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**CONTENTS**

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	<b>SUSTAINABILITY IN GREEN RETAILING: ACHIEVEMENTS, CHALLENGES, AND A VISION FOR THE FUTURE</b> <i>DR. GIRISH.K.NAIR, HARISH K NAIR &amp; SWATI PRASAD</i>	1
2.	<b>CAUSES AND EFFECTS OF RURAL-URBAN MIGRATION IN OYO STATE: A CASE STUDY OF IBADAN METROPOLIS</b> <i>OSHATI TITILOLA, ESAN, ADESIJI DAVID &amp; DR. ADU, EMMANUEL OLUSOLA</i>	6
3.	<b>ORGANIZATIONAL TEACHING AS STRATEGIC PLAN</b> <i>DR. NASSER FEGH-HI FARAHMAND</i>	10
4.	<b>CORPORATE GOVERNANCE PRACTICES IN FIS OF BANGLADESH</b> <i>MOZAFFAR ALAM CHOWDHURY</i>	17
5.	<b>MAJOR PROBLEMS AND ISSUES IN SRI LANKAN UNIVERSITY SYSTEM – STUDY FOCUS ON THE STUDENT PERSPECTIVE</b> <i>W.M.R.B.WEERASOORIYA</i>	22
6.	<b>A DIVERSIFIED APPROACH OF FACE DETECTION AND RECOGNITION</b> <i>KALIYAPERUMAL KARTHIKEYAN, DR. MUNGAMURU NIRMALA &amp; SREEDHAR APPALABATLA</i>	27
7.	<b>IMPROVING THE SOCIAL DISABILITIES OF PRIMARY SCHOOL STUDENTS</b> <i>MATEBE TAFERE</i>	32
8.	<b>RELATIONAL SOCIAL CAPITAL AND CUSTOMER LOYALTY IN RETAIL BANKING IN KENYA: THE CASE OF NAKURU COUNTY</b> <i>DR. DANIEL ONWONGA AUKA &amp; JOSEPH BOSIRE</i>	36
9.	<b>JOB INVOLVEMENT AS A MEDIATOR OF THE RELATIONSHIP BETWEEN ORGANIZATIONAL COMMITMENT AND JOB PERFORMANCE IN THE SYSTEMICALLY IMPORTANT BANKS IN SRI LANKA</b> <i>U.W.M.R. SAMPATH KAPPAGODA</i>	44
10.	<b>A STUDY ON EXISTING CAR CUSTOMERS (ALL BRANDS) ON THEIR REPLACEMENT PLANS</b> <i>S. SHRILATHA &amp; DR. A. ARULAPPAN</i>	49
11.	<b>EVALUATION OF RESOURCE MOBILIZED THROUGH MUTUAL FUNDS IN INDIA</b> <i>DR. RAM SINGH, PALLAVI MANIK &amp; ANUBHUTI MODGIL</i>	54
12.	<b>EMOTIONAL LITERACY – TEACHERS AND STUDENTS IN SELF-FINANCING ENGINEERING COLLEGES WITH SPECIAL REFERENCE TO TIRUCHIRAPALLI DISTRICT</b> <i>K. ARUN PRASAD &amp; DR. S.V. DEVANATHAN</i>	59
13.	<b>AN OVERVIEW MODEL ON THE BUSINESS ENVIRONMENT AND GROWTH CHALLENGES OF SMEs IN INDIA</b> <i>VENKATARAMAN.KK</i>	65
14.	<b>MEASUREMENT OF FINANCIAL PERFORMANCE OF KURUKSHETRA CENTRAL CO-OPERATIVE BANK THROUGH RATIO ANALYSIS</b> <i>DR. SUDESH &amp; ARCHANA MAKKAR</i>	68
15.	<b>PERFORMANCE OF DISTRICT CENTRAL CO-OPERATIVE BANKS (DCCBs) IN INDIA - AN EVALUATION</b> <i>S. USHA &amp; C. SIVARAMI REDDY</i>	73
16.	<b>A STUDY ON ECONOMIC RETURNS IN POULTRY FARMING WITH SPECIAL REFERENCE TO SUGUNA BROILER CONTRACT FARMS IN COIMBATORE DISTRICT</b> <i>A. SRIDHARAN &amp; DR. R. SARAVANAN</i>	76
17.	<b>DEVELOPMENT OF KNOWLEDGE BASED FRAMEWORK FOR AGRICULTURE SECTOR: A STEP TOWARDS SUSTAINABLE e-GOVERNANCE IN RURAL INDIA</b> <i>ALPANA UPADHYAY &amp; DR. C. K. KUMBHARANA</i>	80
18.	<b>HEALTH INSURANCE STRUCTURE IN INDIA – CURRENT PRACTICES AND CHALLENGES</b> <i>DR. SHIBU JOHN</i>	86
19.	<b>A STUDY ON THE CUSTOMERS SUCCESS ON THEIR INVESTMENTS IN A RESIDENTIAL FLAT AND THEIR GUARANTEE</b> <i>DR. P. RAMAN</i>	89
20.	<b>THEORETICAL COMPARISON CRITERIA FOR SOFTWARE RELIABILITY MODELS</b> <i>SANJEEV KUMAR &amp; DR. AMIT GUPTA</i>	92
21.	<b>INVESTIGATING SERVICE QUALITY DIMENSIONS THROUGH EXPLORATORY FACTOR ANALYSIS IN A HEALTHCARE SETTING</b> <i>DR. MUSHTAQ AHMAD BHAT &amp; DR. MOHD. YASEEN MALIK</i>	95
22.	<b>WORKING CAPITAL MANAGEMENT OF MICRO, SMALL AND MEDIUM ENTERPRISES (MSMEs) IN MANIPUR- AN EMPIRICAL STUDY</b> <i>MOIRANGTHEM BIREN SINGH &amp; DR. TEJMANI SINGH</i>	104
23.	<b>PERFORMANCE ANALYSIS OF AODV PROTOCOL UNDER BLACK HOLE ATTACK</b> <i>MONIKA SINGH &amp; RAKESH KUMAR SINGH</i>	109
24.	<b>21ST CENTURY ADS- ADDS MORE</b> <i>ASHISH RAMI &amp; PRIYANKA SRIVASTAVA</i>	116
25.	<b>CORPORATE RESTRUCTURING THROUGH MERGERS AND ACQUISITIONS-A CASE STUDY ON TATA STEEL AND CORUS</b> <i>NARGIS BEGUM &amp; EVELINA MOHAPATRA</i>	121
26.	<b>CLOUD COMPUTING: SMARTER COMPUTING FOR A SMARTER WORLD</b> <i>DR. IKVINDERPAL SINGH</i>	128
27.	<b>SATISFACTION OF SMALL CAR OWNERS IN SELECT AREAS OF AUNDH, BANER AND PASHAN IN PUNE CITY</b> <i>DR. G. SYAMALA</i>	133
28.	<b>CRM: SERVICE QUALITY &amp; CUSTOMER LOYALTY - A STUDY OF MOBILE TELECOM INDUSTRY AT JAIPUR CITY</b> <i>DR. ANJU PANWAR, SHUCHI MATHUR &amp; NEHA CHAHAL</i>	138
29.	<b>TOUGH TIME FOR INDIAN TEA INDUSTRY</b> <i>KAKALI HAZARIKA</i>	141
30.	<b>IMPACT OF OPEC ON SUPPLY AND PRICE OF PETROLEUM PRODUCTS</b> <i>GAURAV MANOJ JHA</i>	146
	<b>REQUEST FOR FEEDBACK</b>	155

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**IMPACT OF OPEC ON SUPPLY AND PRICE OF PETROLEUM PRODUCTS**

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**GOA**

**ABSTRACT**

Petroleum products form the backbone of our modern civilisation and OPEC is arguably the world's most important organization when considering crude oil supply price stability. The members of OPEC are countries which have some of the largest oil reserves and ever since its formation in 1960s, OPEC has been a very important player in the crude oil market. This study aims to ascertain the impact of OPEC on the supply of oil and global imports and its effect of oil price stability. Historical data of world oil prices before and after the formation of OPEC have been compared and analysed considering the world and OPEC oil supply and reserves. Proportions of world imports from OPEC have also been discussed and the reasons for price shocks and fluctuations over the years have been analysed with greater emphasis on the role of OPEC in particular. This study confirms the fact that OPEC wields a heavy influence on the supply and price of petroleum products. Though there have been new oil well discoveries in Venezuela and Brazil and technological developments have enabled extraction of huge shale oil reserves in US and Canada, these reserves will take several years to develop in an economically viable manner and hence, for the foreseeable future, OPEC will continue to remain the most important organization in the crude oil market.

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**KEYWORDS**

OPEC, Crude Oil Price Volatility, Cartel, Supply of Crude Oil.

**INTRODUCTION**



The Organization of Petroleum Exporting Countries (OPEC) is an organization consisting of the world's major oil-exporting nations which was founded in 1960 to coordinate the petroleum policies of its members, and to provide member states with technical and economic aid. OPEC is a cartel that aims to manage the supply of oil in an effort to set the price of oil on the world market, in order to avoid fluctuations that might affect the economies of both producing and purchasing countries.

OPEC membership is open to any country that is a substantial exporter of oil and that shares the ideals of the organization. As of 2011, OPEC had 12 member countries, including founder members Iran, Iraq, Kuwait and Venezuela.

**OPEC's Mission**

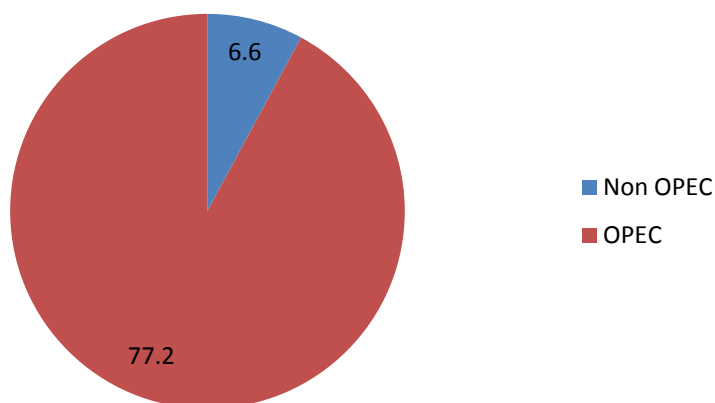
- To coordinate and unify the petroleum policies of its Member Countries
- Efficient, economic and regular supply of petroleum to consumers
- Fair return on capital for those investing in the petroleum industry
- Steady income to producers
- Stabilization of oil markets

**BACKGROUND OF STUDY**

**IMPORTANCE OF OPEC**

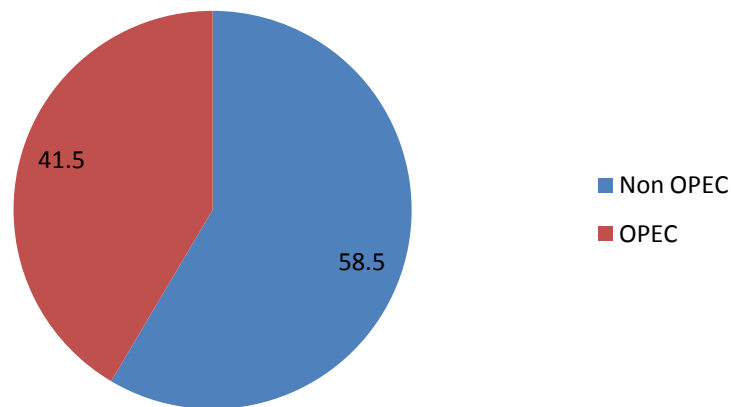
OPEC holds an immensely important position in the world oil market, because of its massive share of oil reserves and production as shown in Figure 1 and Figure 2 below.

**FIGURE 1: PERCENTAGE OF OIL RESERVES**



Source: BP Statistical Review of World Energy

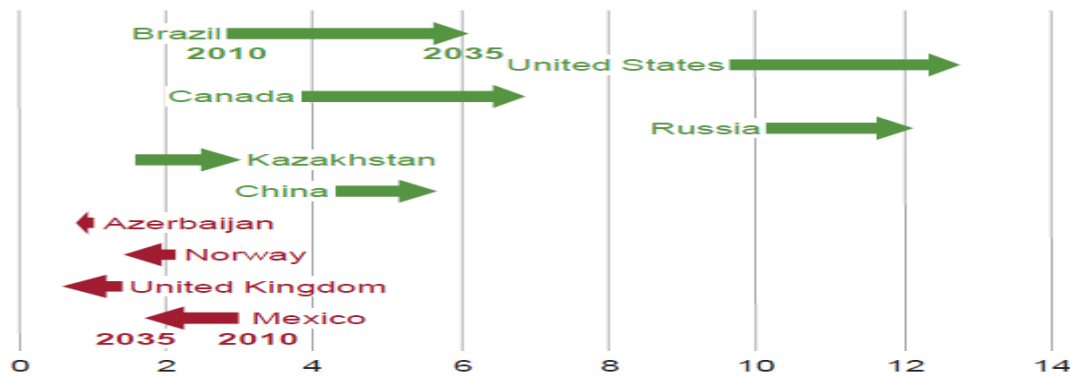
FIGURE 2: PERCENTAGE OF OIL PRODUCTION



Source: BP Statistical Review of World Energy

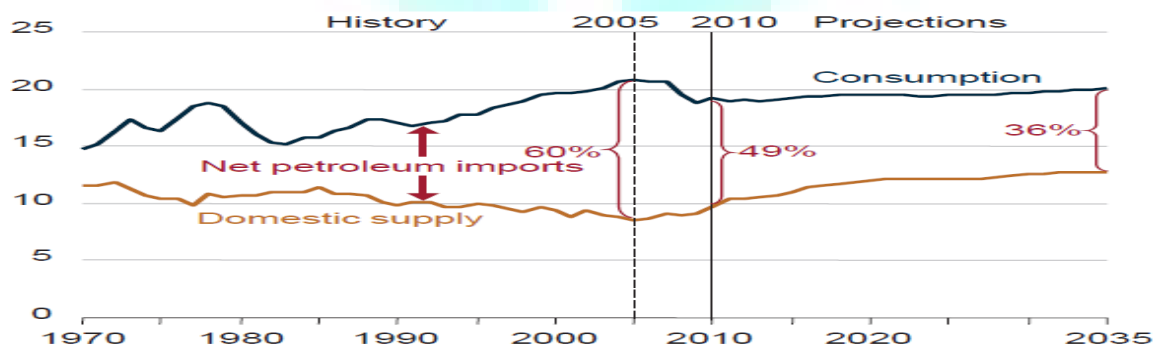
Over the past few years, as shown in Figure 3 and Figure 4 below, there has been an increase in the exploitable oil reserves of US (the largest consumer of oil), Canada and Brazil due to technological innovations. But the commercially viable extraction of these reserves will still take a few decades. And hence, even now, and for a considerable time in the foreseeable future, OPEC will remain dominant.

FIGURE 3: CHANGE IN OIL PRODUCTION FOR TOP NON-OPEC COUNTRIES.



Source: Energy Information Administration

FIGURE 4: US OIL CONSUMPTION AND SUPPLY



Source: Energy Information Administration

**STATEMENT OF THE PROBLEM**

This study aims at scrutinising the impact that OPEC has had on supply and price of petroleum products.

**OBJECTIVES**

- To study the impact on the supply of oil and global imports
- To ascertain the impact of OPEC on the world oil prices
- Analysis with respect to world imports
- Research the estimates of future oil production by Non-OPEC countries

**RESEARCH METHODOLOGY**

The period of study that has been taken into consideration is 1910 to 2011. This is because OPEC started its operations in 1960s. We have also taken a few years prior to the formation of OPEC to have a more holistic analysis. The data and information for analysis have been collected from –

- British Petroleum Global Energy Outlook Report



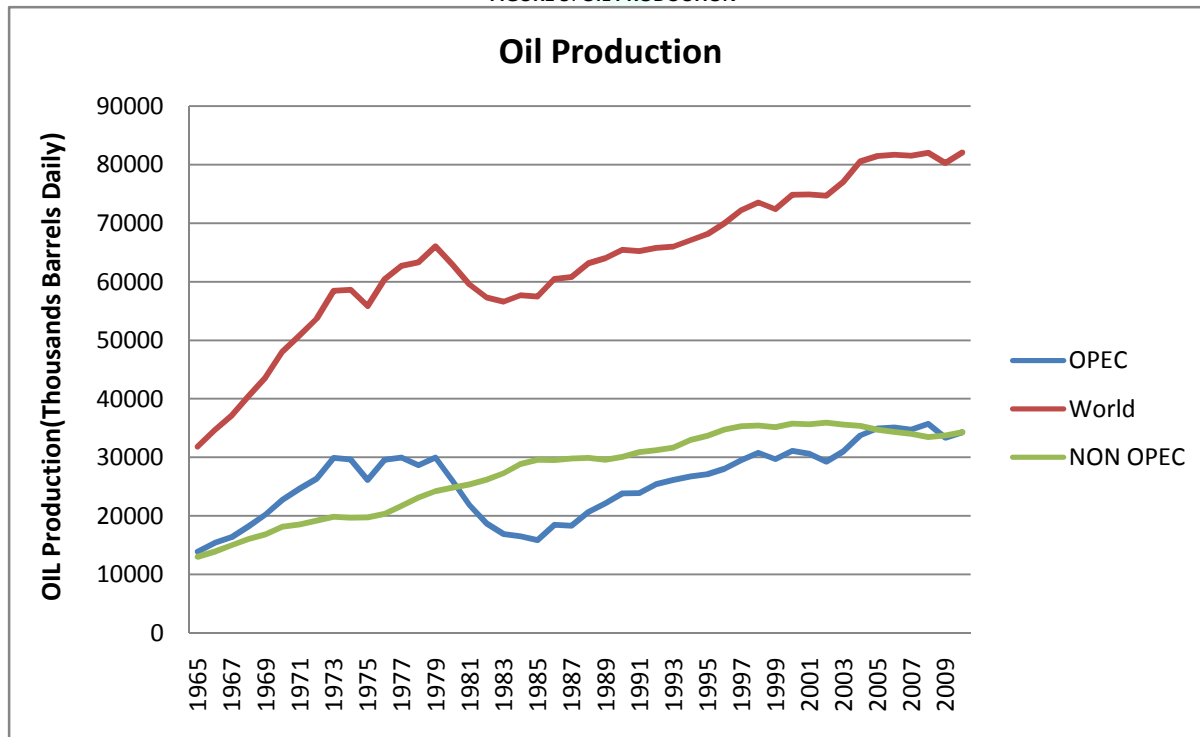
- Energy Information Administration
  - OPEC website
- Analysis has been done by –
- Comparison of historical data of world oil prices across the years, before and after the formation of OPEC
  - Comparison of world and OPEC oil supply and reserves
  - Studying the proportions of world imports from OPEC

**RESULTS, DISCUSSION AND FINDINGS**

**IMPACT OF OPEC CRUDE OIL PRODUCTION ON WORLD PRODUCTION**

The following graph (Figure 5) shows the total world, OPEC and Non OPEC crude oil production from the period 1965-2010. It can be easily seen that the world oil production trend has simply followed the OPEC oil production trend. The OPEC produced an average of 40.97 % of world oil and thus had a significant impact on world oil production. Non-OPEC nations produced an average of 43.24% of world oil over the period.

FIGURE 5: OIL PRODUCTION

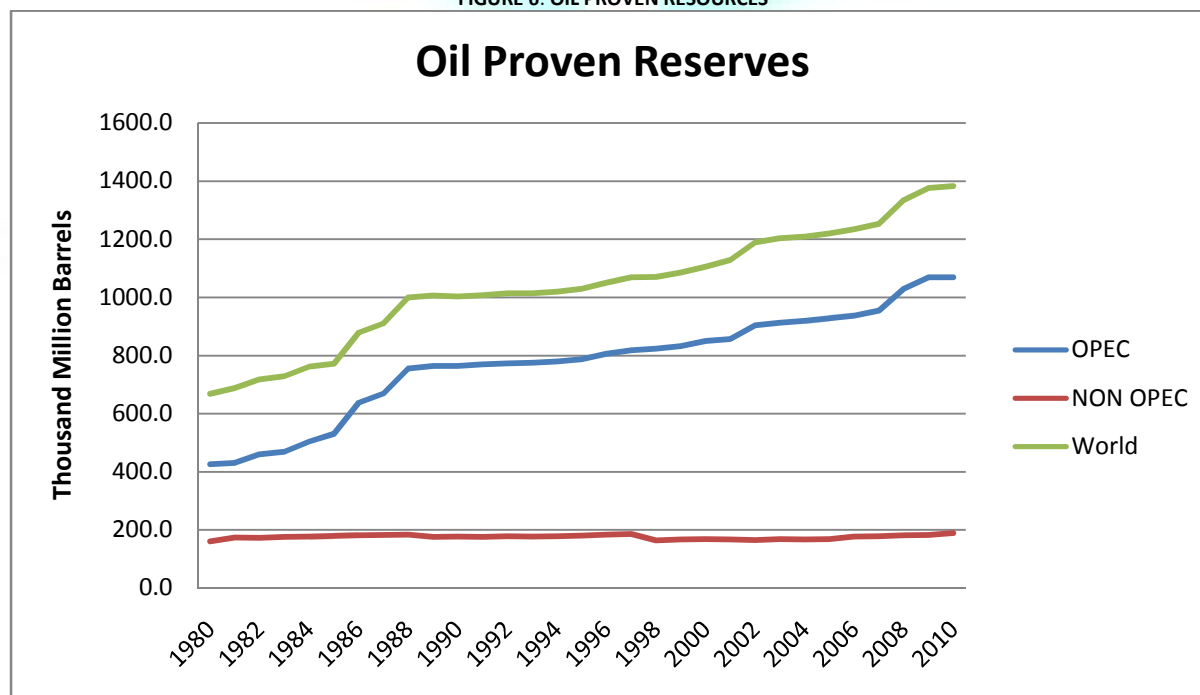


Source: BP Statistical Review of World Energy June 2011

**PROVEN RESERVES IN WORLD, OPEC AND NON OPEC NATIONS**

Analysis of the data clearly indicates that around 73.9% of the world oil reserves are with the OPEC nations and around 17.57% with the NON OPEC nations. The following graph (Figure 6) plots the total proved reserves of oil in OPEC, NON OPEC and World over the period 1980-2009.

FIGURE 6: OIL PROVEN RESOURCES



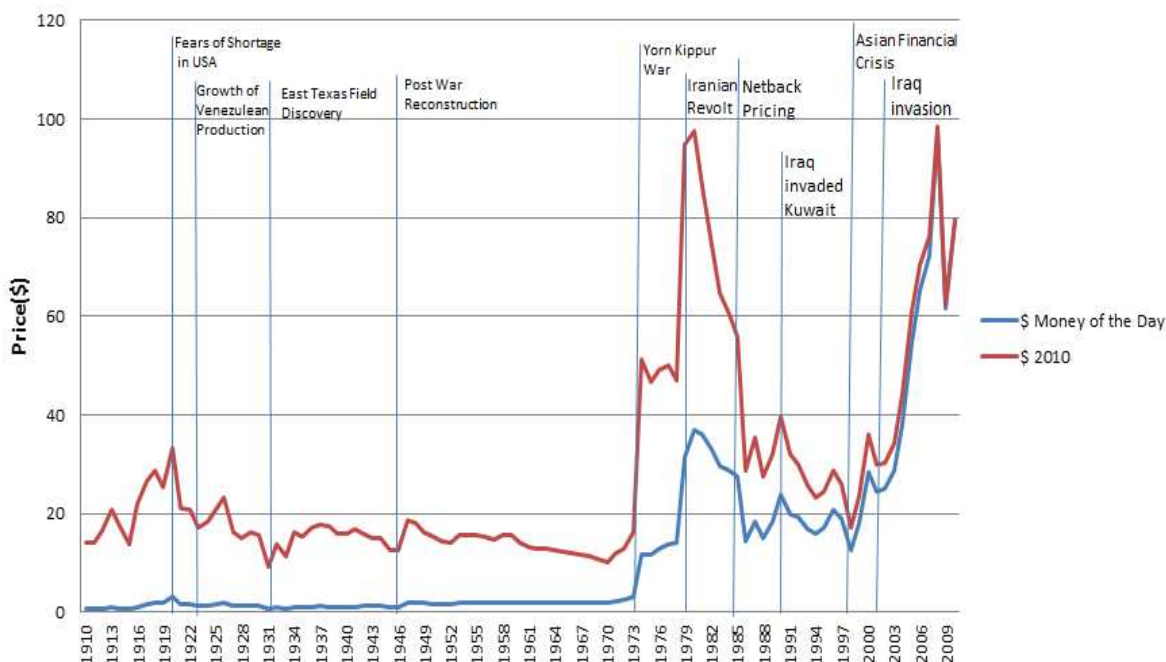
Source: BP Statistical Review of World Energy June 2011

As the OPEC had an average of 73.9% of total world oil reserves since 1980, world oil reserves almost follow a similar trend as OPEC oil reserves. Analysis of graphs in Figure 5 and Figure 6 clearly shows that OPEC has formed a cartel and influenced oil supply. OPEC nations had around 73.9% of oil reserves but produced only 40.97% of world production while NON OPEC nations had only around 17.57 % of world oil reserves but produced more than the OPEC nations around 43.24% of world production. This clearly indicated that OPEC nations have restricted production to influence world oil prices.

**IMPACT OF OPEC ON WORLD CRUDE OIL PRICES**

The graph in Figure 7 shows the historical trend in world crude oil prices over the period 1910-2010 both in terms of dollar prices in 2010 and prevailing dollar prices on the day analysed in the past. In the past century, world crude oil prices have been highly volatile especially after the 1970s.

**FIGURE 7: WORLD CRUDE OIL PRICES 1910 - 2010**



Source: BP Statistical Review of World Energy June 2011

Prior to the formation of OPEC in 1960, world oil prices saw small fluctuations due to factors such as shortage fears, new field discoveries or world wars as depicted in Figure 7. However, after the formation of OPEC in 1960, world oil prices mainly depended on factors affecting production in OPEC nations.

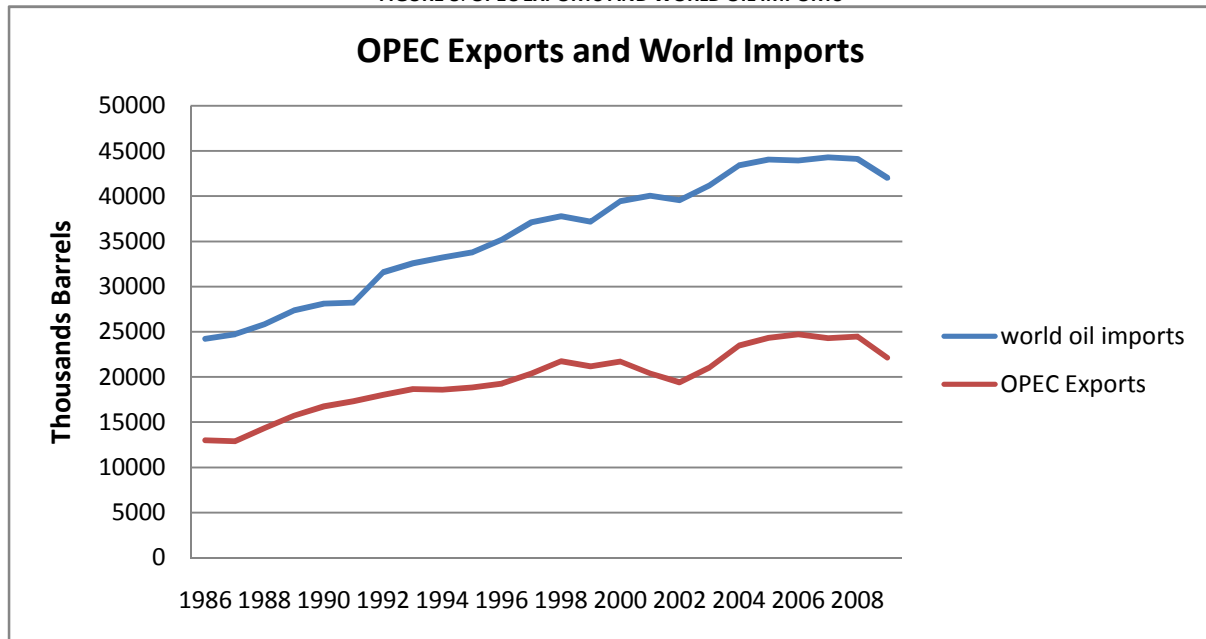
**POST-OPEC PERIOD ANALYSIS**

- 1) Yom Kippur War: On October 5, 1973, Syria and Egypt attacked Israel to which US and many western countries extended support to Israel. In reaction to this several Arab exporting nations joined Iran and imposed an embargo on the countries supporting Israel. Production was curtailed by 5 million barrels leading to a quadruple rise in crude oil prices from \$3.50 in 1972 to \$12.00 in 1974.
- 2) Iranian Revolution: The Iranian Revolution in 1978-79 resulted in the loss of 2-2.5 million barrels per day of oil significantly affecting world crude oil prices. This was followed by Iraq's invasion on Iran in September 1980. Combined oil production of both the countries fell around by 6.5 million barrels as compared to last year. As a result of the above mentioned two events, nominal crude oil prices went from \$14 in 1978 to \$35 per barrel in 1981.
- 3) Reduced Demand: Surging prices in 1979-80 led to several changes in the global scenario such as improved energy efficiency in industrial processes and automobiles. Such factors along with global recession led to a fall in OPEC oil demand leading to a fall in prices. Higher prices also promoted production in Non OPEC by 6 million barrels per day. This led to a dramatic fall in world crude oil prices from \$36.83 in 1980 to \$14.43 per barrel in 1986.
- 4) Invasion of Kuwait & Gulf War: Following Iraqi invasion of Kuwait on August 2, 1990, the world crude oil prices saw a spike which lasted only for 9 months. But after the success of military operations against Iraq led by US, prices began to fall as uncertainty regarding long term supply reduced.
- 5) Asian Financial Crisis: Due to the economic crisis in Asia in 1997, growth in Asian economies slowed down and Asian oil consumption declined accompanied by increased production from OPEC leading to fall in crude oil prices and reduction in production quotas by OPEC.
- 6) Invasion of Iraq- In 2003, US invaded Iraq which led a loss in producing capacity of Iraq. This led to an increase in crude oil prices. Also around 2004-05, world economies were growing and hence demand increased leading to further rise in crude oil prices.
- 7) Global Recession : The global recession in the late 2000's led to a reduction in demand of crude oil which led to a continuous fall in crude oil prices from \$97.26 in 2008 to \$61.67 in 2009.

**IMPACT OF OPEC EXPORTS ON WORLD OIL IMPORTS**

The following graph in Figure 8 analyses the impact of OPEC exports on world oil imports over the period 1986-2009. OPEC contributed around 55.17% of world imports over this period.

**FIGURE 8: OPEC EXPORTS AND WORLD OIL IMPORTS**



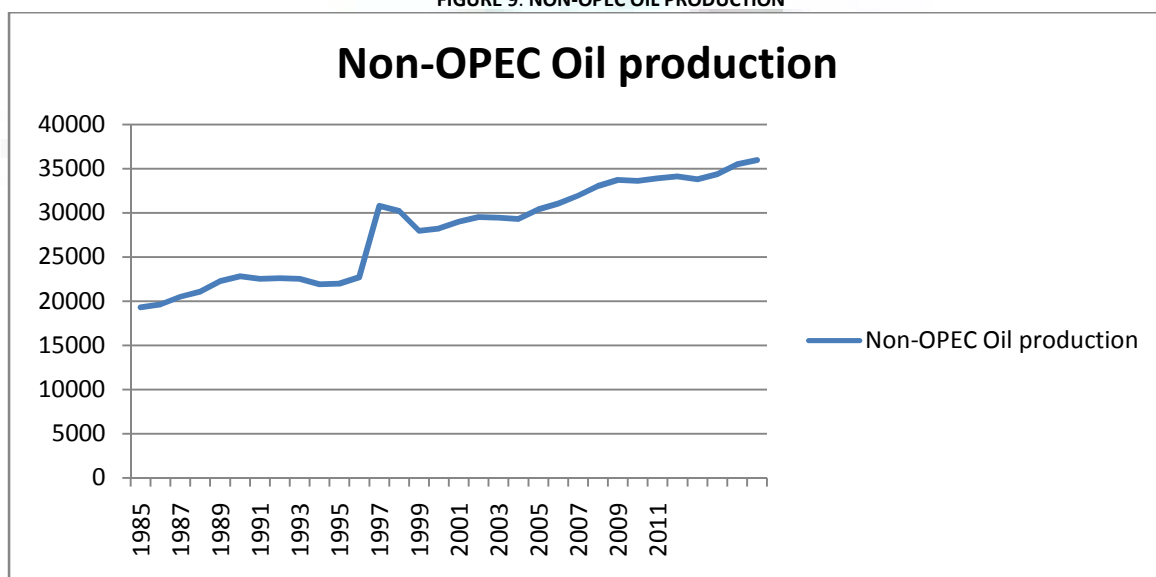
Source: BP Statistical Review of World Energy 2011

It can be easily concluded that world oil imports follow a similar trend as that of OPEC exports and thus, import of crude oil depends heavily on OPEC exports and supply.

**CONCLUSIONS**

- 1) As can be seen from the World Crude Oil prices analysis, after formation of OPEC there has been a lot of fluctuations in Crude Oil prices as compared to the initial period.  
The Oil Embargo of 1973 clearly shows how members of OPEC curtailed flow of crude oil to the United States and other western countries that supported Israel in the war and cut down the production by five million barrels per day. The extreme sensitivity of prices to supply shortages became all too apparent when prices increased 400 percent in six short months.  
Also the Iranian revolution and the subsequent invasion of Iran by Iraq led to the combined production of both countries just a million barrels per day. The loss of production from the combined effects of the Iranian revolution and the Iraq-Iran War caused crude oil prices to more than double. The price of crude oil spiked again in 1990 with the lower production, uncertainty associated with the Iraqi invasion of Kuwait and the ensuing Gulf War.  
All these incidents clearly show the influence and control of OPEC to affect world crude oil prices and hence OPEC has a strong hold to control oil prices.
- 2) Another fact that significantly strengthens the OPEC's position is the fact that among the entire world's oil producing countries only OPEC nations have a significant spare oil production capacity. They can expand oil production when demand increases. OPEC member countries respond to market fundamentals and forecast developments by co-coordinating their petroleum policies. If demand grows or some producers are producing less oil, OPEC can increase its oil production in order to prevent a sudden rise in prices. It can also reduce production in response to market conditions.
- 3) OPEC's ability to control the price of oil has diminished somewhat since the Gulf War due to the subsequent discovery and development of large oil reserves in Alaska, the North Sea, Canada, the Gulf of Mexico, the opening up of Russia, and market modernization.

**FIGURE 9: NON-OPEC OIL PRODUCTION**

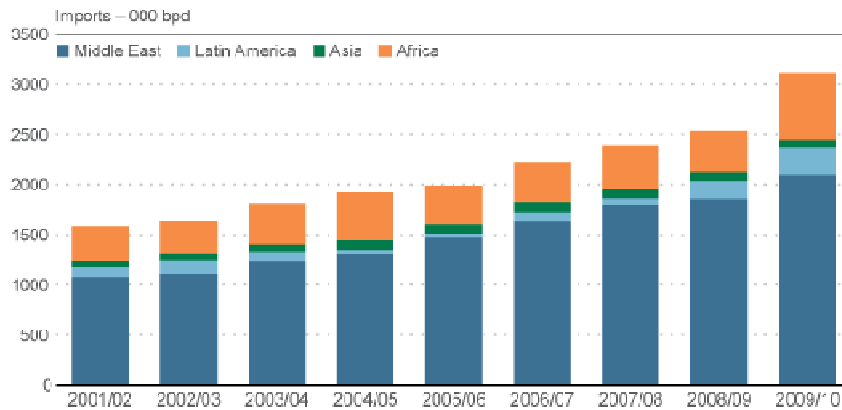


Source: Energy Information Administration

The Non-OPEC Oil production graph clearly depicts the increase in Non-OPEC Oil production around 1996 which somewhat reduced the hold of OPEC to influence Oil prices.

- 4) The Import Scenario of India clearly shows that India is heavily dependent on OPEC on its oil imports and hence any fluctuation in supply from OPEC is likely to affect India.

**FIGURE 10: INDIA'S DEPENDENCE ON DIFFERENT REGIONS FOR CRUDE OIL**



Source: Reuters

- 5) Prices are fore-casted to rise due to global economic recovery (leading to increased oil demand), and slower growth in non-OPEC oil supply and continuous production restraint by members of OPEC.
- 6) US oil production expected to increase tremendously because of extraction from shale – primarily from Bakken Fields (North Dakota) – 503 billion and underground reserves at Rocky Mountains (2 trillion) which will make it the country with highest reserves. This has been possible because of technological progress, which has enabled economical extraction of shale oil.

A part of the Williston Fields of North Dakota is in Canada and the production is expected to undergo a huge increase by 2015. Canada will become the largest source of US oil imports.

Brazil has found new reserves. This will bring it among the top 6 in terms of production over the next 4-5 years. Brazil will also benefit from the massive oil reserves recently discovered in Venezuela and Colombia.

So it is expected that OPEC will lose their hold to the United States on Oil prices when sufficient technology to extract shale oil is developed in the future.

#### LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The study does not take into account the recent oil well discoveries in Venezuela and Brazil and the impact of the development of new technology which enables economically viable extraction of shale oil. This has led to a tremendous increase in extractable oil reserves of US and Canada and is likely to have a very significant impact on the world scenario in the years to come depending on how quickly the technology can be implemented successfully.

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## APPENDIX

## APPENDIX 1: OIL PRODUCTION (THOUSAND BARRELS DAILY)

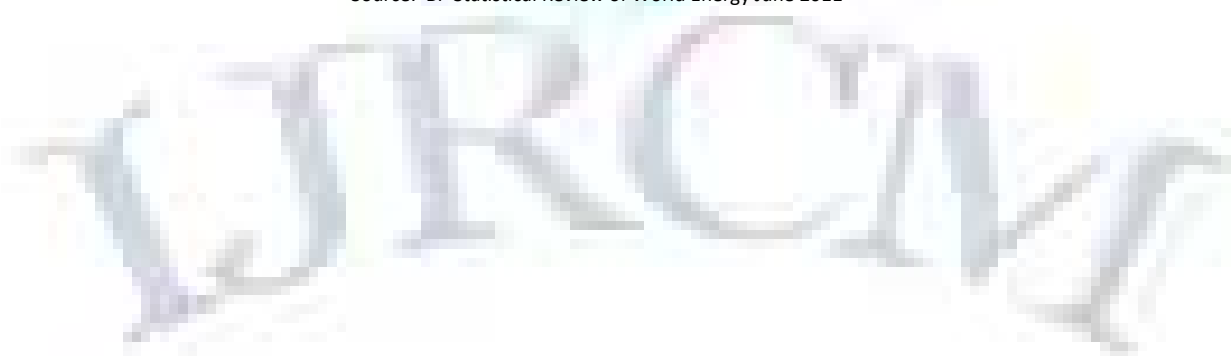
A	B	C	D	E	F
Year	OPEC	NON OPEC	World	OPEC % of World Production	NON OPEC % of World Production
1965	13922	13027	31806	43.77004162	40.95705688
1966	15381	13888	34571	44.49201031	40.17149911
1967	16381	14978	37121	44.12900357	40.34860455
1968	18250	16021	40438	45.13091928	39.61836461
1969	20243	16826	43635	46.39104711	38.561454
1970	22762	18175	48064	47.35840897	37.81382485
1971	24702	19533	50846	48.5817873	36.45043397
1972	26393	19211	53668	49.17820156	35.79583663
1973	29932	19868	58465	51.19690133	33.98334219
1974	29667	19681	58618	50.61096335	33.57417514
1975	26181	19729	55826	46.89715558	35.34067418
1976	29590	20357	60412	48.97962035	33.69675631
1977	29983	21721	62714	47.80943132	34.63481818
1978	28677	23125	63332	45.28031536	36.51295769
1979	30011	24235	66050	45.43571775	36.69095037
1980	26028	24804	62948	41.34842999	39.40333555
1981	21895	25379	59535	36.77734568	42.62920865
1982	18756	26213	57298	32.73324494	45.74814183
1983	16943	27252	56599	29.93546864	48.14991203
1984	16535	28854	57686	28.66354862	50.01989349
1985	15871	29561	57472	27.61530543	51.43487384
1986	18517	29504	60463	30.62488917	48.79698724
1987	18351	29777	60784	30.19107477	48.9887972
1988	20678	29875	63154	32.74269264	47.30475197
1989	22180	29564	64042	34.63331945	46.1630807
1990	23857	30037	65460	36.44552627	45.88617573
1991	23904	30890	65268	36.62415429	47.32873639
1992	25428	31196	65774	38.65903698	47.42884771
1993	26181	31653	66028	39.65185733	47.93798093
1994	26780	32933	67104	39.9084451	49.07724762
1995	27161	33683	68141	39.85979918	49.43128962
1996	28083	34725	69978	40.13041619	49.62192703
1997	29560	35305	72238	40.91977918	48.87255446
1998	30801	35390	73583	41.85939416	48.09574583
1999	29718	35127	72397	41.04888726	48.51920767
2000	31145	35734	74893	41.58591962	47.71336245
2001	30640	35606	74906	40.90429245	47.53438427
2002	29261	35907	74700	39.17131368	48.0674687
2003	31020	35556	77075	40.24631403	46.13227768
2004	33776	35385	80568	41.92196469	43.91922608
2005	34951	34695	81485	42.89294079	42.57764754
2006	35098	34315	81229	42.94425634	41.98638368
2007	34757	33991	81544	42.62424699	41.68428748
2008	35722	33466	82015	43.55516427	40.80469966
2009	33365	33699	80278	41.56138771	41.97838552
<b>2010</b>	<b>34324</b>	<b>34287</b>	<b>82095</b>	<b>41.81050262</b>	<b>41.76470675</b>
Average				40.97461833	43.24244074

Source: BP Statistical Review of World Energy June 2011

## APPENDIX 2

OIL Proved Reserves (Thousand million Barrels)					
Year	OPEC	NON OPEC	World	OPEC % of World	NON OPEC % of World
1980	425.4	160.2	667.5	63.72166487	23.99420464
1981	429.3	173.3	687.6	62.43696219	25.20089857
1982	459.2	172.1	717.4	64.01327091	23.99086226
1983	467.8	175.6	728.3	64.2366212	24.11294613
1984	503.7	176.9	761.6	66.1328908	23.23166843
1985	529.8	178.8	771.3	68.68803871	23.18466845
1986	636.7	180.6	878.0	72.51516116	20.57105156
1987	668.6	181.9	910.0	73.4739634	19.98764207
1988	755.0	183.1	999.0	75.5736457	18.32832296
1989	763.2	175.8	1006.4	75.83648932	17.4721516
1990	763.4	176.5	1003.2	76.09774736	17.59318947
1991	769.0	175.5	1007.6	76.32487025	17.41638458
1992	772.7	177.8	1013.3	76.25114066	17.54903003
1993	774.9	176.8	1014.3	76.40038401	17.42891615
1994	778.9	178.3	1019.5	76.39885641	17.48484581
1995	786.6	180.3	1029.0	76.44398997	17.51900225
1996	805.0	183.7	1050.6	76.62197255	17.48757773
1997	817.5	185.3	1069.3	76.45068132	17.32779348
1998	823.1	163.3	1069.6	76.95370542	15.26878404
1999	831.9	166.4	1085.0	76.67874591	15.33498511
2000	849.7	168.2	1104.9	76.89997057	15.21970414
2001	855.5	167.3	1129.0	75.78067533	14.81723664
2002	903.3	165.0	1189.6	75.93128576	13.87132136
2003	912.1	167.5	1203.2	75.80545676	13.92138089
2004	918.8	167.3	1209.3	75.9831997	13.83280333
2005	927.8	167.7	1219.7	76.06902676	13.75367385
2006	936.1	176.8	1234.1	75.85920165	14.32771438
2007	954.0	177.8	1253.5	76.10490399	14.18768403
2008	1028.8	181.1	1334.6	77.08742014	13.57150348
2009	1068.6	182.6	1376.6	77.63072576	13.26182395
2010	1068.4	188.7	1383.2	77.23975155	13.64248599
Average	773.7	175.2	1036.3	73.92394904	17.57716959

Source: BP Statistical Review of World Energy June 2011





## APPENDIX 3

Thousands Barrels per day			
Year	World Oil imports	OPEC Oil Exports	% of world imports
1986	24240.88409	12987.83393	53.57821885
1987	24729.34309	12898.29095	52.15783898
1988	25850.89592	14351.17264	55.51518479
1989	27390.80751	15733.18336	57.43964779
1990	28148.34882	16761.47216	59.54691079
1991	28231.43541	17306.48708	61.30218612
1992	31613.7253	18047.23092	57.08669494
1993	32588.48611	18677.31237	57.31261129
1994	33243.02639	18596.08067	55.93979457
1995	33784.07012	18832.96132	55.74509304
1996	35214.05019	19263.22478	54.70323543
1997	37143.2551	20382.82068	54.87623695
1998	37788.58725	21742.04982	57.53602186
1999	37189.62452	21187.0246	56.97025682
2000	39449.66817	21709.9646	55.03205884
2001	40060.41257	20401.44708	50.92670238
2002	39561.42454	19419.10476	49.08595933
2003	41200.06192	21037.29119	51.06130964
2004	43444.09945	23468.68893	54.02042907
2005	44071.66674	24325.72116	55.19582752
2006	43975.50758	24720.65344	56.2145949
2007	44313.87451	24302.356	54.8414154
2008	44124.41602	24475.308	55.46885423
2009	42044.5472	22130.762	52.63646174
Average			55.17473105

Source: BP Statistical Review of World Energy June 2011



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