Chapter 13

COORDINATED EFFECTS IN MERGER REVIEW: QUANTIFYING THE PAYOFFS FROM COLLUSION

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ABSTRACT

Mergers can affect the extent of coordinated interaction among firms in an industry by changing the payoffs from such conduct. Coordinated effects analyses currently provide little quantification of these payoff changes. Our proposed approach quantifies the magnitude of the potential post-merger gains from incremental explicit collusion by subsets of firms in the post-merger industry. Large (small) payoffs imply that coordinated effects may (not) be a substantial concern. We provide two abstract examples and discuss the application of the methods to Airtours.

I. INTRODUCTION

Competition policy recognizes that mergers tend to create incremental opportunities for coordinated behavior as reflected in section 2 of the Horizontal Merger Guidelines (Guidelines) of the Federal Trade Commission (FTC) and Department of Justice (DoJ).1 The Guidelines implicitly demand an understanding of the incremental payoffs from coordinated behavior as a consequence of a merger; however, merger analysis often lacks a quantification of these incremental payoffs. In this paper we propose an additional analysis that could be performed as part of a merger review that would provide such a quantification. Under the

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premise that payoffs drive firm behavior, if the payoff to a given coordinated interaction is large, then firms will have an incentive to seek ways to achieve it.

Current merger analyses of coordinated effects tend to focus on the change in the Herfindahl index, whether the merger will absorb a “maverick” firm or otherwise negatively affect a “maverick” firm, whether the merger will allow conspirators to detect deviations by other conspirators more easily, and whether the punishment of deviators will be easier or more effective.\(^2\) With the exception of the Herfindahl index, these analyses are qualitative rather than quantitative. The change in the Herfindahl does not provide a quantification of the incremental payoffs from coordinated behavior, although since it measures the change in concentration in an industry a large change suggests greater concern regarding coordinated effects.\(^3\)

Coordinated interaction can range from no coordination at all (static noncooperative behavior) to explicit collusion where the subset of firms essentially functions as one entity. We model this type of explicit collusion as a merger among a subset of firms. We propose that merger analysis include the calculation of the payoffs from explicit collusion by all subsets of firms in the pre-merger and post-merger market. Given a model of noncooperative behavior for a market and a specification of the set of firms engaged in explicit collusion, these expected payoffs are easily calculated when much of the groundwork for doing the calculations is done as part of unilateral effects analysis. The increase in the payoffs from explicit collusion as a result of the merger allows us to quantify the impact of the merger with regard to coordinated effects. Because we model explicit collusion as perfect coordination among the colluding firms, and because less perfect coordination is also possible, our calculations give an upper bound for what suppression of within-cartel rivalry can achieve.

The calculations we propose require that we select a model of competition that incorporates the relevant features of the market. In this paper, we provide examples involving differentiated products price competition and bidder competition within a procurement. We then describe how a model of differentiated products price competition could have been used to analyze the Airtours merger. Once an appropriate model has been selected and fitted and/or calibrated to the market, we then calculate the effect of the merger and the effects of various pre-merger and post-merger explicit collusion scenarios.

\(^2\) As shown in M. Coate, Economic Models and the Merger Guidelines: A Case Study, Rev. L. and Econ. (2006), evidence contained in hot documents, validated customer concerns and event analyses appears to play an important role in confirming the implications of Guidelines-based theoretical models of a merger's competitive effect.

We do not intend for our proposed calculations to displace any existing analyses but, rather, we intend for it to augment existing analyses. These payoff calculations may reveal that incremental coordinated interaction is a significant concern or that there is little concern.

Similar to existing analyses, our proposed calculations do not directly quantify the probability of post-merger coordination. However, by quantifying the payoffs from coordination, and assuming the probability of coordination is increasing in its payoff, our analysis offers indirect information regarding the probability of coordination.

The paper proceeds as follows. Section II sets the proposed analysis within the Guidelines. Section III describes how this proposed analysis could have been applied in hypothetical environments as well as a past European merger case, Airtours. Section IV concludes.

II. THE PROPOSED ANALYSIS AND THE GUIDELINES

The Guidelines’ treatment of coordinated effects focuses on the capacity of a merger to increase coordination by firms that remain in the relevant market with respect to price, quality or other dimensions of competition. Section 2.0 of the Guidelines states that “[c]oordinated interaction is comprised of actions by a group of firms that are profitable for each of them only as a result of the accommodating reactions of the others.”4 Successful coordination requires “reaching terms of coordination that are profitable to the firms involved.”5

The Guidelines’ analysis of possible future coordination, and the increased profitability it may generate, focuses chiefly on the presence or absence of industry conditions that would facilitate the completion of the three tasks – the formulation of a consensus, the detection of deviations from the consensus and the punishment of cheaters – that are necessary to successful coordination.6 To this end, the U.S. antitrust agencies “not only assess whether the market conditions for viable coordination are present, but also ascertain specifically whether and how the merger would affect market conditions to make successful coordination after the merger significantly more likely.”7 The assessment of post-merger performance outcomes “includes an assessment of whether a merger is likely to foster a set of common incentives among remaining rivals, as well as to foster their ability to coordinate successfully on price, output, or other dimensions of competition.”8

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4 HMG, at Section 2.1.
5 Id.
7 Id., at 18.
8 Id.
Like the Guidelines, our analysis is concerned with the incentives of firms in the relevant market, but with a somewhat greater emphasis. Our approach focuses greater attention on how a proposed merger affects the perceptions of the industry participants regarding their post-merger profitability and how perceptions of greater or lesser profitability affect their incentives to strive to solve the tasks that must be accomplished for coordination to succeed. Our approach assumes that firms will try harder to solve the coordination tasks as the perceived positive impact on profitability increases.

As a final note, cartels often suppress competition in ways that exceed the mitigation of within-cartel rivalry. Cartels engage in predation, exclusive dealing, tying, the blocking of entry and other anti-competitive behaviors that are associated with section 2 violations of the Sherman Act.9 It is part of our research program to investigate to what extent our proposed methodology can be extended to understand these additional section 2-like coordinated effects. This being said, if the post-merger world makes these section 2-like coordinated behaviors more likely, then our current proposal will potentially understate the magnitude of the threat to consumer surplus from post-merger coordinated effects.

III. APPLICATIONS

We begin by describing how our proposed analysis could be applied within a model of differentiated products price competition. We discuss the application of this model to the Airtours merger. Then we describe how the analysis could be applied within a model of bidder collusion at procurements.

A. Differentiated Products Price Competition

A common model used for the analysis of unilateral effects is differentiated products price competition. For purposes of illustration, we consider a four-firm oligopoly, where the products of the firms are assumed to be imperfect substitutes for one another.10 Thus, the pre-merger market

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9 See R. Heeb, W. Kovacic, R. Marshall, L. Marx, Illuminating Section 2 through Cartels, Penn State University CAPCP Working Paper (2006) for a discussion of cartel behavior that extends past the suppression of interfirm rivalry and enters the realm of monopolization-like conduct. In a nutshell, many practicing cartels, once having suppressed rivalry among firms in the cartel, become like a single dominant firm and take anticompetitive actions that are typically thought of as Sherman Act Section 2 violations.

10 As in N. Singh and X. Vives, Price and Quantity Competition in a Differentiated Duopoly, RAND J. Econ. (1984), we assume a representative consumer
has firms 1, 2, 3 and 4. The market structure where these four firms act non-cooperatively is referred to as pre-merger noncooperative.\footnote{The four firms could be engaged in some extent of pre-merger coordination but we use the absence of such coordination, namely pre-merger noncooperative, as a benchmark.}

We assume that a merger is proposed between firms 1 and 2. We denote the merged entity by 1/2. Thus, the post-merger market consists of three firms: 1/2, 3 and 4.

It is important to note that unilateral effects analysis focuses on the change from a market with firms 1, 2, 3 and 4 to a market with firms 1/2, 3 and 4. In many cases one would want an economic model of the market. We propose to extend the analysis of such a model to calculate the payoffs associated with coordinated effects.

Using brackets to denote collusion among firms, there are four post-merger market structures of interest:

1. Post-merger noncooperative: 1/2, 3, 4 – no collusion in the post-merger market;
2. Post-merger collusion of the merged firm with one of the two remaining firms: [1/2, 3], 4 or [1/2, 4], 3 – the merged firm 1/2 colludes with firm 3 or firm 4 (For the purposes of this section, we assume pre-merger symmetry among the firms, so collusion by 1/2 with 3 is equivalent to collusion by 1/2 with 4);
3. Post-merger collusion among the non-merged firms: 1/2, {3, 4} – the firms not involved in the merger, 3 and 4, collude with each other, but not with the merged firm 1/2;
4. All-inclusive collusion: {1/2, 3, 4} – the merged firm 1/2 colludes with both firms 3 and 4.

For each case, we can use the model of differentiated products price competition to calculate equilibrium prices, quantities and profits. We can then compare these calculations to the benchmark of pre-merger noncooperative behavior in which all four firms act independently.

that maximizes \( U(q_1, \ldots, q_4) = \sum_{i=1}^{4} p_i q_i \), where
\[
U(q_1, \ldots, q_4) = \sum_{i=1}^{4} \left( q_i - \frac{1}{2} q_i^2 - \frac{1}{2} \sum_{j \neq i} q_j q_i \right).
\]
This utility function gives rise to a linear demand structure with inverse demands given by, for \( i = 1, \ldots, 4 \),
\[
p_i = 1 - q_i - \frac{1}{2} \sum_{j \neq i} q_j.
\]
In this model, consumer surplus is
\[
U(q_1, \ldots, q_4) = \sum_{i=1}^{4} q_i p_i,
\]
and welfare is consumer surplus plus the sum of the firms' profits. We assume firm \( i \) has constant marginal cost, which we normalize to zero, and zero fixed costs.
Note that the transition from post-merger noncooperative to post-merger collusion of the merged firm with one of the two remaining firms is of interest for understanding the potential for post-merger coordinated effects. This is also true for the transition from post-merger noncooperative to post-merger collusion among the non-merged firms as well as from post-merger collusion of the merged firm with one of the two remaining firms to all-inclusive collusion.

Focusing on post-merger noncooperative to begin, the merger increases the profits of firm 1/2 by 13% and increases the profits of firms 3 and 4 each by 23%. Note that the profits of the non-merged firms rise substantially as a consequence of the merger. This is not unexpected. The prices of firm 1/2 increase 29%, while the prices of firms 3 and 4 increase by only 11%, causing the quantity sold by firms 1 and 2 combined to decrease and the quantities sold by firms 3 and 4 to increase.

However, if firm 3 colludes with the merged entity 1/2 (post-merger collusion of the merged firm with one of the two remaining firms), then the profits of the cartel increase by 65% and the prices of firms 1/2 and 3 increase by 115% relative to pre-merger noncooperative. Commensurately the three firms supply 23% less quantity to the market.

Consumer surplus decreases as a result of the merger (post-merger noncooperative), but consumer surplus decreases by five times more if we move to post-merger collusion of the merged firm with one of the two remaining firms.

We can also view this information from a different perspective. Prior to the merger, collusion between any two firms increases profits for the two firms by 13%. Post-merger collusion of the merged firm with one of the two remaining firms increases profits for the three by 46% above post-merger noncooperative profits. Post-merger collusion among the non-merged firms increases their profits by 43% relative to pre-merger noncooperative and by 27% relative to post-merger noncooperative profits. These calculations show that payoffs to incremental collusion increase substantially as a result of the merger. They suggest that the most important cases for enforcement authorities to watch, should the merger be approved, are post-merger collusion of the merged firm with one of the two remaining firms, as opposed to post-merger collusion among the non-merged firms.

This quantification is specific to the exact case and parameterization used. If we had considered five firms of different sizes whose products differed in their substitutability with one another, then the profit, price and quantity calculations would be different. The calculations may tell us that post-merger coordinated effects are of little concern, or they may tell us that a specific interfirm coordinated effect needs to be monitored by enforcement authorities if the merger is approved. The results depend on the model chosen and its parameterization. Thus, to be of most value, the specifics of the model should map well to the actual case under consideration.
Current merger analysis often involves unquantified assertions and aggregate measures such as the Herfindahl index. In contrast, our analysis provides quantitative results and allows economically meaningful debate on the underlying assumptions of the model.

In our related research, we posit a model of differentiated product price competition designed to capture the salient features of the *Hospital Corporation* merger case from the 1980s. The calibration of the model in that case is far more complicated than the simple example posed above. That model has 11 firms, four of whom are relatively large. The proposed merger is between one of the large firms and four other relatively small firms. In that framework we are able to quantify the effects of post-merger potential collusion, especially the type that was of most concern to the FTC. We provide preliminary quantitative results showing that the FTC’s concerns were warranted. However, without the ability to quantify the potential harm from coordinated effects back in the 1980s, the FTC was left with ambiguous assertions that were not compelling to the court.

B. Airtours

A potential application of the differentiated product price competition model is the European Airtours case. As a bit of background, there are vertically integrated companies that provide leisure travel services in the European community. Two of these companies, Airtours and First Choice, proposed to merge in 1999. The European Commission focused on the impact for subsequent competition in the “short-haul” part of the leisure travel business (within Europe and North Africa). Several salient features of the industry were noted by the European Commission.

- The top three firms would have an 85% market share post-merger, while pre-merger the top three had only a 70% share.
- The Herfindahl index pre-merger was 1700, while it would be 2150 post-merger.
- The products of the firms were viewed as reasonably good substitutes so that consumers were relatively sensitive to price.
- Costs were nearly the same for all major firms.
- There was a substantial fringe (although it was unclear if the fringe would be negatively impacted by certain post-merger features of the industry).

After going through this description, the European Commission asserted that the post-merger world would lend itself more readily to

coordinated effects than the pre-merger world. Therefore the European Commission attempted to block the merger, although a court overturned this assessment and allowed the merger to proceed. We find this case to be ideally suited to the methods we describe above. In particular, a differentiated product price competition model can be formulated that incorporates four main firms and a substantial fringe. Parameterizations can be selected that result in market shares and Herfindahl indices, pre and post merger, that mimic the data as reported by the European Commission. Using this model one can then quantify the gains to incremental post-merger collusion. If this had been done, the European Commission, industry firms and relevant judicial bodies could have heard the confrontation between opposing economic experts regarding the modeling and analysis, and sorted out which model, and thus which quantification, was most sensible. At the end of the day a quantifiable measure of the payoff to post-merger collusion would have been in place for all to consider. This is a far preferable process to unquantified assertions, and it would displace absolutely nothing that was done in the case. All analyses that were conducted could still be conducted. However, we note that the eyes of all concerned are likely to be focused on the incremental payoffs to collusion that we propose be calculated since, at the end of the day, it is these incentives that speak directly to the potential threat of post-merger coordination.

C. Bidder Competition at Procurements

In this section, as a second example, we pose a model of bidder collusion at procurements. This type of model is relevant for understanding coordinated effects because most corporations conduct competitive procurements to acquire many of the products and services they require. In our related research, we use a model of procurements to analyze the Arch Coal/Triton merger since most of the coal from the South Powder River Basin was and is purchased by utilities through competitive procurements.

Explicit collusion by bidders has received attention in the economics literature over the past two decades.  Analytically, explicit collusion has

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14 See Kovacic, Marshall, Marx, and Schulenberg, note 12, supra.
15 See, e.g., R. Marshall and L. Marx, Bidder Collusion, Journal of Economic Theory (2006) (forthcoming). Much of the literature focuses on auctions rather than procurements, but for simple procurements there is no meaningful difference between a procurement and an auction. Multiple object auctions and procurements have received less attention than single object auctions and procurements, and independent private value models have received more attention than affiliated and common value models. The emphases reflect both the perceived relevance of various models as well as their analytic tractability.
been treated as if the bidders became one bidding entity. A recent breakthrough in the economics literature by Gayle and Richard (2005) permits the type of analysis required to quantify the effects of bidder collusion at procurements and so to study coordinated effects.\footnote{W.R. Gayle and J.F. Richard, Numerical Solutions of Asymmetric First Price Independent Private Values Auctions, University of Pittsburgh Department of Economics Working Paper (2005) provide numerical methods, together with an analytical result for evaluating Taylor Series expansions of inverse functions, that allow the use of any underlying distribution for values or costs, even empirical ones.}

In addition to affecting the behavior of colluding bidders, collusion at a sealed-bid procurement affects the bidding behavior and expected payoff of non-colluding bidders.\footnote{This is not the case for oral auctions or procurements. See, e.g., M. Robinson, Collusion and the Choice of Auction, RAND J. Econ. (1985) and Marshall and Marx (2006). We use the words “sealed bid” to be synonymous with “first price” in this paper. Namely, in an auction context bidders simultaneously submit sealed bids - the high bidder wins and pays the amount of their bid. Specifically, we are not considering second price auctions or procurements where, in an auction context, the high bidder wins and pays the amount of the second highest bid. These seemingly small differences in the payment rule for the two auctions have a very large implication for the potential success and sustainability of collusive bidding (see Marshall and Marx (2006)).} The benefits from the suppression of competition between the merged entities typically cannot be captured exclusively by the merging firms. Some of the suppression of rivalry benefits non-merging firms as well.\footnote{T. Duso, K. Gugler and B. Yurtoglu, EU Merger Remedies: A Preliminary Empirical Assessment, The Political Economy of Antitrust (V. Ghosal and J. Stennek ed. 2005) (forthcoming) examine the abnormal returns of non-merging firms around the announcement of a merger and other events related to antitrust enforcement for evidence of anticompetitive effects.}

Our analysis based on a single object procurement, which, by definition, never entails a reduction in the quantity brought to market. Perfect explicit collusion without a reduction in quantity purchased as a consequence of the collusion is an upper bound on the potential harm from incremental collusion.

We offer a simple example using uniform power distributions so that the underlying methodology and lines of argument can be understood. Calculations based on the example are shown in Figure 1.
Figure 1: Payoffs: pre-merger noncooperative, post-merger noncooperative and post-merger coordinated effects\(^{19}\)

The first column is the starting point. There are four firms in the industry, which will be treated as bidders at a procurement. Each bidder has a type. The first bidder’s type is “3.” Think of this as meaning that this bidder gets to take three draws from a uniform distribution on zero to 100, and retain the lowest of those draws as its cost for the item. The bidder labeled “2” gets to take two draws. The bidders labeled “1” gets one draw. The expected surplus column provides the average payoff that the bidder can expect from participating in the procurement. The total surplus is the sum of the expected surpluses. The expected cost is what the buyer can, on average, expect to pay for the item being purchased.

The next major column is labeled “Three Bidders.” Consider the entries in the first cell. The bidder labeled “5” gets five draws from the uniform distribution on zero to 100 and acts as if its cost is the lowest of those. The other two bidders only get one draw. To see how this case relates to the previous one, note that there are still two bidders labeled “1,” but we have gone from two bidders labeled “3” and “2” to one bidder labeled “5.” Recall that the bidder labeled “3” took three independent draws from the uniform distribution and treated its cost as the lowest of those. The bidder labeled “2” took two draws and treated its cost as the lowest of those. If those two bidders shared their cost draws, then they

\(^{19}\) Costs are distributed over \([0,100]\) according to \(F_s(x) = (0.01x)^s\), where \(s\) is the bidder type.
would become a single bidder who had five independent draws and bid as if its cost were the lowest of those five draws. This is exactly the case described in the second major column, first cell. In other words, “5,1,1” is just a merger of “3” and “2” from the case of “3,2,1,1.” The remainder of the table is read in similar fashion.

The first point to note from Figure 1 is that the comparison of the first major column to the second major column falls within the domain of standard unilateral effects analysis. The third major column is not considered in either standard unilateral effects analysis or coordinated effects analysis. However, we believe that the third major column addresses many of the queries posed regarding coordinated effects in the Guidelines. Specifically, the incremental payoffs to any form of post-merger explicit collusion can be directly quantified. The analysis is grounded in theory, and the assumptions are exposed for all to consider and probe.

The payoff changes associated with incremental collusion do not offer any explicit statement about the chance of that particular collusion occurring, but they do offer an implicit statement - it is reasonable to presume that the probability of incremental collusion is increasing in the payoff to that collusion. This may be viewed as a limitation to the analysis, but no other coordinated effects analysis that we are aware of is capable of producing a quantifiable probability.

As an illustration, assume the example above represents a specific industry that has four firms to start and consider what we might learn from the example regarding coordinated effects.

- **Incremental payoffs.** Consider any proposed merger (one of the four cells in column two). Now consider one of the three cells in column three that may emerge as a cartel from post-merger incremental bilateral collusion. It is clear that the biggest payoff in column three comes from a duopoly with a highly asymmetric structure “6,1.” The incremental payoff is largest in going to “6,1” as opposed to any other incremental collusion that is possible regardless of the starting point in column two.

- **Merging firms anticipating future coordinated effects.** “3,3,1” is more likely to be approved on the grounds of unilateral effects than “5,1,1” since the impact on seller’s expected cost is much lower, but there is significant danger in the approval of “3,3,1” for future coordinated behavior. Specifically, there is a bigger incremental payoff to “6,1” from the starting point of “3,3,1” than from “5,1,1.” In addition, when starting from “3,3,1,” each of the “3” bidders is an obvious beneficiary from the collusion, whereas some type of unequal split would have to be formulated to get “5” to agree to the incremental collusion.
• *Maverick firm.* Suppose that in considering the bidders comprising “3,3,1” we were able to identify one of the “3” bidders as a maverick. Now the concerns regarding “6,1” from the merger producing “3,3,1” are mitigated.

It is common for the focus of attention in merger cases to be on the last column of Figure 1, which shows an all-inclusive cartel. We believe that this focus is largely misplaced. Not even the international Vitamins Cartel was all-inclusive for many vitamins. In addition, the Guidelines recognize the importance of maverick firms, which are portrayed as firms not wanting to join cartels. The emphasis on all-inclusive collusion may stem from the economics literature that largely emphasizes the all-inclusive cartel.20

1. **Extension 1 – Substantial Fringe**

Up to this point it may appear that our approach will only show that coordinated effects are problematic. However, this is not the case. Merging firms can use the methodology to potentially show that assertions regarding large detrimental coordinated effects are exaggerated and largely ungrounded.

The example shown in Figure 2 is essentially the same as the one in the previous section except that we have introduced a competitive fringe. Specifically, this industry has eight firms where four comprise the fringe and are “type 1” or weak bidders. What are the incremental payoffs to post-merger collusion? In the worst case, there is a 13% increase in firms’ payoffs from incremental collusion (going from “3,3,1” to “6,1”) and for the case that might be of greatest concern ex ante – “5,1,1” to “6,1” – the incremental payoff increase is 7%.

Imagine the debate on the issue of coordinated effects in the absence of such quantification. Enforcement authorities assert a potential harm, and the merging firms assert that the argument makes no sense. In the absence of the kind of quantification we are proposing, the court is left with little to sort out the issues.

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20 Notable exceptions include Marshall and Marx (2006) and cites therein.
2. **Extension 2 – Merger Efficiencies**

Finally, we want to note that the methodology can incorporate efficiencies that are alleged to be present with certain mergers. In Figure 3 we consider a merger of “2,1.” In the absence of efficiencies the merger would produce a “3” but with efficiencies it allegedly produces a stronger type. In the case below we show what happens when it produces a “5.” The efficiency produces more vigorous competition and, in fact, the expected procurement cost falls relative to the pre-merger world. One would expect the merging firms to strongly advocate the merger based on these efficiency effects. However, the payoffs to coordinated effects are as strong with the efficiency as without it, and the payoff to incremental post-merger collusion is quite large. Enforcement authorities should not be blinded from analyzing coordinated effects when confronted with a compelling story about merger efficiencies. Use of our proposed analysis would avert this.

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### Table 1: Payoffs with a fringe

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<thead>
<tr>
<th>Bidder type</th>
<th>Expected surplus</th>
<th>Bidder type</th>
<th>Expected surplus</th>
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<td>1</td>
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<td>Fringe</td>
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<td>Total surplus</td>
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<td>Fringe</td>
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**Figure 2**: Payoffs with a fringe: pre-merger noncooperative, post-merger noncooperative, and post-merger coordinated effects.

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21 Costs are distributed over $[0,100]$ according to $F_s(x) = (0.01x)^s$, where $s$ is the bidder type. The fringe is assumed to be four bidders of type $s=1$. 

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<tr>
<td>Expected cost</td>
<td>25.03</td>
<td></td>
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</tbody>
</table>

**Figure 3:** Payoffs with merger efficiencies: pre-merger noncooperative, post-merger noncooperative and post-merger coordinated effects\(^{22}\)

**IV. CONCLUSION**

To review, we advocate extending current unilateral effects analyses to investigate coordinated effects and thus allow a direct quantification of the incremental payoffs to post-merger collusion among subsets of post-merger firms. Any level of collusion can be investigated and specific firms, who might be “mavericks” can be isolated. Calibration and estimation can be undertaken with guidance from pre-merger data so that the post-merger simulations are appropriately benchmarked. The analysis may flag specific subsets of firms who may earn extraordinary payoffs from post-merger collusion and, if the merger is approved, these subsets could be monitored for suspicious activities or enjoined ex ante from certain actions as part of merger approval.

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\(^{22}\) Costs are distributed over [0,100] according to $F_s(x) = (0.01x)^s$, where $s$ is the bidder type. The merger is assumed to achieve efficiencies such that a type 2 and a type 1 combine to form a type 5.
References


