The Price Effects of Horizontal Mergers: A Survey

by

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1 Introduction

From 1988 through 2005, over 46,000 intentions to merge were filed with the Federal Trade Commission and Department of Justice in accordance with the Hart-Scott-Rodino Act. The agencies review these mergers in an effort to identify and block mergers if they would increase prices. The vast majority of these mergers are allowed to pass without modification. On average, 3.8% of mergers were required to answer second requests for more information regarding the transaction each year from 1988-2005.[1]

When reviewing mergers, the antitrust authorities focus on the tradeoff between the costs of allowing the creation of monopoly power with the benefits of efficiency gains that may be passed through to consumers. Mergers are to be blocked if they result in price increases. Three different approaches are used to evaluate the competitive effects of horizontal mergers: event studies, merger simulations, and direct before and after comparisons of prices.

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[1]These figures were obtained from the 1997 and 2005 and FTC/DOJ Annual Report to Congress.

Beginning with Eckbo (1983) and Stillman (1983) a large number of papers have used event studies to analyze the abnormal stock market performance of merging parties and their rivals around the time of merger announcements and antitrust challenges. If a merger were to result in higher prices and thus a transfer of surplus away from consumers and towards firms, there would be an increase in the equity value of the merging parties and their rivals. If the antitrust authorities announced an attempt to block such a merger, there would be negative abnormal returns for rival firms and, obviously, the merging parties. Eckbo finds that in his sample, rivals exhibited positive abnormal returns around antitrust challenges and conclude that these mergers were not anticompetitive. Stillman finds that most of the rival firms in his sample demonstrated no abnormal returns on the dates of events that would impact the probability of those mergers being consummated and concludes these mergers were not anticompetitive. The mergers studied in these papers occurred before the passage of the HSR Act in 1976. Before the HSR Act, firms did not have to notify the agencies before merging and wait for a review prior to coordinating activity. Eckbo & Weir (1985) study mergers that occurred after the HSR act and find that the abnormal returns of rival firms actually increased around the time of antitrust complaints. They argue that antitrust policy tends to block mergers that would be efficient, and that the HSR Act did not improve the government's ability to prevent anticompetitive mergers. While simple in design and intuitive, these studies are controversial for three reasons. First, the informational content of merger announcements and antitrust challenges is not clear. For example, a merger announcement may inform stock market participants that industry wide efficiencies will soon be realized and this would be expected to generate positive abnormal returns as well (Mulherin & Mitchell 1996). Furthermore, it is not easy to determine exactly when stock market participants become aware of potential mergers and antitrust challenges. Finally, McAfee & Williams (1988) argue that the high variance of stock returns of large rival firms that receive a relatively

small proportion of their profits from the market affected by the merger makes event study tests for anticompetitive mergers of little power.

Using demand estimates together with an assumption of Bertrand competition and constant marginal costs has become a common way of predicting the competitive effects of mergers ((Hausman, Leonard & Zona 1994), (Nevo 2000), (Werden & Froeb 2006)). These models allow simulation of the price effects of mergers, but rely on strong assumptions on demand, costs, and conduct. These assumptions have been tested by Peters (2006) and Weinberg (2006) through comparing indirect, simulated price changes with direct estimates of the price effects of mergers. Both papers find that merger simulations did not accurately predict actual post-merger prices. Further, these papers and work by Slade (forthcoming) and Crooke, Froeb, Tschantz & Werden (2003) demonstrate that simulated price changes are very sensitive to exactly which variant of the model is used.

A growing number of papers have directly looked at prices before and after mergers occurred to estimate the effects of mergers on prices. These papers include both industry studies that estimate the average effect of a merger on prices within a specific industry and individual case studies. Table 1 lists these studies and their principal findings. While it is not straightforward to use these studies for predicting anticompetitive mergers and care must be taken in constructing a control group, before and after comparisons of prices and do not suffer from as many of the strong economic assumptions required by the event study or simulation approach and are the most credible way of assessing the competitive effects of completed mergers.

This paper provides a survey of the results from direct estimates of the impact of mergers on prices[2]. Section 2 presents the evidence on price increases of the products controlled by merging firms, Section 3 presents the evidence on the price increases of rival firms, Section 4 discusses the timing of price changes, Section 5 discusses characteristics

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[2]For a broader survey that covers event studies and simulations as well, see Pautler (2001) or Whinston (2006).

of mergers and merging parties associated with price increases, and Section 6 concludes.

2   Price Changes of Merging Parties' Products

The 1997 revision to the Department of Justice-Federal Trade Commission Merger Guidelines states that mergers will be permitted if verifiable efficiencies 'would be sufficient to reverse the merger's potential to harm consumers in the relevant market, e.g., by preventing price increases in the market.' The courts also make their decisions based upon a consumer welfare standard. Antitrust policy has the goal of blocking mergers that would increase prices. This section serves as an introduction to the various studies of the price effects of mergers, and summarizes the evidence on price changes of the merging firms' products.

Estimating the impact of mergers on prices is challenging for several reasons. Simply comparing average prices for the firms directly involved in a merger before and after the merger occurred will lead to biased estimates of the merger effect if factors affecting demand or costs are changing concurrently. For this reason, most studies of mergers have compared the changes in product prices of the merging firms with changes in prices of other firms. If the comparison group's prices evolve in the same way they would have had the merger not occurred, this difference-in-differences will estimate the impact of the merger on prices.

Kim & Singal (1993) examine 14 airline mergers from 1985 to 1988 and estimate the effect of a merger on fares. The airline industry lends itself well to constructing a control group as the route between each city-pair is arguably a separate market, and not all airlines compete in each of these market. Kim & Singal compare the change in fares on routes serviced by merging firms with the change in fares on routes of a similar distance in which none of the merging parties operated. Over the entire period spanned by their data, they find that fares increased by 9.44% and report that this was significant at the

.01 level.

Prager & Hannan (1998) provide evidence on the effects of mergers in the U.S. banking industry on deposit account interest rates. Using monthly data from 1991 to 1994, they identified banking mergers by looking for large changes in the concentration of regional markets in Federal Deposit Insurance Corp's annual summary of deposits data. If a bank experienced a change in the Herfindahl-Hirschman Index (HHI) greater than 100 points to a level exceeding 1400 points the bank was examined further for evidence that it merged. If the post-merger HHI exceeded 1800 points, the merger was defined as 'substantial', and the possibility that mergers could be missed due to simultaneously occurring events that would prevent the HHI from becoming large is acknowledged (mergers occurring simultaneously with entry, for example). They estimate the effects of mergers by comparing changes in deposit rates of banks located in markets where there were mergers with changes in rates of banks not operating in such markets. Three types of accounts over which different amounts of market power could plausibly be exercised were analyzed: interest-bearing checking accounts called NOW accounts, personal money market deposit accounts, and three-month certificates of deposit. They find that interest rates fell by 18 percent for NOW accounts, by 10 percent for money market accounts, and by a small and statistically insignificant amount for the certificates of deposit in markets that were affected by mergers. This pattern of interest rate changes is supported by Prager and Hannan's argument that access to bank branches is most important for NOW accounts, while banks' abilities to exploit market power when setting interest rates for 3-month CDs are constrained by competition from lenders outside the local market.

Datasets such as those used in the industry studies of mergers described above are rarely available. Barton & Sherman (1984) provide a case study of mergers in the microfilm industry. This paper studies the price effects of Xidex Corporation's acquisitions of the microfilm businesses of Scott Graphics and Kalvar Corporation. Barton and Sherman

study the price changes of two types of microfilm. Xidex produced both types, while Scott Graphics and Kalvar each produced one type that differed across them. They compare the relative price changes of these two types of microfilm before and after the merger and estimated price effects of 12 and 23% for the two merger.

Borenstein (1990) separately examined the effects of the Northwest and Republic airlines, and Trans World Airline's merger with Ozark airlines. These mergers were both initially discussed in 1985, and the Department of Transportation approved an October 1986 merger date for the Northwest-Republic merger in August of 1986 and the TWA-Ozark merger in September of 1986. Both of these mergers involved airlines that carried large shares of the total enplanements from their major hubs, yet the price effects of the two mergers were quite different. Using fare prices for each firm in each city-pair market for the third quarter of 1985, 1986, and 1987, Borenstein reported the average percentage fare change from 1985 to 1987 to be 9.5% relative to industry averages across the 84 routes including Northwest/Republic's hub of Minneapolis/St. Paul. In contrast to the experience of Northwest/Republic, little evidence of an increase in prices resulted from the TWA/Ozark Airlines merger. The reason for these dissimilar outcomes is unclear, but potentially due to a negative demand shock in the St. Louis market.

McCabe (2002) provides case studies of several mergers of publishers of biomedical journals. He points out that, at first glance, one might suppose that each academic journal makes up a unique market, and if this is the case there should be no price increase as a result of a merger according to the standard theory. However, McCabe claims that librarians choose which journals to order by constructing cost per use ratios based upon the subscription price and the number of times the journals are used per year, and then selection the journals with the lowest cost per use ratio until they meet their budget. This creates competition for budget dollars of libraries, and the prediction that firms holding larger portfolios of journals will charge higher prices. This theory is supported by the

price increases he found for journal titles produced by the merging firms. His data covers a time period in which several mergers occurred, the first of which was Wolters Kluwer's purchase of Lippincott's 15 journals to supplement the 75 they already owned. The next event studied was Reed Elsevier's acquisition of Pergamon. This merger was the largest examined by McCabe in the sense that Elsevier the firms owned 190 titles and Pergamon 57. The price effects of both of these mergers were studied by comparing their price changes with the change in prices of other biomedical journals. Using data from 1988 to 1994, it was found that the Wolters Kluwers/Lippincott merger resulted in an increase in prices of 5 percent relative to average journal prices and the Reed Elsevier/Pergamon merger was estimated to have caused prices to increase by a larger 10 percent, which is consistent with the prediction of McCabe's model that larger portfolios will lead to higher prices. McCabe also studies the price effects of a sequence of acquisitions made by Churchill Livingstone, which purchased Harcourt in September of 1997 and Mosby in October of 1998. Churchill Livingstone owned 17 journals, Harcourt owned 118, and Mosby owned 27. Also in 1998, Wolters Kluwers, which then owned 112 titles, purchased the 22 titles of Plennum in July, 41 titles of Thomson in February, and 37 of Waverly's in May. When treating these two sets of acquisitions as single events and using data from 1995-2001 it was found that they both were associated with an increase in prices relative to changes in average journal prices during that time of between 2 and 6 percent.

A large amount of merger activity has occurred in branded consumer product industries. In 2005, 29.4% of acquired entities that filed under the HSR act were classified as belonging to the consumer goods industry group, up dramatically from 11.5% in 2004 and 12% in 2003 [3]. Ashenfelter & Hosken (2004) analyze price effects resulting from mergers in the feminine hygiene product, distilled spirit, motor oil, ready to eat cereal, and breakfast syrup industries. Each merger they consider is involves products sold nationally, and therefore it is not possible to form a comparison group from regional markets unaffected

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[3]These figures were obtained from the 2003, 2004, and 2005 FTC/DOJ Annual Report to Congress.

by merger as in some of the previously discussed studies. Instead, most similar to McCabe, in their preferred specification they compare the price changes of products sold by the merging firms with price changes of private label products. They drop data generated from within three months of when firms were legally allowed to coordinate their pricing decisions to avoid issues of timing, and generally find that price changes were the result of these mergers. Only the breakfast syrup merger involving the firms that produce Mrs. Butterworth and Log Cabin brand syrups did not cause significant price increases.

The high price of gas in recent times has created much interest in research into whether or not petroleum mergers have contributed to increases. Hosken & Taylor (2006) examine the price effects of the joint venture of Marathon and Ashland to form the Marathon Ashland Petroleum Company. This transaction led to the consolidation of seven refineries (four of which were owned by Marathon and three by Ashland), 84 terminals, 5,400 gas stations, and 5,000 miles of pipeline. There were thus potential anticompetitive effects at the retail, wholesale, and refining levels of the market. Kentucky was the only state in which both Marathon and Ashland were among the top four suppliers, and Hosken and Taylor identify Louisville as the most likely region to experience anticompetitive harm from the merger. A difference-in-difference approach is used to estimate the effect of the merger on both wholesale and retail prices where other markets that arguably face similar demand and supply conditions were used as control groups. These other markets included Chicago, Houston, and northern Virginia. The difference-in-difference model was estimated separately for each of the different control regions, and no significant effect was found on retail prices. Wholesale prices, however, increased by rough 5 cents per gallon 15 months after the transaction. This implies a reduction in retail margins of between 20 and 30 percent.

In summary, of the 14 case studies of individual mergers, 11 were estimated to have resulted in higher prices charged by the merging parties. The industry studies of Kim

and Singal in the airline industry, Prager and Hannan in U.S. banking and Focarelli and Panetta in Italian banking also estimate that mergers have increased product prices, at least in the short-run.

3   Timing of Price Changes

Most merger retrospectives have found increases in prices as a result of mergers. Many of them also report evidence on the timing of these price changes. This is useful information for at least two reasons. First, while it is widely recognized that reductions in marginal costs might result from merger, little is known about when these cost savings might be realized. It is possible that the studies described in the previous section are only able to measure short run effects of merger and not the effects of cost savings which occur longer after the firms are allowed to coordinate. Second, there is some evidence that merging firms have increased their prices before the date at which they're legally allowed to coordinate their operations, a fact difficult to explain by standard theories.

In their study of banking mergers, Panetta & Focarelli have data covering a long enough time period to permit a separation of the merger effect on interest rates into one specific to the first three years afterwards and another specific to the next three years afterwards. They find evidence that mergers actually increased interest rates for deposits in the long run. The effect over the first three years was to decrease rates by 13.5 basis points, and the effect over the next three years was to increase rates by 12.6 points. They find no evidence of a merger effect before completion dates. The finding of no anticipatory 'price increases' is a result in contrast to those found in the Prager & Hannan study of banking mergers in the U.S. They find that half of the effect of the merger on interest rates occurred pre-merger for interest bearing checking accounts, and that for personal money market deposit accounts 16 percent of the total price effect occurred pre-merger.

Data as rich as that used in the Panetta & Focarelli study is rare, and other studies

have been able to only look at price changes within a relatively short interval around merger dates. Kim & Singal separate the effect of mergers into two periods: the announcement period, which is the quarter the successful bidder could be identified in the press, and the completion period, which is the quarter in which the acquiring firm begins running the target firm. They hypothesize that efficiency gains will not be realized until the completion period, but the ability to exercise market power will begin in the announcement period. While they only look one quarter after the mergers were completed, this is supported by their finding that relative fares increased by 5.54 percent in the announcement period but did not change during the completion period for the seven out of the fourteen mergers in which there was a large enough gap between announcement and completion to make this calculation with quarterly data. Borenstein also provides evidence of anticipatory increases in price before the mergers of Northwest and Republic airlines. These airlines were granted permission to merge by the Department of Transportation in August of 1986, but management met to discuss the transaction in 1985. He reports that the fares charged by these airlines were 14.7 percent above industry averages in the third quarter of 1985, and 21.5 percent higher in the third quarter of 1986.

Standard unilateral effects models are unable to explain price increases occurring before the merging parties are allowed to legally coordinate their operations. Because the merging parties are not yet one firm, there is an incentive to deviate from charging the price that maximizes joint profits at any point in time before the HSR waiting period is over. Yet three different studies have found product price increases before mergers were actually completed. One explanation for this is that these studies focused on the banking and airline industries, which both produce products with substantial consumer switching costs. In standard models of switching costs (Klemperer 1995), firms initially price low in order to gain market share. Switching costs lock in these consumers, and their surplus is extracted later through increasing prices. If managers of a firm know that they will be

acquired, the incentive to invest in market share is lost because they may lose their job as a result of restructuring and not realize the return from investing in future market share. Prices would rise as soon as management knows that it may be taken over. When new management takes over, the model would predict that prices would again fall. This is an alternative explanation for the price patterns observed in the Kim and Singal, Prager and Hannan, and Borenstein studies.

4 Price Changes of Rivals

Consumer welfare depends upon prices charged by all firms in the market. Oligopoly models used to analyze mergers predict that in theory rival firms will increase their prices too (Deneckere & Davidson 1985). This section presents the evidence on rivals' responses.

Prager & Hannan find that, when allowing the effect of merger to differentially impact participants and rivals, that interest rates on savings accounts decreased similarly across these two groups. This was true across each of the account type considered in their study. Panetta & Focarelli, however, find little evidence of price changes by rival firms during the first three years following mergers in the banking industry. This effect changed in the following three years, during which their interest rates decreased by 6 percent. As it was found that the merging firms interest rates first decreased and then increased, the authors argue that the results for rival firms further supports their argument that efficiency gains were realized and passed on to consumers only in the long run.

The airline studies both report large price changes by rival firms as well. In fact, Kim & Singal estimate that rival firms actually increased their fares 12.17 percent whereas the merging parties increased their fares by only 9.44 percent. When this is broken up into the announcement and completion periods as described in the previous section, they find that both merging parties and rivals increased their prices by about 5 percent in the announcement period. However, over the completion period the rivals increased their

prices by 6 percent while the merging firms' fares remained the same. This authors take this as evidence that the merging firms passed cost savings resulting from the merger on to consumers in the form of lower fares. Borenstein also reports that rival firms increased their prices in a similar way to merging firms on routes in which they were in competition with merging firms.

Ashenfelter & Hosken (2004) were interested in determining if mergers resulted in higher prices for merging firms, and in their preferred specification estimated this effect by comparing price changes of merging firms' products with price changes of private label products. When making this comparison with other branded products, the magnitude of their estimates drops in the motor oil, feminine hygiene, and distilled spirits markets, but not in the cereal and syrup markets. This implies that the prices of other branded products rose over time more dramatically than the prices of private label products. These issues are explored further in Weinberg (2006). The principle objective of this paper was testing if a model of Bertrand competition in differentiated product markets could accurately simulate price changes resulting from a merger in motor oil industry and the breakfast syrup industry. This model predicts price changes for non-merging firms as well, and in that study their price changes were explicitly examined relative to the price changes of private label products. It was found that in the syrup industry, the rival firms did not change their prices, as was found for the merging firms. In the oil industry, positive price increases ranging from 3 to 6 percent were estimated for four of the rival firms' products and one price actually fell by 6 percent. The private label prices remained the same before and after the merger occurred in both industries.

5 Characteristics of Mergers that Led to Price Increases

Standard theory (Willig, Salop & Scherer 1991) predicts that anticompetitive effects are more likely the larger the merger and the more concentrated the market. It has also been suggested that larger firms in the airline industry are more able to deter entry onto routes involving the merged firms' hub airport, and that a merger may result in higher prices through resulting in an increase in multi-market contact (Whinston 2006).

Focusing on flights out of the merging firms' hub airports, Borenstein looks at fare changes of the merging firms flights relative to industry averages by four different market structure. Specifically, he examines fare changes on routes that were a duopoly between the merging firms before merger and became a monopoly, routes that both merging parties competed along with other firms, routes on which one of the merging firms was a monopoly before and after merger, and routes in which one of the merging firms competed with outside parties. As might be expected, the largest price change occurred in markets where the merger was for monopoly in the Northwest/Republic merger. The fares of the merging firms in these markets increased by 23 percent relative to industry averages. Perhaps surprisingly, in the Northwest/Republic merger prices also increased significantly in both the economic and statistical sense on routes in which only one of the merging firms operated, both alone and with competitors. This could be explained by the merger resulting in an increased ability of the merging firms to deter entry into routes involving their hub airport, or an increase in the ability to tacitly collude due to more multi-market contact (Bernheim & Whinston 1990).

In their extension of Borenstein's study of airline mergers, Kim and Singal also analyze price changes by different market structures. They partition the routes in their sample into one of four different categories: routes with a common hub at the same airport

and that was served be both merging parties, routes with a common hub at the same airport that was served by only one of the merging parties, routes without a common hub on which both firms competed, and routes in which the firms did not both operate nor connected to a common hub. They find, for normal firms, that prices increased the most on the routes which did not share a common hub and only one of the merging firms. They also find increases in fares during the announcement period that were offset by fare decreases, arguably due to efficiency gains, during the completion period. These findings on the timing of price changes across different market structures are exactly reversed for mergers with a failing firm; they tend to decrease their prices during the announcement period and increase them during the completion period. Again in contrast to the findings for normal firm mergers, over the full sample mergers involving a failing firm increased their fares by the most on routes with a common hub on which both firms competed and the least on routes which did not share a common hub and were operated on by only one of the merging parties. Kim and Singal also explicitly correlate fare changes with concentration as measured by the HHI. They find, as predicted by the theory, that concentration changes are positively correlated with fare changes. This result holds for mergers between both normal and failing firms and for rival firms in both settings as well.

Prager and Hannan also estimate the effects of 'less substantial' mergers on interest rates. These are mergers that did not qualify as substantial as defined in section II, but in which the *pro forma* increase in the HHI was at least 100 points to a post-merger level of at least 1400 points. These mergers were found to actually increase interest rates by about 10 percent for NOW accounts and by 6 percent for 3 month certificates of deposit. There was no effect on interest rates of money market accounts. This suggests that efficiency gains outweighed gains in market power for these smaller mergers.

6 Conclusions

The papers reviewed in this paper show that several mergers have resulted in increased market power and reductions in consumer welfare. However, most of the studies have been able to look at the impact in a relatively small window about merger dates. It may be the case that the studies of mergers reviewed in this study are unable to capture eventual efficiency gains as the evidence from Italian banking provided by Panetta & Focarelli suggests. Pre-merger price changes have been found in three of the merger retrospectives, which is difficult to explain with standard unilateral effects theory.

The merger retrospectives reviewed in this study do not constitute a random sample of U.S. mergers, and not all were subject to the scrutiny of the antitrust authorities. Authors such as Ashenfelter & Hosken have focused on approved mergers that looked most anticompetitive *a priori*. The hospital merger considered by Vita & Sacher was small enough that the Hart-Scott-Rodino tests did not apply and the government was not notified. It is possible that the majority of the mergers passed do not result in price increases, but the most direct evidence available on the price effects of mergers suggests that a stronger anti-merger policy on the margin would better protect consumer welfare.

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Table 1: Summary of Merger Retrospectives

Study	Industry	Methodology and Comments	Price Effects
Barton and Sherman (1984)	Case study of Xidex-Scott Graphics and Xidex-Kalvar microfilm mergers	D.V.=Price ratio of two types of microfilm. Control group: Prices of substitute products.	Xidex-Scott: 11% Xidex-Kalvar: 23%
Borenstein (1990)	Case study of Northwest-Republic and TWA-Ozark Airline Mergers	D.V.=Fares on routes involving firm's hub. Control group: Prices for routes of similar distance. Fares increased prior to merger completion.	NW-RC: 9.5% (2.1) TWA-OZ: 0 (3.5)
Kim and Singal (1993)	Airline industry. Quarterly data from 1985-1988. 14 mergers, 5 of them involved financially distressed firms	D.V.=log of fares. Control group: routes on which no merging firm operated and distance within 7.5% of sample route. Reported effect is over entire period. Rival price changes similar. Fares increased before merger completion.	All mergers: 9.55% Normal firms: 3.25% Distressed firms: 26.35% (all significant at .01 level)
Prager and Hannan (1998)	Banking. Monthly data on about 500 banks from October 1991-August 1994. 7 mergers in sample	D.V.=Log of interest rates on different personal banking accounts. Control group: Banks in regions where both merging firms did not compete. 'Prices' increased pre-merger.	NOW accounts: -17.7%(7.2) Money market accounts: -9.5%(3.9) 3-month c.d.'s -1.7% (3.4)
Sacher and Vita (2001)	Case study of a not-for-profit hospital merger. Quarterly data from 1986 through 1996. Merger occurred in first quarter of 1990.	D.V.=Average net revenue per inpatient acute-care admission for the privately insured. Control group: Other CA hospitals with similar number of beds, size, location, and not located in a county where a merger occurred.	Acquiring hospital: 1005.49 (506.40) (estimate of change in net revenue per admission) Mean of acquiring firm: 4434.55 Rival hospital: 671.83 (399.48) Mean of rival: 3897.98

Notes: Standard errors in parenthesis when available.

Table 2: Summary of Merger Retrospectives (continued)

Study	Industry	Methodology and Comments	Price Effects
McCabe(2002)	Case study of publisher mergers. Yearly price data for about 900 biomdedical journals from 1988-2001. 2 merger events in 1990-1991, 2 in 1997-1998.	D.V.=Log of price. Control group: Other biomedical journals.	Elsevier/Pergamon 10% (2.16) Wolters Kluwer/Lippincott 5% (3.23) WK/Thomson Plennum/Waverly's 2% (1.63) Harcourt/Church Livingstone/Mosby 2% (1.80)
Focarelli and Panetta (2003)	Italian banking. Yearly deposit rate data from 1990 to 1998 by province for banks. On average 67 banks per year reported needed data. 1.6% of bank-province observations of "in-market" deals.	Fixed effects. D.V.=log relative interest rates on current accounts. Break up effect into that of first two years and that of three or more years. Control for total assets, ratio of bad loans to total lending, cost-income ratio, GDP per capita, bank entry dummy, and HHI of deposit market.	Years 0-2: -13.5% (1.9) Years 3+: 12.6% (1.9)
Ashenfelter and Hosken (2004)	Case study of Pennzoil-Quaker State motor oil merger. Scanner data aggregated to the monthly frequency across 10 regions. Merger occurred 12/98, data from 1/1997 to 1/2001.	D.V.=log of average revenue. Control group: Private label motor oils. Dropped data within 3 months of merger date. Used equal amount of pre and post-merger data.	Pennzoil: 3.9% (1.9) Quaker State: 8.1% (1.5) Quaker State Deluxe: 6.1%

Notes: Standard errors in parenthesis when available.

Table 3: Summary of Merger Retrospectives (continued)

Ashenfelter and Hosken (2004)	Case study of Proctor and Gamble/Tambrands feminine hygiene product merger. Scanner data aggregated to monthly frequency across 64 regions. Merger occurred 7/1997, data from 11/1996-4/1998.	D.V.=log of average revenue weighted by revenue shares. Control group: Private label liners, pads, and tampons. Dropped data within 3 months of merger date. Used equal amount of pre and post-merger data.	Always Liner: 8.0% (1.1) Always Pad: 7.8% (1.2) Tampax Tampon: 5.8% (1.2)
Ashenfelter and Hosken (2004)	Case study of General Mills/Ralcorp ready-to-eat cereal merger. Scanner data aggregated to the monthly frequency across 64 regions. Merger occurred 1/1997, data from 7/1995-8/1998.	D.V.=log of revenue share weighted average. Control group: Private label cereals. Dropped data within 3 months of merger date. Used equal amount of pre and post-merger data.	11/11 merging parties' products increased in price. 7/11 significant at .05 level. Average increase: 2.6%
Ashenfelter and Hosken (2004)	Case study of Guiness/Grand Metropolitan spirit merger. Scanner data aggregated to monthly frequency across 5 regions. Merger occurred 2/1997, data from 11/1996-2/1999.	D.V.=log of revenue share weighted average. Control group: Private label spirits. Dropped data within 3 months of merger date. Used equal amount of pre and post-merger data.	22/28 merging parties' products increased in price. 16/22 significant at .05 level. Average increase: 4.5%
Ashenfelter and Hosken (2006)	Case study of Aurora/Kraft syrup merger. Scanner data aggregated to monthly frequency across 64 regions. Merger occurred 7/1997, data from 11/1996-4/1998.	D.V.=log of revenue share weighted average. Control group: Private label breakfast syrup. Dropped data within 3 months of merger date. Used equal amount of pre and post-merger data.	Log Cabin: 2.0% (1.6) Mrs Butterworth: -1.5% (1.5)
Taylor and Hosken (2006)	Case study of Marathon/Ashland joint venture. Oil Price Information Service retail and wholesale price data aggregated to weekly frequency across 8 regions. Merger occurred 1/1998, data from 1/1997-12/1999, inclusive.	D.V.=Cents per gallon. Effect estimated separately for different affected regions. Control groups: Similar regions. Wholesale prices did increase.	Avg.retail price effects year after merger across controls: 0.65, each insignificant at .05 level. Retail effects two years after: -0.18, each insignificant at .05 level.

Notes: Standard errors in parenthesis when available.