

Gas and Oil Cartels: A Game-theoretic Analysis

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Questions

- ▶ Could we see a gas cartel emerge in the near future?
- ▶ Moreover, will the major oil and gas producers collude across the oil and gas markets?

Gas cartel

Why are the questions relevant?

- ▶ There are only a small number of major producers in oil and gas;
- ▶ The oil prices have been going up;
- ▶ Russia seems to have an incentive to form a gas cartel:
 - ◇ Currently facing competition from Qatar on the gas market;
 - ◇ Can be squeezed on the oil market by Saudi Arabia.

Modeling challenges

- ▶ Need to consider both economic and **geopolitical** payoffs for the countries in different scenarios:
 - ◇ Economic payoffs (costs or benefits);
 - ◇ Geopolitical payoffs – How will a cartel affect Qatar and Saudi's relationships with the US, or their standing in the region/world?
- ▶ The two markets are interconnected.

Our approach: game-theoretic analysis

- ▶ The players (countries) are rational; they do their best to advance their interests;
- ▶ The players maximize their **total** payoffs, taking into account both economic and geopolitical components;
- ▶ **Equilibrium (stable) outcome**: If one of the actors is better off from a different arrangement than forming a particular cartel, then we predict the cartel cannot be formed.

Model

- ▶ There are three players: R , Q , and S :
 - ◇ R is a player in both oil and gas markets: R_O, R_G ;
 - ◇ Q is a player in the gas market;
 - ◇ S is a player in the oil market.
- ▶ We enumerate all possible coalitions that can be formed in the two markets;
- ▶ We eliminate the coalitions that are not stable (not an equilibrium);
- ▶ Thus, we answer the questions raised by examining whether a gas cartel is a stable outcome.

Preliminary analysis: all possible outcomes

1. Status quo: $\{R_O, R_G\}$, $\{S\}$, and $\{Q\}$;
2. $\{R_O, S\}$, $\{R_G, Q\}$: two cartels in both markets;
3. $\{R_O, S\}$, $\{R_G\}$, $\{Q\}$: Russia forms a coalition with Saudi on oil;
4. $\{R_O\}$, $\{S\}$, $\{R_G, Q\}$: Russia forms a cartel with Qatar on gas;
5. $\{R_O, R_G\}$, $\{S, Q\}$: Russia is alone; Saudi and Qatar form a coalition over both oil and gas;
6. $\{R_O, R_G, S, Q\}$: Grand coalition over both oil and gas.

Preliminary analysis: non-stable outcomes

- ▶ Outcomes require collusion between Russia and Saudi are not stable; Saudi is better off going it alone because:
 - ◇ Has to share the power of setting oil price with Russia;
 - ◇ Risks losing special relationship with the US;
 - ◇ Consumer countries may move away from oil to gas.
- ▶ The outcome in which Saudi and Qatar form a coalition is not stable; Qatar is better off going it alone because:
 - ◇ Gives Saudi more power to interfere in Qatar's internal affairs and block its regional interests;
 - ◇ Risks losing special relationship with the US;
 - ◇ Its power as an independent gas supplier is diluted.

Preliminary analysis: stable outcomes

1. Status quo: $\{R_O, R_G\}$, $\{S\}$, and $\{Q\}$;
2. Gas cartel between Russia and Saudi: $\{R_O\}$, $\{S\}$, $\{R_G, Q\}$;
3. Grand coalition: $\{R_O, R_G, S, Q\}$.

A closer look: gas cartel unlikely

1. Russia forms a cartel with Qatar on gas:

- ◇ Having both resources, Russia will have an incentive to use the cartel to advance its *overall* interests;
- ◇ Qatar will be constrained on the gas market;
- ◇ Qatar weakened geopolitically by losing its special relationship with the US.

2. Grand coalition over both oil and gas:

- ◇ Saudi is doing well with oil; additional economic gains are relatively small compared with geopolitical costs;
- ◇ Qatar cannot gain much more leverage on gas by having the cartel because there is an over-supply of gas in the world already; it risks losing special relationship with the US.

Price wars are also unlikely

In principle, all three can wage price wars, but

- ▶ Saudi was successful at waging a price war against Russia in the 80s, but today's Russia is no longer an easy target.
- ▶ Qatar is already producing gas at a zero cost, and the status quo in the gas market is in effect a price war against Russia, which pushes Russia towards forming a gas cartel.
- ▶ Russia is constrained by domestic policies to increase productions quickly; and, given the richness of resources of Saudi and Qatar, it is not clear what goals Russia can achieve through this strategy.

Geopolitical factors: declining US influence in the ME

- ▶ Key to our analysis is the geopolitical payoffs of Saudi and Qatar, which might dominate their economic payoffs.
- ▶ The geopolitical payoffs are largely derived from their relationships with the US.
- ▶ If the US influence declines in the ME, the geopolitical payoffs decrease and new coalitions may form on the energy markets.
- ▶ Natural question: Is a decline in US influence likely?
 - ◇ The US economic and military power strengths decline in absolute terms;
 - ◇ Democratization in the ME;
 - ◇ Hostile democratically elected governments in the ME.

Conclusion

- ▶ Gas cartel unlikely without significant shifts in geopolitical factors in the near future;
- ▶ Price wars in oil and gas unlikely;
- ▶ Given time, the political development in the ME has a potential to change the status quo, even leading to a gas cartel.