SELECT REVIEW OF LITERATURE AND METHODOLOGY

Introduction

Oil represents the great asset which provides the capital, which is crucial for economic development of underdeveloped countries. It is of particular importance to countries located in the Middle-East for whom oil is the economic life. Oil provides more than half of the world energy consumption and it has become the most important fuel of the industrialised countries. During 1960s one-third of western Europe's energy requirements were supplied by oil. The United States, which was importing about 20 per cent of the oil consumed, imported about 42 per cent by 1980. Western Europe depends on oil for 60 per cent of energy needs while Japan relies on oil
for 75 per cent of her energy requirements. Thus the world powers have found their oil interests in the Middle East, where around 52 per cent of the world's proven oil reserves exist.\(^1\)

The political and economic structure, and policies of the Middle East has been changed by oil and it dramatically influenced political alignments, both within the region and world's great powers. The strategic geographical location of the Middle East has made the region from ancient times the centre stage of conflict among nations and empires as they vied for control over the trade routes to the East. Soviet entry into the European market is incidental to the main forces eroding the monopoly position of the majors in maintaining market prices. It soon became clear to company executives that the 1957 price hike was not going to hold in the face to increased production. In February 1959, and again in August 1960, official or posted prices at the persian Gulf were cut to reflect the weakening market prices. The revenue of the producing states was directly tied to the posted price per barrel of crude multiplied by the

number of barrels produced. This created no problem as long as the posted price was more or less equivalent to the selling price. The financial interest of the countries only conflicted with the companies once the actual market price was less than the posted price on which the 50–50 profit split was calculated. By lowering the posted prices, the majors were able to pay less in taxes to the producing countries, thus making them pay for the erosion of monopoly profits in the European crude and product markets. The 1959 and 1960 price cuts were undertaken unilaterally by the companies, without consulting the governments involved. The five countries responsible for 80 per cent of the world's exports of oil, viz., Saudi Arabia, Iran, Iraq, Kuwait and Venezuela — met in Baghdad from 10 to 14th August 1960 and on 15th September these countries announced the establishment of the Organisation of Petroleum Exporting Countries (OPEC).

The important objectives of OPEC, laid down in the OPEC Statute, were (a) to co-ordinate and unify the petroleum policies of member countries and to safeguard their interests; (b) to devise ways and means of ensuring stable prices in the market; (c) to secure a steady income for the producing countries; (d) to ensure an
efficient, economic and regular supply of petroleum to consuming countries; and (e) to assure a fair return on their capital to those investing in the industry.\textsuperscript{2} However, these objectives had to be fought for. It took many years of painstaking effort and protracted and difficult negotiations to win the first concessions from the multinational oil companies that continued to control the oil industry in OPEC countries. And it was not until October 1973, that OPEC assumed the power to consider and set prices unilaterally for its oil resources. Determination, vision and solidarity were of vital importance to OPEC in those early formative years.

The early 1960s were characterised by a protracted campaign to gain recognition and credibility. The majors adopted various fictions to avoid giving the impression that they were aware of OPEC's existence. The first truly titanic struggle came over the issue of royalty which commenced after the Fourth Conference in June 1962. This was an attempt by OPEC to end the sleight-of-hand procedure in certain countries, whereby the major companies agreed to pay royalties on lifting, but were then able to offset the amounts against their tax liabilities in those countries,

\textsuperscript{2} Dr. Subrato, "OPEC - the First 30 Years and the Challenge ahead", \textit{OPEC Bulletin}, Vol.XXI, Sep., 1990, p. 10.
thus effectively cancelling them out. Over the decade, various OPEC member countries were gradually able to move towards a kind of common interpretation and insistence on the principle that taxes and royalties should be calculated on the basis of posted rather than realised prices. Thus the 1960s marked the beginning of the end of the majors with decisive ability to play off one producer country against another. The fact that there were no new cuts in the posted price of oil in the 1960s despite the soft market conditions created by over-production, is another measure of OPEC's increasing weight in this struggle. A further achievement, although it was largely overlooked at the time, was the 'Declaratory Statement' of petroleum policy in member countries issued after 16th OPEC conference in Vienna, June 1968. This document spelt out the need for members to go into direct exploration and development of their hydro-carbon resources, wherever feasible. Governments of member states were urged to participate in the ownership of the concession holdings through equity arrangements. It was also decided that there should be progressive and accelerated relinquishment of acreage of existing concessions. And finally long before the warning signals of resource-depletion and environmental concerns were raised in the west, the state-
ment demanded that the oil companies should observe the best conservation practices, bearing in mind the long-term interests of the country concerned. This historic statement laid the foundations for the leadership, role, which the producing countries grouped within OPEC, were later to play in the direct exploitation of their resources.

While the 1960s was a period of struggle and consolidation for OPEC, the 1970s saw the organisation face some oil price shocks. World demand for crude had been growing at the rate of 10-11 per cent per year, with OPEC crude production providing an increasing proportion of this increased consumption. Thus, from 46 per cent of total world production in 1965, OPEC members' share in output has increased to over 50 per cent by 1970.\(^3\)

Demand was growing much faster than additions to reserves; the reserves-to-product-ratio in the OPEC area alone fell from 68:1 in 1960 to 48:1 in 1970.\(^4\) There were other signs of a coming supply shortage. The 'cushion' of spare capacity in the USA had virtually disappeared by the beginning of the decade. The beginning of conservation measures in some OPEC states as a consequence of the

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1968 Declaration also had an effect on supply. And yet despite the trend in fundamentals, which might have led to higher 'real' prices, the oil majors continued to try to keep the lid on prices paid to particular member countries, leading to a renewed erosion of the 'real' price received by those countries. This situation was generally aggravated by the continued erosion in the international value of the dollar, the currency in which all calculations were made. Thus, in 1972 and 1973, participation in the ownership of concessions began to be rivalled as an issue in OPEC conferences by compensation for the dollar's de-facto devaluation. Following the outbreak of the October 1973 war in the Middle East and the deep frustration in the region felt at the role of some western countries in the crisis, some persian Gulf producers introduced an embargo on oil exports to certain industrial countries. The resulting market tightness, accompanied by panic and speculative buying, drove spot prices to about $17 per barrel in cases. By January 1974, OPEC has raised the official price of oil to $11.65 per barrel.

The achievements of OPEC in the 1970s have important global implications. It was due to the price

5. Ibid., p.12.
increase of that time that the world started to become energy-conscious, aware of the fact that oil was a depletable and exhaustible resource, and needed to be differentiated from renewable products. In consequence, whereas the consumption of oil had grown by over 80 per cent between 1965 and 1973—the era of excessively cheap oil-production increased by only one per cent during the ten years between 1973 and 1983. Between 1974 and 1985, OPEC tried to act as price administrator, setting a fixed price for oil and playing the role of swing producer at the international level in order to defend the price structure.

The first half of the 1980s then saw OPEC struggle to defend its price structure and, in the process, losing market share in the face of an over-supplied market. OPEC was steadily relegated to the position of world residual supplier, especially following the arrival of North sea crudes in quantity and the re-emergence of Mexican oil in the late 1970s. This loss of market share and the attempt to shore up the price structure unilaterally, enabled non-OPEC producers gradually to displace OPEC by pumping to their maximum capacity and undercutting sufficiently to erode OPEC's customer base.
Thus from producing 51.5 per cent of total world crude oil in 1975, OPEC's share, by 1980 had dropped to 45 per cent. At the 76th conference in Geneva, it had no alternative but to abandon its role as price administrator and go all out to defend its market share. The result was the price collapse of 1986, when a barrel of crude oil could be bought for less than $10 for the first time in 12 years. All oil producers were severely affected by this developments.

OPEC countries have the ability to increase production capacity to the levels needed to satisfy predicted demand in the coming years. Subarato says, "Capital is scarce in our countries and they are in urgent need of fresh funds, not only to boost our production capacity, but also to help finance our efforts as developing countries to maintain a cleaner environment. Presently, this threatens to become an added burden on our fiscal resource which, however, creditable is likely to impose unfair constraints on our struggling economies". Any attempt to forecast supply and demand over the next ten years is bound to be fraught with uncertainty. OPEC member countries are understood to hold proven reserves of over 990

billion barrels of oil, that is, some 78 per cent of the world's total. Of the so-called non-communist world's total proven oil reserves of roughly 922 billion barrels, OPEC countries hold 84 per cent. The reserves-to-production ratio of OPEC countries now stands at more than 100 years. By the year 2000, that ratio will still be about 80 years. This contrasts sharply with the ratio in the rest of the world. Currently OPEC output stands at about 23 million barrels a day, although sustainable production capacity is closer to 29 million barrels. If the members of OPEC continue to build oil production capacity over the next decade, perhaps to 35 million barrels, then they will able to meet the rising expectations of the customers. Global demand for oil presently stands at 51.80 million barrels. Even excluding the potential energy needs of Eastern Europe, World wide demand for oil in 1995 will be around 54.83 million barrels, climbing to 56.67 million barrels in the year 2000. During this period it will be expected that non-OPEC oil supplies will decline from 27.27 million barrels at present to 27.07 million barrels in 1995 and then to 26.19 million barrels by the year 2000. Therefore, the call on OPEC oil, including natural gas liquids, will rise from the present figure of 24.53 million barrels to 27.76 million barrels in 1995 and 31.48 million barrels
early in the 21st century. This would imply that in less than 10 years from now, OPEC will be supplying more than half of the world's oil needs.

The past few months have brought into sharper relief the measure of interdependence which exists between oil and the world economy. The dramatic movements in the oil price triggered by recent events in the Middle East produced psychological reactions which point to the importance attached to the availability of oil in maintaining world economic stability. This is why OPEC was insisting that supply management will provide the key to stability in the oil markets in the 1990s. At least $120 billion will have to be invested by OPEC countries between now and 1995 in order to boost the collective production capacity to the level where the anticipated call on OPEC oil can be met. 7

In the 1990s, the major producers notably OPEC, may hesitate to force prices too high, given their awareness of the likelihood of consumer reaction in the form of import levies, product taxation and other measures to cut demand. Equally, a price collapse, as in 1986, is

painful to the non-OPEC oil and gas producers that the leaders such as the US are most likely to step in to defend their domestic industry. In this growing tacit mutual understanding between producers and consumers lies great hope that major price disruptions of 1973-74 and 1979-80 can be avoided in the 1990s.

Iran is an oil exporting country with huge oil reserves, large oil revenues and extensive capacity to absorb the newly gained capital. During early seventies, oil production in Iran has reached its capacity and in 1986 it stood at 3.4 million barrels. However, the demand for foreign exchange outplaced oil revenues. Until mid 60's Iran enjoyed the current account balance of payment surplus. By late 60's, it's balance of payments deficits have grown rapidly and they were met by increased foreign borrowings and advanced payments from oil companies operating in Iran. Incremental oil price adjustments between 1971 and 1973, temporarily relieved the balance of payments pressure. But the long-run problems continue to exist. The oil price increase of late 1972 and early 1974 improved Iran's long-run prospects. During early 70's, we notice a substantial increase in G.N.P., capital formation, imports and exports of non-oil goods.
In 1986, Iran's income has increased by 88 per cent mainly because of the expansion of oil revenues by about 20 per cent. Current and development expenditure also increased by 31 per cent. With regard to capital formation, we notice a substantial increase between 1950 and 1985. However, due to frequent shocks in oil prices and tension prevailed in the Gulf region Iranian economy has undergone substantial changes and had to face difficulties, especially the balance of payments problem, inflation, and budgetary problems.

In view of the recent thrust on international oil production and price adjustments and growing importance of OPEC, the literature on this subject is growing. A select review of literature on this subject is attempted in the following lines.

Select Review of Literature

Annual outlook for oil and Gas 1989 provides projections of crude oil and natural gas supply and prices through the year 2000 with focus on the US Markets. It discusses recent developments in the petroleum markets, emphasizing the dramatic changes in the price of these fields, the regulatory changes affecting natural gas
over the recent years, and the implications of these changes over the longer term. 8

Beredjick and Walde edited a book, 9 which includes current investment policies in the international petroleum industry, the structure of petroleum agreements, economic, legal and contractual issues of petroleum development, the legal status of oil companies, financing natural gas projects, gas clauses in petroleum arrangements, and incentives in recent petroleum contracts.

A collection of papers by Feinberg and French 10 analyses global trends in trade, capital and technology flows. It also contains country-specific studies which examine the particular conditions of Brazil, Peru and Costa Rica. Recommendations are offered for altering the shape of the international economy and for improving the economic management in Latin American Countries.


The study of International Energy Analysis Group\textsuperscript{11} reviews and evaluates the world oil market from the 1970s to date as well as other world events which have direct and indirect influence upon it. Evidence examined in this paper strongly suggests that world oil prices will not be as uncertain as in the past few years and that a firm upward trend to the year 2000 is expected.

European Petroleum Year Book 1989\textsuperscript{12} gives information on oil and gas fields in Western Europe, crude oil and natural gas in the North sea, West-European refineries and pipelines, European petroleum statistics in a world wide country by country comparison, and maps of oil and gas pipelines in the Soviet Union upto 1987.

The report entitled, Energy Policies and Programmes of IEA countries' presents an energy market which displays improvements in the efficient use of energy, surplus production for all major energy resources, low energy prices, and more competitive and transparent energy markets.


\textsuperscript{12} ANEP, European Petroleum Year Book 1989, Hausburg, 1989.
with decreasing government intervention. Energy forecast to 2000 A.D. and a review of energy policies are given for IEA countries as a whole and for each individual member country. 13

The report, "Proven Petroleum Reserves of 30 Large Energy Companies, 1980-87", has five statistical sections; petroleum reserves, production replacement rates, financial outlays, oil and gas finding costs, and economic returns. According to this report the US and overseas liquid reserves of the 30 companies increased in 1987, but their natural gas reserves dropped sharply and their petroleum replacement rates marked no improvement from the depressed 1986 level. 14

Koopman and others in their work examine the effects of rising oil prices on the international financial system and identify ways by which oil-importing countries can overcome the financial and adjustment problems caused by them. They project the long-term trend in real oil prices and present economic policy


options to help avoid future financial problems for industrialized and developing countries alike.\textsuperscript{15}

The report, "World Petroleum Markets : A Framework for Reliable Projections" summarises the principal factors that influence long-run conditions in the petroleum markets and presents a framework for projecting crude oil prices, based on leading economic indicators. The long-run future of the world oil market can be projected as a continuation of the cycles of expansion and contraction.\textsuperscript{16}

Horwich and Weimer in their work on International Oil Crisis, examine the emergency programmes of the International Energy Agency - The actual record of demand restraint, the likely effects of oil sharing, and the IEA guidelines for accumulating oil stocks and coordinating their drawdown. It is held that theoretical and empirical analysis of the world oil market during major disruptions are both supportive and critical of the IEA programmes.\textsuperscript{17}

\begin{itemize}
\item\textsuperscript{15} G. Koopman, K. Mathies and B. Reszat, \textit{Oil and the International economy : Lesson from ten price shocks}, Transaction Publishers, New York.
\end{itemize}
Pierre Terzian in his study reviews the current situation of foreign down-stream sector of seven OPEC countries, Viz., Abu Dhabi, Saudi Arabia, Kuwait, Libya, Venezuela, Iran and Iraq. He also examines their experiences and assesses the future prospects for investments by oil producing countries in the foreign downstream sector.18

The study by the Petroleum Finance Company summarizes the principal factors that influence long-run conditions in the petroleum markets and presents a framework for projecting crude oil prices, based on leading economic indicators. The long-run future of the world oil market can be projected as a continuation of the cycles of expansion and contraction.19

The 1988 edition of OPEC Annual statistical Bulletin lays bare the world oil and gas industry in considerable detail. A wealth of statistics provides essential information for all observers and analysts of the world's most strategic commodity, permitting observations to be drawn


about trends in hydrocarbon exploration, production, refining and distribution. 20

The report of the United States Department of Energy covers World Oil prices, production potential, refining capacity and consumption trends, and world energy consumption. The report emphasises on oil markets developments - particularly future world oil market. OPEC's oil pricing behaviour assumed in this report is based on historical relationships between price changes and the use of available oil production capacity. 21

John Roberts 22 examines the behaviour of the diverse collection of nations which are responsible for the oil production outside OPEC, the USA and the USSR. He analyses their efforts at acting collectively in open support of oil price stability and forecasts the future pattern of their cooperation with OPEC.

OPEC General Information and Chronology presents OPEC Fund's operations until the end of 1985, and the


relationships between OPEC and other international organisations. It also contains about the functioning of OPEC chronology from 1960 to the 1983. 23

The book entitled "Economic and Political Factors and Their Impact on Future OPEC Cohesion and Market Power" by Cyrus and others outlines OPEC countries, political and economic objectives and constraints, as well as possible future coalitions and conflicts. The conclusion presents the outlook for OPEC Cohesion and market power. 24

Annual Outlook for Oil and Gas 1990 provides projections of crude oil and natural gas supply, consumption and prices upto the year 2010, focussing on the US markets. It also discusses recent developments in the petroleum markets, emphasizing changes in the oil and gas industries - especially the role of the future market in the new environment - and the implications of these changes over the longer term. 25


Long Term World Energy Outlooked covers many issues relating to energy supply and demand, energy intensity, oil prices, coal, natural gas and oil production, and nuclear energy. It provides the background for a study on energy and the environment which will be published in the first quarter of 1990. The projections go up to the year 2005.  

The study entitled 'The Middle East to the year 2002' analyses the risks and opportunities which are likely to affect business and politics in the Middle East during the next 12 years. Emphasis is given to downstream investments, joint ventures, oil demand and supply, and natural gas. A review of regional groupings - the Arab Co-operation Council, the Arab Magherb Union, and the Gulf Cooperation Council - is provided.

The First Oil War; Implications of the Gulf Crisis for the Oil Market examines the behaviour of governments, companies and consumers, the prospect of reduction in oil consumption in the short-run through price and tax increases,


the scope for fuel switching away from oil, the inventory situation in the USA and the bottlenecks in oil refining.28

The book entitled "Free-World Oil and Energy Outlook" examines OPEC's production capacity and non-OPEC supplies. The consumption of coal, nuclear energy and natural gas will continue to rise, projections of energy consumption and economic activity to the year 2010 are provided.29

The study on "Oil Capacity Costs and Prices in the 1990's" examines oil price expectations for the 1990s, with the emphasis on OPEC capacity plans (1990), worldwide field development costs, and oil production costs in the Soviet Union (1975-85).30


SPE Hydrocarbon Economics and Evaluation Symposium \(^{32}\) discusses the valuation of oil reserves; OPEC production and crude prices in the 1990s; world oil supply and demand up to 1995, financing opportunities for oil companies; US gas supply outlook; and risk analysis in Hydrocarbon appraisals.

The Arab Press Service Conference on "Middle East Strategy to the Year 2003" examines the oil and gas reserves in the Middle East (1980-89), advances in reservoir appraisal, world gas to the year 2020, the Gulf Crisis and its global implications, the petrochemical business in the Pacific region, OPEC production capacity and investments in overseas operations. \(^{33}\)

According to Sarah Miller and Thomas Wallin's work entitled "The Complete Guide to Oil Price Swaps" \(^{34}\), which permit users to set a fixed price for oil, are the most prominent among the new financial tools in risk management that are reshaping the international oil industry.

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33. 4th APS Conference, Middle East Strategy to the Year 2003; Arab Press Service; Cyprus.

This report explains and assesses the working of oil swaps and other long-term specialised financial tools.

The study by Ibrahim identifies the OPEC member countries, with the developing countries of the world. Statistically, it demonstrates that, the aid provided by the OPEC countries, as a proportion of GNP far exceeds aid provided by the West. Historically, it traces the development of Arab aid, from the setting up of Kuwait fund and others aimed primarily at developing the resources of fellow Arab Countries, to its present impressive volume and scope. The author reviews the institutions. Through which Arab aid is channeled, in all their variety and complexity from relatively simple bilateral transactions, through corporate Arab aid organisations, to the highly complex, international bank an monetary foundations. The author also deals with the problems of control over investment. In sum, the study shows, how the OPEC member countries conceive and attempt to fulfil the responsibility to the third world.

The major objective of the study by Abdulazizal Sowayegh is to evaluate the role and significance of oil

power as used by the oil producing countries to achieve their political aims. The basic methodology and structure of the study are designed to provide a general framework within which to analyse the major forces and issues concerning oil power. In order to do so, the study deals with the international oil system by analysing the triangular interaction among three actors: the oil companies, the oil consuming countries and the oil producing countries. This study generally confines itself to the political aspects of oil power; technical, economic and geographic considerations will be treated only as they relate to the primary issue under examination.

V.P. Chitale and Nas M. Roy, in their study on petro dollars, have examined three fundamental issues which are of interest to a developing country like India. (a) Appraisal of the accumulation and disposal of oil money with the organisation of petroleum Exporting Countries (OPEC) over the next decade in the light of recent trends in energy markets, (2) Examination of possibilities of recycling petro-dollars for the development economy and stability of the international monetary system, and (3) Evaluation of India's opportunities in exploiting trade, investment and aid potential of this region as a result of oil bonanza. 37

37. V.P. Chitale and Mrs. M. Roy, Petro-Dollars, Economic and Scientific Research Foundation, New Delhi, 1976.
The book edited by Walid Sharif, "The Arab Gulf and Japan. Prospects for Co-operation" deals with the concept of oil security supply within the context of the current state of the world oil market and in the light of the producers' and consumers' interests, the issue of development assistance, development training, the general economics of petrochemical industries, and wider perspective of cooperation between the two regions. 38

The studies reviewed above examine the world oil production, demand, supply, price variations, the problems of oil producing countries in respect of adjustments etc. Different authors have examined the issues from different angles and from the point of different countries. Studies pertaining to specific countries and specific organisations (OPEC) are of great-significance. The present study attempts to examine the issue of oil production and other aspects with reference to OPEC in general and Iran in particular.

Objectives

The present study aims at

1. reviewing world's oil problem in terms of production, demand, price adjustments and their effects;
2. examining the objectives, progress and structure of OPEC; and
3. analysing the problems and prospects of Iranian oil industry.

Source of Data

The study made use of secondary data drawn from various international publications. They include the publications of the World Bank like World Development Reports, World Bank Annual Reports and World Economic Outlook, the publications of International Monetary Fund, such as, International Financial Statistics, IMF staff Papers, Finance and Development etc., and the publications of OPEC such as OPEC bulletin, Facts and Figures, OPEC annual statistical bulletin, etc. Further the publications of individual scholars are also made use of in the present study.

Analysis

Linear growth rates have been computed to study the long-run trends in the growth of production, demand, proven Reserves, revenue, spending oil imports, GDP, population and capital formation, using the following equations.
\[ Y = a + bx \]
where \( Y \) = Index numbers of oil production/demand/proven reserves/revenue/spending/imports/GDP/capital formations.
\( X \) = Time
\( a \) and \( b \) are constants.
For testing the significance of linear growth rate, t-test of the following form is employed.
\[
t = b \times (n-2) \frac{(x_i - x)^2}{(y_i - Y)^2}
\]
where \( b = \frac{(x_i - \overline{x})(y_i - \overline{y})}{(x_i - \overline{x})^2} \)

**Scope and Limitations of the Study**

The study confines to world oil economy in general and Iranian oil economy in particular. The discussion is limited to production, demand and price movements relating to oil. However, the study has not probed into the factors affecting production and demand for oil and oil price shocks in detail. With regard to OPEC, the genesis, objectives, structure and progress of OPEC are analysed. The problems and prospects of OPEC have not been dealt with in detail. Though the study refers to Iranian economy the discussion is confined to oil industry and its implications for imports, exports and debt.
problems of the country. Other sectors of the Iranian economy, such as agriculture, industry and service sectors have not been covered in detail.

Chapter Scheme

The study is organised into six chapters. In chapter one, World's oil economy has been examined in terms of production, demand, trends in oil prices, factor affecting oil price variations, current account balances of oil exporting and importing countries, and investment of petro-dollars. The design, select review of literature and methodology of the study have been discussed in Chapter two. Chapter three and four are concerned with OPEC. The genesis, objectives, organisation, progress and structure of OPEC and investment of OPEC fund have been discussed in these chapters. Chapter five is concerned with Iranian oil economy. Iran's imports and exports, Iranian oil industry, oil revenues, balance of payments and other development indicators form the subject matter of this chapter. Summary of findings is presented in Chapter six.