The Analysis of Efficiencies in Horizontal Mergers

Eliana Garces
Lucrezio Figurelli
Tom Dorrington Ward

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Agenda

- Why do Mergers Occur?
- Economic Evaluation of Efficiencies in the EU
- Quantifying the Net Effect of Mergers
  - Pass-on
  - Embedding the Efficiencies Argument in the Competitive Assessment
  - Minimum required efficiencies and UPP
- Qualitative assessment of efficiencies
- The role of economists
Key Takeaways

1. Merger efficiencies must be an integral part of merger investigations
   - In oligopolistic industries often strong presumption of competitive harm and real efficiencies are at play
   - Need an upfront convincing story on the determinant role of efficiencies

2. Presentation of concrete and compelling expected efficiencies that meet regulatory standards is important

3. Structural tools can be used by economists to assess net competitive effects within a commonly accepted framework

4. Early cooperation among economists, lawyers, and business participants is essential
Motivation for The Mergers: The Good and The Bad
Potential Anticompetitive Motivations

To strategically *soften competition* in both capacity constrained and price competition environments

**Unilateral motivations**

- Removing an aggressive competitor
  - e.g. a maverick firm pricing/bidding aggressively in relatively homogenous market
- Removing a close substitute
  - In differentiated product market, this increases market power

**Coordinated motivations**

- Removing a firm that would disrupt coordination
- Aligning firms’ incentives to raise prices / reduce supply
2 Procompetitive Motivations

To take advantage of efficiency opportunities

Possible efficiencies

- Reduction of costs through reorganization and rationalization
- Realization of unique synergies by joining complementary assets
- Easier path to restructuring
Regulatory Challenge for The Merging Parties

Demonstrating that the rationale for the merger is based on efficiency gains that will benefit consumers

Required steps:
- Early identification of merger-specific efficiencies
- Embedding the efficiencies in the competitive analysis
- Providing quantification
- Gathering qualitative evidence for hard-to-quantify dynamic efficiencies

Presumption in some industries:
Mergers to “discipline” competitors

Offsetting efficiencies:
Efficiencies as leading component of merger analysis, not an afterthought
Economic Evaluation of Efficiencies in the EU
Three Assessment Criteria (1)

Efficiencies must be merger-specific

Cannot be achieved by less anticompetitive means

- **Less anticompetitive means** include internal growth, contractual arrangements, joint ventures, specialization agreement
- **But such means may only be theoretically possible and infeasible in practice**
  - Look at transaction costs or regulatory risks of alternative arrangements
    - **Example:** would they require non-compete clause?
- **Firms may lack incentives to realize efficiencies by other means**
  - **Example:** Parties may continue to operate below minimum efficient scale because of expectations of declining demand

Role of economists

- Demonstrate why efficiencies could not be achieved but for the merger
- Exclude non-merger-specific efficiencies
Three Assessment Criteria (2)

Efficiencies must **benefit consumers**

**Should offset competitive harm to consumers due to merger**

- Consider only cost savings that are passed on to consumers
  - Fixed cost savings generally not passed on because pricing decisions only involve marginal costs – should not be counted
- Benefits must accrue in same market (or to at least to same consumers)
- Benefits must be timely

**Structural model estimation of merger effects can provide net effects**
- Provides joint framework for assessing competitive effects and efficiencies
- **Oligopolistic markets may require large efficiencies for positive net effect**
Efficiencies must be **verifiable**

**Information asymmetry makes regulators suspicious of efficiency claims**

- Regulators have less information than business about the production process
- Remove asymmetry with complete, credible, and factual information
  - Standards for evidence required by antitrust authority is often higher than what businesses rely on in ordinary course of business

**Presented documentary evidence must be relevant and credible**

- Efficiencies must ideally be measured based on Integration plan
  - Management’s estimates of synergies are a good starting point
Integration Plan Considerations

Efficiencies must be probable

- Only efficiencies included in their integration plan by the parties should be considered. Efficiencies that are not achievable under the actual integration plan are not likely to be achieved.

- The likely success of the plan must be critically assessed. The integration plan needs to align with the *raison d’être* of the transaction.

- In the absence of a fully developed integration plan a clean team can prepare a preliminary analysis of efficiencies estimating the likely integration plan. Any conclusions will necessarily be qualified and need to be conservative.
Critically Consider Efficiency Estimates

Adjust management’s estimates to meet the regulatory standard
- Identify and retain synergies in per-unit production
- Exclude any savings that would likely be achieved absent the transaction
- Exclude fixed cost synergies
- Exclude all synergies relating to revenue
- Exclude any impact from assumed changes in output

Adjust management’s estimates to get to the amount likely to be achieved
- Get expert opinion as to the run-rate cost synergies
- Apply professional skepticism to forecasts:
  - Why was the forecast prepared? Is it balanced?
  - Who prepared the forecast? How experienced are they? Etc.
- Be alert for general bias and deal momentum
Procedural Best Practices

- Attempt to create documents to facilitate the process
- Full disclosure of all assumptions and workings
- Be conservative and transparent
Other Information Sources

- Firms’ engineers, business plans, consultancy reports, and documents used by management to decide on merger.
- Past experience and applicable historical examples.
- Econometric estimates of cost efficiencies based on cost functions (using information on input prices, costs).
Types of Efficiencies

1. Rationalization of production
2. Economies of scale
3. Technological synergies
4. Efficiencies in procurement of inputs
5. Dynamic efficiencies
Rationalization of Production (1)

Merger can allow for the efficient reallocation of production
- Possible because of different marginal costs due to capacity utilization, level of capital, or know-how
- This does not imply an increase in joint technological capabilities

Likely that this happens in mergers that are presumed to create harm
- Gains from rationalization are generally larger in environments with less intense competition pre-merger and less efficient production pre-merger

Strong presumption that these efficiencies are not merger-specific
- Could be realized without merger by internal growth of more efficient firm

Need to build a convincing case
1 Rationalization of Production (2)

**Show that without merger:**

No incentive to grow by low cost firm. Perhaps due to:
- Dynamic market conditions
- Firm specific barriers to expansion
- Competitive environment

**Show that with merger:**

Incentive to increase output **despite higher market concentration**
- Expansion into new range of products (specialisation)
- Synergies
Economies of Scale (1)

Savings in average costs associated with increase in total output

- Total cost per unit decreases with production because additional units are produced without a proportional increase of all costs

1. Reduction in fixed costs

Elimination of duplicate departments not depending on production level (*e.g.*, SG&A)
- Combined production requires lower level of such expenses
- Generally not accounted for under consumer welfare standard – presumed to benefit shareholders only
  - Only decrease in marginal cost assumed passed on
  - May be relevant in bargaining or bidding setting with large infrequent transactions
Economies of Scale (2)

2. Rationalization of production

Reduces marginal costs, but raises issue of merger-specificity (see above)

3. Long-run economies of scale

Reducing costs which are fixed in the short term, but variable in the long term – R&D, capital investments

- Large capital investments leading to lower marginal cost may be profitable only at a larger scale of production
- Lower marginal costs due to specialization of functions or product lines
- Raises issues of verification and timing
3 Technological Synergies

Moves forward the production possibility of entire market
- Some consider to be the only “real” efficiencies

**Firm-specific assets**

 Assets must be highly specific, hard to contract on market in order to meet merger-specificity standard

**Diffusion of know-how**

**Issues of verifiability and quantification**
- Quantification methodologies can be found – for example, if improvement of product, can use quality-adjusted price
- Need convincing qualitative assessment
4 Efficiencies in Procurement of Inputs

Larger firm may be able to purchase inputs at more favorable price
- May not be accepted if are not associated with production efficiencies
- Increase in bargaining position for procurement of inputs in face of weak suppliers may not be accepted as an efficiency
  - If new terms are detrimental to suppliers the better prices may be considered as just a rent transfer (ex: supermarket “squeezing” farmers)
- Larger discounts in cases of non-linear pricing can reflect an efficiency
- Lower cost of capital (when one firm has high costs) can be accepted

Savings must be large and for inputs that account for significant share of costs
Dynamic Efficiencies

Long-term shifts in production function from synergies in know-how, R&D, and economies of scale from large capital investments

- Typically neglected because difficult to quantify and uncertain timeframe
- But dynamic effects on R&D and innovation are receiving more scrutiny
  - ambiguous effect, case-specific
- Dynamic efficiencies may also become more relevant in contexts where long term international competitiveness matters
- May play a role on merger review in the cases involving strategic sectors
Quantification of Net Effect
Pass-On (1)

Pass-on of cost reductions to prices is generally incomplete in oligopolistic markets:

- Profit maximizing firms with some degree of market power internalize marginal cost savings through higher mark-up over marginal cost
- There is an extensive literature in the IO field of economics that studies the factors that determine the rate of pass-on.

No inverse link between amount of competition and pass-on

- Perfect competition does not ensure full pass-on of one firm’s cost savings

Degree of pass-on crucially depends on:

- Curvature of demand function
  - Change of market power of firm: high change due to merger likely to produce higher pass-on—but also higher harm
- Slope of marginal cost curve
  - increasing MC decrease pass-on
Pass-On (2)

Pass-on estimates can be used to:
- Directly screen for magnitude of required efficiencies (Minimum Required Efficiencies)
- Inform choice of demand function for structural estimation

One can estimate pass-on by looking at prior shocks that affect the cost of the firm and observing the associated pass-on
- Must ideally be shocks that affect only one or both of the merged firms and not the whole industry (ex: new local clean-up regulation, local labour negotiation)
- Industry-wide cost shocks can, nonetheless, provide useful information about consumers’ preferences (i.e., the shape of demand curves)

Pass-on estimates can be retrieved from firm or market estimates.
Embedding Efficiencies in The Assessment (1)

There are benefits from integrating assessment of harm and efficiencies

- Allows for the netting of harm and benefits under the same assumptions about the parameters of demand and form of competition

- Allows the discussion to occur within a *common agreed* framework with regulators

- Requires the choice of a structural model
Embedding Efficiencies in The Assessment (2)

Structural model takes into account:

- Nature of competition
- Size and market power of merging firms and their rivals
- Structure of demand

Structural model chosen impacts results

- Structural model incorporates efficiencies in post-merger marginal cost
- Features of the selected model will impact the magnitude of the competitive harm and degree of pass-on of efficiencies to consumers
European Commission’s Assessment

EC has chosen structural models based on:

- Degree of product homogeneity and type of competition: capacity versus price driven competition
- Existence of excess capacity: degree of accommodation to prices by competitors
- Degree of differentiation and closeness of competition between products
- Barriers to entry
- Competitive pressure from imports
- Competitive constraints due to buyer power
Price Competition with Differentiated Products

Most commonly applied framework for consumer goods markets

- Firms compete in price for sale of products differentiated by perceived quality, brand, positioning, etc.

- Assumptions must be made about the shape of demand
  - How price elasticity changes with changes in price
  - Lack of available data may lead to assumptions so that pattern of substitution may be inferred from market shares (ex: assumptions of constant elasticities)

- Results will be very sensitive to the specification of the demand function (higher curvature produces higher competitive effect and highest pass-on)

Choice of demand function drives results
Demand Estimation Models

Broad variety of models with different degree of complexity

- Constant Elasticity of Substitution (CES)
  - Predict larger price increases
  - Strong assumptions
- Almost Ideal Demand System
  - Data intensive
  - Also imposes restrictions
- Logit model and extensions (Nested Logit)
  - Computationally simple, commonly applied
- Mixed logit, Random Coefficient models
  - Complex and computationally burdensome
  - More flexible
  - Used to accommodate specific industry characteristics
How the Framework Works

Profit-maximizing firms price products **taking into account diversion to other products** that price increase generates

**At pre-merger price**

Firms constrained from increasing price unilaterally by the diverted sales
- Higher revenues from retained customers are offset by lost revenues from diverted sales

**After merger**

Diversion of sales between merging firms no longer a revenue loss
- Merged firm has a stronger incentive to raise price

Framework tends to predict a price increase at the post-merger price
Price Competition with Homogeneous Products and Capacity Constraints

Bertrand-Edgeworth model

- Model where firms compete on prices but face capacity constraints
- Framework has been used to evaluate mergers in mature oligopolistic industries (steel, chemicals,...)

Model of oligopolistic competition with following characteristics:

- Homogeneous products (or high demand-side substitutability)
- All firms are needed to cover market demand at market competitive prices (market cannot be served by all firms but one)
- Total capacity exceeds market demand
- Yet, the market results in excess capacity and prices higher than the competitive level
How the Bertrand/Edgeworth Model Works

Firms undercut each others’ prices but do not reach price level of a perfectly competitive market

Model assumes that at least one firm exerts market power because it is a monopolist on the margin

- At competitive prices part of its production is needed to satisfy market demand so it has market power on its residual demand
- Others accommodate in some manner

Model generally does not produce a Nash equilibrium

- No Nash equilibrium (given other firms’ prices, at least one firm could increase profits by pricing differently)
- Capacity is not fully utilized
- Several computational methods used to determine range of final prices
Example of Estimated Pass-On and Net Effect

- Efficiencies embedded in marginal cost post-merger
- **Pass-on** determined by comparing post-merger price range with and without efficiencies
- **Net effect** evaluated by comparing prices before merger with prices after merger with efficiencies

For this model to have positive net effects for consumers, efficiencies may have to be *large*
Other Commonly Used Models

1. Standard quantity-based competition: the Cournot model
   - Firms simultaneously decide the capacity they will produce in the next period given their expectations of competitors’ production level.

2. Bargaining models
   - Effect of percentage of total procurement on bargaining position determines the impact

3. Bidding models
   - Closeness in costs and relative bidding positions determine the impact

The overall selection is very large and it is important to choose a model that captures the facts of the market

Example: capacity constraints in differentiated product markets
Remarks on Mergers in Mature Industries

Similar economic challenges
- Commoditization – Excess production capacity – High level of concentration
  – Little or no entry – Increased global competition

Because of restructuring, efficiencies may play an important economic role (opportunities for rationalizing production)
- Parties are often genuinely convinced about the efficiencies
- The analytical framework will tend to predict competitive harm (barriers to entry, industry concentration)

Issues of miscommunication between the parties and antitrust regulators because of misunderstanding of antitrust enforcement
- Requirements of the consumer welfare benchmark, issues of geographical market definition, overall assessment
- Economists can help in a common understanding of the regulatory exercise
Minimum Required Efficiencies (MRE)

Also called Compensating Marginal Cost Reductions

Percentage reduction of marginal costs needed to compensate for any potential anticompetitive effect caused by the merger and stay at the same price/quantity level

\[ \text{MRE} \times \text{Pass-on rate} = \Delta P \]

where \( \Delta P \) is the price increase due to the merger

- Does not require calculating the competitive harm and does not require assumptions about the shape of the demand curve
- But does require assumptions about either:
  1. The level of pass-on at the pre-merger price point OR
  2. The competitive environment and the price point elasticity of demand.
A Formula for MRE (1)

Can be obtained for some standard models such as quantity-setting competition or differentiated products

Quantity-setting competition (Cournot)

- Reduction in marginal cost, $MC_A$, of lower-cost firm, Firm A, must be at least as large as the pre-merger margin, of the other firm, Firm B:

\[
MC_A - MC_{\text{Merged firm}} \geq Price_B - MC_B
\]

- Firm B’s pre-merger margin

- The higher the margin of the less efficient firm, the more the efficient firm can increase prices and recover revenues from sales diverted to the other firm – cost reduction must be higher to compensate

- Assuming constant price elasticity, can also be expressed as relation between % reduction in marginal cost, market shares, and market elasticity – all relatively easy to obtain
A Formula for MRE (2)

**Price competition with differentiated products**

Size of the offsetting efficiencies will depend on demand price elasticities and cross price elasticities

- High elasticity rates among the merging firms’ products results in upward pressure on prices for the merged firm compared to pre-merger firms and will require stronger offsetting efficiencies

Cross price elasticities are sometimes approximated with observed diversion rates

- Under certain assumptions market shares can be used to approximate diversion rates (no estimation needed)
Upward Pricing Pressure ("UPP") Test

MRE method in differentiated products markets relates to UPP test:

- Lost revenues put “upward pricing pressure” on the firm that needs to be compensated by the efficiencies

\[ UPP_A = 0 \quad \text{if} \quad D_{AB}(P_B - MC_B) = E_A \]

where \( D_{AB} \) is the diversion ratio between products \( A \) and \( B \), \( P_B \) and \( MC_B \) are the price and marginal cost of producing \( B \), and \( E_A \) is the reduction in the marginal cost of \( A \)

- The merged firm faces a loss in marginal revenues if it decreases prices
- These lost marginal revenues occur because of the fall in the sale of competing products that the firm now owns
- No net harm if the decrease in marginal cost offsets the lost marginal revenues
Verifying Dynamic Efficiencies

Concerns investments in R&D, innovation in products and processes

Likelihood may be difficult to address
- Documentary evidence might be speculative
- Absence of commitment

Dynamic efficiencies are hard to quantify.
- There are ways to model changes due to innovation
- Level of uncertainty in the parameters of assessment

Time frame may not be too long

- Qualitative and quantitative assessment of efficiencies must grounded in solid economics, sensible predictions, risk assessment
- Assessment criteria must be addressed
Economists’ Role in a Case Investigation (1)

Work with business and lawyers early on to identify efficiencies relevant for the regulatory scrutiny.

Bring economic expertise and objectivity into the process of quantification.

Development of theoretical framework analyzing net effects of the merger balancing competitive harm with the positive effect of efficiencies.

Implications of possible remedies on the efficiency rationale of the merger.
## Economists’ Role in a Case Investigation (2)

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<th>PHASES OF TRANSACTION / LITIGATION</th>
<th>Pre-bid</th>
<th>Merger Review Process</th>
<th>In-depth investigations</th>
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<tr>
<td><strong>Information Available</strong></td>
<td>Client's data and public information; often limited access to business people due to extreme confidentiality</td>
<td>“Clean team” type access to both parties' plans, data and intelligence, select discussions with business people</td>
<td>Full access to both parties' plans, data and intelligence</td>
</tr>
<tr>
<td><strong>Competitive Effects</strong></td>
<td>Preliminary assessment of price effects</td>
<td>Robust assessment of price effects and efficiencies; consideration of alternative models, arguments</td>
<td>Preparation and submission of formal reports</td>
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<td></td>
<td>Assist with analysis of market definition</td>
<td>Assist with submissions and responses to RFI</td>
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<tr>
<td><strong>Efficiencies</strong></td>
<td>Assessment of company's internal integration plans and synergies estimates</td>
<td>Refinement to efficiencies estimates based on more thorough analysis of integration plan. Presentation to agency.</td>
<td>Preparation of formal reports and submissions to agency</td>
</tr>
<tr>
<td><strong>Net Effect Analysis</strong></td>
<td>Preliminary identification of antitrust scrutiny risks; provide input into deal and pricing risk</td>
<td>Refine pass-on and net effect scenarios based on updated effects and efficiencies and feedback from the agencies on potential concerns</td>
<td>Complete net effect analysis with consideration of remedies sought or likely to be sought</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Board presentations to consider deal risk</td>
<td>Present to other party's counsel to assist them in advising their client</td>
<td>Affidavits for hold separate / injunction applications, etc. (e.g., irreparable harm)</td>
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Author Information

ELIANA GARCES
Principal | Washington, DC
Eliana.Garces@brattle.com

DANIEL GAYNOR
Senior Consultant | Washington, DC
Daniel.Gaynor@brattle.com

ANDY HARINGTON
Principal | Toronto, ON
Andy.Harington@brattle.com

Eliana is an economist with broad experience in antitrust enforcement and regulatory design. While she was in the cabinet of Vice President Joaquín Almunia, the European Commissioner responsible for competition policy in 2010-2014, she supervised antitrust and merger investigations in financial services, information technology, telecommunications, and energy markets. She was previously a member of DG COMP Chief Economist Team and before joining The Brattle Group she was the deputy chief economist in DG Internal Market and Industry.

Daniel has extensive experience in antitrust and competition matters, including the analysis of the competitive effects of mergers and acquisitions. He specializes in combining industrial organization theory and computer modelling to analyse competition issues relating to mergers, international trade investigations, and intellectual property disputes.

Andy is a leading expert on financial aspects of Canadian competition law, including efficiencies, failing firm, and likelihood of entry analyses as well as 100/104 hold separate opinions. His evidence and testimony on efficiencies has been accepted by the Tribunal (Tervita) and the Bureau.

The views expressed in this presentation are strictly those of the presenter(s) and do not necessarily state or reflect the views of The Brattle Group.
Lucrezio is an economist with extensive experience in litigation and antitrust investigations. His practice focuses on the economic analysis of telecommunications, technology and intellectual property, and he has consulted on behalf of operators and regulators on numerous matters, including mergers and acquisitions involving wired and wireless network operators.

Tom is an economist with experience in litigation in energy and financial services. Tom has a M.S. in Finance and Economics from London School of Economics and Political Science and an undergraduate degree in Economics and Mathematics from University of Edinburgh.

Sara is an economist with experience in litigation and in antitrust enforcement. She has a M.S. and an undergraduate degree in Economics and Social Sciences from Bocconi University with focus on the empirical methods employed in competition economics.

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