

Outline

EE475: Natural Resources Economics

Some issues on Energy, market and public policies

10th April 2015
by
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- Effects of price ceiling: Case of Natural Gas in the U.S.
- Problem of Monopoly and Cartel in Oil market
- Fossil Fuels: National Security Considerations

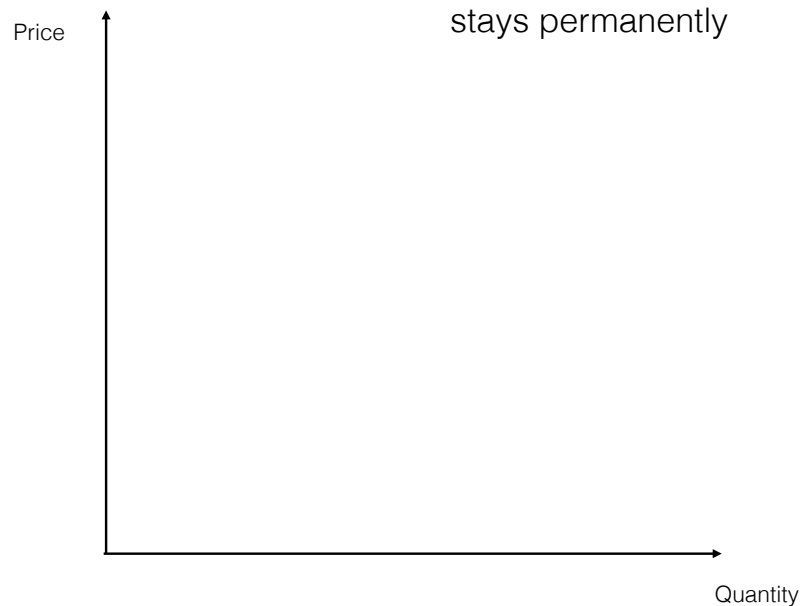
Price Ceiling

- During 1974-1975, the US. experienced serious shortages in natural gas.
 - Customers who had contracted for and were willing to pay for the natural gas were unable to get as much as they wanted.
 - The shortages were amounted to TWO TRILLION cubic feet of natural gas (10 percent of marketed production in 1975).
 - What happened?

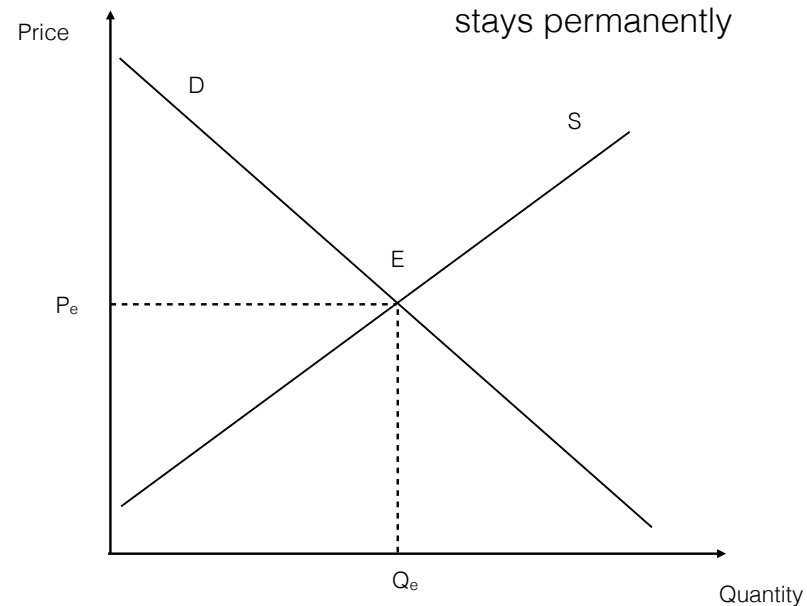
Price Ceiling

- The problem was the price control (Price ceiling).
 - The authority wanted to maintain a 'just' price on natural gas. They did two things.
 - Extending the price control regulation to **producers**. Previously the control was limited to pipeline companies.
 - Interim ceiling price remained in effect for too long (a decade) before an appropriate 'just' price.

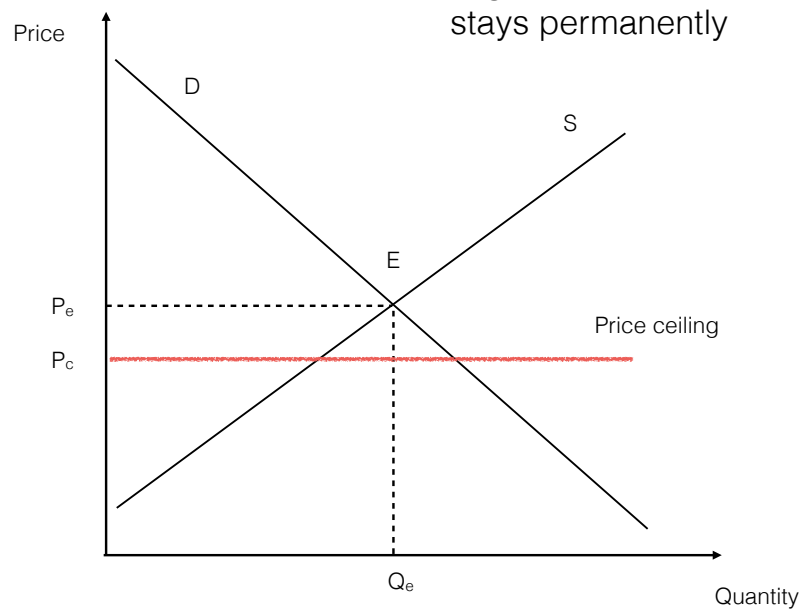
Assuming that the price ceiling
stays permanently



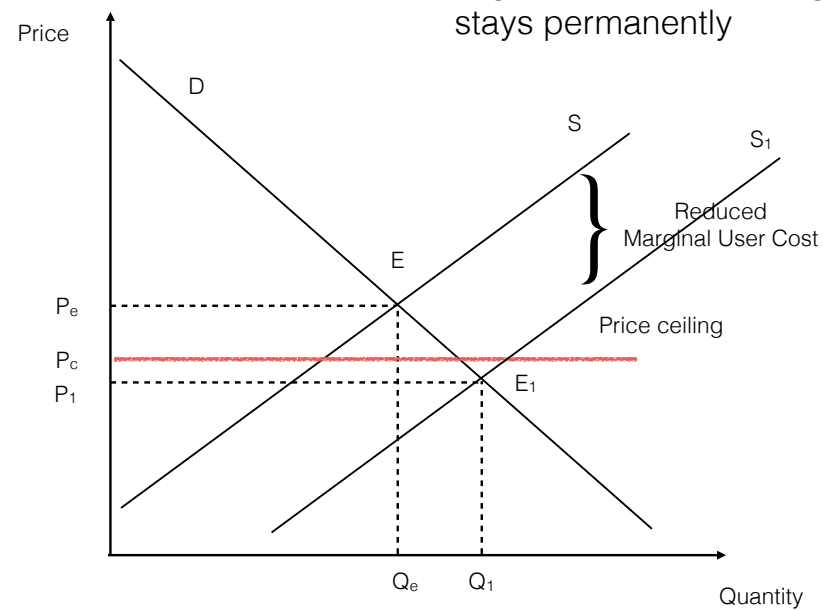
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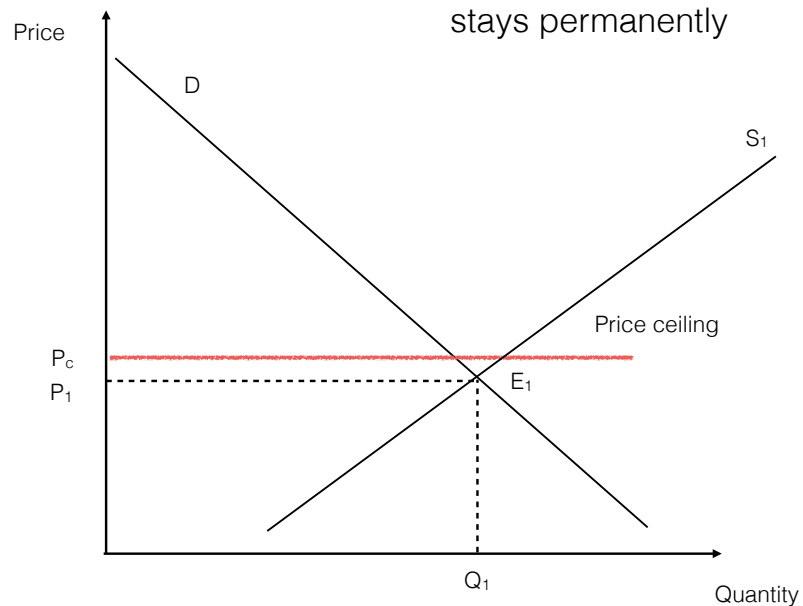
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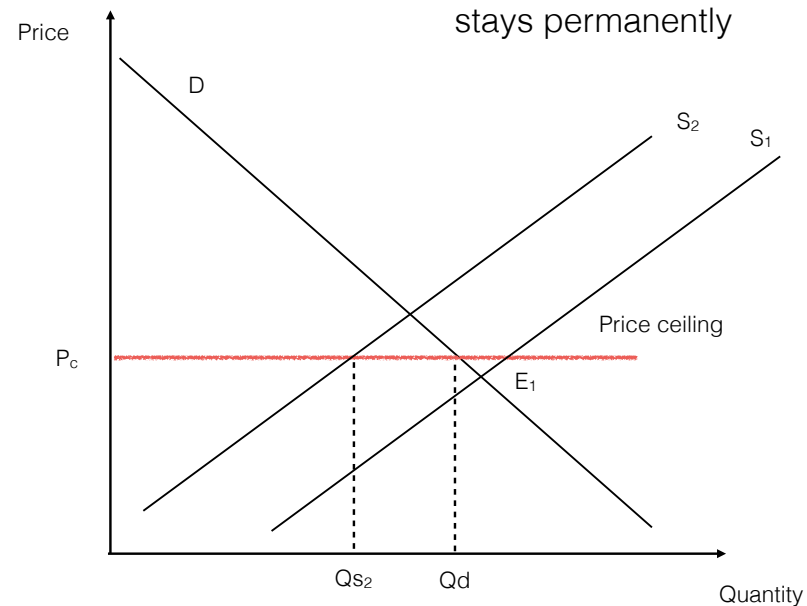
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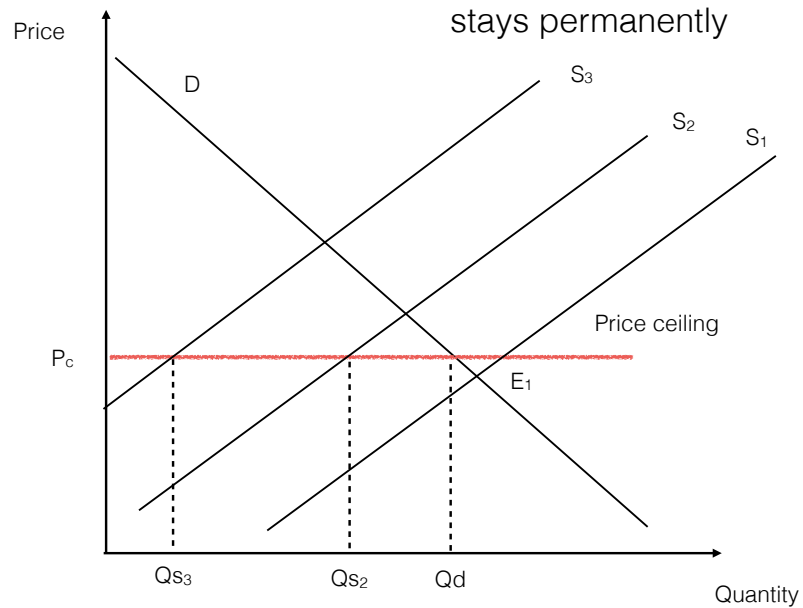
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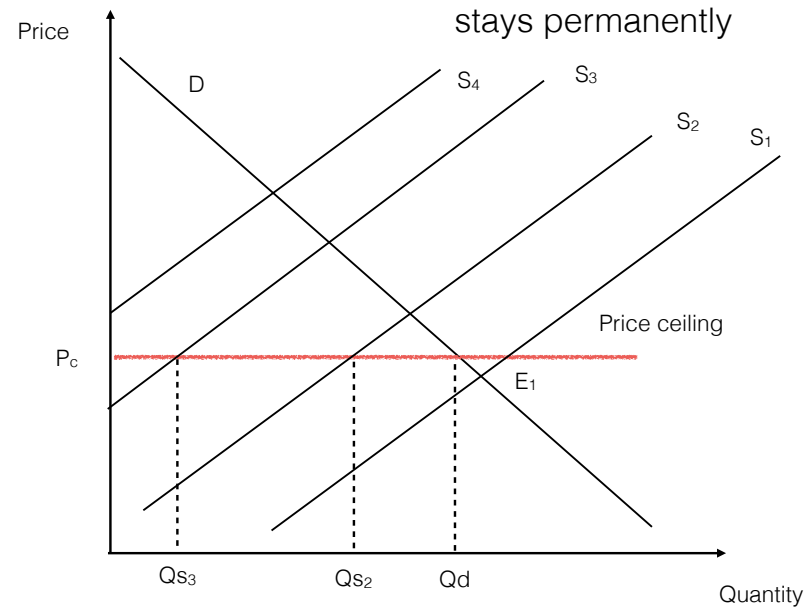
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Assuming that the price ceiling stays permanently

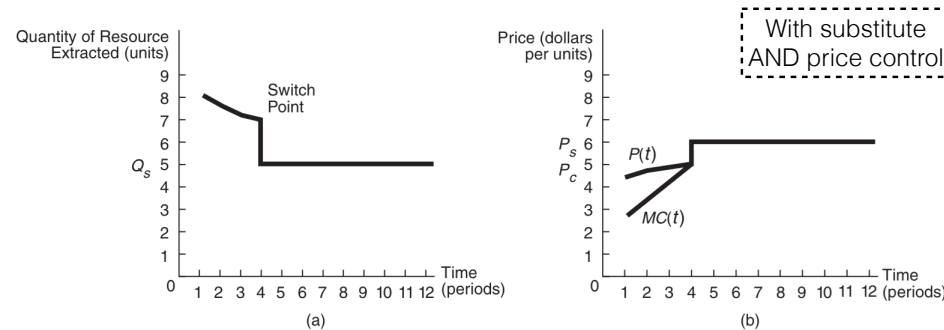
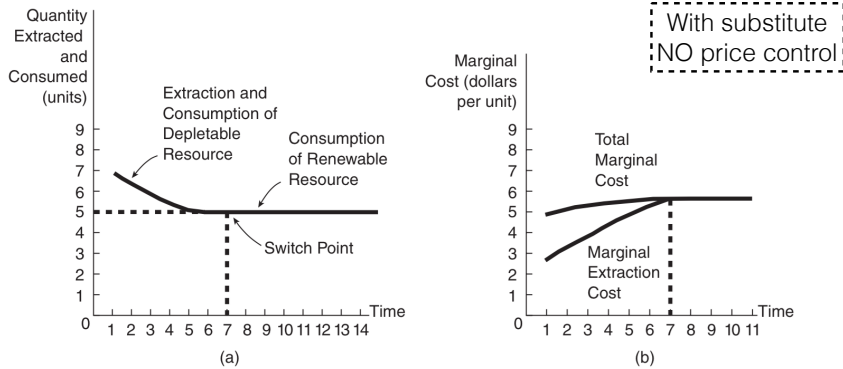


Assuming that the price ceiling stays permanently



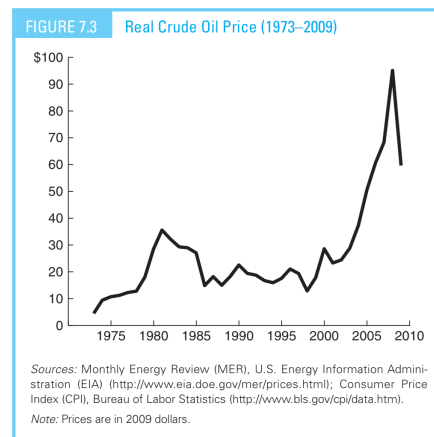
Price Ceiling

- Important effects of the price ceiling
 - More of the resource is left in the ground.
 - The rate of consumption is too high.
 - The time of transition is earlier.
 - The transition is abrupt, with price suddenly jumping to new, higher levels.



Oil: The Cartel Problem

- Organization of Petroleum Exporting Countries (OPEC)
- When the sellers have market power, they can restrict supply and thus force prices higher than otherwise.
- Reducing society's net present value benefits from the resource.



Tietenberg & Lewis 2012, p.147

Factors that make the oil cartel possible

- The price elasticity of demand for OPEC oil in both the long run and the short run
- The income elasticity of demand for oil
- The supply responsiveness of the oil producers who are not OPEC members
- The compatibility of interests among members of OPEC

The price elasticity of demand

- What is the price elasticity of demand?
- When the elasticity is low, the increase in price lead to increase in revenue.
- The price elasticity depends on
 - the opportunities for conservation
 - the availability of substitutes

Income elasticity of oil demand

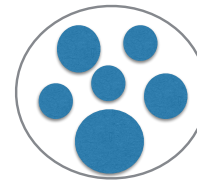
- It indicates how sensitive oil demand is to growth in the world economy.
- As the world economy keeps growing, OPEC has the ability to increase its prices.
- This also implies that the demand for oil is also sensitive to the business cycle of the world economy.

Non-OPEC suppliers

- Another key factor for the cartel success is the ability of producer nations to prevent new suppliers from entering the market and undercutting the price.
- Slant (1976) proposes a model of monopoly pricing in the presence of a fringe of small nonmember producers.

Non-OPEC suppliers

- Assumptions



Cartel

Can set the oil price to maximize its collective profits, by restricting its production, taking the competitive fringe production into account.



Competitive fringe

- Cannot set the price
- Free to choose the level of production that maximizes its own profits
- Its output affects the cartel's pricing strategy

Non-OPEC suppliers

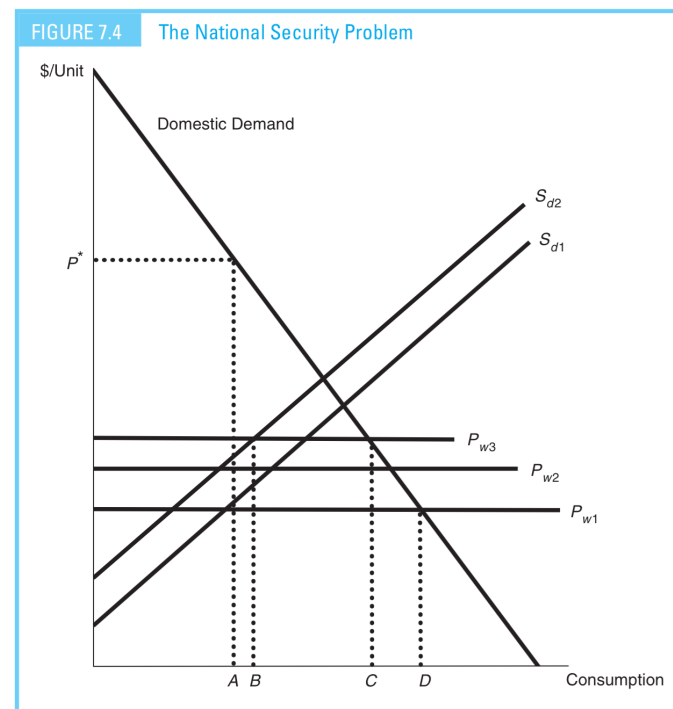
- The model conclusions
 - The cartel would set price lower initially.
 - The fringe will response to the rising demand and produce more in the earlier periods and to eventually exhaust their supplies.
 - Afterwards, the cartel would raise the price
 - Sales and profits of the competitive fringe decline over time whereas those of the cartel increase over time.
 - Present value of competitive fringe profit is more than the present value of cartel profit by an even greater percentage. Why??

The National Security Dimension

- Oil is a strategic resource.
- Importing oil can increase vulnerability to the country's economy and national security.
- National Security is a classic public goods. Market usually fails to provide adequate public goods.
- Leaving the determination of the appropriate balance between imports and domestic production to market —> Excessive dependence on imports.

Compatibility of Member Interests

- With many sellers working together, the freedom to choose is limited for each seller. The incentives of the members and the group as a whole may diverge.
- Cartel members have a strong incentive to cheat.
- Successful cartelization needs a means for detecting cheating and enforcing the collusive agreement.



The National Security Dimension

- What would happen during an embargo (an official ban on trade or other commercial activity with a particular country)?
- If self-sufficient option is possible for the importing country, should it stop importing and be self-sufficient?
- Why would we want any imports at all when national security is at stake?