Returning to the contention that convex costs provide a resolution to the merger paradox, we show that for reasonable degrees of convexity, the minimum market share needed for merger to be profitable remains close to that associated with linear costs. Moreover, convex costs do not eliminate the free rider problem identified as part of the merger paradox. Finally, we retain convex costs while modeling a firm-by-firm sequential merger process, showing that the paradox constrains a larger share of potential mergers. These findings help reduce the relevance of convex costs as a resolution to the merger paradox. (JEL L12, L13)

I. INTRODUCTION

A simple canonical model published in the early 1980s suggests that mergers are rarely profitable for potential participants. Salant, Switzer, and Reynolds (1983) examined a model of n-identical firms, of which m merged. The model demonstrates that only in the unlikely event of more than 80% of the firms merging could the participants earn additional profits as a result of the merger. In all other cases, the profit of the firm created by the merger is lower than the sum of premerger profits of the constituent firms that merge. This result has grown to take prominent places in textbooks such as that by Pepall, Richards, and Norman (1999, Chapter 8) and to take the name The Merger Paradox.

While a variety of researchers have attempted to resolve the paradox, Perry and Porter (1985) used the simple modification of allowing for increasing marginal cost. They showed that for sufficiently convex costs, two firms do profit from merging. At issue in our study is the extent to which cost convexity actually relaxes the merger paradox. We show that any merger of m of n-identical firms (a merger of any market share) will be profitable to the participants with a sufficiently steep marginal cost structure and that this can be used to identify critical concentration measures for given degrees of convexity, which can be compared with the famous 80% figure. This allows us to specify the extent to which convexity relaxes the merger paradox. We also show that although convexity may reduce to some extent the critical degree of concentration needed to earn profit, it does nothing to relax the second crucial element of the merger paradox. Even with convex costs, firms remain better off being excluded from the merger than being a participant. Finally, we add realism by arguing that mergers of m of n firms may happen sequentially rather than simultaneously. Yet, the power of cost convexity to relax the merger paradox is greatly reduced in this realistic case of sequential mergers. In sum, we believe that we are the first to give cost convexity a thorough hearing as a potential solution to the merger paradox and that we find it of only marginal importance.

The next section examines the literature on the merger paradox, defending the rationale for convex costs. The third section introduces the basic model, presenting the pre- and post-merger equilibria. The fourth section compares the equilibria isolating the central propositions and presents simulations for the case of a simultaneous merger of two or more firms. The remainder of the fourth section examines a sequence of firm-by-firm mergers comparing them to simultaneous mergers. A final section concludes and suggests additional research.
II. MERGERS AND PROFITABILITY: THE PARADOX

The basic insight of the merger paradox remains important. If firms merge to restrict quantity, then excluded Cournot competitors will increase their output. Moreover, this increase in output can frequently be sufficient to reduce the profit of the newly merged firms. In this sense, the paradox suggests that the primary beneficiaries of horizontal merger are the rivals excluded from the mergers. Certainly, this idea has received currency in both the popular press and the econometric work. Thus, the major beneficiary of the recent merger of U.S. banks Chase Morgan and Bank One was identified in the business press by Berenson (2004) as excluded rival Citigroup. In econometric work, a series of studies focus on the profit levels of excluded rivals as a test for whether or not the mergers hurt welfare. While Stillman (1983) found that excluded rivals did not benefit as judged by stock market data in the 1970s, Song and Walkling (2000) used more recent data confirming that excluded rivals do earn increased profit as a result of mergers in their industry.

Recognizing the importance of the merger paradox, we further explore the Perry and Porter (1985) modification, which ensures that the newly merged firm retains the sum of its previous capital by allowing for convex costs (increasing marginal costs). We expand on one part of their analysis while emphasizing that other parts of their examination are of no relevance for what we wish to explore. For example, not of relevance is their model of competitive fringe firms coalescing to form a Stackelberg leader with respect to the remainder of the fringe. This model, and related demonstrations such as that by Mallela and Nahata (1989), shows a profit incentive for merger that depends on the behavior of the merged entity being different in kind from that of its constituent parts. Instead, our object is to follow as closely as possible the canonical model of the merger paradox while adopting Perry and Porter’s point that merger does not imply “a loss of a seat at the table.” That is, the merger does not eliminate the importance of the premerger plants.1

While actual mergers may result in the closure of plants, it does not routinely result in one plant for the newly merged firm. Indeed, the actual pattern of plant closure is complex and frequently involves a multiplant firm retaining plants with a wide variety of underlying cost structures as shown by Reynolds (1988) and Whinston (1988). Although the elimination of plants and so fixed costs may be an incentive to merge, this was not part of the original merger paradox. Moreover, the insight of Perry and Porter was that with sufficiently convex costs, an incentive for merger exists precisely because keeping multiple plants provides a variable cost advantage relative to single-plant firms. It is this point we examine in more detail.

Having adopted convex costs from Perry and Porter, it is incumbent upon us to differentiate our demonstration from theirs. First, our structure more closely follows the original one in Salant, Switzer, and Reynolds’s study in that we examined the minimum size of the simultaneous coalition required for a merger of equals to be profitable. In that sense, our demonstration provides a sharp identification of the extent to which increasing marginal cost alleviates the paradox. This deviates from the Perry and Porter’s model in which each firm was either small or large (in essence one plant or two) and in which the issue became as when will two small firms merge to form a large firm. Second, we reexamine the contention that increasing marginal costs can eliminate the paradox by focusing our attention on the second part of the paradox. That is, we not only examined the minimum size required for a merger of equals to be profitable but also examined whether or not the firms engaged in that merger would be better off if other firms took place in the merger. Put differently, a critical part of the merger paradox is that firms excluded from the mergers do better than the included firms, and this reduces the likelihood that the mergers will take place. Perry and Porter did not examine this part of the paradox. Third, we examined a series of mergers that lead to the minimum coalition size, showing the differences that emerge when the merger process is taken to be sequential rather than simultaneous. This is a realistic modification as multifirm (more than two firms) mergers remain unusual.

Our effort differs from many others who had made modifications to the model of the merger

1. Indeed, the idea of “not losing a seat at the table” is fundamental in the work on endogenous mergers by Kamien and Zang (1990, 1991).
paradox. A series of researchers have relaxed the assumption of linear demand. Cheung (1992) showed that if industry revenue is concave in industry output, the threshold for a profitable merger can be reduced from an 80% market share to a 50% market share. Hennessy (2000) took this point further, showing that if a negative exponential demand function is assumed, it can generate profitable mergers for any market share. Fauli-Oller (1997), demonstrating the degree of concavity we note that by increasing the fixed cost as discussed by Basu and Fernald (1997). Yet, to scale beyond anything observed in practice without fixed costs implies decreasing returns that the quadratic cost structure of the firm cerns may arise. First, it might be suggested its constituent parts.

Second, as made clear, we do not consider entry. While this fits the vast majority of the literature on mergers (making them short-run analyses), there does exist a small literature on mergers with free entry considered by Cabral (2003), Spector (2003), and Davidson and Mukherjee (2004). While this literature routinely assumes linear rather than convex costs, it makes clear that the profit of the excluded firms is unchanged by merger being zero, both before and after merger because of entry. In these models, the profitability of merger depends directly upon the extent of “synergistic” cost reductions brought about by the merger as shown by Davidson and Mukherjee (2004).

The critical comparison determining the profitability of merger in our model is the sum of profits earned by $m$ of the $n$ premerger firms and the profit earned by one of the $m - n + 1$ postmerger firms. We seek to identify the conditions under which the postmerger profit of the combined firm is greater than sum of profit from its constituent premerger firms.

In our market of $n$ premerger competitors, the equilibrium quantities, price, and profits are as follows:

$$q_i = a/(n + c + 1) \quad \forall i$$

(1)  

$$P = a(1 + c)/(n + c + 1)$$

$$\pi_i = a^2(2 + c)/2(n + c + 1)^2 \quad \forall i$$

If $m$ firms from this equilibrium merge, the total premerger profit will be $m\pi_i$.

The postmerger equilibrium follows from similar underlying conditions. While the $n - m$ firms excluded from the merger retain cost functions $C_i = (1/2)cq_i^2$, the merged firm retains $m$ plants, each with the same cost function. The resulting composite cost function of the multiplant firm is $C_{n-m+1} = (1/(2m))cq_{n-m+1}^2$. This function reflects the underlying advantage of being able to direct

---

2. The work by Hennessy follows previous work by Fauli-Oller (1997), demonstrating the degree of concavity in demand as a main determinant of merger profitability.

3. Our attempt to allow for free entry but with the introduction of positive fixed costs confirms this insight. Nonetheless, we could not fully identify the gain to merger as the introduction of an additional endogenous variable, number of firms, made the math intractable.
output across multiple plants. Note, however, that if the output of the merged firm remained identical to that of its constituent premerger firms, \( q_{n-m+1} = mq_i \), the total cost to produce that output would be unchanged. The merger by itself does not immediately provide cost savings.

The point of the merger remains to reduce output to exploit market power. The equilibrium resulting from \( n - m \) firms with \( C_i \) and one firm with \( C_{n-m+1} \) can be characterized as:

\[
q_i^M = \frac{(am + ac)}{(nm - m^2 + (n + m + 1) c)} + 2m) \quad \forall i, i = 1 \text{ to } n - m
\]

\[
q_{n-m+1}^M = \frac{(am + amc)}{(nm - m^2 + (n + m + 1) c + 2m)}\]

(2) \( P^M = a(1 + c)(m + c)/(nm - m^2 + (n + m + 1) c + 2m) \)

\[
\pi_i^M = a^2(m + c)^2(2 + c)/2(nm - m^2 + (n + m + 1) c + 2m)^2 \quad \forall i, i = 1 \text{ to } n - m
\]

\[
\pi_{n-m+1}^M = a^2m(1 + c)^2(2m + c)/2(nm - m^2 + (n + m + 1) c + 2m)^2
\]

In what follows, we evaluate and compare the premerger and postmerger equilibria with an eye toward the profit consequences and thus the incentive for merger.

IV. THE RESULTS FROM MERGER

The premerger Equation (1) and the postmerger Equation (2) equilibria reveal a series of comparisons that set the stage for later results.

PROPOSITION 1. (i) \( q_{n-m+1}^M > q_i^M \); (ii) \( P^M > P \); (iii) \( mq_i > q_{n-m+1}^M \); and (iv) \( q_i^M > q_i \).

Proof. Compare the values in Equations (1) and (2).

The first comparison illustrates that the merged firm continues to produce from its premerger plants, does not lose its seats at the table, and as a consequence, produces more than the single plant excluded rivals. This contrasts with the canonical model in which all postmerger firms produce the same quantity. The second comparison follows from the merged firm’s exploitation of market power to reduce quantity and increase price. The third comparison shows that as a result of the reduction in quantity, the output of the merged firm is less than that of its pre-

\[
g(n, m, c) = \pi_{n-m+1}^M - m\pi_i
\]

Substituting from Equations (1) and (2) into Equation (3) and setting the result equal to 0 permits solving for the \( n \) that is the maximum initial market size in which \( m \) firms with

\[
n \ast (m, c)
\]

\[
= \frac{2m^2 + cm^2 - 2m - cm - c - c^2 + (8c m^3 + 4c^3 m^2 + 2c^3 m^2 + c^4 m^2 + 4m^3 + 10m^3 c + 5c^2 c^2 + 2m^2 c^2(2m + mc + c))^{1/2}}{2m + mc + c}
\]
cost $c$ can merge and earn non-negative additional profit from doing so.\(^4\)

The relationship in Equation (4) defines the critical values for the underlying variables that determine the potential for profitability from merger. Note that the demand intercept, $a$, is absent.

**PROPOSITION 2.** For any merger by $m$ of $n$ firms, there exists a $c$ such that the profit earned from merger is positive.

**Proof.** Hold $n^*(m, c)$ constant and apply the implicit function theorem to Equation (4) to show that $\partial c/\partial m < 0.\(^5\)$ Thus, for any $n$, as $m$ decreases, $c$ can be increased sufficiently such that the profit from merger is held at 0. Any increase in $c$ beyond that yields positive profit from merger.\(^6\)

The intuition is that the larger the $c$, the larger the relative cost savings of the merged multiplant firm resulting from a reduction in output. As the merged multiplant firm exploits market power by reducing output, it moves down the marginal cost curves of each of its plants, while the excluded firms each move up their marginal cost curve as they respond with greater output. There will always be a large enough $c$, a steep enough marginal cost curve, such that the resulting cost difference between the merged firm and the excluded rivals makes merger profitable. As an illustration, a merger of two firms is never profitable in the canonical model of constant marginal cost even when there are only three firms in total. Setting Equation (3) equal to 0, $n = 3$, $m = 2$, and solving for $c$ shows that such a merger is profitable in the case of upward sloping marginal costs whenever $c > 1.60$.

Table 1 shows two sets of simulations from Equations (3) and (4) in order to further understand the implications of the model. The left panel shows the minimum value of $c$ that ensures a profitable merger for various values of $n$ and $m$. The critical value of $c$ increases in $n$ but decreases in $m.\(^7\)$ The right panel presents a related illustration of the minimum market share ($mln$) necessary to ensure a profitable merger for various values of $n$ and $m$. Whenever $c$ is positive, the minimum market share is below the 80% level from the canonical model. Some of the shares fall below 50%, but these require an enormous degree of convexity.\(^8\) All the required shares remain far from trivial and far above most observed in actual mergers. For example, with a parameter of $c = 1$ (a slope of the marginal cost curve

\begin{table}
\centering
\caption{Minimum Conditions for a Profitable Simultaneous Merger}
\begin{tabular}{lcccc}
\hline
 & \text{Critical Cost Parameter, $c$} & \multicolumn{4}{c}{\text{Critical Market Share, $mln$}} \\
 & $m = 2$ & $m = 4$ & $m = 6$ & $m = 8$ & $c = 1$ & $c = 3$ & $c = 5$ & $c = 10$ \\
\hline
$n = 3$ & 1.60 & & & & .711 & * & * & * \\
$n = 5$ & 7.45 & 0.00 & & & .688 & .550 & * & * \\
$n = 10$ & 22.38 & 7.22 & 2.47 & 0.11 & .707 & .569 & .476 & .332 \\
$n = 15$ & 37.36 & 15.31 & 8.54 & 4.51 & .732 & .603 & .514 & .364 \\
\hline
\end{tabular}

\textit{Notes:} \(^*\) denotes that the value of $c$ is sufficiently high that the initial two-firm merger and also all simultaneous mergers of a larger number of firms will be profitable.
\end{table}

\begin{itemize}
\item 4. This process generates two roots, but only the positive one is relevant and is shown as Equation (4).
\item 5. In the implicit function expression, $\partial c/\partial m = -(\partial h^*/\partial m)/(\partial h^*/\partial c)$, the numerator is unambiguous, with each term in the resulting derivate positive. The sign of the denominator is less immediate, but optimizing the denominator subject to the constraints $m \geq 2$ and $c \geq 0$ shows that denominator takes its minimum of .384 at the corner solution of $m = 2$ and $c = 0$. Thus, the denominator is also unambiguously positive in the relevant range of $m$ and $c$. These expressions were computed and evaluated in MAPLE8 and are available from the authors upon request.
\item 6. The result is established by taking the derivative of $g(n, m, c)$ with respect to $c$ and evaluating it when $n = n^*(m, c)$. The derivative is positive $n$ for all values of $m$ greater than or equal to 2.
\item 7. The critical values of $c$ are generated from Equation (3) as described for the case of two of three firms merging. They represent the value such that $g(n, m, c) = 0$, so values larger than those given indicate a positive gain from merger.
\item 8. As the market shares suggest “fractional firms,” they are presented primarily for illustrative purposes.
\end{itemize}
equal in size to that of the demand curve), the deviation from the 80% rule is not great. Such a showing is important in light of claims, such as that by Martin (1993), that the assumption of convex costs implies that mergers “are much more likely to be privately profitable” (italics added).

The minimum market share decreases with increased \( c \) but shows an ambiguous pattern with increases in \( n \). This ambiguity results because the increase in \( n \) necessitates an increase in \( m \), but the rate of increase in \( m \) varies as given by Equation (4). Thus, both the numerator and the denominator of the market share are increasing, but at varying rates. After an initial decline, the minimum market share needed to ensure profitability increases with \( n \).

An important pattern somewhat hidden in the simulations in Table 1 can be formalized. If a merger of \( m \) firms is profitable, a merger of more than \( m \) firms will be more profitable (a formal proof is available from the authors).

On the one hand, a larger merger will result in a bigger decrease in quantity by the merged firm as it has greater market power. On the other hand, with fewer excluded rivals remaining, the per firm increase in output in response by the rivals will be larger. This combination means that a larger merger drives the merged firm further down the marginal cost curve of its plants and excluded rivals further up their respective marginal cost curves. The result is a larger gain from merger.

Finally, we investigated the gain in profit from the merger for the excluded rivals. This gain for a representative firm is

\[
\begin{align*}
(5) \quad h(n, m, c) &= \pi_i^M - \pi_i.
\end{align*}
\]

Under the assumption that the gains from merger are evenly split among the participants, the value of Equation (5) can be compared to the per firm gain earned by the merging firms: \((1/m) g(n, m, c)\).

**PROPOSITION 3.** The profit gain from a merger of \( m \) of \( n \) firms is always greater for the excluded rivals than for the merger participants.

**Proof.** From Equations (1) and (2), it follows that

\[
\begin{align*}
h(n, m, c) - (1/m) g(n, m, c) &= \left( a^2 (2m(m-1) + c(m^2 - 1))/(2nm - m^2 + (n + m + 1 + c)c + 2m)^2 \right).
\end{align*}
\]

For \( n > m \geq 2 \), this is unambiguously positive.

Thus, the gain from being a free rider rather than participating in the merger is positive. This remains true even when \( c \) is large enough to generate a positive return for merger participants. The presence of a benefit to free riding on mergers by others carries over from the case where marginal cost is constant. Thus, this critical aspect of the merger paradox remains completely unaffected by increasing marginal costs, and the suggestion by Perry and Porter (1985, 226) that the results of Salant, Switzer, and Reynolds do not generally hold in a model of increasing costs should be amended accordingly. It remains a paradox, even with convex costs, that no firm wishes to participate in a merger, hoping always to remain an excluded rival.

**Allowing for Merger Sequences**

In this subsection, we summarize our consideration of a series of sequential mergers, each adding only one outside firm to an existing merger of \( m - 1 \) firms. This natural extension reveals that many of the insights of the previous section carry over but that the power of the paradox emerges as stronger. As many of the results are proven through simulation, we suppress their demonstration but make them available to any interested reader.

In the earlier section, \( g(n, m, c) \) determines the critical \( c \) necessary for a subset of \( m \) of \( n \) firms to merge simultaneously. The sequential merger analogue, \( \gamma \), is the difference of two components: the added profit to the merged firm of moving from \( m - 1 \) constituent firms to \( m \) constituent firms and the profit that the \( m \)th firm would have earned had it not joined the other \( m - 1 \) firms in merger.

\[
\begin{align*}
(6) \quad \gamma(n, m, c) &= \left( \pi_i^M - \pi_i^n \right) - \pi_i^M.
\end{align*}
\]

Each of the components can be identified from Equation (2), and while the result of this substitution yields a more complicated expression, we can proceed with the same analysis as with simultaneous mergers.

Setting \( \gamma(n, m, c) = 0 \) and solving for \( n \) yields two roots, only one of which is positive, \( n^*_i(m, c) \). As mentioned before, for all values of \( n \) below \( n^*_i(m, c) \), a merger of \( m \) firms with marginal cost of \( c \) will be profitable. As a
consequence, for any merger of one firm and a group of \( m - 1 \) previously merged firms, there exists a \( c \) such that the profit earned from merger is positive.

While by construction, the \( c \) necessary to support a merger of two of \( n \) firms is identical for the sequential and simultaneous cases, the necessary values of \( c \) diverge for \( m > 2 \). This happens because the profit of firms outside a merger, \( \pi^M_i \), increases in \( m \) [as shown in Equation (2)]. Moreover, as Proposition 3 makes clear, the gap between the profit earned by being an excluded firm and that earned by being a part of a simultaneous merger grows as \( m \) grows. This makes it more difficult to support a sequential merger than a simultaneous merger. In the sequential case, the outside profitability to the potential merging firm has been increased by all the sequential mergers to that point. The profit of the merged firm is the same regardless of whether the merger is simultaneous or sequential. This important point can be summarized as follows: for any \( c > 0 \) and \( m \geq 3 \), the set of profitable sequential mergers is strictly smaller than that of profitable simultaneous mergers.

To illustrate the difference, we identify in Table 2 the minimum \( c \) and market share for profitable sequential mergers in order to compare to those shown earlier for simultaneous mergers in Table 1. As made clear, when \( m = 2 \), the minimum necessary \( c \) will be identical to that presented for the simultaneous case. For all other cells, the sequential merger conditions are shown to be more restrictive.

Despite the differences in magnitudes, the model of sequential merger shares another critical aspect with simultaneous mergers. If an initial merger is profitable, all subsequent sequential mergers remain profitable, suggesting monopoly as the eventual equilibrium market structure. Thus, despite the fact that excluded firms have increasing profits as sequential mergers occur, it will remain profitable to join an already merged firm. Each sequential merger allows for greater ability to exercise market power by reducing output, an output reduction that lowers the merged firm’s costs more than that of excluded firms. The additional profits to the merged firm that arise from reduced competitiveness and cost reduction dominate the increased profitability of any single outside firm due to the sequential mergers to that point.

VI. CONCLUSIONS

This inquiry explores further relaxing the implicit assumption in the canonical model of the merger paradox that the merging firm closes all plants but one, thereby “losing seats at the table.” Retaining multiple postmerger plants seems a reasonable alternative assumption and one generated by adopting increasing marginal costs. Adopting upward sloping marginal cost curves but retaining the remainder of the canonical model generates the fundamental results of the study.

Primary among the results is that a simultaneous multiple firm merger of any size in a market of any size can be profitable to the participants with a sufficiently large cost convexity. It is the convexity that determines the cost savings of an output reduction by the merged firm and the cost increase associated with the resulting expansion in output by excluded rivals. Yet, despite this result, with reasonable degrees of convexity, the market shares necessary to obtain profit from merger

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
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<tbody>
<tr>
<td>Minimum Conditions for a Profitable Sequential Merger</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>( n )</th>
<th>( m = 2 )</th>
<th>( m = 4 )</th>
<th>( m = 6 )</th>
<th>( m = 8 )</th>
<th>( c = 1 )</th>
<th>( c = 3 )</th>
<th>( c = 5 )</th>
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<tbody>
<tr>
<td>3</td>
<td>1.60</td>
<td></td>
<td></td>
<td></td>
<td>.736</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>5</td>
<td>7.45</td>
<td>1.05</td>
<td></td>
<td></td>
<td>.805</td>
<td>.660</td>
<td>*</td>
<td>*</td>
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<tr>
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<td>7.08</td>
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<td>.748</td>
<td>.667</td>
<td>.519</td>
</tr>
<tr>
<td>15</td>
<td>37.36</td>
<td>29.53</td>
<td>21.13</td>
<td>13.21</td>
<td>.905</td>
<td>.794</td>
<td>.719</td>
<td>.595</td>
</tr>
</tbody>
</table>

Notes: For \( m = 2 \), the cost conditions are identical to those in Table 1. For all cells, the number is the minimum necessary for a merger of the \( m \)th firm with \( m - 1 \) previous to be profitable. The “*” denotes that the value of \( c \) is sufficiently high that the initial two firm merger and all subsequent sequential mergers will be profitable.
remain far above those typically observed in actual mergers.

We emphasize that the gain to merger in our model remains larger for the excluded firms. Thus, the free rider problem recognized as a part of the merger paradox is not eliminated by convex costs. Each firm wants other firms to be the ones to merge and reduce output. This “chicken game” has no easy solution, but we reiterate that increasing marginal costs, even steeply increasing marginal costs, cannot eliminate this aspect of the paradox.

The possibility of profitable merger carries over to the sequential firm-by-firm case. When merging sequentially, a steeper marginal cost is required than in the simultaneous case, but again, any merger can be supported with a sufficiently steep marginal cost. Importantly, if the first merger of two firms is profitable, all additional sequential mergers will be profitable. This happens despite the fact that the profit of excluded rival grows with each sequential merger. Nonetheless, cost convexity does less to eliminate the merger paradox when mergers are assumed to be sequential.

Future work that might be productive includes considering alternative demand curves and examining asymmetric costs. As emphasized in reviewing the literature, concave demand has been shown to lessen the extent of the merger paradox. The expectation would be that the combination of upward sloping marginal costs and concave demand would lessen the paradox further than does either alone. Moreover, all firms have been presumed to be identical at the outset of our model. If there exist differences in marginal cost slopes, mergers will be differentiated by the cost structures of the merging firms. Even if the merging firms share the same average marginal cost as the excluded rivals, the fact that an output reduction would result in greater reallocation in outputs between plants, as suggested by Tirole (1988), might yield differences from the results we have presented.

REFERENCES