Antitrust Policy and Vertical Mergers

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Recently, federal regulators responsible for enforcing the antitrust laws have shown a renewed interest in the potential anticompetitive effects of vertical mergers—mergers between two independent firms in successive stages of production. For example, the U.S. Department of Justice has intervened in a series of vertical merger cases involving communications. In three cases, the acquisition of McCaw Communications by AT&T, the partial acquisition of MCI by British Telecommunications, and the merger between Liberty Media and Tele-Communications Inc., the Justice Department obtained consent decrees altering the outcomes. This greater activism in vertical merger cases is in striking contrast to the permissive policies that prevailed throughout the 1980s, which, in turn, were a response to the Justice Department's and the Federal Trade Commission's open hostility to vertical mergers during the 1960s and the early 1970s.

The cyclical antitrust treatment of vertical mergers over the past three and one-half decades has been strongly influenced by the theoretical research of academic economists and lawyers. In the 1960s, the Department of Justice and the Federal Trade Commission believed that vertical mergers were anticompetitive because they have the potential to foreclose independent competitors in the upstream market from a potential customer and foreclose independent competitors in the downstream market from a potential supplier of a critical input. (A vertical merger is called an "upstream" acquisition if a firm acquires an independent supplier of one of its inputs, a "downstream" acquisition if a firm acquires one of its independent customers.) If a vertical merger led to the foreclosure of even a small share of the upstream or the downstream market, the antitrust enforcement agencies would challenge the merger and the courts would typically support their decision. This hostile treatment of vertical mergers was based on the views of Bain (1959) and other economists who evaluated the competitive effects of vertical mergers on the basis of the market shares of the upstream and downstream

firms and the shares of the market that were foreclosed to rivals of the merging firms.

The hostile treatment of vertical mergers was challenged by the research done in the late 1960s and the 1970s by academic economists and lawyers associated with the "Chicago" school of thought. For example, Bork (1978) and Posner (1976) showed that anticompetitive foreclosure is almost never a profitable strategy for the merging firms. At the same time, Williamson (1985) and other economists associated with the "New Institutional" school of economics emphasized the possibility that vertical mergers can improve efficiency by reducing the transaction costs associated with market exchanges between independent firms in successive stages of production.

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When Ronald Reagan became President, he appointed members of the Chicago school to antitrust policy positions within the Justice Department and the Federal Trade Commission. Since the Reagan appointees believed that vertical mergers almost always increase competition, the enforcement agencies showed little interest in aggressively challenging these mergers. Their policy was formally incorporated into the 1982 and 1984 versions of the *Merger Guidelines* issued by the Justice Department.

The view that vertical mergers are procompetitive has recently been challenged by articles arguing that vertical mergers can result in higher prices to consumers if they foreclose unintegrated rivals from access to customers or inputs. Articles by Ordover, Saloner, and Salop (1990), Krattenmaker and Salop (1986), Salinger (1987, 1988, and 1989), and Bolton and Whinston (1991) use the tools of modern economics, including game-theoretic models, to show that vertical mergers can have anticompetitive effects by raising the costs to unintegrated rivals. It is this new learning that has generated an interest in pursuing a more aggressive stance against vertical mergers in the telecommunications industry and other markets.[1]

Despite the amount of theoretical work examining vertical mergers, very little empirical work has been done to determine the circumstances in which vertical mergers are anticompetitive. This is surprising, because the theoretical models that have resulted in the more recent aggressive treatment of vertical mergers offer little guidance about the circumstances under which anticompetitive vertical foreclosure occurs. It may be that anticompetitive vertical foreclosure occurs only rarely, as the Chicago economists and lawyers have claimed. Thus, a more aggressive enforcement policy may be necessary only in those rare cases.

This article examines the empirical evidence of anticompetitive foreclosure in vertical mergers challenged by the Department of Justice and the Federal Trade Commission during the period from 1963 to 1982. We find no evidence of anticompetitive market foreclosure for the sample of vertical merger cases challenged by the antitrust agencies during this period. Consequently, we suggest that a more permissive policy towards vertical mergers be maintained until the theory can spell out more clearly the circumstances when vertical mergers result in anticompetitive foreclosure.

I. When Are Vertical Mergers Anticompetitive?

The treatment of vertical mergers by the enforcement agencies and the courts traditionally has focused on the difficulty unintegrated firms have in buying goods from vertically integrated rivals. This legalistic concern with foreclosure of unintegrated rivals, as discussed in *Brown Shoe Co. v. United States* in 1962 (370 U.S. 294), was embraced by the courts as denying unintegrated rivals a fair opportunity to compete. This reasoning led the courts to focus on the market share foreclosed by the merger and on the degree of market concentration in the foreclosed market. An additional concern was that vertical mergers would raise the barriers to entry, making it difficult for a new firm to enter the downstream or the upstream market, unless entry occurred in both markets.

[1] This recent theoretical work is also coming under heavy criticism. See for example, Brennan (1988), Choate and Kleit (1994), Reiffen (1992), and Reiffen and Vita (1995).

These concerns with vertical foreclosure resulted in active enforcement of vertical merger cases through much of the 1960s and 1970s by both the Justice Department and the Federal Trade Commission. The legal view of vertical foreclosure does not have a strong theoretical foundation, however. Economists argue that injury to competitors is not sufficient to prove injury to competition. Injury to competition requires a reduction in output and an increase in the price to consumers. Most of the economic research in the 1960s and 1970s found the opposite, that vertical mergers frequently result in lower prices to consumers. Vertical mergers can lead to lower costs and more efficient operation if the acquisition reduces the transaction costs, reduces uncertainty, improves the production process, or eliminates the misallocation of resources that occurs because of market power at one or more of the successive stages of production.

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Transaction costs are the costs of negotiating, monitoring, and enforcing an agreement between two independent parties. These costs are higher when the buyer or the seller has to make investments that are very specific to the transaction.[2] These transaction-specific investments have a substantially lower value when they are used in transactions with alternative buyers or sellers. Once they are in place, they reduce the latitude of the transacting parties to find alternative customers or suppliers.

Once the parties are locked in to each other, they have the incentive to act opportunistically and bargain for a greater share of the gains created by the transaction. Opportunistic behavior can take the form of bargaining for more favorable prices, lowering the quality of the products or services exchanged, or delaying delivery of the products or services.

Negotiation over prices can adversely affect the firms because it can substantially increase the cost of completing a transaction. If the producers of the inputs provide goods of uneven quality, the purchasers of these goods may also find their business adversely affected. Similarly, bad customer service from the seller of the good may lower the quality of the buyer's products and adversely affect its customers' view of its products. Delayed delivery may cause disruptions in the buyer's production process, adversely affecting business. For example, the entire production of a Navy ship may be delayed if a critical component is not delivered in a timely fashion, even if the component is only a small fraction of the total value of the ship. Delays in the delivery of the ship to the Navy may affect the ability of the shipbuilder to negotiate future contracts with the Navy.[3]

Each of these bargaining problems may be resolved by carefully constructing a contract, but such contracts usually entail substantial bargaining, monitoring, and enforcement costs. Frequently, the transaction costs of dealing with independent suppliers are greater than the costs of producing the products and coordinating the transactions internally. When they are, it is more efficient for the firms involved to integrate vertically.

Uncertainty is also a major concern. Transportation difficulties, labor disputes, inventory problems, or production problems can impose serious costs on a business. Sometimes these problems can be resolved differently and more efficiently when the firm produces the inputs internally rather than purchasing them from an independent supplier. Thus, to avoid costly disruptions, a firm may choose to integrate vertically by acquiring one of its independent suppliers.

The production process may be improved by having all levels of production conducted at one place. Sometimes the technology of the production process

[2] There are five types of transaction-specific investments: (1) physical-asset specificity, which is an investment in a piece of equipment designed for a particular customer or supplier; (2) location specificity, which occurs when the buyer or the seller locates its plant in close proximity to the plant of the other; (3) dedicated-asset specificity, which occurs when an investment is made specifically to supply a particular customer and, if that customer were to terminate the relationship for some reason, the supplier would be stuck with a substantial amount of excess capacity; (4) human-asset specificity, skills needed specifically for dealing with the other party; and (5) temporal specificity, which occurs when certain functions must be performed sequentially and substantial costs are incurred when they are not performed on time.

[3] See Masten, Meehan, and Snyder (1991).

makes production most efficient if it is all conducted at one place.

Vertical integration may also lead to increased efficiency by eliminating the anticompetitive effects of market power at one or more stages of production. If a buyer uses inputs in variable proportions to produce its products, and if it buys one of those inputs in a market where there is market power, it can vertically integrate downstream by acquiring one of its suppliers and in this way eliminate the inefficient distortions caused by the inputs being priced above the competitive level. As long as the upstream firm can substitute for inputs (that is, the inputs are used in variable proportions) that are priced above the competitive level, an inefficient allocation of inputs occurs when the supplier of inputs has monopoly power.[4]

As vertical mergers were increasingly viewed as efficiency-enhancing rather than anticompetitive, the pendulum swung from aggressive intervention in vertical mergers in the 1960s and 1970s, to virtually no government intervention in vertical mergers in the 1980s.

If market power exists in both the input and output markets, the distortion is even more severe. As in the case above, monopoly power in the upstream market leads to a restriction of output and higher input prices. But now, the downstream firms restrict their output and raise their prices above their competitive level. In other words, the distortion in monopoly pricing is compounded, because each stage of production restricts its output and raises its price above the competitive level in its respective market.[5] This double distortion can be avoided if the upstream and downstream firms integrate vertically by a merger and set the price for the input produced by the upstream firms at the competitive level. Thus, vertical integration can increase the sum of the profits for the upstream and the downstream firms, increase output, and lower prices. That is, the vertical merger is procompetitive rather than anticompetitive.

As vertical mergers were increasingly viewed as efficiency-enhancing rather than anticompetitive, the pendulum swung from aggressive intervention in vertical mergers in the 1960s and 1970s, to virtually no government intervention in vertical mergers in the 1980s. This policy was enshrined in Department of Justice 1982 and 1984 *Merger Guidelines*, which significantly reduced the conditions for intervening in vertical mergers. As a result of the new guidelines, no significant intervention in vertical merger cases occurred in the 1980s.

Recent contributions by Ordover, Saloner, and Salop (1990) and by Salinger (1987, 1988, and 1989) use modern theoretical models to show that vertical foreclosure can raise the costs to unintegrated rivals and lead to a restriction in output and higher prices for consumers. In Salinger's model, which is typical of the newer models, he assumes that some market power exists in both the upstream and downstream markets prior to the vertical merger.[6] In this model, a vertical merger between a firm in the upstream market and an independent firm in the downstream market has two effects.

The first effect reduces competition by restricting output and raising prices. If the integrated firm sells all of its upstream output to its wholly owned downstream division, the vertical merger will reduce the number of competitors in the unintegrated segment of the upstream market. The reduction in the number of competitors in the unintegrated upstream market leads to a reduction of output and an increase in the price of one of the inputs used by the independent firms in the downstream market. The higher price of inputs to the unintegrated downstream rivals of the integrated firm raises their costs and forces them to restrict their output and raise their prices. Since the downstream rivals of the integrated firm are selling at a higher price, the integrated firm can also raise its price in the downstream market.

A second and offsetting effect also occurs because of the vertical merger. After the merger, the vertically integrated firm can avoid the double distortion caused

[4] If the inputs are used in fixed proportions, which eliminates substitution, vertical integration will not affect overall monopoly power and will not enhance efficiency. If inputs are used in variable proportions, substitution is possible, and vertical integration will result in cost efficiencies.

[5] The double distortion exists in both the fixed proportions and the variable proportions cases.

[6] Salinger uses a Cournot model to examine the effects of vertical integration.

by prices being set above the competitive level in both markets, by setting the upstream price equal to the competitive price. This will lower the cost to the downstream division of the integrated firm and allow it to lower its price and expand its share of the downstream market. To the extent that the nonintegrated firms lose market share to the integrated firm in the downstream market, their demand for inputs sold by the unintegrated upstream firms will fall, as will their price. As a result, it is possible that prices in the downstream market will fall, as well.

The net effect of the vertical merger on competition in this model is unclear. If the first effect dominates the second effect, the merger will have an anticompetitive effect. On the other hand, if the second effect dominates, the merger will have a procompetitive effect. Unfortunately, the Salinger model does not offer any clear guidelines for antitrust action because it does not make it clear what kinds of market characteristics make it more likely that the anticompetitive effect will dominate the procompetitive effect.[7]

This is a particularly propitious time for reexamining vertical mergers, because antitrust authorities are once again challenging vertical mergers and appear to be expanding their investigations beyond the 1984 guidelines. As noted above, in the past year, the Department of Justice has entered into three major consent decrees in mergers involving communications companies, and the FTC has entered a consent decree to modify the acquisition by Martin Marietta of certain assets of the space division at General Dynamics.

Whether the new academic evidence regarding vertical mergers provides compelling evidence for greater antitrust enforcement remains an open question. While the theoretical models indicate it is possible to have anticompetitive vertical mergers, the empirical evidence is wanting on whether these concerns are sufficient to alter public policy and, if they are, under what circumstances vertical mergers should be contested.

II. Testing for Anticompetitive Vertical Mergers

Rosengren and Meehan (1994) have shown in a simple extension of the Salinger model that a necessary condition for anticompetitive foreclosure is that unintegrated rivals are less profitable after the merger. If vertical mergers that result in foreclosure significantly reduce the profitability of unintegrated rivals, this should be shown in the stock price, which would reflect reduced expectations of future earnings. Thus, if foreclosure was a problem in earlier cases challenged by the Federal Trade Commission and the Justice Department, the stock prices of unintegrated rivals should have fallen when a merger was announced.

A problem with this study, as with many similar event studies, is the possibility of alternative explanations for changes in stock prices as a result of an announcement. The most serious alternative explanation is that vertical integration provides the merging firm with cost advantages unavailable to unintegrated rivals, so the profits of unintegrated rivals will fall because their rivals are more competitive (efficient). However, if the firm is able to integrate vertically, the rivals could also choose to integrate vertically, either by merger or by internal expansion, so that they too could capture the efficiency benefits. If all firms can lower their marginal costs by integrating, competition will drive the price down to reflect these lower costs. Thus, if vertical integration is available to all, then the rival firms' value should fall only from foreclosure, not from efficiency gains, and all reductions in rivals' values can be attributed to foreclosure.

Second, the merger announcement may convey information to management and shareholders of the unintegrated rivals. Information that significant efficiency gains are available from vertical integration may cause unintegrated rivals themselves to vertically integrate, either by merger or by internal expansion of their own operations. Alternatively, the information may relate to the existence of significant underutilized assets, which may cause rivals that also have underutilized assets to be "in play." Both types of information will cause the profits and therefore the stock price of unintegrated rivals of the merging firm to increase. The predictions of these alternative hypotheses are summarized in Table 1.

A finding of no significant negative stock price movement has two possible implications for the foreclosure hypothesis. One possibility is that the effects

[7] In a recent paper, Riordan and Salop (1995) claim that vertical mergers are more likely to have an anticompetitive effect when the pre-merger upstream and downstream markets are highly concentrated, when the supply elasticity of rivals is low, and when there are barriers to entry into both the upstream and downstream markets. In a comment on this article, Reiffen and Vita (1995) note that the procompetitive effects of mergers are also more likely when market power exists in the upstream and downstream markets (see the discussion below). Therefore, measures of market power, such as market concentration and barriers to entry, are not good predictors of the anticompetitive effect of a vertical merger.

Table 1
Impact of Vertical Merger on Unintegrated Rivals' Profits

Hypothesis	Vertical Merger Announcement	Complaint Announcement
1. Foreclosure	−	+
2. Cost Advantage[a]	−	+
3. Information		
a. Efficiency gain	+	No effect
b. Underutilized assets	+	No effect

[a]If the gains to rivals can be realized by merger or internal expansion, no effect would occur.

on rivals are small, so no significant anticompetitive foreclosure occurred. The second possibility is that the effects are large and significant, but the negative foreclosure effect is offset by the positive information effects.

To disentangle these two possibilities, we also examine the movement of the stock price on the announcement that the Justice Department or the Federal Trade Commission is contesting the merger to prevent foreclosure of competitors. If foreclosure is a problem, the stock price of the unintegrated rivals should increase when the government announces its antitrust complaint to prevent foreclosure. The stock price of unintegrated rivals would also rise if a vertical merger with efficiency gains was prevented, since the rival would be less competitive if it was unable to realize the efficiency gains through merger. The information effect is likely to be minimal. If the original information gain was that the industry had significant undervalued assets, no new information concerning the undervaluation would be revealed by an antitrust complaint. If the information was that efficiency gains could be realized by vertically integrating, firms could still integrate by internal expansion.[8]

If foreclosure is the dominant effect of a vertical merger, the stock price of unintegrated rivals should drop on the announcement of the merger and rise on the announcement of an antitrust complaint. If the foreclosure effect were significant but offset by information effects, then no effect would follow the merger announcement but a positive effect would follow the complaint announcement. Since the efficiency and foreclosure hypotheses move in the same direction, the pattern of stock prices described above will be consistent with the foreclosure hypothesis but it cannot prove that foreclosure occurred. However, it is possible to reject the foreclosure hypothesis if the stock price movements are not consistent with this pattern.

Note that these different hypotheses have similar implications for the reactions of stock prices of target and acquiring firms. Regardless of the effects of a vertical merger, the stock price for the target firm should rise, since target shareholders will sell their shares only if the acquiring firm offers them a premium. For the acquiring firm, the effects are ambiguous. While the combined share value of the acquiring and target firms should rise under the market efficiency or foreclosure hypothesis, the effects on the acquiring firm will depend upon how much of the increased value is captured by target shareholders. Since the competing hypotheses are not differentiated by examining the share prices of targets or acquirers, we focus our empirical test on the rivals.

III. The Data

To determine if anticompetitive foreclosure is a serious problem, we examined all vertical mergers challenged by the Justice Department and the Federal Trade Commission for the period from 1963 to 1982. These cases are summarized in the American Bar Association's *Merger Case Digest* and in various editions of the Commerce Clearing House *Trade Regulation Reporter*. From the case summaries and a reading of the actual cases, the products and their vertical relationships were established. In the challenged cases used in this study, the antitrust authorities not only established the vertical relationship but also indicated the belief that foreclosure was a serious potential problem.

Since a test of the foreclosure theory requires an evaluation of the effect of vertical merger announcements on the rivals of the merged firm, it is important to carefully determine the rival firms that produced the same products at the time of the merger. Generally, competitors were not listed in the cases, so we referred to various trade publications for the year prior to the merger. For most cases, competitors were found in *Thomas' Register of American Manufacturers: Products & Services*, which provides a list of the pro-

[8] A possible complication is that if the unintegrated rival could gain the efficiency benefit by integrating, then its value would rise on the announcement that the merger is contested because it might become more efficient than the rival. However, even if the acquirer is prevented from vertically integrating by acquisition, it still has the option to vertically integrate by internal expansion.

ducers of raw materials, industrial products, and intermediate goods and services. This list of rivals at the time of the merger was supplemented by contacts with trade associations, trade publications, phone conversations with company officials, and general sources such as the *Chemical Buyers Handbook*. To be included in the sample, the rival had to be traded on the New York or American Stock Exchange so that its share prices were available on the CRSP tapes.[9]

This procedure has several advantages over alternative test designs. Other studies examining horizontal mergers have found rivals by using 4-digit SIC product codes from the CRSP tape, Standard & Poor's *Registry of Corporations*, or Dun & Bradstreet's *Million Dollar Directory*. However, SIC product codes are sometimes broader than the product relevant for our case. Our classification system omits some rivals, but it has the advantage that our rivals produce the products cited in the case.

Only unintegrated rivals may be foreclosed by a vertical merger, because integrated rivals will not face higher marginal costs that occur because of the vertical merger. We eliminated any firm that we found to be producing in both upstream and downstream markets according to the sources we used to identify rivals. In addition we talked with company officials and used SIC codes from Standard & Poor's *Registry of Corporations* to verify that our rivals were unintegrated. Since 4-digit SIC designations were often broader than the product categories in the case, some unintegrated competitors are eliminated. However, this approach is preferred, because including integrated firms in the sample will bias the results against finding effects from foreclosure. We dropped vertical merger cases challenged by federal agencies from our sample under the following conditions:

1. No clear vertical relationship could be established, either because horizontal or conglomerate concerns dominated the vertical aspects of the case or because the potential for foreclosure could not be defined. For example, in the ITT Canteen case the vertical relationship was both a food service provider and a buyer of food services. Since any firm could purchase food services, no clear potential for foreclosure could be established and the case was dropped from this study.
2. All of the rivals were vertically integrated or the unintegrated rivals were not listed on the New York or American Stock Exchanges.
3. No merger announcement could be established. *The New York Times*, *The Wall Street Journal*, and in some cases employees of the firms were consulted to ascertain merger dates.
4. Neither the acquirer nor the target appeared on the CRSP tape.

The most frequent reason for dropping cases was that the merger announcement was not available. The final sample included 19 cases and 150 rival firms for the merger announcement window and 134 rival firms for the complaint announcement window.

A summary of the cases used in this study is presented in Table 2. For each case the acquirer and target are paired and the one that is the downstream firm is identified, as well as the product lines relevant to the case, the year of the merger announcement, and the four-firm concentration ratio. The four-firm concentration ratio provides the percentage of industry sales by the four largest firms in the industry. To calculate it we used the 5-digit product class from the *Census of Manufactures* from the year prior to the merger announcement, unless it was available from the case or from the Federal Trade Commission documents. For nonmanufacturing industries, no four-firm concentration ratio could be calculated.

For those cases involving manufacturing industries, the concentration ratios are quite high; in 13 of the 17 cases, the concentration ratios were at least 50 percent in either the upstream or downstream markets. Thus, if foreclosure was a problem, one might expect it to be in industries such as these because of the high degree of concentration.[10]

IV. Empirical Results

This study follows the standard methodology of event studies that look at the impact of mergers on stock price, described in more detail in Rosengren and Meehan (1994). The daily stock prices for all the rival firms were gathered for a period 200 days prior to the first announcement of a vertical merger until 10 days after the merger announcement. We first formed an equally weighted portfolio of the relevant rivals in the industry. This provides an estimate of the impact of the merger announcement on the average rival in the industry and avoids problems with the contempora-

[9] *CRSP Stock Files* are produced by the Center for Research in Security Prices, University of Chicago.

[10] While 5-digit classifications are narrow for most empirical studies, they may still be too broad for a proper definition of the market. Ideally the market would be identified according to the degree of substitutability with other products. Thus, to the extent the product definitions are broader than the actual market, the concentration ratios would be understated.

Table 2
Vertical Merger Cases, 1963 to 1982

Firms	A=1*	D=1#	Product	Announcement Date	Four-Firm Concentration Ratio (%)
1. Albertsons and	1	1	retail grocery	1972	
Mountain States Wholesale	0	0	distribution	1972	
2. Allis Chalmers and	1	1	sells tractors	1963	
Simplicity Man	0	0	manuf. tractors	1965	42
3. Aluminum LTD and	1	0	primary aluminum	1964	93
National Distillers	0	1	fabricator aluminum	1964	33
4. Budd and	1	0	truck parts	1973	64
Gindy	0	1	truck trailer	1973	46
5. Caterpillar Tractor and	1	1	diesel engines	1967	81
Chicago Pneumatic	0	0	compressors	1967	90[a]
6. Cooper Industries and	1	0	compressors	1967	58
Waukesha Motor Co	0	1	gas engines	1967	91
7. Eaton Yale & Town and	1	0	engine parts	1969	63
McQuay Norris Man	0	1	engine wholesaler	1969	
8. Endicott Johnson and	1	0	footwear manufacturer	1965	25
Nobil Shoe	0	1	shoe retailer	1965	
9. Fruehauf and	1	2	truck trailers	1973	46
Kelsey-Hayes	0	0	truck parts	1973	64
10. Gifford Hill and	1	0	cement hydrolic	1972	78[b]
Becker Sand & Gravel	0	1	ready-mix cement	1972	30[b]
11. General Mills and	1	0	flour	1968	31
Gorton	0	1	frozen fish	1968	32
12. Inco and	1	0	nickel	1974	74
ESB	0	1	batteries	1974	58
13. Chrysler and	1	1	trucks	1964	81
Mack Trucks	0	0	diesel engines	1964	72
14. Combustion Engineering and	1	1	sell nuclear fuel	1968	
United Nuclear Corp	0	0	produce nuclear fuel	1968	
15. Occidental and	1	0	resins	1978	25
Mead	0	1	paper mill	1978	25
16. OKC and	1	0	cement hydrolic	1969	87[b]
Janke	0	1	ready-mix cement	1969	34[b]
17. Firestone Tire & Rubber and	1	0	tire manufacturer	1965	72
Abel/Barley Tire	0	1	tire retailer	1965	
18. White Consolidated and	1	1	farm machinery	1970	45
White Motor	0	0	diesel engines	1970	81
19. Illinois Central and	1	0	brake parts	1971	63
Midas	0	1	brake repair	1971	

Note: See the text for the methods used to select the cases examined and to calculated the four-firm concentration rate.

*acquirer = 1, target = 0

#downstream = 1, upstream = 0

[a]Concentration ratio taken from case.

[b]Concentration ratio taken from "Economic Report on Mergers and Vertical Integration in the Cement Industry," Federal Trade Commission, 1967. The concentration ratios are for the regions specified in the case, since cement is a regional market.

Table 3
Response of Stock Prices of Rival Firms to Announcement of Vertical Mergers

Days in Event Window	All Unintegrated Rivals	Downstream Rivals	Upstream Rivals	Target Rivals	Acquiring Rivals
2 Days: Residual[a]	.000	.001	.000	.003	−.002
Z Statistic[b]	−.079	.272	−.415	1.068	−1.067
3 Days: Residual[a]	.000	.002	−.002	.004	.003
Z Statistic[b]	.240	.807	−.529	1.240	−.791
21 Days: Residual[a]	.001	.004	−.002	.011	−.007
Z Statistic[b]	.208	.298	.018	1.297	−.887

[a]The residual is the difference between the actual return and the return estimated from a market model prior to the event. The excess returns are then cumulated over the event window.
[b]The critical value of the z-statistic at the 5 percent confidence level is 1.96.

Table 4
Response of Stock Prices of Rival Firms to Announcement of Complaint by Antitrust Authorities

Days in Event Window	All Unintegrated Rivals	Downstream Rivals	Upstream Rivals	Target Rivals	Acquiring Rivals
2 Days: Residual[a]	−.004	−.006	−.001	−.007	−.001
Z Statistic[b]	−1.163	−1.468	−.132	−1.926	.195
3 Days: Residual[a]	−.002	−.005	.003	−.006	.002
Z Statistic[b]	−.271	−.969	.640	−1.158	.700
21 Days: Residual[a]	−.001	−.006	.006	.005	−.006
Z Statistic[b]	.355	−.268	.806	.938	−.382

[a]The residual is the difference between the actual return and the return estimated from a market model prior to the event. The excess returns are then cumulated over the event window.
[b]The critical value of the z-statistic at the 5 percent confidence level is 1.96.

neous correlation across rival firms. To test the effects of the merger, we estimate a simple model of stock returns (the market model) from 200 to 30 days before the merger announcement, to determine the expected return in the absence of the vertical merger. We then compare the actual returns with the merger announcement with the estimated returns from the market model (the difference is called the abnormal rate of return) and determine if the difference in the returns was statistically significant.

The announcement day is the day the announcement of the merger appears in *The Wall Street Journal*. Frequently it is difficult to determine if the announcement (A) occurred before trading stopped for the day; therefore, the 2-day event window, which includes the day before and the day of *The Wall Street Journal* announcement, is used to capture the smallest event window that includes all announcements. We also included a 3-day event window (one day before and one day after A) and a 21-day event window (15 days before A until 5 days after A). We focus on the smallest event window, because longer event windows are more likely to include factors that cause a portfolio of rivals in a particular industry to diverge from the usual relationship with the market portfolio. Where relevant, we cite differences that occur with the larger event windows.

The average cumulative abnormal return is examined over all industries, as shown in Table 3.[11] We split the sample two ways, into upstream and downstream rivals of the merging firm and into rivals of the target and the acquiring firms.

[11] The target firms in the 21-day event window have risk-adjusted gains of 51 percent, and for the largest event window (35 days) the risk-adjusted gains are 41 percent. Both are signifi-

The downstream/upstream split examines whether foreclosure is more likely in downstream markets, as suggested by Salinger (1987, 1988). The target/acquirer split focuses on informational gains, which may differ between these two groups. If rivals of targets are more likely to be acquired as more bidders realize the potential gains of vertically integrating, we may expect rivals in the target industry to be more likely to show positive gains.

The statistical results are inconsistent with the foreclosure hypothesis. For the 2-day event window, only acquiring rivals have negative residuals.[12] Furthermore, no other event window has negative residuals significant at the 5 percent level or better.

The evidence from stock price movements suggests that foreclosure is not the dominant effect of vertical mergers on unintegrated rivals. However, it is possible that the negative effects of foreclosure on unintegrated rivals' stock prices are offset by a positive information effect. To examine this possibility, we reviewed the announcement of the antitrust complaint that was designed to prevent foreclosure. As noted above, the announcement of the complaint will have little information content, so if foreclosure is a problem, the complaint announcement should cause the stock price of unintegrated rivals to rise.

Table 4 shows the rivals' reaction to an announcement of an antitrust complaint. For the all unintegrated rivals column, the signs are *negative* but statistically insignificant for the *three* event windows examined. Similarly, when the sample is split between downstream and upstream rivals and between target and acquiring

Table 5
Responses of Stocks of Individual Rivals to Merger Announcement during Two-Day Event Window
Number of Rival Firms

Firms	Positive Response	Negative Response	Significantly Positive[a]	Significantly Negative[a]
1. Albertsons and	2	7	0	1
Mountain States Wholesale	0	1	0	0
2. Allis Chalmers and	1	1	0	0
Simplicity Man	3	2	1	0
3. Aluminum LTD and	0	1	0	0
National Distillers	0	4	0	0
4. Budd and	1	3	0	0
Gindy	2	0	1	0
5. Caterpillar Tractor and	7	5	0	0
Chicago Pneumatic	2	3	0	0
6. Cooper Industries and	2	0	0	0
Waukesha Motor Co	4	3	2	0
7. Eaton Yale & Town and	2	1	0	0
McQuay Norris Man	2	2	0	0
8. Endicott Johnson and	1	4	0	0
Nobil Shoe	3	2	0	0
9. Fruehauf and	1	1	0	0
Kelsey-Hayes	0	2	0	0
10. Gifford Hill and	2	3	0	0
Becker Sand & Gravel	3	0	0	0
11. General Mills and	2	1	0	0
Gorton	1	3	0	0
12. Inco and	2	0	0	0
ESB	2	2	1	0
13. Chrysler and	2	0	0	0
Mack Trucks	4	3	0	1
14. Combustion Engineering	3	1	0	0
and United Nuclear Corp	3	1	0	0
15. Occidental and	4	3	0	2
Mead	0	2	0	0
16. OKC and	2	3	0	0
Janke	1	1	0	0
17. Firestone Tire & Rubber	1	4	1	1
and Abel/Barley Tire	0	1	0	0
18. White Consolidated and	1	2	0	0
White Motor	2	2	0	0
19. Illinois Central and	2	1	0	1
Midas	0	5	0	0

[a]5% confidence level.

cantly different from zero at the 1 percent confidence level. These gains are similar to the gains reported in Jensen and Ruback's (1983) survey of gains from mergers. Thus, at the time of the announcement, the merger is expected to succeed.

[12] It is possible for the mean cumulative residual to be positive and the mean cumulative standardized residual to be negative if most residuals are positive with a few large negative outliers.

rivals, the signs are generally negative but insignificant. This evidence provides no support for the foreclosure hypothesis.

While the overall sample shows no evidence of foreclosure, the extent of foreclosure may vary substantially across cases. In fact, some cases listed in the *Merger Case Digest* as being primarily vertical had such a tenuous vertical link that they were dropped from the sample. With such variability in the strength of cases brought by the government, the extent of possible foreclosure may be biased against finding an effect when the data are averaged across cases. In addition, the extent of foreclosure may vary substantially across firms in the same industry. Some firms may be completely dependent on the merging firm, while other firms may be well-positioned to seek alternative suppliers for the products after a vertical merger. Table 5 shows, by case, the number of firms with significant positive and negative residuals on the announcement of the vertical merger. Again, no systematic pattern of negative residuals is found.

Another potential source of bias arises from the fact that some rivals may be large conglomerates, whose earnings in the market being foreclosed are only a small percentage of the total earnings of the firm. To focus on firms whose main business is in the affected markets, we eliminated any rival firm that did not list the SIC of the relevant market as its first entry in Standard & Poor's *Million Dollar Directory*. Since firms are supposed to list the SIC codes in order of importance to the firm, this should eliminate those firms whose main activities are outside the industry being foreclosed. This approach provides a list of firms primarily focused in the industry where foreclosure is likely to be a problem. The evidence from Table 6 indicates that even this more exclusive list of rivals shows no evidence of foreclosure.

Finally, we searched for any significant differences between cases that were overturned by the courts and cases where remedial action was taken. Again, no statistically significant difference was found between the two samples, indicating that cases where remedial action was taken show no greater evidence of potential foreclosure than those abandoned or lost by the antitrust authorities.

We also examined the effects of the complaint announcement for all firms in the sample. Again, we found no significant pattern consistent with foreclosure. As a final check, we examined the effect of a merger announcement on the vertically integrated rivals. If anticompetitive foreclosure occurred, the vertically integrated rivals' costs would not change, but since the price in the final product market would increase, their stock prices should rise on the merger announcement date. Furthermore, the announcement of a merger should not provide these firms with any new information about the efficiency gains from vertically integrating, because they are already integrated. Our admittedly small sample of vertically integrated rivals provided no support for the foreclosure hypothesis.[13]

Table 6
Reaction of Focused Rivals during Two-Day Event Window
Number of Rival Firms

	Positive Response	Negative Response	Significantly Positive[a]	Significantly Negative[a]
Primary Industry[b]	16	22	1	2
Only Industry[c]	7	9	0	2

[a]5% confidence level.
[b]Primary Industry indicates that the 4-digit SIC code relevant to the case appears as the first entry for the firm in *Standard & Poor's Register*.
[c]Only Industry indicates that the 4-digit SIC code relevant to the case is the only entry for the firm in *Standard & Poor's Register*.

V. Conclusion

Foreclosure resulting from vertical mergers can lead to higher costs for unintegrated competitors and higher prices for consumers. A necessary but not a sufficient condition for anticompetitive foreclosure is that unintegrated rivals will be less profitable. In a sample selected from all vertical mergers challenged by the Justice Department and the Federal Trade Commission between 1963 and 1982, we find no evidence of anticompetitive foreclosure.

[13] Since Riordan and Salop (1995) predict that the anticompetitive effect of a vertical merger is likely to be greater, the higher the concentration and the barriers to entry in the pre-merger upstream and downstream markets, we regressed abnormal returns of rivals on market concentration and various measures of individual measures of barriers to entry. If the predictions of Riordan and Salop (1995) are correct, the measures of concentration and barriers to entry should be negatively related to abnormal returns of the rivals of the vertically integrated firms. We find no evidence to support the contention that vertical mergers are more likely to have an anticompetitive effect when the pre-merger markets are characterized by high concentration and high barriers to entry. See Rosengren and Meehan (1994).

Many contested cases may have resulted in foreclosure with no anticompetitive effects, either because the merged company still sold to unintegrated rivals or because the unintegrated rivals could find alternative suppliers at no additional cost. However, the antitrust authorities have an incentive to bring cases with the highest probability of success. Cases with anticompetitive foreclosure, where both unintegrated rivals and customers are hurt, should be stronger than cases where rivals and customers are unaffected. If the strongest cases were contested, our evidence indicates that few if any vertical mergers during this period had anticompetitive effects.

The results reported in this paper do not preclude economic foreclosure as a possibility; however, during the period examined, the U.S. Department of Justice and the Federal Trade Commission did not identify cases where foreclosure was a problem. As long as cases where economic foreclosure occurs are difficult to identify, the enforcement agencies' neglect of vertical merger cases is well founded. If theoretical models of anticompetitive mergers are to be useful to policymakers, they must provide methods of identifying cases that should be contested.

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