

Mergers in the energy sector

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Outline

- Trends. The quest for size
- Characteristics of electricity markets
- Horizontal merger analysis
- Vertical merger and foreclosure
- Remedies
 - Market power mitigation

Trends

- Convergence of gas and electricity
- Security of supply and geopolitics
- European integration and regulatory fragmentation
- Globalization and economic nationalism

Effects of market integration in Europe

- Market power of large firms smaller in a larger market
- Entry threat disciplines incumbents
- Arbitrage stabilizes markets and reduces necessary reserve margin
- Larger firms can secure supply at lower cost in international markets

The quest for size

- Technology: Convergence of gas and electricity
 - Gas as input to CCGT
 - Economies in retail gas and electricity
- To obtain bargaining power in international input markets and secure supply (e.g. gas)
- Diversification
- Financial muscle
- Political economy: to get protection from government in turbulent international environments

Characteristics of the sector

- Electricity can not be stored; need of reserve margin at each point in network
- Marginal cost of production depends on location of generating plant (transmission and congestion costs)
- Available capacity is random
(depends on available generating plants, demand –climate)
- Generation:
 - multiple technologies with different characteristics
- Natural monopoly segments: transport and distribution
- Regulation

The problem of market power

- Characteristics of sector imply that substantial exercise of unilateral market power may occur even in moderately concentrated markets
 - Inelastic supply (no storage) and short run capacity restrictions
 - Inelastic demand in the short run
 - (consumers typically face regulated price independent of consumption)
 - Therefore market power is high when total demand and supply are close (in the aggregate or locally because of transmission constraints)
 - Multiple technologies capable of setting price
- Asymmetries in capacities and costs create productive inefficiency
- Concentrated markets may attract excess entry
- Influence of market design
 - Uniform vs discriminatory auctions

Collusion

- Spot market:
 - Homogenous product
 - Repeated interaction
 - Concentrated
 - Transparent for producers
 - Inelastic demand,
 - Barriers to entry
- Symmetry in capacities tends to help collusion
- Market design
 - Uniform vs discriminatory auctions

Vertical relations

- Contracts (futures, ..):
 - Pro-competitive effect in principle
- Vertical integration between generation and commercialization:
 - Only net position in spot market matters for incentives to set prices different from marginal cost
- Ignoring vertical relations tends to overestimate impact of market power

Horizontal merger analysis

Pricing model

- What is the right pricing model for electricity generation?
 - Possibly supply schedule competition (auction model as contender)
 - Cournot model has three advantages:
 - Provides upper bound to the exercise of (unilateral or non-collusive) market power: worst case scenario.
 - Capacity constraints are easily incorporated in the analysis.
 - Non-strategic competitors can be incorporated in the model as a competitive fringe.

Mergers with supply function competition

- Both outsiders and insiders contract due to a merger and spot equilibrium price rises (and consumers loose)
- Any merger is profitable due to outsider behavior
- Welfare impact depends on distribution of capacities

Calibrating Cournot

1. Assuming simple functional forms for demand and costs incorporate information on demand elasticity, market size, and capacities of firms.
2. Compute the benchmark Cournot market outcome, CS and TS pre-merger
3. Simulate the effects of reorganizing capacities of production in the industry in the alternative merger scenarios and divestiture proposals in terms of changes in concentration (Herfindahl), prices, and TS.

Sample results

- Find, e.g., that some divestiture proposals that superficially look equally attractive because they keep the same number of competitors in the market in fact have very different welfare consequences
(symmetry of firms is important for productive efficiency)
- Introduce potential cost reduction in merger and calculate effect on different merger + divestiture scenarios
- Check robustness to alternative demand and cost specifications.

Coordinated effects: checklist

- Structural conditions of market
 - Monitoring (frequency of orders, demand uncertainty)
 - Distribution of capacities
 - Concentration/Number of firms
 - Asymmetries in costs/demand
 - Entry conditions and buyer power
 - Multi-market contact
- Facilitating practices
 - Communication of plans
 - Exchange of information
 - History of cooperation in industry

Vertical merger and foreclosure

Anticompetitive potential

- Necessary condition: when there is market power at some level including barriers to entry
 - Safe harbor: when individual market share is small and collective exercise of market power unlikely
- Foreclosure: input or customer
 - E.g. Firm VI into transport (high-tension grid or pipeline) excludes rivals (E.On-Ruhrgas)
- Raising rivals' costs
 - (input foreclosure) VI gas-electricity firm internalizes effect of input gas price on spot price electricity wholesale market and may raise input price to rivals (or exclude them from the market –*complete foreclosure*)
 - (customer foreclosure) Inducing a lower demand for gas rivals in gas wholesale market

Conditions for input foreclosure

- VI firm must have:
 - Ability to raise rivals' costs in a significant way
 - Incentive to do it with the effect of raising the cost of rivals (harming competitors)
- The consequence must be that prices downstream increase
- No countervailing factors must be present
 - Merger efficiencies (other than elimination of double margin)
 - Market power downstream
 - Possibility of entry
 - Counter-mergers by rivals

Rivals' costs may go up or down

- Whenever there is the *ability* (imperfect competition upstream and upstream division of VI firm is a relevant supplier) there is the *incentive* to raise rivals' costs:
 - Sales to rivals increase their production and hurt VI firm
- But rivals' costs need not increase in equilibrium
 - Whenever pre-merger the upstream division sets price above cost, the downstream division of the VI firm has lower costs (elimination of double margin), sells more, and rivals sell less and have a reduced derived demand for the input
 - The impact on the input prices of rivals is ambiguous

Impact downstream

- Necessary but not sufficient condition for a vertical merger (that does not produce diseconomies) to increase spot prices downstream is that it increases costs of rivals
- Rivals' costs may go up and spot prices downstream may go down
 - This happens when VI firm increases its production enough to compensate for the reduction in output of rivals
- Vertical mergers tend to increase welfare because direct effect of elimination of double margin often dominates potential indirect effect of raising rivals' costs

Welfare impact

- Vertical mergers tend to increase welfare because direct effect of elimination of double margin often dominates potential indirect effect of raising rivals' costs
- Downstream Cournot competition with homogenous product
 - Increasing degree of VI improves welfare whenever complete foreclosure is not credible
 - If complete foreclosure is credible then it depends on whether the direct or the indirect effect dominate
- Upstream price competition and downstream quantity competition
 - If firm with cost advantage upstream merges with firm downstream welfare improves if
 - complete foreclosure is not credible (i.e. there is no technological commitment mechanism to foreclose) or
 - there is more than one independent firm upstream

Potential competition

- A gas firm may be a credible entrant in electricity market (e.g. EDP-GDP) because of
 - elimination of double margin in gas supply to own CCGT and
 - use of distribution/retail network to sell electricity or bundle gas and electricity
- A foreign firm may be credible entrant in national market
- Cross border mergers increase multi-market contact

Remedies

- There is no reason to have a bias against remedies in electricity mergers:
 - No presumption of more detrimental additional impact of mergers in electricity sector
 - No presumption of less efficiencies to be obtained by mergers (e.g. gas-electricity)
 - Structural remedies implementable
 - Divestiture of units (plants, pipelines, grid) which are viable business and there exist qualified buyers to operate the assets
 - Behavioral remedies monitored by specialized regulator
 - E.g. access commitments/interconnection
 - Market power mitigation schemes

Wholesale market

Market power mitigation: structural

- Divestiture of assets to
 - lower horizontal concentration,
 - balance the generation (capacity and technology) portfolio of firms, and
 - balance generation supply and demand in spot market in VI firms
- Virtual capacity (VPP)
- Increase interconnection capacity with other markets
- Develop long term contracts and futures markets

Wholesale market

Market power mitigation: structural

- Vertical separation of transport
 - Lowers barriers to entry
 - Avoids foreclosure
- Ensure sufficient competition in gas market
- Augment elasticity of demand in wholesale market
(consumer demand must be more responsive to price)

Market power mitigation: regulation

- Forced contracts for dominant operators
- Access regulation
- Price caps?

Challenges

- Regulating the natural monopoly segment maintaining investment incentives
- Manage interaction of regulation, competition and merger policy
- European integration: attack regulatory fragmentation