

Contributions to Economic Analysis & Policy

Volume 3, Issue 1

2004

Article 11

Law Serials Pricing and Mergers: A Portfolio Approach

Mark J. McCabe*

*Georgia Institute of Technology, mark.mccabe@econ.gatech.edu

Copyright ©2004 by the authors. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher, bepress. *Contributions to Economic Analysis & Policy* is one of *The B.E. Journals in Economic Analysis & Policy*, produced by The Berkeley Electronic Press (bepress). <http://www.bepress.com/bejeap>.

Law Serials Pricing and Mergers: A Portfolio Approach*

Mark J. McCabe

Abstract

Using data from more than 400 legal serials, I estimate the impact of six publisher mergers on law serial prices during the period, 1990-2000. The results suggest that merger-related price increases were substantial during this period, even after accounting for secular price trends. Furthermore, these merger effects occurred across a broadly-defined portfolio of serial titles consisting of legal encyclopedias and treatises. For other types of serials, such as newsletters and looseleaf services, these effects were not observed. Based on the portfolio demand behavior of buyers, I offer an explanation for this result based on the degree of product differentiation at the level of the individual title. Of particular interest is the purchase of West Publishing Company by Thomson Financial & Professional Publishing Group in 1996. Despite a government-mandated divestiture of more than 50 titles, the results indicate that titles published by West-Thomson experienced a significant post-merger price increase.

KEYWORDS: law serials, pricing, mergers, portfolio

*I would like to thank the AALL and especially Bob Oakley, Nancy Johnson, Kendall Svengalis, Craig Lelansky, and Claire Engle for their patient support of this project. I also wish to express my gratitude to the numerous AALL member libraries and librarians, and the legal publishers whose data contributions made this study possible. Craig Conrath deserves kudos for offering me my first tour of a law library and inspiring my interest in this subject. Aaron Edlin's excellent comments helped me improve the paper's substance and style. And I am most grateful for the insights and suggestions of two anonymous referees. Finally, expert data support was provided by a number of Georgia Tech students, including Ben Stearns, Kelly West, Noel Winter and Antoine Yazbek. School of Economics Georgia Institute of Technology 781 Marietta St NW Atlanta, GA 30318

Introduction

The trajectory of periodical prices, including law serials, has been tracked for decades by the American Library Association's Library Materials Price Index Committee. For example, according to the ALA's 2001 report, law periodical prices experienced a 75% increase over the period 1991-2000.^{1, 2} For the same period, consumer prices (as measured by the CPI) increased only 26%. A similar pattern is observed in other disciplines, e.g. the same ALA study reports a 165% increase in medical periodical prices over the 1991-2000 period. Of course, the existence of this inflationary pattern is common knowledge among librarians, regardless of discipline. What is perhaps not as well understood are the possible explanations, and the empirical support for these claims. Although the library science literature has devoted a considerable number of pages to these questions over the past decade or so, the attention has been focused primarily on journals published in the areas of science, technology and medicine.³ The same can be said for the small set of economics papers written on this subject.⁴ Thus, although the price trends among law serials resemble those of STM titles, there does not exist any economic analysis of these trends or the factors determining price changes in the law serials "market."⁵

This study is the first to examine these issues. The focus here is the impact of recent publisher mergers on law serials pricing. Specifically, do these mergers raise prices? If so, in which markets? The results of this analysis have important implications for antitrust policy. Before assessing the potential impact of a merger, markets must be defined. In the case of law serials, at least two competing approaches exist. In the "content-based" approach, it is assumed that libraries substitute between titles that address the same subject; mergers matter only if the merging parties control overlapping content in at least one such market. In the second approach, based on a portfolio model of law serials acquisition, a broader set of serials titles compete for the same library budget dollars; in this case, mergers that increase a firm's share of a given portfolio are likely to result in higher prices. The

¹ According to the ALA's report this estimate is based on prices for 273 law periodicals. However, no details are provided regarding the identity of these publications.

² The 1991-2000 period is chosen to correspond to the data considered here in this report.

³ See Tenopir and King (2000, Ch. 13) for a review of this literature.

⁴ See, for example, Bergstrom (2001) and McCabe (March, 2002).

⁵ Svengalis (various years) offers a brief history of the market for legal periodicals and identifies consolidation through merger as a likely explanation for at least some of the observed price inflation.

narrower, content-based approach to market definition was used by the U.S. Department of Justice to review law publisher mergers during the 1990s (see below). If this approach is correct, then merger-related price increases should not be observed when overlapping content is divested; if prices increases are observed in this case, then we can conclude that a broader, portfolio-based market definition is appropriate.

To address these questions, a unique panel data set was assembled that includes price information for nearly 500 print law serial titles, drawn from eight broad categories of commercial titles,⁶ as well as holdings and use information for these same titles at 60 law libraries. This paper reports the results from a difference-in-differences analysis of the price variables.⁷ The results suggest that merger-related price increases were substantial during the sample period, even after accounting for secular price trends. Furthermore, these merger effects occurred across a broadly-defined portfolio of serial titles consisting of legal encyclopedias and treatises. Of particular interest is the purchase of West Publishing Company by Thomson Financial & Professional Publishing Group in 1996. During its review of this transaction the US Department of Justice adopted a content-based approach to market definition. Divestitures were required in a number of cases where apparent content overlap existed between individual titles; with one exception, the divested titles were purchased by Reed-Elsevier.⁸ Despite these divestitures the results reported here indicate that West-Thomson's titles experienced significant post-merger price increases. One interpretation is that DOJ simply failed to remedy all

⁶ These categories include reporters, citators, encyclopedia, treatises, looseleaf services, newsletters, codes, and digests. Reporters contain the text of judicial opinions. Citators trace the history of a case, list cases that cite other cases, etc. Legal encyclopedias provide an introduction to federal and/or state law and cite many (thousands of) federal and state cases. Treatises describe and interpret specific areas of the law, such as antitrust law. Looseleaf services and newsletters provide timely reporting of legal, legislative and regulatory developments in specific subject areas. Due to the constantly changing legal environment, the "serials" in each of the categories are updated frequently, whether several times a week (some newsletters/looseleaf services) or annually (treatises, encyclopedias). Note that due to problems with the price data for codes and digests, these two categories were excluded from the analysis.

⁷ See McCabe (July, 2002) for a preliminary analysis of the other data.

⁸ The divestitures consisted of more than 50 titles, including treatises, encyclopedias, codes and digests. For example, a Michigan legal encyclopedia was divested since the merging parties published two encyclopedias for that state. Note that at the time of the divestiture, Reed Elsevier already owned a diverse set of legal serials. By 2002, West-Thomson and Reed-Elsevier were ranked one and two in the US legal and regulatory information market, with sales shares of 38% and 27%, respectively. Wolters-Kluwer was third, with a 15% share. (see "US Legal Publishing Industry," JP Morgan, September 27th, 2002).

of the overlap problems that existed in various content-based markets. However, I also observe similar price increases for the *divested titles* purchased by Reed-Elsevier. This latter result would not be expected if buyers had an incentive to purchase only the lowest priced option available in any given content-based market.⁹ Rather, taken together, these results suggest that a publisher's portfolio size matters, and that antitrust markets ought to be more broadly defined. Note, however, that these price effects are observed only within a subset of the legal serials: treatises and encyclopedias. My explanation is that these titles' content are relatively differentiated compared to, say, newsletters or looseleaf services. So, even if a library's demand is generally portfolio-based, owing to the differentiated nature of most legal materials and the diversity of user needs, this may not always be the case. If (almost) perfect substitutes exist among some serials, mergers affecting these titles may not influence prices when ownership of these overlapping titles is not concentrated.

These results raise at least two important policy questions: 1. Do antitrust authorities need a new paradigm for academic publishing and other portfolio-type markets? 2. Does the current transition from print to electronic distribution have implications for the analysis of portfolio markets, and in particular, the legal serials market? I briefly address these questions at the conclusion of the paper.

The paper is organized as follows. Journal demand, publisher pricing strategies and the implications for merger analysis are first discussed. Empirical evidence is then considered. The empirical model and the underlying hypotheses are discussed, followed by a description of the data, and then the estimation results. Finally, I conclude by discussing the policy issues mentioned earlier.

Law Serials Demand

Most discussions of mergers start with market definition and thus demand. To assess the potential impact of a proposed merger, antitrust authorities define a market just large enough so that a hypothetical monopolist in the market would find it profitable

⁹ Six of the divested titles – three treatises and three state-specific encyclopedias – are in my data set. An examination of the holdings data reveals that during the sample period almost all of the 60 libraries purchased the divested treatise (now owned by Reed-Elsevier) *and* the corresponding West-Thomson treatise in each of three practice areas: bankruptcy, contract and insurance law; in the case of the legal encyclopedias for Illinois, Michigan and Pennsylvania, libraries located in those states behaved in similar fashion. Thus, even though the divestitures diversified the ownership of legal serials, the portfolio behavior of libraries seems to have neutralized the intended pro-competitive effects.

to raise prices some percentage amount above current prices. That is, market demand in the defined market is sufficiently inelastic to justify the price increase.

In legal publishing, experience as a user often suggests that each *unique* title constitutes a distinct market for the purposes of antitrust analysis. For example, no one would argue that a treatise on federal antitrust law could easily substitute for one focusing on state antitrust law, much less one addressing commercial law. If each title corresponds to an antitrust market, then owners of individual titles already have the capacity to achieve monopoly returns; a corollary is that mergers don't matter. An exception should occur only when titles are not unique, producing a more conventional market definition that encompasses the substitute titles. In such cases, antitrust scrutiny would seem warranted.¹⁰

These priors about market definition imply that demands for individual titles are largely unrelated if their content is highly differentiated. However, this intuition is generally incorrect, at least for the largest individual purchasers of legal serials, the libraries.¹¹ Discussions with law librarians employed by academic and government institutions, as well as law firms, revealed that the acquisition of legal serials is generally based on two factors — annual price and expected use. To assemble and maintain their collections, law library behavior appears to be consistent with the following scenario:¹² Libraries first construct a cost per use ratio for each title. Given a budget for a relevant set of legal categories they then proceed to rank the corresponding titles from lowest to highest according to this ratio, and identify a cutoff above which titles need to be canceled; conversely, if their holdings do not exhaust the budget, additional titles can be purchased until the budget constraint is met. From year to year, as budgets and titles' use change, collections are adjusted

¹⁰ Such scrutiny was observed for only one of the six mergers considered in this paper — West/Thomson. As I describe later, some of these transactions involved titles from the same legal categories, and others did not. In the latter cases, of course, content overlap is not an issue.

¹¹ Law libraries exist in several institutional environments, including universities, government, law firms, and corporate offices. University and government libraries tend to be larger and more comprehensive; law firm libraries are smaller but far more numerous; corporate libraries are also small in size. According to the American Association of Law Libraries, in 2001 their members were distributed across 238 academic libraries, 485 government libraries, and 1261 private law firm and corporate libraries. The AALL estimated that its members' libraries budgeted about \$1.2 billion for legal information products. Of this \$1.2 billion, 17% was spent by academic libraries, 13% by governments and 70% by private firms. (see "2001 Salary Survey," AALL, 2002).

¹² This claim is based on my conversations with law librarians and an analysis of law library holdings and use patterns (See McCabe, July, 2002). Unlike the sciences, where journal citations are often used as a proxy for use value, in law no such easy-to-use metric exists. In lieu of actual use data, it appears that law librarians rely on their subjective experience at a particular library to construct cost/use ratios, etc.

accordingly.¹³ Over the past decade or so the general trend is for increases in library budgets to lag journal price inflation; a consequence is that many libraries have been forced to re-allocate dollars from monographs to serials, to postpone the purchase of new titles, and in some cases, to cancel titles.

The most interesting aspect of library journal acquisition, of course, is that individual titles across one or more categories are considered simultaneously. So, for example, a law library might group treatises from various sub-categories, e.g. antitrust, arbitration, commercial law, corporations, etc., into a single “portfolio” and broadly apply the cost per use criterion. Thus, in this scenario, titles compete with each other for budget dollars across an entire category or a set of categories rather than across a narrow sub-category, as intuition might otherwise suggest (an intuition based on the perspective of the typical user of law serials). Furthermore, since serials content is highly differentiated even within sub-categories, libraries try to provide access to as many titles as possible.¹⁴

Publishers’ Pricing Strategies

Given this demand structure, how do commercial publishers set prices?¹⁵ Like firms in any industry, they will take into account the structure of demand and the likely strategies of competitors when setting prices. As described earlier, libraries – which constitute the bulk of the demand for legal serials considered here – attempt to purchase the most “use” given their budgets for specific serials categories. In practice this amounts to ranking titles on a cost/use basis and identifying a threshold cost/use value above which titles are no longer added (the budget is exhausted).

¹³ This type of constrained optimization problem is commonly referred to in the operations research literature as a “knapsack” problem. Note that in practice a library’s budget constraint may be “soft”; it may be expanded slightly to accommodate the marginal title that doesn’t quite “fit” the budget. For an introduction to this issue in the OR literature see Daellenbach and George (1978).

¹⁴ The extent of such differentiation may be category-specific. In cases where publishers bundle court and regulatory decisions and related news, e.g. case reporters, looseleaf services, newsletters, and citators, the level of differentiation is expected to be low when multiple publishers target the same content area. Differentiation is expected to be higher among authored titles, e.g. treatises and encyclopedias, that address the same subject matter. Presumably, as the level of differentiation declines, law librarians may be more willing to substitute between similar titles. If so, then in that category, the size of the effective portfolio will be a subset of the total number of available titles.

¹⁵ There is a small set of non-profit publishers that sell (mostly) law reviews at modest prices. In general, these publishers are primarily interested in disseminating knowledge as opposed to profits. Here I assume that these publishers set prices to cover costs (and are thus ignored in the analysis that follows).

Given this portfolio demand, McCabe (2003) proposes a pricing model in which publisher pricing strategies are determined by the distribution of budgets and a title's relative use value; each title's content is considered to be unique. Since all titles in a particular demand portfolio compete for the same budget dollars, relative use value determines demand for individual titles (if prices are equal, higher quality serials experience greater demand). The equilibrium price for a title is increasing in its quality (but decreasing in the aggregate amount of content sold to libraries). And the budget distribution influences whether, for example, owners of high use titles choose "low" prices and sell to most libraries or set "high" prices and sell only to the largest budget institutions.

Furthermore, in the model, firms controlling larger portfolios of titles have an incentive to charge higher prices, all else equal. The intuition for this result is similar to that in more traditional product markets. Greater portfolio size, perhaps due to a merger, enables a publisher to better internalize pricing externalities. In the case of a multi-title publisher, j , increasing the price of title i provides an incentive for j to increase the prices for other titles it owns with similar or lower cost/use ratios. This is a direct consequence of the libraries' portfolio demand. Since only the highest cost/use titles are marginal purchases, i 's price increase loosens the pricing constraint on all other lower cost/use titles, including those owned by j . And as the size of the j 's portfolio increases this incentive often increases as well, leading to higher *average* prices for j 's titles.¹⁶ Of course, these price changes affect the pricing of other firms as well; when a competitor's prices increase, a publisher's best response is to raise its own prices too. Note, however, that in simulations of various merger scenarios the merged firm's average prices increased the most.

Though this model seems appropriate for the legal serials market(s) there are at least two factual issues which need to be addressed. One issue is whether library budgets for serials are comprehensive in scope, covering all categories of titles, or category-specific. If the latter is true, then I would expect that an *inter*-category merger, e.g. a publisher of treatises merging with a publisher of newsletters, would not influence prices. This is because the pricing externalities described earlier should only exist within a given demand portfolio. However, if budgets are generally comprehensive in scope, I would expect inter-category mergers to raise prices in certain situations, but not in all cases.

This caveat is related to the second factual issue, namely the extent to which content differentiation influences competition in each category of law serials. In cases where content is highly differentiated, the pricing model should apply quite

¹⁶ Note, however, that in raising its average journal price, the large firm may find it optimal to lower the prices of some of its titles. The best response function for an individual title, i.e. whether price is a strategic complement or a strategic substitute, depends on its relative quality, the distribution of library budgets and the pricing strategies of the other titles.

well. So, for example, if budgets are defined comprehensively, I expect that a merger between a treatises publisher and an encyclopedias publisher would result in higher prices. On the other hand, when content is similar at the sub-category level, e.g. two court reporters for the same jurisdiction, or several newsletters summarizing activity at the same federal agency, etc., then even if budgets are defined broadly, an inter-category merger may not result in higher prices. Why? When the content of law serials in a given sub-category is fairly homogeneous, libraries are more likely to choose the best single product rather than acquire all or most of the available products. This demand behavior leads to more intense price competition among titles in a specific sub-category. And since this competition is not affected by an *inter*-category merger involving, for example, a publisher of treatises and a publisher of newsletters, the price impact of the merger will depend on the degree of competition among the affected titles. For example, if buyers could easily substitute away from a newsletter then its owner could not easily raise its price after a merger. As a corollary, an *intra*-category merger involving this type of content is not likely to result in higher prices unless the transaction increases the degree of overlap at the sub-category level.

Publisher Mergers

At the outset of the sample period, in 1990, 18 commercial law serials publishers were active (in the data collected for this paper). By 2000 this number had declined to 12 due to mergers in the market. This wave of consolidation resulted in the emergence of 3 large publishers of law materials in the US – the Thomson Publishing Group, Reed-Elsevier and Wolters Kluwer. All of the transactions studied in this paper involve acquisitions by one of these three firms.¹⁷

In 1995, Thomson acquired Shepard's (treatises only), and then purchased West Publishing Company the following year. Prior to these mergers, Thomson's serials portfolio, as represented by the data used in this study, numbered 135 titles.¹⁸

¹⁷ Prior to the mergers described here, each of these three companies had already absorbed or created numerous legal serials imprints, e.g., Lawyers Cooperative by Thomson, Aspen Law & Business by Wolters Kluwer, and Lexis-Nexis by Reed-Elsevier.

¹⁸ An assumption I make in the empirical analysis below is that the information reported in this section is an accurate representation of the portfolios owned by each firm, i.e. if, in the sample, publisher X publishes treatises and newsletters, then I assume that this firm published no titles in other categories. In the case of the smaller publishers, including Wolters Kluwer circa 1995, I checked with librarians to confirm the accuracy of this assumption. In the case of Reed-Elsevier, West, Thomson, and the titles divested by West/Thomson this assumption is violated due to the absence of codes and digests from the sample. I address this problem in the next section of the paper.

One hundred and nineteen of these titles can be classified as treatises, and 9 as legal encyclopedias; the remaining Thomson titles consisted of one reporter and six looseleaf services. Given the available data, the Shepard's merger added 16 treatises; the purchase of West added 42 more titles, consisting of reporters (17), legal encyclopedias (4) and treatises (21).

Reed-Elsevier added to its portfolio three times during the sample period. Starting with 18 legal encyclopedias and treatises, it acquired 50% control of 17 Shepard's citators in 1996 (and full control in 1998), and 84 Matthew Bender treatises in 1998. In addition, it added most of the West-Thomson divestitures in 1996 (3 legal encyclopedias and 3 treatises in the sample, 5 of which were owned previously by West).

Finally, Wolters Kluwer purchased Commerce Clearing House in 1995, Little Brown (treatises only) in 1996 and Wiley Law Publications in 1997. Prior to these acquisitions, Wolters Kluwer's holdings, published under the imprint Aspen Law & Business, were relatively insubstantial (only 7 titles in the sample: 2 looseleaf services, 3 newsletters, and 2 treatises). Based on the sample titles, the CCH transaction added 17 newsletters and looseleaf services, the purchase of Little Brown contributed 18 treatises, whereas Wiley added only 2 treatises.

The Empirical Model

Most previous empirical studies of *journal* pricing have not attempted to assess the impact of mergers on journal pricing. Cressanthis and Cressanthis (1994) specified a reduced form hedonic model to study the determinants of economic journal pricing. Their results suggest that prices are related to journal characteristics (e.g., prices are increasing in journal quality and size). Lieberman, et. al. (1992) estimated a supply and demand system using data for 225 science journals ranked by the Institute for Scientific Information. They find that supply is downward sloping, consistent with the notion that publishing is characterized by scale economies at the individual title level. Based on this evidence they argue (indirectly) that entry by new titles has lowered circulation for existing journals, forcing the latter to raise prices to cover fixed costs. Furthermore, they identify a significant inflation residual that is unexplained by the model. McCabe (2000) examined the effect of mergers in the market for ISI-ranked biomedical titles by estimating a structural model. He also shows that journal demand elasticities are very small in absolute terms, and using this result offers an explanation for the observed residual price inflation based on a model of dynamic profit maximization. In a later paper, McCabe (March, 2002) estimated the impact of mergers in this market using a difference-in-differences

approach. In both papers, significant price increases are associated with publisher mergers.¹⁹

In this paper, the differences-in-differences approach is employed to detect whether six mergers in the 1990s raised law serial prices. This approach involves specifying a separate fixed effect for each title (to “difference” the data), a series of time dummies for each of the years in the sample, and a set of merger dummies (which measure the differences in the differenced data). Although this non-structural approach does not allow us to identify the separate contributions of market power and other confounding factors, e.g. coincident changes in demand elasticities or costs, it is less data intensive and permits us to examine the recent mergers using price data through 2000.²⁰ Indeed, consistent evidence of merger-related price increases provides support for a market power explanation.

Ideally, this approach allows me to test three hypotheses:

- H1: Intra-category mergers involving highly differentiated content, e.g. treatises or encyclopedias, are associated with relatively large price effects.
- H2: Intra-category mergers involving content that is less differentiated at the sub-category level, e.g. looseleaf services or newsletters, are less susceptible to anti-competitive price effects.
- H3: (a) If budgets are category-specific then inter-category mergers do not influence prices.
 (b) If budgets are comprehensive in scope, then the price impact of an inter-category merger depends on the degree of product differentiation among the affected titles. Price increases should be largest when two sets of differentiated content are combined (see H1) and less when one or both sets consist of content that is less differentiated at the sub-category level (see H2).

Of course, to properly test each hypothesis the necessary natural experiments need to have occurred. Given that the sample contains data for 6 categories of legal

¹⁹ Two of the big 3 law publishers were involved in the STM mergers studied by McCabe: Reed-Elsevier and Wolters-Kluwer.

²⁰ Much of the non-price data necessary to estimate a structural model is not available, e.g. proxies for cost and quality. However, an accurate count of reporter volumes published during the sample period is available as a cost correlate. Note that the page size of these volumes was generally constant or decreasing in size over time (see Ryan, 2001, for evidence that pages/volume for West reporters *declined* after the West-Thomson merger). When reporter prices are regressed on a series of time dummies, fixed effects and this volume count I observed that the change in prices over time are unrelated to the reporter volume count. This suggests that costs are unrelated to any price inflation observed in the data.

serials, testing all of the H1, H2 and H3 possibilities would require six different “pure” intra-category mergers, and 15 distinct inter-category mergers. However, the data does not contain any such pure cases. Furthermore, in some cases only one firm owns all or almost all titles from a specific category, e.g. West owned all but one reporter in the sample, and Shepard’s owned all the citators. This situation precludes identification of separate merger effects and category-specific time trends. In other cases, estimation of a category specific merger variable is questionable due to the small sample size, e.g. there are only 4 West encyclopedias, or only 3 Aspen newsletters.

Nevertheless, if I redefine some of the categories it is still possible to test modified versions of H1 and H2. In the case of H1, by combining treatises and encyclopedias in to a single category I can minimize the sample size problem. Similarly, I can combine newsletters and looseleaf services to better test H2. And due to data limitations, I need to assume that library budgets are comprehensive in scope.²¹ Thus, most of H3 needs to be discarded, except for cases involving mergers of H1-type content with H2-type content. That is, compared to an H1 merger, price increases should be relatively small or nonexistent if one of the merging firms publishes H2-type content. Furthermore, given the diverse portfolios of the merging parties, any post-merger price increases must be interpreted with some caution since inter-category effects may be affecting the results. For example, in the case of West-Thomson, I can test H1 only by assuming that H3 holds, since the two companies not only owned treatises and encyclopedias but also codes, digests and reporters. The best test of H2 is Wolters Kluwer’s 1995 purchase of CCH. The absence of any post-merger price increases in that case would jointly confirm H2 and H3 due to Kluwer’s ownership of treatises.²² Given the serials holdings for each publisher in the sample, Table 1 summarizes, by transaction, which of these three modified merger hypotheses can be tested.

²¹ This claim can be explained using the following example. Suppose a publisher of treatises and encyclopedias merges with a similar firm. Following the transaction a general price increase is observed. Because of the hybrid nature of each firm it is not possible to determine empirically whether the price increase reflects only treatise-treatise and encyclopedia-encyclopedia interactions, or also treatise-encyclopedia effects.

²² In the sample there are 7 Aspen titles including only two treatises. Because of the relatively small number of treatise observations, they are deleted from the estimation to help identify any price impact of the CCH merger on the remaining Aspen newsletters and looseleaf serials. Also, since there are only two Wiley treatises in the sample, I do not attempt to estimate the impact of the Wolters-Kluwer/Wiley merger; these Wiley observations are also deleted from the sample.

Table 1, Merger Hypotheses: For Merger *i*, can H1, H2, and/or H3 be tested?

Merger	H1	H2	H3
Thomson/Shepard's 1995	Yes ¹	No	Yes ²
Thomson/West 1996	Yes ³	No	Yes ⁴
Reed Elsevier/Divested West 1996	Yes ⁵	No	No
Reed Elsevier/Matthew Bender 1998	Yes ⁶	No	No
Wolters Kluwer/CCH 1995	No	Yes ⁷	Yes ⁸
Wolters Kluwer/Little Brown 1996	Yes ⁹	No	Yes ¹⁰

H1: Intra-category mergers involving treatises and/or encyclopedias are associated with relatively large price effects.

H2: Intra-category mergers involving looseleaf services and/or newsletters are associated with negligible or relatively small price effects.

H3: Inter-Category mergers do not result in higher prices

Notes:

- 1: Both firms owned treatises and/or encyclopedias
- 2: Thomson owned looseleaf services, Shepard's owned treatises.
- 3: Both firms owned treatises and encyclopedias.
- 4: Thomson owned looseleaf services, West owned treatises and encyclopedias.
- 5: Both firms owned treatises and encyclopedias.
- 6: Both firms owned treatises and encyclopedias.
- 7: Both firms owned newsletters and looseleaf services.
- 8: Wolters Kluwer owned treatises (not in sample), and CCH owned newsletters and looseleaf services (joint with 7).
9. Both firms owned treatises (Wolters Kluwer treatises not in sample).
10. Wolters Kluwer owned newsletters and looseleaf services, and Little Brown owned treatises.

As discussed in the text, some of the cells in this table are coded as "No" due to data limitations rather than the absence of a potential natural experiment. For example, since all citators in the sample are owned by the same firm throughout the sample period, it is not possible to test whether H3 holds after their acquisition by Reed Elsevier.

The basic estimating equation is:

$$(1) \quad \ln \text{Price}_{it} = \beta_i + \gamma_{kt} \cdot \text{Time Dummy}_{kt} + \delta_{1jt} \cdot \text{Pre Merger Dummy}_{jt} \\ + \delta_{2jt} \cdot \text{Post Merger Dummy}_{jt} + \delta_3 \cdot \text{Pre Divest Dummy}_t \\ + \delta_4 \cdot \text{Post Divest Dummy}_t + \mu_{it}$$

The four subscripts, i , j , k and t , refer to law serial i , publisher j , category k , and year t . Price_{it} is the annual acquisition price for law serial i in year t . The β_i term represents the fixed effect for law serial i . The Time Dummy_{kt} variable equals one in year t for titles that belong to law category k and zero otherwise.²³ A category-specific time trend is specified to allow for the possibility that demand is more inelastic for some categories than others, and thus more or less prone to publisher-induced price increases; furthermore, the emergence of an online competitor to Shepard's Citators in 1997 (West-Thomson's "KeyCite") is likely to have made demand for these titles more elastic.²⁴ The μ_{it} is a disturbance term that I assume is uncorrelated with the right hand side variables. Note that this assumption would be violated if the fixed effects were not estimated: a Hausman test of the null hypothesis that the fixed effects are uncorrelated with the remaining independent variables is easily rejected. To allow for the possibility of heteroscedasticity and serial correlation at the level of the individual title, I report OLS and robust standard errors.^{25 26}

²³ Alternatively, a polynomial time trend of order 3 or 4 can be specified. The results for the other parameters in the model do not change. I report the time dummy results since they are easier to interpret.

²⁴ Generally speaking, academic and legal publishers announce annual price increases, and libraries respond by allocating more funds to their serials acquisition budgets. When content is highly differentiated, I expect demand for individual titles to be relatively inelastic, enabling publishers to set prices that fully exploit the expected budget increases. When content-overlap is important, competition is likely to be more intense, and thus prices increases may be more modest.

²⁵ Bertrand, et. al (2004) use simulation techniques to demonstrate that serial correlation in panel data can lead to underestimation of the true standard errors in difference-in-difference models. I use STATA to estimate (1); that program's *AREG* procedure contains a *cluster* option which addresses this problem. The standard errors for the γ and δ parameters in (1) are consistently estimated by this cluster option as the number of time series, N , goes to infinity. Bertrand, et. al. report good results for $N=50$; $N>400$ in this paper.

²⁶ Although it might be interesting to account for *firm*-level correlation in the error term (since prices for titles with a common owner are likely to reflect a common pricing strategy) the 25 publishers in

For a publisher j involved in a merger, *Pre-Merger Dummy* _{jt} equals one in each of the years prior to and including the year in which j 's *first* transaction was consummated, *except* for the first year of the sample period, and zero for later years (the initial year of each period is the reference year for both dummy variables). In contrast, the *Post-Merger Dummy* _{jt} equals one in each year following the year in which this first transaction closed, and zero for earlier years. A pair of merger dummies is specified rather than a lone variable to allow for the possibility that some publishers may increase prices at different rates over time compared to the average observed in the law serials market.²⁷ So, for example, although the effect of a merger may be to increase a firm's average price level in the post-merger period, this price level may be greater than, equal to, or even less than the average for the rest of the law serials market. By specifying a pre-merger dummy as well, this relative change can be captured.²⁸ To check whether the results were sensitive to the definition of the pre- and post-merger periods, I estimated additional specifications in which the effective merger dates were moved one or two years earlier, as well as one or two years later. These alternative specifications reduced the magnitude and precision of the merger effects reported below.

For the law serials that were divested by West-Thomson, the *Pre-Divest Dummy* variable equals one in each year prior to the divestiture, *except* for the first year of the sample period, and zero for later years. The *Post-Divest Dummy* variable equals one in each year following the divestiture, and zero for earlier years. Note that these variables measure the impact of the divestiture relative to the *Pre-* and *Post-Merger* variables for *West Publishing* (since the latter variables are "turned on" when the corresponding Pre- and Post-Divest Dummy variables are "on").²⁹ Thus, for example, if the West titles purchased by Thomson experienced a price increasing following the merger, but the divested titles did not, then West's *Post-Merger*

the data set are too few to permit estimation of both title-specific fixed effects and firm-level error correlations. Note that the pre- and post-merger firm dummies do at least partially capture these firm-level effects for many of the observations in the data set.

²⁷ The one exception involves Thomson's titles. Since the sample contains treatises, encyclopedias and looseleaf services owned by Thomson I can test for different merger effects on these two types of holdings by specifying category-specific merger dummy pairs: one pair for the Thomson treatises and encyclopedias and a second pair for its looseleaf services.

²⁸ This flexible specification allows me to measure the effects of mergers even if there exist other differences in publishers' pricing strategies that are beyond the scope of this paper.

²⁹ In the sample, there are 6 divested titles, 5 former West titles and one former Thomson title. Since it is not practical to estimate a separate divestiture dummy for the single Thomson title it is deleted from the sample.

Dummy variable and the *Post-Divestiture Dummy* variable would be of similar magnitude but exhibit opposite signs.

Since the three large publishers in this market each participated in two to three acquisitions during the sample period, and because these transactions occurred close in time for each firm, the firm-specific dummy variables in (1) capture the *cumulative* impact of mergers on the prices of the acquiring firms' titles (and, for the earlier mergers, on the prices of the acquired firms' titles). This specification precludes any clean testing of H1-H3. To better achieve this objective, I also report results for a more general version of (1) in which the Post-Merger Dummy variable is allowed to vary as subsequent mergers occur. The idea here is to attempt to capture the separate contributions of a first and second merger.³⁰ This second specification is designed to test the full set of merger hypotheses summarized in Table 1. Finally, note that the panel of data is not perfectly balanced. For some titles, observations are missing for a year or two, and in a relatively small number of cases, the first publication date is later than 1990.³¹

Data

Members of the American Association of Law Libraries and I defined a set of the "480 most important" legal serials, drawn from eight broad categories of commercial, print titles – reporters, codes, digest, citators, encyclopedia, looseleaf services, newsletters, and treatises.³² The AALL members responded to the following hypothetical request: if you were assembling a new law serials collection, one with national scope but limited to 480 titles, which titles would you include? Although many more legal serials exist it was not practical to collect information on additional titles. For the period 1990-2000, annual price data for these titles were constructed using records from Georgetown University, and in the case of treatises, supplemented by Svengalis' annual price survey (various years). Because Georgetown did not subscribe to all 480 titles, and since their data for codes and digests could not be used, some 405 titles are represented in the price data.

³⁰ However, given the timing of the transactions, if the price impact of a merger is not immediate, then even this specification will only partially capture the separate effects.

³¹ 19 titles were first published in either 1991 or 1992; 3 started in 1993, 3 in 1994 and 2 in 1995. Note that the earliest merger in the sample occurred in 1995.

³² This AALL advisory committee included Claire Engel, Nancy Johnson, Craig Lelansky, Bob Oakley, and Kendall Svengalis.

Table 2, Descriptive Price Statistics

Serial Category	N	Mean	St. Dev.	Min	Max
Reporters	147	704	441	60	2309
Citators	183	581	326	245	2630
Encyclopedias	131	711	464	137	2701
Looseleaf Services	342	954	621	212	4715
Newsletters	148	1029	1127	275	6922
Treatises	2308	420	459	14	2860

Number of Observations: 3259

Table 2 reports a number of statistics for serial prices by category. The sample period, 1990-2000, is useful in at least two respects. First, it is sufficiently long to provide a useful measure of price inflation in the legal serials market. Second, as described above, the period contains a number of natural experiments that enables me to identify the impact of mergers on pricing. Growth via merger should be distinguished from organic internal growth arising from the introduction of new titles. The latter may produce benefits (such as coverage of emerging fields of practice) that help to offset any intentional competitive harm; harm associated with acquisitions, on the other hand, is less likely to be balanced by substantial benefits – titles are simply reshuffled, and the cost savings seem to be small.³³

Estimation Results

The basic estimation results are reported in Tables 3, and 4. In each case, the fixed effect estimates are suppressed. Two additional tables, 3A and 4A, are designed to simplify the interpretation of the various merger effects. These additional tables report standard errors that correspond to the *net* impact of each merger, i.e. standard errors for the difference between the post and pre-merger dummies. In all the tables two sets of standard errors are reported – OLS-based estimates and their robust counterparts. In many but not all cases the robust standard errors are a bit larger in magnitude. The inferences made here are not weakened much when these robust standard errors are used and so heteroscedasticity and/or serial correlation do not

³³ Furthermore, if publishing mergers do result in cost savings, and the market is competitive, then economic theory implies that post-merger prices should *decline*, all else equal.

appear to be a major problem. In any case, these robust estimates are used exclusively in the discussion that follows.

In Table 3, estimates for the basic model are presented. With the exception of reporters, most time dummies for each serial category are precisely estimated. Based on these estimates the price increases for the 1991-2000 period are:³⁴ reporters (+50%), looseleaf services (54%), newsletters (68%), citators (91%), encyclopedias (157%), treatises (86%).³⁵ Note that the price increases are lower for the three serial categories – reporters, newsletters, and looseleaf services – where content competition was most likely during the entire sample period. In the case of citators, where no such competition existed until the 1997 entry of the Lexis Nexis' product, KeyCite, the post-1996 price increase amounted to only 5%. In contrast, prices for citators increased 82% during the 1991-96 period.³⁶

The net cumulative merger effects are reported in Table 3A. No attempt is made to distinguish among the separate contributions of each of the three acquiring firms' transactions. For each of the three acquiring firms – Thomson, Reed-Elsevier and Wolters-Kluwer – the addition of treatises (and for two of the firms, encyclopedias) to their existing portfolio of titles resulted in higher post-merger prices. In the case of Thomson, the cumulative post-merger impact on its treatises and encyclopedias amounts to an increase of about 40% ($=100 \cdot (e^{\Delta_{\text{Thomson, T/E}}} - 1)$). It is important to emphasize here that this merger effect and those reported below are independent of the category-specific price trends described earlier. That is, these Thomson titles experienced a 40% price increase during the period 1996-2000 that exceeded price increases experienced by comparable titles published by other firms. The titles acquired by Thomson also benefitted: the point estimates suggest that prices for the Shepard treatises increased about 11%, and those for the West portfolio increased about 23%. With the exception of the Shepard's titles, these net effects are significantly different from zero at conventional levels. This evidence is consistent with H1, since each of these three portfolios contained treatises and in two cases, encyclopedias. Furthermore, prices for Thomson's looseleaf services appear to be

³⁴ 1991 is used here for comparison purposes because no 1990 data was available for reporters.

³⁵ These price increases are measured by calculating $100 \cdot (e^{\Delta} - 1)$, where $\Delta = 2000$ time dummy – 1991 time dummy, for each category of serials. The corresponding “raw” price increases are: reporters (+61%), looseleaf services (66%), newsletters (188%), citators (96%), encyclopedias (211%), and treatises (99%). Since the data are unbalanced, large deviations from the regression estimates are possible, e.g. data for a pair of costly newsletters are missing prior to 1995 and this produces an upward bias in the unadjusted price increase.

³⁶ Since there is only one owner of all of the citators in the sample at any point in time, no merger effects can be separately identified.

Table 3, Basic Model

Dependent Variable In Price	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
Reporter Time Dummy 1992	-.0131	.0875	0.881	.0342	0.702
Reporter Time Dummy 1993	.0794	.0875	0.364	.0440	0.071
Reporter Time Dummy 1994	.0543	.0875	0.535	.0441	0.219
Reporter Time Dummy 1995	.1121	.0889	0.208	.0646	0.083
Reporter Time Dummy 1996	.2437	.2844	0.392	.0417	0.001
Reporter Time Dummy 1997	.0566	.1007	0.574	.1311	0.666
Reporter Time Dummy 1998	.0473	.1007	0.639	.1295	0.715
Reporter Time Dummy 1999	.2295	.0994	0.021	.1689	0.174
Reporter Time Dummy 2000	.4057	.1455	0.005	.2028	0.046
Citator Time Dummy 1991	.0288	.0928	0.756	.0699	0.680
Citator Time Dummy 1992	.0187	.0928	0.840	.0522	0.720
Citator Time Dummy 1993	.4963	.0928	0.001	.1290	0.001
Citator Time Dummy 1994	.4365	.0916	0.001	.1506	0.004
Citator Time Dummy 1995	.5594	.0916	0.001	.1271	0.001
Citator Time Dummy 1996	.6284	.0916	0.001	.1225	0.001
Citator Time Dummy 1997	.5554	.0916	0.001	.0588	0.001
Citator Time Dummy 1998	.5571	.0916	0.001	.0853	0.001
Citator Time Dummy 1999	.8021	.0916	0.001	.0923	0.001
Citator Time Dummy 2000	.6765	.0916	0.001	.0737	0.001
Looseleaf Time Dummy 1991	.0230	.1388	0.863	.0321	0.473
Looseleaf Time Dummy 1992	.0716	.1344	0.594	.0334	0.032
Looseleaf Time Dummy 1993	.1225	.1331	0.357	.0329	0.001
Looseleaf Time Dummy 1994	.1684	.1329	0.205	.0358	0.001
Looseleaf Time Dummy 1995	.2003	.1311	0.127	.0303	0.001
Looseleaf Time Dummy 1996	.2945	.1314	0.025	.0315	0.001
Looseleaf Time Dummy 1997	.3337	.1311	0.011	.0337	0.001
Looseleaf Time Dummy 1998	.3632	.1316	0.006	.0351	0.001
Looseleaf Time Dummy 1999	.3896	.1322	0.003	.0367	0.001
Looseleaf Time Dummy 2000	.4572	.1327	0.001	.0374	0.001
Newsletter Time Dummy 1991	.0251	.1379	0.856	.0380	0.509
Newsletter Time Dummy 1992	.1426	.1379	0.301	.0346	0.001
Newsletter Time Dummy 1993	.1866	.1379	0.176	.0396	0.001
Newsletter Time Dummy 1994	.2648	.1379	0.055	.0485	0.001
Newsletter Time Dummy 1995	.2967	.1285	0.021	.0364	0.001
Newsletter Time Dummy 1996	.3408	.1290	0.008	.0343	0.001
Newsletter Time Dummy 1997	.3802	.1290	0.003	.0321	0.001
Newsletter Time Dummy 1998	.4323	.1290	0.001	.0265	0.001
Newsletter Time Dummy 1999	.4835	.1290	0.001	.0273	0.001
Newsletter Time Dummy 2000	.5461	.1318	0.001	.0287	0.001
Encyclopedia Time Dummy 1991	.4737	.1792	0.008	.2495	0.058
Encyclopedia Time Dummy 1992	.6863	.1792	0.001	.2596	0.008
Encyclopedia Time Dummy 1993	.8290	.1781	0.001	.2451	0.001
Encyclopedia Time Dummy 1994	.9291	.1772	0.001	.2343	0.001
Encyclopedia Time Dummy 1995	.9289	.1786	0.001	.2426	0.001
Encyclopedia Time Dummy 1996	.8602	.2271	0.001	.2833	0.001
Encyclopedia Time Dummy 1997	.8175	.1774	0.001	.2714	0.001
Encyclopedia Time Dummy 1998	.9619	.1765	0.001	.2664	0.001
Encyclopedia Time Dummy 1999	1.2075	.1764	0.001	.2650	0.001
Encyclopedia Time Dummy 2000	1.4170	.1774	0.001	.2554	0.001

Table 3, continued

Dependent Variable In Price	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
Treatise Time Dummy 1991	.2800	.1398	0.045	.2031	0.168
Treatise Time Dummy 1992	.5105	.1392	0.001	.2032	0.012
Treatise Time Dummy 1993	.5496	.1390	0.001	.2045	0.007
Treatise Time Dummy 1994	.6412	.1389	0.001	.2044	0.002
Treatise Time Dummy 1995	.6821	.1388	0.001	.2056	0.001
Treatise Time Dummy 1996	.6375	.1381	0.001	.2045	0.002
Treatise Time Dummy 1997	.6854	.1379	0.001	.2038	0.001
Treatise Time Dummy 1998	.7469	.1369	0.001	.2047	0.001
Treatise Time Dummy 1999	.8196	.1374	0.001	.2038	0.001
Treatise Time Dummy 2000	.8980	.1375	0.001	.2024	0.001
Thomson T/E, 1990-95	-.1282	.1352	0.343	.1951	0.511
Thomson T/E, 1996-00	.2102	.1342	0.117	.1972	0.286
Thomson L, 1996-00	.0185	.2359	0.938	.1219	0.880
Thomson L, 1996-00	.0246	.2303	0.915	.1160	0.832
Shepard's, 1990-95	-.0490	.1712	0.775	.2743	0.858
Shepard's, 1996-00	.0566	.1695	0.738	.2919	0.846
West, 1990-96	-.2839	.1863	0.128	.2290	0.215
West, 1997-00	-.0732	.1861	0.694	.2288	0.749
Reed Elsevier, 1990-96	-.5462	.1726	0.002	.2656	0.040
Reed Elsevier, 1997-00	-.3951	.1707	0.021	.2781	0.156
Divested West, 1990-96	-.0099	.1915	0.959	.2143	0.963
Divested West, 1997-00	.1426	.1953	0.465	.3096	0.645
Matthew Bender, 1990-98	-.1811	.1445	0.210	.2077	0.383
Matthew Bender, 1999-00	-.2584	.1453	0.075	.2079	0.214
Wolters Kluwer, 1990-95	-.0724	.1561	0.643	.0602	0.229
Wolters Kluwer, 1996-00	-.0772	.1576	0.624	.0413	0.062
CCH, 1990-95	.0669	.1506	0.879	.0335	0.046
CCH, 1996-00	-.0230	.1506	0.879	.0499	0.645
Little Brown, 1990-96	-.0650	.1702	0.703	.2423	0.789
Little Brown, 1997-00	.0597	.1703	0.726	.2547	0.815

Number of observation = 3259

Adjusted R-squared = 0.9419

Note: Separate merger dummies are estimated for the Thomson treatises and encyclopedias ("T/E") and looseleaf serials ("L").

Table 3A, Net Merger Effects, Basic Model

	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
$\Delta(\text{Thomson}), \text{T/E}$	.3385	.0278	0.001	.0345	0.001
$\Delta(\text{Thomson}), \text{L}$	.0061	.0938	0.948	.0362	0.886
$\Delta(\text{Shepard's})$	.1056	.0520	0.042	.0783	0.177
$\Delta(\text{West})$	.2108	.0482	0.001	.0887	0.018
$\Delta(\text{Reed Elsevier})$	.1510	.0499	0.003	.0744	0.042
$\Delta(\text{Divested West})$	.1524	.0909	0.094	.2084	0.465
$\Delta(\text{Matthew Bender})$	-.0773	.0324	0.017	.0292	0.008
$\Delta(\text{Wolters Kluwer})$	-.0047	.0883	0.957	.0469	0.919
$\Delta(\text{CCH})$	-.0889	.0696	0.197	.0385	0.020
$\Delta(\text{Little Brown})$	.1246	.0503	0.013	.0773	0.107

$\Delta(\) = (\text{Post-Merger Coefficient}) - (\text{Pre-Merger Coefficient})$

unaffected by the two mergers. This absence of inter-category effects is consistent with H3: owning more treatises and encyclopedias does not provide an opportunity for an owner of looseleaf services to raise the latter's prices.³⁷

The qualitative story for Reed-Elsevier is much the same, with one exception. The cumulative post-merger impact on its own titles amounts to a statistically significant increase of about 16%. Prices for the divested titles increased at least as much as the West titles that remained under the control of West-Thomson; in fact the point estimates for the *Pre-* and *Post-Divest* dummies imply that this increase may have been as large as 44% ($=100 \cdot (e^{\Delta_{\text{West}}} + \Delta_{\text{Divested West}} - 1)$). These results are consistent with H1. However, the post-merger estimate corresponding to the Matthew Bender treatises implies a 7% decline in prices, relative to the price level observed for treatises during the period 1999-2000. This estimate is precisely estimated. Although this rejection of H1 is troubling there may exist extenuating circumstances. Apparently during much of the sample period, prices for these titles

³⁷ Alternatively, I might argue that the observed increases in prices for treatises and encyclopedias is inconsistent with H3, given the possible influence of the Thomson looseleaf services. This ambiguity is a data limitation that cannot be avoided here: there are no pure H3-type mergers in the sample. However, since there is no reason to expect asymmetries in the merger effects, and because the four H3 type mergers in the sample produce the same result – substantial prices increases for treatises and encyclopedias, and either smaller increases or no increases at all for looseleaf services and newsletters – I conclude that H3 is not rejected.

were “excessive” compared to treatises published by other firms.³⁸ If true, then the usual incentives to raise prices after a merger might not have existed in the post-merger period.

Following Wolters Kluwer’s 1996 acquisition of the Little Brown treatises, prices for these titles may have jumped about 13%. However, this increase is not quite significant at the 10% level. In contrast, prices for the CCH looseleaf services and newsletters actually declined after their purchase in 1995 by Wolters. Furthermore, there appears to be no cumulative effect of these two transactions on the prices of Wolters’ newsletters and looseleaf services. Given that Wolters Kluwer owned treatises (not in the sample), the price increases observed for the Little Brown treatises are consistent with H1 while the absence of price increases by the CCH or Wolters Kluwer titles is consistent with H2. This latter result is also consistent with H3 (but see footnote 37).

Some of the ambiguity associated with these results can be reduced by permitting the appropriate merger dummy variables to vary as the acquiring firm engages in consecutive transactions. For example, suppose a publisher of treatises purchases a portfolio of treatises (an H1 merger), and then at some later date acquires a second set of treatises (also an H1 merger). It is then possible to identify the separate effects of these two transactions by defining a pair of “post-merger” dummy variables for each of the sets of newsletters – one that corresponds to the interval between the two mergers, and one that turns on after the second merger.³⁹ For each of seven sets of titles in the sample – the Thomson treatises and encyclopedias, the Thomson looseleaf products, the divested West titles, and those owned originally by Shepard’s, Reed-Elsevier, Wolters Kluwer and CCH – a pair of consecutive mergers may have influenced prices. In each case, I specify a pair of post-merger dummy variables as described above. The results are reported in Table 4. An F-test of the null hypothesis that these 1st and 2nd post-merger coefficients are jointly pair-wise equal can be rejected at the 1% level of significance. Note that the time dummy results for each of the categories are generally unchanged. The net impact of the merger transactions are reported in Table 4A. The results regarding H1, H2 and H3 for this expanded set of merger effects are summarized in Table 5.

³⁸ This claim is based on discussions with librarians and a former MB executive. Apparently, during the late 1980s and early 1990s, MB increased prices dramatically (in 1991 average prices for MB treatises in the sample were much higher than those owned by other publishers). This strategy was controversial. In response, MB decided to reduce its annual price increases in the early 1990s – in fact, prices were frozen for some titles -- but by 1996 the increases had resumed. An inspection of the actual data does reveal such a pattern during the sample period.

³⁹ Again, a maintained assumption here is that the effects of the first merger manifest themselves quickly; if not, then the coefficient for the second merger dummy may include price effects from both transactions.

Table 4 Multiple Post-Merger Dummies

Dependent Variable In Price	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
Reporter Time Dummy 1992	-.0131	.0874	0.881	.0342	0.702
Reporter Time Dummy 1993	.0794	.0874	0.364	.0440	0.071
Reporter Time Dummy 1994	.0543	.0874	0.535	.0442	0.219
Reporter Time Dummy 1995	.1120	.0891	0.208	.0647	0.084
Reporter Time Dummy 1996	.2432	.2842	0.392	.0419	0.001
Reporter Time Dummy 1997	.0252	.1015	0.804	.1327	0.849
Reporter Time Dummy 1998	.0161	.1015	0.874	.1313	0.903
Reporter Time Dummy 1999	.2054	.1003	0.041	.1687	0.233
Reporter Time Dummy 2000	.3922	.1463	0.007	.2066	0.058
Citator Time Dummy 1991	.0288	.0927	0.756	.0700	0.681
Citator Time Dummy 1992	.0187	.0927	0.840	.0523	0.720
Citator Time Dummy 1993	.4963	.0927	0.001	.1291	0.001
Citator Time Dummy 1994	.4365	.0916	0.001	.1507	0.004
Citator Time Dummy 1995	.5594	.0916	0.001	.1273	0.001
Citator Time Dummy 1996	.6284	.0916	0.001	.1226	0.001
Citator Time Dummy 1997	.5554	.0916	0.001	.0588	0.001
Citator Time Dummy 1998	.5571	.0916	0.001	.0853	0.001
Citator Time Dummy 1999	.8021	.0916	0.001	.0924	0.001
Citator Time Dummy 2000	.6765	.0916	0.001	.0738	0.001
Looseleaf Time Dummy 1991	.0235	.1337	0.861	.0320	0.464
Looseleaf Time Dummy 1992	.0720	.1343	0.592	.0332	0.031
Looseleaf Time Dummy 1993	.1229	.1330	0.356	.0327	0.001
Looseleaf Time Dummy 1994	.1687	.1329	0.204	.0356	0.001
Looseleaf Time Dummy 1995	.2007	.1311	0.126	.0302	0.001
Looseleaf Time Dummy 1996	.2751	.1400	0.050	.0275	0.001
Looseleaf Time Dummy 1997	.3396	.1317	0.010	.0350	0.001
Looseleaf Time Dummy 1998	.3690	.1321	0.005	.0365	0.001
Looseleaf Time Dummy 1999	.3955	.1328	0.003	.0377	0.001
Looseleaf Time Dummy 2000	.4624	.1332	0.001	.0384	0.001
Newsletter Time Dummy 1991	.0248	.1378	0.857	.0379	0.514
Newsletter Time Dummy 1992	.1423	.1378	0.302	.0345	0.001
Newsletter Time Dummy 1993	.1862	.1378	0.177	.0395	0.001
Newsletter Time Dummy 1994	.2645	.1378	0.055	.0484	0.001
Newsletter Time Dummy 1995	.2964	.1284	0.021	.0364	0.001
Newsletter Time Dummy 1996	.3347	.1304	0.010	.0338	0.001
Newsletter Time Dummy 1997	.3815	.1291	0.003	.0323	0.001
Newsletter Time Dummy 1998	.4337	.1291	0.001	.0267	0.001
Newsletter Time Dummy 1999	.4849	.1291	0.001	.0273	0.001
Newsletter Time Dummy 2000	.5471	.1318	0.001	.0286	0.001
Encyclopedia Time Dummy 1991	.4912	.1794	0.006	.2494	0.049
Encyclopedia Time Dummy 1992	.7038	.1794	0.001	.2593	0.007
Encyclopedia Time Dummy 1993	.8466	.1783	0.001	.2451	0.001
Encyclopedia Time Dummy 1994	.9468	.1773	0.001	.2342	0.001
Encyclopedia Time Dummy 1995	.9469	.1787	0.001	.2425	0.001
Encyclopedia Time Dummy 1996	.9020	.2278	0.001	.2716	0.001
Encyclopedia Time Dummy 1997	.7919	.1778	0.001	.2706	0.001
Encyclopedia Time Dummy 1998	.9369	.1768	0.001	.2653	0.001
Encyclopedia Time Dummy 1999	1.2025	.1767	0.001	.2676	0.001
Encyclopedia Time Dummy 2000	1.4129	.1777	0.001	.2585	0.001

Table 4, continued

Dependent Variable In Price	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
Treatise Time Dummy 1991	.2961	.1400	0.035	.2026	0.144
Treatise Time Dummy 1992	.5263	.1394	0.001	.2026	0.009
Treatise Time Dummy 1993	.5657	.1392	0.001	.2039	0.006
Treatise Time Dummy 1994	.6571	.1390	0.001	.2041	0.001
Treatise Time Dummy 1995	.6981	.1390	0.001	.2053	0.001
Treatise Time Dummy 1996	.6837	.1397	0.001	.2039	0.001
Treatise Time Dummy 1997	.6772	.1379	0.001	.2040	0.001
Treatise Time Dummy 1998	.7391	.1368	0.001	.2049	0.001
Treatise Time Dummy 1999	.8123	.1374	0.001	.2042	0.001
Treatise Time Dummy 2000	.8900	.1376	0.001	.2027	0.001
Thomson T/E, 1990-95	-.1447	.1355	0.286	.1949	0.458
Thomson T/E, 1996	.1203	.1391	0.387	.1977	0.543
Thomson T/E, 1997-00	.2290	.1343	0.088	.1979	0.247
Thomson L, 1990-95	.0145	.2358	0.951	.1181	0.902
Thomson L, 1996	-.0177	.2654	0.947	.1098	0.872
Thomson L, 1997-00	.0262	.2311	0.910	.1127	0.816
Shepard's, 1990-95	-.0650	.1713	0.704	.2731	0.812
Shepard's, 1996	.0267	.1843	0.885	.2715	0.922
Shepard's, 1997-00	.0608	.1700	0.721	.2995	0.839
West, 1990-96	-.3018	.1864	0.105	.2281	0.186
West, 1997-00	-.0634	.1860	0.733	.2293	0.782
Reed Elsevier, 1990-96	-.5671	.1729	0.001	.2667	0.034
Reed Elsevier, 1997-98	-.3241	.1738	0.062	.2932	0.269
Reed Elsevier, 1999-00	-.4489	.1734	0.010	.2765	0.105
Divested West, 1990-96	-.0111	.1914	0.954	.2139	0.958
Divested West, 1997-98	.1521	.2063	0.461	.3174	0.632
Divested West, 1999-00	.1371	.2038	0.501	.3245	0.673
Matthew Bender, 1990-98	-.1946	.1446	0.178	.2074	0.348
Matthew Bender, 1999-00	-.2511	.1453	0.084	.2082	0.228
Wolters Kluwer, 1990-95	-.0714	.1560	0.647	.0599	0.233
Wolters Kluwer, 1996	-.0432	.1932	0.823	.0365	0.237
Wolters Kluwer, 1997-00	-.0856	.1610	0.595	.0437	0.050
CCH, 1990-95	.0666	.1501	0.657	.0334	0.046
CCH, 1996	.0293	.1732	0.866	.0463	0.527
CCH, 1997-00	-.0364	.1521	0.811	.0516	0.481
Little Brown, 1990-96	-.0873	.1704	0.608	.2413	0.717
Little Brown, 1997-00	.0681	.1702	0.689	.2555	0.790

Number of observation = 3259

Adjusted R-squared = 0.9420

Note: Separate merger dummies are estimated for the Thomson treatises and encyclopedias ("T/E") and looseleaf serials ("L").

Table 4A, Net Merger Effects, Multiple Post-Merger Dummies

	Estimate	OLS		Robust	
		Error	P>|t|	Error	P>|t|
Δ_1 (Thomson), T/E	.2649	.0398	0.001	.0418	0.001
Δ_2 (Thomson), T/E	.3736	.0320	0.001	.0364	0.001
Δ_{21} (Thomson), T/E	.1087	.0441	0.014	.0349	0.002
Δ_1 (Thomson), L	-.0322	.1566	0.837	.0434	0.458
Δ_2 (Thomson), L	.0117	.0975	0.905	.0352	0.740
Δ_{21} (Thomson), L	.0439	.1519	0.772	.0251	0.080
Δ_1 (Shepard's)	.0917	.0857	0.285	.1012	0.365
Δ_2 (Shepard's)	.1258	.0559	0.024	.0865	0.146
Δ_{21} (Shepard's)	.0341	.0873	0.696	.1098	0.756
Δ_1 (West)	.2384	.0500	0.001	.0889	0.007
Δ_1 (Reed Elsevier)	.2430	.0603	0.001	.1013	0.017
Δ_2 (Reed Elsevier)	.1183	.0644	0.066	.0914	0.196
Δ_{21} (Reed Elsevier)	-.1248	.0682	0.067	.1162	0.283
Δ_1 (Divested West)	.1632	.1128	0.148	.1728	0.345
Δ_2 (Divested West)	.1483	.1084	0.171	.2653	0.576
Δ_{21} (Divested West)	-.0150	.1257	0.905	.1767	0.933
Δ_1 (Matthew Bender)	-.0565	.0353	0.110	.0285	0.047
Δ_1 (Wolters Kluwer)	.0282	.1427	0.641	.0415	0.496
Δ_2 (Wolters Kluwer)	-.0142	.0944	0.880	.0493	0.773
Δ_{21} (Wolters Kluwer)	-.0424	.1457	0.771	.0212	0.045
Δ_1 (CHH)	-.0374	.1109	0.735	.0350	0.286
Δ_2 (CCH)	-.1030	.0731	0.159	.0404	0.011
Δ_{21} (CCH)	-.0656	.1078	0.543	.0174	0.001
Δ_1 (Little Brown)	.1554	.0524	0.003	.0807	0.054

$\Delta_1(\) = (1^{\text{st}} \text{ Post-Merger Coefficient}) - (\text{Pre-Merger Coefficient})$

$\Delta_2(\) = (2^{\text{nd}} \text{ Post-Merger Coefficient}) - (\text{Pre-Merger Coefficient})$

$\Delta_{21}(\) = (2^{\text{nd}} \text{ Post-Merger Coefficient}) - (1^{\text{st}} \text{ Post-Merger Coefficient})$

In the case of Thomson, prices for its treatises and encyclopedias increased 30% ($= 100 \cdot (e^{\Delta_1^{\text{Thomson, T/E}}} - 1)$) in 1996, the year after the acquisition of the Shepard treatises (and thus prior to any effects from the purchase of West). The later addition of the West titles is associated with a further increase of about 11% ($= 100 \cdot (e^{\Delta_{21}^{\text{Thomson, T/E}}} - 1)$). Both effects are precisely estimated. A similar pattern is observed for the Shepard titles, though the magnitude remains smaller and none of the parameters are precisely estimated. Since the Thomson/Shepards combination

is a relatively “clean” H1 merger – the Shepards’ portfolio contained only treatises – the increase in prices for Thomson’s treatises and encyclopedias is this paper’s best evidence in support of H1. Absent are any caveats regarding H3, including concerns about the possible influence of West’s reporters. The fact that the addition of the West titles are associated with another jump in prices for the Thomson and (to a much smaller extent) the Shepard titles is consistent with H1 but not definitive. Again, other complementary explanations include delayed effects of the initial Thomson-Shepards merger, as well as inter-category effects due to West’s reporters, codes, etc. The point estimate for the West titles is slightly larger than before, implying a post-merger increase of 27%. Regarding the Thomson looseleaf products, no price increase is observed immediately after the addition of the Shepard’s treatises (Δ_1 Thomson, $L < 0$) although a small but significant increase of 4% is observed after the West merger (Δ_{21} Thomson, $L > 0$). Both results are consistent with H3.

The impact of Reed-Elsevier’s acquisition of the divested West titles now appears to be larger in magnitude. During the period 1997-98, and thus prior to the purchase of the Matthew Bender treatises, statistically significant price increases are observed for both sets of titles. Based on the point estimates, prices for the Reed titles, consisting of treatises and encyclopedias, increased some 28%. Again, prices for the divested titles increased at least as much as the West titles that remained under the control of West-Thomson, or about 27%; furthermore, the point estimate for the Δ_1 (Divested West) dummy suggests that this increase may have been as large as 49%. Although these results are consistent with H1, the potentially confounding influence of other serials categories does remain. The results for the Matthew Bender treatises are basically unchanged: a statistically significant price decline of 5% during the post-merger period, 1999-2000, is observed. Note that, relative to the market, average prices for the remaining titles controlled by Reed-Elsevier also appear to have declined during 1999-2000: the point estimates for Δ_{21} (Reed Elsevier) and Δ_{21} (Divested West) are negative, though not precisely estimated. Together, these results might be expected if pre-merger prices for the Matthew Bender titles had been “too high” and Reed-Elsevier then re-optimized prices for its entire 1999-2000 portfolio.

In the case of Wolters Kluwer, allowing for a more extensive set of merger dummies now enables separate tests of H2 and H1. The acquisition of CCH in 1995 allows me to examine H2 in 1996, prior to any expected effects from the purchase of Little Brown. The 1996 post-merger parameter estimate for Wolters Kluwer reveals a small but insignificant price decline whereas the CCH coefficient is associated with a more substantial decline of almost 10%. Thus, at least in this one instance, H2 is not rejected: compared to the H1 mergers in this paper, this intra-category merger involving looseleaf services and newsletters is not associated with

Table 5, Results Summary: Do Results for Merger *i* reject H1, H2, and/or H3?

Merger	H1	H2	H3
Thomson/Shepard's 1995	No	--	No
Thomson/West 1996	No	--	No
Reed Elsevier/Divested West 1996	No	--	--
Reed Elsevier/Matthew Bender 1998	Yes	--	--
Wolters Kluwer/CCH 1995	--	No	No
Wolters Kluwer/Little Brown 1996	No	--	No

H1: Intra-category mergers involving treatises and/or encyclopedias are associated with relatively large price effects.

H2: Intra-category mergers involving looseleaf services and/or newsletters are associated with negligible or relatively small price effects.

H3: Inter-Category mergers do not result in higher prices

-- : not applicable

any positive effects. This result is also consistent with H3 since the CCH titles do not apparently benefit from the treatises already owned by Wolters Kluwer. During the post-merger period following the Little Brown acquisition, i.e. 1997-2000, the addition of that firm's treatises did not have a positive impact on the prices of the looseleaf services and newsletters associated with Wolters Kluwer or CCH: $\Delta_{21}(\text{Wolters Kluwer})$ and $\Delta_{21}(\text{CCH})$ are both negative. This is consistent with H3. Prices for the Little Brown treatises increased about 15% during this period; this estimate is more precisely estimated than previously, at about the 5% level. This result is consistent with H1.

Conclusions and Policy Implications

On June 19, 1996, the Department of Justice announced its settlement with Thomson and West. Anne K. Bingaman, the Assistant Attorney General in charge of the Department's Antitrust Division was quoted in the official press release as saying that, "This settlement will ensure that consumers continue to obtain the benefits of competition and entry in these markets for the basic tools of legal research." In summarizing the Department's complaint against the companies, the press release

claimed that without the divestitures required by the consent decree, “...the merger would have lessened competition substantially in nine markets for enhanced primary law legal publications of statutes or court decisions in which commentary is offered, in more than 50 markets for secondary law products, treatises (sic) and legal guides...”

Based on this and other statements made by the DOJ it is clear that the agency imagined that dozens if not hundreds of distinct antitrust markets existed within the legal serials publishing industry, that competition between publications was based on the extent of content overlap, and that control of overlapping titles might be anti-competitive. For example, prior to the merger Thomson and West both published legal encyclopedias addressing the subject of Pennsylvania law (both are included in this analysis). The consent decree specified the spinoff of the West title; it was later acquired by Reed-Elsevier.

The evidence presented here appears to contradict this antitrust framework in the “markets” for secondary law products. In the case of the West-Thomson merger, and despite the required divestitures, the econometric estimates suggest that the average prices for almost all treatises and encyclopedias published by the acquiring *and* acquired companies were affected by this merger (an “H1” merger). Furthermore, prices for the divested encyclopedias and treatises contained in the sample, as well as those published by their new owner, Reed-Elsevier, increased as well. Moreover, with one exception, the observed post-merger price increases were substantial and statistically significant.⁴⁰ In fact, for four of the five H1-type mergers observed in the data, statistically significant price increases were observed.⁴¹ This is consistent with the idea of portfolio demand. As described earlier, buyers of this subset of legal serials prefer purchasing as many of these titles as possible, regardless of the ostensible content overlap. As a consequence, the anti-competitive potential of a merger has less to do with market shares in narrowly-defined subject areas than with the total quality and quantity of content in certain broadly-defined serials categories.⁴²

⁴⁰ Again, the one exception involved the Shepard’s treatises. Δ_{21} (Shepard’s) is positive but small and imprecisely estimated.

⁴¹ The five H1 mergers include: 1. Thomson and the Shepards treatises (1995), 2. Thomson and West, (1996), 3. Reed-Elsevier and the titles divested by West and Thomson (1996), 4. Wolters Kluwer and the Little Brown treatises (1996), 5. Reed-Elsevier and Matthew Bender (1998).

⁴² The likelihood that a content overlap approach to market definition has resulted in errors in merger enforcement begs the obvious question of why it occurred. One possibility is that when analyzing the markets for law serials the natural inclination of agency economists and attorneys was to rely on their own experience as *users* of these materials. This tendency can obscure the fact that publishers set prices in response to the behavior of those who *purchase* their products, typically a library.

On the other hand, the results presented here suggest that *inter*-category (H3) mergers, e.g. those involving newsletters and treatises, probably do not result in anti-competitive effects. Similarly, the anti-competitive potential of *intra*-category mergers involving content that is often similar at the sub-category level, e.g. a merger of two publishers of newsletters, is probably less than observed in the market for treatises and encyclopedias. For these H2-type mergers, control of titles with overlapping content may be a necessary condition for anti-competitive effects. However, this latter claim is tentative and is based on relatively limited evidence.

Finally, these conclusions are contingent on buyers' ability to select individual titles freely from the various categories of legal serials. Although this assumption was satisfied throughout the sample period, and according to librarians I spoke with, remains true in most cases, what if conditions change? The recent transition to digital distribution of *bundled* content in the market for scientific journals suggests that a similar development in the market for legal serials might strengthen the conclusions presented here.⁴³ Bundling offers publishers with relatively high quality portfolios the opportunity to foreclose lower quality competitors. Although this strategy is likely to succeed with highly-differentiated content, e.g. treatises and encyclopedias, its applicability to categories of less-differentiated content, not to mention inter-category bundles, is an unexplored subject.

⁴³ See McCabe (2003, 2004) for a discussion of this transition from print to digital distribution in the market for scientific journals.

References

- Chressanthis, George A. and June D. Chressanthis. "The Determinants of Library Subscription Prices of the Top-Ranked Economics Journals: An Econometric Analysis," *Journal of Economic Education*, v25 (4), 1994. pp. 367-382.
- Bergstrom, Theodore C. "Free Labor for Costly Journals," University of California, Santa Barbara. *Journal of Economic Perspectives*. Fall 2001 15(4), pp. 183-198.
- Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. "How Much Should We Trust Differences-In-Differences Estimates," *The Quarterly Journal Of Economics*, February 2004 119(1), pp. 249-275.
- Daellenbach, H. and J. George, *Introduction to Operations Research Techniques*, Allyn and Bacon, 1978.
- Lieberman, Lisa, Roger Noll. and W. Edward Steinmuller. "The Sources of Scientific Journal Price Increase," Center for Economic Policy Research, Stanford University, 1992 working paper.
- McCabe, Mark J. "Academic Journal Pricing and Market Power: A Portfolio Approach." Georgia Institute of Technology. 2000 working paper.
- — . "Journal Pricing and Mergers: A Portfolio Approach." *American Economic Review*. March 2002. Vol 92, No. 1, pp. 259-269.
- — . "A Portfolio Approach to Print Legal Serials Pricing." Georgia Institute of Technology. July, 2002 working paper.
- — . "A Portfolio Model of Journal Pricing: Print v. Digital." Georgia Institute of Technology. June, 2003 working paper.
- — . "Information Goods and Endogenous Pricing Strategies." Revise and resubmit at *Economics Bulletin*. March, 2004 working paper.
- Ryan, Susan M. "Cost Inflation by Page Reductions: A Discrete Example of New Price Increases in Legal Serials." *The Bottom Line: Managing Library Finances*. Vol. 14, No. 1, 2001.

Svengalis, Kendall. *Legal Information Buyer's Guide & Reference Manual*.
Westerly, RI: Rhode Island Law Press (various years).

Tenopir, Carol and Donald King, *Towards Electronic Journals*, Special Libraries
Association, Washington, D.C., 2000.