and that to be in line with the customer's requirements.*** To make their operation more efficient, Petrochemical companies are learning to use the

most advanced technologies (Al-Mady, 2007). Teams of researchers and scientists that focus on the needs of customers to teach petrochemical companies to meet those needs, assisting the company in finding the best ways to improve its plants' operations (Pennwell, 2006).

3.5.3. Other Challenges Facing the Industry

There are positive improvements that are occurring in the petrochemical industry in the region; nevertheless, challenges beyond the Middle East region affect the whole industry (Al-Na'imi, 2006).

3.5.3.1. The Doha trade round

One of the key challenges faced is the Doha Trade Round, because, as Clatanoff *et al*. (2006) pointed out, the Saudi future of petrochemical industry would be influenced by the economic progress that developing countries witness, which would increase their demand for petrochemicals. As explained in the previous chapter, the successful completion of the Doha Trade Agreement of the WTO would reduce tariffs and trade barriers, increase world trade, and provide more prosperity and lower global poverty (Ramady and Mansour, 2006).

In addition, the negotiations of the Doha Trade Round would force the developed countries and their petrochemical industries to become more competitive. Countries like Saudi Arabia are obliged to encourage policymakers in all parts of the world to reject protectionism and work for achieving a new round of tariff reductions, like the global producers who depend upon openness in world trade (Al-Mady, 2007).

3.5.3.2. Global warming

The entire world is becoming more and more concern about the issue of global warming. In a number of regions efforts have been taken to reduce the level of manmade hydrocarbons (CO2) emission. In near future this might impact the petrochemical industry as the industry emits huge level of CO2 in the air. Hence, the petrochemical plants have to be made in such a way that they can properly respond to this issue and undertake sufficient measure to reduce the level of CO2 emission and take other positive steps to protect the climate (Al-Mady, 2007).

Global warming has become more significant in recent years and has led Saudi Aramco to affirm that 'stewardship of the natural environment' is one of its goals, whilst assuring the supply of energy to the world. Consequently, like other petroleum and petrochemical companies, Aramco is constantly looking for cleaner alternative of energy sources that are not contributing to global warming (Aramco, 2007).

3.6. SUMMARY: STRATEGIC FORCES ON THE PETROCHEMICALS INDUSTRY

The period between 2008 and 2010 are potentially very challenging for both the global and regional petrochemical industry. The large capacity build-up offers opportunities and also opens up the industry to wider competition, greater risks, and more threats that would be regarded in detail in the following chapters.

The effect of the industry on the growing economies with their high growth rates and populations will in turn influence the future markets for petrochemicals. Economists predict that in the next decade some 1 billion inhabitants of Asia, Eastern Europe, and Africa will rise above the poverty level and enter the global marketplace as new consumers (Glass, 2007), which creates challenges for the energy and petrochemical industry. The rising economic powers of China, India, Russia, Brazil, and Mexico all possess solid mechanisms of economic growth. The trend that has been in place for several years continues, while the balance of economic power shifts from the world' developed economies to the developing ones.

The following facts indicate this change as it appeared in The Economist (Rodenbeck, 2006):

- Emerging economies compromise more than 80% of the world's population;
- They hold 70% of the world's foreign exchange reserves;
- Their allocation of the world's exports has risen from 20% in 1970 to 43% in 2005;
- They accounted for nearly 80% of the oil demand's growth in the past five years;
- Emerging economies accounted for more than 50% of the world's GDP; and
- It is been estimated that by 2025, emerging economies will account for more than 60% of the world's GDP.

The future of the global petrochemical industry will be very much linked to the emerging economies of the world; and these facts will be instrumental in determining its future. Petrochemical companies in the Middle East, especially in Saudi Arabia, must acquire the knowledge to cope with globalisation and pursue a strategic vision that serves the growing global markets facing increased competition from the European and American more established and experienced giants who are equally keen on serving the same markets without the advantage of abundant feedstocks (SABIC, 2007).

Healthy petrochemical business depends to a great extent on healthy global petroleum industry operating in a complex, geopolitical uncertain world. That questions future energy supplies, and is concerned about risks of climate change (Glass, 2007). Regardless of all the mentioned complexities, the petroleum industry's mission is to meet the world's increasing needs for affordable and consistent energy which is not only dependable, but also safe and environmentally responsible. According to the industry's record so far, the mission can be accomplished.

It is worth noting that the petrochemical industry is constantly facing challenges, while in response to these the business environment is rapidly changing and the competition is intensifying. Because developing nations need more of its products to raise the standard of living of their inhabitants, the prospects for current and future businesses would immensely grow to provide experienced and new companies in the field with chances to becoming more competitive if they learn to adjust.

The petrochemical industry's approach should be always based and focused on long-term views of the business to capture the previously mentioned opportunities, bearing in mind the high entry challenges faced. A disciplined approach to investments in addition to continuing advances in technological innovation must be put in the spotlight. The leader of the industry should base decisions on business fundamentals; they should also have long-term commitment to business strategies through the unavoidable business cycles that are experienced by all regions and industries.

More importantly, the petrochemical industry must be prepared to face the changes that would occur in the feedstock availability; it must also acquire skills to learn to use the technologies at their disposal, as well as meeting the customers' requirements

and needs. Skilled and competent people that are already part of the petrochemical industry must be ready to adopt the developments of the industry and seize the available opportunities to disentangle any faced problems.

As the preceding discussion indicates, it is now clear that this is where Saudi Arabia's competitive advantage rests and where it needs to find its way through the world trade as per the regulations of the WTO if it wants to make sustainable, long-term profits from this advantage. By learning and adjusting the advanced technologies of the industry in addition to getting the best available workforce, Saudi Arabia and its petrochemical industry can grow, prosper, and be one of the world's future market leaders.

Still, the road is long, yet as previously presented, it is obvious that a lot of the groundwork has already been done, Saudi Arabia along with other countries of the region are insisting on taking this long, yet gratifying path towards development.

Chapter 4

WTO MEMBERSHIP AND PETROCHEMICAL INDUSTRY IN SAUDI ARABIA

4.1. INTRODUCTION

The main theme of this thesis is to look at the impact of joining the World Trade Organization on the sustainability of the competitiveness of the petrochemical industry in Saudi Arabia. To gradually approach the aim of the thesis, the previous two chapters (chapter 2 and 3) have been devoted to provide background information. Chapter 2 provides information about the Saudi Arabia joining WTO, which included the rules, regulations and articles designed by WTO, while chapter 3 presents the petrochemical industry in Saudi Arabia. Chapter 3 not only discusses the development and trends of the petroleum as well as the petrochemical industries, but also discusses the issues and challenges faces the Saudi petrochemical industry for global competitiveness. To complete the picture this chapter discusses the consequences of WTO accession on the petrochemical industry of the Kingdom of Saudi Arabia. It presents some WTO rules on chemical tariffs and other related agreements that affect petrochemicals. The Harmonized Commodity Description and Coding System (HS) is briefly presented to provide a background on the product categories and the uniform tariff classification system. This topic serves as a take off point in explaining the chemical tariff harmonization agreement that particularly concerns HS Chapters 28 – 39.

The chapter introduces other initiatives toward eliminating chemical tariffs. These include the accelerated tariff liberalization initiative, non-agricultural market access, and elimination of chemical tariffs at Doha round. The accelerated tariff liberalization initiative has been pushed forward by the Asia Pacific Economic Cooperation to liberalize trade in the region, starting with priority sectors, including chemicals. The Doha ministers-initiated negotiations on the non-agricultural market access aimed to further liberalize trade on non-agricultural goods that includes chemicals. A comprehensive chemical tariff elimination agreement is proposed on all chemical line

items under Chapters 28-39 of the Harmonized Tariff System. The benefits of chemical tariff elimination are briefly argued.

The chapter presents the results of WTO accession on petrochemical tariffs as far as both the import and export of petrochemicals is concerned. The harmonization rates are presented as well as the current tariff schedule of some petrochemicals. In addition, the performance of the petrochemical exports (olefin and aromatics petrochemicals) of Saudi Arabia using available time series data is also presented in the following sections. To do this, the percentage of the petrochemical exports to total chemical exports is graphed to illustrate the trend overtime.

4.2. WTO RULES ON CHEMICAL TARIFFS, AND RELATED AGREEMENTS

4.2.1. Harmonized Commodity Description and Coding System

All WTO members use the Harmonized Commodity Description and Coding System (HS) in classifying imported goods for purposes of duty and tax collection.

In the past, the GATT had no rules on tariff classifications, and countries had their own individual systems. As trade expanded, they realized the necessity for a uniform classification. This resulted in the preparation of the HS in 1988 by the World Customs Organization. Countries adopted HS as a "global classification system where products are grouped according to what they are, what they are made of, and how they are manufactured or processed" (Global Tariff, 2008).

This multi-level system consists of 21 Sections and 98 Chapters under broader product groupings, such as agricultural products, mineral products, chemical and related products, non-consumable animal and plant products, textile and apparel, non-metallic mineral products, metals and manufacture articles made mostly of metal, and other highly manufacture and specific-purpose goods (see Appendix III for sections and chapters of the Harmonized Tariff Classification System) (Global Tariff, 2008).

Each section and chapter has both Legal Notes and Explanatory Notes. The former specifies the scope and limits of each Chapter, Section, Heading or Subheading, while Explanatory Notes elaborate the classification for better understanding. In each

Chapter, goods or commodities are hierarchically classified, and broken down into finer categories. The Classification Number indicates the lowest breakdown level, which must be used in the Customs Documents (Global Tariff, 2008).

The World Customs Organization's Harmonized System Committee carries out a periodic review of the HS to incorporate technology changes and international trade patterns, and recommend amendments to the HS. The series of reviews took effect on 1 January 1992 (HS92), 1 January 1996 (HS96), 1 January 2002 (HS2002), and 1 January 2007 (HS2007) (WTO, 2008b).

4.2.2. The Chemical Tariff Harmonization Agreement

In 1991, chemical associations from several countries proposed harmonized tariffs of 0%, 5.5% or 6.5% (See Table 4.1 for Harmonization rates, and Appendix IV for Harmonized Tariff Schedule and Chemical Tariffs) for all chemicals covered under Chapters 28-39 of the Harmonized System of Tariff Classification, except for a few items as part of the Uruguay Round agricultural negotiations (Steenblik, 2005).

Table 4.1: **Harmonization Rates**

Tariff Level	Harmonization Level	Time Frame
10% or less	5.5 - 6.5 %	5 years
10.1 – 25%	6.5 %	10 years
>25%	6.5%	15 years

Source: International Council of Chemical Associations [ICCA], (1991).

It was proposed that the tariff harmonization scheme should have a phased-implementation schedule of up to 15 years since some products are sensitive to tariff reductions (ICCA, 1991).

The tariff harmonization would still be subject to reduction and elimination of non-tariff measures that would be identified by the country chemical industries to their respective negotiators. It was further proposed that this agreement would become an integral part of the total Uruguay package. It was also recommended that this agreement replace the previous tariff rates in the chemical sector (ICCA, 1991).

Based on this chemical industry proposal, the Uruguay Round Chemical Tariff Harmonization Agreement (CTHA) was signed by more than twenty country

signatories. As part of the WTO accession commitments, several countries have adopted the CTHA (Steenblik, 2005).

Harmonization started from currently applied rates of most favoured nations. Any applied tariffs lower than the harmonization levels remained the same. In specific sectors or products, the goal is to cut back the tariff rates below the harmonization level, or eliminate total tariffs (ICCA, 1991).

4.2.3. Initiatives to Eliminate Chemical Tariffs

4.2.3.1. Accelerated Tariff Liberalization Initiative

At the 1997 meeting in Vancouver, sixteen leaders of the Asia-Pacific Economic Cooperation (APEC) proposed on Early Voluntary Sectoral Liberalization (EVSL) initiative as a step in attaining free and open trade in the region, which happen to be APEC goal (Austria, 1998). APEC initially identified forty–one EVSL items for early liberalization, but this was narrowed down to a final fifteen (Changrok and Chang-Yong, 2001). These fifteen sectors have been divided by APEC into two groups: nine of these sectors under priority debate and six other sectors (Japanese Ministry of International Trade and Industry, 2000a; Austria, 1998).

The nine priority sectors include chemicals, medical and scientific equipment, forest products, environmental goods and services, gems and jewelry, energy and energy related goods and services, fish and fish products, toys and telecommunications; the latter was later omitted (Japanese Ministry of International Trade and Industry, 2000a; Austria, 1998).

The EVSL package of tariffs, services, non-tariff measures, and economic and technical cooperation, was presented at the APEC annual meeting in Kuala Lumpur in November 1998. Since there was no agreement on the tariff elimination proposals of the EVSL package, the ministers decided to refer the tariff elements to the WTO. This was an attempt to organize a critical mass within the WTO, so that agreement can be attained during 1999 WTO Ministerial Meeting, and EVSL would eventually be adopted by WTO membership. This WTO process for eight priority sectors is known as Accelerated Tariff Liberalization (ATL) initiative (Japanese Ministry of International Trade and Industry, 2000a).

During the third WTO Ministerial Meeting in Seattle (December 1999), ATL supporters argued that the eight ATL sectors represent the interests of developing and developed countries. Furthermore, they argued that trade liberalization in these eight sectors will have positive effect on trade, investment and economic growth (Austria, 1998).

Despite pronouncements of the advantages, ATL proponents encountered strong opposition from European Union, among other opposition countries. Since the Seattle meeting was complicated in nature, the package showed minimum progress (Steenblik, 2005; Japanese Ministry of International Trade and Industry, 2000a).

4.2.3.2. Non-Agricultural Market Access

In preparation for the 1999 Ministerial Conference, the United States submitted the objective and overall framework for negotiations on Non-Agricultural Market Access (NAMA) that built on the ATL initiative (WTO, 1999).

NAMA was discussed during the Doha Ministerial Meeting in 2001. Paragraph 16 of the DOHA Ministerial Declaration stipulates that the WTO negotiations on NAMA are aimed to attain more market access for non-agricultural products by reducing or where appropriate eliminating tariffs, tariff peaks, high tariffs, and tariff escalation, as well as non-tariff barriers on export products to developing countries, of which special needs and interests are being considered (WTO, 2008c).

NAMA objectives are clear, but the modalities are being negotiated, e.g., tariff schedule, product coverage and flexibility mechanism. In 2003, the Swiss Chairman of the NAMA negotiating group introduced a Swiss formula in reducing tariffs (WTO Watch, 2006). During the Cancun Ministerial Meeting in 2003, Derbez text on NAMA was proposed. However, this was rejected, as this did not take into account the needs of developing countries. During the WTO General Council Meeting in July 2004, the General Council adopted the “2004 July Package” or “NAMA Framework” (WTO Watch, 2006).

The Hong Kong Ministerial Declaration in 2004 indicates that the NAMA framework adopts the Swiss formula in reducing or eliminating tariffs (paragraph 14), reiterates the “importance of the flexibilities for developing countries” (paragraph 15), and

recognizes the engagement of members in sectoral initiatives (paragraph 16). For the sectoral initiatives, the following sectors have been discussed for either reduction or total elimination of tariffs: chemicals, automobile/auto-parts, bicycles, electronics/electrical parts, fish and fish products, forest products, gems and jewellery product, raw materials, sports equipment and healthcare (Aggarwal, 2006).

For chemicals, and depending on the current chemical harmonization initiative and the principle of inclusive product coverage, NAMA members discussed product coverage including complete range of chemical products (HS chapters 28 – 39). Discussions have also centred on "incorporating flexibility for developing countries, encouraging participation of additional key traders, and targeting tariff end rates" (Aggarwal, 2006).

A huge amount of work with some development has been documented since the Hong Kong Ministerial Meeting. However, the 2006 deadline in submitting the modalities has been missed. Even though the draft Modalities of July 2007 and February 2008 has some limitations, they are considered a step ahead in the negotiations (LDC Briefing Book, 2008).

4.2.3.3. Comprehensive chemical tariff elimination

In 2005, ICCA (2005a) urged the Doha negotiators to prepare a comprehensive chemical tariff elimination agreement on all chemical line items under Chapters 28-39 of the Harmonized Tariff System, as well as specific line items in other chapters that are considered chemicals. For the final tariff elimination, no products would be an exception.

ICCA (2005a) hoped that WTO member countries with a viable chemical industry, agree to eliminate all chemical tariffs, dismantle all identified non-tariff barriers, and prevent formation of new non-tariff barriers. This will apply to all WTO members, except the least developing countries, with chemical production of $3 billion or more per year.

It was proposed that the staging of tariff elimination be as a continuous process. Reduction of tariff below CTHA levels of 5.5% and 6.5% would only start "if an agreed upon critical mass of WTO members with a viable chemical industry commit

to tariff elimination". A maximum of five years was set for phasing of tariff elimination for the present CTHA members. For non-CTHA participants, staging should be based on the level of bound rates: 25% or less for 10 years, and more than 25% for 15 years (ICCA, 2005a).

As part of trade liberalization, ICCA (2005a) also appealed to eliminate the non-tariff barriers in the chemical industry, including trigger price mechanisms, export taxes, quotas, import licensing, and discriminatory standards. A significant non-tariff barrier in the global chemical industry is the difference in regulations used in assuring protection of safety, health and environment.

The outcome of the agreement on chemical tariff elimination will supersede the results of other negotiations in NAMA covering HS Chapters 28 – 39, for instance, low tariffs and environmental goods. Yet, there is still a chance for enhancements in implementing the pharmaceutical zero-to-zero agreement (ICCA, 2005a).

ICCA (2005b) claimed that the chemical tariff elimination is beneficial to the chemical sector as well as to other sectors. First, chemical industries are competitive everywhere. Since the comparativeness between chemical industries depends on chemical input, countries with low chemical tariffs can well attract investors in the chemicals sector. Furthermore, being one of the main inputs to most of the manufacturing and agricultural products, chemicals with low tariff results in a reduction of the costs and prices of the goods. Sloten (2005) states that in the long-run, chemical companies with minimum experience to foreign competition and that were protected by tariffs would not be sustainable. He further contends that high tariffs and development goals are not in agreement as export industries would remain uncompetitive due to the elevation of input costs, and generally, firms would stay uncompetitive as a result of the reduction of pressures from foreign competition. Second, chemicals are essential inputs to some manufacturing and agricultural production, such as textiles, leather, electronics, automotive, and so on. The lower chemical tariffs will reduce input costs and prices of intermediate and finished goods, hence, further benefiting the end consumers.

4.3. WTO RULES ON CHEMICAL TARIFFS, AND RELATED AGREEMENTS- IMPLICATION TO SAUDI ARABIA

Saudi Arabia has been incorporating changes in their import process and regulations in order to come at par with the WTO requirements. However the procedures for customs duty in the nation is somewhat lacking in clarity. The Brussels Harmonized Commodity Description and Coding System have been adopted by Saudi Arabia since 1991 (Hoekman and Khayer Al-Din, 2000) – "The Saudi tariff regime operated under what was known as the Brussels Tariff Nomenclature (BTN) until 1993 when the Kingdom shifted to the more comprehensive Harmonized System Code (HS Code) which was used by most GATT members at the time" (Samba, 2006, p. 7) at present Saudi Arabia follows HS 2002 incorporating 7177 tariff lines pertaining to industrial and agricultural products identified at the level of 8-digit figure. Out of these the first six belongs to the HS code and the last two digits are specifically used for Saudi Arabia. The document incorporating membership of Saudi Arabia includes the Schedule of Specific Concessions and Commitments on Goods and the HS code number. Along with these the tariff rates introduced after the accession to WTO membership are also indicated for each commodity (Samba, 2006).

Saudi Arabia has also attempted to reform its trade related norms and restructure its legislation in line with WTO regulations. The areas covered in this respect are import licensing, customs valuation, standards and technical regulations and even intellectual property rights protection. While onerous the burdensome non-tariff rules are removed some tariff regulations have been introduced. These include harmonization of tariffs on imports of chemical goods at extremely low or almost zero rates of duty (U.S. Trade Representative, 2005). Saudi Arabia has adopted the CTHA since the Uruguay Round (Office of the United States Trade Representative, 2008). The Chemical Tariff Harmonization Agreement might be promoted by Saudi Arabia in order to utilize its cost advantage. The agreement imposes a ceiling of 6.5 percent on around 1100 chemicals out of which 64 are exported by Saudi Arabia. Saudi Arabia, which has an exclusive cost advantage in natural gas and feedstock production, obviously will be able to promote this agreement and include more participation. Thus they will gain better access in the global markets owing to lower tariff rates and their own cost advantage (Oxford Business Group, 2007; Samba, 2006).

At the time of joining the WTO, Saudi Arabia agreed upon reducing gradually the tariffs in various sectors following the different sectoral initiatives taken. These included the telecommunications, information technology, aviation, pharmaceuticals and chemicals (Samba, 2006). Saudi Arabia has already taken several measures to cut down tariffs before accessing the WTO membership. The Doha Negotiations Progress Report (2007) allows some of the Recently Acceded Members (RAMs) a provision of two years' grace period for the purpose of implementing the terms of Doha negotiations pertaining to non-agricultural market access rules. They also get a two years period before the application of these tariff cuts. However this is applicable for those nations who would adopt the 'Swiss Formula' in the Draft Modalities. Since in this case the tariff cuts will be on products exported to developing nations, this might affect negatively the interest of the new members. However, as far as Saudi Arabia is concerned it "would not be required to undertake tariff reductions beyond their accession commitments" (Law Offices of Stewart and Stewart, 2007).

As far as the petrochemical industry of Saudi Arabia is concerned, the nation will adopt growth strategies like –" diversifying the product portfolio, establishing more joint ventures with industry majors, placing greater emphasis on research and develop and diversifying further downstream" (Al-Sa'doun, 2006). This reflects a positive outlook regarding the chemicals industry such that even if tariffs are almost eliminated the nation will have a strong foundation to control the growth of this sector. Thus despite the tariff cuts which the nation is moving towards, the petrochemical industry is not likely to lose its market.

Thus we find that Saudi Arabia has committed to tariff cuts in almost all the sectors. As far the petrochemicals, the trade balance is surely affected by the chemical tariff harmonization policy but the cost advantage is retained. The foreign markets accused Saudi Arabia of double pricing its Natural Gas products like propane, butane, natural gasoline, etc. However, the current price of NGLs (natural gas liquids) at the international market is 30 percent above the domestic pricing of these products. Thus the economic viability will persist as far as these products are concerned despite the tariff cuts (Samba, 2006).

4.4. RESULTS OF WTO ACCESSION ON PETROCHEMICAL TARIFFS FOR SAUDI ARABIA

With the Chemical Tariff Harmonization Agreement (CTHA) requiring substantial reduction in global tariffs on chemical imports, Saudi Arabia redesigned the tariff structure of its chemical goods, including 64 chemicals exported by SABIC (Bourland *et al.*, 2006). The harmonization rates included zero, 5.5 percent, or 6.5 percent with differing staging schedule as required (ICCA, 2005a).For some chemical products, tariff reduction is in two phases with the final harmonization rates to be effective on the first of January 2010 (Al-Zuhd, 2005).

Table 4.2 shows the current tariff schedule of some Saudi Arabia petrochemicals, as result of WTO accession. The tariff bound rates of some petrochemicals had already been reduced to 6.5%, for example Polyisobutylene (HS Code No. 39022000).

As mentioned in the preceding paragraph, the tariff bound rates of other petrochemicals went through a one phase reduction in 2008, and will go through further reduction in 2010. For instance, the bound rate of “polyethylene having a specific gravity of less than 0.94” (HS Code No. 39011000) at 12% was reduced to 8% at interim stage in 2008, and the final phase will be 6.5% at full implementation stage in 2010.

This tariff reduction offers an avenue for Saudi Arabia’s petrochemical industry to gain better access to foreign markets (Bourland *et al*., 2006). Appendix V provides the overall tariff profile of Saudi Arabia.

Table 4.2: **Current Schedule of Sample Saudi Petrochemicals**

HS Code 2002	Description	Bound %	Final bound %	Implementation	Interim %
3901	Polymers of ethylene, in primary forms.				
39011000	Polyethylene having a specific gravity of less than 0.94	12	6.5	2010*	8 (2008)
39012000	Polyethylene having a specific gravity of 0.94 or more	12	6.5	2010*	8 (2008)
39013000	Ethylene-vinyl acetate copolymers	6.5			
3902	Polymers of propylene or of other olefins, in primary forms.				
39021000	Polypropylene	12	6.5	2010*	8 (2008)
39022000	Polyisobutylene	6.5			
39023000	Propylene copolymers	6.5			
3903	Polymers of styrene, in primary forms.				
39031	Polystyrene:				
39031100	Expansible	12	6.5	2010*	8 (2008)
39031900	Other	12	6.5	2010*	8 (2008)
39032000	Styrene-acrylonitrile copolymers	6.5			
39033000	Acrylonitrile-butadiene-styrene copolymers	6.5			
3904	Polymers of vinyl chloride or of other halogenated olefins, in primary forms.				
39041000	Poly(vinyl chloride), not mixed with any other substances	6.5			
39042	Other poly(vinyl chloride): Non-plasticised / Plasticised	6.5			
39043000	Vinyl chloride-vinyl acetate copolymers	6.5			
39044000	Other vinyl chloride copolymers	6.5			
39045000	Vinylidene chloride polymers	6.5			
39046	Fluoro-polymers:				
39046100	Polytetrafluoroethylene	6.5			

*: First of January

Source: WTO

In addition to these, Saudi Arabia may use the WTO dispute settlement mechanism against "any anti-dumping duties or other barriers in the foreign markets on petrochemical exports of Saudi Arabia" (Al-Zuhd, 2005). However, as of April 2008,

there were no complaints filed, nor were there complaints filed against Saudi Arabia (see Appendix VI for the trade profile of Saudi Arabia).

On the export regulations, WTO requires revisions to export restrictions and subsidies. The Saudi feedstock pricing for petrochemical productions has gone through the toughest negotiating situation in the WTO accession process. The European Union viewed the low-cost feedstock as unfairly subsidized, but eventually Saudi Arabia was not obligated to change the pricing system; this kept intact the cost advantage of the domestic petrochemical manufacturers over their competitors (Bourland *et al.*, 2006).

The difference in pricing is as follows: the current price of Aramco natural gas (methane and ethane) fixed at $0.75 per million BTUs for domestic consumers is relatively lower than the current price of natural gas in the United States of over $14 per million BTUs. Natural gas is not for export, and that is related to the high cost of the infrastructure of gas export. This feedstock pricing scheme provides a cost advantage to Saudi companies especially the ones that uses natural gas, particularly the petrochemical industry, which is not given to foreign competitors (Bourland *et al.*, 2006).

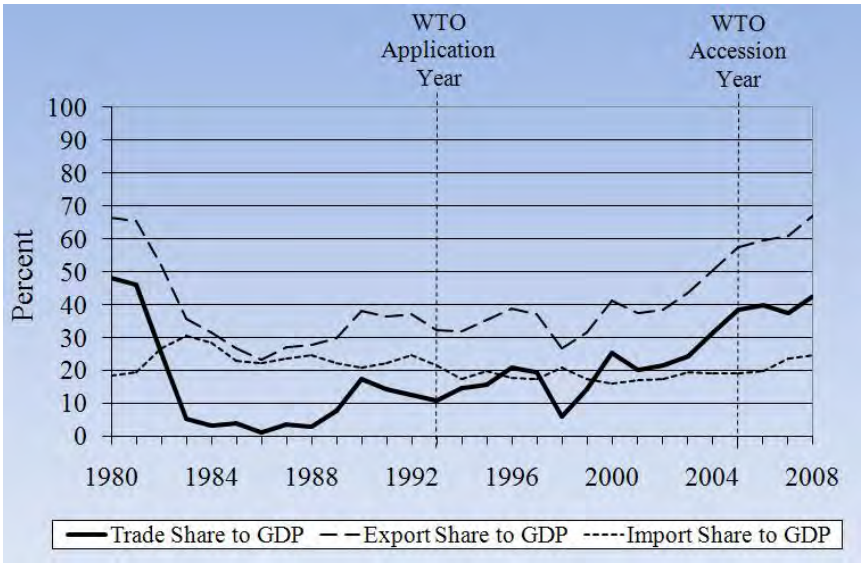
Trading partners also raised concerns on the dual-pricing of the natural gas liquids (NGLs) (propane, butane, and natural gasoline) as these products are also for exports (Bourland *et al.*, 2006). Domestic buyers pay less than the export price of NGLs since the domestic market does not require export marketing or infrastructure (Global Investment House, 2008). However, the dual-pricing of NGLs is not inconsistent with the WTO guidelines as the price is determined by its exports. The export price is higher as it takes into account the cost of infrastructure and product shipment of around 30 percent of the price of the Saudi export; and cannot be considered as preferential treatment (Al-Sa'doun, 2005).

In response to the concerns of trading partners, Saudi Arabia assured that the prices of the natural gas and NGLs would be based on the full cost of recovery of production and are sold in the domestic market without any discrimination between Saudi-owned firms and foreign-owned companies (Bourland *et al.*, 2006).

4.5. WTO AND PERFORMANCE OF SAUDI' PETROCHEMICAL EXPORTS

As can be seen from Figure 4.1, in general, Saudi Arabia has been enjoying trade surplus for years (prior to WTO application, during negotiation years and beyond) as exports are more than imports. Both exports and imports have upward trends during negotiation years and onwards. Figure 4.1 shows that the Saudi exports showed a sharp reduction between years 1981 and 1983, followed by serious of fluctuations for both exports and imports until the application year that was varied between 25% and 40% for the exports and 20% and 30% for the imports. After 1993 and although the fluctuations in the level of exports and imports continued, both exports and imports showed an upward trend, that was marked after the WTO accession year (2005) as the exports increased from 58% in 2005 to 68% in 2008 and the imports increased slightly from 20% in 2005 to 25% in 2008. (See Appendix VI for the Trade Profile of Saudi Arabia).

Figure 4.1: **Share of Exports and Imports to GDP**

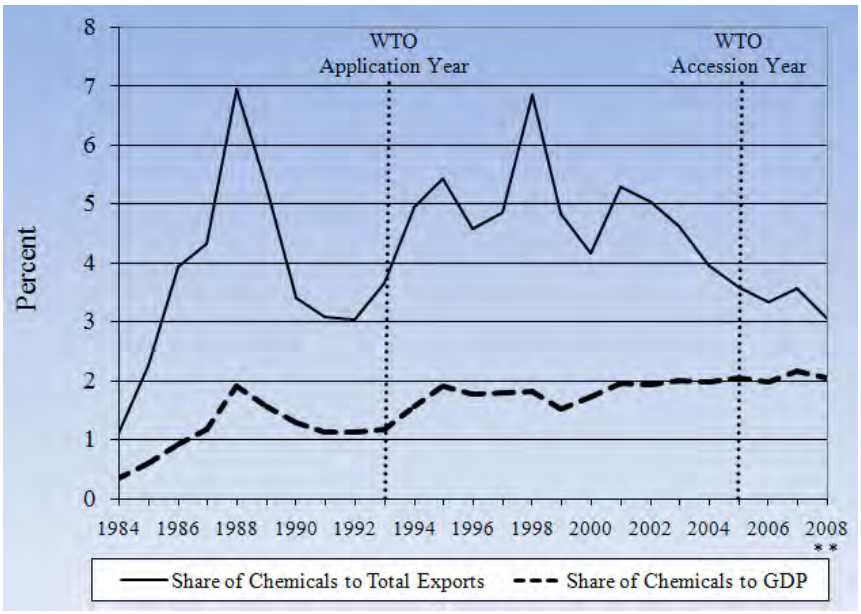


Source of Data: Saudi Arabian Monetary Agency (2009) *Forty Fifth Annual Report;* Saudi Arabian Monetary Agency (2009) *Appendix of Statistical Tables of the Forty-Fifth Annual Report.*

Figure 4.2 depicts the trend of percentage share of chemical exports to total exports and to GDP. As can be seen, petrochemicals are part of the chemical exports, which have increasing demand in the international market. The share of chemical exports to

GDP has an upward trend. From 1984 to 1993, the WTO application year, the average chemical export share to GDP stood at 1.11%. During the application period from 1993 until the WTO membership approved in 2005, the average chemical export share to GDP is registered at 1.87%, which went up to 2.17% in 2007 Indicating the positive impact of WTO membership. However, it slightly declined to 2.06% in 2008.

Figure 4.2: **Share of Chemicals to Total Exports and GDP**

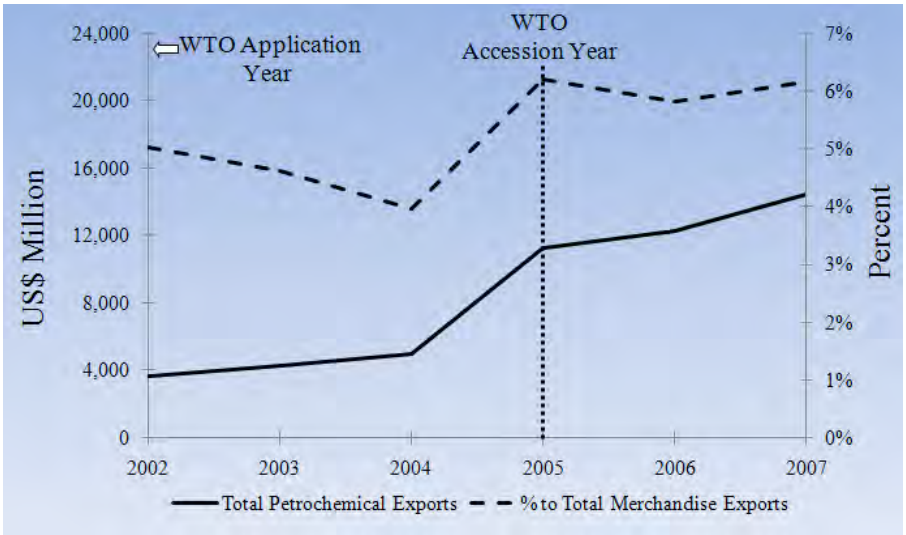


** 2008 Data provisional.

Source of Data: Saudi Arabian Monetary Agency (2009) *Forty Fifth Annual Report;* Saudi Arabian Monetary Agency (2009) *Appendix of Statistical Tables of the Forty-Fifth Annual Report.*

As can be seen from Figure 4.3 and table 4.3 the total petrochemicals exports recorded a sharp increase of 125.22% from 18.7 billion in 2004 to 42.1 billion riyals (US Dollar = 3.75 Saudi Riyal) in 2005 – the WTO membership approval year. The petrochemicals continued to have an increasing trend until 2007. The share of the petrochemicals to the total merchandise exports peaked in 2005 at 6.21%, but declined to 5.8% in 2006. Figure 4.3 also shows that it recovered at 6.16% in 2007. Business Monitor International (2009) indicates that the economic downturn in the global market has slid off the profits of the petrochemical industry in the fourth quarter of 2008. However, Saudi petrochemical exporters were able to avoid losses in the foreign markets because of their access to cheap ethane feedstock.

Figure 4.3: **Total Petrochemicals Exports and Percentage to Total Merchandise Exports**



Note: The total chemical exports in Saudi Arabia Riyal were converted to US $ using the foreign exchange rate of 1 USD = 3.74957 SAR.

Source of Data: Saudi Arabian Monetary Agency, SAMA annual reports (forty-second, forty-third and forty-fourth)

Table 4.3: **Total Petrochemical Exports and Percentage to Total Merchandise Exports**

Year	Total Petrochemical Exports			Total Merchandise Exports (million US $)
	Amount (million US $)	Annual Changes (%)	% to Total Merchandise Exports	
2002	3648.753		5.03%	72473.93
2003	4312.842	18.20%	4.62%	93256.17
2004	4980.131	15.47%	3.95%	126014.4
2005	11216.16	125.22%	6.21%	180595.8
2006	12251.23	9.23%	5.80%	211051.9
2007	14361.11	17.63%	6.16%	233205.22

Note: The total chemical exports in Saudi Arabia Riyal were converted to US $ using the foreign exchange rate of 1USD = 3.74957 SAR.

Sources of data: Saudi Arabian Monetary Agency , SAMA annual reports (forty-second, forty-third and forty-fourth)

On the export side, the tariff reduction further opened the foreign markets for Saudi petrochemical exports at lower prices for tariff-protected markets, like EU, US and Japanese markets, but kept the natural advantage of low-cost feedstock. As shown in Figure 4.3, WTO membership, as a result, induced sizeable demand for Saudi petrochemical products, depending on the import price elasticity of these countries. To demonstrate this: the reduced tariffs on polymers in EU from 12.5 percent to 6.5 percent would attract EU consumers to prefer Saudi petrochemical products to locally produced petrochemical products. This demand shift will result to reduced production levels or profit margin of domestic producers in the short run, or reduced industry size in the long run as domestic producers would exit from the industry, which will further increase import demand for Saudi petrochemical products under the conditions that the income elasticity of demand would remain the same (Al-Sa'doun, 2005).

As regards to imports, by lowering its own tariffs, imported petrochemical products will find its way to the Saudi Arabia market. For instance, tariffs on key secondary petrochemicals, such as polyethylene are currently at 12 percent and will drop to 8 percent, 6.5 percent by the end of 2008 and 2010 respectively (Al-Sa'doun, 2006a).

The reduced tariff will stimulate strong competition among petrochemical producers in Saudi Arabia, as they seek a share in the domestic market. This will compel petrochemical producers to regularly reduce their production costs and ensure product quality match or even exceed that of the world standards. This may result to a narrower profit margin on the local sales in the short-run. However, over the long run, there would be general benefit and improve in the competitive capacity of the Saudi petrochemical industry (Al-Zuhd, 2005).

The downstream petrochemical industries will gain from the expanded markets caused by lower prices. But with the commitment to gradually reduced tariffs on processed plastic imports from 20 percent to 6.5 percent in 2010, imports of finished plastic products from lower cost Asian producers may increase. However, the downstream industries need to restructure by consolidating or merging the small players to compete in domestic and global markets alike (Al-Sa'doun, 2005).

4.6. SUMMARY

Membership to WTO requires, among others, consistency of import goods classification with the HS for duty and tax collection purposes. On the chemical sector, which covers petrochemicals, WTO requires chemical tariff rate reduction as provided under CTHA.

Saudi Arabia complied with the chemical tariff reduction agreement. Tariff reduction and the low pricing scheme for feedstock and natural gas, together with other reforms made the Saudi petrochemical industry more competitive in the global market. The total exports of petrochemicals as percentage of total merchandise exports have increased, suggesting increased competitiveness as result of the tariff reduction. Any global economic downturn will slightly affect the petrochemical industry, because of its competitive advantage of cheap feedstock.

Chapter 5

RESEARCH METHODOLOGY

5.1. INTRODUCTION

As mentioned in chapter 1, that the main aim of this research is to assess the strategic or long-term impact of WTO membership on Saudi Arabia's petrochemical industry and enumerate a set of recommendations that would assist in overcoming the potential difficulties and sustain its competitive advantage in the sector. Therefore, this chapter describes the methodology used to collect primary and secondary data required to achieve this aim. The chapter begins by presenting the research methodology, design and strategy adopted in this research, followed by in depth description of the research method. The last sections of the chapter provided information about the methods used for data analysis, ethical issues considered and the limitations and difficulties encountered during data collection. Finally, the chapter is concluded with a summary section.

5.2. RESEARCH METHODOLOGY

The research methodology can be in a form of quantitative and the qualitative (both discussed in research method section). The research methodology of this study is qualitative in nature as it is a case study that is exploring and evaluating the strategic or long-term impact of WTO membership on Saudi Arabia's petrochemical industry. It also tries to provide a set of recommendations that would assist in overcoming the potential difficulties and sustain its competitive advantage in the sector.

5.3. RESEARCH DESIGN

A Research design is an outline detailing the techniques and processes to be used in the collection, analysing and interpreting the study data (Zikmund, 2003). It enables researchers to be certain that the data obtained will enable them answer the research question(s) as clearly as possible (David de Vaus, 2001). Bryman (2004, p40) have introduces different experimental designs (discussed next page); however, the

decision regarding which design should be selected is related to the priority given to a set of research process dimensions. These are related to the importance attached to "expressing casual connections between variables; generalizing to large groups of individuals than those actually forming part of the investigation; understanding behaviour and the meaning of that behaviour in its specific social context; having temporal (i.e. over time) appreciation of social phenomena and their interconnections". The types of qualitative research designs as proposed by Bryman (2004) are:

1- **Cross-sectional or survey design** in which data regarding several variables is collected, by either questionnaire or structured interview, from large group of subjects and at a single point in time. The analysis is then conducted between the proposed variables to identify any patterns of association.
2- **Archival method:** it is a research design that looks at factors, condition or phenomenon that occurs in the past and tries to relate them to another factors condition or phenomenon at present through the use of historical review or biographical analysis. Such research design allows the researcher to understand the current issues under investigation; formulate relationships, if present, between variables and try to predict future.
3- **Field experiment/explorative study**, such study design aims at identifying the relative level of significance of single or multiple variables in situations.
4- **Case-study** is a research design that explores and examines intensively current and past factors effecting either a single case such as country, community, organization, school, person or even a single event (single case study); or group of cases (comparative case study), and tries to generate recommendations to be consider in the future.

This study is an explorative case study as it looks only at Saudi Arabia and aims at gathering information, ideas and suggestions proposed by respondents, who were executive and general managers in Saudi Arabian petrochemical companies and petrochemical experts employed in academic organizations, related to the impact of WTO on petrochemical industry. Therefore, data were obtained from semi-structured purposive interviews. A purposive (or judgemental) sampling technique was used to select the respondents based on the expertise they possess. Such a non-probability sampling technique allows an objective observation of the important events from all

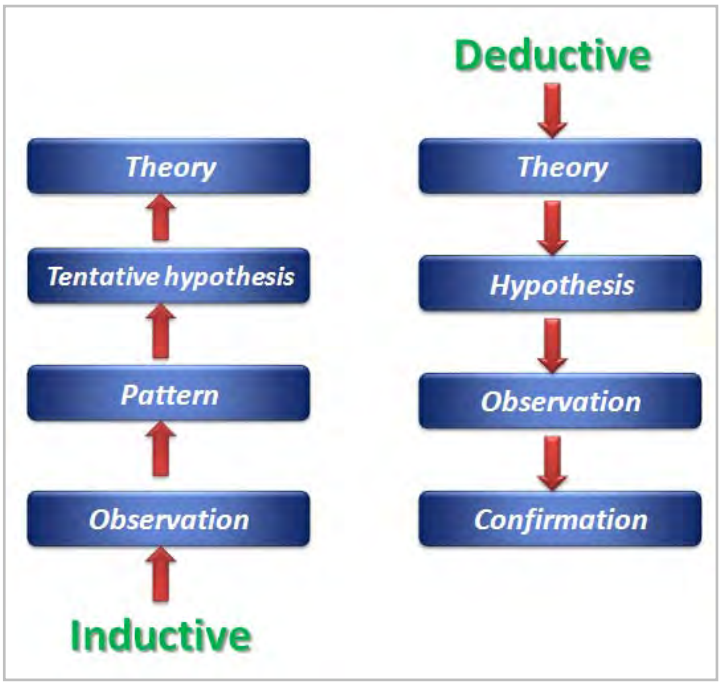
angles. This interview technique is best suited and "often used when working with a very small sample and when the researcher wishes to select cases that are particularly informative" (Neuman, 2000; Saunders *et al.*, 2002). Interviews were conducted on a face-to-face basis to allow the acquisition of first-hand information from actual sources. Correspondence techniques such as telephone, mail, and the internet were also used when necessary.

Secondary data were also obtained from economic and financial reports and studies, government statistics, and other forms of quantified data on the petrochemical and allied industries in Saudi Arabia, its competitors, and other WTO members under consideration.

5.4. RESEARCH STRATEGY

In social research two reasoning methods are used to find a relationship between a research theory and the data collected deductive (whole to part or top-down approach) and Inductive (part to whole or bottom-up approach) (figure 5.1).

Figure 5.1: Research Types: Deductive And Inductive Reasoning.



Source of Information: Bryman, 2004

The deductive reasoning approach moves from more general to specific. The research starts with a theory, which is then narrowed down to a hypothesis. Formation of hypothesis is followed by data collection to test the proposed hypothesis. The results of the data collection will either confirm or refute the original theory. This type of reasoning is often used in quantitative research methodology (Bryman, 2004).

The inductive reasoning approach, on the other hand, moves in the other direction i.e. from specific observation to a more generalizations and theories. It starts with specific observation that is used to detect a specific pattern, which will then lead to formation of a tentative hypothesis. It then ends up by developing a general theory. This approach is most commonly used in the qualitative methods (Bryman, 2004).

As the main of this research is to assess the strategic or long-term impact of WTO membership on Saudi Arabia's petrochemical industry and enumerate a set of recommendations that would assist in overcoming the potential difficulties and sustain its competitive advantage in the sector, the deductive reasoning approach could not be used due to the exploratory nature of the study (as discussed in the research design section) and due to paucity of the research and literature related to the topic under investigation. Therefore, this study adopted the inductive reasoning approach in order to find general patterns that regulate the subject matter through the perception of executive and general managers in Saudi Arabian petrochemical companies, and petrochemical experts employed in academic organizations participated in this study as well as secondary data trend.

5.5. RESEARCH METHOD

In their basic form, research methods outline the way data will be gathered. Two specific research methods – the quantitative and the qualitative methods were looked at. These may be combined to give the 'mixed-method' approach, but they were discussed separately in this chapter. In discussing them, four specific areas were looked at. These are: (1) Types of data collected, (2) Instruments used to collect the data, (3) Fundamental differences in how both types of research are conducted, and (4) Procedures used to analyse the data. For each one of these areas, some examples were addressed for both types of research methods so that the comprehensiveness of

these methods can be seen (Diaz and O'Hanlon, 2001). Based on the discussions presented, the choice of the method to be used was rationalized.

Quantitative research reveals information that is subjective because the participants' input serves as the primary source of information to the researcher (Creswell, 2001). Types of data collected in quantitative research include the answers in response to conducted surveys, the statistical information that can be found either through the use of surveys or through a more expanded study, the comparison data that can be collected between one individual or group and another, and data that is raw and needs to be coded on a yes/no basis. This is contrasted to the longer answers that are often collected and analyzed in qualitative research where the opinions of the subjects are generally examined (Diaz and O'Hanlon, 2001). Instruments used to collect the data include statistics, surveys and comparisons. There are also fundamental differences in how both types of research are conducted which is discussed later in this chapter, along with the procedures that are used to analyze the data.

Qualitative research generates data that is based on the participants' own categories of meaning, it is useful for studying a limited number of cases in depth, and tends to collect data in naturalistic settings (Creswell, 2001). Types of data collected generally involve the opinions and beliefs of the researcher and the subjects that are being examined, through the use of various instruments. Instruments used to collect the data include case studies, interviews, focus groups and observation (Creswell, 1994).

Creswell (2001) describes qualitative research as an exploratory focus, while quantitative research focuses on explanatory inquiry. In addition, with the qualitative approach the researcher is more subjective. In other words, qualitative research is used when the researcher's inquiry is based on the participant's opinion about a particular situation. In that method, the researcher wants to gather subjective data, therefore his personal knowledge and research methodology influences the research to some degree (Herndl and Nahrwold, 2000). One of the most important outcomes with this method is that it highlights the researcher's views during the research process.

The similarities and differences between qualitative and quantitative research approaches are based more on the philosophical perspective of the researcher who is able to participate in the activities being studied (Herndl and Nahrwold, 2000).

Quantitative studies are based on scientific methods of inquiry and measure the analysis of causal relationships between variables. Qualitative research is based on gaining insight and understanding about an individual's experience and having a sense of reality in a way that does not generally involve attachment of a number to observations. Qualitative studies, therefore, provide guidance to test theories and validate information while the activity of qualitative research legitimizes and generates credible data for analyses through exploration, description, or expansion of existing knowledge and theory (Herndl and Nahrwold, 2000).

In summary, therefore, qualitative research is used when the researcher wants to understand and to further describe subjective meaning from the participants' perspectives. Types of qualitative instruments (tools) include; case studies, interviews, observation of participants, surveys, and statistical data. On the other hand, when the purpose of the study is to explain relationships among variables or to predict what may happen based on the objective findings the quantitative research design is used. Quantitative methods measure differences between variables and provide data that would help researchers understand their significances. The numerical differences can be compared by using statistical measures to determine whether the differences that are seen are actually significant (Glitz, 1997).

Quantitative research is based on the fundamental hypothesises of: prediction, manipulation, and control process of recording and analysing data (Creswell, 1994). Quantitative research verifies hypotheses that are formulated to direct the research process. Information is collected and then analysed after which a hypothesis is formed that provides precise numerical data, thereby making it possible for predictions to be made (Glitz, 1997).

The quantitative research method is used to describe variables and examine relationships among those variables (Creswell, 2001). According to Creswell (2001) this research is the mostly used method of scientific investigation in nursing and can determine cause-and-effect relationships between variables. It is also very useful in testing a theory by testing the validity and reliability of the specific relationship. Validity indicates whether a specific type of study has been performed appropriately enough to have valid research findings, while reliability is more involved with the study instrument used and whether there is proof that said instrument works correctly

for the study task at hand or whether it should be changed or adjusted (Diaz and O'Hanlon, 2001; Glitz, 1997).

This study has adopted a qualitative method with secondary and primary data. Since large amount of data exists, in general terms, on the subjects of interest, it is clear that use of secondary data to address the objectives outlined was a hard and unproductive task when employed in this context. This is important, as new findings on the investigation subject may have been documented. Secondary data was obtained from government agencies, books, the internet, journals, and scholarly articles.

As part of the qualitative method, primary data was collected and used for the most part. Semi-structured interviews were administered to experts on the petrochemical industry in Saudi Arabia, specifically executive officers and managers of petrochemical concerns, and petrochemical experts employed in academic organizations. The primacy of questionnaires in this study lies in their ability to uncover current data information from respondents.

5.5.1. Data Collection Method

5.5.1.1. Interviews

Understanding the answers given by respondents is the primary reason for conducting interviews. Meanings credited to the respondents' answers need to be understood, the right questions need to be asked in a right way, and factual information gathered from the respondents. The interview process consists of seven stages: purpose of interview, designing an interview guide, interviewing, generate written document of the interview, analysing the information gathered, checking the validity and reliability of the data analysed, and finally reporting the result of the interviews. All these stages need to be carefully thought through and appropriately conducted for the interview to lead to good results (Guion, 2006).

Interview is considered to be a very useful and powerful tool for conducting researches, particularly qualitative researches. During any research, interviews of the selected people are conducted to find out what a person actually think regarding a particular issue. Interviews enable researchers to access the perspective of the people who are being interviewed. Through interviews it is possible to find out certain

important things relevant to the studies that cannot be obtained or observed directly. Interviews also help in uncovering and exploring the meanings of certain things related to the people's behaviour, feelings, routines etc. Furthermore, interviewing also stands for a measure of systematic data collection by asking different sort of questions, listening to them carefully and recording and noting all the answers accurately. Through in interviews researchers get access to a wide range of experiences, different kinds of circumstances and a range of knowledge that could otherwise not be obtained. During an interview, there exists a great chance that an interviewee would describe some private or sensitive behaviour, relevant to the topic of interview, that took place in past or in some locations which are inaccessible for the interviewer. Interviews are also able to provide certain information regarding the means or definitions that people give to different events or behaviour (Rubin and Rubin, 1995).

As far as the present study is concerned interviews are extremely important as the present study is dependent on qualitative research to a large extent. The study actually seeks to find out the impact of the World Trade Organisation (WTO) on the sustainability of competitiveness of the petrochemical industry in Saudi Arabia. To get some accurate ideas regarding this impact a mere empirical study employing quantitative analysis of secondary data is not enough. Here comes the need for conducting a qualitative research and for this interviews are must.

5.5.1.1.1. Forms of interview

- Structured interviews: Closed, fixed response interviews. In this method, similar questions are administered to all the respondents with the option of selecting responses from similar alternatives.
- Semi-structured interviews: Standardized, open-ended interviews where a standard set of open-ended questions is administered to all the respondents.
- Unstructured interviews: Informal conversational interviews where questions to be asked are not formulated in advance.

(Arksey and Knight, 1999)

Since the present research is explanatory in nature, a semi-structured interview technique had been undertaken. This kind of interviews is capable of exploring

relationships between different aspects relevant for the study. Semi-structured interviews generally consider a number of open-ended questions in different categories selected by the researcher. Open-ended questions must be framed in detail and have to be straight to the point so that the level of confusion can be minimised in the best possible manner. Through semi-structured interviews, valid and reliable answers are expected to be gathered. Before conducting final interviews researchers have to keep in mind one thing that the questions have to be pre-tested for avoiding all the irrelevant questions to the main topic. One of the major advantages of this interviewing technique is that through this technique the questions set by the researchers can be discussed with the interviewees with more detail and this is the reason behind considering the technique of filling up the questionnaire and the technique of observation and field notes together while interviewing someone. The data obtained through this type of interviewing is very extensive. This process, however, has one disadvantage. In some occasions, interviewees tend to give long answers and later on it become difficult as well as time consuming in transcribing the data from this long answers. But for the present study this method is quite appropriate as the present study is explanatory in nature ((Arksey and Knight, 1999; Fowler, 2002; Silverman, 2004).

Interviews can be conducted through telephones, or through emails or directly by face-to face. All these three ways of interviewing have their own advantages and disadvantages. For example, in case face to face interviews in-depth knowledge sharing is possible. It also helps in developing bigger picture regarding the selected issue and analysing the results in more elaborate way. Face-to-face interview is also good for networking. However, it has certain disadvantages, like it is very much time consuming and very often interviewers find it difficult to arrange an interview time with all the interviewees. Face-to-face interview also possess difficulty during the time of comparing and analysing information. Among all the disadvantages of face-to-face interviews the major disadvantage is setting an appointment with the interviewees as in most of the cases interviewees are found to be very busy, especially in case of those interviewees who hold high profile jobs. In some cases, interviewers are left with no response from the people they have targeted for the interviews. There exists one technique that can solve this problem and can increase the response rate of the data collection method. This process is email interview (Fowler, 2002).

Interviews through emails have several advantages. For example, email interviews provide the interviewers with ready-made data and therefore interviewers can save their time from transcribing the data. This technique is also economical and convenient to the respondents also. The data obtained through email interviews are not worse than that obtained from face-to-face interview. Rather, the answers obtained from email interviews are more direct and straight to the point. This makes it easier for the researcher to transcribe the data. One can think that during face-to-face interview more information's and ideas can be drawn compared to email interviews. But this is not always true. All these actually depend on the interviewee. One major advantage of email interviews is that the respondents can remain anonymous and can speak more freely without any kind of constraint. However, in case of email interviews the process of observation and field notes becomes inactive as there are no face-to-face interactions and therefore no facial expressions or body languages of the respondents cannot be observed and analysed by the interviewers (Fowler, 2002).

Interviews over telephone can also be an efficient way of collecting relevant data. If the respondents are found to be busy professionals, telephonic interviews are conducted. Telephonic interviews are also appropriate when the questions demand straight forward answers. Telephonic interviews are found to be more efficient in terms of cost and time when the respondents are widely geographically distributed. But it has also a number of disadvantages. First of all, in case of interviews over telephone, respondents are less likely to spend long time answering questions. In case of telephonic interviews the questions are required to fixed response type. Open-end questions are difficult to be managed over the phone than face-to-face. Telephonic interview is also more expensive than interview through e-mails and provide just as good responses as could be obtained from other forms of interviews (Fowler, 2002).

For the present study, only face-to-face interviews have been conducted. During the pilot study, face-to-face interviews have been conducted with 3 people, while during the final survey face-to-face interviews have been conducted with 20 people. However, at the initial stage 45 people were selected for the interviews, but 25 of them refused to give interviews. The reason for their refusal was either because of their limited time, or because the questions were too long, or because they did not want to be held responsible for their answers to the questions. The appointments for

the interviews were done either through e-mails or phone calls. Taking the appointment was a bit hard especially with those in high positions. The number and characteristic of participants, however, provides a potential limitation to the study as it may not be complete representative. Therefore, generalizations cannot be accurately made (further explanation is given in Chapter 9, Section 9.6).

Since, the present research is a qualitative study, observations and field notes had to be incorporated. It has been discussed, just above, that observation and field notes are not valid in case of email interviews and to a large extent telephonic conversation is also not appropriate for this to be done in a proper way. Face-to-face interview therefore is the most suitable option for using the technique of observations and field notes which is very essential in case of explanatory studies. Apart from this, open end questions are difficult to be handled properly by telephonic interviews and through email interviews also to some extent. Since, the present study is quite explanatory in nature, and therefore semi-structured form of interview has to be undertaken, face-to-face interview technique has been found to be the most suitable option.

5.5.1.2. Pilot study

"Pilot studies" means a term which is used to describe many research techniques used to carry out a study on a small scale before the larger study is conducted. Sampling is involved in this process though the procedures normally used to get specific quantitative assessments from big representative samples are not applied. A pilot study also referred to as a feasibility study, can point out limitations in the research design which can then be dealt with before time and money is spent on the larger study (Zikmund, 2003).

Zikmund (2003) describes a focus group interview as a continuous unstructured interview administered to a small sample group. As opposed to the usual interview, this is a flexible meeting which encourages a free discussion of issues, which is clearly opposite to the inflexibly formulated question-and-answer gatherings characteristic of most interviews.

Focus group interviews have several advantages. They are relatively cheaper to do, are easy to carry out, and data collected from this method can be analysed quickly. Few sittings can be organized and analysis completed in a short time and at obviously

reduced cost as compared with other techniques. Since these interviews are flexible, several different topics can be addressed (Zikmund, 2003).

However for the present study, due to some problem, focus group interviews were not possible to be conducted. The interviewees cannot be grouped as these top officials have hardly any time to gather together and give their views to the researcher. Instead, for the pilot study only three interviewees were selected. All of these three interviewees were male, and one of them belongs to academic, another to government sector, and the last one to a petrochemical company. The interview was done face to face and it took about an hour with each one of them.

For pilot interview, one hour is quite sufficient because if the interview extends more than one hour, it may result in restlessness and may also lose its focus. Interviewer should not spend much time on any particular question because in that case the interviewee may get exhausted and tends to give shorter answers for to the rest of the questions (Arksey and Knight, 1999).

In the present case, it was not very hard to take an appointment with them to meet them. The arrangement for the meeting was done either through the e-mail (for one interviewee), or phone call (for two interviewees). The interview was done in Riyadh (one interviewee), in Al-Jubail (one interviewee) and in Dhahran (one interviewee). The interview with all of them was done in Arabic, and they answered all the questions. Their reply was recorded and notes were used for discussion and side comments.

The questions for the final interview have been selected on the basis of the answers obtained in the pilot study. The questions which had created lots of confusions in the mind of the interviewees, those questions were either excluded or rephrased in the final interview.

5.5.1.3. In-depth Interviews

An in depth interview is a qualitative research technique which allows discussion on a person-to-person basis. The key objective is to ask questions so that insight can be gained from the respondent's answers. In its basic form, it is an open-ended and discovery-oriented technique that is unstructured and extensive (Guion, 2006; Zikmund, 2003).

In-depth interviews are characterized by several features. One of these is the use of open-ended questions where the respondent is required to answer freely on any questions in a non-restrictive way (Zikmund, 2003).

In conducting this study, the in-depth interview sought to find out how WTO membership would benefit Saudi Arabia's petrochemical industry and allow it to realise its possibilities, the strategies that Saudi Arabia could use in order to maximize the value-added element of petrochemicals to its huge petroleum exports, if WTO membership would provide a drive to reduce production costs in the petrochemical industries and if WTO membership, as a consequence, would help to sustain the competitiveness of the petrochemical industry and increase its profitability and diversification. Insight would also be sought on whether Saudi Arabia is ready for WTO membership and whether the national competitiveness of Saudi Arabia's petrochemical industry would be sustained institutionally and operationally after WTO. So data obtained will complement the secondary data that were gathered.

A general list of an interview guide containing a list of questions and follow-ups was designed to act as a guide to enable the interviewer stay on track, ensure that all the important questions are asked, to provide an outline and progression for the questions, and assist in creating unity across interviews with different interviewees. The guide was prepared using acceptable formats with a complete face sheet for recording time, date, interview location, respondents' demographic information and any exceptional factors that may impact on the interview (Guion, 2006).

To enhance the quality of the interview, good interviewing practices such as active listening, patience and flexibility (Guion, 2006) were used. An audiotape was used, but was subject to permission from the respondent, for future reference and in order to improve the accuracy of the interview.

5.5.1.3.1. The preparation of interview questions

The preparation of interview questions is a huge task for any research. It is basically an art. Interview questions are required to be set in such a fashion that it reflects the research questions, aims and objective of the research. Before preparing interview questions, the researcher has to make sure that the interviewing is the most

appropriate method for collecting data for the topic chosen for the research purpose (Guion, 2006).

For the present study semi-structured interviews has been applied. Semi-structured interviews always involve open-ended question based on the selected topic of the research. The questions are formed on a number of areas related to the main topic of the research (see appendix VII). For the present study questions have been formed in the following areas:

- A brief overview of the Petrochemical Industry of Saudi Arabia.
- The Petrochemical Industry of Saudi Arabia and its competitive advantage
- Petrochemical Industry in Saudi Arabia and WTO
- Petrochemical Industry, trade related agreements, and environment related agreements.
- Major challenges facing the Petrochemical Industry in Saudi Arabia and solutions.

The above topics and the interview questions relating to those topics have been set following the methods applied in the existing literature. Responses to these questions that were obtained through interviews were analysed through the process known as textual or content analysis by using coding method. Content analysis is a systematic, objective and quantitative or qualititative analysis (depending on the objectives) of the characteristics contents of a study. The objective of the content analysis in this research is to qualitatively analyse the responses obtained from the interviewees. In this analysis the responsibility of the researches is to find how and why the interviewees differ in their answer or view. According to Denscombe (1998), several 'hidden' aspects of what is being communicated by the use of written text can be disclosed with content analysis. Palmquist (n.d.) points to several pros and cons of content analysis summarized in table 5.2.

Table 5.2: **Pros and Cons of Content Analysis**

Pros
The main aspect of social interaction is achievable through direct looking at communications via texts and transcripts.
Quantities and qualitative analysis are possible.
Important cultural and historical insights throughout time are allowable through text analysis.
Codes provided in text can be statistically analysed
Provides deep insight about complicated models related to human thought and use of language
Easy way of analysing interactions
Compared to discourse analysis, it is considered as "exact" research month only when done correctly
Cons
Time consuming
expose to increased degree of error, mainly when relational analysis is required to obtain high level of interpretation
Difficult to automate or to program using computerized systems
Tendency to consists of only counts' of words
Frequently lacking theoretical base
naturally reductive, especially when handling complicated texts
Frequently ignores the context generated by the text, in addition to the state of things after generation of text

Source: Palmquist, (n.d.)

In order to perform the content analysis the data needs to be organized depending on few factors for instance the date, site of interview, and its time. In order to retain the anonymity of the interviewees, each interview is given a number such as "interview 1" and "interview 2". The next step required to complete the analysis is to code the data. Coding has been defined as giving the piece of text or statement a label and that by summarizing it. Coding is a very crucial step as it requires consistency. It starts with initial coding, in which the interviewee's answers are divided into general categories. The general categories are then narrowed down into specific categories, a step called focused coding. The final step is to narrow down the focused coding into a main theme. This kind of procedure is very systematic in nature and is able to identify the major categories and using them to develop into themes of the research. Table 5.3 and 5.4 provide an example from this study on the steps taken to perform a content analysis.

Table 5.3: **Example of Content Analysis**

Category	A brief Overview of the Petrochemical Industry of Saudi Arabia
Question 2	**Which sub-sectors comprise Saudi Arabia's petrochemical industry?**
Focused Coding	
1	Industries producing Chemical Products
2	Industries producing Fertilizers
3	Industries producing Pesticides
4	Industries producing Plastics or Innovative Plastics
5	Industries producing Aromatic products
6	Industries producing Metals or different metallic products
7	Industries producing Polymers
Theme	Petrochemical Industry in Saudi generally comprises of a number of sub-sectors which produce chemical products, fertilizers, pesticides, plastics, several innovative plastic products, different types of aroma products, metals, polymers and some other products**.**

Table 5.4: **Example of Focused Coding**

Focused coding 1: Industries producing chemical products	
Interview	**Initial coded answers**
Participant 1,8,10-19	Chemicals
Participant 2, 4,5,7,20	Manufacture of chemical compounds

Chapter 6 of this thesis contains full analysis of our data based on content analysis. The list of questions that have been set in accordance to the topic areas and asked to subjects participated in the study has been divided into general categories and presented below:

5.5.1.3.1.1. A brief overview of the Petrochemical industry of Saudi Arabia

To build some preliminary ideas regarding the Petrochemical industry of Saudi Arabia, some simple straight forward questions have been asked. Since these are the starting questions of the interview, these questions have been set in a simple format so that interviewees face no complications while answering these questions and get comfortable with the interview process. The interview questions set for this section are as follows:

- How can you describe Saudi Arabia's petrochemical industry in comparison to other countries?
  (a) Very competitive (b) relatively competitive (c) not competitive
- Which sub-sectors comprise Saudi Arabia's petrochemical industry?
- What impact has the petrochemical industry had on Saudi Arabia's economy?

5.5.1.3.1.2. The Petrochemical Industry of Saudi Arabia and its competitive advantage

Under this section, efforts have been made to find out what the interviewees think regarding the competitive advantages that the petrochemical industry of Saudi Arabia enjoys. This part is very crucial for understanding the impact of WTO on the Petrochemical industry of Saudi Arabia. Efforts have been made to find out whether there exist any competitive advantages for the Petrochemical industry in Saudi Arabia, and if yes what are the factors that has helped in gaining such advantages. Along with this, the study also seeks to examine the major factors that posse challenges to this competitive advantage. Apart from that the interviewers have also been asked to give their opinion regarding the possible solution to fight against these challenges. To avoid any kind of complications, the questions have been framed in a very simple language. The questions under this topic are as follows:

- Does Saudi Arabia have any competitive advantage in the oil sector?
  (a) Yes (b) No
- If the answer above is yes, would you please identify these advantages?
- How can Saudi Arabia sustain this competitive advantage?
- If the answer is no, what are the sources of the identified inefficiency in the sector which prevents competitive edge?
- What difficulties, if any, are faced by Saudi Arabia's petrochemical industry?
- How can the above mentioned difficulties be overcome?

5.5.1.3.1.3. Petrochemical Industry in Saudi Arabia and WTO

This is the most important topic areas for the present research and under this the questions have set very carefully so that it become possible to figure out from the responses of the interviewees policies of WTO in general for its oil producing member states, policies that are specific to Saudi Arabia's Petrochemical Industry, and the problems associated with those policies. The present study under this topic

area has made a very cautious effort to examine the effect of policies regarding the concessions offered to Saudi Arabia's Petrochemical industry by WTO. The questions that have been asked under this topic area are as follows:

- How has the CET among the GCC countries impacted on Saudi's petrochemical exports?
- What benefits does membership in the WTO confer on oil-producing countries? (Mention example(s) of (a) specific oil-exporting country)
- What limitations does membership to WTO impose on Saudi's petrochemical industry? Please identify these in relation to legal, economic, financial and competitiveness issues.
- Do you also believe that WTO conceded to give some concession to Saudi Arabia in relation to petrochemical industry?
- If yes, what are these concessions and their consequences?
- Will the concessions given by WTO strengthen Saudi Arabia's petrochemical industry? If so, to what extent?
- Has accession to the WTO affected Saudi's petrochemical exports?
- Would you please comment on the political and economic sources of the concession given by WTO to Saudi Arabia on petrochemical industry?

5.5.1.3.1.4. Petrochemical Industry, trade related policies and agreements and environment related agreements

Under this topic area, the present research mainly seeks to find out the effects of different trade policies and trade related agreements on Saudi Arabia's petrochemical industry. Along with these efforts have also been undertaken to examine how environmental protection related policies enforced by international agreements like Kyoto Protocol have affected the petrochemical industry of Saudi Arabia. These issues are very crucial for singling out the impact of WTO on the petrochemical industry of Saudi Arabia. The following questions have been set under this topic area.

- Is Saudi Arabia's current tariff schedule for petrochemicals self-limiting?
- How will reduced tariffs affect Saudi's petrochemical industry?
- What effect has Saudization had on Saudi Arabia's petrochemical industry
- How has the Doha Trade Agreement affected Saudi's petrochemical industry?

- How has the Chemical Tariff Harmonization agreement impacted on petroleum exports at a global level and what consequences it has for Saudi Arabian petrochemical industry?
- What effect, if any, will the Kyoto Protocol and other global emission reduction strategies have on Saudi's petrochemical industry?

5.5.1.3.1.5. Major challenges facing the Petrochemical Industry in Saudi Arabia and solutions

This topic covers a wide area. Under this topic area, questions have been set to find out different current challenges that the petrochemical industry of Saudi Arabia face. This challenges ranging from the major problems facing the production of natural gas, which is very much essential to the production of petrochemical products, to different economic, and political policies that might hinder the growth of this industry. This section also tries to find out the possible solutions that could help the industry to come out the problems, if any. Under this topic area, the following questions have been asked to the interviewees.

- What are the challenges faced by Saudi Arabia in producing natural gas?
- How has diversification of the Saudi economy affected its petroleum industry and its production of petrochemicals?
- Should availability of feedstock be a major concern to Saudi Arabia?
- If yes, what makes it important?
- Is there an overcapacity of petrochemical industries in the Middle East and if yes, what does this portend?
- Does Saudi Arabia have the requisite manpower needed by the rapidly expanding petrochemical industry?
- How is the increasing global demand for oil likely to affect Saudi's oil industry?
- How the global demand for Saudi petrochemical production can be promoted?
- What are the ingredients necessary for success in the petrochemicals industry?
- How would you evaluate the role of government in promoting petrochemical industry and growth in its output?
- What should the government do more to enhance production in the sector?

- Do other petrochemical producers in the region and the world pose a serious competition to Saudi Arabian petrochemical production?
- Do you think the current structure of the firms in the industry/sector is adequate enough to respond to the global challenges? If yes/or no, why?
- Do you think related and supporting industries fulfil their role in supporting the petrochemical industry? If yes/or no, why?

In case of all the topic areas under consideration, due attention has been paid on making the question as simple as possible so that the interviewees easily understand what are being asked to them. The questions have also been arranged in such a way that a continuous flow could be maintained which at the end bring out a clear idea regarding the impact of WTO on the sustainability of the competitive advantage of the petrochemical industry of Saudi Arabia.

While preparing the above interview questions a number of guidelines have been adhered to. Some definite guidelines are required to adhere for ensuring that the interview questions are readily understandable and clear to the interviewee. If the questions are unclear then it would simply results in poor quality of data and consequently, the reliability and validity of the data will be reduced significantly in case of answering the research questions.

The guidelines that have been followed for preparing the interview questions mentioned above are as follows (Arksey and Knight, 1999):

- The questions are essentially required to be clearly understandable and perfectly suitable for the selected interviewees. Questions that are very complicated and designed using theoretical languages can only create confusions in the interviewers mind and results in inappropriate responses.

- Those languages should be avoided which contain some kinds of assumptions while asking any question to an interviewee. Otherwise, interview questions will be able to create some kind of biases by reinforcing some beliefs or prejudices.

- If a question contains any word whose meaning is not clear and may lead to ambiguity in interviewees mind, then the questions should be interpreted in a

different way so that interviewees could clearly understand the meaning in the desired way.

- Those questions should be avoided that are expected to lead the interviewees towards a definite direction.

- Questions having double meaning should be avoided. Because, this type of questions make interviewees confused regarding what to answer.

- Researchers need to refrain from asking any kind of assumptive question as they may cause some irritation or some kind of odd feelings among the interviewees and make them uncomfortable. For example, when an interviewee is asked whether he goes to his office in his car then it simply reflects that the interviewer by himself has made the assumptions that the interviewee has a car and he is engaged in economic activity. These kinds of assumptions just rule out the fact that every one may not have car or go for work.

- Hypothetical questions should also be avoided as it is very unlikely of them to generate useful data for analysis purpose.

- Personal and sensitive questions relevant to the research issue should be asked at the end of the interview when the interviewer have built a level of confidence, trust in the interviewees and have also made a good rapport with him.

- While interviewing anyone, one thing should be kept in mind that the interviewee is not any specialist. Hence, in the time of asking questions, interviewers need to ensure that the interviewee has the ability to answer the questions.

5.5.1.3.2. Preparation for Interview

To conduct an efficient interview, researchers need to devise an interview schedule convenient to both the interviewee and interviewer, particularly to interviewee, and build the content of the interview perfectly apt to the research issue. The process of devising an appropriate schedule and an appropriate content involves a number of

elements. These elements include structuring of the questions, suitable phrasing of the questions, determining the exact depth of the research topics to be included, ordering of question, and finally deciding on the timing of the questions (Arksey and Knight, 1999).

While devising the interview schedule, the interviewer is required to keep in mind the purpose and focus of the research. As far as the making the content is concerned, the questions must be structured and phrased in such a way that they are easily understandable, answerable and familiar to the interviewees. Interviews are always time consuming, no matter in whatever form they are being conducted. So the interview should be framed in such a way that it can be done at the minimum possible time. It is also very essential for the interviewers to send the questionnaire in advance to the interviewees as it would give them some idea regarding the research issue as well as some time to prepare their answers (Arksey and Knight, 1999). For the present research, the interviews have generally taken from one hour to two. The entire interview was completed in one session, and questioned have been framed in such a way that it would have been possible to get answers for all the questions from all the interviewees.

Appropriate phrasing of the questions is also very important. The questions have to be phrased with clarity for avoiding rephrasing. Rephrasing should be avoided because if the questionnaire contains a lot of questions that are required to be rephrased while conducting interviewees, it simply implies that the interview questions are ambiguous (Arksey and Knight, 1999).

As far as the depth of topic is concerned, it refers to the categorisation of the interview questions into different sections for organising it properly. Categorisation is important for providing a flow to answering the interview questions and making it easier for the researcher to understand each of the questions. Categorisation is also important for the interviewer while doing analysis of the data generated from the interviews (Arksey and Knight, 1999).

Question ordering should also be very carefully. Complicated questions should not be asked at the starting point of the interview because it is likely to discourage the interviewee from participating in the interview. Interview should be start by asking

some simple and easy question to make the atmosphere comfortable for the interviewee (Arksey and Knight, 1999).

And finally, while determining the timing of the interview, the interviewer is required to make sure that the major issues of the research have been duly addressed and he or she should resist every possible temptation to get diverted for each of the questions. For every question, a particular amount of time has to be allocated. This allocation of time is largely dependent on the amount of questions that the questionnaire contains and the extent of difficulty associated with each question (Arksey and Knight, 1999).

For the present research, all the important elements for conducting an efficient research have been taken into account and due attention have been paid in making the interview questions easily understandable and answerable. However, some problems have been encountered in case of interviewing some of the selected interviewees. For example, during the interview itself, some of the interviewees have not understood some of the questions so those questions have had to be rephrased or some clarification of the meaning of the questions have had to be made.

5.5.1.3.3. Building rapport with the interviewees

It is an essential part of the interview. For achieving desired outcome, the interviewer needs to build a rapport with the interviewee. Establishing rapport with interviewee is very essential for making the interviewee comfortable with the research topic and encouraging them in giving appropriate answers. Hence, for the present research, the interviews have been conducted in a relaxed informal manner for ensuring that the interviews do appear more as a discussion rather than a conversation. Since all the interviewees in the present case are high profile government employees or academicians or researchers, sufficient care has also been taken to ensure that body language of the interviewer has not been indicating any kind of restlessness. Thus a friendly atmosphere has been possible to be created. Establishing a good rapport has helped in reducing the fear in the mind of interviewees in passing of information (Arksey and Knight, 1999).

For establishing good rapport, the interviewer needs to ensure a number of elements at every stage of interview, i.e. the opening, middle, and the ending. For the opening stage due care has to be taken for ensuring appropriate communication with the

interviewee (Arksey and Knight, 1999). For the present case, the interviewers belong to the category of high professionals like deputy minister, directors, advisors to the ministry, secretary general, professors, etc. Hence, in the present case, the interviewer cannot afford to be casual in appearance as well as during conversation. In the present case, the interviews have been conducted in a formal way.

5.5.1.3.4. Recording of the interviews

During the interviews, interviewers can take notes or can tape record the whole interview (Arksey and Knight, 1999). For the present case, only 18 of the interviewees gave the permission to tape record the interviews. For the remaining two cases, therefore, notes were taken instead of recording.

5.5.1.4. Secondary data

Secondary data is information collected and recorded by persons other than the researcher and is usually historical. This data does not require the use of respondents or research subjects (Zikmund, 2003). This data is especially important where primary data collection cannot provide the information being sought, perhaps because such information may be inaccessible to private concerns. This is an important point because some relevant information on the oil sector in Saudi Arabia may be unavailable to public and only government reports may provide such data.

Secondary data were collected and the main objective was fact finding. Here, the researcher seeks to uncover facts relating to Saudi Arabia's petrochemical industry with regard to export volumes, reserve capacity, financial reports, and trade statistics. Additionally, such information was also sought on Saudi Arabia's competitors and on the global economy in general.

Secondary data were obtained from books and periodicals such as professional journals and government sources including economic data series, standard reference works, and market research reports of the Saudi Arabian petrochemical organizations. Additional information were also sourced from media sources such as the Wall Street Journal, commercial sources, market share data, demographic and census updates, stock market sources, and other financial sources such as firms' annual reports.

In accessing this kind of research work, care was taken to avoid the difficulties associated with secondary data. The major difficulty associated with secondary data is that these data are not collected for this research purpose. Therefore, they cannot answer the specific research questions made by the researcher. There may not be some particular data in those secondary sources that are necessary for the research work. It may also happen that the secondary data sources are not collected for the same region or population under question. Also the subject of the secondary data may be different from the subject of the research work. In that case, the researcher has to work with the data that is already collected, and cannot change them according to his/her desire. There is another related problem. The variables in the data may not be defined in the same way as the researcher done. For example, the data on age may have been collected in categories and not as a continuous variable as the researcher wants. Also it may happen that all the information is not released with the data. For example, a secondary data prepared by some government agencies may not provide the information regarding the respondents and the sampling techniques. As the researcher is not involved in the data collection process, he/she will not know about the whole process, its level of success and limitations. There may be manipulations in the data or may be response misunderstanding during the survey (Boslaugh, 2007). For these reasons, secondary data must be carefully examined to confirm that the data includes the necessary information required for the research work.

Outdated information was not considered. Data conversion was carried out where it is in a format that does not meet the needs of this study. An example of this would be an occasion where there is a difference in definitions or currencies. Assessment of secondary data will be performed in order to ensure the accuracy of the data collected. Inaccuracy of data is more problematic than the irrelevance of data. But the researchers are also wise enough to combat with such inaccuracy. They can presume some extent of accuracy associated with a level of inaccuracy. They can either consider the data after filtering it, leaving the inaccurate data, or they may use specific actions in regard to accuracy of the data. Inaccuracies in the data may be intentional or coincidental. The coincidental inaccuracies are common feature of research works, which may be simple or serious. The researchers remain unable to detect activities and the associated problems that took place at the time of the primary data collection process. Intentional inaccuracies take place when the primary researcher or report

maker intentionally manipulates the data and associated report to serve a particular purpose. There may be biased reports and/or misreporting and misinterpretation of the data (Patzer 1995). Therefore the accuracy of secondary data can be assessed by taking the following actions:

Cross-verification of the data: Secondary data can be cross-verified by examining consistency between two independent sources. Data obtained from one source is directly compared with corresponding data found in another source. To be considered valid, the two sources should be independent of each other (Patzer 1995).

Data collected from original sources: If the secondary data is collected from the original sources, and not from the subsequent sources, the accuracy of data enhances. The original source is defined as the earliest source available in regards to specific secondary data. Generally it is the individual or organization whose name is linked to the originating of the presented data. A subsequent source of data, however, is the data source that obtains the data from the original source for their research purpose (Patzer 1995). Both methods i.e. Cross-verification of the data and data collected from original sources were used when using secondary data presented in this thesis.

5.5.1.5. Observations and field notes

Since the research is qualitative in nature to a great extent and involves semi-structured form of interview, observation and field note occupies an important place for the present study. Since the questions that have been asked during the interview session are open-ended, very often it has not been possible to obtain straight forward answers. In those circumstances, it was very much necessary to observe the behaviour of the interviewees to those questions, and build some idea regarding what the answers would be. Very often interviewees were also not able to convey their thoughts regarding some question in proper way. In those cases, thorough examinations of their reactions and behaviours have been found to be helpful in perceiving what exactly the interviewers intended to say (Arksey and Knight, 1999).

5.5.2. Sample Description

Respondents chosen were experts and opinion leaders in the petrochemical industry, specifically top executives and managers of petrochemical companies in Saudi

Arabia, as well as petrochemical experts employed in academic organizations. There are also several top officials from the government sector and ministers. The interviews were done to twenty respondents of which nine are from the government sector, eight are officials from the petrochemical industry and three others are academicians engaged in research on this sector.

5.5.2.3. Sampling

Sampling is a term referrers to the selection of cases from the population of interest. Since our sample is small and specific as it represents top executives and managers of petrochemical companies and experts employed in academic organizations, the aim is to analyse the sample picked so that generalizations can be made about the population from which the samples were picked (Trochim, 2006). Non-probability sampling, specifically purposive (or judgemental) techniques were used to select the respondents. Non-probability sampling has few advantages:

1- Does not involve random selection and therefore is not dependent on the probability theory rationale (Trochim, 2006), since the subjects were selected on some unique characteristics which they have. Such a technique allows an objective observation of the important events from all angles.
2- This sampling technique is best suited and mainly used when working with small and specific sample size (Neuman, 2000; Saunders *et al.*, 2002).
3- It is a valuable technique where the desired population is very rare or extremely difficult to locate (Sampling Methods, 2005).
4- Purposive sampling is equally useful when the desired sample needs to be reached quickly and sampling for proportionality is not a concern (Trochim, 2006). Zikmund (2003) asserts the value of purposive sampling in forecasting, a key objective of this study.

The location of the primary data collection was petrochemical companies and academic organizations in Saudi Arabia.

5.5.3. Validity and Reliability

Zikmund (2003) defines validity as “the capacity of a measure to measure what it is supposed to measure.” Stated differently, validity points out the degree to which

collected data gives a true measurement of social reality (Livesey, 2008). On the other hand, reliability refers to the extent to which measures are free from imperfections and thus give consistent results (Peter, 1979). According to Livesey (2008) reliability has three characteristics: consistency, precision, and repeatability of the collected data.

Several methods were used to ensure the validity of the data obtained such as cross-verification of the data and data collected from original sources (both mentioned above). For instance, secondary data collected from reports of government agencies as well as reputable organizations and agencies were considered valid. Articles from refereed and peer-reviewed journals relevant to the study were also considered to be reliable and valid. However, these data were checked to ensure that they are a true measure of reality. As such, definitions used in such works must be current, taking into account any changes that may have occurred over the years.

To ensure that data collected in the field is valid, the test-retest method was used. Consistency of the information collected was checked out. Here, the same people to whom the questions were administered were asked similar questions after a certain period of time. Similar responses were deemed to be valid whereas markedly differing responses were considered invalid (Ferraro, 2008).

Data reliability was assured in the following ways:

(i) Precision of the data collected was achieved by administering the questionnaires to the right people, workers and experts in the petrochemical industry in Saudi Arabia.
(ii) Standardization was achieved by use of similar questions asked in a similar fashion to all the respondents.
(iii) Bias was reduced through use of clear and precise questions, simple and short questions, avoiding slangs and technical language and use of common words. Other measures to reduce bias included avoiding use of vague language in the questionnaires, use of complete data, use of sensitive measures and reliable scales, avoiding leading questions.
(iv) Other measures included use of consistent language (Choi and Pak, 2005).

To eliminate bias, the following measures were undertaken by use of appropriate formatting of interview questions in such a way that it is not too lengthy. Redundant questions were eliminated. Only precise and relevant questions which address the issues at hand were considered. Care was taken not to design an imperfect interview questions structure.

Randomisation of the order of questions administered was done so as to eliminate the possibility of learner bias into the study. Questions were worded carefully to minimize cultural bias (Choi and Pak, 2005).

5.6. DATA ANALYSIS

In the following chapters, an analysis will be presented on the development and trends in the Saudi Arabia petrochemical industry and the impact of its recent accession in the World Trade Organization (WTO).

Primary and secondary data included in our study were interpreted through content analysis (discussed further in the next paragraph). It is an analytical method used to determine the existence and frequency of specific words or concepts contained in a text, whether it is a written text from books or articles or text that was generated from interviews or any other communicative language, and examine the relationships between these concepts. Hence, the data were first organized, coded, through labelling, and the original codes were narrowed to focus coding and then categorized into themes. Such method of coding and categorizing is not only simple to analyse, but also provides the researcher with an easy access to the interviewee's views, impressions and opinions about the topic under investigation (Bryman, 2004).

In Chapter 6, a content analysis is conducted using the interviews made with the top government officials, higher-grade officials from the petrochemical industry and some academicians. The interviewees are interrogated with the questions related to the overall condition of the petrochemical industry in Saudi Arabia; the petrochemical industry in Saudi Arabia and its competitive advantage; petrochemical industry in Saudi Arabia and WTO; petrochemical industry, trade related agreements, and environment related agreements; and major challenges facing the petrochemical industry in Saudi Arabia and solutions. As defined earlier, content analysis examines

evidence to solve question and answer problems. The technique tries to limit their examination only to relevant information. The evidence collected from the interviews are reduced and summarized for the relevance to the present study.

In Chapter 7, a Porter Diamond Model is used to understand the overall developments of the activities of the Saudi Arabia petrochemical industry. In 1990, Michael Porter has developed a model that can explain the strategies of the enterprises which can lead them to their success in the international competition. His model is known as 'Diamond Model of Competitive Advantage'. Around a decade and half has been passed after he introduced the theory, but it still remains an important part of the academic field dealing with the issue of competitive advantage. Chapter 7 analyses all of the four factors of the model that determine competitive advantage of the Saudi Arabia petrochemical industry. The four factors, as proposed by Porter, are factor conditions, demand conditions, related and supported industry, and firm's strategy, structure and rivalry. These four factors are considered to be principal sources of competitive advantage of an industry and can make some industries of a country internationally competitive. It can be said that, in a particular country, some industries have very powerful diamond, whilst other have relatively weak diamonds.

Chapter 8 performs a SWOT analysis of the Saudi Arabia petrochemical industry. SWOT stands for the strengths, weaknesses, opportunities and threats of an industry. The strengths and weaknesses factors are always analysed based on the industry's internal resources, while the opportunities and the threats are studied on the basis of the external factors that are confronted by the industry.

The research findings further analysed through an interpretative method to give further meaning to the data and the results of the data analysis.

5.7. ETHICAL CONSIDERATIONS

The right to privacy of the respondents were respected. Accordingly, questions which overstep the limits of individual privacy were avoided. Where the respondent's right to privacy is confirmed, anonymity of the respondent was safeguarded. Informed consent was sought from the respondents before the beginning of the study. In this regard, respondents were clearly informed of the purpose of the research and

permission to answer to research questions requested. Additionally, the right of the respondents to be left alone or discontinue the interview at any one stage was given. Respondents' contributions were treated with high confidentiality.

Deception and concealment by the researcher were avoided at all costs. In regard to this, respondents were informed on all the aspects of the study and the researcher was guided by honesty and openness. Permission from relevant governing authorities, where needed, was sought.

5.8. SUMMARY

In conducting the research and responding to the research questions, two forms of research data were gathered to guide the research investigation. Quantitative data was in the form of economic and financial reports and studies, government statistics, and other forms of quantified data on the petrochemical industries in Saudi Arabia.

Qualitative data was in the form of semi-structured purposive in-depth interviews of experts and opinion leaders in the petrochemical industry as well as petrochemical experts employed in academic organizations. The pilot study was carried out prior to the in-depth interviews and secondary data collection in order to test logistics as well as gather information which will help improve the overall study's efficiency and quality.

In conducting the interviews, a purposive (or judgemental) sampling technique was used to select the study sample based on the expertise they possess. Such a technique provides an objective observation of the important events from all aspects. This interview technique is often used with small and informative sample group (Neuman, 2000; Saunders *et al.*, 2002).

Interviews provide first-hand information from actual sources using a combination of correspondence and personal narrative techniques that are considered the best forms of primary sources in research. Interviews are the source of primary research data and are conducted by the researcher. The quantitative and qualitative data collected were analysed according to specific analytical methods summarized in the analysis section (5.6) and presented in detail in their relevant chapters.

Chapter 6

ANALYZING THE PERCEPTIONS REGARDING THE IMPACT OF WTO ON PETROCHEMICAL INDUSTRY IN SAUDI ARABIA

6.1. INTRODUCTION

This chapter presents the results obtained from the interviews carried out for the present research. As mentioned in the previous chapter, the questions which were asked to the interviewees have been grouped into five, a brief overview of the petrochemical industry in Saudi Arabia; the Petrochemical Industry in Saudi Arabia and its competitive advantage; petrochemical industry in Saudi Arabia and WTO; petrochemical industry, trade related agreements, and environment related agreements; and finally major challenges facing the petrochemical industry in Saudi Arabia and solutions. This chapter presents and analyses answers of the respondents to each question of each of the five categories under consideration.

6.2. A BRIEF OVERVIEW OF THE PETROCHEMICAL INDUSTRY OF SAUDI ARABIA

Under this sub-category of main research topic of the study, three questions were asked to the twenty selected people who had participated in the interview process. Interview question 1 has been set to obtain an idea regarding the status of Saudi's petrochemical industry in relation to that of other countries.

Table 6.1 presents the results of question 1 on the basis of the answers obtained from the interviewees. Focused coding in table 6.1 categorizes the whole set of answers given to question 1 in terms of the nature of the industry as identified by the interviewees.

Table 6.1*:* Results of Question 1

Question 1	**How can you describe Saudi Arabia's petrochemical industry in comparison to other countries?**
Focused Coding	
1	Very competitive
2	Relatively competitive
Theme	Saudi Arabia's petrochemical industry is quite competitive relative to other countries

Table 6.1 shows that participants have either recognized the petrochemical industry as very competitive or relatively competitive in relation to the petrochemical industry of other countries. Tables 6.2 and 6.3 give the results for focused coding 1 and 2 of question 1.

Table 6.2: **Focused Coding Number 1 for Question 1**

Very Competitive	
Participants 1 -9, 11-20	Very competitive

Table 6.3: **Focused Coding Number 2 for Question 1**

Relatively Competitive	
Participant 10	Relatively competitive

Table 6.2 shows that nineteen of the participants in the interviews have regarded the petrochemical industry of Saudi Arabia as very competitive compared to other countries. While table 6.3 that one participant has recognized the petrochemical industry as a relatively competitive in relation to other countries.

Question 2 intends to find out the sub-sectors that the petrochemical industry of Saudi Arabia is comprised of. Table 6.4 presents the results of question 2 on the basis of the answers obtained from the interviewees. Focused coding in table 6.4 categorizes the whole set of answers given to question 2 in terms of the sub-sectors as recognized by the interviewees.

Table 6.4: Results of Question 2

Question 2	**Which sub-sectors comprise Saudi Arabia's petrochemical industry?**
Focused Coding	
1	Industries producing Chemical Products
2	Industries producing Fertilizers
3	Industries producing Pesticides
4	Industries producing Plastics or Innovative Plastics
5	Industries producing Aromatic products
6	Industries producing Metals or different metallic products
7	Industries producing Polymers
Theme	Petrochemical Industry in Saudi generally comprises of a number of sub-sectors which produce chemical products, fertilizers, pesticides, plastics, several innovative plastic products, different types of aroma products, metals, polymers and some other products**.**

Table 6.4 shows that participants have recognized seven sub-categories of industries that belong to the petrochemical industry of Saudi Arabia. Tables 6.5, 6.6, 6.7, 6.8, 6.9, 6.10 and 6.11 give the results for focused coding 1, 2, 3, 4, 5, 6, and 7, respectively, of question 2.

Table 6.5: **Focused Coding Number 1 for Question 2**

Industries producing chemical products	
Participant 1,8,10-19	Chemicals
Participant 2, 4,5,7,20	Manufacture of chemical compounds

Table 6.5 shows that seventeen participants have recognized industries producing chemical products as a major sub-sector of the petrochemical industry of Saudi Arabia, while as many as eighteen out of twenty participants have identified fertilizers producing industries as a very important sub sector of the petrochemical industry of the Kingdom, as can be found from table 6.6.

Table 6.6: **Focused Coding Number 2 for Question 2**

Industries producing Fertilizers	
Participant 1, 3, 6, 9, 11-20	Fertilizers
Participant 2	Manufacture of fertilizers
Participant 5, 7, 8	Fertilizer industry

Tables 6.7 and 6.8 show that while only five out of twenty participants have considered pesticides producing industry as a part of petrochemical industry in the Kingdom, as many as eighteen out of twenty people have recognized industries producing plastic or innovative plastic as one of the very important sub sectors that the petrochemical industry of Saudi Arabia comprises of.

Table 6.7: **Focused Coding Number 3 for Question 2**

Industries producing Pesticides	
Participant 2	Manufacture of pesticides
Participants 6, 7, 12, 20	Pesticides industries

Table 6.8: **Focused Coding Number 4 for Question 2**

Industries producing Plastics or Innovative Plastics	
Participant 1,3,5,6,7,9, 11, 12, 20	Plastics
Participant 2	Manufacture plastics
Participant 8	Chemical industries
Participant 13-19	Innovative Plastics

Table 6.9 and 6.10 show that five participants have considered industries manufacturing aromatic products actually from a sub sector of petrochemical industry, while ten out of twenty participants have recognized industries producing metals as sub sectors of the petrochemical industry of Saudi Arabia.

Table 6.9: Focused Coding Number 5 for Question 2

Industries producing Aromatic products	
Participant 3, 9, 11, 20	Aromatic products
Participant 7	Aromatic

Table 6.10: **Focused Coding Number 6 for Question 2**

Industries producing Metals or different Metallic products	
Participant 6, 12-20	Metals

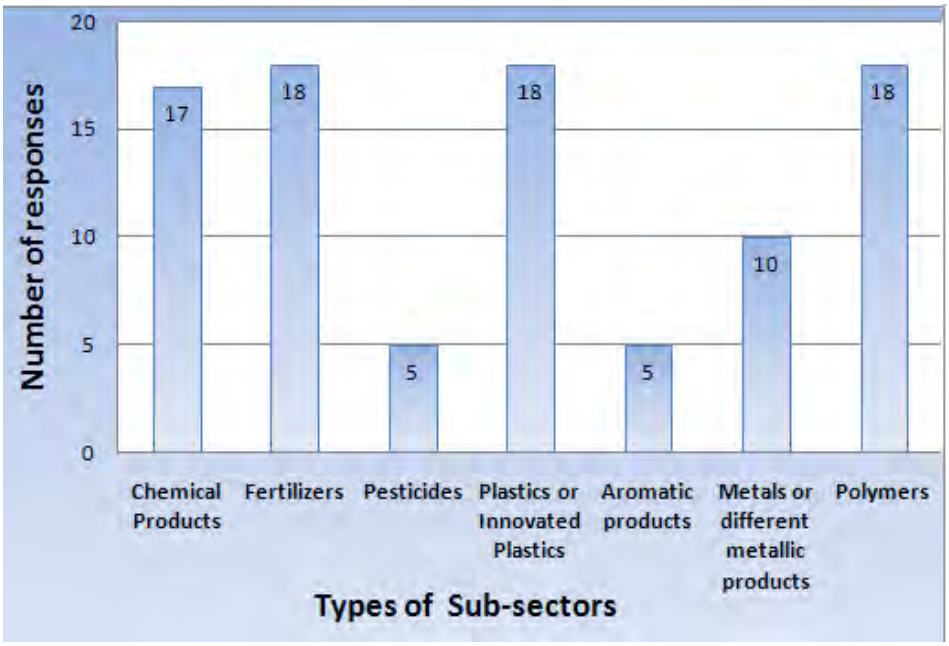
Table 6.11 shows that eighteen out of twenty participants have recognized industries producing polymers as also one of the very important sub sectors of the petrochemical industry of Saudi Arabia.

Table 6.11: **Focused Coding Number 7 for Question 2**

Industries producing Polymers	
Participant 1, 3-6, 8-20	Polymers

On the basis of the above observations relating to question 2, it can be said that while industries producing chemical products, fertilizers, plastics, polymers and metallic products have been identified as sub sector of the petrochemical industry of Saudi Arabia by majority of participants, a few participants have also identified industries producing pesticides, and aromatic products as sub sectors of the petrochemical industry of the Kingdom. Figure 6.1 shows the summary of the participants answers about the sub-sectors comprise petrochemical industry.

Figure 6.1: **Perception Distribution on the Sub-sectors Comprise Petrochemical Industry in Saudi Arabia**



Question 3 attempts to analyse impacts of the petrochemical industry on the economy of Saudi Arabia. Table 6.12 presents results of question 3 on the basis of the answers obtained from the interviewees. Focused coding in table 6.12 categorizes the whole set of answers given to question 3 in terms of the possible impacts that the participants think the industry to produce on the economy of the country. Table 6.12

shows that participants have identified six possible impacts of the petrochemical industry on the economy of the Kingdom.

Table 6.12: **Results of Question 3**

Question 3	**What impact has the petrochemical industry had on Saudi Arabia's economy?**
Focused Coding	
1	Contribution to G.D.P or Income of the Country
2	Contribution to creating job opportunities
3	Making provision for huge amount of domestically produced petrochemical products and thereby lessening imports from abroad
4	Creating new investment opportunities for business enterprises
5	Opening up opportunities to explore international market
6	Diversifying sources of income and reducing dependence on oil
Theme	Petrochemical industry is expected to create significant positive impacts on a countries economy by increasing total output of the country, diversifying income sources and therefore reducing reliance on oil only for earning income, creating new job opportunities, creating new opportunities for business investments, opening up domestic markets for a number of new products to international market, and reducing dependence on imports for a number of products.

Table 6.13 shows that just one participant thinks that the petrochemical industry has a direct impact on GDP.

Table 6.13: **Focused Coding Number 1 for Question 3**

Impact on GDP or Total Income of Saudi Arabia	
Participant 2	The petrochemical industry has a positive impact on the Saudi economy in terms of the contribution of the industrial sector in GDP increases

On the other hand, table 6.14 shows that majority of the participants, as many as eighteen out of twenty participants mentioned that the petrochemical industry sector is one of the very important factors that has an impact on Saudi Arabia's economy in creating more jobs in the Kingdom, so it creates new source of income and new opportunities for businesses.

Table 6.14: **Focused Coding Number 2 for Question 3**

Impact on creating job opportunities	
Participant 1	Provides jobs for citizens
Participant 2	Also provides a wide range of jobs for citizens
Participant 3	Provides jobs for citizens in different majors
Participant 4	Improve new possible business opportunities so increase jobs
Participant 5	Way to create jobs for citizens
Participant 6-9	Provides jobs for citizens
Participant 11	Provides more jobs in different places and different majors
Participant 13-20	Provides jobs for citizens in different majors

Table 6.15 shows that while sixteen out of twenty participants think the petrochemical industry is one of the very important factors that impact on the Kingdom's economy by reducing the amount of imports of various petrochemical products by making provision of wide range of petrochemical products.

Table 6.15: **Focused Coding Number 3 for Question 3**

Lessening Imports from abroad	
Participant 1	Reduce Importing the petrochemical products
Participant 2	The provision of these petrochemical products in the market in a competitive price instead of Saudi Arabia imported from abroad
Participants 3-7	Reduce Importing the petrochemical products
Participants 12-20	Reduce Importing the petrochemical products

Table 6.16 shows that as many as fifteen participants think that the one of the very important factors impacts on the Kingdom's economy is creating new investment opportunities for the businessmen.

Table 6.16: **Focused Coding Number 4 for Question 3**

Impact on creating new investment opportunities for business enterprises	
Participant 1-3	Provides opportunities for businessmen to investment
Participant 4	Improve new possible business opportunities
Participant 5	Also Investment opportunity for Businessmen
Participant 6, 8-16	More opportunities for businessmen to investment

As shown in table 6.17, only one participant is hopeful that the petrochemical industry will help in exploring international market.

Table 6.17: **Focused Coding Number 5 for Question 3**

Impact on opening up opportunities to explore international market	
Participant 4	Open up to the International Market

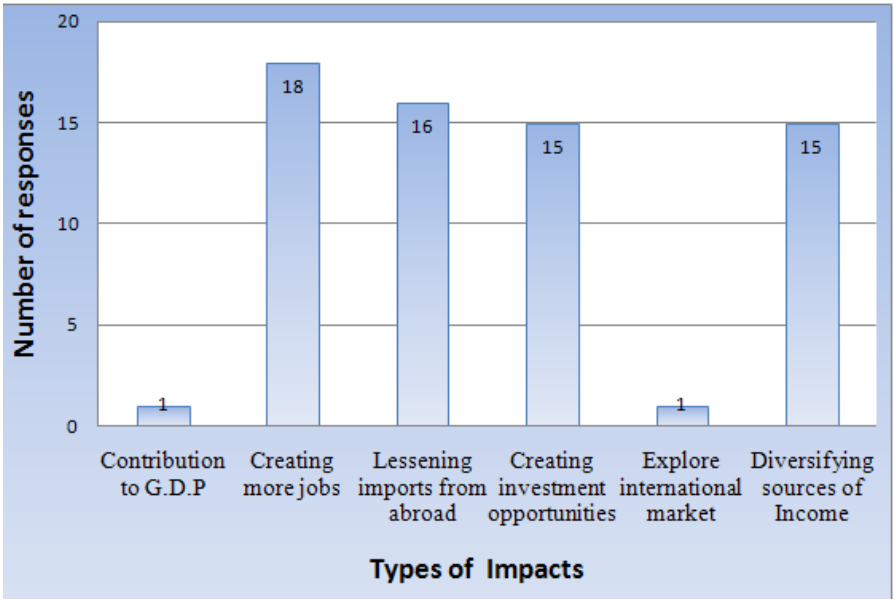
On the other hand, table 6.18 shows that as many as fifteen out of twenty participants think that the petrochemical industry is also has a very important impact on the economy of Saudi Arabia, since it provides a huge opportunity of reducing dependence on oil as a main source of income. Petrochemical industry helps in diversifying income sources by creating more opportunities of earnings for the people living in the Kingdom.

Table 6.18: **Focused Coding Number 6 for Question 3**

Impact on diversifying sources of income and reducing dependence on oil	
Participant 1	So as to diversify sources of income, and reduce reliance on oil
Participants 2-4	Helps to diversify sources of income, and reduce reliance on oil
Participants 5	Opens another source of the non-oil income - A source of national income
Participants 6-13	Helps to diversify sources of income, and reduce reliance on oil.
Participant 19-20	Help to diversify sources of income, and opens another source of the non-oil income

Figure 6.2 below shows the six different effects that the participants perceived, of the petrochemical industries on the Saudi economy.

Figure 6.2: **Perception Distribution on the Impact of Petrochemicals Industry on the Saudi Economy**



6.3. THE PETROCHEMICAL INDUSTRY OF SAUDI ARABIA AND ITS COMPETITIVE ADVANTAGE

Under this sub-category of main research topic of the research, nine questions were asked to the twenty selected people who had participated in the interview process. Interview question 4 has been set to find out whether Saudi Arabia has competitive advantage in oil sector.

Table 6.19 presents the results of question 4 on the basis of the answers obtained from the interviewees. Focused coding in table 6.19 presents only one category of the whole set of answers given to question 4.

Table 6.19: **Results of Question 4**

Question 4	**Does Saudi Arabia have any competitive advantage in the oil sector?**
Focused Coding	
1	Yes
Theme	Saudi Arabia possesses significant competitive advantage in oil sector

All the participants are quite sure about the fact that Saudi has huge competitive advantage in oil sector.

Finding out that all participants think Saudi Arabia has huge competitive advantage in oil sector, while question 5 was asked to recognize the advantages possessed by the oil Sector of the Kingdom. Table 6.20 presents results of question 5 on the basis of the answers obtained from the interviewees. Focused coding in table 6.20 categorizes the whole set of answers given to question 5 in terms of the possible advantages that the participants think the oil sector of Saudi Arabia to possess. Table 6.20 shows that participants have identified four major advantages of the oil sector of Saudi Arabia.

Table 6.20: **Results of Question 5**

Question 5	**If the answer above is yes, would you please identify these advantages**
Focused Coding	
1	Huge Oil Reserves and huge production of oil
2	Location advantages
3	Low cost of oil extraction
4	Flexibility in supply so as to appropriately adjust to demand changes
Theme	There are a number of factors which contribute to the competitive advantage of Saudi Arabia in oil sector. The Kingdom enjoys several advantages in its oil sector. It has huge reserves of oil and therefore production level is also very high. Apart from these the Kingdom has the benefit of some location advantages in terms of the locations of its oil fields and having equal defiance to east and the west. The oil fields in Saudi Arabia are located in such areas that are quite easy to access them. Cost of oil extraction is also very low, which is another important factor that works behind huge production of oil.

Table 6.21 and 6.22 provide the response patterns of the participants corresponding to the first two focused coding, which show that while all the participants have identified the huge oil reserve and huge oil production as a major advantage of Saudi's oil sector, while four participants think that convenient locations of the oil fields in land as well as in seas also serves as an advantage of the oil sector of the Kingdom.

Table 6.21: **Focused Coding Number 1 for Question 5**

Huge Oil Reserves and huge production of oil	
Participant 1, 2	Has the largest oil reserves in the world and large production
Participant 3	Large reserves and production
Participant 4	Has very huge reservation and huge production
Participant 5	Has a huge oil reserves, and its production is very large
Participant 6-8	Large production, large reserves
Participant 9-10	Huge production and reservation
Participant 11-20	Large production, large reserves

Table 6.22: **Focused Coding Number 2 for Question 5**

Location advantages	
Participant 1	Location of the country, and oil fields near to ports of export
Participant 2	Oil fields in places of easy access to either land or sea and the oil fields near the port of export, besides the country's location
Participant 3	The large diversity of the fields (on land and sea)
Participant 4	Location of the country

Table 6.23 and 6.24 show that while majority of the participants, eighteen out of twenty, have recognized low extraction cost of oil as a major advantage of the oil sector of Saudi Arabia, fifteen participants have identified flexibility of the oil sector in adjusting its supply to changing demand as one of very important advantages of Saudi's oil sector.

Table 6.23: **Focused Coding Number 3 for Question 5**

Low cost of oil extraction	
Participant 1,2,3,6,8,11-20	Low cost of extraction
Participant 4	Financial
Participant 9	Easy extraction of oil from the fields
Participant 10	Low marginal cost of pumping a barrel of oil from the ground

Table 6.24: **Focused Coding Number 4 for Question 5**

Flexibility in supply so as to appropriately adjust to demand changes	
Participant 1	Can increase the production when required
Participant 2	Ability of increase the production when the demand raises
Participant 3	The capacity to increase as global demand
Participant 4	Raw materials (long term uniform continues supply)
Participant 5	Can increase the production when needed
Participant 6	Ability of rise production
Participant 7	Increasing the production immediately when needed
Participant 8-13,18,19	Can increase the production when required

Now, question 6 has been formed to obtain some ideas regarding the possible ways of sustaining these competitive advantages of Saudi Arabia in its oil sector. Table 6.25 presents results of question 6 on the basis of the answers obtained from the

interviewees. Focused coding in table 6.25 categorizes the whole set of answers given to question 6 in terms of the possible ways that the participants think essential for making competitive advantages of the oil sector of Saudi Arabia sustainable. Table 6.25 shows that participants have identified seven advantages of the oil sector of Saudi.

Table 6.25: **Results of Question 6**

Question 6	**How can Saudi Arabia sustain these competitive advantages?**
Focused Coding	
1	Gradually increase dependence on other sources of income but oil
2	Develop and improve techniques of oil extraction to reduce cost
3	Continuous the exploration of oil fields
4	Maintaining high market share by holding the existing market and finding new markets
5	Build more refineries
6	Maintaining price at competitive level
7	Develop the oil sector of the country as a whole
Theme	The competitive advantages of Saudi Arabia oil sector can be sustained through gradually increase reliance on other sources of income other than oil, development of newer technology and technique of extracting oil from the oil fields, continuous exploration of oil fields, maintenance market share very high at international level by holding existing market as well as finding out new markets, building of new refineries to meet increasing demand, maintains of price of oil at competitive level so as to get more markets and development of the oil sector of the country as a whole.

Table 6.26 provides some ideas regarding the extent of acceptability of each possible ways of making the oil sector of Saudi Arabia sustainable by the participants by presenting number of responses to each focused coding which actually represents alternative way of making the sector sustainable. It can be found from the table that majority of the participants, as much as sixteen, think gradual increase in the extent of dependence on other sources of income rather than on only oil sector to be an effective way for maintaining sustainability of the oil sector, as high as fifteen participants consider improvement in technique of oil extraction as helpful, two participants recognizes continuous oil exploration as an important way, thirteen participants wants Saudi Arabia to maintain its high market share by finding out new

markets and holding the existing ones, three participants votes for building more refineries, one participants thinks maintenance of price at competitive level as an important strategy, while as high as ten participants want the Kingdom to develop the oil sector as a whole.

Table 6.26: **Number of Responses to Each Focused Coding for Question 6**

Focused Coding Number	Possible Ways	Number of Responses
1	Gradually increasing dependence on other sources of income other than oil	16 participants: Participant 1-12, 17-20
2	Developing improved technology of oil extraction to reduce cost	15 participants: Participant 2, 4, 5, 6, 7, 11-20
3	Continuous exploration of oil fields	2 participants: Participant 1 and 2
4	Maintaining high market share by holding the existing market and finding new market	13 participants: participant 3, 4, 6, 11, 12-20
5	Building more refineries	3 participants: participant 5, 7, 11
6	Maintaining price at competitive level	1 participant: participant 11
7	Develop the oil sector of the country as a whole	10 participants: participant 9, 12-20

In the questionnaire question 7 was set to find out possible inefficiencies of the oil sector of participants find the oil sector as not having competitive advantages. Since no participant has found that the oil sector of Saudi Arabia suffers from competitive disadvantage, so question 7 has no answers therefore there are no effects here.

Now, question 8 has been asked to find out the difficulties faced by the petrochemical sector of Saudi Arabia. Table 6.27 presents results of question 8 on the basis of the answers obtained from the interviewees. Focused coding in table 6.27 categorizes the whole set of answers given to question 8 in terms of different difficulties that the participants have identified. Table 6.27 shows that participants have recognized five difficulties that the petrochemical sector of Saudi Arabia faces.

Table 6.27: **Results of Question 8**

Question 8	**What difficulties, if any, are faced by Saudi Arabia's petrochemical industry**
Focused Coding	
1	Low reserves of natural gas
2	Lack of trained and specialized labour
3	Scarcity of raw materials
4	Availability of improved technology
5	Price of raw materials
Theme	Major obstacles that the Petrochemical Industry of Saudi Arabia faces include low reserves of natural gas, problems in availability of trained and specialized workers, problems associated with availability and price of raw materials. Problems in the availability of improved technology.

Tables 6.28 and 6.29 show that only four out of twenty participants have recognized low reserves of natural gas as one difficulty facing Saudi's petrochemical sector, whereas as many as twelve participants have identified scarcity of trained and specialized labourer as one of the major difficulties.

Table 6.28: **Focused Coding Number 1 for Question 8**

Low reserves of natural gas	
Participant 1	Fewness of natural gas
Participant 2	The lack of natural gas on which the petrochemical industry depends
Participant 3	Lack of raw materials (especially natural gas)
Participant 8	Availability of natural gas

Table 6.29: **Focused Coding Number 2 for Question 8**

Lack of trained and specialized labour	
Participant 2	Scarcity of specialized labour
Participant 5, 11-13	Availability of trained manpower
Participant 14-20	Trained manpower

Table 6.30 shows that fourteen out of twenty participants think that scarcity of other raw materials is also a vital problem facing the petrochemical industry of Saudi Arabia.

Table 6.30: **Focused Coding Number 3 for Question 8**

Scarcity of raw materials	
Participant 3	Lack of raw materials
Participant 5	Availability of raw materials at a reasonable price
Participant 7, 11-20	Availability of raw materials
Participant 10	Fewness of raw materials

From table 6.31 it is found that nine out of twenty participants think that problems related to availability of improved technology is also a vital problem facing the petrochemical industry of Saudi Arabia.

Table 6.31: **Focused Coding Number 4 for Question 8**

Availability of improved technology	
Participant 4	Technology
Participant 5	Provide the necessary technical
Participant 14-20	Getting last world technology

Table 6.32 shows that three out of twenty participants considers unreasonable price of raw materials as one of the major difficulties facing the petrochemical industry of Saudi Arabia.

Table 6.32: **Focused Coding Number 5 for Question 8**

Price of raw materials	
Participant 5	Availability of raw materials at a reasonable price
Participant 6	Price of the raw materials
Participant 9	The raw materials prices

Question 9 has been asked to find out possible ways that could be undertaken to overcome the above mentioned difficulties facing the petrochemical sector of Saudi Arabia. Table 6.33 presents results of question 9 on the basis of the answers obtained from the interviewees. Focused coding in table 6.33 categorizes the whole set of answers given to question 9 in terms of different possible ways that the participants

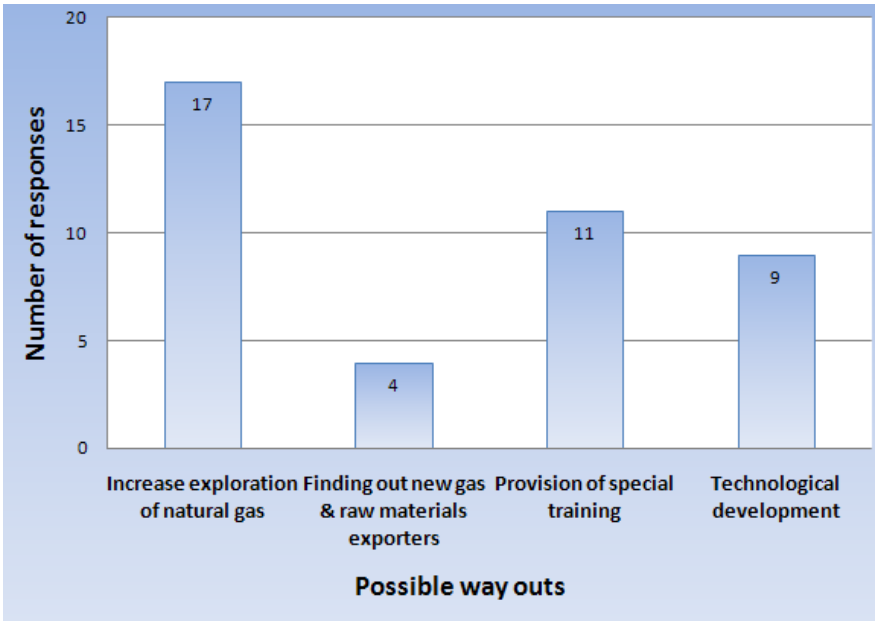
consider as solutions to those problems. Table 6.33 shows that participants have recognized four possible solutions that could be undertaken.

Table 6.33: **Results of Question 9**

Question 9	**How can the above mentioned difficulties be overcome?**
Focused Coding	
1	Increasing exploration for natural gas with other raw materials
2	Finding out exporters of natural gas in the international market who export gas at reasonable prices as well as getting other raw materials
3	Providing specialized training to the youth of Saudi Arabia and setting up training centres for workers
4	Development of Diversity and Research and getting improved technology used in the process of manufacturing
Theme	To overcome the difficulties of the Petrochemical sector of Saudi Arabia, it seems to be essential to increase the level of exploration of raw materials including natural gas as well to find out exporters in the international market who are ready to export natural gas to Saudi Arabia at reasonable prices, to undertake sufficient steps for providing adequate training to the Saudi workers, and to take measures for improving technology used in the manufacturing process of the products of the industry.

Figure 6.3 shows the extents of responses to alternative solutions. As many as seventeen out of twenty participants considers increased exploration of natural gas along with other raw materials as an effective way to overcome the difficulties facing the petrochemical industry of Saudi Arabia. Four out of twenty participants considers the process of finding out exporters of natural gas in the international market who export gas at reasonable prices as well as getting other raw materials at low cost as an effective way to overcome these difficulties. Eleven out of twenty participants considers the process of providing specialized training to the youth of Saudi Arabia and setting up training centres for workers as a way to overcome the difficulties facing the petrochemical industry of Saudi Arabia, while nine out of twenty participants considers development of diversity and research and getting improved technology used in the process of manufacturing as another potential way of overcoming the difficulties facing the petrochemical industry of Saudi Arabia.

Figure 6.3: **Perception Distribution on the Effective Strategies to Overcome the Difficulties Facing the Petrochemical Industry in Saudi Arabia**



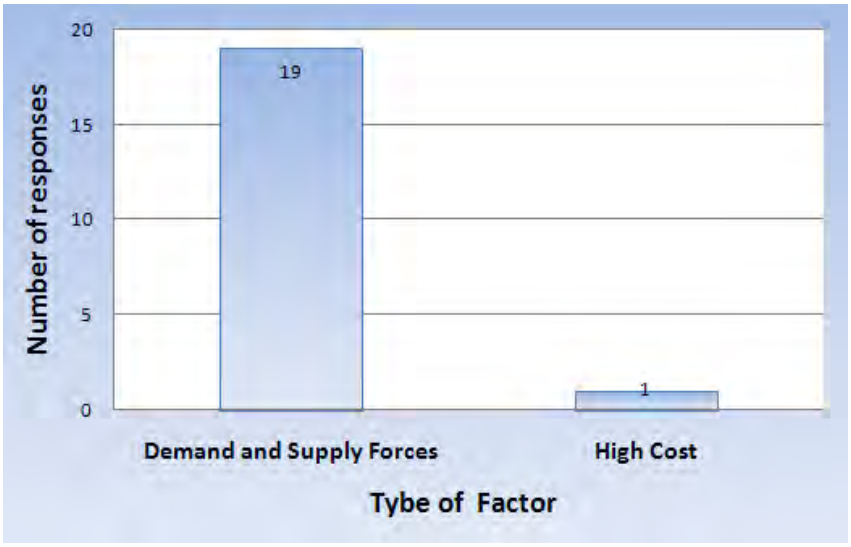
Question 10 has been asked to find out possible ways that could be undertaken to obtain some idea regarding the factors that can effectively stand in the way of increased oil production. Table 6.34 presents results of question 10 on the basis of the answers obtained from the interviewees. Focused coding in table 6.34 categorizes the whole set of answers given to question 10 in terms of different possible factors that the participants consider as hindrance to increasing oil production. Table 6.34 shows that participants have recognized two factors.

Table 6.34: **Results of Question 10**

Question 10	**What factors stand in the way of increased world oil production?**
Focused Coding	
1	Supply and Demand forces
2	High cost
Theme	Close interrelation between supply and demand is a major factor behind increase in world oil production. As demand for oil at an international level increases, supply of oil needs to be increased to meet up the increased demand that in turn results in increased production of oil. Hence, it can be said that low level of demand results in low level of production. Sometimes high cost can also stands in the way of increased oil production.

Figure 6.4 shows that nineteen out of twenty close relation between supply and demand stand in the way of increased oil production. If demand for oil reduces drastically then it would immediately translate into decline in supply of oil implying lower level of oil production. Only one participant thinks that high cost of production can also serve as huge hindrance in the production process.

Figure 6.4: Perception Distribution on the Factors Stand in the Way of Increased World Oil Production



Question 11 has been asked to find out possible ways that could be undertaken to deal with the above mentioned factors. Table 6.35 presents results of question 11 on the basis of the answers obtained from the interviewees. Focused coding in table 6.35 categorizes the whole set of answers given to question 11 in terms of different possible ways that the participants consider as solutions to those problems. Table 6.35 shows that participants have recognized two possible solutions that could be undertaken.

Table 6.35: **Results of Question 11**

Question 11	**How can the factors stated above be dealt with?**
Focused Coding	
1	Increase in demand with time
2	Avoidance of high cost
Theme	To deal with the problem of low level of production of oil, demand for oil need to be increased globally with the passage of time and efforts should be taken to avoid high cost associate with oil production.

Table 6.36 shows that as many as nineteen participants consider increase in demand as the only factor that could lead to significant increase in oil production.

Table 6.36: **Focused Coding Number 1 for Question 11**

Increase in demand with time	
Participant 1	The solution will be with the passage of time, because it will increase the demand for oil is certainly
Participant 2, 5	When oil global demand increases the production will increase
Participant 3	Supply and demand changes from time to time by the global needs
Participant 4, 14-20	If the world's demand increases the production will increase to
Participant 6-9	When world demand increases the world oil production increases to
Participant 11-13	When world demand increases

According to table 6.37, only one out of twenty participants considers avoidance of high cost as a factor that could help in increasing oil production.

Table 6.37: Focused Coding Number 2 for Question 11

Avoidance of high cost	
Participant 10	Avoidance of high costs.

Question 12 has been aimed at finding out whether increased production of petroleum has resulted in increased petrochemical production. Table 6.38 shows that all the participants have agreed on the fact that increased production of petroleum has resulted in increased petrochemical production in Saudi Arabia.

Table 6.38: **Results of Question 12**

Question 12	**Do you think increased petroleum production has resulted in increase in the petrochemical production?**
Focused Coding	
1	Yes
Theme	Increased petroleum production has resulted in increase in the petrochemical production

6.4. PETROCHEMICAL INDUSTRY IN SAUDI ARABIA AND WTO

This subsection comprises of results of eight questions, from question 13 to question 20.

Question 13 has been asked to examine impacts of the CET on Saudi's petrochemical exports.

Table 6.39: Results of Question 13

Question 13	**How has the CET* among the GCC countries impacted on Saudi's petrochemical exports**
Focused Coding	
1	Has produced positive impact, Saudi's exports increase
2	No impact
Theme	CET has been able to positively impacted Saudi Arabia by providing higher access to GCC market with no custom costs, so Saudi's exports increases.

* **CET**: Common External Tariff

Table 6.40 shows that as many as nineteen participants think that the CET among GCC countries has positive impact on petrochemical exports of the Kingdom, therefore the petrochemical products exports increases.

Table 6.40: **Focused Coding Number 1 for Question 13**

CET among the GCC countries has produced positive impact on the Kingdom's petrochemical products exports.	
Participant 1	Yes, positive, Saudi's exports increase
Participant 3	Positive impact, Saudi's exports implement the GCC markets more
Participant 4	Saudi's exports increase
Participant 5	Saudi products find more places in the Gulf states markets
Participant 6-8	Saudi's products can through to any GCC state markets more
Participant 9	Saudi's products can through to any GCC state with no customs
Participant 10	Open the GCC markets to Saudi's products
Participant 11-13	Saudi's products access the GCC markets with no custom costs
Participant 14-20	Positive impacts. Saudi's exports increase

Table 6.41, however shows that there is one participant who does not think that the CET will be helpful in increasing exports.

Table 6.41: **Focused Coding Number 2 for Question 13**

No impact	
Participant 2	Does not affect, since the GCC is a customs union area

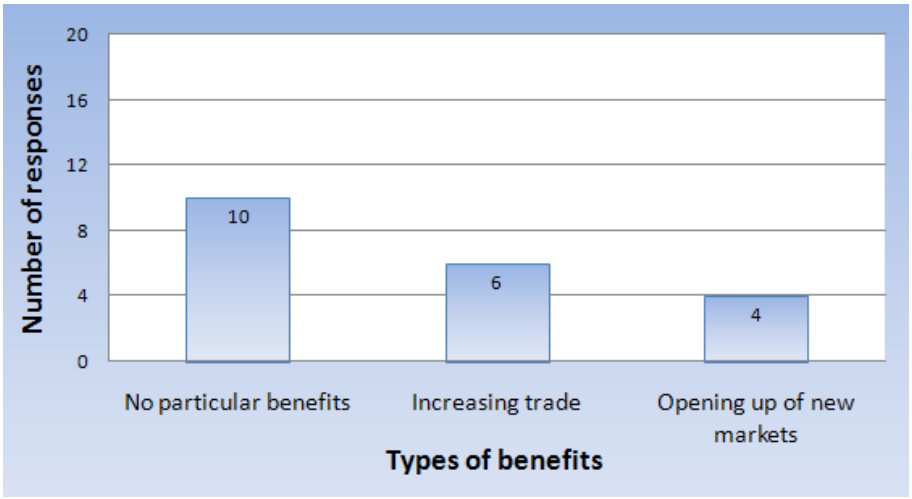
Question 14 has been aimed at finding out the benefits that the WTO membership has conferred on oil producing countries. According to focused coding in Table 6.42, participants have recognized three possible impacts.

Table 6.42: **Results of Question 14**

Question 14	**What benefits does membership in the WTO confer on oil-producing countries? (Mention example(s) of (a) specific oil-exporting country)**
Focused Coding	
1	No particular benefit
2	Increase trade with other member countries producing other goods
3	Opening up of new markets
Theme	Although in most of the cases no particular benefit is conferred on oil producing nations by WTO, for certain countries like Saudi Arabia, Qatar and United Arab Emirates, WTO membership has helped in increasing trade with other members of WTO producing other goods and opening up of new markets.

Figure 6.5 shows that ten out of twenty participants have mentioned that there is no any particular benefit that has been conferred by the WTO upon oil producing countries including Saudi Arabia. Some participants, however, have been able to recognize some benefits. For example, six participants think that WTO membership has helped Saudi Arabia along with countries like Qatar, United Arab Emirates, in increasing the volume of their trade with other member nations, while four have directly identified opening up of new market for the products of these countries.

Figure 6.5: **Perception Distribution on the Benefits Conferred by WTO upon Oil Producing Countries**



Question 15 has been asked for identifying limitations that the WTO membership has imposed on Saudi's petrochemical industry. According to focused coding presented in table 6.43, participants have either found no limitation or have identified the condition of opening up of own market as a limitation.

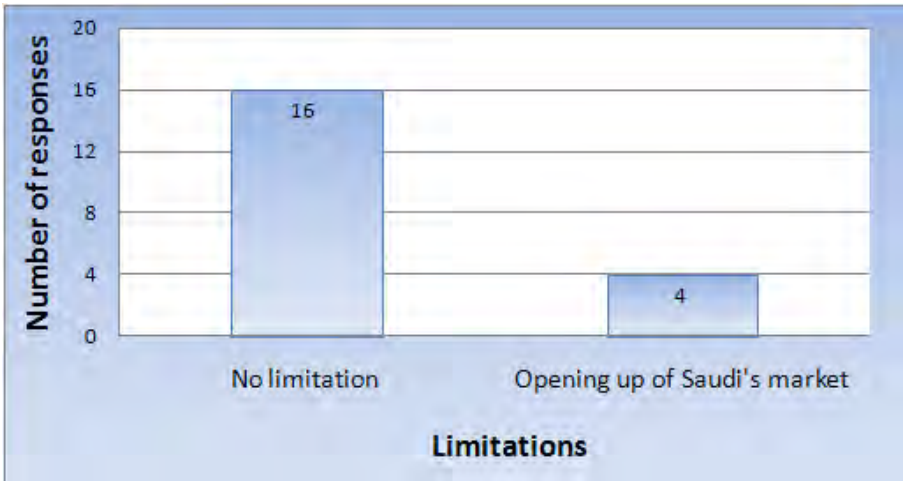
Table 6.43: **Results of Question 15**

Question 15	**What limitations does membership to WTO impose on Saudi's petrochemical industry? Please identify these in relation to legal, economic, financial and competitiveness issues.**
Focused Coding	
1	No limitation
2	Saudi markets must be opened up for other countries' products

Theme	Generally WTO has not imposed any kind of limitation on Saudi Arabia's Petrochemical industry except the condition that like other members states Saudi Arabia has to open up its market for the other member countries.

Figure 6.6 shows that sixteen out of twenty participants have not identified any limitation, while four participants have recognized opening up of own market as a limitation.

Figure 6.6: **Perception Distribution on the Limitations Imposed by the WTO on Saudi's Petrochemical Industry**



Question 16 has been asked for finding out whether any concession has been given to Saudi's petrochemical industry by the WTO. Table 6.44 shows that no member has been able to recognize any concession given to Saudi's petrochemical industry.

Table 6.44: **Results of Question 16**

Question 16	**Do you also believe that WTO conceded to give some concession to Saudi Arabia in relation to petrochemical industry?**
Focused Coding	
1	No
Theme	Saudi Arabia's petrochemical industry did not get any special concession from the WTO

Since the answer to question 16 was no for the entire twenty participants, question 17 which aimed at finding out different types of concessions, no longer remains valid.

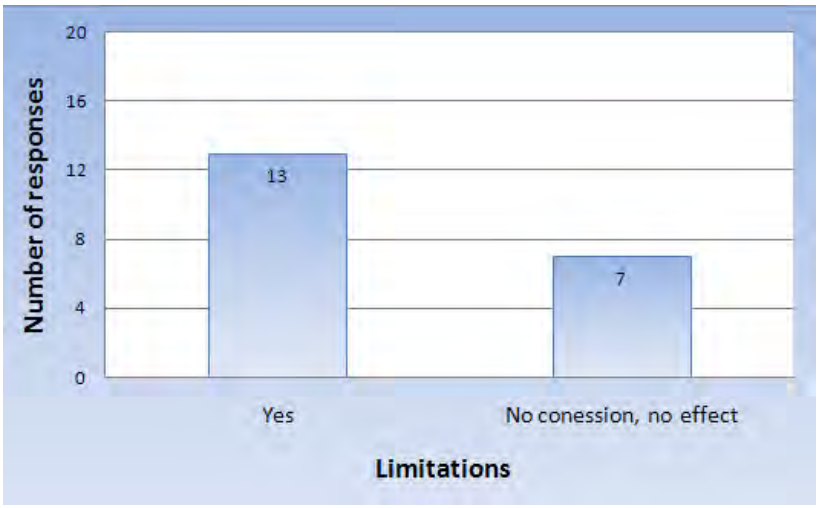
Now, Question 18 has been asked to examine whether concessions given by the WTO have potential to strengthen Saudi's petrochemical industry.

Table 6.45: **Results of Question 18**

Question 18	**Will the concessions given by WTO strengthen Saudi Arabia's petrochemical industry? If so, to what extent?**
Focused Coding	
1	Trade agreement support the petrochemical industry of Saudi Arabia by providing it access to the markets of other member states.
2	No concession.
Theme	Since no special concession is given by WTO to Saudi's petrochemical industry, sometimes its impact on the industry become unclear, but still it frequently seems that the trade agreement has supported the petrochemical industry of Saudi Arabia by offering higher access to other members' markets.

Figure 6.7 shows that although no special concession has been given, thirteen participants think that higher access to overseas market will help the industry to grow further. But seven participants are unclear about the effect of WTO membership.

Figure 6.7: **Will the Concessions Given by WTO Strengthen Saudi Arabia's Petrochemical Industry?**



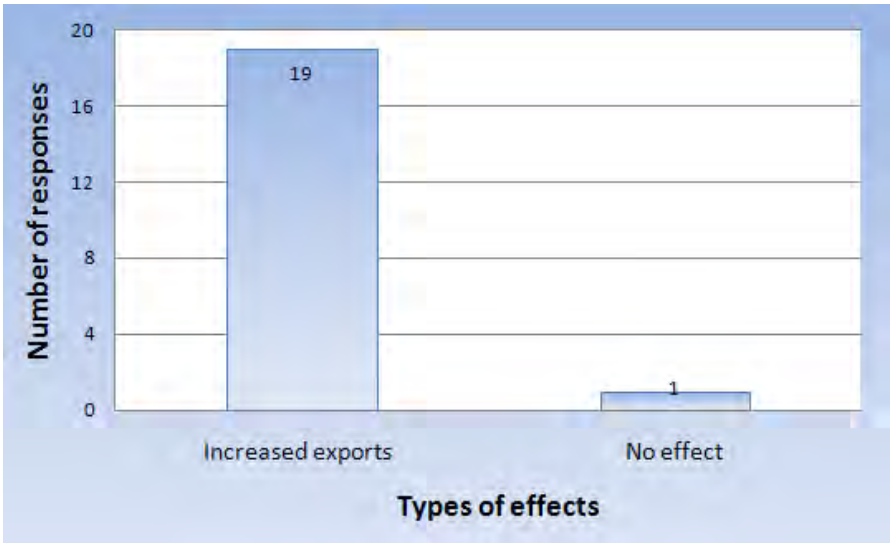
Question 19 has been asked to examine impacts of the WTO on Saudi's petrochemical exports.

Table 6.46: **Results of Question 19**

Question 19	**Has accession to the WTO affected Saudi's petrochemical exports?**
Focused Coding	
1	Yes
2	No
Theme	It is quite likely that accession of WTO has helped in increasing the volume of export of petrochemical products of Saudi Arabia by providing it greater access to the markets of other member states.

Most of the participants think that the WTO membership has helped Saudi Arabia in increasing its volume of exports. As many as nineteen out of twenty participants think that access to the WTO will help the Kingdom in increasing its exports by providing easy access to the markets of other member states of the WTO with a low rate of tariff. However, one participant does not think that access to the WTO will be able to produce any effect on Saudi's export. The results of question 19 are depicted in figure 6.8.

Figure 6.8: **Perception Distribution on the Effect of Access to the WTO on Saudi's Exports**



Question 20 has been aimed at finding out political and economic sources of the concession given by the WTO to Saudi's petrochemical industry. In the absence of any special concession a number participants have failed to recognize any source.

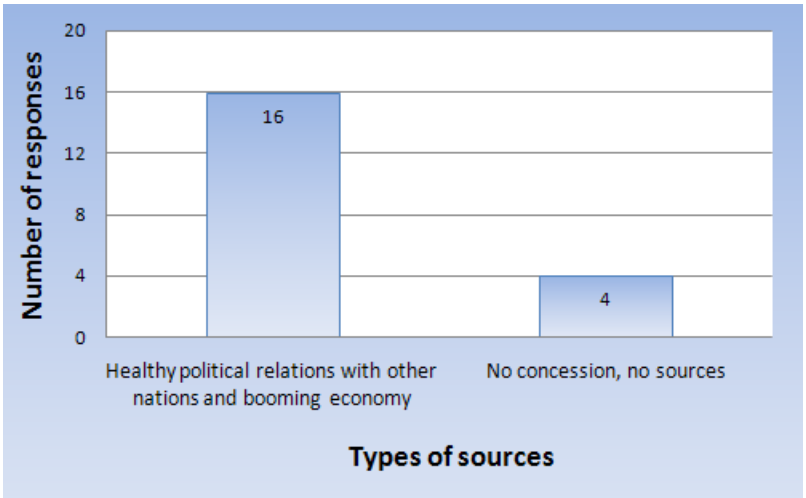
However, some have tried to find out some sources. Table 6.47 presents the results along with focused coding.

Table 6.47: **Results of Question 20**

Question 20	**Would you please comment on the political and economic sources of the concession given by WTO to Saudi Arabia on petrochemical industry?**
Focused Coding	
1	No clear source as no special concession is given
2	Healthy political relations with other nations and booming economy.
Theme	Since no special concession is given by WTO to Saudi Arabia, sometimes it becomes difficult to find out the political and economic sources of communication, but whatever facilities are obtained through WTO membership can be attributed to healthy political relations among member states and booming economy of the countries

Reviewing the answers given by the participants, it is found that four out of twenty participants did not identify any political or economic sources concession as no special concession has been given by the WTO to Saudi Arabia. However, Figure 6.9 which presents the pattern of responses to question 20 shows that sixteen participants think that although no special concession has been offered, it is healthy political relation with other nations and booming economic conditions that has helped the Kingdom to obtain easy access to markets of other member nations through WTO membership.

Figure 6.9: **Perception Distribution on the Political and Economic Sources of the Concession Given by the WTO to Saudi Arabia on Petrochemical Industry**



6.5. PETROCHEMICAL INDUSTRY, TRADE RELATED AGREEMENTS AND ENVIRONMENT RELATED AGREEMENTS

This subsection comprises of results of six questions, from question 21 to 26.

Through question 21, efforts have been made to examine whether current tariff schedule facing Saudi's petrochemical industry is self limiting in nature. Table 6.48 and 6.49 present the results. These two tables show that all the twenty participants have agreed to accept that current tariff schedule for Saudi's petrochemical industry is self limiting.

Table 6.48: **Results of Question 21**

Question 21	**Is Saudi Arabia's current tariff schedule for petrochemicals self-limiting?**
Focused Coding	
1	Yes

Table 6.49: **Focused Coding Number 1 for Question 21**

Yes	
Participant 1, 3-9, 11-20	Yes
Participant 2	Yes, and applies to chemical harmonization initiative
Participant 10	Perhaps Yes.

Question 22 has been asked for investigating into the effects of reduced tariffs on Saudi's petrochemical industry. Table 6.50 shows that no member has been able to recognize any concession given to Saudi's petrochemical industry. Focused coding in table 6.50 categorizes the whole set of answers given to question 22 in terms of different impacts that the participants have identified. Table 6.50 shows that participants have recognized two possible effects.

Table 6.50: **Results of Question 22**

Question 22	**How will reduced tariffs affect Saudi's petrochemical industry?**
Focused Coding	
1	Produce positive impact in terms of providing more access to markets to huge number of petrochemical products
2	Produce negative impact as some products may lose markets because of their inability to stand in increasing competition
Theme	Reduced tariff is expected to produce positive as well as negative impacts on Saudi's petrochemical industry. While in one hand, the products will have greater access to markets and therefore face increasing competition which might increase their quality, on the other hand, some product might lose markets because of their inefficiency to stand in increasing competition and high cost.

Table 6.51 shows that nineteen participants have expressed their strong opinion in favour of positive impacts of reduced tariff on Saudi's petrochemical industry.

Table 6.51: **Focused Coding Number 1 for Question 22**

Produce positive impact in terms of providing more access to markets to huge number of Petrochemical products	
Participant 1	Will have more access in global markets
Participant 3, 6-9	Saudi's petrochemical products will access more in the global markets, and, consequently, competition will increase.
Participant 4	Will find new markets.
Participant 5	Some products will find more markets
Participant 10	Increase its total revenue (and profits, too).
Participant 11-13	Saudi products will access the global markets, and then competition will increase.
Participant 14-20	Saudi's products will find place in other's markets, so the Saudi's petrochemical industry will grow.

Table 6.52 shows that two participants, are, however doubtful about positive impact of reduced tariff. They think that for some products impacts could be negative.

Table 6.52: **Focused Coding Number 2 for Question 22**

Produce negative impact as some products may lose markets because of their inability to stand in increasing competition	
Participant 2	There will be a negative affect on some of the items imported
Participant 5	Negatively at the same time, some cannot because of competition and high cost, perhaps in some cases, the product's quality.

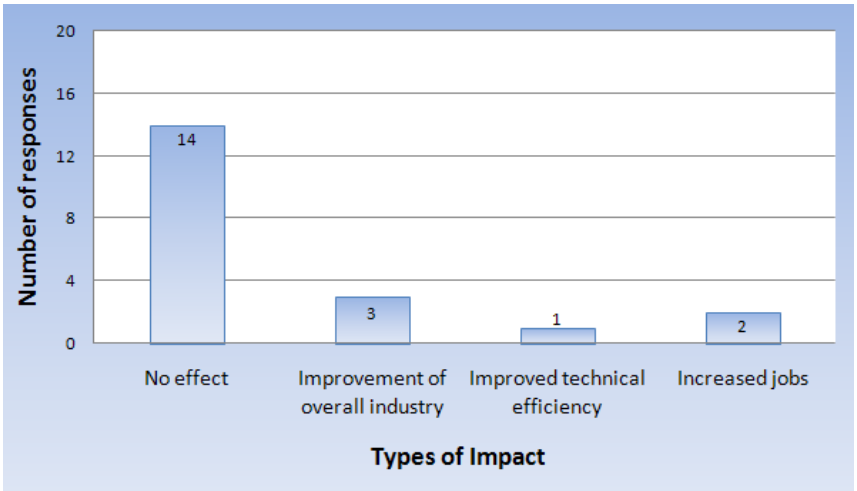
Question 23 has been aimed at finding out possible effects of Saudizaion on Saudi's petrochemical industry. Focused coding in table 6.53 categorizes the whole set of answers given to question 22 in terms of different impacts identified by the participants. Table 6.53 shows that participants have recognized four possible effects.

Table 6.53: Results of Question 23

Question 23	**What effect has Saudization had on Saudi Arabia's petrochemical industry?**
Focused Coding	
1	No Effects
2	Increase in jobs for Saudis in the petrochemical sector
3	Improvement of the industry as a whole in continuity and attainment of more stability
4	Gain of technical efficiency by Saudi works
Theme	Although apparently most of the time Saudization seems to have produced no significant effect on the petrochemical industry, it would, however, not be very difficult to find out that in many cases it has increased job opportunities of Saudi workers in this industry, and it has been quite successful in providing training to Saudi workers as well as improving the industry's condition as a whole.

Figure 6.10 presents results of question 23. Most of the participants, fourteen out of twenty participants, have failed to recognize any effect of Saudization on the petrochemical industry of Saudi Arabia. However, two participants think Saudization to be helpful in creating more jobs for the workers of Saudi Arabia. One participant thinks that Saudization will also be helpful in increasing technical efficiency of workers, while three participants have opined that Saudization will help in bringing about overall improvement of the industry.

Figure 6.10: **Perception Distribution on the Effect of Saudization on the Petrochemical Industry of Saudi Arabia**



As far as effect of Doha agreement is concerned, as asked in question 24, all the twenty participants have agreed on the fact that Doha Trade agreement did not affect Saudi's petrochemical sector.

Table 6.54: **Results of Question 24**

Question 24	**How has the Doha Trade Agreement affected Saudi's petrochemical industry?**
Focused Coding	
1	No effect
Theme	Doha Agreement generally seems to have no effect on Saudi's petrochemical industry

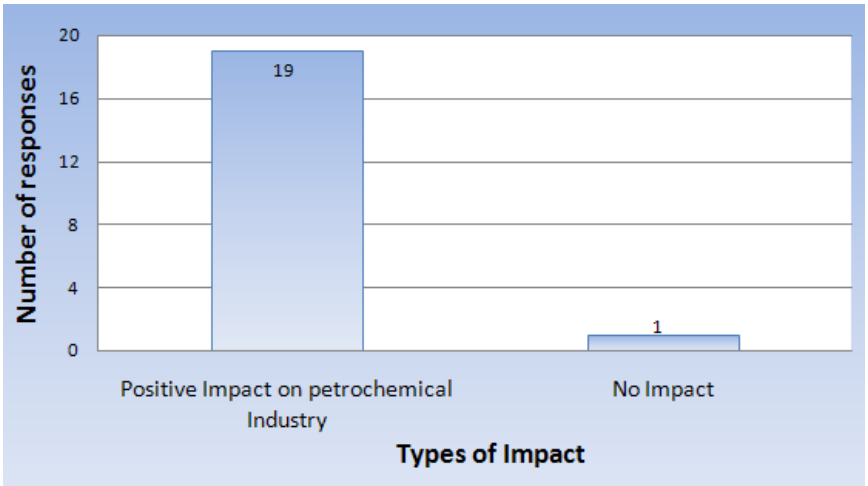
Question 25 has been aimed at finding out possible effects of Chemical Tariff Harmonization agreement on Saudi's petrochemical industry. Focused coding in table 6.55 categorizes the whole set of answers given to question 25 in terms of different impacts identified by the participants.

Table 6.55: **Results of Question 25**

Question 25	**How has the Chemical Tariff Harmonization agreement impacted on petroleum exports at a global level and what consequences it has for Saudi Arabian petrochemical industry?**
Focused Coding	
1	No impact on oil but will positively affect petrochemical industry by increasing the level of competition, and opening up of new markets
2	No impact
Theme	Since the agreement is on petroleum products, there will be no effect on oil, but petrochemical sector is expected to be affected positively by the agreement as it will face new markets and increasing competition which in turn help in the enhancement of the industry.

Reviewing the answers given by the participants, it has been found that most of participants have recognized no impact of the agreement on petroleum but positive impact on petrochemical industry. Figure 6.11 shows that as many as nineteen out of twenty participants have answered in favour of positive impact of the agreement on Saudi's petrochemical industry. However, one participant has denied any kind of positive impact on the industry.

Figure 6.11: **Perception Distribution on the Impact of Chemical Tariff Harmonization Agreement on Saudi's Petrochemical Industry**



Question 26 has been aimed at finding out possible effects of Kyoto Protocol on Saudi's petrochemical industry. Table 6.56 presents the results. It is found that no participant has been able to identify any effect.

Table 6.56: **Results of Question 26**

Question 26	**What effect, if any, will the Kyoto protocol and other global emission reduction strategies have on Saudi's petrochemical industry?***
Focused Coding	
1	No effect
Theme	Seems to have no effect on Saudi's petrochemical industry

* (Kyoto Protocol: Its purpose is to impose obligations on industrialized nations to reduce emissions of greenhouse gases)

6.6. MAJOR CHALLENGES FACING THE PETROCHEMICAL INDUSTRY IN SAUDI ARABIA AND SOLUTIONS:

This subsection comprises of the rest of thirteen questions, from question 27 to 40.

Question 27 has been aimed at finding out the challenges faced by Saudi Arabia in producing natural gas. Focused coding in table 6.57 categorizes the whole set of answers given to question 27 in terms of different challenges identified by the participants. Table 6.57 shows that the participants have identified three major challenges.

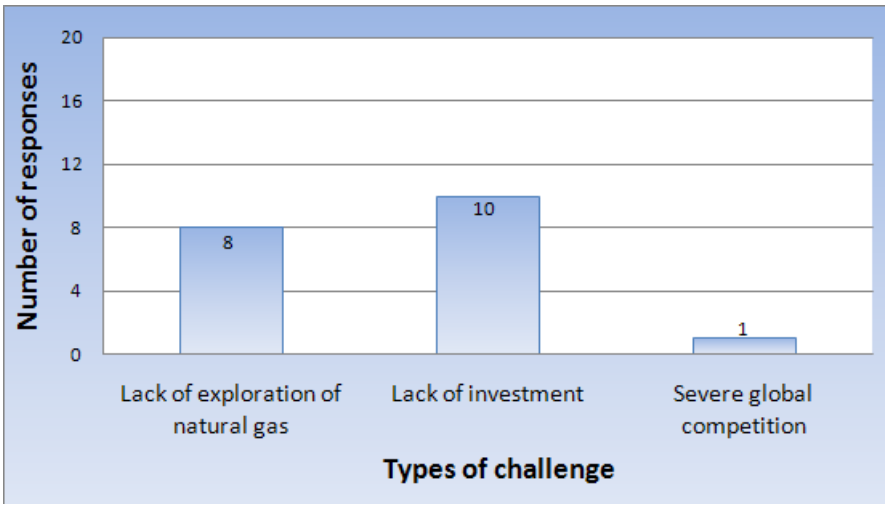
Table 6.57: **Results of Question 27**

Question 27	**What are the challenges faced by Saudi Arabia in producing natural gas?**
Focused Coding	
1	Lack of serious exploration of natural gas by specialized companies
2	Lack of investment in this sector
3	Severe global competition
Theme	Natural gas exploration in Saudi has not been given due importance and therefore there is lack of serious efforts on the part of specialized companies in the area of exploration. Investors are also not very willing to invest in this sector. Sometimes competition at international level also seems to be quite severe.

Figure 6.12 presents the results in terms of bar diagram. From figure 6.12, it is found that eight out of twenty participants think lack of huge exploration of natural gas is a

major challenge faced by Saudi. Ten out of twenty participants consider lack of investment in natural gas sector is a major problem that the Kingdom faces in the production of natural gas. Only one participant thinks that severe global competition poses a serious problem in the production of natural gas in Saudi Arabia.

Figure 6.12: **Perception Distribution on the Challenges Faced by Saudi Arabia in the Production of Natural Gas**



Question 28 intends to find out how economic diversification in Saudi Arabia has affected petroleum industry as well as production of petrochemicals. Table 6.58 presents the results. Each of the twenty participants thinks that diversification has reduced dependence on oil as the only source of income and hence it has negative or no favourable impact on petroleum industry, whereas it has positively impacted the petrochemical sector.

Table 6.58: **Results of Question 28**

Question 28	**How has diversification of the Saudi economy affected its petroleum industry and its production of petrochemicals?**
Focused Coding	
1	Reduction in dependence on oil as the only source of income implying negative or no significant impact on petroleum industry but positive impact on petrochemical industry
Theme	Since oil no longer remain the only source of income, petroleum industry might remain constant or gets reduced, but petrochemical industry would surely gets flourished.

Question 29 aims at finding out whether feedstock availability is a major concern in Saudi Arabia. Table 6.59 presents the results. Each of the twenty participants thinks availability of feed stock as a major concern of the Kingdom.

Table 6.59: **Results of Question 29**

Question 29	**Should availability of feedstock be a major concern to Saudi Arabia?**
Focused Coding	
1	Yes

Question 30 has been aimed at finding out the factors that have made availability of the feedstock as an important factor for Saudi's industry in general and petrochemical industry in specific. Focused coding in table 6.60 categorizes the whole set of answers given to question 30 in terms of different factors identified by the participants. Table 6.60 shows that the participants have identified four major factors.

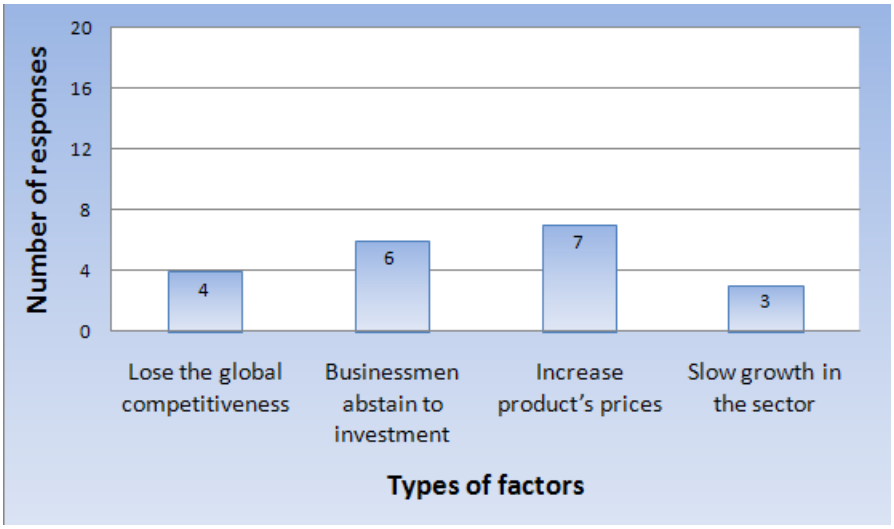
Table 6.60: **Results of Question 30**

Question 30	**If yes, what makes it important?**
Focused Coding	
1	The lack of feedstock will lose the industry sector its opportunity for global competition.
2	Investors abstain from investment in the Kingdom when there is a lack of feedstock.
3	Will Increase product's prices when there is not enough of feedstock
4	Slow growth in the Industry sector when there is few of feedstock available
Theme	The availability of feedstock is a very important for the industry, because the lack of feedstock the sector loss the global competition; businessmen abstain from investment; the products prices will increase and the growth of the industry will Slow down.

Figure 6.13 presents the results of question 30. It can be seen that the lack of feedstock in petrochemical industry will cause four possible difficulties and challenges. Four out of twenty participants think that lose the opportunity of the world competition resulting from lack of availability of feed stock lead to decline in level of competitiveness of the industry which in turn results in loss of market. Six participants have recognized that businessmen will abstain to investment in the sector

when there is a lack of feedstock. Seven participants think that the products prices will increase. While three think that the petrochemical sector will slow its growth.

Figure 6.13: **Perception Distribution on the Factors that Make Raw Materials as an Essential Element for the Success of Petrochemical Industry**



Now, Question 31 has been aimed at finding out whether there is any overcapacity of petrochemical industries in the Middle East. Table 6.61 presents the results and it is found that no participant has recognized any overcapacity of the industry in the Middle East.

Table 6.61: **Results of Question 31**

Question 31	**Is there an overcapacity of petrochemical industries in the Middle East and if yes, what does this portend?**
Focused Coding	
1	No

Question 32 has been aimed at finding out whether Saudi Arabia has required manpower needed by the petrochemical sector which is expanding rapidly. Focused coding in table 6.62 categorizes the whole set of answers given to question 32 in terms of types of responses given to the question.

Table 6.62: Results of Question 32

Question 32	**Does Saudi Arabia have the requisite manpower needed by the rapidly expanding petrochemical industry?**
Focused Coding	
1	Yes in some major areas, given the expansion of the same speed
2	No
Theme	In some areas yes, while in some areas no

Table 6.63 shows that fourteen participants think that Saudi Arabia posses required manpower need for rapidly expanding petrochemical sector.

Table 6.63: Focused Coding Number 1 for Question 32

Participant 1, 5, 13-20	At present, yes, if the expansion of the same speed
Participant 6-9	In some majors yes

Table 6.64 shows that six participants think that Saudi Arabia does not possess required manpower need for rapidly expanding petrochemical sector.

Table 6.64: **Focused Coding Number 2 for Question 32**

Participant 2	Not yet, in terms of training and preparation in present the requisite manpower will not cover the rapid expansion
Participant 3	In some majors yes, and in some not in the required needed.
Participant 4, 10, 11, 12	No.

Question 33 has been aimed at finding out how increasing global demand for oil will affect Saudi's oil industry. Table 6.65 presents the results. It is found that all the participant have agreed on the fact that increasing global demand for oil will help the oil industry to flourish.

Table 6.65: **Results of Question 33**

Question 33	**How is the increasing global demand for oil likely to affect Saudi's oil industry?**
Focused Coding	
1	The industry will flourish
Theme	The oil industry will expand in Saudi Arabia

Question 34 has been aimed at investigating into the factors that could help in promoting global demand for Saudi's petrochemical production. Focused coding in table 6.66 categorizes the whole set of answers given to question 34 in terms of different factors identified by the participants. Table 6.66 shows that the participants have identified two major factors.

Table 6.66: **Results of Question 34**

Question 34	**How the global demand for Saudi petrochemical production can be promoted?**
Focused Coding	
1	Making globally competitive by improving quality, reducing costs, and good marketing
2	Avoiding high production costs and opening up new markets
Theme	Petrochemical production can be promoted by making the industry globally competitive through reduction in high production costs, good marketing and making improvement in quality

Table 6.67 shows that nine participants think that to promote global demand for petrochemical products of Saudi Arabia it is necessary to improve production, reduce production cost and use good marketing strategies.

Table 6.67: **Focused Coding Number 1 for Question 34**

Participants 1-9	Improve production; reduce cost of production and marketing in the world markets

Table 6.68 shows that eleven participants think that to promote global demand for petrochemical products of Saudi Arabia it is necessary to avoid high production cost and to open new markets.

Table 6.68: **Focused Coding Number 2 for Question 34**

Participants 10-20	Avoidance of high production costs, open new markets

Question 35 intends to find out the ingredients necessary for success of the Saudi's petrochemical industry. Focused coding in table 6.69 categorizes the whole set of answers given to question 35 in terms of different ingredients identified by the

participants. Table 6.69 shows that the participants have identified eight major ingredients.

Table 6.69: **Results of Question 35**

Question 35	**What are the ingredients necessary for success in the petrochemicals industry?**
Focused Coding	
1	Raw materials at competitive price
2	Trained manpower
3	Good marketing
4	Good management
5	Product quality
6	Low production cost
7	Investors
8	Opening up of market for different types of products
Theme	Availability of raw materials at competitive prices, trained work force, good marketing power, good managerial efficiency, product quality, low cost of production, adequate number of investors and opening up of market for different types of products produced in the industry are some essential factors for achieving success in the petrochemical industry.

Table 6.70 provides some ideas regarding the extent of acceptability of each ingredient. Seventeen participants think availability of raw materials at competitive price as a main ingredient, as high as eighteen participants consider trained manpower as essential for success, six participants place their stress on good marketing and good management, five participants considers product quality as very important, six participants put their stress on low production cost, as high as eleven participants consider high investment as essential, while one participant thinks that opening up of new market to different products is also important for the success.

Table 6.70: **Extents of Responses to Alternative Ingredients of Success of the Petrochemical Sector**

Focused Coding	Ingredients	Number of responses
1	Availability of raw materials at competitive price	17
2	Trained man power	18
3	Good marketing	6
4	Good management	6
5	Product quality	5
6	Low production cost	6
7	Investors	11
8	Opening up of market for different types of products	1

Question 36 has asked the participants to evaluate government role in promoting petrochemical industry of the Kingdom. As we can see in table 6.71 all the participants have found out government's role as very effective and excellent in promoting the industry.

Table 6.71: **Results of Question 36**

Question 36	How would you evaluate the role of government in promoting petrochemical industry and growth in its output?
Focused Coding	
1	Excellent role and effective

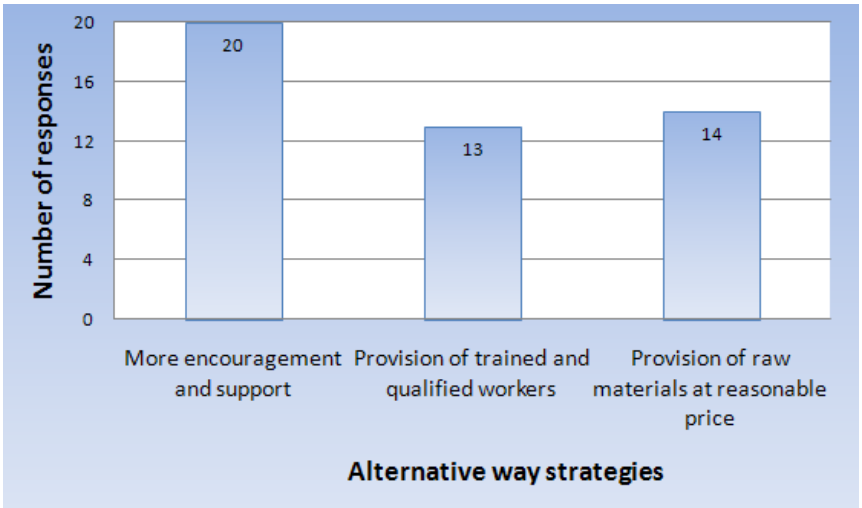
Now question 37 intends to find out effective strategies that government should undertake to enhance production of the petrochemical industry. Focused coding in table 6.72 categorizes the whole set of answers given to question 37 in terms of different strategies identified by the participants. Table 6.72 shows that the participants have identified three potential strategies.

Table 6.72: **Results of Question 37**

Question 37	What should the government do more to enhance production in the sector?
Focused Coding	
1	More encouragement and support to the producers and investors
2	Provision of trained and qualified workers
3	Provision of raw materials at reasonable prices
Theme	Government needs to provide more encouragement and support to the industry along with making good provision of trained manpower and raw materials at good prices for enhancing production capacity of the sector

Figure 6.14 shows that all twenty participants think that more encouragement and support to the investors and producers of the petrochemical industry will be helpful in increasing production. Thirteen among the twenty participants also thinks that making provision of trained and specialized manpower is also quite essential for enhancing production, while fourteen participants consider enough provision of raw materials at reasonable prices as another important strategy for improving production level of the petrochemical industry.

Figure 6.14: **Perception Distribution on the Governmental Strategies to Enhance Production in the Petrochemical Sector of Saudi Arabia**



By question 38 it has been intended to find out whether petrochemical produces in the region and the world pose a serious competition to the petrochemical production of Saudi Arabia. Table 6.73 shows that all the twenty participants have agreed on the fact that Saudi's petrochemical industry face serious competition from the petrochemical producers in the region and the world.

Table 6.73: **Results of Question 38**

Question 38	**Do other petrochemical producers in the region and the world pose a serious competition to Saudi Arabian petrochemical production?**
Focused Coding	
1	Yes
Theme	The Saudi's petrochemical industry faces serious competition from other producers.

Now, by question 39 efforts have been made to find out whether the current structure of the firms in the industry/sector is adequate enough to respond to the global challenges. Table 6.74 shows that while some participants think the current structure as adequate; some others think that it is not sufficient enough to face global challenges, whereas some other participants think that only for some companies it is adequate.

Table 6.74: **Results of Question 39**

Question 39	**Do you think the current structure of the firms in the industry/sector is adequate enough to respond to the global challenges? If yes/or no, why**
Focused Coding	
1	Yes
2	Yes for some companies, no for others
3	No
Theme	The current structure of the firms in petrochemical sector is adequate enough to respond to the global challenges, in some cases not all the firms and in some opinions all the firms are not adequate.

Figure 6.15: **Is the Current Structure of the Firms in the Petrochemical Sector is Adequate Enough to Face Global Challenges?**

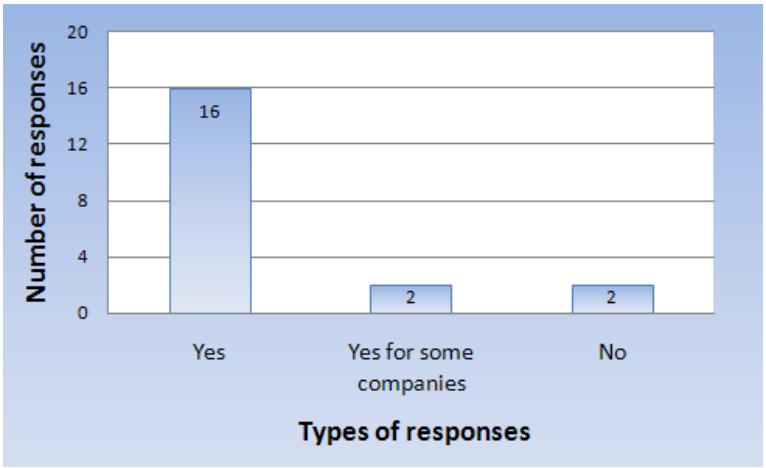


Figure 6.15 shows that while sixteen participants think that the current structure of the firms in the petrochemical industry of Saudi Arabia are adequate enough to face

global challenges, two participants do not consider it to be sufficient enough to meet global challenges. Two other participants, however, think that for some firms the current structure is adequate, while for the others it is not adequate enough for meeting global challenges.

Table 6.75: **Results of Question 40**

Question 40	**Do you think related and supporting industries fulfill their role in supporting the petrochemical industry? If yes/or no, why?**
Focused Coding	
1	Yes
Theme	Related and supporting industries fulfill their role in supporting the petrochemical industry, Because they supply and provide all what the petrochemical industry needs.

Question 40 has asked if the related and supporting industries have fulfilled their role in supporting the petrochemical industry in the Kingdom. As we can see in table 6.75 all the participants have agreed that the related and supporting industries fulfill their role in supporting the petrochemical industry and they agreed that the reason is all what the petrochemical industry needs are provided and supplied by them.

6.7. CONCLUSION

In this chapter we presented the results that we have achieved from the interviews carried out for the research. The questions which were asked to the interviewees has been categorized into five sub-topics, a brief overview of the petrochemical industry of Saudi Arabia; the Petrochemical Industry of Saudi Arabia and its competitive advantage; petrochemical industry in Saudi Arabia and WTO; petrochemical industry, trade related agreements, and environment related agreements; and finally the major challenges facing the petrochemical industry in Saudi Arabia and solutions, all of which are related to the main topic of the research. Next chapter will present secondary data collected from journal articles and other appropriate source to analysis, using Porter model, the competitive advantage of the petrochemical industry after joining the WTO.

Chapter 7

EVALUATION OF THE SUSTAINABILITY OF THE COMPETITIVE ADVANTAGE OF SAUDI ARABIA'S PETROCHEMICAL INDUSTRY AFTER JOINING WTO

7.1. INTRODUCTION

The Kingdom of Saudi Arabia is not only the largest country in the Middle East region, but it also accounts for the highest share of GDP of this region (Jasimuddin, 2001). The Kingdom, however, lagged behind other nations at the very beginning of twenty first century in terms of the pace of global integration. Throughout the world the speed of globalisation has started to intensify since the last decade of the twentieth century. In order to become an active participant in the process of globalisation, the Kingdom decided to become a member of WTO, which was granted in 2005. After Joining WTO the Kingdom has obtained higher access to international markets. The WTO membership has, however, also placed the Saudi economy in fierce economic competition in the international market as the Saudi industries are now exposed to widespread competition from other countries.

As demonstrated in the previous chapters, Saudi Arabia petrochemical industry is one of the major contributors to its GDP. The petrochemical industry, which is based on the rich oil and natural gas resources of the country, has become exposed to higher level of competition from the petrochemical products produced by other nations. WTO asks for establishing free trade regime and hence it has made it mandatory for its member states to reduce and progressively eliminate all sorts of trade barriers. After becoming a member to WTO and to take part in the process of globalisation, while in one hand Saudi Arabia is not getting much easier access to the petrochemical market of other nations which earlier put barriers in the way of entering to their markets, Saudi's own petrochemical market is becoming increasingly open to the international players which poses a great thereat of loosing domestic market share to international market players for the petrochemical industry of Saudi Arabia. Under such fierce competition the country is required to properly use its competitive

advantages in order to remain highly competitive (Al-sahlawi, 2000). This chapter aims at analysing the competitive advantages of Saudi's petrochemical industry after accessing WTO membership using the theoretical framework of competitive advantages of a nation in the area of a certain industry proposed by Porter.

For the convenience of the analysis, however, it is first required to look at the performance of the petrochemical industry before and after the WTO accession. This will help in examining whether the industry has been able to improve its performance in post WTO regime. If the petrochemical industry is found to have enhanced its performance in post WTO accession regime, it would indicate that the industry is facing some competitive advantages over other countries that have helped the petrochemical industry of Saudi Arabia in sustaining its competitiveness. The Kingdom has joined WTO in 2005 with a hope that accession to WTO would enhance the economic performance of the country. Since petrochemical industry is one of the most crucial sectors of the Saudian economy, it was also expected that by utilizing the competitive advantages of it, Saudi's petrochemical industry would be able to improve its performance rapidly after WTO accession. Looking at the trend of petrochemical sector's performance, it would be possible to find out whether the Kingdom has been successful in extracting benefits of WTO membership with respect to the improvement of its petrochemical sector. After analysing this trend, this chapter provides a precise discussion on the terms and conditions of WTO accession that the Kingdom has to comply with. This will help in analysing potential opportunities and threats to Saudi economy from the accession to WTO membership. Finally this chapter will conduct a rigorous analysis of competitive advantages using Porters Model. However, before implementing Porters approach in discussing competitive advantages of the petrochemical industry of Saudi Arabia, this chapter provides a brief discussion on the theoretical framework of the model, as it will enhance understanding over the applicability of this model for the current purpose of the analysis.

7.2. MEASURES UNDERTAKEN BY SAUDI ARABIA TO MEET TERMS AND CONDITIONS OF WTO COMMITMENT

In order to obtain the WTO membership, a country requires liberalizing its economy. Hence, in the course of obtaining the WTO accession, the Kingdom of Saudi Arabia liberalized its economy by a large extent. Along with opening up its market to foreign players, the country also undertook a restructuring program of its legal system in order to make the process of economic integration smooth and hassle-free. By entering into the new millennium when most of the developed countries and a large number of developing countries were actively participating in the process of building more open and more balanced economy by increasing entering into free trade regime through various multilateral, bilateral or pluri-lateral trade agreements, Saudi Arabia have also realized the importance of the process of economic liberalization in the process of enhancing economic growth. In an era when most of the countries across the world are engaged in integrating their economies, it becomes very difficult for nations to remain in isolation by barring other countries from entering into its own market. Saudi Arabia has well understood the importance of increasing foreign participation in its economy and its implications on the stability of its economy (Rosenthal, 2006).

All economic and legal structural reform measures that Saudi Arabia undertook during the course of its WTO accession were all aimed at diversifying and privatise its economy (Samba, 2006). To obtain the WTO accession, Saudi Arabia has committed to meet a number of terms and conditions. The measures that Saudi Arabia has undertaken in order to meet these terms are necessary to be looked at for the purpose of assessing competitive advantages of the petrochemical sector of the country after the WTO accession. It could be that some of these measures have been able to create some conditions for the petrochemical industry that have put this industry in a comparatively advantageous position compared to the other countries. Some of the important measures that Saudi Arabia has undertaken in order to meet the terms and conditions that Saudi Arabia has committed to meet after becoming a member of the WTO are as follows:

7.2.1. Enhanced Transparency of the Legal System

In order to smoothing the process of foreign entities' entry into the domestic market of Saudi Arabia, the Kingdom has undertaken a number of measures. Indeed, the country has gone beyond the requirements of the WTO. For example, apart from meeting the WTO requirements, the Kingdom has undertaken some effort to publicize laws, regulatory aspects along with several judicial and administrative decisions regarding the issue of opening up of the country to foreign entities in an official gazette before all these come into force. It would help domestic industries to make required adjustments before these administrative or judicial decisions or laws or regulations start taking their effect. The government posts all measures on a government controlled website in order to maximize public access. The government has also extended the period of taking feedbacks from domestic market players before bringing new measures in practice. As a result domestic players across various industry gets more time to express their grievances over those measures which seem to deteriorate their interests which in turn provide the administrative and judicial authority more time in amending those measures accordingly. Adding to these, the Kingdom has simplified several regulatory regimes (Rosenthal, 2006).

7.2.2. Establishing Rule of Law

The Saudi government has committed to establish the rule of law by renewing its commitment towards enforcing intellectual property rights along with undertaking various cross-sectoral initiatives. These reforms simply indicate towards a fundamental shift within the Kingdom, which is expected to facilitate the operations of the industries (Abdulfattah, 2009).

7.2.3. Establishing Trading and Distribution Rights

By entering into the WTO, the Kingdom has committed to provide foreign entities in its domestic market trading and distribution rights which allow foreign entities in commercially registering them with the Ministry of Commerce and Industry of the Kingdom. This move is expected to attract more foreign players to enter into Saudi market (Al-Alamy, 2006).

7.2.4. Reduced Restrictions on Foreign Investment (FDI)

Earlier foreign entities had to overcome a number of barriers in order to make investments in various projects in the Kingdom. However, after becoming a member of the WTO, Saudi Arabia has significantly relaxed various restrictions on foreign investments (New Nations, n.d.). Under this new setting, foreign players no longer need to form partnership with Saudi firms in order to invest in projects, as foreign investments can take one of these forms- **i**. a joint venture in partnership with a Saudi firm, and **ii.** a fully foreign owned company (Rosenthal, 2006).

7.2.5. Reduction in Tariffs on the Imports of Goods

The Saudi government has significantly reduced tariffs on a huge set of imports. The Kingdom also plans a further staged reduction of tariffs in the future. This measure has helped in liberalizing its economy. For example, the Kingdom has completely eliminated import tariffs on the imports of civil aircraft, information technology etc. Furthermore, the Kingdom is participating in Chemical Harmonization Initiatives and has drastically reduced tariffs on the imports of most of the major chemical products. Thus, the Kingdom can now imports petrochemical products at a reduced tariff rate. This has in turn put the domestic petrochemical industry in competition with foreign firms that produce the same products (Al-Si'ari, 2005).

7.3. PERFORMANCE OF THE PETROCHEMICAL INDUSTRY OF SAUDI ARABIA BEFORE AND AFTER WTO ACCESSION: AN INDICATION FOR THE SUSTAINABILITY OF COMPETITIVE ADVANTAGES

In chapter three, development and trends of the petrochemical industry of Saudi Arabia have already been discussed in detail. Here again a brief look at the performance of the industry pre and post WTO accession is required to be made in order to set the context of the main theme of this chapter. This section will mainly try to find out whether the petrochemical industry of the Kingdom has performed better after its accession to WTO. It will also include some predictions regarding future performances of this industry.

Saudi Arabia is one of the most important and largest petrochemical producers in the world. The petrochemical industry of the Kingdom is one of the most significant

pillars of its economy. This industry has come to its present shape after passing three phases. The first phase is the pre mid-eighties period, which was the establishment period of this industry. During this period the petrochemical industry was completely under government control. The completely government owned company SABIC was the sole producer of petrochemical products during this period. In this phase the Saudi government mainly concentrated on building adequate opportunities for facilitating the growth of this industry in the upcoming period and hence the government paid wider attention on building required infrastructure for the industry (Al-Sa'doun, 2006a).

In phase two, the period of 1983-1999, for the first time the Saudi government undertook the initiatives of deregulating the industry from complete government control. In the year of 1995, the Saudi government opened its upstream petrochemical sector to private investors. However, during this period only domestic investors were allowed easy access to this sector while foreign investors were subjected to a number of restrictions. The first completely private owned petrochemical company was the Saudi Chevron Phillips Co., which was established in 1999 in Al-Jubail (Al-Sa'doun, 2006a; Saudi Arabia, 2007).

Phase three, the period of 2000-2005, was the period that immediately preceded the event of Saudi Arabia accession to WTO. Although the nation has joined the WTO only in 2005, its preparation to become an active participant in the process of intense globalisation started immediately after its entry into the new millennium. Since this period serious initiatives have been undertaken to move towards globalise production. The petrochemical producing firms of the Kingdom stared to acquire foreign firms during this phase (Al-Sa'doun, 2006a; Samba, 2009a).

A very crucial feature worth mentioning here about the development of petrochemical industry of Saudi Arabia is that the petrochemical industry of Saudi Arabia was not developed to respond to a huge increase in the demand for petrochemical products domestically, unlike in any other industrialized nations, instead Saudi Arabia had felt the impetus to develop a full-fledged petrochemical industry as it had and still has huge reserves of natural gas in its possession (GOIC, 2002). This gas is the most important source of ethane, which is the most important feedstock of this industry (Al-Ghamdi and Sohail, 2006).

Since the phase 2 of its development, the petrochemical industry has followed a steady growth path. Since 1985 to 2006, the production capacity of the petrochemical industry had increased by around ten times. In 2006, the production capacity was stood at the level of 36 million tones/ year (Al-Sa'doun, 2006a). After the WTO accession, it is also being expected that the growth pattern will not get halt in the post WTO accession era. Although the petrochemical industry of the country is now exposed to fierce competition from foreign companies where it is not only competing in the market outside the country for obtaining higher market share, but also facing huge competition from foreign entities in the domestic market, it is still being expected that the production capacity of the country would reach to a level as high as 70 million tons per year by 2010. Growth at such a high level could not be obtained unless the industry enjoys some competitive advantages in the post WTO regime (Al-Sa'doun, 2006b).

In chapter 3, some challenges that the industry is facing and is expected to face in near future have been discussed. In spite of these, the industry is still now maintaining its growth momentum. Thus in the post WTO accession regime the petrochemical industry is being expected to a positive, and even exponential growth trend countering all these challenges. Given these it would be quite interesting to analyse the competitive advantages that the petrochemical industry of the Kingdom of Saudi Arabia is enjoying in the deregulated post WTO accession regime (Rosenthal, 2006).

Very often, competitive advantages of a country in certain fields are analysed by employing some theoretical model. One of the most widely used models in analysing competitive advantage of certain industry or sector of a particular nation is Porters Model. Therefore, this chapter will attempt to analyse the competitive advantages of the petrochemical industry of the Kingdom by employing Porter's model. However, before directly moving on to the analysis of competitive advantages of the petrochemical industry of the Kingdom, it is necessary to present the theoretical framework of the Porter's model in detail in order to enhance understanding of this approach so that when this model is applied, in order to analyse the competitive advantages of the Saudi's petrochemical industry, the analysis becomes easier to understand.

7.4. COMPETITIVE ADVANTAGES OF THE PETROCHEMICAL INDUSTRY OF SAUDI ARABIA: EVALUATING THE MAJOR DETERMINANTS OF THE KINGDOM'S COMPETITIVE ADVANTAGES APPLYING THE THEORETICAL FRAMEWORK OF PORTER'S MODEL

In this era of globalisation, domestic industries are exposed to significant international competition. Once a nation becomes a member of the WTO, which has been advocating for increasing global integration to enhance economic performances of the countries, it becomes mandatory for the nation to eliminate barriers to international trade (WTO, n.d.). A WTO member nation is required to adopt a number of measures for moving to a complete free trade regime. Once the Kingdom got the membership of the WTO, it has to undertake a number of measures, as mentioned earlier in this chapter, to comply with the WTO's rules and regulations. On account of all these measures, the industries of Saudi Arabia including the petrochemical industry have become exposed to fierce international competition where a huge number of firms are competing with each other. In order to sustain under such competitive environment the industry is required to have some competitive advantages. Those industries of a particular nation will flourish in the mid of such wide spread competition for which the nation possesses certain competitive advantages.

Michael Porter has developed a theoretical model, which discusses the factors that account for having competitive advantages in certain sector or industry of a country in the context of international competition. In the year of 1990, Michael Porter, who is commonly known as Management Guru, proposed a theory to explain the issue of why some nations succeed to stand in international competition while other nations just failed in the area of international business. Around two decades have been passed after he introduced the theory, but it still remains an important part of the academic enquiry dealing with the issue of competitive advantage.

His theory is commonly known as the 'Porter Diamond Model of Competitive Advantage'. While in recent times; however the application of Porter Diamond model to international business is slowly losing its relevance, it is still widely used by researchers to examine competitive advantages of a nation in case of a particular industry (Cho and Moon, 2000). This section will discuss the major determinants of

competitive advantages, which were proposed by Porter along with conducting a rigorous analysis of the role of each of these factors in determining competitive advantages of the Kingdom in its petrochemical industry.

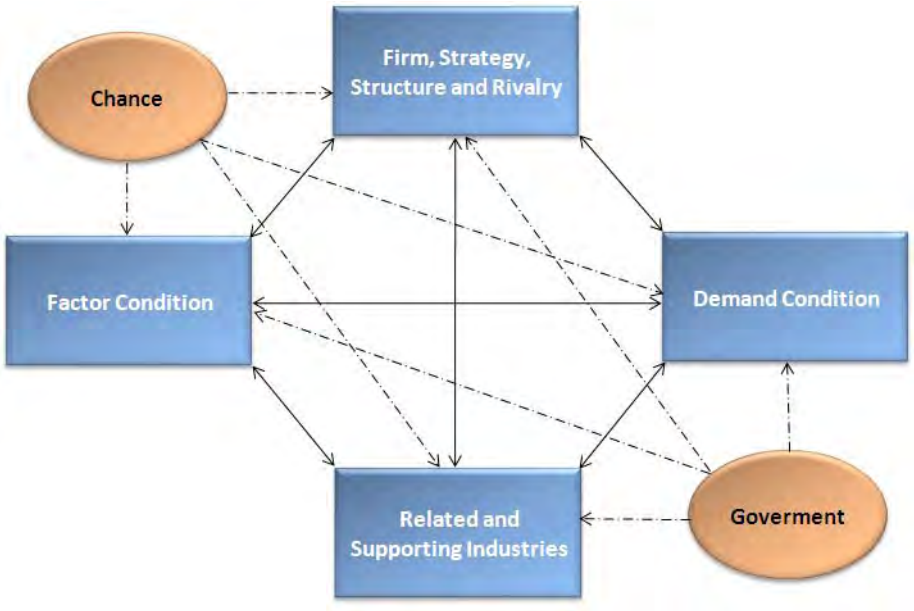
Porter proposed the well-known Diamond Model to assess the level of competitiveness of a nation in the sphere of international business. It is important to note that, the Diamond Model actually represented a quite different paradigm than what were found in the earlier theories. Smith's theory of 'absolute advantage' (1776) or the 'comparative advantage' theory of Ricardo (1817) put their focus on factors of production of each of the nations – land, labour, capital and natural resources. According to Smith, it is the total output that determines a nation's total wealth. Ricardo, on the other hand, argued that instead of productivity of the factors of production, the opportunity cost of the factors determines the advantage that a country enjoys over the other in international business. In 1990, Porter pointed towards a problem regarding the applicability of these two theories in later twentieth century. When the theories of Adam Smith and Ricardo were proposed in eighteenth and nineteenth century, respectively, only low level of skills were necessary to stand in international competition. During those periods, the principal sources of competitive advantage were natural resources and factors of production. The problem with these theories, as detected by Porter, was that the application of these theories in the modern technologically advanced age of late twentieth century seems to give rise to a number of complications. Over the years, technological innovations have taken place in an increasing amount and along with it globalisation has also taken place in the markets. As a result, the earlier theories of competitiveness no longer explain the success of the countries that have inadequate natural resources as well as the poor performance of some nations that have huge amount of natural endowments (Cho and Moon, 2000; Porter, 1998).

According to Porter, productivity is the principal factor of international competitiveness. Porter argues that standard of living of the people of any country can get improved by the increase in productivity. Productivity, in turn, depends on skills of the workers, technological development, production of quality products, and cost reduction. Productivity can be augmented at the national level by upgrading the efficiency level of the industries. Porter argues that a nation should place its focus on

those some of the industries that have the potential to become highly successful, rather than focusing on every industry as for a nation all its industries cannot be highly competitive. To put the interaction of country and industry competitiveness in a theoretical framework, he developed the Diamond Model. In the proposed diamond, Porter has identified four major stages through which a country can gain competitive advantages. According to Porter, a nation's development of competitive advantages in certain industry/industries are factor driven, innovation driven, investment driven and wealth driven (Cho and Moon, 2000; Porter, 1998).

The Diamond Model consists of four factors that determine competitive advantage of an industry in a country. The four factors, as proposed by Porter, are factor conditions, demand conditions, related and supported industry, and firm's strategy, structure and rivalry (Porter, 1998). These four factors are considered to be principal sources of competitive advantage of an industry and can make some industries of a country internationally competitive. It can be said that, in a particular country, some industries have very powerful diamond, whilst other have relatively weak diamonds. Porter introduced a diamond shaped diagram that shows the inter-linkages between the four factors. The diamond model can be shown as follows:

Figure 7.1: **The Determinants of National Advantage**



Source: Porter (1998)

The four determinants of competitive advantage in the area if international business are explained as follows (Cho and Moon, 2000):

7.4.1. Factor Conditions

These are the factors of production as well as infrastructure that are required to efficiently compete in a particular industry. The factor conditions suggested by Porter include the workers' skills, and natural resources. These provide an advantage in the early developmental stage. Porter (1998) talks about two types of factors – basic and advanced. The basic factors are related to natural endowments, cheap abundant labour supply, geographical location, and some others. The country itself creates the advanced factors, like a base of skilled labourers, technologically advanced infrastructure, institutional research and development, etc. It is commonly assumed that the advanced factors provide more sustainable source of competitive advantage than the basic ones (Cho and Moon, 2000; Porter, 1998).

Apart from this most fundamental categorization, the factors can be grouped into five major categories- human resources, knowledge resources, physical resources, capital resources and infrastructure. It is, however, not the case that all these factors are employed in all types of industries in same proportion. A country can gain competitive advantage in a particular industry only if it has access to low price and high quality factors of those categories that are most essential in increasing competitive power of that industry. For example, if an industry is required huge number of skilled man power, then a nation would enjoy competitive advantage in this industry if it has huge pool of skilled human resources that are available at relatively lower costs compared to other countries. Selection and application of appropriate technology has immense capacity to enhance competitive advantage of a nation in a particular industry. If a country has a huge pool of skilled human resource and a particular industry requires a large number of skilled workers, then the nation should direct a significant proportion of its skilled human resource towards this industry other than any other industry, which is not in any such requirement (Cho and Moon, 2000; Porter, 1998).

However while analysing the determinants of competitive advantages in terms of factor conditions for a particular nation with regards to a particular industry, it is very

important to take into account the aspect of factor creation, the hierarchy among the factors relevant towards realizing competitive advantage in the given context, and factor disadvantages as all these concepts are essential in assessing future potential of the industry in having such competitive advantage.

On the basis of the theory explained above, it will now be possible to analyse the factor conditions that have built competitive advantages of petrochemical industry of Saudi Arabia.

7.4.1.1. Favourable factor conditions in Saudi Arabia

The first factor in the proposed Diamond Model that determines a nation's competitive advantages is factor conditions. During the primary survey of this research when the interviewees were asked to identify major sources of success of the petrochemical industry, they identify availability of raw materials at competitive prices, trained work force, good marketing power, good managerial efficiency, product quality, low cost of production, adequate number of investors and opening up of market for different types of products produced in the industry as some essential factors for achieving success in the petrochemical industry.

The government of Saudi Arabia has placed huge attention in the creation of adequate infrastructure for the petrochemical industry. In fact, the entire first phase, the period of pre 1983, of the development of petrochemical industry in Saudi Arabia was devoted to the building of proper infrastructure for the industry. Thus the infrastructural conditions in Saudi Arabia immensely favour in industries growth. It is not that the infrastructural development for the petrochemical industry has been stopped after the first phase. There has been a huge and regular inflow of capital into this industry, which significantly helps, in the rapid growth of the industry (Jasimuddin, 2001). The capital inflow comes from either the foreign direct investment (FDI) or the domestic investment. FDI is a significant factor of capital and economic growth in Saudi Arabia as it provides new ways of technologies, variable techniques of management, finance and market access for goods' and services' production (Al-Sa'doun, 2006b). The FDI targeting Saudi Arabia in 2007 was $24.3 billion, however, the financial and economic crisis in the following year negatively effected the Kingdom and lead to a 6.5% reduction ($22.5 billion) of FDI inflow. A further reduction is expected by the end of 2009 as a consequence of the global

economic slowdown and its strong effect on foreign corporations, which led to delays in the implementations of several investment projects (FDI inflows to ESCWA region down 6.3 percent, 2009). However, the investment, mainly in the petrochemical sector, which account for around 16 % of total FDI, is expected to reach $70 billion by 2012. This increase in investment will lead to an increase of the Kingdom's total share of the world's production of petrochemical from the current 7% to 13% by 2010 (Al-Sa'doun, 2006b; SAGIA, 2009).

Several measures have been taken by the government that have attracted international investors to Saudi Arabia, specifically to the petrochemical industry. For instance, in addition to being the only country in GCC that allows private investment in petrochemical sector, the Kingdom's accession to WTO, diversifying the economy from oil, introduction of more than 40 laws such as reduction of tax tariffs, reduction of red tape and elimination of price fixation, reduction of time needed to obtain a license, permission to own a land and to hold the majority of stakes in all the economic sectors, except oil and military equipment production industries (Venditti, 2009). Furthermore, these measures are associated with few elements such as the Kingdom's geographical location, cheap feedstock, long-term feedstock supply, diversification of petrochemical derivatives, giant and highly developed industrial infrastructure, presence of large scale coastal and rapidly developing petrochemicals cluster, and strong demand growth from various industries such as automobiles, construction, plastic and appliances (Venditti, 2009; SAGIA, 2009). Table (7-1) provides some information about few current foreign investment projects in the Kingdom's petrochemical sector.

Table 7.1: **FDI in the Saudi Petrochemical Sector**

Name	Foreign investor	Production material	Investment	Production capacity	Location
Saudi Industrial Investment Group+	Chevron Phillips	petrochemicals complex	$4.B billion	-	-
MMC International Holdings and Saudi Binladin Group*	Chalco-Aluminum Corporation of China limited	aluminium smelter	$3 billion	one million tonnes/year	Jizan Economic City
Saudi Aramco and US Dow Chemical Co*+	US Dow Chemical Co	petrochemical complex	$26 billion	-	Ras Tanura
Saudi Aramco and Total*	Total-French	various petrochemical and chemical products	$6.4 billion	- 700,000 tonnes per annum (tpa) of paraxylene, -140,000tpa of benzene -200,000tpa of polymer-grade propylene	Al-Jubail
Sumitomo Chemical - Japan and Saudi Aramco*^	Sumitomo Chemical from Japan	oil-refining and petrochemical complex	$8.5 billion	1.2 mtpa of polyethylene, ethylene glycol and propylene oxide	Rabigh
Shaw Group and YANSAB*	US Shaw Group	butane and aromatic plants	-	-	Yanbu
SIPCHEM with Canadian and French companies*	Canadian and French companies	acetic acid and vinyl acetate	-	-	Al-Jubail

Note: (US Dollar = 3.75 Saudi Rial)

Source: *(Venditti, 2009); +(Gulf industry fair, 2009); ^ (Watkins, 2009)

In addition to the foreign investment in petrochemical, several projects have been generated and supported by domestic players and are summarized in table 7-2.

Table 7.2: Domestic Investment in Petrochemical

Name	Domestic Investor	Production Material	Investment	Production Capacity	Location
Sabic-Ma'aden+	Ma'aden - minerals company	-phosphate venture	$5.6 billion	-	-
Sabic-Ma'aden+	Ma'aden - minerals company	-bauxite	$7 billion	720,000 tonnes of aluminium per year	-(mine) Az Zabirah in the north of the Kingdom -(facility) Aes Az Zour on the east coast
Sabic**	-	30 petrochemical projects	$48.2 billion	-	- (For completion between 2011-2020)
King Abdullah Economic City+	-	aluminium smelter	$5 billion	700,000 tonnes per year.	-
SAFRA^	-	aliphatic and aromatic solvents	-	110,000 tons per annum	Yanbu
the Ras Tanura Integrated Project (RTIP)++	-	various petrochemical and chemical products	SAR 101.25 billion	11 million tonnes per annum	Ras Tanura
integrated petrochemicals facility++	-	-	SAR 33.75 billion	6 million tonnes per annum	Al-Jubail
Petro Rabigh Refinery Upgrade project++	-	-	SAR 37.5 billion	2.4 million metric tonnes	-
SABIC and Sipchem*	-	specialty petrochemical products	$ 3,2 billion (seven plants)	-250,000 tons of methyl metha acrylate -30,000 tons of poly methyl metha acrylate -200,000 tons of acrylonitrile -50,000 tons of polyacrylonitrile -50,000 tons of polyacetyl resins -3,000 tons of carbon fiber -40,000 tons of sodium cyanide annually	Al-Jubail (Expected to be operational by mid 2013.
SABIC	-	specialty	$ 810	-125,000 tons of	Al-Jubail

and Sipchem*		petrochemical products	million (two plants)	poly vinyl acetate -200,000 tons of ethylene vinyl acetate annually	(Expected to be operational by mid 2013.
Saudi Organometallic Chemicals Company (SOCC) +	Ibn Hayyan Plastic and Albemarle Corporation Products Company (TAYF)	tri-ethyl aluminum catalyst	$ 80 million	6,000 metric tons of tri-ethyl aluminum equivalents annually	Al-Jubail (Expected to be operational by early 2012)

Note: (US Dollar = 3.75 Saudi Rial)

Source:** (Gulf industry fair, 2009); +(SABIC, 2009); *(Tunnicliffe, 2009); ^(Venditti, 2009); ++(Zawaya, 2009)

Since the Saudi government allows to move foreign exchange rate smoothly, capitals are free to move in and out. Apart from this, the tax factor is quite in favour of the producer of the industry. A very interesting feature of the tax system of Saudi Arabia is that the Saudi government does not collect any income taxes and it provides an impressive ten years long tax holidays to manufacturing projects which significantly reduce production and operation costs of the petrochemical industry of the country. It proved a huge cost advantage to the petrochemical sector of Saudi Arabia over other nations, which do not provide such tax incentives to their producers. Not only that, but the firms producing petrochemical products can import raw materials under the new WTO regime without paying any duty which has contributed further to the reduction of costs that these firms have to incur (Jasimuddin, 2001).

It has been found that after entering into the phase 2 of the development the Saudi government has been taking important initiatives to privatise the petrochemical industry by allowing easy entry of private ventures into this industry (Al-Sa'doun, 2006a; Al-Sa'doun, 2006b). The point worth mentioning here is that along with making the path of private entry to this industry easier, the government has also adopted some strategies that would provide some protection to these private entities (Al-Sa'doun, 2006a; Al-Sa'doun, 2006b; Jasimuddin, 2001)

Apart from having favourable infrastructure, capital resources, other basic factors that are important for creating competitive edge include natural endowments, cheap abundant labour supply, geographical location etc. As far as the position of the Saudi

Arabia with respect to these factors are concerned, natural endowments, labour force and geographical conditions are all in favour of providing huge competitive advantages to the nation in respect of the petrochemical industry. As mentioned earlier, the major motivational factor for the Saudi government in establishing the petrochemical industry was its huge source of natural gas, as the country is not only rich in its oil reserves, but it also has a huge reserve of natural gas. The Kingdom's gas reserve is about 263 trillion cubic feet as of January 2009, which gives it the fourth place in the world in terms of gas reserve. Its production in 2008 was 3.0 trillion cubic feet; about 75% of the production is for domestic uses, while the remaining is for export. The Kingdom also produces natural gas liquid (NGL). Its production in 2008 was 402.2 million barrels, 66% of the production is for export, which is 266 million barrels, and the 34% is for domestic uses (OPEC - Annual Statistical Bulletin, 2008; Aramco, 2008, Saudi Ministry of Petroleum and Mineral Resources, 2009).

The feedstock that is essential for producing petrochemical products is ethane and the source of this feedstock is natural gas (GOIC, 2002; Al-Ghamdi and Sohail, 2006). Thus, for having a continuous supply of ethane, Saudi Arabia does not have to rely on other countries. The Kingdom can supply ethane to its petrochemical manufacturers without any discontinuation and at a cheaper price, which in turn significantly reduces production costs. Saudi Arabia has in fact access to cheapest feedstock around the world. As of 2006, it was even below $2/barrel (Clatanoff *et al*., 2006). In 2006, a Saudi petrochemical manufacturer was able to buy required raw materials only at $4.45 including a profit of $2.50 earned by Saudi oil and natural gas producing giant Aramco. The Germans who were one of the major competitors of Saudi Arabia at that time were buying raw materials at as high as $62 per barrel (Clatanoff *et al*., 2006). However in recent times, the availability of feedstock is facing a serious challenge which will be discussed later in this chapter.

Now as far as human resource or labour force is concerned, some macroeconomic factors have to be considered first. It is possible for an industry to have an access to cheap as well as skilled human resources only if the macroeconomic conditions of the country are favourable. Saudi Arabia is counted as one of the wealthiest nation across the globe in terms of per capita income (Jasimuddin, 2001). The country has been on

an impressive growth path particularly since 1990s. The growth process has further been intensified by the turn of new millennium. However, as found in chapter three, after entering into the WTO Saudi Arabia has entered into a new era of development with implementation of a new developmental plan which focuses more on long term growth rather than short term.

Once the country has started to focus more on long-term developmental goals rather than on short term goals, the country has experienced huge increase in the quality of life of the people living in all parts of the country (Samba, 2009a).

All these improvements in the macroeconomic conditions and increase in quality of life along with increase in population which has been rising at the highest rate in the world simply reflects the fact that the country has been able to create an environment in which availability of a large skilled work force becomes higher. It is very much expected that with increase in income, people will be willing to spend additional income in enhancing their quality of life. Development is accompanied with increased investment in education, which significantly helps in generation of skills. Thus Saudi Arabia has been able to create a huge pool of skilled worker. Government has also taken some strategies to enhance workers skill. For example, it has initiated various training programs, which are aimed at augmenting skills of workers. Today availability of skilled human resource is considered to be a very crucial factor of providing competitive edge to the petrochemical sector of the country (Economy and Resources, 2006; Jasimuddin, 2001).

Apart from all these advantages with regards to the factor conditions of Saudi Arabia, another crucial advantage is its location advantage. The Kingdom is situated in the Gulf region which is well connected with western and eastern countries with cheap water routs as well as through roads. All these have contributed to reduction in transaction costs at the time of importing raw materials as well as exporting final products (Economy and Resources, 2006).

Thus, it would not be quite wrong to say in spite of entering into the WTO regime, which represents fierce competition in the international as well as domestic markets, in terms of factors conditions the country has still been enjoying significant competitive advantages in its petrochemical industry. Easy access to raw materials,

capital sources, human resources, geographical positioning along with strong infrastructure have been playing crucial role in building competitive advantages of the petrochemical industry of Saudi Arabia.

7.4.2. Demand Conditions

In Porter's Diamond Model, demand conditions are considered to be another important factor that determines a nation's competitive advantage in the production of certain product. Demand conditions refer to the pressures, which created by buyers' requirements regarding the quality, price, and services that a particular industry provides. These kinds of pressures prepare the industry for international competition in future. For example, if the buyers of petrochemical products in Saudi Arabia place excessive pressures on the petrochemical producers for improving the quality of their products along with their processes and practices, it will enhance the power of competition of the Saudi Arabian petrochemical producers in the international market.

Domestic demand actually significantly helps in shaping up the rate of improvement of characters of the products along with proving great impetus to the producers in implementing various innovative ideas, which are capable of providing completive edge to the domestic producers in international market. Demand in the domestic market is also very important in influencing economies of scale that provide statistical efficiencies to the firms. Thus, the characteristics of home demand, its pattern of growth over time and the process through which the preferences in the domestic market are transmitted to international market are very important in determining a country's competitive advantages in international competition (Porter, 1998).

The characteristics of domestic demand determine how the firms belonging to a particular industry perceive and respond to the needs of buyers. There are actually three characteristics of domestic demand which are important in this respect-segmentation of total demand, presence of sophisticated buyers who look for higher quality and anticipatory needs of buyers. As for the demand size and its growth patterns, sometimes a large domestic demand is considered to be strength as it enhances economies of scale. Some other times, however, it is blamed of squeezing export incentives for the firms (Porter, 1998).

On the basis of the theory explained above, it will now be possible to analyse the demand conditions that have built competitive advantages of petrochemical industry of Saudi Arabia.

7.4.2.1. Favourable demand conditions in Saudi Arabia

Demand conditions, as pointed out by Porter in his Diamond Model, are very important in providing competitive edge to the petrochemical industry of the Kingdom. To sustain under fierce global condition, it is necessary for a country to enhance global demand for its products. Now during the time of primary survey respondents have recognized, as found in chapter six, improvements in the quality of petrochemical products as an important factor in enhancing global demand. Now in order to analyse to what extent the Kingdom has created demand conditions favourable for enhancing quality of products, it is first necessary to look at economic growth of Saudi Arabia in pre and post WTO accession period in order to find out size, growth and pattern of demand for petrochemical products.

It is not that the Kingdom is experiencing economic growth only recently. In fact, the significant increase in oil prices in the middle of the 1970s and again during early 1980s had made significant contribution to the growth in GDP. In 1972, per capita GDP of Saudi Arabia had stood at a level of $1,200 only, while in 1981 it became as large as $16.650 (Jasimuddin, 2001). However, at the end of 1980s GDP growth rate was not as impressive as it was in late 1970s and early 1980s. GDP per capita also fell. However, the country had managed to be on a stable growth path through out 1990s. The rate of inflation was also very low, as it was less than 1 percent throughout the decade of the 90s. Low rate of inflation significantly contributed in bring cost of living down. Decrease in cost of living played a very important role in creating a huge market for various goods and services including petrochemical goods. The Saudi government's success in achieving low cost of living for its citizens was obtained through huge control on the supply of money as well as subsidization of a number of essential products and services. Since 1990s the Saudi government has been trying to stabilize its currency and developing a capital market that is quite sufficient in serving as a major catalyst of the development of crucial industries including the petrochemical industry of the country (Jasimuddin, 2001).

The Kingdom has even been able to follow a steady growth path even after entering into the new millennium. Between mid-2003 and mid-2006, Saudi Arabia's economy grew because of high oil prices, increased oil production and export earnings, and good economic management that were founded on structural reforms, financial diversification, and steady macroeconomic policymaking (EIU, 2007). On the other hand, the country has entered into a new era of development after the implementation of the development plan that was envisaged in 2005. After the implementation of this eight-development plan, the country has experienced remarkable growth in the overall economy. This plan has put more focus on long terms growth rather than on short terms development unlike other development plans undertaken earlier. As for the GDP growth rate, it has been forecasted in 2009 that the GDP of Saudi Arabia will experience a reduction of about 1.2 percent, which occur mostly due to contraction in the oil sector. However it is being expected that increasing amount of government spending and higher level of government subsidy will play a major role in offsetting the impact of oil sector contraction on GDP (Samba, 2009a).

Although the year of 2009 is expected to experience a fall in GDP, it is also forecasted that in the next year, i.e. in 2010 the country's economy will be able to recover its GDP. GDP growth rate is expected to increase to a level of 4.4 percent in 2010 and will continue to rise in the up-coming years also. Most of the rise in GDP will take place on account of increase in the production of oil which is expected to increase gently by 2010 owing to fresh investments in the sector. For the upcoming years, the rate of inflation is expected to hover around an average rate of 3.32 percent. The average rate of inflation for 2009 is expected to be 5.5 percent. However, in 2010 the overall price situations are expected to improve a little bit with an inflation rate of 4.5 percent. As for the countries situation in terms of fiscal deficit, the country will experience a huge deficit of 13 percent of total GDP in 2009 compared to a huge fiscal surplus in 2008 (around 34.1 percent of GDP). The outlook regarding fiscal situation is expected to improve slightly in 2010 as fiscal deficit is expected to decline a little bit and become 11.2 percent of the total GDP. The Kingdom's current account balance shows a deficit of as high as 14.6 percent in 2009 compared to a surplus of 29.2 percent in 2004, while for 2010 a little improvement is being expected with current account being 10.1 percent (Samba, 2009a).

Given this economic situation, it is easy to predict the presence of a huge domestic market. Although recent depression has slightly affected income as well as prices, the two major determinants of demands, in an adverse way, the forecasts are pointing towards a bright future only.

On account of very low rate of inflations, high per capita income level domestic demands for goods and services have been quite large in Saudi Arabia. Thus the petrochemical industry has also been exposed to a vast domestic market as always. Adding to these increases in population has further contributed to the growth in demand. A very interesting fact about Saudi Arabia is that although population is increasing at a very high pace, income per capita has not decreased. Instead, the country has been able to put itself on an increasing path of per capita GDP, except for the year of 2009. Thus domestic demand for petrochemical products has always seen a steady increasing path. Thus one of the two major conditions of demand, size and growth as proposed by Porter, has been met even after accession to WTO.

Along with this huge size and steady growth of domestic demand, a very crucial feature of domestic demand of Saudi Arabia is that people living in Saudi Arabia demand high quality products. This is considered to be one of the strengths of Saudi Arabian market, which provides huge impetus to the petrochemical industry of the country to improve product quality and innovates new ranges of products (Jasimuddin, 2001). The domestic market of the Kingdom, which demands high quality petrochemical products from its domestic producers have created an atmosphere regarding expectations of high quality exports to other countries across the world.

Thus it is found that demand conditions are capable enough of creating competitive advantages of Saudi Arabia in its petrochemical industry.

7.4.3. Related and Supporting Industries

Related and supporting industries is the third important determinant of competitive advantages of nation in a particular sector in Porter's model, which are actually the networks of suppliers and distributors that provide a substantial support to the industry in case of augmenting the international competitiveness. This particularly refers to the case where the supporting network of suppliers and the distributors have

already competed themselves in the international market. For an industry, it is very difficult to compete internationally if it does not have access to strong networks as strong networks help the industry in reducing costs through the process of efficient supply chain management as well as by producing high quality raw materials and other important components that are required for production (Cho and Moon, 2000; Porter, 1998).

An internationally competitive suppliers industry creates important advantages for downstream industries in many ways. For instance, in the present of domestic high quality supplier industry it becomes possible for a firm to efficiently, quickly and sometimes preferentially access the most vital and cost effective inputs. Domestic suppliers are far more preferable than foreign suppliers as information flow required for efficient transactions becomes smooth and open on account of managerial and technical proximity along with similarities in cultural aspects. All these contribute to reduction in transaction costs (Porter, 2008).

On the basis of the theoretical explanation given above, it will now be possible to analyse the favourable conditions with respect to related and supporting industries that have created competitive advantages of petrochemical industry of Saudi Arabia.

7.4.3.1. Favourable conditions regarding related and supporting industries in Saudi Arabia

These are actually the networks of suppliers and distributors, which provide a substantial support to the petrochemical industry in order to enhance their international competitiveness. A strong and cost effective network of related and supporting industries is needed for achieving efficient in production in terms of reducing production costs (Porter, 2008). The most important related industries are oil and gas, which provide the petrochemical industry with the row materials needed. Logistics industry, common berths and jetties, waste treatment facilities and chemical warehouses are considered supporting industries to the petrochemical industry. In addition to that, engineering and finance services industry, equipment and machinery suppliers, marketing and Research and Development (R&D) organizations are also petrochemical supporting industries. When interviewees were asked if the related and supporting industries have fulfilled their role in supporting the petrochemical industry in the Kingdom, it was found that all the participants have agreed that the related and

supporting industries fulfill their role in supporting the petrochemical industry and they agreed that the reason is that all what the petrochemical industry needs are provided and supplied by these related and supporting industries.

Now any industry can enjoy reduced costs through a large network of suppliers of raw materials only if these materials are available at low prices. The price level, on the other hand, is determined by the bargaining power of the suppliers. The industries, which supply raw materials to petrochemical industries, are mainly dominated by a set of large number of firms that are scattered around the world. Furthermore, the cost of moving from one firm to another is also quite low. Thus the petrochemical industry of Saudi Arabia has access to such a network of related and supporting industries that possess low bargaining power. Apart from these petrochemical manufacturers also enjoys huge advantages of having far wider set of strategic options as suppliers from different part of the world are competing against one another in order to enter into the Saudi market. Petrochemical products manufacturing firms are better placed in terms of obtaining reasonable price as well as having greater facilities of obtaining credit. All these have huge potential of reducing costs of production, which provides competitive edge to the industry in the international market of petrochemical products (Al-Ghamdi and Sohail, 2006).

However, one thing worth mentioning here is that, in case of some very critical raw materials such as aluminium alkyls which is used as a catalyse in the production process, suppliers have significant bargaining power on account of the importance of these factors in the process of production. If these raw materials become unavailable, the producers of petrochemical products are even forced to shut down their production. In these cases, Saudi petrochemical producers face higher prices. Apart from these, some suppliers have also been attempting to form an integrated group so that they can achieve higher bargaining power. At present although supplies of essential raw materials are not being discontinued on account of disputes between the petrochemical products manufacturers and suppliers of raw materials with regards to price settlement, the threats from these suppliers has been increasing. If the bargaining powers of the suppliers are not adequately controlled within right time, it might jeopardize production (Al-Ghamdi and Sohail, 2006).

7.4.4. Firm Strategy, Structure and Rivalry

This fourth component of Diamond Model captures the heftiness of the competition in the domestic market. The competitive power of an industry in the domestic market influences the productivity augmentation that is necessary to be able to compete internationally. For instance, in some Latin American Countries, where monopoly practices and close economy exists, it has been found that in these countries the existence of very few competitors in the domestic market undermines the level of competitiveness in the international markets as it reduces the possibility of maintaining high standards and efficient production (Cho and Moon, 2000; Porter, 1998).

Competitive advantages of a nation in a particular industry result from an appropriate match among firm's strategy, it structure and the extent of rivalry it is exposed to. While explaining national competitive advantage, Porter gives stress on the issue of rivalry. According to Porter, rivalry plays a crucial role in firm's innovation and their implementations, which ultimately enhances the prospects of firms' success in the international field. According to Porter, differences among nations in terms of management practices in the areas like the use of decision making tools, functional coordination, labour relationships, attitude towards activities in international market, individual initiative building, leadership orientation and so on. Among all these areas differences in labour management is the most crucial aspect in determining or creating advantages for a particular country in competing with other nations in different kinds of industries (Al-Ghamdi and Sohail, 2006; Porter, 2008).

Porter also put great emphasis on differences in firms' goals. According to Porter, for a nation it would be possible to become successful in those industries where these goals are in line with the sources of competitive advantages (Al-Ghamdi and Sohail, 2006; Porter, 2008).

Finally comes the issue of rivalry, which is very important in the creation of competitive advantages. If a nation is exposed to huge international rivalry in certain industries, then these provider huge impetus to the domestic firms in those industries to improve their product quality and implement innovative ideas in order to obtain competitive edge. Rivalry in the domestic market is also equally important in creating competitive advantage for a nation. Rivalry in domestic market prompts each firm to

reduce costs along with improving product quality and creating new ranges of products (Al-Ghamdi and Sohail, 2006).

On the basis of the theoretical explanation given above, it will now be possible to analyse the favourable conditions regarding firm's strategy and rivalry that have helped in creating competitive advantages of petrochemical industry of Saudi Arabia.

7.4.4.1. Favourable firm's strategy and rivalry in Saudi Arabia

Porter has stressed on the fact that the more efficient the management practices within an industry in a particular country in strategy making, the more efficient the country would be in attaining competitive advantages over other nations in that industry. Saudi Arabia enjoys significant advantages in terms of management of labour relations, as labourers are not allowed to form any trade unions unlike in many other countries. Furthermore, trade unions do not enjoy any legal status and there is no minimum wage. The Kingdom has never faced any labour unrest as there is no such trade union. Apart from having no legal status, labour unionism is also nonexistent in Saudi Arabia on account of the fact that around eighty percent of labourers in the Kingdom of are actually non-Saudis. This kind of unique labour management system has played a very crucial role in preventing strikes in Saudi industries along with its petrochemical sector. Thus, with the absence of any labour unions, the petrochemical industry is not faced with any pressure for increasing wage rate. This kind of labour relations in Saudi Arabia has played a very important role in making the petrochemical products manufacturing companies more competitive in the international market (Jaismuddin, 2001).

Petrochemical products are now exposed to huge competition in the international market which occurs due to globalisation. For instance, Saudi petrochemical organizations encounter a strong competition from different chemical companies such as Exxon, Shell and BASF.

The market for petrochemical products in Asia is very huge. The extent of rivalry is such strong that basic petrochemical products' prices have reduced sharply. It now expected that the slow rate of growth and increasing competition would lead to a price war among the rivals. Under such intense competition it is quite expected that the petrochemicals producers of the Kingdom, which holds a significant market share

internationally, will put its effort to enhance the quality of its products so that it can sustain its position (Al-Ghamdi and Sohail, 2006).

Apart from increasing rivalry in international market, rivalry in domestic market has also been increasing at a rapid pace in the petrochemical industry of the Kingdom. Under the wave of privatisation and accession to WTO, more and more firms, including foreign firms, are entering into the domestic markets. In the presence of this intense competition, the Saudi companies also feel the charge of increasing the quality of their products along with implementing more innovative ideas to introduce wider varieties. All these are expected to provide a competitive edge to Saudi's petrochemical industry in the global market (Al-Ghamdi and Sohail, 2006). For instance, the number of firms and unites, in Saudi Arabia, working and producing petrochemical materials and products at the end of 2008 were 422 unite and 473 firms and unites in plastics, with 91150 workers (Saudi Arabian Monetary Agency, Annual Report Forty Fifth, 2009).

Apart from the above four factor, there also exist two other factors in the Diamond Model. These two factors are the role of chance and the role of government. These two factors can be described as follows.

7.4.5. The Role of Chance

It basically refers to the likelihood that several events external to the domestic economy, like wars or natural disasters, influences a nation or an industry. But the important thing here is that all these events are completely out of control of the government, the nations or the management of the industry. For example, increased level of border security in U.S. after the 9/11 attack of the terrorists on World Trade Centre has produced a huge impact on the export of other countries, especially Mexico's, to U.S. (Cho and Moon, 2000; Porter, 1998).

According to Porter, major chance events that can influence competitive advantages of a nation in some particular industry/industries include pure innovative acts, discontinuation in major technology, discontinuation in the costs of essential input, important changes in international financial market or market for exchange rates, sudden increase in international or regional demand, several political decision undertaken by the governments of foreign countries at different point of time, and

wars. All these events are very effective in influencing competitive position of a nation with regards to an industry/industries. However, it depends on the attributes of a nation whether these chance factors would deteriorate competitive advantages or increase competitive edge. Porter's opinion was that the nations, which are placed with a very strong diamond position, will be more efficient in converting these chance events into their competitive advantages (Porter, 1998).

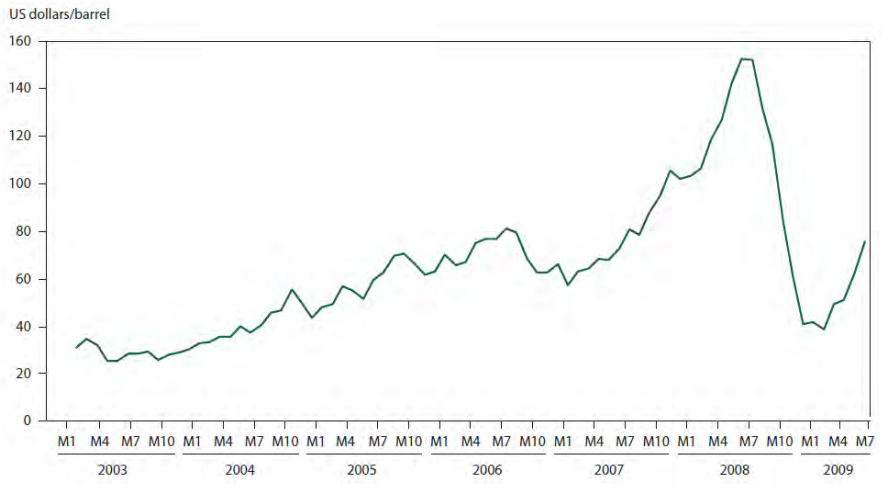
However, in recent times, particularly after WTO accession, no such important chance factor has arisen which could help Saudi Arabia in creating competitive advantages in its petrochemical sector. However, the country was able to convert some chance factors into its advantages in past. For example, during the oil crisis in the mid 1970s, when oil prices increased rapidly and became very high, as a major producer of petroleum Saudi Arabia took advantage of this situation and the petroleum sector of the country had made huge profit and the economy, as a whole, had experienced a huge increase in its per capita GDP. The oil crisis had made Saudi Arabia as one of the strongest economy in the Middle East. During this period, the country for the first time felt the impetus to invest more money in other sectors and petrochemical sector started to emerge as one of the vital economic sectors of the country (Yizraeli, 2000). Afterward, the world oil prices started to rise from 2003–04 onwards. It climbed very quickly from US$92 a barrel in January 2008 to more than the $140 a barrel mark in June. On July 11, 2008, it surged to a new high of US$147 a barrel. It then collapsed to less than $40 a barrel in December 2008. It again started to rise. The oil prices begin to mount in 2009 from a low position of about US$40 a barrel in January to around US$70 a barrel in July (Figure 7-2). There are several hypotheses around this behavior, but most of the theorists go with the "peak oil" explanation. This explanation is based on M. King Hubbert theories of "Hubbert's Peak" fame. His supporters, mainly Colin Campbell and Matthew Simmons argued that the world has low stock of oil (Khan, 2009).

There are the market fundamentalists, mainly John Lipsky, the first deputy managing director of the International Monetary Fund (IMF) and Philip Verleger, a well-known oil expert, who argue that the price rise occur in early 2008 might be related to fundamental demand and supply theory. This theory was also supported by US Treasury. This view was further expressed in July 2008 by David McCormick, then

undersecretary for international affairs in US, during a presentation at the Peterson Institute for International Economics (Khan, 2009).

Some others have described it as a temporary instance, which cannot be explained by peak oil theory or market fundamentals. There are many financial market participants as well as the main oil producers who supported this view. There remained surprised with the quick change in oil prices only over a few months. They argue that this unique increase in price in commodity markets between years 2006 and 2008, including specifically the oil market, led to speculation and momentum trading. This, on the other hand, and as determined by fundamentals, has pushed oil prices way outside their long-term equilibrium level (Khan, 2009).

Figure 7.2: **Oil Prices From 2003-2009**



Source: Khan, 2009

7.4.6. The Role of Government

It is generally expected that all the policies and regulations on international business that the policymakers make at all levels of government can sometimes benefit and/or sometimes adversely affect the competency of a country or industry. A government, which adopts the policies of protecting its indigenous firms from foreign firms, does not encourage the domestic firms to increase their productivity level as well as the quality of their products. Consequently, when there is no free market, firms are not able to make them prepared for the challenges that are posed by international competitive environment. On the other hand, the governments, which take steps to reduce protection measures, and try to open up domestic economies to international

businesses, encourage its domestic firm to upgrade its efficiency and quality to stand in international competition. Some times, some governments also make joint ventures with foreign firms. This facilitates technology transfer. For example, in Mexico, NAFTA has supported through a set of policies to boost up the competitiveness of the indigenous firms (Cho and Moon, 2000; Porter, 1998).

On the basis of the theory explanation given above, it will now be possible to analyse the favourable government strategies that have helped in creating competitive advantages of petrochemical industry of Saudi Arabia.

7.4.6.1. The role of government in Saudi Arabia

The government has played a very significant role in enhancing the competitive power of this industry. At the time of primary survey, the interviewees were asked to evaluate government's role in promoting its petrochemical industry. On the basis of their responses to this question, it has been found that all the participants have found out government's role as very effective and excellent in promoting the industry.

The government has undertaken a number of steps in order to make the industry competitive in the global market. Some of the most crucial steps are as follows (Al-Sa'doun, 2006b):

- For achieving competitive edge, one of the most important things to do is implementation of innovative ideas in order to create unique features in the products so that they can attract more customers towards them. The Saudi government has recognized research and development (R&D) as a major source of creating competitiveness. R&D are also important in maintaining an impressive growth in future. In early 1990 SABIC had launched a R&D centre, which is located in Riyadh. After joining the WTO, SABIC has built up four R&D centres in four other countries including India, the Netherlands, Al-Jubail and Houston in order to supplement the activities undergoing at the centre of Riyadh. These R&D centres are aimed at commercialising of various indigenous technologies of Saudi Arabia.

- The Saudi government is speeding up the process of privatisation of the petrochemical industry. Today this industry is largely dominated by a large

numbers of private players including Tasnee, Sipchem, Saudi Chevron, Sahara Petrochemical Co., Lujian Industrial Co., Kayan Petrochemical Co etc. The privatisation process aims at developing large scale projects in the Saudi petrochemical industry. The government is making crucial steps in making marketing alliances among the manufacturers in order to increase market share of the industry in the global market along with increasing geographical spread of the industry in order to capture more markets.

- The government has been trying to conduct a downstream expansion of the market. Investments in Saudi's petrochemical sector is mainly concentrated in the upstream portion of the industry as the manufacturers in this segment obtain significant benefits from cheap feedstock which provides huge cost advantages to these producers. These kinds of benefits are however, not being shared with downstream portion of the industry.

- The government of Saudi Arabia attempted to enhance the rate of implementing structural and institutional reforms, which were indispensable to ensure a continuous flow of private investment as well as FDI. It will also help in opening up employment opportunities and enable diversification of the nation's economy (detailed information about FDI was given in section 7.4.1.1)

The interviewees were also asked to suggest some strategies that government should adopt to enhance production in the petrochemical sector of the Kingdom. All of the participants were of the opinion that more encouragement and support to the investors and producers of the petrochemical industry will be helpful in increasing production. Apart from this 65 percent of total participants also think that making provision of trained and specialized manpower is also quite essential for enhancing production, while 70 percent consider enough provision of raw materials at reasonable prices as another important strategy for improving production level of the petrochemical industry. SABIC's production and export by product group from 2000-2007 is provided in table (7-3) as an example of increased production, which occur due to several factors such as the establishment of several new local and international enterprises.

Table 7.3: **SABIC's Production and Exports, by Product Group: 2000 – 2007 (In thousands of metric tons)**

Years / Product Group	2007	2006	2005	2004	2003	2002	2001	2000
Production								
Basic Chemicals	17835	17650	17360	16528	16173	15845	15404	12523
Metals	4792	3856	3753	3624	3727	3489	3311	2864
Intermiediates	10148	10340	9395	7623	7514	7460	7227	4816
Fertilizer	7514	5922	5418	5226	5297	5259	5357	5115
* Polymers	5816	5600	5441	5262	4798	4608	4148	2661
**SEPC	8540	5754	5299	4596	4793	3958	0	0
Total	54645	49122	46666	42859	42302	40619	35447	27979
Exports								
Basic Chemicals	6597	7414	6900	7833	7210	7315	7349	6484
Metals	443	566	445	428	783	480	520	498
Intermiediates	3894	5069	3433	3738	3815	3699	3409	2588
Fertilizer	4374	3598	3139	2635	2866	2784	2882	2670
* Polymers	3122	4589	4461	3911	3918	3831	3398	1948
Total	18430	21236	24735	24370	18592	20232	17558	14188
Rate of Exports to Production (%)								
Basic Chemicals	37	42	40	47	45	46	48	52
Metals	9	15	12	12	21	14	16	17
Intermiediates	38	49	37	49	51	50	47	54
Fertilizer	58	61	58	50	54	53	54	52
* Polymers	54	82	82	74	82	83	82	73

Source of data: Saudi Arabian Monetary Agency, Annual Statistic Reports 45, 44, 43 and 42.
* Classification of SABIC Production started at 1998 A.D.
**SEPC: Sabic Europe Petrochemicals

A brief overview of the model that has been explained above is the summary of Porters Diamond Model that talks about national competitive advantages. Here only

Porter's approach has been followed in explaining competitive advantages of Saudi Arabia in its petrochemical industry after its accession to the WTO.

7.5. COMPETITIVE DISADVANTAGES OF SAUDI'S PETROCHEMICAL INDUSTRY IN THE POST WTO ACCESSION REGIME

In the last section of this chapter a number of factors have been discussed using the framework of Porter's Diamond Model. It is, however, not the case that the Kingdom enjoys only competitive advantages in its petrochemical industry. The Kingdom also suffers from certain weaknesses which have immense potential to deteriorate its competitively advanced position in the international market. The factors, which can be considered as competitive disadvantages of Saudi's petrochemical industry, are as follows:

7.5.1. Deficits and Budget and Balance of Payments

Saudi Arabia has been experiencing huge deficit in its budget and balance of payments from 1983. Even after accessing the WTO, it is still suffering from these deficits although over time its extent has been decreasing. After joining the WTO, the country is required to increase its speed of international economic integration. But in order to increase the pace of its global integration, it is essential for the Kingdom to effectively improve its position in terms of budgetary and balance of payment deficit; otherwise it might also adversely affect the prospects of the petrochemical industry (Jasimuddin, 2001).

7.5.2. Financial Constraints

The banking system of the Kingdom is one of the strongest banking systems in the world. It is, however, still facing a great problem as the country lacks a secondary market where banks can resell their assets in order to raise cash to meet increasing demands of the industries including the industry producing petrochemical products. Petrochemical products manufacturing firms are also facing a problem of raising required funds from secondary market as the stock market of the Kingdom is not very well developed (Jasimuddin, 2001).

7.5.3. Skill Shortages

Although Saudi Arabia is investing huge funds to augment the skills of its labourers, the country is lagging behind other countries in terms of having skilled human resources. The workers lack skills mainly in the areas of new sciences that are very important in achieving competitive edge as application of improved technological skills results in production efficiency (Jasimuddin, 2001).

7.5.4. Problems from Regional Cooperation

Regional cooperation off course provided Saudi Arabia huge opportunities in terms of providing large market as well as supplying required materials essential for product development. According to Jasimuddin (2001), the GCC looks forward to achieving four basic freedoms, which include the free of movement of commodities, services, capital and labour or human resource. As the GCC member states integrated economically, greater opportunities for expansion of the industries came into play. However foreign competition may not be ignored. If the transnational companies merged strategically, the competitive structure of Saudi Industries could be vulnerable.

7.5.5. Problems in Feedstock Availability

As mentioned earlier in this chapter, feedstock availability has become one of the prime concerns for Saudi Arabia's petrochemical industry. One important factor that has been proving significant competitive advantages to the Saudi petrochemical industry is the availability of cheap feedstock, which provides the industry with huge cost advantage. But the problem is that, as found in chapter three of this thesis, the growth of the petrochemical industry of the country seems to outpace the ability of the country in producing feedstock. The price of feedstock is also expected to rise in future, as the government owned firm, Aramco, itself, is thinking of increasing its price. Apart from this, other industries are also competing severely for the feedstock of conventional types. Since the feedstock is limited, this increases huge concerns for the petrochemical industry of Saudi Arabia (Al-Mady, 2007).

7.5.6. Increase in Inflationary Pressure

Since long rate of inflation in the Kingdom has been very low. Up to 1998, the rate of inflation was even lower than 1 percent. However, in recent times, particularly after joining WTO, the rate of inflation has been increasing. Higher rate of inflation might deteriorate competitive advantage of Saudi's petrochemical industry as it would drastically reduce its cost advantage (Jasimuddin, 2001).Table 7-4 shows the recent surge of inflationary pressure in Saudi Arabia.

Table 7.4: **Inflation in Saudi Arabia in Recent Times**

Year	Inflation Rate
2001	-1.1
2002	0.2
2003	0.6
2004	0.4
2005	0.6
2006	2.2
2007	4.1
2008	9.9
2009 (average from January to September)	5.8

Source of data: Saudi Arabian Monetary Agency, Inflation Report Third Quarter 2007 and Second Quarter 2009.

Data show that there is a huge change in the rate of inflation during 2001-2009. Inflation rate increased from -1.1% in 2001 to 9.9% in 2008. Saudi Arabia controls internal inflation through a series of price subsidies. The Saudi Arabian government takes policies to control the market prices down for consumers when the prices tend to surge high. For example, in April 2006 the government reduced automobile gas prices by 20 percent. However, this time the riyal is pegged mainly due to the external forces. The US dollar showed its weakness and therefore affecting the cost of the imported goods from US. The cost of living index figures released by Saudi Arabia government departments showed that the price of consumer goods rose by 1.1 percent in 2005. The rate of inflation in the Kingdom increased in 2006, and remained between 1.9 and 2.2 percent. In 2007 the annual rate of inflation in Saudi Arabia increased at a much high level. The rate showed a further increase in 2008 also because of the high oil prices. Increase in oil prices keep on increasing import prices

and strong domestic demand. Inflation averaged 4.1 percent in 2007 and rises to 9.9 percent in 2008. Inflation is soaring despite a several measures undertaken by the government. Apart from the weaknesses of US dollar, there are also other factors that are responsible for the increase in rate of inflation. There are shortages in housing supply, increased domestic demand, rise in liquidity and high import prices. The Saudi Arabian Monetary Agency also shows that the inflation rate in Saudi Arabia is affected by its own trading partners (Saudi Arabian Monetary Agency, Inflation Report Third Quarter 2007 and Second Quarter 2009).

According to Saudi Arabian Monetary Agency (SAMA) (2009), the Saudi Arabia imports from the US, which is considered the largest commercial partner of Saudi Arabia, increased by around 171.1 percent in 2008 as compared to that in 2000. The imports from US amounted to SR59.1 billion in 2008 from SR21.8billion in 2000 (US$ = 3.75 SR). Also the US share in Saudi Arabia's total imports shrinks to 13.7 percent in 2008 compared to 19.3 percent in 2000. This happens because of increase in inflation in the US to 3.8 percent in 2008 from 3.4 percent in 2000. On the other hand, the imports from the Euro-zone increased to SR89.5 billion in 2008 from SR26.8 billion in 2000, though the share slightly declined to 20.7 percent from 23.7 percent. On the contrary, the rate of inflation increased to 3.3 percent from 2.2 percent. The inflation problem in Saudi Arabia became more pronounced with the increase in imports from China during this period. The share of imports from China has increased from 4 percent in 2000 to 11 percent in 2008. As the inflation rate in China has risen from 0.4 percent to 5.8 percent in the same period, this affected the rise in Saudi Arabian inflation a lot. Share of the imports from India has also risen from 2.8 to 4.2 percent in the period after the rate of inflation in India increased from 4 percent to 8.3 percent. The share of imports from Japan, which was -0.8 percent inflation in 2000, has increased to 1.4 percent in 2008 (Saudi Arabian Monetary Agency, Inflation Report Third Quarter 2007 and Second Quarter 2009).

The high rate of inflation impels the government to take several control policies, and that to minimize the bottlenecks in area such as housing market as they try to encourage more competition and decrease administrative fees, however there was no extend on price controls. The reforms have to confront several factors such as inflow of expatriate workers, internal migration, increase population’s growth and a

reduction of the average household' size, taken into consideration the limited supply that will manage this growth in the near future (Kawach, 2008).

7.5.7. Overcapacity

Overcapacity is another problem that create competitive disadvantage for the country's prospect in international business of petrochemical products. In the next two or three years there will be a huge rush for the start up of the new facilities in this industrial sector of the Kingdom. The chemical and petrochemical industry of Saudi Arabia has a history of over production. Looking at this type of history some analysts are now predicting that there could be a downturn in the level of production, which will result in nothing but spare capacity of the industry. It could be that the new projects that are being expected to start up their operation between 2010 and 2013 will not operate at their full capacity (Al-Mady, 2007).

7.6. CONCLUSION

This chapter of the thesis has adopted Porter's approach to analyse competitive advantages of the petrochemical industry of Saudi Arabia after the WTO accession. In order to study this we have had a look at the development of the petrochemical industry in Saudi Arabia and how the sector was liberalized during phase two when the government encouraged foreign funds. Going by the terms of the WTO, the economy began to privatise and liberalize trade barriers with a view towards making the petroleum sector competitive. The huge oil sector of the country has provided significant competitive advantage to the country in its petrochemical sector after its entrance into the WTO. This chapter also discusses some factors that have immense potential to deteriorate competitive advantage of this industry in future. The analysis has been developed using Porter's Diamond Model of competitive advantage. Certain factors responsible for increasing productivity were identified at this stage using the four determinants of competitive advantage. In terms of skilled human resource and other factors conditions Saudi Arabia surely enjoys an advantage in competitive terms. From the demand side, the nation enjoys competitive advantages owing to the size and growth mainly of its GDP. From the perspective of firm strategy and rivalry, the nation is not staying backward but the main problem is that the petrochemical sector has not enhanced the factors for competitive advantage to any significant level.

Hence, the government should take adequate steps to ensure increased production of feedstock, more investments in skill generating process and R&D, control of overcapacity and reduced financial problems by developing its stock market. Table (7-5) provides summary information about the degree of competitiveness each factor of Porter's Model contributes toward the Saudi petrochemical sector.

Table 7.5: **Porter's Factors and Degree of Competitiveness in Relation to the Saudi Petrochemical Industry**

Condition	Competition grade
Factor Conditions	Strongly competitive
Demand Conditions	Strongly competitive
Related and Supporting Industries	Strongly competitive
Firm Strategy, Structure and Rivalry	Moderately competitive
Role of Chance	Strongly competitive
Role of Government	Strongly competitive

Chapter 8

SWOT ANALYSIS FOR SAUDI ARABIAN PETROCHEMICAL INDUSTRY: CONTEXTUALISING THE RESEARCH FINDINGS

8.1. INTRODUCTION

This chapter presents a SWOT analysis of the present scenario of Saudi Arabia petrochemicals industry with the objective of contextualising the findings of the research in a systematic and integrated manner.

SWOT analysis is the procedure that captures the managerial environment of any industry or business enterprise. In this procedure a SWOT matrix is constructed. The structure of the matrix is comprised of four cells (shown in Table 8.1). In the first row of the matrix, there are two cells. The left one demonstrates the 'strengths' of the industry while the right one shows the 'weaknesses'. Both strengths and weaknesses of the industry are analysed on the basis of the industry's internal resources. In the lower row of the matrix, the left cell shows the 'opportunities' and the right one shows the 'threats' that are before the industry. The opportunities and the threats are studied on the basis of the external factors that are confronted by the industry (SWOT Analysis, 1998).

Table 8.1: SWOT Matrix Structure

	Favourable Effects	**Adverse Effects**
Internal resources	Strengths	Weaknesses
External factors	Opportunities	Threats

Source: Kobayashi, 2007

The SWOT matrix then comes up with several managerial questions related to the future prospects of the industry. Firstly, the strategies should be designed that could increase the strengths of the industry. Secondly, the strategies that can reduce the

weaknesses need to be planned. And lastly, the industry must take policies that could face the threats with the help of the opportunities confronted by the industry. This chapter clearly identifies the strengths, weaknesses, opportunities and threats of the Saudi Arabia petrochemicals industry. The chapter is designed as follows: Section 2 gives the SWOT matrix of the Saudi Arabia petrochemicals industry and explains the strengths, weaknesses, opportunities and threats that are presently faced by the industry. Section 3 analyses the concluding remarks, and also include the future prospects of the industry. The last section gives the thoughtful recommendations for the future improvement of the industry.

8.2. SWOT ANALYSIS OF SAUDI ARABIA PETROCHEMICALS INDUSTRY

Table 8.2 shows the SWOT matrix of Saudi Arabia petrochemical industry. It contains the four factors and the elements discussed for each factor. Full analysis for each factor is provided in the next sections.

Table 8.2: **The SWOT Matrix of Saudi Arabia Petrochemicals Industry**

Strengths	**Weaknesses**
-Large petrochemicals production capacity -Low production cost using abundant natural gas and crude oil -High level security for petrochemicals infrastructure -Favourable economic situation of the country -Favourable relation with the government -Much advanced technology and infrastructure -Efficient and motivated employees	-Dependence on a selling of only petroleum related products -Relatively low downstream capacity -Recent attack at petrochemicals site by terrorists
Opportunities	**Threats**
-Increasing petrochemical demand. -Near about monopoly in natural resources business -High capital inflow -Agreement with WTO	-Price slowdown following global recession -High global competition -Tariff protection from many countries -Increasing demand for petro-products in the domestic market followed by shortage in potential gas supply

Source: Kobayashi, 2007

8.3. STRENGTHS

8.3.1. Large Petrochemicals Production Capacity

During the last thirty years, Saudi Arabia has evolved as a major petrochemical producer and exporter of the world. In global petrochemical production, Saudi Arabia holds a share of approximately 10%., which is expected to be doubled in the coming years. It is expected that the total petrochemical production will reach at a figure of 70 million metric tons by 2010. Saudi Basic Industries Corporation (SABIC) is the largest non-oil industrial company of the Middle East which is located in Saudi Arabia. The industry is also expanding its petrochemical production using natural gas continuously (Al-Sadoun 2006a).

As a major step forward, the future projects of Saudi Arabian petroleum industry include the titan PetroRabigh petrochemical complex. It is a joint undertaking between Saudi Aramco and Japan's Sumitomo Corporation. The production has already started from April 2009. The export commenced in May 2009 and the goods are first exported to China. Several corporations of Japan are getting attracted to the petrochemical industry owing to its low costs. SABIC's Sharq Petrochemical Company is a 50/50 joint undertaking in Al-Jubail with a group of organizations. These organizations are led by the Mitsubishi Corporation (Cousins, 2009).

There has been a significant development, which is about to take shape for Saudi Aramco (largest oil company in the world). The Offshore Projects Division of Saudi Aramco of late celebrated the commencement of fabrication actions for four offshore platforms. This is the first offshore facility of Saudi Arabia and has the feature of setting up of a large number of offshore well podiums and channels. The future strategies of this organization include the STAR facility. It covers around 300,000 square meters land and is equipped enough to fabricate nearly 14,000 metric tons of structural steel per annum. This will directly comprise of about 900 employees, which will result in employment opportunities and new businesses in a domestic framework. According to Abdulaziz I. Fallatah, the Northern Area Projects Department manager, the novel high-tech facility will help to achieve the company's objectives of raising the economy of Saudi Arabia. It has been anticipated that STAR yard will make some of the projects secured and establish facilities for the other Gulf Cooperation Council

(GCC) -based clients and ensure new ventures within the nation. This offshore fabrication facility will raise the regional production capacity and boost demand within the economy (Saudi Aramco News, 2009).

Saudi Aramco Total Refining and Petrochemical Co. (SATORP) entered into a treaty on January 24, 2009 for its intended refinery in Al-Jubail. The refinery is anticipated to commence its production process by the end of 2012. The main aspect of this refinery is that it has ability to process up to 400,000 barrels everyday of the heavy crude of Saudi Arabia (Saudi Aramco, 2009). Recently, Saudi Aramco Total Refining and Petrochemical Company (SATORP) decided the donation plan for Engineering, Procurement and Construction (EPC) agreements. The donation of these agreements provides a solid beginning of the production of 400,000 barrels of oil every day. The high-quality, full-conversion refinery is supposed to be absolutely operational by the second half of 2013 (Saudi Aramco, 2009). After the completion of the refinery, this refinery will be one of the most contemporary refineries across the globe. It has been designed to process Arabian heavy crude products having most severe requirements and to fulfil the increasing demands of these fuels. A segment of the production of Al-Jubail's refinery will be kept aside for meeting the domestic demand. The joint venture of Al-Jubail enables to meet the requirements of both the domestic as well the international clients. It has locational advantage and can supply in an effective and efficient way. According to Khalid Al-Falih, President and CEO of Saudi Aramco, the joint venture with TOTAL has proved to be successful landmark over the years. The company has decided to initiate the refinery project of Al-Jubail with Saudi Aramco. Even in an economic environment, which is characterized by recession, the petroleum industry of Saudi Arabia can think of strategic association between Saudi Aramco and TOTAL, which can achieve far-reaching projects. Both these corporations hope to meet the growing demands of high-quality refined products both domestically and internationally. There has been value addition to the domestic economy through this project. This will bring about generation of employment opportunities for additional downstream investments by the domestic businessmen. It has been approximated that the plant will create direct job opportunities for about 1200 individuals. This, in turn, will generate about five to six indirect employment opportunities by each of the direct job opportunities (Total, 2009; Saudi Aramco, 2009).

8.3.2. Low Production Cost

Apart from its own production capability, the industry enjoys several internal strengths regarding the production, infrastructure and management. The production cost of petrochemicals is lowest in comparison to other oil-producing countries of the world. This is due to the much abundance of the resources of the petrochemical production. Along with the abundant resources, the improved technology and motivated employees used by the industry also helps the production a lot (Al-Na'imi, 1999**).**

As mentioned previously Saudi Arabia has the largest oil reserves in the world. In recent years it has been observed that global oil reserves have increased by 400 billion barrels and Saudi Arabia itself is contributing to one quarter of that total reserve. In relation to this evidence, it has been determined that Saudi Arabia is able to generate one barrel of oil from three barrels of oil production. This abundance of natural resources leads to growing investments in the resources of hydrocarbons and energy by the foreign participators (Al-Na'imi, 1999**).** However, the huge reserve of oil in Saudi Arabia puts it in a critical position towards the requirements of the world to oil, mainly during crises and growing demand for oil, which exhausts the Saudi oil reserves.

Also the oil production cost in Saudi Arabia is quite low compared to that of other oil producing countries around the world. This is because a large fraction of the Saudi Arabian oil grounds are free-flowing from reservoir pressure alone. They do not require any pumping equipments to extract oil from the ground. There is one estimate about the total production cost of Saudi Arabia petrochemicals industry that supposes the Kingdom's total cost of production is less than US$1.5 per barrel. This is inevitably the lowest production cost among all major oil producers in the world, which is US$5 per barrel (Al-Na'imi, 1999**).**

Another advantage that can be stated is the cost related to the augmentation of new reserves. Globally it costs US$4 per barrel to discover a new area whereas in Saudi Arabia it costs around less than ten cents per barrel. For example, Shaybah is a much remote area in Saudi Arabia from where an oil field has been discovered. To approach the oil field from the city, the Government builds a 240-mile road and a 400-mile pipeline to connect the oil field. The field has the potency to produce around 15billion barrels of oil and the cost associated with that is $2.5 billion. Therefore the

development cost incurred with this oil field becomes just US$1.67 per barrel (Al-Na'imi, 1999**)**.

As the case of natural gas, report of 2009 shows that Saudi Arabia has reduced the import of gasoline. The reduction rate is approximated at around 29% and this decision has arrived after Saudi Arabia has successfully managed to increase its capacity. In addition to these it needs to be said that the performance in maintenance work has gone up. At present the country is importing gasoline at a rate of 57000 barrels a day while previously it used to import 80000 barrels a day (Economy Watch, n.d.; Samba, 2009a).

8.3.3. Favourable Economic Situation of Saudi Arabia

One of the most important strength of the industry is the booming economic conditions and the increasing trend in foreign investments. In 2008, the Saudi Arabia's economy has experienced a booming growth in spite of the tricky global economic outlook. Global financial turbulence could not craft any impact on the overall economy of Saudi Arabia. This year the real oil GDP grew by 5.6%. This has also built up the net foreign asset position thereby showing a positive result on current account and fiscal account. Depending on such results the economy became able to come out from the susceptibility of trade shocks and fiscal deficits. The petrochemicals, natural gas and crude oil outputs are continuously showing an increasing trend. The growth in the GDP was 4.4 percent in 2008 compared with 3.4 percent in the previous year. Also the total exports in 2008 have gone up by $289 billion in which oil and petrochemicals exports are contributing around $259 billion, which presents 90 percent of the total exports income. In 2008 the income from the oil exports has risen by 26%. In case of current account surpluses the economy is expected to touch a figure of an all time high of $138 billion. The growth in the economy is due to the booming external position of net foreign assets (Khaleej Times, 2008; Saudi Arabian Monetary Agency, Annual Report Forty Fifth, 2009). The budget of Saudi Arabia got a total of SR450 billion in 2008 ($US=3.75SR) leaving a surplus of SR40 billion, which is much higher surplus than the previous year of 100 percent. The increase in the petroleum and petrochemicals revenues is almost the only contributors of the increment of the budget (Saudi Arabian Monetary Agency, Annual Report Forty Fifth, 2009).

The World Bank has also approved of the strong position of Saudi Arabia in their annual business report. Saudi Arabia has got the 13th rank in the world. The World Bank has also ranked Saudi Arabia ahead of developing nations such as Japan, Germany, France and Switzerland. The main reason for which Saudi Arabia has improved their business is due to the reforms they have undertaken. The reforms have made it easier for foreign companies to start business in the Kingdom due to the reduction of time, cost and complexity. The significant improvement which has been seen in case of Saudi Arabia is due to the vision undertaken by the government. Encouragement has been shown in the established of the Saudi Arabian General Investment Authority "SAGIA" (foreign investment law) which gave confidence to the foreign participators. Achieving membership in the WTO as well as privatising public companies have only yielded benefits for the nation. Economic growth can only be achieved if there is competitiveness. Saudi Arabia has encouraged entrepreneurship and has created new jobs for their people. In addition to the business report of the World Bank another key component has shown the development in the business of Saudi Arabia. "United Nations conference on Trade and Development World Investment Report" have also shown that the foreign direct investment (FDI) have been on the upsurge for Saudi Arabia. During this hour of financial crisis FDI inflows have kept on increasing for the nation. In 2006 the total FDI totalled around $US18.3 billion but the regulatory reforms and improved business conditions have only taken that figure to $US 4 billion in 2007 (Reuters, 2009).

The FDI flows to Saudi Arabia are on the rise. The rise is expected to continue in the following years too (Khaleej Times, 2008). Saudi Arabia is enjoying the role of the top oil and petrochemicals exporter and most importantly the boom is led by the private sectors of the economy. Judicious macroeconomic management coupled with proper use of oil revenues has stimulated the development of the private sector. This has certainly helped the government to reduce the burden of debt. Structural reforms, diversification in the economy and the coming of age of the private sector has all combined to help the economy grow. This has also combated the economy from petrochemical price shocks. Standards and Poor, "the Global Rating Agency" has determined that the foreign reserve of Saudi Arabia was around $220 billion by the year end of 2006. The growth in the foreign reserves is expected to be around 55% from the year 2004 (Saudi Arabia records strongest economic growth in decades,

2006).

8.3.4. Favourable Relation with the Government

The Saudi Arabia petrochemicals industry enjoys favourable supports from the Saudi Arabian government. The government gives an active encouragement to the industry towards its expansion at a faster rate. SABIC has expanded the Yanbu petrochemical facility in 2001 which costs about US$1 billion. This is till now the largest polyethylene plant in the world. It also has permitted a loan for $1.15 billion for the construction of a new petrochemical plant in the eastern industrial city of Al-Jubail. In 2003, Saudi Aramco made a contract to Snamprogetti to construct new units at the site. The programme was completed by the second half of 2004 and produces around 1 million tons of ethylene per year. The site also produces olefins, polyethylene and glycol ethylene (Samba, 2009b).

8.3.5. High Level Security for Petrochemicals Infrastructure

The Saudi Arabian Government spends lots of money on the security of the infrastructure to petrochemicals industry. While details of the Saudi security budget are classified, it is estimated to more than $5.5 billion in 2003 spent on oil-related industries. The 2004 security budget is increased to 50% higher than the previous year, making it by far the highest in the Middle East. Between 2002 and 2004, the Saudi government allocated approximately US$1.2 billion to increase security at all of its energy facilities. There are about 25,000 to 30,000 troops are employed to protect the petroleum and petrochemical infrastructure of the country (Cordesman and Obaid, 2004).

8.4. WEAKNESSES

8.4.1. Heavy Dependence on the Export of Only Petroleum Related Products

The over dependence on the natural resource can proved to be fatal for the Saudi Arabian nation. Oil and petrochemicals are dominant in the Kingdom’s export portfolio as explained previously. The lack of diversification in the country’s revenue sources has resulted in very volatile revenue flows in the past, particularly in the 1980s. The introduction of petro-products futures market has resulted to such

volatility. Too much fluctuation is a cause of concern for the producers, customers and investors (Al-Na'imi,1999**).** The industry is in need of revenue source diversification in order to stabilize its annual income.

However the Saudi government is taking some strategic steps to reduce the heavy dependency on oil and natural gas. Around 30 years ago oil contributed around 60% to the overall GDP of the nation which has dipped now. At present it has fallen to 45%. Government is stressing on other sectors and hoping that the percentage will keep on declining. The government believes that any economy cannot stand on one commodity. The reason is that it believes that the income from this commodity is subject to major fluctuations. An example can be provided in this light which shows that in the recent past the production of oil has increased from 7.5 to 9.5 million barrels per day (MMBD). On the other hand it was seen too that the prices have increased to a record high level of $100 per barrel but less than a decade ago the price was reeling at around $10 per barrel. The Kingdom is hence focusing on the growth and development of the other economic sectors. Reforms and restructuring have been seen in the sectors such as water, electricity, commerce and industry. The Kingdom's economic growth and prosperity have a direct impact on the other countries of this region. The people of other countries are affected by the trade exchange, movements of capital, investment and recruitment of citizens. The Kingdom has a workforce of around 6 million and these people are transferring whopping money of $18 billion. This transferring of money is directly related not only to the financial and economical sides of the nation but it also affect the social side (Saudi Arabia's Petroleum Policy and Its Economy, 2009).

8.4.2. Terrorists Attack at Petrochemicals Sites

Although there are growing efforts to provide security to the petrochemicals sector, some recent incidents of terrorist attacks on the industry give blows to the strength of the sector, converting it to a weakness. In 2002, counter-intelligence inquiry agency has uncovered a sabotage plan at Saudi Aramco's Ras Tanura terminal. On May 2004, four terrorist attacked the ABB Lummus offices in Yanbu, a Saudi petrochemical compound, and killed seven workers, six senior multi-nationals and one Saudi worker. Al Qaeda has announced responsibility for the attack. There is another attack at a residential complex at Khobar that takes place at the end of May following the attack

at Yanbu, killed 22 people including mostly foreigners. Several more foreign workers are killed in the first few weeks of June 2004 (Cordesman and Obaid 2004). Last terrorist attack so far happened in February 2006, in which an attempted suicide bomb targeting Abqaiq petroleum processing facility was prevented by the Saudi security. Such attempt occurred after Al-Qaeda leadership announced a threat to attack the main source of the Kingdom's economy (EIA, 2009).

The Al-Qaeda partisans are not the only threat to the Saudi petrochemicals industry. There is large Shia Muslim population in the Eastern Province of Saudi Arabia who causes political disturbances for the industry. Most of them reside at Al-Ahsa, where most of the petroleum infrastructure is situated. In the early 1980s, riots break up in this group following the recorded messages of the late Ayatollah Al-Khomeini. In 1996, the Saudi Shia terrorists killed nineteen American Air Force officials at the Al-Khobar Towers near Dhahran, which is headquarters of Saudi Aramco. These Saudi Shia terrorists are trained and financed by Iran's Revolutionary Guard. The Shia makes up about 50 percent of the total workforce of Saudi Aramco and around 7.5 percent of the total country population. (Cordesman and Obaid 2004).

The terrorist attacks in Yanbu and Al-Khobar have increased the fear about the helplessness of Saudi Arabia's petrochemical industry. Media has started to point out the growing instability in the Kingdom and its effects on the world energy markets. This is because, with the booming petrochemicals industry, lots of foreign investments are attached with this industry. Any of such attacks may opt for fluctuations in petro prices, resulting in fluctuations in dollar (Cordesman and Obaid 2004).

However, it must be noted that during the attack on Yanbu, the security workers became able to protect the infrastructures of the petrochemical sites very quickly. They are also succeeded in removing the terrorists from the plant compounds (Cordesman and Obaid 2004).

8.5. OPPORTUNITIES

8.5.1. Increasing Petrochemical Demand

The demand for petrochemical products in the world is growing very fast, giving a great opportunity to the Saudi Arabia petrochemicals industry. Along with the very low price elasticity, the growth of the industry is inevitable. The International Energy Agency reports that the world petrochemical demand may have been much higher in this quarter of the century than that in the previous quarter. With this hiking demand, the industry has the opportunity to secure sufficient funds for capital investments. With the support of the growing capital inflows in this sector, the industry has undertaken a number of investment projects. These projects would cover the entire value chain, from exploration to refining and shipbuilding (Cousins, 2009).

Saudi Arabia has several joint ventures with other global players of the petrochemical industry. The global organizations are attracted by the cheap feedstock. There are about 81 petrochemical projects for Saudi Arabia, which are premeditated or are in progress. Out of these 81 projects, 32 of them are about to finish by 2009. Ten of the remaining projects are scheduled to be completed between 2010 and 2013. The rest of them, which are priced above US$40 billion, are still in development stage. These projects will result in top quality production as well as enthusiastic marketing strategies. Thus, markets of Saudi Arabia will witness growth trend provided the current market saturation (Cousins, 2009).

8.5.2. Near Monopoly in Natural Resources

The growth opportunity in the petrochemical sector is also supported by the near about monopoly business of oil and natural gas sectors, which are the major supplements of petrochemicals. A 2000 report shows that several foreign companies would invest around US$100 billion in the Saudi Arabia oil and natural gas industries in the next 20 years. Saudi Aramco will participate in the accomplishment of the projects (Malik, 2000). The International Oil Corporation (IOC) has also made investments in the Saudi Arabia’s energy sector. These investments are also expected to expand the energy sector of the Kingdom and also increase the employment opportunities. It has been reported that the world’s leading exporter, Saudi Arabia will

maintain constant control over the constricted volumes of crude in November 2009. This amount of crude is supplied to the purchasers of Asia. The control over the supply of crude oil would be kept at 5 to 15 percent. As per Mr. Al-Na'imi, the Saudi minister of Petroleum and Mineral Resources, the month of May saw a moderate price of oil at $75 barrel. Thus, he thinks that Organization of the Petroleum Exporting Countries (OPEC) need not alter its production till the next conference in December 2009. The price of the oil has been observed to be floating between $65 and $75 a barrel since August. Saudi Arabia, the largest producer in OPEC, has cut down its supply to Asia since December 2008. It is due to the fact that the Kingdom has entered into an agreement to cut down its supply by 4.2 million barrels per day (bpd) of the oil production. Nearly fifty percent of the crude is exported to Asia from Saudi Arabia. However, the allocations of crude to United States have remained unaltered by the nation (Saudi keeps Nov supply cuts steady to Asia buyers, 2009).

8.5.3. Agreement with WTO

In 2005, Saudi Arabia got included into the World Trade Organization (WTO). This situation gives an important favour especially to the Saudi Arabia petrochemicals industry. The biggest achievement for Saudi Arabia in its negotiations during the WTO admissions process is that it could convince the other member nations to allow the country to maintain its low domestic natural gas price. The Kingdom's current domestic natural gas price of $0.75/MM BTU is the lowest compared to international market prices. This, in effect, provides significant market dominance of the Saudi natural gas-based industries, such as petrochemicals manufacturing. In fear of this Saudi industry-dominance, the European Union strongly resisted Saudi Arabia inclusion into the WTO. They pleaded for the adjustment of the product prices by Saudi Arabia before coming to WTO. The situation was sorted out by the then Crown Prince Abdullah. Inclusion in the WTO leads the country's access to profitable global petrochemical markets, particularly China (Seznec, 2008; Kobayashi 2007).

8.6. THREATS

8.6.1. Price Slowdown Following Global Recession

In spite of growth in the petroleum industry, it has not proved to be unaffected by the global recession. As per the estimate provided by the Central Department of Statistics in Riyadh, the exports earnings from the petrochemical products are about US$664 million in July 2009, reduced from the export earnings in the same month of 2008 (US$920 million). The export earning declined by 27.8 percent and awfully, this downtrend has been continuing till now. In the second quarter of 2009, the sales revenue from the petrochemical industry is around US$1.87 billion. Last year in the same period, it is about US$2.4 billion. This decline is due to the cut in the sales revenue to China or other Asian nations. The recession-driven organizations are compelled to cut their production or even shut down their companies. Following such activities, there has been 60 percent fall in the price of high-density polyethylene (HDPE) in July and November 2008. Similarly, there has been a drop in the price of ethylene by 80 percent. In the first quarter of 2009, Saudi Basic Industries Corporation (SABIC) had recorded around SR 937 million losses. After that the picture has improved due to revival in the Asian market (Cousins, 2009).

The first quarter loss of SABIC in 2009 has changed into US$480 million profit due to increase in the price of HDPE from US$600/ton in January to US$1,000/ton in August. However, this situation appears to be unstable. The trading merchants of US and Europe anticipate the HDPE price to go down by the end of 2009, as there has been excess supply of polyethylene due to opening of more Middle East plants. As announced by Riyadh-based Samba Financial Group (report publisher on the Saudi petrochemicals industry in August), the attitude of the petroleum industry appear to be positive in the long run. The petrochemical sector is estimated to flourish and expected to be the major centre of the worldwide production in the long run (Cousins, 2009).

8.6.2. High Global Competition

There may be threats from China and the Far East, which are presently considered to have captured a big portion of the market share in petrochemicals. They are the potential competitors of Saudi Arabia. In long-term this competition may throw the

Saudi Arabian manufacturers of petrochemicals behind the counterparts of the East Asia. But this threat may be proved unusual as the Saudi Arabia has access to inexpensive feedstock, which is not available to the Far East nations. China, on the other hand, has the advantage of cheap labour. This country is believed to be the main rival of Saudi Arabia in the petrochemical domain with its well-equipped, low-priced and bendable labour market. Recently, the first indication of conflict has come into view between China and Saudi Arabia. Saudi Arabia has been blamed by China for damaging its own emerging petrochemical industry. Saudi Arabia is accused of unloading its subsidized products into the market. The debate aroused due to the utilization of the cheap feedstock, which is less than the global market price. On the other way, the exporters of Saudi Arabia complain that China is making use of the cheap labour and making its currency artificially low. Hence, they are having the advantage in export trade. The exporters of Saudi Arabia, therefore, want to take revenge by imposing their own tariffs on the products of China (Cousins, 2009).

The attacks are not able to stop the production as well as the export made to the other countries. But the problem lies in the psyche of the foreign investors. Any fear and instability will drive them out of the industry. That is why it is very important for the industry and the country as a whole to provide security to the energy and petrochemical industries and to the foreign labourers. In the global petrochemical market, Russia is one of the major for the Saudi Arabian economy in exporting products to the European Union and the Unites States. In 2004, Russia holds the top position in the exporting of natural gas. In addition, they also hold the second largest position in terms of oil exporting. It has been found that Russia's production is on the rising spree and it is asking the EU and the US to reduce over dependence on the oil production of the Middle East. Both the EU and US have responded positively to the calling of Russia and it seems that the over dependence of oil from Middle East may shift. This is an early sign for the Saudi Arabian nation to quickly realize the situation as it may cause them the foreign investment in their sectors of oil and gas **(**Bahgat, 2004).

8.6.3. Tariff Protection from Many Countries

The Arabian petrochemical industry is under major threat due to the new protectionist tariffs imposed by many countries on their products. The low cost production of

petrochemicals in Saudi Arabia supersedes the producers from Asia and Europe. The gulf producers are exporting their petrochemical products at a lower cost than others. The enterprises in overseas market accuse that the GCC enterprises receive government subsidies in account of oil and natural gas. Therefore they are surely at the cost advantage. As a result, these countries are facing severe downturn in their industries. To solve the problem, India and China have already imposed tariffs on the imports from Saudi Arabia and Oman. Europe is also taking similar steps to control the situation. They also included UAE in their list. Saudi Arabia opposes this allegation. While Europe and Asia blames them for dumping their products, they claimed for an investigation in this regard. As a result, an investigation of dumping has been started by European Commission in 2009. China is also conducting another investigation project to find whether the Saudi companies are dumping methanol in the Chinese market (Kobayashi 2007).

In the mean time, the Chinese government imposes a temporary tariff on Saudi exports. The amount of tariff will be refunded if the claim found baseless. India also imposed tariffs on petrochemical imports from Saudi Arabia in this year. Though Saudi Arabia gets access to WTO in 2005 which will suppress the claims against them, they will surely hamper the repute of the industry if the claims are proved (Kobayashi 2007).

8.6.4. Increasing Demand for Petro-products in the Domestic Market Followed by Shortage in Potential Gas Supply

There is a growing concern that the increasing production in the Saudi Arabia petrochemical industry may result in the shortage of oil and natural gas supply. Though there is no imminent warning for the industry right now, the speedy expansion in the petrochemical production may lead to potential gas supply shortage in the country. As the industry has taken up several new projects, their productions are likely upset the already stretched balance of natural gas. The growing petrochemical production may stop the exports of liquefied petroleum gas (LPG) from Saudi Arabia because they will substitute the natural gas used for the petrochemical products of the Kingdom. As Saudi Aramco is the sole supplier of LPG at domestic level, there is a threat to the domestic gas supply also (Kobayashi 2007).

8.7. REFLECTING ON THE RESULTS OF THE SWOT ANALYSIS

Since the discovery of oil fields, Saudi Arabia has become one of the super powers in the world economy. The SWOT analysis of the Saudi Arabia petrochemicals industry shows that there are lots of strengths and few weaknesses in the industry. The strengths of the industry lie in the abundance of petroleum products, which are used as resources in the industry. With the huge stock of resources, the industry achieves the potency to lead the world. Till now, the industry is capable of grabbing about 10% of the world petrochemical production. But the world-wide growing demand for petrochemical products leads to mounting foreign investments in this industry. This also contributes to the country. On the other hand, posing as one of the major industries of the country, it enjoys high quality security assurance from the government. It has great opportunity to grow in the near future and to help more to grow the country's economy. With the recent accession of the country in the World Trade Organization (WTO) in 2005, the industry gets further upliftment in its growth. Lots of new petrochemical projects have been setting up in the Kingdom.

But the overall picture also has some adverse points. The country is too much dependent on the natural resources which may come as a threat to the natural petroleum reserves. There is already a threat in the petrochemical industry of losing its natural raw materials. A shortage of natural gas is feared. Also the world competition in the petrochemical industry is increasing. China is the major rival of the Kingdom. With cheap labour and several favourable policies, the country stands as a prime threat to Saudi Arabia. The domestic riots and increasing terrorist attacks in the recent times also pose major weaknesses to the industry.

The petrochemical production is based on oil and gas derived feedstocks (i.e. naphtha, gas oil, LPG, ethane, aromatic fractions). The steam cracking of these feedstocks is the basis for the petrochemical industry. Increasing quantities of intermediates are recovered from refineries. Saudi Arabia, once an importer of petrochemical products, now became one of the major exporters of it. In 2008, the total petrochemical exports from the Kingdom worth US$14.3 billion. The main importers of the products are the far-east countries. Looking at these prospects the country needs further increase in production and more proper use of resources.

The industry and the Saudi Arabia government are continuously giving efforts to improve the security systems provided to the industry, following the recent attacks on them. The energy sector is spread over huge areas of the nation. Therefore, improvements in the energy and petrochemical infrastructure are much difficult job. The Kingdom's five enormous oil fields are connected by thousands of miles of pipeline. Al-Ghawar, the world's largest field, is 150 miles long and 25 miles wide. The Kingdom has fortified its oil infrastructure security through the use of high tech surveillance systems and the creation of special security units, as well as deployment of members of various guards and security forces.

A special unit has been created under the Ministry of Interior to look after the security at the major petroleum and petrochemical industries. This unit comprises of personnel from the Special Security and Special Emergency Forces. There is also General Security Service which is the domestic intelligence service of the Kingdom. A number of officers from the Public Security Administration, the National Guard, the Navy and the Coast Guard are included in the regular troops. The government also employed the Petroleum Installation Security Force (PISF) to control the total security system of the industries (Cordesman and Obaid, 2004).

The Petroleum Installation Security Force protects the wells and other important equipments within a specific plant. They are often supplemented by the sentinels from the National Guard. The personnel of the Special Emergency Forces and the National Guard usually protect the boundaries of the plants. The officials from Navy and Coast Guard take care of the terminal docks and off-shore oil field areas. The observation and protection from the air are provided by the Air Force. The regular police officers look after the overall protection of the industry. The General Security Service and officials from the Special Security Forces conducts the anti-terrorism squad (Cordesman and Obaid, 2004).

The role played by gas in supporting the local and foreign investments is inevitable. An instance can be cited in relation to these where natural gas feedstock contributed to 19 petrochemical projects. The total investments were in the range of $7 billion. It is expected that the total petrochemical production will be expected to reach at a figure of 70 million metric tons by 2010. The Kingdom also helped the upstream gas to develop for an international investment. This caused the international companies to

explore four areas. The reason behind opening up the upstream was to further expand the petrochemical industry. The natural gas capacity of the Kingdom has also doubled during this era. Projects such as water desalination, industrial feedstock, and electricity generation have only raised the demand for natural gas. The rise is expected to be around 4% per year. The Kingdom is expecting to produce 12-14 BSCFD of gas to meet the demand by 2025 (Thomas *et al.*,2005).

In addition to the benefits provided by the petrochemical industry to the economy the Kingdom will establish petroleum and energy related industries and services. Efforts are also taken to establish energy intensive industries. The main reason behind the creation of such industries is to utilize the various mineral ores that are found in the Kingdom. This builds up a value added industry, which contributes to the overall development of the economy. An example can be cited in relation to this where the construction of a railway will be done to transport the bauxite and phosphate ores from the Kingdom's northern parts to the eastern parts, which will be constricted through open international competitive bidding process. This will also include a new industrial city on the coast of the Arabian Gulf. This will again add value to the economy, as it will become a centre for manufacturing aluminium and fertilizers. This will also make the Kingdom Asia's major producer for these two products. The Kingdom also used its competitive edge in oil and gas to sign an agreement with Japan's "Sumitomo Chemical". This was created to develop the 'Rabigh' refinery. The main aim was to transform this refinery into an international complex for oil refining, producing and exporting petrochemicals to other parts of the world (Saudi Arabia Ministry of Petroleum and mineral resources, 2009).

The Saudi Arabia petrochemical industry is continuing to expand. It has the capability to become one of the leading venues of global production of petrochemicals in the long run. Though there are current financial problems and downturn in global demand for petrochemicals, the industry would be able to overcome these adverse situations. Saudi Arabia has been considered as the epicentre for capital investment across the globe. About $117 billion has been scheduled for investment in the petroleum refining and petrochemical segment. This project is planned for more than the subsequent two years (Reuters, 2009).

The future strategies of the petroleum industry of Saudi Arabia are to limit the current consumption level of the petroleum to eight million barrels per day. Thus, this will help to save the non-renewable resource for the near future. As stated by Ali Al-Na'imi, the nation is expected to continue its production of oil at a constant pace. Recently, the nation seemed to have funded profoundly for the production of oil. This has increased the production of oil up to 14 percent after the advent of the new oil fields. Saudi Arabia is presently producing nearly 12.5 million barrels per day. This increase in production has led to the increase in the prices of the oil. As a result, there has been excess demand for oil leading to supply crunch. Even after the global economic downturn, Mr. Al-Na'imi made commitment that the nation of Saudi Arabia will continue its production up to 4.5 million barrels per day. In spite of the unutilised capacity, he asserted that Saudi Arabia would be putting in more funds into the oil sector. In recent times, the Kingdom has declared an expenditure of nearly $60 billion for the coming five years into the infrastructure of oil and energy. It has been observed that after thirty years, Saudi Arabia has turned from an importer to an exporter of petrochemicals. In 2008, as per World Trade Organization's (WTO) figure, the value of the exports accrued to about $14.3 billion (Coker, 2009).

Table 8.3 provides summary information about the degree of effect each factor of SWOT structure contributes toward the Saudi petrochemical sector.

Table 8.3: **SWOT Factors and Degree of Effects in Relation to the Saudi Petrochemical Industry**

Factor	Degree of Effect
Strength	Highly in favor
Weaknesses	Relative concern
Opportunities	Highly in favor
Threats	Moderate concern

Chapter 9

CONCLUSION: FURTHER REFLECTIONS ON THE FINDINGS AND RECOMMENDATIONS

9.1. INTRODUCTION

The main focus of this research has been to address the impact of WTO membership of the Kingdom of Saudi Arabia on its petrochemical industry. This is important, as the economy of the Kingdom is largely dependent on its petroleum related industries and of course crude oil itself. The aim of this research is, therefore, to analyse whether the competitiveness of the industry is sustainable after its entry into WTO. The economy of Saudi Arabia had to adapt to several changes in order to keep up with the developments in the global scenario over the past few decades.

The research begins with a background study of the Saudi Arabian petrochemical industry and hence the WTO rules and regulation before associating both and analyzing the impact of the rules and policies of WTO on the petrochemical industry of Saudi Arabia. Based on the analysis results, the research also provides some recommendations regarding the steps to be taken by Saudi Arabia in order to maintain its competitive with respect to the petrochemical industry in the global market.

In analysing the impact of the WTO accession, it is important to state that ‘progress without change’ vision has been the main thrust of the Saudi Arabian modernisation. However, due to the WTO accession and other reasons of reform, government had to undergo vast and constructive changes in order to ‘progress without instability’. In order to create a commerce and trade friendly economy, several steps had to be taken by the government and the economy needs to be competitive enough with respect to the policies undertaken. The aim of this study, thus, was to study how the membership of WTO would assist the economy in opening up to the global forces and enhance the competitiveness across all industries. The sensitive stock market captured the expected positive impact as it steadily improved from October 28, 2005 onwards, that is, the day when Saudi Arabia submitted all necessary documents to gain accession to WTO and the membership was approved on 11 November 2005 (Saudi WTO

Membership Approved, 2005). The WTO membership has contributed to this, as it has given confidence to the investors about the future of the economy and the country.

As part of the WTO rules, to which Saudi Arabia is now a party, transparency and predictability would surely develop in positive direction, but this would be accompanied by vulnerability and exposure to global challenges. Experts believe, however, that this decision would be a crucial one in the context of the economic and structural reforms undertaken by Saudi government (Saudi WTO Membership Approved, 2005). In addition, as discussed in Chapter Seven, sharing of information and transfer of technology will assist in the creation of employment and investment opportunities. However, as for the petrochemical industry the economy has strengths as well as weaknesses to be addressed, as discussed in Chapter Eight.

9.2. CONTEXTUALISING THE FINDINGS

The Kingdom of Saudi Arabia, despite having to adopt the rules and regulations of WTO since 2005, had its share of the bargain too, which was secured as a result of being in possession of the largest oil reserves in the world. The nation ranks first as an oil exporter in the global oil exporters league. This position, with respect to petroleum, has provided the nation with an advantageous position with respect to the world economy. Despite the concept of free trade and liberalization being adopted by WTO members, Saudi Arabia has managed to ban imports of certain goods and products among other which include alcohol and pork on the ground of a nonexistent demand for these products in the domestic market. More importantly, Saudi Arabia managed to get concession in other dynamic areas: although the membership would ensure inflow of foreign investment and opening of the economy to multinationals, as discussed in Chapter Two, Saudi Arabia agreed with this in favour of Saudi Arabia, as the special concession protects the Saudi Arabian employment and labour market in an effective way by not giving up the idea of Saudization in the labour market. As presented in Chapter Two, this is done by conditioning a 75 percent Saudization even for the foreign companies or multinationals (Zahid, 2006). Apart from its open approach practices for the past years, the oil price increase prior to the negotiations had also assisted in gaining the membership of WTO with some of its terms remaining intact.

Saudi Arabia is one of the youngest Gulf members of the WTO, but just like a new buyer it has spent enough time studying the policies and facilities of the WTO. This is why it could manage to protect its own local industries by drawing out the preconditions of joining the organization. These on the one hand have helped the nation act on its own terms as well as obtain the trade benefits in other member countries of WTO. Therefore, it could be derived that with its strong position in petroleum industry the nation is unlikely to lose its strong position of membership. The Saudi government did not commit regarding change in pricing of feedstocks and the Chemical Tariff Harmonization Agreement facilitates lowering of global tariff rates imposed on chemicals imports. This includes the list of 64 chemicals exported by the nation. The Saudi Arabian manufacturers of petrochemical will enjoy a cost advantage if the tariff falls globally. The dispute settlement body of WTO may be accessed to challenge the imposition of high tariffs by some nations on petrochemical imports. Although the EU objected to the unfair subsidization of feedstock prices the nation did not require any commitment towards a change in pricing (Bourland *et al*., 2006).

The trends and growth of the petrochemical industry, as analysed in Chapter 3, demonstrates that the country finds it far more profitable to use the petroleum by products to generate domestic revenues rather than exporting petroleum to other nations. The GDP of the nation is dependent to a large extent on petroleum and petrochemicals as is evident in impact of oil price fluctuations on the GDP of the country. Apart from government's strategy of diversification of industries, the firms playing in the petrochemical sector have also grown in number. At the same time the challenge is to keep the flow of the raw input into this industry quite steady and to deal with the threat of decreasing natural reserves. Drilling and exploration continues, therefore, along with ventures of building pipelines to make transportation easier. Another important challenge identified is the extensive use of feedstock in the industry owing to its cheap availability.

The threat is that the growth of feedstock might not keep up with the growth of the industry. If the country wants to obtain the benefits of WTO membership it has to expand its manufacturing industries based on petrochemical products. Major petrochemical companies like SABIC has already looked into these challenges and

have taken wise steps of looking for solutions outside the geographical locations and increasing alternative for feedstock. The overcapacity problem and the plan for initialisation of several petrochemical related businesses in recent years is another challenge that the country has to resolve.

As there has been problem of underutilization of feedstock and inadequate growth of the petrochemical industries, Saudi Arabia has thus decided to export its products to other nations such as, India and China. Saudi Arabia has surfaced as a key investor in Chinese processing plants. In the year 1999, Saudi Arabia's Aramco Overseas Company granted a $750 million investment in a petrochemical complex in Fujian. It was capable of processing approximately 8 million tons of Saudi crude oil per year (Pant, 2006). India has appeared to be Saudi Arabia's 4^{th} largest export destination with about $9.8 billion worth of exports. Oil makes up 94 percent of the Saudi's exports (Khaleej Times, 2006). In 2001, exports of Saudi Arabia amounted to SR8.15 billion and by 2008 exports had attained nearly SR116.25 billion. Over the last 9 years Saudi exports to China have increased by 963 percent (Sfakianakis, 2009). It should be stated that now the nation has directed its products mainly to the non-tariff protected Asian countries of India and China.

As discussed in chapters three and eight, China has already begun a rapid expansion of its petrochemical industry and very soon it might no longer require imports from Saudi Arabia. Therefore the plans for expansion would perhaps become more than needed. This has also been identified as a threat in chapter eight. Another threat is caused by the call by Russia to reduce dependence on the Middle East oil exports, and U.S.A and European Union have been giving positive response in this direction (Bahgat, 2004). Therefore, WTO membership should also be considered with this context in relation to petrochemical industry.

The skill set of manpower is another area which has been identified for improvement as part of the policies to sustain the competitiveness of the petrochemical industry, and this may be achieved through effective training and educational programs. The best way of developing skills is probably through micro-company level, as can be seen in the example set by SABIC through the establishment of its learning centre for education and skill development.

As a result of the analysis presented in this study, finance and construction costs are found to be other issues of concern for the growth of this industry. For instance, during the time of financial crisis several lender organizations and banks have withdrawn from providing finances. Furthermore, availability of good contractors is rare and the cost of construction is high (Al-Mady, 2007). These constraints have been discussed in Chapter Three in details. It was found that firms in the industry developed their policies to overcome such problem areas. For instance, the problem of contractors and financial requirements has been addressed by SABIC to some extent, which has developed its own contractors and used Initial Public Offering (IPO) to raise the finance necessary. As an institutional development in the sector, the Gulf Petrochemicals and Chemical Association (GPCA) has contributed to the position of Middle East in the petrochemical industry quite strong. This association has helped to address the problems of Saudi Arabia related to the petrochemical industry, especially those problems, which are not unique to the nation but affects the entire Middle East (Al-Mady, 2007).

The petrochemical industry, as studied in Chapter Three points out the challenges and also the opportunities for growth. After addressing all the industrial and environmental challenges, the main idea of the petroleum industry is to provide to the world a safe and possible trade opportunity related to this industry, the future of which will be connected to a large extent with the developing or emerging economies like China. With its entry into the WTO, Saudi Arabia will now be bound to cut its tariffs leading to lower prices. Chapter Four, therefore, emphasizes upon the different measures that the country had to take in order to adapt itself with the WTO environment especially with respect to tariff cuts and lowering of prices of petroleum related products. The sustainability of Saudi Arabia's competitive position will thus depend on addressing of the challenges and maintaining its competitiveness with respect to this sector.

As regards to the WTO accession, the question arises is regarding how the nation has already adopted the WTO principles and rules after becoming a member of the organization and how the nation would be able to sustain its membership by adjusting to the WTO's propositions and regulations. A question also arises at this point

regarding whether this accession is likely to bring about a revolution in the country's economy.

The president of the Middle East Council, Freeman, suggests that the Saudis had not been able to obtain its advantage in this industrial sector owing to the European Union's closed nature of market. Using tactful measures the European Union had prevented some producers from entering into the downstream processes, which would otherwise be profitable to carry out. Saudi Arabia's prospects in petrochemicals are foreseen, therefore, in terms of occupying a prominent position as a manufacturer with the help of WTO accession (Clatanoff *et al*., 2006).

To respond to this, from the year 2001, the country therefore strove hard to join the WTO. With the entrance into WTO the nation is in a position to gain the advantage of its natural resources. For instance, in order to produce petrochemicals feedstock required. This might be in the form of natural gas, oil or naphtha from oil. This leads to a cost of $2 per barrel and this is enough reason for them to take over the markets. Around 46 million tons of petrochemicals are produced per year, which has positioned Saudi Arabia as the 7^{th} largest producer of petrochemicals in 2006. The country therefore also enjoys a comparative advantage in this sector. Another positive point is that it is not only SABIC which is doing all the production, but around 10 percent is coming from the private sector as well (Clatanoff *et al*., 2006).

Before entering into more deep issues about the European Union and its dominance in the petrochemical market, one may try to establish the link between China's growth and Saudi's petrochemicals. Saudi sells around $20 billion worth commodities to America each month and in every cent there is a proportional contribution of petrochemicals. However, some parts of the traded package come from the Chinese markets, which support the employment opportunities there. Yet, the important investor of petrochemicals in China is Germany (KPMG, 2005; Clatanoff *et al*., 2006).

Although the government at the ministerial level has planned for Saudi to become the biggest and most prominent petrochemical producer in the world by 2015, a study of the current situation depicts the contrary to some extent. This market has a strategic and commercial importance to the country, which should therefore ensure its grip and

enhancement of this sector. However, Germany holds the top position in petrochemicals and despite being the third largest seller of commodities coming into Saudi it is operating against the Saudis. For instance, there is no petrochemical firm, which operates as a joint venture with Germany within the Saudi economy. The issue of disagreement between the European Union and the Saudis was that of double pricing. While natural gas was sold at a very cheap rate (75 cents per million BTUs) to the local markets, the market in New York reflects a figure of $8.60 a million BTU. Germany has to acquire the same at $62 per barrel in contrast with $4.35 barrel of oil equal to at which the natural gas is sold to the energy intensive sectors like the electricity or water desalination companies and also SABIC and the private sector (Clatanoff *et al*., 2006).

After a lot of controversies, the Saudis promised to drop double pricing, but the implication is that there will not be any requirement of exporting natural gas since their own industries are growing at such a fast rate that all the domestically produced natural gas will be used up within its country itself. Although the participants in our study think that the Kingdom did not get any special concession from joining the WTO, during the negotiation period the Kingdom was able to convince other WTO member nations to allow the Kingdom to maintain its low domestic natural gas price. Later, however when the Saudis joined the WTO the EU was forced to drop the issue of double pricing. Though, France has invested in the Saudi markets, Germany has not. The companies of United States are largely gaining from investments in these markets. They are producing in the Saudi markets mainly to sell in the Chinese markets that being an emerging nation is rapidly expanding its industries and eagerly buying the natural gas at a cheap price from the Saudis. This has been an important contribution of the WTO accession. Thus, as long as Saudis can maintain this price difference they will succeed in enhancing their petrochemical production. The only way this may be stopped by the European Union is by banning Saudi products which will not be possible as Saudi Arabia enters WTO. Here again the vision of the Saudi government is reflected and it proved that the Saudi Arabia chose the WTO especially for its own gains and on its own terms.

After locating that the idea behind the accession into the WTO was guided by self interest of the country, it now should be considered, as discussed in the previous

chapters, whether the government has or can sustain the competitiveness in the petrochemical sector. In this research, primary survey was undertaken in order to investigate the opinions of experts in the industry in this context. A general look at the results shows that while the majority of the people interviewed believe that Saudi Arabia holds a strong position with respect to the petrochemical industry, many of them also feel that the nation has to face strong global competition. In such a case, the experts feel that the main strategy adopted by the government, apart from training of workers and ensuring cheap raw materials, would be to provide further encouragement and support to the investors and producers of the petrochemical industry, such that it leads to increased production. The participants mostly agree that the government has been effective in promoting the industry. Among the identification of the important factors responsible for the robust growth of this sector, most of the participants addressed the raw material availability and trained workforce to sustain the potential role while some also give importance to efficient and effective marketing power, managerial efficiency, product quality, low cost of production, adequate number of investors and opening up of market for different types of products produced in the industry. Thus, the participant experts have brought out some serious policy implications in order to address all the concerns and issues discussed.

The current situation and developments in the sector implies that certain policies and steps by the government should be taken in order to ensure that economic liberalisation works in its favour. The economy should be made attractive to foreign direct investments. Supporting industries need to be encouraged along with petrochemicals. The bargaining power of suppliers of raw materials for the petrochemicals sector needs to be limited. Industrial competition needs to be encouraged rather than monopoly, which should rather be curbed in order to encourage competition and innovation. Furthermore, the research and development needs to be strengthened for the sustainability of competitiveness. Moreover, the government should pay greater attention to education and professional training of young people to develop skills in favour of the industrial development. This will give a positive signal to the foreign investors about the adaptability of Saudi Arabia to the free or open market policies.

As analysed in Chapter Seven, the government has already succeeded in taking appropriate measures to encourage foreign investment and privatisation as part of the WTO treaty. Such positive measures include tariff reduction, red-tape reduction, giving away price fixing, cutting of time taken to get a license and diversify resources from the petrochemical sector to the other economic sectors. These steps can yield positive returns only when the economy ensures cheap raw material availability, growth of supporting industries and industrial and petrochemicals infrastructure. The overcapacity issue has to be considered too and it needs to be ensured that there is no over production or that production is matched by demand. In order to generate the adequate demand, energy intensive industrial sectors should be encouraged. To succeed against foreign competition, however, the nation should reform its policies such that the GCC countries are integrated and have strength of a union such that no outside power can affect its economy to any considerable extent. As reported by Bourland (2007), even if a single currency of the GCC cannot be ensured by the year 2010, it has achieved a single market for the free movement of resources such as capital and labour. While there is an economic rationale for such a union, the foreign politics and domestic politics conditioned by the foreign politics do not allow such a union to play an effective role.

According to Abdulrahman Al-Rashid, Chairman of both the Eastern Province Chamber of Commerce and Industry and of the Council of Saudi Chambers of Commerce and Industry, suggests that the idea of using the natural gas that usually went to waste, as an input resource or a feedstock for the chain of industries to be set up has actually been the initialisation of a new era of diversification within the economy. This decision has proved to be a brilliant way of turning the waste into riches (Cousins, 2006). Owing to the rising demands for industrial locations, the Al-Jubail Industrial City II was established. It was to be developed in four stages (Cobb, 2008). The first stage according to the plan has nine petrochemical plants with a total expected investment of about SR200 billion in this sector. The initiative taken towards natural gas production has also provided encouragement to the growth of Al-Jubail petrochemical sector. After the entry of the country into the WTO, the demand for feedstock has increased sharply. Thus, the Eastern Province has developed into a key production area for petrochemicals, plastic and the associated sectors of fertilizers, steel and cement (Cobb, 2008; Asharqia Chamber, 2006).

Concentrating on the Arab Economic Forum in Beirut on May 4, 2007, Petroleum and Mineral Resources Minister of Saudi Arabia Mr. Ali Al-Na'imi asserted that Saudi Arabia aspired to become the number three petrochemicals producer by 2015. The Kingdom is said to hold the 10^{th} position in production of petroleum derivatives. It has accomplished remarkable growth in this industry over the past thirty years having a share of nearly 8 percent of worldwide production. (SAUDI ARABIA - The Saudi Petrochemicals Sector; Big Expansions Ahead, 2007). It should be noted that over the years, the production of petrochemicals in Saudi Arabia has been increasing rapidly, which has grown from 60 m t/y in 2007 and expected to reach 100m t/y by 2015. This implies an annual forecasted growth rate of 12% (The Saudi Petrochemicals Sector; Big Expansions Ahead By SABIC & Saudi Aramco, 2009). The annual growth rate is anticipated to have reached 12 percent by 2015. According to Mr. Al-Na'imi, the increase in investments between 2005 and 2012 will sum up to approximately $70 billion (SAUDI ARABIA - The Saudi Petrochemicals Sector; Big Expansions Ahead, 2007). The joint venture intends to boost the flow of direct investments from within and outside the nation.

During the conference and exhibition of the Petrochem Arabia 2009 at Al-Dammam, which gathered the business leaders and government officials to discuss the feedstock, challenges and opportunities and geographical advantages of the nation with respect to petrochemical. A joint venture of Saudi Aramco and Dow Chemical of United States (Ras Tanura Integrated Project (RTIP)) was focused upon. This was supposed to be the third biggest facility of the world (Canty *et al*., 2009). The commercial director of Dow Chemical in India, Middle East and Africa, Zuhair Allawi concentrated his speech on the role of technology and believed in sustainable environment building. He also observes that Saudi Arabia is undergoing a phase of late industrial development in this modern age. At this stage therefore the nation would require acceptance of new and innovative technologies or technical-know how in order to bring on fast progress. In this context, he addressed Dow’s support towards the measures adopted by the country to form a knowledge oriented economy specialized in terms of technology. This new platform gained through the accession of WTO membership for a healthy exchange of technological knowledge and information would support sustainability (The Saudi Petrochemicals Sector; Big Expansions Ahead By SABIC & Saudi Aramco, 2009).

As part of the new policy making, sustainability needs to be addressed in the steps taken for the growth of the nation: such policy making will turn Saudi Arabia into a net exporter of original solutions to serve the human requirements. The implication here is towards the responsibility to be shown for the environment, society and economic success. All the considerations regarding technical improvements in the processes of the plants for saving energy and optimising the use of resources related to hydrocarbons should be addressed within an overall developmental and economic strategic framework. According to Allawi, therefore, such a structure needs to give good returns for future years to come and thus sustainability factor should play a crucial role in the strategy (The Saudi Petrochemicals Sector; Big Expansions Ahead By SABIC & Saudi Aramco, 2009). Mr. Allawi's articulation of a new and dynamic strategy reflects the method of tackling social and environmental challenges with the help of advancement in technology used in processing within the petrochemical industry.

As part of the new strategy, the idea that has been finally popularised is to diversify the portfolio of commodities and thus reducing the risk. The future production basket would require the incorporation of heavier combination of feedstock, which could be those of propane and butane (non ethane feedstock). Although a shift away from the essential or fundamental petrochemicals would help in diversification (like Riyadh has done), this will also reduce the cost advantage it enjoyed with respect to feedstock production. Thus, the producers will not find a cheaper means of transport or easy access to end users as before (The Saudi Petrochemicals Sector; Big Expansions Ahead By SABIC & Saudi Aramco, 2009). The government of Saudi Arabia has facilitated privatisation of the petrochemical industry by permitting entry of new firms into this sector (Bahgat, 2004). There are a number of policies being adopted by the government so as to safeguard the new entities. As the nation has the access of cheapest feedstock, it attracts several firms to enter into the market of Saudi Arabia. Considering the bargaining power, it can be stated that if there is an excess supply of petrochemical products, then the buyers have more influence over the price of the products. Likewise, if there is an excess demand of those products, then the sellers will be able to influence the price of the product. As there have been very few firms within the domestic market of Saudi Arabia, the competition level within the economy is not strong. As a result, it minimizes the probability of maintaining the

standard and the efficacy level in the global context. The petrochemical industry faces tremendous competition in global level because of globalisation. The level of competition is so strong that it compels the firms to cut down its prices in order to survive in the market (Clatanoff *et al.*, 2006; Al-Ghamdi and Sohail, 2006). After becoming an associate of WTO, this industry has enabled easy entry of new firms into the market while this petrochemical sector is facing threats of rivalry from the other countries. As a result, appropriate competitive strategy needs to be adopted by this nation in order to survive in the global market.

9.3. CONCLUSION

The membership of Saudi Arabia into the WTO is supposed to benefit the country in more ways than one. The petrochemical industries have always proved to be a possible area of trade and hence profit for the nation, which is evidenced from extensively significant contribution to the GDP. In addition, the production capacity of petrochemicals is quite high mainly owing to the activities of companies like Saudi Aramco and SABIC. Furthermore, the economic situation of the nation is also optimistic since it has not been affected much by the recent global recession. The private sector has received its stimulation through the reforms undertaken at large.

Adopting the policies of the WTO would affect all the sectors and encourage more liberalization as well as capitalization. Saudi Arabia has been able to bargain on the basis of its profitable position of the petrochemicals sector and have managed to sign the deal keeping its other positions unaffected to some extent.

As far as competitiveness and opening up to the world economy is concerned, the nation has and will be facing certain challenges. For instances, in order to attract foreign capital in this sector one has to maintain security. The recent terrorist attacks at the petrochemicals site of Yanbu and Al-Khobar have set an alarm among foreign investors. Therefore it is time now to diversify the economy towards sectors complementary or related to petrochemical.

In order to avoid over dependence on this single sector, no matter how profitable it might be, will make the position of Saudi Arabia weak to the investors and will also prove dangerous for the nation. Energy intensive sectors have already been focused

upon. With these steps for increasing and solidifying the position of the economy, the demand for domestic use of petroleum is also on the rise. Thus, if production is to be increased further in order to promote exports, then it implies greater necessity for feedstock (used as a resource for production of petrochemical production). The downstream activities, therefore, need to be improved. At the same time, with increasing global competition, slowdown in prices across the world and cuts in tariffs undertaken by emerging economies like China and India, there is also a threat of production capacity more than needed. The Saudi government has been well aware of these issues and is taking steady measures in order to address them. SABIC and other oil companies have contributed largely to the improvements necessary in the infrastructure and resources for the production and other segments of the industry.

Finally, sustainability of competitive environment in the petrochemical sector of Saudi Arabia against the backdrop of the WTO accession will mainly be ensured by provision of foreign investor friendly economy with respect to this sector. This would require some smart steps to be taken by the government in relation to the economic and social issues as already been discussed. The companies need to adopt the right proportion of technology, manpower and managerial skills in order to deal with the challenges in this industry and encourage competition and therefore sustainability of the petrochemical sector.

9.4. CONTRIBUTIONS OF THE STUDY

It can be stated that the study succeeded in analysing and addressing the steps taken by the government to develop the petrochemical industry and to increase the exports of petrochemical products, and its change in vision or outlook regarding the economy. If we ask the question as to why the government of Saudi Arabia has undertaken the change towards the ‘progress without instability’ vision for the country, the answer lies in the present competitiveness and profitable position of the country with respect to trade and commerce especially banking on the petroleum and petrochemicals sector. This has been possible through the membership of the nation within the WTO. The study essentially contributes to the understanding of the rules, regulations and terms of agreement, the country is subject to as a member of the WTO.

Secondly, the study helps in identifying how an oil rich economy with certain conservative principles, has managed to gain in the bargain through negotiations with the WTO. Advantages related to natural conditions have surely played a major part, but the role of the government and policymakers with respect to careful study of the rules and regulations of WTO before becoming its member, cannot be ignored. The country has already adopted the reform measures in order to gain its entry. The last and most important part of the study is that it helps to identify the weaknesses in the developmental framework, which need to be addressed.

The further steps to be taken by the government in order to help the economy continue getting the advantages of the membership are also discussed. Some basic recommendations projected based on the findings of this study have illustrated how a balance may be brought among the strengths, weaknesses, opportunities and threats in petrochemicals sector of Saudi Arabia. This might therefore be a good example for all other Middle East countries to follow, especially those who do not yet have an entry in the WTO.

Furthermore, Porter's Diamond Model was used and discussed in detail in chapter 7 to determine the county's competitive advantage. Such analysis shows that further skill generation, research and development, increase feedstock production and development of stock market to address the financial problem are recommended. In chapter 8 SWOT analysis was discussed and shows that the economy and especially the industry has adequate strengths and opportunities to explore but some relative moderate degree of concerns come as threats and weaknesses too. Abundance of petroleum products, large feedstock production at competitive prices, growing demand for petroleum products all support foreign investments and increased competition. SWOT analysis further shows that the weakness lies in the fact that the nation is too much dependent on natural resources for its GDP growth. A crisis in the same would therefore lead to negative impact on the economy. Again security issue is a major threat and steps are taken to improve the scenario in this respect. Energy intensive sectors need to be concentrated upon in order to avoid over dependency of the economy on the oil sector.

9.5. RECOMMENDATIONS

Business capabilities of Saudi Arabia petrochemical industry look bright as far as the future goes for them. Recently Saudi Arabia is placed as the thirteenth most competitive country among the rest of the world. This has only made the government realize that more reforms can be undertaken to achieve its target of progressing and growing steadily within its economy. Various positive as well as negative views may come in when reforms are spoken about. Regarding the privatisation of the important industries, the country has greatly benefited.

There are several other areas where the country needs to be focused in order to sustain its competitiveness. One of such sector is mineral resources, as abundant amount of such mineral resources is possessed. The minerals are in such large quantity that the economy can be greatly benefited by it. Through crude oil to petroleum products, the industry has been able to deliver great business for the economy.

The government must remember that producing excessive oil in spare can prove fatal for their sake. Newer field extracting is a good sign and for that relevant cost associated with it in terms of having proper technology is acceptable. However, too much dependence on a particular commodity is not a good sign of a robust economy. To emerge as a leading nation in the world market they need to diversify their products. Most economies in the world have initially started off with a particular commodity production, but later on they managed to shift to some other products also. Saudi Arabia is also developing policies in these lines. That is why other sectors are also getting priority. The natural gas and petrochemicals sectors are the related sectors of oil industry; and therefore there is a deep need to diversify to other such sectors.

It is a well known fact that foreign investors when come to any particular country they expect safety from the government of another nation. However, if the safety factor does not meet its requirements the foreign participators may shift out of their country. This may cause a dent not only to their current projects but might also cause a concern for the future. Finally the rising volatility is the biggest threat to the pricing of oil. Since the rise of oil futures in the early 1980’s the price have kept on fluctuating. Controlling and stability can be achieved if the financial tools such as options, futures and derivatives can be properly applied. In case of business, the oil exports as well as

the non-oil exports has to be compared with the overall GDP of the economy. This needs to be done to find out the exact growth of the oil and non-oil products.

The petrochemical industry needs various competitive advantages in its costing, so that it can contribute greatly in the overall Saudi Arabian economy. Newer investment in the energy sector has to be greeted with positive attitude. Privatisation is also a new concept that the Ministry of Petroleum has undertaken as a policy and this kind of reforms only look better as it takes the overall economy in a new direction. Allowing foreign companies to take part in the overall business of the nation through joint ventures with public and private companies is another major step taken by the government. The biggest advantage that Saudi Arabia has is the low cost of production of oil in comparison with the other countries. It already contributes to the low cost production of petrochemicals. Demand and supply interaction requires the production capacities to be kept at a tighter level. One of the confrontations that the nation faces is attaining its deliberate vision to add production capacity. The existing fields undergo nearly 6 to 8 percent annual decline rates approximately in existing fields. It implies that the nation requires about 700,000 barrel per day (bbl/d) in added capacity every year to recompense natural decline. However, decline rates fluctuate extensively for Saudi Arabia. Saudi Aramco has asserted that it will also carry out further drilling at existing fields, so as to help pay off for the natural declines from the established fields (EIA, 2009).

Saudi Arabia's long-term objective is to further expand its lighter crude reserves incorporating the Shaybah Field, situated in the Empty Quarter (Al-Rub Al-Khali) region covering the United Arab Emirates, the Abu Hadriya, Fadhili and Khursaniyah (AFK) fields and the enormous Khurais Field. In 2005, the Saudi Ministry of Petroleum and Mineral Resources proclaimed a striving goal of escalating capacity to 12.5 million barrel per day by the end of 2009. While production levels went down slightly in the late 2008, the government continued to be confident that it will attain its production target. To reach these determined production targets and to meet the increasing demand for energy around the globe, the nation needs to invest billions of dollars to enhance production capacity by developing new projects and promoting existing ones. Whilst the worldwide recession that began in 2008 has introduced new economic confrontations, the country is approaching forward with several

development projects in the oil and gas sector (The Oil and Gas Sector in the Kingdom of Saudi Arabia, n.d.).

9.6. LIMITATIONS OF THE RESEARCH

Similar to any other study, this study also has certain limitation as an inevitable part of controlled research. The main limitation of this study is the fact that Saudi Arabia joined the WTO in December 2005. Therefore, resources such as books and articles related to the research are very limited. In addition, sources related to the petrochemical industry are very conservative *i.e.* no detailed information about production, exports and sales are rendered. Furthermore, accessibility to governmental data was not also easy.

A rather important limitation is related to the measurement of the impact of Saudi Arabia's accession to the WTO, which took place in 2005; just one year before this study was commenced. Thus, with the available data, it is terribly difficult to measure such an impact, which could have, otherwise, provided valuable understanding regarding the evolving developments in the industry and the country.

Other limitation in the study was related to the use of small and specific sample size as it may not be complete representative. Therefore, generalizations cannot be accurately made. For instance, the interviews are done only with the top officials at government levels and from the petrochemical sector. Therefore, the study has potential for bias as the government sector has too much stake in the development of the petrochemical sector. Their views are expected to be positively biased towards the growth of the sector. Since the interviews were conducted with the elite experts (i.e. experts and opinion leaders in the petrochemical industry as well as petrochemical experts employed in academic organizations); there are, therefore, chances for a biased view about the economic impacts of the growth and future prospects of the sector. In other words, the study was not conducted through random sampling. It is entirely through purposive sampling. Therefore, it might happen that the respondents who are left behind would give different views.

Additionally, the interpretation of the results from this study, like many other exploratory designs, is premised on the researcher's judgment. However, noting that there is no objective reality in social research, such a limitation can be justified.

Finally, conducting interviews were rather difficult, as it was difficult to schedule an appointment for an interview with some participants particularly those in high positions. We had also some difficulties conducting the interviews at specific locations as we had to go through security checks.

Despite the limitations and difficulties, the study helps us get an elaborate picture of the Saudi Arabian economy, its competitiveness with respect to the petrochemicals industry and the factors associated with its success and growth. The study also provides an analysis to guide the government for the future developments in the industry by providing recommendations and point out the threats and weaknesses.

9.7. REFLECTING ON THE FUTURE WORK

The end of the thesis focused on sustainability of the petrochemical industry's growth in Saudi Arabia. This will in turn depend on foreign investment in this sector. Therefore, an econometrics study can be taken up to measure the impact of the FDI on the developments in the industry. For this, the data for the flow of FDI from 1995 to 2008 could be taken for the analysis and corresponding share of petrochemicals in exports may be taken for a regression analysis with petrochemicals in exports as dependent variable and FDI as independent variable. Although causal relationship cannot be determined by such an analysis, but at least we would know the degree of association between the variables. We would expect to find here a positive relation and this would have proved the final presumptions regarding the future of this industry, that is, more flow of foreign capital owing to increasing competition has helped in making the industry grow (Saudi non-oil exports build new economy, 2007).

Secondly, there could also be a significant correlation between the flow of FDI and growth in the production of petrochemicals. A forecast analysis can be conducted regarding the growth of petrochemicals and their exports based on the qualitative and quantitative study. Hence the compound annual growth rate could be calculated to

give a more vivid estimate of the future of this industry in Saudi Arabia. Throughout the study it was found that there has been an increasing flow of foreign investment in the petrochemicals sector. The absorption of local workers in the foreign companies within this industry might be taken up to study the benefits these reforms have on the people. The increasing number of jobs over the period considered could be traced in the form of a graph and the number of foreign companies in the respective years might be taken up for the analysis. This would help in verifying that the FDI has actually been able to generate more employment in this industry. Thus, further quantitative analysis based on association between the different key variables could be analysed in order to generate a valid analysis.

Lastly, Porter's model related to competitive advantage was utilised for the analysis purpose. This can be extended through a model to investigate the comparative advantage in a detailed manner as well.

9.8. EPILOGUE

This study aims to assess the strategic or long-term impact of WTO membership on Saudi Arabia's petrochemical industry by directly evaluating the country's competitiveness and comparative advantage and their sustainability in petrochemical industry. In doing so, the study attempts directly to correlates developments and trends in Saudi Arabia's petrochemical industry with the impact of the WTO. This study also aims to enumerate a set of recommendations that would assist in overcoming the potential difficulties and sustain its competitive advantage in the sector.

In attempting to fulfil these aims, two forms of research data were gathered to guide the research investigation in this study. Quantitative or secondary data were in the form of economic and financial reports and studies, government statistics and other forms of quantified data on the petrochemical industries in Saudi Arabia. Qualitative or primary data were in the form of semi-structured purposive interviews of experts and opinion leaders in the petrochemical industry as well as petrochemical experts employed in academic organizations.

The analysis of the secondary and primary data and the findings indicate that Saudi Arabia has taken significant steps to reform its trade regime. The country has concluded bilateral market access settlements with all important WTO Members. The accession is said to improve the business atmosphere in Saudi Arabia by adding up more precision and predictability, which is evident in the developments have taken place in petrochemical industry as indicated with the analysis and discussion provided in the preceding chapters and sections.

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APPENDICES

APPENDIX I

Saudi's Oil Summary

Year	Saudi's crude oil production (million bbls/d)	Average OPEC basket price ($/b)	Saudi's share of world production %	Saudi's proven crude oil reserves (m bbls)	Saudi's crude oil exports (million bbls/d)
1970	3,799.1	1.67	8.37	141,350	3,216.9
1971	4,768.9	2.03	9.92	139,609	4,186.8
1972	6,016.3	2.29	11.89	146,000	5,444.1
1973	7,596.2	3.05	13.75	143,227	7,014.6
1974	8,479.7	10.73	15.24	173,150	7,922.4
1975	7,075.4	10.73	13.35	170,567	6,601.1
1976	8,577.2	11.51	14.93	167,428	8,031.8
1977	9,199.9	12.39	15.37	164,070	8,608.4
1978	8,301.1	12.70	13.78	168,940	7,706.0
1979	9,532.6	17.25	15.19	166,480	8,817.7
1980	9,900.5	28.64	16.59	168,030	9,223.2
1981	9,808.0	32.51	17.52	167,850	9,017.9
1982	6,483.0	32.38	12.10	165,484	5,639.4
1983	4,539.4	29.04	8.66	168,848	3,920.8
1984	4,079.1	28.20	7.70	171,710	3,186.9
1985	3,175.0	27.01	6.07	171,490	2,150.7
1986	4,784.2	13.53	8.68	169,744	3,265.8
1987	3,975.2	17.73	7.28	169,585	2,416.5
1988	5,100.1	14.24	8.96	254,989	3,030.1
1989	5,064.5	17.31	8.76	260,050	3,335.5
1990	6,412.5	22.26	10.85	260,342	4,499.8
1991	8,117.8	18.62	13.83	260,936	6,526.3
1992	8,331.7	18.44	14.04	261,203	6,581.9
1993	8,047.7	16.33	13.61	261,355	6,292.9
1994	8,049.0	15.53	13.45	261,374	6,233.6
1995	8,023.4	16.86	13.29	261,450	6,290.8
1996	8,102.3	20.29	13.16	261,444	6,109.3
1997	8,011.7	18.68	12.73	261,541	6,184.5
1998	8,280.2	12.28	12.71	261,542	6,390.4
1999	7,564.7	17.47	11.93	262,784	5,719.7
2000	8,094.5	27.60	12.29	262,766	6,253.1
2001	7,888.9	23.12	12.07	262,697	6,035.9
2002	7,093.1	24.36	11.08	262,790	5,284.6
2003	8,410.3	28.10	12.50	262,730	6,522.9
2004	8,897.0	36.05	12.61	264,310	6,813.1
2005	9,353.3	50.64	13.06	264,211.0	7,208.9
2006	9,207.9	61.08	12.79	264,251.0	7,029.4
2007	8,654	69.08	12.12	264,209	6,962.1
2008	9,198	94.45	12.77	264,063	7,321.7

Source of data: (OPEC - Annual Statistical Bulletin 2006; 2007; 2008)

APPENDIX II

Saudi's Natural Gas Summary

Year	Saudi's Natural Gas Production (million standard cu m)	Saudi's Share of World Production %	Saudi's Proven Natural Gas Reserves (billion standard cu m)	Saudi's Natural Gas Liquids Exports * (million standard cu m) **
1986	25,200	1.40	4,021	No Data
1987	26,800	1.42	4,190	No Data
1988	29,100	1.51	5,020	No Data
1989	29,800	1.49	5,218	No Data
1990	33,520	1.65	5,223	No Data
1991	35,170	1.70	5,221	No Data
1992	38,250	1.84	5,249	No Data
1993	40,040	1.89	5,249	No Data
1994	42,770	2.00	5,260	No Data
1995	42,930	1.98	5,545	No Data
1996	44,510	1.97	5,693	40,108
1997	45,840	2.03	5,882	38,795
1998	46,720	2.02	6,068	38,242
1999	46,200	1.95	6,146	37,367
2000	49,810	2.03	6,301	37,807
2001	53,690	2.14	6,456	36,578
2002	57,320	2.24	6,646	38,040
2003	60,060	2.27	6,754	42,279
2004	65,680	2.40	6,834	43,560
2005	71,240	2.54	6,900	46,024
2006	73,461	2.55	7,154	45,370
2007	74,420	2.54	7,305	45,583
2008	80,440	2.63	7,570	45,140

*: Natural Gas Liquids comprising propane, butane, condensate and natural gasoline

Source of data: (OPEC - Annual Statistical Bulletin 2008; **Aramco Facts And Figures, 2000-2008)

APPENDIX III

Sections and Chapters of the Harmonized Tariff Classification System

Agricultural Products

- Section I Chapters 01 to 05: Live animals; animal products
- Section II Chapters 06 to 14: Vegetable products
- Section III Chapters 15 : Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
- Section IV Chapters 16 to 24: Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes

Mineral Products

- Section V Chapters 25 to 27: Mineral products

Chemical and Related Products

- Section VI Chapters 28 to 38: Products of the chemical or allied industries
- Section VII Chapters 39 to 40: Plastics and articles thereof; rubber and articles thereof

Non-Consumable Animal and Plant Products

- Section VIII Chapters 41 to 43: Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)
- Section IX Chapters 44 to 46: Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork
- Section X Chapters 47 to 49: Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard; paper and paperboard and articles thereof

Textiles and Apparel

- Section XI Chapters 50 to 63: Textiles and textile articles
- Section XII Chapters 64 to 67: Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair

Non-Metallic Mineral Products

- Section XIII Chapters 68 to 70: Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass and glassware

Metals and Manufactured Articles Made Mostly of Metal

- Section XIV Chapter 71: Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewelry; coin
- Section XV Chapters 72 to 83: Base metal and articles of base metal
- Section XVI Chapters 84 to 85: Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
- Section XVII Chapters 86 to 89: Vehicles, aircraft, vessels and associated transport equipment
- Section XVIII Chapters 90 to 92: Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof
- Section XIX Chapter 93: Arms and ammunition; parts and accessories thereof

Other Highly Manufactured and Special-Purpose Goods

- Section XX Chapters 94 to 96: Miscellaneous manufactured articles
- Section XXI Chapter 97: Works of art, collectors' pieces and antiques

Source: Global Tariff, 2008.

APPENDIX IV

Harmonized Tariff Schedule and Chemical Tariffs

Harmonized Tariff Schedule	Chemical Tariffs Harmonization Levels
Chapter 28 [1)]	5.5 percent
Chapter 29 [1)]	
2901 – 2902	0.0 percent
2903 - 2915	5.5 percent
2916 – 2942	6.5 percent
Chapter 30 [1)]	0.0 percent
Chapter 31 [2)]	6.5 percent
Chapter 32	6.5 percent
Chapter 33 [2)]	6.5 percent
Chapter 34 [2)]	6.5 percent
Chapter 35 [1)]	6.5 percent
Chapter 36	6.5 percent
Chapter 37	6.5 percent
Chapter 38 [1)],[2)]	6.5 percent
Chapter 39 [2)]	6.5 percent

[1)] Where appropriate, the pharmaceutical 0-for-0 offer applies.
[2)] The industry will seek lower harmonization levels within these Harmonized Tariff System chapters.
Source: International Council of Chemical Associations (1991)

APPENDIX V

Saudi Arabia Tariff Profile

Saudi Arabia

Part A.1 Tariffs and imports: Summary and duty ranges

Summary		Total	Ag	Non-Ag	WTO member since		2005
Simple average final bound		11.8	20.7	10.5	Binding c	Total	100
Simple average MFN applied	2008	5.2	7.1	4.9		Non-Ag	100
Trade weighted average	2007	4.6	7.2	4.2	Ag: Tariff quotas (in %)		0
Imports in billion US$	2007	90.2	11.8	78.4	Ag: Special safeguards (in %)		0

Frequency distribution		Duty-free	0 <= 5	5 <= 10	10 <= 15	15 <= 25	25 <= 50	50 <= 100	> 100	NAV
		Tariff lines and import values (in %)								in %
Agricultural products										
Final bound		0.1	4.1	32.6	51.5	2.8	1.0	0	1.3	8.8
MFN applied	2008	21.2	69.5	0.4	0.6	0.1	0.1	0.2	1.2	1.3
Imports	2007	50.4	45.5	0	0	0	0	0.1	4.1	4.2
Non-agricultural products										
Final bound		8.2	4.9	32.1	54.3	0.4	0	0	0	0.1
MFN applied	2008	6.9	89.5	0.2	2.7	0.3	0	0	0	0
Imports	2007	15.0	85.0	0	0	0	0	0	0	0

Part A.2 Tariffs and imports by product groups

Product groups	Final bound duties				MFN applied duties			Imports	
	AVG	Duty-free in %	Max	Binding in %	AVG	Duty-free in %	Max	Share in %	Duty-free in %
Animal products	13.0	0.3	*40*	100	3.5	30.5	20	2.0	39.6
Dairy products	10.9	0	25	100	5.0	0	5	1.4	0
Fruit, vegetables, plants	12.2	0	40	100	3.4	32.4	40	1.3	56.7
Coffee, tea	9.3	0	15	100	3.8	37.5	15	0.6	49.1
Cereals & preparations	13.0	0	*45*	100	3.7	30.0	15	5.0	78.1
Oilseeds, fats & oils	11.4	0	15	100	4.9	2.8	5	1.0	27.6
Sugars and confectionery	12.4	0	20	100	4.0	25.0	10	0.5	84.1
Beverages & tobacco	180.6	0.7	*> 1000*	100	65.4	0.7	*429*	0.9	0.1
Cotton	13.2	0	15	100	5.0	0	5	0.0	0
Other agricultural products	13.2	0	15	100	4.4	11.0	5	0.4	35.5
Fish & fish products	10.9	0	15	100	3.3	34.4	5	0.3	32.8
Minerals & metals	13.1	1.8	20	100	5.0	3.2	15	18.2	4.1
Petroleum	6.1	0	10	100	5.2	0	10	0.1	0
Chemicals	5.4	11.5	15	100	4.8	11.0	20	9.1	35.5
Wood, paper, etc.	9.0	1.0	20	100	5.5	5.1	20	3.0	2.4
Textiles	14.1	0.2	15	100	5.3	0.2	15	1.9	0.9
Clothing	11.2	0	15	100	5.0	0	12	2.0	0
Leather, footwear, etc.	12.5	4.5	15	100	5.5	0	15	1.7	0
Non-electrical machinery	10.7	15.0	15	100	4.9	4.9	15	19.4	10.6
Electrical machinery	8.0	37.6	15	100	4.1	20.9	15	10.0	40.3
Transport equipment	11.0	4.5	15	100	4.4	19.2	15	17.4	12.8
Manufactures, n.e.s.	10.8	14.3	15	100	4.8	6.2	20	3.8	13.4

Part B Exports to major trading partners and duties faced

Major markets	Bilateral imports		Diversification		MFN AVG of traded TL		Pref. margin	Duty-free imports	
		in million US$	95% trade in no. of HS 2-digit	HS 6-digit	Simple	Weighted	Weighted	TL in %	Value in %
Agricultural products									
1. Jordan	2007	156	13	34	21.1	16.5	16.5	100.0	100.0
2. Qatar	2006	149	17	80	4.1	4.2	4.2	99.8	100.0
3. Bahrain	2007	119	17	86	3.6	4.4	4.4	100.0	100.0
4. Yemen	2007	101	16	55	10.1	9.7	9.7	99.5	100.0
5. Sudan	2007	75	16	47	30.2	31.9	31.9	100.0	100.0
Non-agricultural products									
1. United States	2007	35,215	3	17	3.0	0.1	0.0	52.5	40.4
2. Japan	2007	35,196	1	3	1.5	0.0	0.0	84.8	99.6
3. European Communities	2007	23,872	3	11	3.6	1.0	0.7	73.2	89.7
4. Korea, Republic of	2006	20,533	2	4	5.6	3.0	0.0	26.2	3.5
5. China	2007	17,547	4	9	13.1	1.4	0.0	6.0	74.7

*Source:*WTO, Tariff Profile, 2009

APPENDIX VI

Saudi Arabia Trade Profile

BASIC INDICATORS

Population (thousands, 2007)	24 196
GDP (million current US$, 2007)	381 683
GDP (million current PPP US$, 2007)	554 250
Current account balance (million US$, 2007)	95 080
Trade per capita (US$, 2005-2007)	12 872
Trade to GDP ratio (2005-2007)	86.7

Rank in world trade, 2007	Exports	Imports
Merchandise	18	33
excluding intra-EU trade	12	21
Commercial services	54	29
excluding intra-EU trade	35	18

		Annual percentage change		
	2007	2000-2007	2006	2007
Real GDP (2000=100)	128	4	3	3
Exports of goods and services (volume, 2000=100) a	110	3	...	...
Imports of goods and services (volume, 2000=100) a	107	2	...	...

TRADE POLICY

WTO accession date	11 December 2005	
Trade Policy Review date	...	
Tariffs and duty free imports		
Tariff binding coverage (%)		100
MFN tariffs	Final bound	Applied 2007
Simple average of import duties		
All goods	11.7	5.0
Agricultural goods (AOA)	20.0	7.6
Non-agricultural goods	10.5	4.7
Non *ad-valorem* duties (% total tariff lines)	1.2	1.4
MFN duty free imports (%, 2006)		
in agricultural goods (AOA)		46.2
in non-agricultural goods		11.6
Services sectors with GATS commitments		120

Contribution to WTO budget (%, 2009)	0.927
Import duties collected	
in total tax revenue	...
to total imports	...
Number of notifications to WTO and measures in force	
Outstanding notifications in WTO Central Registry	19
Goods RTAs - services EIAs notified to WTO	2 - 0
Anti-dumping (30 June 2008)	...
Countervailing duties (30 June 2008)	...
Safeguards (28 October 2008)	0
Number of disputes (complainant - defendant)	
Requests for consultation	0 - 0
Original panel / Appellate Body (AB) reports	0 - 0
Compliance panel / AB reports (Article 21.5 DSU)	0 - 0
Arbitration awards (Article 22.6 DSU)	0 - 0

MERCHANDISE TRADE

	Value	*Annual percentage change*		
	2007	2000-2007	2006	2007
Merchandise *exports*, f.o.b. (million US$)	234 951	17	17	11
Merchandise *imports*, c.i.f. (million US$)	90 217	17	17	29

	2007		2007
Share in world total exports	1.68	**Share in world total imports**	0.63
Breakdown in economy's total exports		**Breakdown in economy's total imports**	
By main commodity group (ITS)		By main commodity group (ITS)	
Agricultural products	1.0	Agricultural products	13.8
Fuels and mining products	88.2	Fuels and mining products	4.8
Manufactures	10.6	Manufactures	80.1
By main destination		By main origin	
1. Japan	26.8	1. European Union (27)	31.9
2. Taipei, Chinese	23.6	2. United States	13.6
3. United States	17.5	3. China	9.7
4. European Union (27)	7.1	4. Japan	8.7
5. United Arab Emirates	3.6	5. Korea, Republic of	4.5

COMMERCIAL SERVICES TRADE

	Value	*Annual percentage change*		
	2007	2000-2007	2006	2007
Commercial services *exports* (million US$)	7 901	7	9	8
Commercial services *imports* (million US$)	30 798	16	34	59

	2007		2007
Share in world total exports	0.24	**Share in world total imports**	0.99
Breakdown in economy's total exports		**Breakdown in economy's total imports**	
By principal services item		By principal services item	
Transportation	...	Transportation	...
Travel	...	Travel	...
Other commercial services	...	Other commercial services	...

INDUSTRIAL PROPERTY

Patent grants by patent office, 2007			**Trademark registrations by office**			
Residents	Non-residents	Total	Direct residents	Direct non-residents	Madrid	Total
17	257	274	...	...	...	...

a Refers to 2003 values and to the average annual percentage change for 2000-2003.

Source: Trade Profile, WTO (2009)

APPENDIX VII

Questionnaire Administered To the Study Participants:

1) How can you describe Saudi Arabia's petrochemical industry in comparison to other countries?

   (a) Very competitive (b) relatively competitive (c) not competitive

2) Which sub-sectors comprise Saudi Arabia's petrochemical industry?
3) What impact has the petrochemical industry had on Saudi Arabia's economy?
4) Does Saudi Arabia have any competitive advantage in the oil sector?

   (a) Yes (b) No

5) If the answer above is yes, would you please identify these advantages?
6) How can Saudi Arabia sustain this competitive advantage?
7) If the answer is no, what are the sources of the identified inefficiency in the sector which prevents competitive edge?
8) What difficulties, if any, are faced by Saudi Arabia's petrochemical industry?
9) How the above mentioned difficulties can be overcome?
10) What factors stand in the way of increased world oil production?
11) How can the factors stated above be dealt with?
12) Do you think increased petroleum production has resulted in increase in the petrochemical production?
13) How has the CET among the GCC countries impacted on Saudi's petrochemical exports?
14) What benefits does membership in the WTO confer on oil-producing countries? (Mention example(s) of (a) specific oil-exporting country)
15) What limitations does membership to WTO impose on Saudi's petrochemical industry? Please identify these in relation to legal, economic, financial and competitiveness issues.
16) Do you also believe that WTO conceded to give some concession to Saudi Arabia in relation to petrochemical industry?
17) If yes, what are these concessions and their consequences?
18) Will the concessions given by WTO strengthen Saudi Arabia's petrochemical industry? If so, to what extent?
19) Has accession to the WTO affected Saudi's petrochemical exports?

20) Would you please comment on the political and economic sources of the concession given by WTO to Saudi Arabia on petrochemical industry?
21) Is Saudi Arabia's current tariff schedule for petrochemicals self-limiting?
22) How will reduced tariffs affect Saudi's petrochemical industry?
23) What effect has Saudization had on Saudi Arabia's petrochemical industry
24) How has the Doha Trade Agreement affected Saudi's petrochemical industry?
25) How has the Chemical Tariff Harmonization agreement impacted on petroleum exports at a global level and what consequences it has for Saudi Arabian petrochemical industry?
26) What effect, if any, will the Kyoto protocol and other global emission reduction strategies have on Saudi's petrochemical industry?
27) What are the challenges faced by Saudi Arabia in producing natural gas?
28) How has diversification of the Saudi economy affected its petroleum industry and its production of petrochemicals?
29) Should availability of feedstock be a major concern to Saudi Arabia?
30) If yes, what makes it important?
31) Is there an overcapacity of petrochemical industries in the Middle East and if yes, what does this portend?
32) Does Saudi Arabia have the requisite manpower needed by the rapidly expanding petrochemical industry?
33) How is the increasing global demand for oil likely to affect Saudi's oil industry?
34) How the global demand for Saudi petrochemical production can be promoted?
35) What are the ingredients necessary for success in the petrochemicals industry?
36) How would you evaluate the role of government in promoting petrochemical industry and growth in its output?
37) What should the government do more to enhance production in the sector?
38) Do other petrochemical producers in the region and the world pose a serious competition to Saudi Arabian petrochemical production?
39) Do you think the current structure of the firms in the industry/sector is adequate enough to respond to the global challenges? If yes/or no, why?
40) Do you think related and supporting industries fulfil their role in supporting the petrochemical industry? If yes/or no, why?


تم بحمد الله