

Econ 366

Fall 2012

The International Oil Market:

The Cartel Era

A brief history of oil markets

- 4 major phases preceded creation of OPEC
 1. Oil Rush in US (1859 – 1870)
 - rush to buy land (landowner owns underground resources)
 - large price swings as new discoveries made
 - refined products used mostly for lighting

A brief history of oil markets

2. Rockefeller Monopoly (1870 - 1911)

- Standard Oil gains control of refining and distribution side of the business
- At one point controlled over 90% of refineries
- Market power became eroded as
 - New discoveries made in other countries and in Texas
 - Changes in the laws / regulations (Sherman Anti-trust law)

A brief history of oil markets

3. Internationalization Era (1911 - 1928)

- Oil gains market share relative to coal; increase in fuel demand as automobiles become more popular; increase in industrial demand; military demand
- Strategic value of oil increases → state intervention (beginning of BP)
- Impacts of revolutions on investors
- development of price accords (see textbook for more details)

A brief history of oil markets

4. Seven Sisters Era (1928 - 1960)

- large reserves in Middle East; production in the area largely based on joint-operating agreements (with multinationals supplying 'know-how', well-developed distribution systems, etc)
- The major companies that dominated the oil sectors became known as the Seven Sisters*
- Venezuela becomes a major player
- Oil exporting countries claim larger shares of profits; exert sovereignty in terms of ownership of resources
- 50% of profits, plus lump-sum royalty for becomes 'industry norm'
- US becomes a net importer
- Note importers and exporters have different views regarding 'optimal' pricing

*Standard Oil Company of NJ, SOC of NY, SOC of CA, Texas Oil Company, Royal Dutch Shell, Anglo-Persian, Gulf Oil

The OPEC Era

- Established in Iraq in September 1960
 - Iran, Iraq, Kuwait, Saudi Arabia and Venezuela
- aim: fair share of profits and stable real revenues at a time when their production was increasing but real prices were falling
- Membership grew to 14, and is currently 12
 - Qatar (1961 -), Indonesia (1962-2009), Libya (1962 -), UAE (1967 -), Algeria (1969 -), Nigeria (1971 -), Ecuador (1973-), Gabon (1975 – 1995), Angola (2007 -)

OPEC Era: pre-1973

- Major developments:
 - Changes to tax systems to make them more favourable to the host country (by reducing tax deductions, increasing tax reference prices, etc)
 - Control of Production within OPEC (maximum export growth rates) from 1965-1967*
 - Movement towards nationalization (national oil companies, purchase of operating concessions, ...)
- *There are incentives within a cartel to cheat on quotas (standard micro theory)

OPEC Era: 1973-1975

- Major developments:
 - October 1973: oil embargo against US, Holland, Portugal and South Africa
 - Cut production by 25%
 - Price rises from \$3.01 per barrel to \$5.12 and continued to rise to \$12 by the end of 1974 (referred to by energy economists as ‘the first oil price shock’)
 - Nationalization of oil assets continues

OPEC Era: 1975-1981

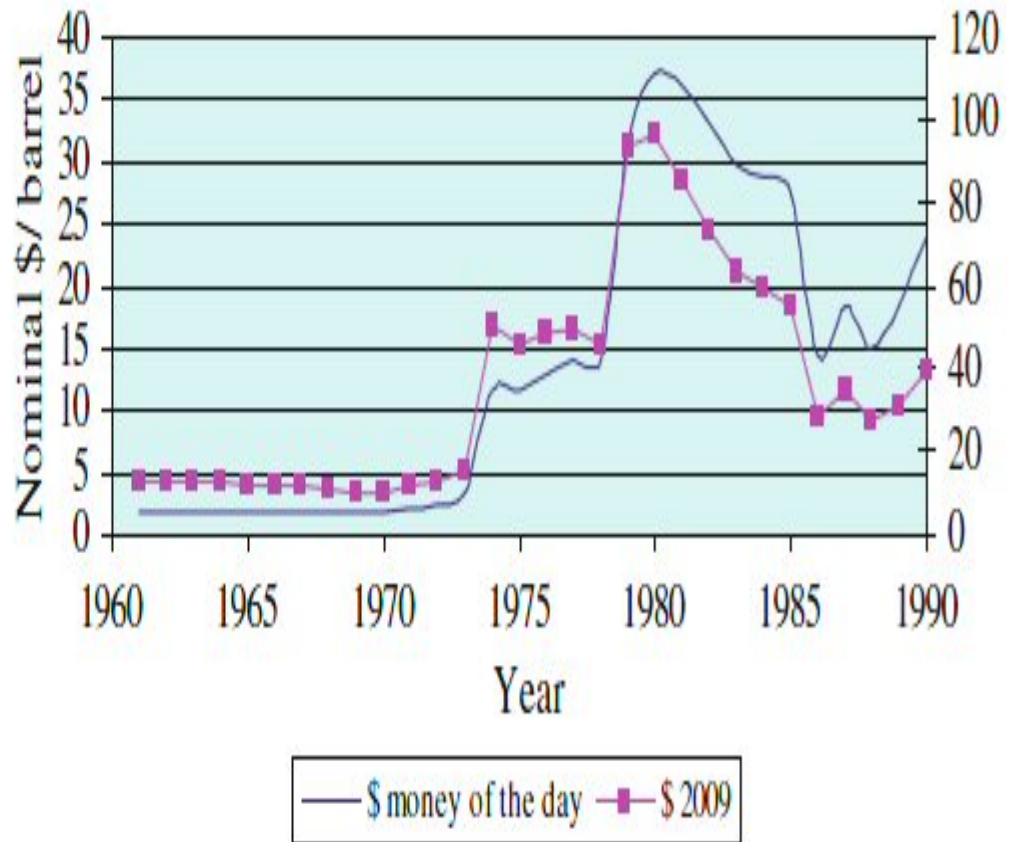
- Major developments:
 - OPEC policies aim towards demand stabilization through moderate pricing strategies
 - Short-lived dual official prices with Arab oil selling at a lower price than that of other member countries
 - Political events lead to production interruptions for some member countries
 - Prices rise to \$24 in 1979 then to \$32 in 1980 then to \$34 in 1981 (*Second Oil Price Shock*)
 - Official OPEC prices become substantially lower than market price → ¼ of OPEC oil sold in spot markets (cartel 'cheating')

OPEC Era: 1981-1986

- Major developments:
 - Reduced consumption in importing countries
 - OPEC share of market falls
 - Production cutbacks by Saudi Arabia followed by imposition of new quotas
 - Saudi Arabia acts as swing producer in attempt to stabilize prices
 - Price war begins, with prices falling to \$7 at one point

First (and Second) Oil Price Shock(s)

Fig. 14.7 Crude oil price between 1960 and 1990. *Data source* BP Statistical Review of Energy Statistics, 2010



Impact of Cartel on Actions of Others

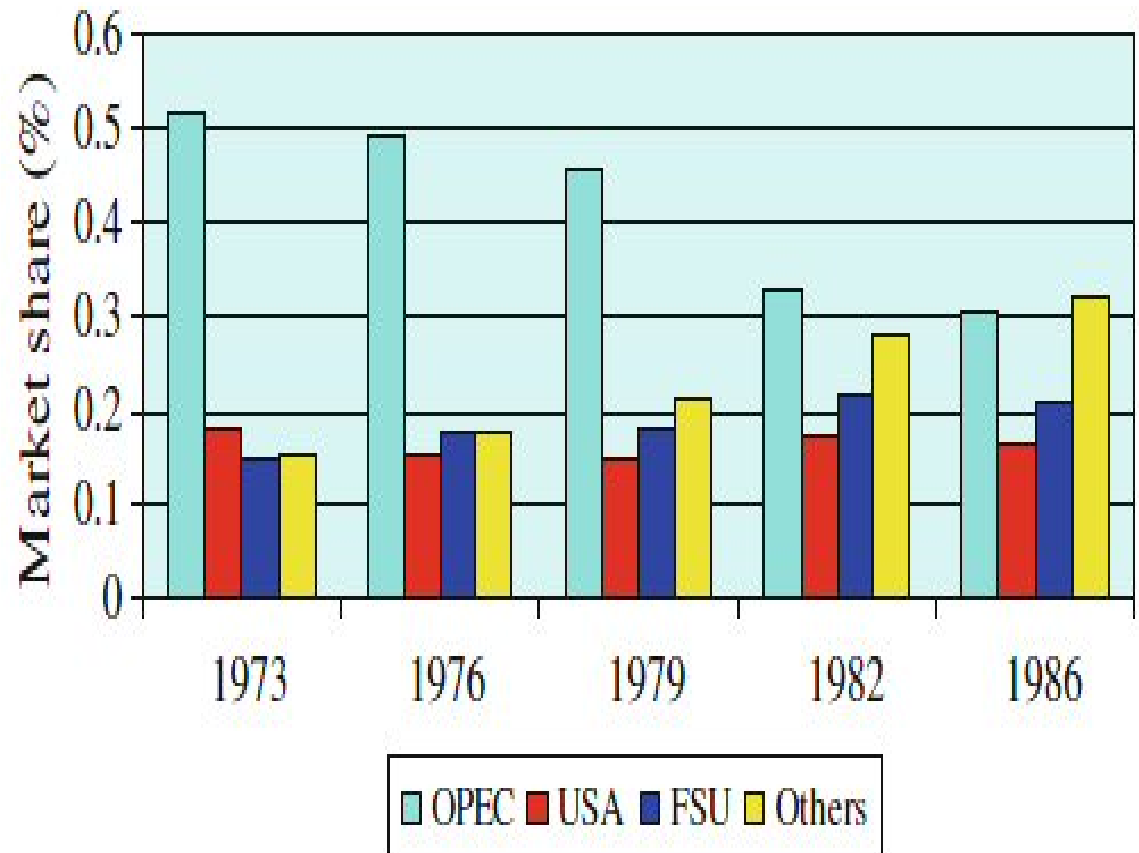
- During periods of price increases :
 1. Fuel-switching and demand management initiatives in many oil-importing countries
 2. Increased exploration for oil in non-OPEC countries due to higher expected returns for a deposit of with given geological / quality characteristics
 3. Increased R&D for the development of alternative energy sources [again, higher prices improve the expected profitability of non-conventional sources]

(1) and (3) → decrease in the share of oil in the primary energy mix

(2) → decrease in OPEC's share of total oil production

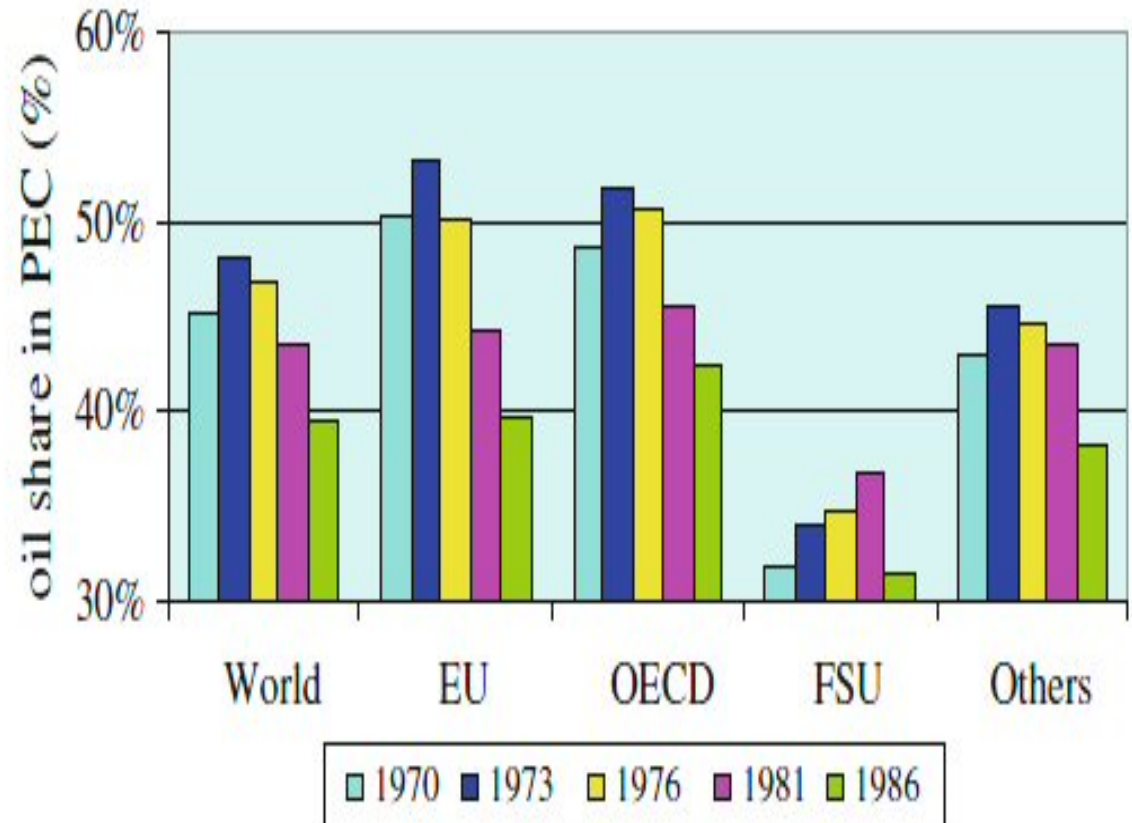
OPEC Market Shares

Fig. 14.6 Declining OPEC share between two oil price shocks. *Data source* BP Statistical Review of Energy Statistics, 2010



Fuel Switching and the Importance of Oil

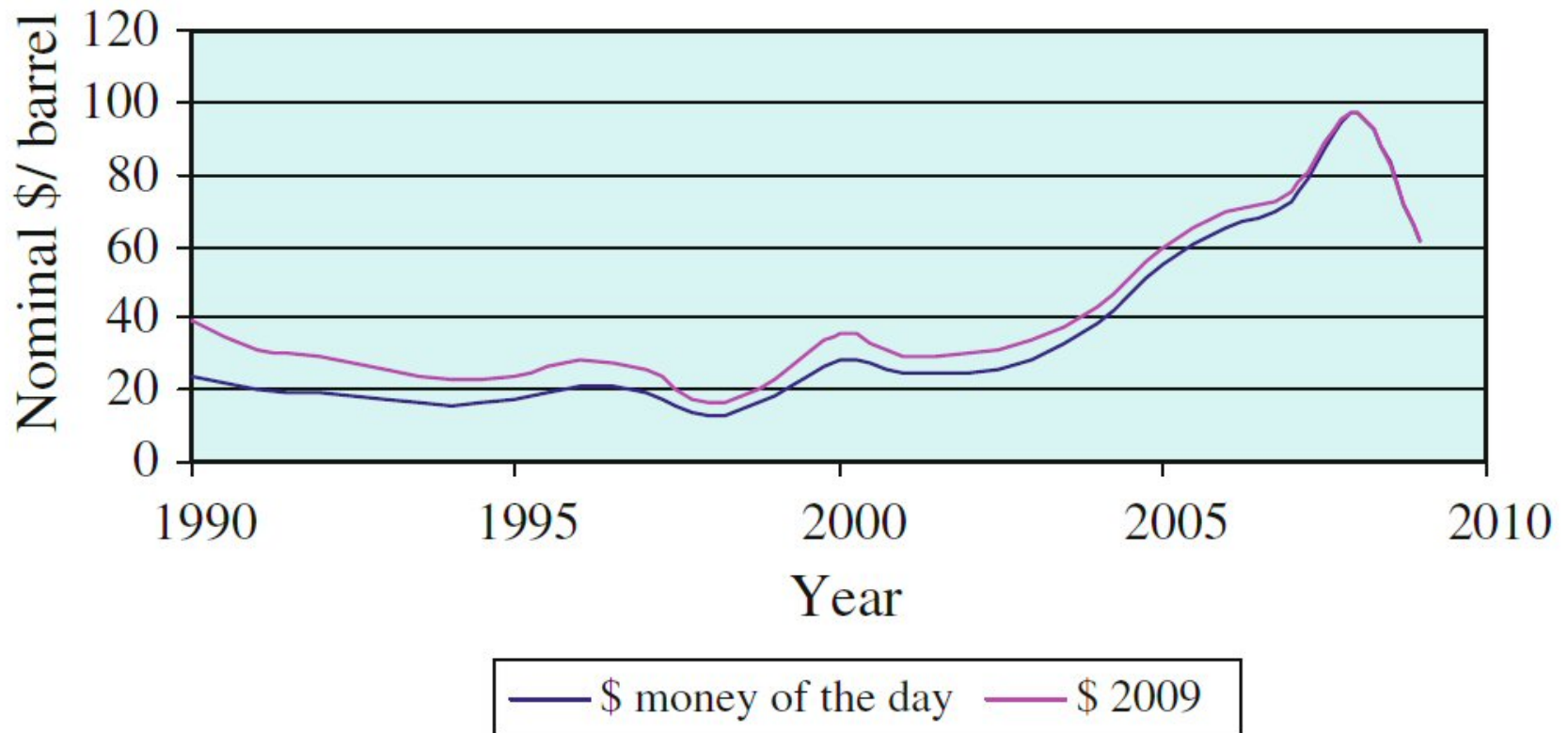
Fig. 14.8 Declining importance of oil in the primary energy mix. *Data source* BP Statistical Review of Energy Statistics, 2010



OPEC Era: 1990s

- Strategies implemented to reduce oil demand / increase non-OPEC reserves contribute to a glut in the market starting in the late 1980s
- Glut → price falls → affects profitability of (i) high cost (including non-conventional) reserves and (ii) alternative technologies
 - (i) lower oil prices lead to lower revenues
 - (ii) lower oil prices mean that consumers generally prefer the low-cost oil to higher cost alternative energy sources
- Other events include movements to market economies in former Soviet Union, war in Iraq, economic crisis in Asia
 - further shocks to oil markets, many of them reducing demand and prices
- OPEC uses quota / supply adjustments to keep prices from falling even further

Oil Prices: 1990s and beyond (Figure 14.10)



Monthly WTI prices: 1986 to 2012

- <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M>

Cushing, OK WTI Spot Price FOB

Dollars per Barrel



OPEC Era: recent

- Return to 'generally higher' prices
- Growth in demand in developing countries
 - 1999 to 2009:
 - demand doubled in China
 - demand increased by 50% in India
 - 2000 to 2009:
 - share of developing economies in total oil demand increased from 33% to 42%
- Capacity disruptions due to weather, labour disputes (Venezuela), political events (Iraq, Nigeria)
- Speculators involved in oil trading
- Financial crisis leads to collapse of prices
- OPEC reactions:
 - during high price periods, little spare capacity → limited ability to stabilize prices;
 - Recession → increased spare capacity → increased ability to influence prices

OPEC Era: recent (October 2011)

- Venezuela proposes OPEC alternative amidst political conflicts and quota problems
- Excerpt #1
 - Venezuela's President Hugo Chávez told Igor Sechin, Deputy Prime Minister of Russia, and Sergei Shmatko, Russian Minister of Energy, that he has a "modest proposal, one of those ideas that you launch: the creation of a new organization in this emerging new world of oil giants. We are no more than four or five (oil superpowers), among them Russia and Venezuela. It is an issue (that is worth) to comment and discuss."
- Excerpt #2
 - Venezuelan Minister of Energy and Petroleum Rafael Ramírez ... said that "countries that produced over their quota have to lower production before talking about any other issue. Some people do not comply with OPEC's decision. They should to stick to oil quotas with discipline."
- Excerpts are quotations from

<http://www.eluniversal.com/economia/111008/chavez-proposes-new-oil-exporter-group-parallel-to-opec>

OPEC: recent

- High volatility in prices (→ increased incentive to hedge)
- Recent highs and lows:
 - Nominal average monthly price for WTI reached \$133.88 / barrel in May 2008; by Feb 2009 the price had fallen to \$39.09

<http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M>

- Nominal daily price for WTI hit a high of \$145.31 on 07/03/08, fell to \$30.28 on 12/23/08, haven't been above \$100 since May 2012

[http://www.eia.gov/dnav/pet/xls/PET PRI SPT S1 D.xls](http://www.eia.gov/dnav/pet/xls/PET_PRI_SPT_S1_D.xls))

Other Developments in Oil Markets

- Movement from long-term contracts to spot trading by the mid-1980s
- Introduction of futures contracts in the early 1980s
 - More details to come when we talk about hedging

General Economic Models of Cartels

- Cartel: group of producers who collude with each other in order to act like a monopoly
- Possible structures could include
 - Group becomes one legal entity that makes decisions then splits profits among ‘members’
 - Market-sharing agreements (quotas)
- Incentives to cheat for individual members → may be unstable → need for an enforcement mechanism (such as a large low cost producer who can ‘punish’ cheaters by bringing prices down)

Theoretical Models of Oil Cartels

- Theoretical models of oil cartels usually try to incorporate (one or more of) a variety of ‘real world’ aspects:
 - A group of firms/countries (the cartel) who try to act, to the extent that they are able to, as a monopoly (dominant firm)
 - Cartel members may want to maximize profits OR may want to achieve target revenues for development / social programs
 - A group of firms/countries who have oil reserves but do not belong to the cartel (competitive fringe)
 - A group of firms who are willing to supply a renewable or non-conventional backstop when prices become sufficiently high (limit pricing models)
 - A group of countries investing in R&D to develop a backstop more quickly
 - ‘Contracts’ among agents are not enforceable by law as agents are not all in the same jurisdiction

Target Revenue Models

- It has been proposed that OPEC members don't want to maximize profits in the traditional sense. They may instead be aiming at target revenues.
- Each member has a set of projects / programs (possibly ranked according to rates of return) that it wishes to pursue and finance through its oil revenues
- If there are more (less) viable projects that a member wishes to pursue than can be funded with the member's current quota, then the country will cheat (underproduce)