

A CRITIQUE OF THE ECONOMIC ANALYSIS IN THE “STUDY ON THE ECONOMIC AND TECHNICAL EVOLUTION OF THE SCIENTIFIC PUBLICATION MARKETS IN EUROPE”

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I. INTRODUCTION

The “Study on the Economic and Technical Evolution of the Scientific Publication Markets in Europe” (hereafter, “EC Study” or “EC Report”), a recently issued report commissioned by The European Commission Directorate-General for Research, concludes, among other things, that: (1) the market for scientific publishing (“the market”) is characterized by imperfections that are serious enough to consider government intervention;¹ (2) substitution possibilities across journals are limited, creating sufficient market power to enable for-profit publishers to price journals to libraries substantially above the average total cost of production and distribution;² (3) mergers among publishers of scientific journals have increased concentration and raised prices;³ and (4) “Big Deal” contracts, under which libraries acquire bundles of electronic and/or print journals from publishers, may have raised entry barriers for new publishers, possibly limiting the number of scientific journals below the welfare maximizing level.⁴ Based on these conclusions, the EC Study offers a number of recommendations, including several ways to regulate the prices that publishers charge libraries for scientific journals.

In our view, the EC Study is seriously flawed in several respects. First, it implicitly assumes that journal publishers compete in a market that, ideally, would perform like a textbook example of Chamberlin’s model of “monopolistic competition”

¹ See, for example, EC Study, p. 25 (“When markets are imperfect, some players in the market may be able to influence the dynamic of the industry, and one objective of this report is to highlight the tradeoffs induced by some of these strategies and also to understand how public intervention may facilitate or hinder these dynamics.”)

² *Ibid*, p. 8.

³ *Ibid*, p. 13,

⁴ *Ibid*, p. 9.

in which, in equilibrium, price equals average cost for every firm.⁵ Because publishers do not price all journals at average cost, the EC Study authors appear to conclude that high concentration and “artificial” barriers to entry have caused the journal market to “fail.” They suggest that, had mergers not increased concentration, and had bundling not raised barriers to entry, greater competition would have forced for-profit publishers to price each of their journals substantially closer to its average total cost. The EC Study, however, is so seriously flawed in terms of both theory and empirical evidence as to make any such conclusions completely inappropriate.

Second, an important basis for the EC Study’s assertion that for-profit publishers can exercise market power is the authors’ belief that a significant share of journal price increases in recent years can be traced to merger-related increases in concentration. That belief appears to rest not on any independent analysis by the EC Study’s authors, but rather on a single empirical study published in the *American Economic Review*.⁶ In a separate paper, we have also analyzed the price effects of mergers among journal publishers. Our study, which uses a different data set than the author of the cited study (McCabe’s dataset is proprietary and unavailable), found no evidence that mergers during the decade of the 1990s created market power or systematically resulted in larger price increases than would have occurred in the absence of those mergers.⁷ Indeed, mergers were sometimes associated with significant reductions rather than increases in the rate of change in publishers’ prices. Section III briefly summarizes our criticisms of McCabe’s analysis and the results of our own empirical study. In the absence of evidence that publisher concentration has created market power, there is no basis for the EC Study’s policy recommendations concerning pricing or bundling.

⁵ Edward Chamberlin, *The Theory of Monopolistic Competition* (Harvard University Press, 1933). The EU Study never references Chamberlin’s model, although it is the basis for an earlier empirical analysis of the pricing of scientific journals. See, Lisa Lieberman, Roger Noll and W. Edward Steinmuller, “The Sources of Scientific Journal Price Increase,” Working Paper, Center for Economic Policy Research, Stanford University, 1992.

⁶ Mark McCabe, “Journal Pricing and Mergers: A Portfolio Approach,” *American Economic Review* 92 (2002), pp. 259-269.

⁷ See Renee Duplantis *et al*, “Mergers without Markets: Do Mergers Among Publishers of Academic Journals Affect Prices?” www.micradc.com/news/publications/pdfs/mergers_without_markets.pdf.

Third, the EC Study's conclusion that Big Deal contracts may deter entry in the future also relies exclusively on a theoretical argument drawn largely from one other paper.⁸ Neither the EC Study's authors nor any of the prior research they cite present any evidence that Big Deal contracts have actually deterred entry, or even that entry affects prices. Section IV considers the arguments and evidence that Big Deal contracts, as well as purported network effects, have deterred entry.

II. PRICES AND COSTS IN MARKETS WITH DIFFERENTIATED PRODUCTS

Compared to many other industries, the "market" for scientific publications is remarkably un-concentrated; more than two thousand independent organizations currently publish one or more scientific journals. Further, while the size distribution of publishers is highly skewed, the share controlled by the largest publisher, whether measured in terms of journals, articles, or citations, is about 20-25 percent.⁹ Thus, the scientific publications industry is not one in which the number or size distribution of firms ordinarily would raise competitive concerns. Increases in concentration have not led either U.S. or U.K. antitrust authorities to block mergers among publishers; nor is concentration at a level that is usually associated with the kind of unilateral market power that demands antitrust scrutiny,¹⁰ much less governmental price regulation which is ordinarily reserved for "natural monopoly" markets.

In light of the market's current structure, the EC Study's authors cite two reasons for their apparent belief that publishers exercise the type of market power that might warrant government intervention or regulation of some kind. One is a set of market

⁸ Aaron Edlin and Daniel Rubinfeld, "Exclusion or Efficient Pricing? The 'Big Deal' Bundling of Academic Journals," *Antitrust Law Journal*, Vol. 72, pp. 119-157.

⁹ In 2002, Reed Elsevier, the largest STM publisher, accounted for 38% of journals published by the 21 large scientific journal publishers for which we have data. Those 21 publishers accounted for 3,493 journals or less than half the total number of scientific journals tracked by ISI (see section IV). Reed Elsevier also accounted for about 41% of the articles and 40% of the citations in our database. Although one might expect the company's revenue share to be somewhat higher than its share of articles or journals based on evidence that prices of for-profit journals are higher than those of non-profit journals, there is evidence, discussed below in section IV, that Reed Elsevier's share of library spending on periodicals is on the order of 25%.

¹⁰ Examples of concentrated markets that have raised antitrust concerns involving unilateral conduct include large commercial aircraft and computer operating systems, *i.e.*, markets where one or two firms account for 80 percent or more of sales.

imperfections that they argue “weaken the price sensitivity of consumers, be they authors or readers”,¹¹ and could create market power even though similar imperfections in other markets have seldom been used to justify regulatory intervention. (These imperfections are discussed below in section III.) The other basic reason offered for government intervention is evidence that for three decades for-profit journal prices have been increasing faster than both the rate of inflation and library budgets, as well as evidence that many journals’ prices do not reflect the average total costs of publishing those journals.¹²

According to the authors, this evidence – particularly the price data – indicates that publishers have significant market power and naturally raises the question “how to make the market more competitive and prone to scientific diffusion.”¹³ In principle, if concentration due to mergers or even internal growth created market power, journal prices could be reduced by encouraging new and/or small publishers to launch even more new journals or by forcing large publishers to divest journals. In Chamberlin’s model of monopolistic competition, which the authors use to infer that publishers have market power, homogeneous firms supply products that, while differentiated, are reasonably close substitutes for each other and are produced subject to economies of scale (*i.e.*, fixed costs are large enough that average cost is always well above marginal cost).

¹¹ EC Study, p. 21. These imperfections include: (1) public funding; (2) the fact that “researchers, the producers of scientific information, are also consumers of scientific information, and the private and social values of publications may differ when the individual researcher behaves as an author or reader”; and (3) “authors and readers are not in direct contact: the market is intermediated.” Barriers to entry from network effects and other sources serve as another market imperfection. See also EC Study, p. 25. “[T]he publishing market is full of imperfections, be they entry barriers, the fact that the price paid to some of the inputs (say author or referee time) does not reflect their social value, the fact that researchers do not internalize the costs they impose on editors, referees and publishers when submitting their work, or the fact that libraries have only an imperfect knowledge of the value of the journals for the end users.” Note that some of these imperfections (*e.g.*, input prices that are less than the social value of the inputs) tend to create an “over-supply” of journals, while others (*e.g.*, entry barriers) would tend to create an “under-supply.”

¹² *Ibid*, pp. 23 and 40-41. Over this period, prices for journals published by learned societies have increased at approximately the same rate as prices for journals published by for-profit firms.

¹³ *Ibid*, p. 41. The authors appear somewhat indecisive with respect to the issue of market power. Elsewhere (p. 21) they note that “[o]f course, the scientific publishing market is not monopolistic (there are several big publisher for example, as well as many smaller ones), and nobody is talking about a natural-monopoly-style regulation... It is, however, a particularly legitimate concern to avoid excessively high prices of scientific journals, in order to foster cost-effective dissemination of publicly funded knowledge.”

Chamberlin's model also assumes a market that has no barriers to entry.¹⁴ Because buyers can easily shift to substitute products and there are no entry barriers, entry is profitable whenever any incumbent firm's average revenue exceeds its average total cost. Entry shifts down the demand for each incumbent firm's products, and continues until the price of each product exactly equals its average total cost. Under the demand and cost assumptions of Chamberlin's model, therefore, empirical evidence that the price of an individual journal does not correspond to its average cost can be taken to imply that the journal market has "failed."

Despite superficial similarities, Chamberlin's model does not fit the scientific journal market. For example, although the demand curves for scientific journals, like the demand curves faced by Chamberlin's monopolistic competitors, are downward sloping, this is true principally because different libraries place different values on the same journal rather than because any given journal's closest substitute is another journal. Even the EC Study recognizes that substitution possibilities across journals are severely limited, and, as many other observers have remarked, a library's demand for one journal is largely independent of its demands for other journals (*i.e.*, the cross price elasticities between any two journals are vanishingly small).¹⁵ Under these conditions, there is no economic mechanism whereby one journal's high prices or profits ordinarily would induce the entry of new journals;¹⁶ nor would the entry of new journals necessarily reduce the demand (or demand elasticity) for incumbent journals. Thus, there is no mechanism that would make each journal's prices tend toward average its cost in equilibrium.

¹⁴ We use the term "barriers to entry" in the Stiglerian sense, *i.e.*, that incumbents would not have a cost advantage over entrants. As applied in the EC Study, the model also implicitly assumes no economies of scope (*i.e.*, publishing multiple journals does not allow cost savings from better utilization of common inputs), but there is evidence of some scope economies in journal publishing.

¹⁵ There is general agreement that each scientific paper is unique and that researchers (and, hence, libraries) cannot easily substitute one scientific paper or journal for another. See, for example, McCabe, p. 260, "In scholarly publishing, experience as a user suggests that each *unique* journal title constitutes a distinct market for the purposes of antitrust analysis. For example, no one would argue that articles in *Brain Research* could easily be substituted for ones in the *New England Journal of Medicine*... These priors about market definition imply that demands for individual titles are largely unrelated."

¹⁶ On occasion, high prices may have contributed to decisions by editorial boards to leave one journal and launch a new journal that is intended to appeal to the same set of readers, and to draw on the same set of potential authors, although the motive for this decision does not appear to have been the prospect of economic profits.

The market for journals also differs from Chamberlin's original model in that journals vary widely in quality because critical inputs – especially articles – vary widely in quality. In a market with such heterogeneous firms and products, however, the margins that for-profit journals earn are Ricardian or “economic” rents that cannot be competed away through entry, as opposed to monopoly profits, which could potentially be eliminated by entry or divestitures. Indeed, suppliers in most markets – including those, such as agricultural markets, that frequently are cited as examples of homogeneous products and perfect competition – earn economic rents.¹⁷ For example, a farm that produces soybeans on unusually productive land will earn more than the minimum necessary to continue in production. But the price that farm receives for its soybeans will be unrelated to its own average total cost of production (including the cost of transporting soybeans to the processing facility or “market”). Moreover, if the farm's cost per ton of output were to increase in a given year due to local conditions (*e.g.*, drought or an infestation of insects), the price it received would not increase. In this respect, the price is not related to individual cost. An individual farm's cost may affect how much it produces but not the price it receives.

More to the point, economic rents also accrue to suppliers in markets with differentiated products, such as motion pictures, sound recordings, attorneys and professional athletes. A soccer player who is paid a salary of €1 million earns an economic rent that reflects the player's inherent, scarce talent. The fact that the player's salary substantially exceeds the amount just sufficient to induce him to continue playing soccer is attributable to a limited supply of highly talented players, and not to any decision by the player to withhold output (*e.g.*, play fewer games). The disconnect between the player's salary and his opportunity cost (*i.e.*, the amount he could earn in his next best profession), does not imply either that the labor market for soccer players is not

¹⁷ See, for example, Margaret Sanderson and Ralph Winter, “‘Profits’ Versus ‘Rents’ in Antitrust Analysis: An Application to the Canadian Waste Services Merger,” *Antitrust Law Journal* (2002), p. 494. “In any market a number of buyers and sellers meet to trade a product. At the market equilibrium price, demand and supply are equal.... On the supply side, the marginal firm is the firm that breaks even, *i.e.*, the firm whose marginal cost is just covered by the equilibrium price. All other firms, ... called *inframarginal* firms, would have been willing to supply their good to the market for less than the equilibrium price. Ricardian rent refers to the income derived in a market by owners of *inframarginal* factors of production above the minimum amount necessary to elicit their supply in a market.”

competitive or that it could be made more competitive by reducing concentration through entry or some other means (albeit, not divestiture).

We conclude that if the ownership of for-profit journals was more widely dispersed among publishers, and concentration was even lower than it is today, the prices of journals would be largely unaffected and would still diverge to the same extent from average costs.¹⁸ To our knowledge, there is no evidence that entry can be expected to shift down the demand curve for each journal to the point where it is tangent to its average total cost curve. Some scientific journals – like some motion pictures, sound recordings, novels, soccer players, and film stars – can be expected to earn economic rents:¹⁹ their average revenue per subscription will always exceed their average total cost.

Monopoly power is the ability of a single firm profitably to raise the *market* price above the competitive level by withholding output and preventing entry. If the relevant market for scientific journals were collections of journals within a discipline,²⁰ a publisher could exercise market power by restricting the total number of journals and raising the prices of marginal journals (*i.e.*, those which earn the lowest economic profits) above the total incremental cost of supplying them. However, the EC Study offers no evidence whatever that any for-profit publisher has restricted the number of new journals it launched (*i.e.*, that a publisher has decided not to launch a journal for which the expected incremental revenue would exceed the expected incremental cost because its entry would lower the demand for and price of other journals it publishes) or that marginal journals can expect to do better than break even (*i.e.*, to earn an internal rate of return on the lifetime investment, including expected losses in the period immediately after launch, that exceeds the risk-adjusted cost of capital). Indeed, although both

¹⁸ See Lieberman *et al, op cit*, for the proposition that entry may drive prices up, not down.

¹⁹ EC Study, p. 39. Some observers argue that the Ricardian rents which accrue to publishers of many for-profit journals should instead accrue either to authors and editors, whose talents are actually in limited supply and are the “true” source of those rents, or to readers.

²⁰ When, for research purposes, no other journal is a close economic substitute for a particular journal, then that journal alone (as opposed to a set of journals) would be a relevant antitrust market under the U.S. Department of Justice/Federal Trade Commission, 1992 Merger Guidelines. Further, for the purpose of merger analysis, a journal and its closest substitute journal would not comprise a relevant market unless a merger between them would enable the merged firm profitably to raise the journals’ prices by a small but significant amount above the pre-merger levels for a nontransitory period of time.

findings should be critical for an inference of monopoly power, the Study's authors appear to concede that for-profit publishers have been primarily responsible for expanding output, noting, among other things, that "the citation pattern and the date of creation of journals indicates that FP publishers have been faster to expand output (they have created many titles with few cites, especially recently). The expansion of FP publisher outlets has provided the supply to meet the development of research output."²¹

In summary:

- The structure of scientific publication markets provides no basis for any expectation that any publisher would have monopoly or even market power of the kind that ordinarily gives rise to antitrust concerns.
- There is no evidence that journals are sufficiently close economic substitutes that concentration gives rise to monopoly power.
- Even if journals were reasonably close economic substitutes for each other, the price of a differentiated journal in a competitive market would be driven by the quality-adjusted price of the *marginal* journal, not by its average total cost. Prices of individual journals would reflect their own costs only when prices are regulated to equal own costs.
- The difference between the average price and average total cost of an infra-marginal journal (*i.e.*, the difference between the costs of the infra-marginal and marginal journals, adjusted for quality) is an economic rent, not a monopoly profit.
- The EC Study provides no evidence that the prices of *marginal* scientific journals are above their total costs (including the cost of capital) or that for-profit publishers have exercised market power by restricting the number of new journal, and thus no evidence that the profits earned by successful, for-profit journals are monopoly prices rather than economic rents.
- None of the antitrust or regulatory policies suggested by the EC Study (*e.g.*, preventing mergers, prohibiting the price of electronic access to a bundle of

²¹ EC Study, p. 32. See also p. 40. "FP publishers have given new impetus to scientific publishing (they have launched many new field journals) while NFP publishers have focused on high quality journals." It is not clear why non-profit publishers and professional societies have not expanded more rapidly, particularly if some societies have used surpluses from journals to fund other activities.

journals from depending on the historical number of print subscriptions, or requiring prices to “be related to transparent indicators, like usage”) would result in cost-based pricing.

III. AN ANALYSIS OF THE EFFECTS OF PUBLISHER MERGERS DOES NOT PROVIDE EVIDENCE THAT SUPPORTS THE EC STUDY’S PRICING RECOMMENDATIONS

As explained in section II, heterogeneous price-cost margins do not provide support for the EC Study’s recommendations concerning bundled pricing. Therefore, the only empirical evidence the EC Study cites which might suggest a role for more vigorous antitrust enforcement or other regulatory intervention in the scientific publication industry is one study (McCabe, 2002) which purports to show that mergers among for-profit publishers of biomedical journals have led to significant price increases.²² Reliable evidence that mergers have, in fact, increased prices would indeed support an inference that at least some of the margin between the average prices of journals and their average total cost is attributable to market power (rather than exclusively to economic rents) and that deconcentrating the industry would lead to lower prices. For several theoretical and empirical reasons, however, McCabe’s empirical analysis of the price-concentration relationship is both unreliable and insufficient for supporting the EC Study’s policy recommendations.²³

First, McCabe develops a model of library purchasing decisions where, because libraries have fixed budgets for individual “portfolios” of journals, a merger-related increase in the size of a profit-maximizing publisher’s journal portfolio would give that publisher an incentive to raise the prices of its high-ranked journals as long as the demand for each of those journals is elastic (*i.e.*, has an absolute value greater than one). The same model also implies, however, that a merger would give that publisher an incentive to *lower* the prices of each of its journals if the demand for each journal is inelastic. This feature of the model is significant because the conventional wisdom

²² Specifically, McCabe finds that publishers who merged raised the prices of their journals in the years immediately following their mergers faster than publishers who did not merge.

²³ See Duplantis, *op cit*, for a more detailed analysis of the flaws in McCabe’s study.

among many industry observers is that library demand for well established journals has been, and remains today, inelastic.²⁴ Given inelastic demands, McCabe's model, correctly interpreted, actually implies that mergers between publishers are more likely to lower the rate of price change than to raise it.

Second, if mergers create market power, we would expect a merger between two publishers, each with a large portfolio of journals in a given discipline or domain, to raise price by more than a merger between two publishers with small overlapping portfolios. However, McCabe's own empirical results offer no evidence of a positive correlation between the size of the overlapping portfolios of merging parties and the magnitude of any (positive or negative) price effect, and we have found no such evidence in our data. For example, using the same econometric model that McCabe used to estimate the price effect of mergers but a different data set, we estimated the price effects for mergers among fourteen different publishers. Three of the transactions, which involve seven of the publishers, were not included in McCabe's analysis. In the case of two of those omitted transactions – Taylor & Francis's 1998 acquisition of Routledge and Bertelsmann's 1998 acquisition of Springer-Verlag – only one party to each merger (Taylor & Francis in the former and Springer-Verlag in the latter) published biomedical journals, *i.e.*, there was no overlap of biomedical journals. Nevertheless, McCabe's approach to estimating price effects indicated that the first merger raised the prices that Taylor & Francis charged for its biomedical journals while the second merger lowered Springer-Verlag's prices for those journals – effects that must be attributable to something other than increases in market power from increasing the number of journals within a discipline.

The third merger that we examined and McCabe did not (because his data set did not extend into the relevant years) was Reed Elsevier's 2001 acquisition of Harcourt. Again, using the same model that McCabe used to estimate the price effect of a merger, we found that the rates of price increase of both parties' biomedical journals declined

²⁴ See, for example, Edlin and Rubinfeld, *op. cit.*, p. 127, McCabe, "Academic Journal Pricing and Market Power: A Portfolio Approach," unpublished working paper, November 2000, table 5.

Many economists would argue that for-profit publishers would not set a journal's price at a level where demand was inelastic, and we agree that this is an anomaly in search of an explanation. Whatever the reason for this behavior, however, it seems unlikely that journal prices could have increased faster than costs for more than two decades if prices were at the profit-maximizing level two or three decades ago.

following the merger, despite the fact that the transaction combined two relatively large biomedical portfolios.

Moreover, even in the set of mergers that McCabe analyzed, there is no systematic relationship between the sizes of merging parties' portfolios and the price effects of a merger. The absence of any relationship between the magnitude of a price effect and a merger-related increase in concentration argues against attributing any merger-related price effect to market power even in those cases where a merger was associated with an increase in prices.

A third flaw in McCabe's empirical analysis is the failure to take account of whether some factor other than merger could explain why merged publishers' prices increased more than other publishers' prices during the post-merger period. Our analysis of journal prices, for example, showed that over time the percentage increase in the prices a publisher charges tends to "regress toward the mean." By this we mean that if the prices in a given publisher's portfolio increase less than the average for all publishers in year t and year $t+1$, they will increase by more than average in year $t+2$. We also found that the publishers in McCabe's study who merged tended to increase their prices by less than average during the two years prior to a merger (years t and $t+1$). Therefore, given the tendency for a publisher's price changes to regress toward the mean, the merged publishers' prices should have increased more than average in the year they merged ($t+2$) even if they had not merged.

A fourth, more technical, flaw in McCabe's analysis involves the fact that his tests for statistical significance assume that the price of each journal is determined independently of the price of every other journal, even though his theoretical model assumes that a publisher takes into account the prices of all other journals in its portfolio when it sets the price of any one journal.²⁵ To analyze the effect of mergers on journal prices using a statistical test that does not treat a publisher's journal prices in a given discipline as independent, we also used an alternative model in which the dependent

²⁵ Specifically, in his model, McCabe assumes (p. 261) that "firms controlling larger portfolios of journals may 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. So, in some instances, as a firm's size increases, the firm's *average* price does as well."

variable is the log of the *average* price of a publisher's journals in each of a large number of portfolios (*i.e.*, disciplines).

The results from our average-portfolio-price analysis do not support the hypothesis that mergers create market power. Specifically, a merger that increases a publisher's share of journals within a given discipline *by a very small amount* is associated with an increase in the merged firm's average price within that discipline. However, as the merger-related share change increases, the price effect *declines*. As a result, a merger that results in a large increase in a publisher's share of journals within a given discipline is associated with a decline in the merged firm's average price for the journals in that portfolio.²⁶ We are not aware of any theoretical model of market power that is consistent with this finding.

Finally, while McCabe's model of the journal publishing industry suggests that a publisher's prices should be directly related to the size of its portfolio,²⁷ our analysis finds no empirical support for that hypothesis. Specifically, we ran regressions using the log of the prices per article charged by from 21 to 24 different publishers in each of eight different years as dependent variables. (The number of publishers varied over time.) The independent variables in the regressions included each publisher's share of articles in one of fourteen academic fields, dummy variables for each of the academic fields to which a journal belonged, a citation-based measure of the quality of each publisher's articles in a field,²⁸ and whether the publisher was a for-profit firm.²⁹ If price increases with size of publisher, then the coefficients on the publisher-share variable should be positive. In fact, the coefficient on publisher share is positive and significantly different from zero in the regressions for 1995, 1996 and 1997, but is negative and significantly different from zero in the regressions for 1999, 2000, 2001 and 2002. Thus, like our empirical analysis of

²⁶ See Duplantis, *op cit*, p. 17.

²⁷ McCabe, *op cit*, p. 261.

²⁸ The numerator of the quality variable is the number of citations in year *t* to articles published in a journal in years *t-1* and *t-2*, while the denominator is the total number of articles published in a journal in years *t-1* and *t-2*.

²⁹ A more complete description of the variables and the regression outputs is found in Appendix A.

mergers, this analysis provides no evidence that, given the current structure of academic journal markets, modest increases in the size of publishers will raise journal prices.³⁰

The share and price data presented in the EC Study also provide no evidence of a relationship between a publisher's share of journals and the prices it charges. Table 2 of the EC Study shows the average prices per article of for-profit and non-profit journals in twenty-two separate disciplines. Under the assumption that on average non-profit publishers in different disciplines set the price per article in the same ratio to the average total cost per article, the ratios of for-profit to non-profit prices across disciplines provides a crude measure of the relative extent to which for-profit publishers in different disciplines mark up price over average total cost;³¹ that is, for-profit journals in disciplines with higher ratios have higher mark-ups over cost than for-profit journals in disciplines with lower ratios. Table 3 of the EC Study "gives an overview of the 'market shares' in terms of citations" of the leading publishers for the same 22 disciplines. We summed the shares of the three largest for-profit publishers in each of the disciplines and calculated the correlation coefficient between those shares and the for-profit to non-profit

³⁰ It is also worth noting that our regression results were different from those of the EC Study with respect to the effect of journal quality on price. The authors of the EC Report found a positive relationship between number of citations and price. In the regressions described in Appendix A, the coefficient on our measure of journal quality was negative and significantly different from zero in six of our regressions (years 1997 through 2002), and was positive (but not significantly different from zero in only one regression (1995). Using a similar, but not identical, specification to that used in the EC Study (our data do not include information about journal age or language), we found a positive relationship between citations per journal and journal price. However, we did not find a positive relationship between citations and price per article. As discussed in Appendix A, both models are likely affected by an "omitted variables" problem that could affect estimates of the price-quality relationship.

³¹ There are at least two reasons why the ratio of for-profit publishers' margins relative to non-profit publishers' margins is likely to be lower than the for-profit/non-profit price ratio. First, because many non-profit journals are general purpose and widely read, then tend to earn substantially more advertising revenues. Second, non-profit journals tend to have more individual (*i.e.*, non-institutional) subscribers, which also makes the ratio of for-profit to non-profit prices higher than the ratio of for-profit to non-profit revenues. In short, because non-profits journals ordinarily spread their fixed costs over more subscriptions, they are more likely to break even at a given price level than is a non-profit journal that charges the same price.

Further, the prices of non-profit journals should not be proposed as a competitive benchmark without first explaining why non-profit publishers have launched far fewer new journals than for-profit publishers. As discussed further below, barriers to entry do not offer a cogent explanation. If anything, prices of journals launched by small for-profit publishers would provide a more appropriate benchmark. Small for-profit publishers will seldom, if ever, charge higher prices for journals in the expectation that some lost subscribers might switch to that publisher's closest substitute journals. If small, for-profit publishers price above total cost, then market power from controlling substitutes is not an explanation for the observed price/cost differential.

price ratios for each discipline. If higher levels of concentration led to market power and higher mark-ups, the correlation coefficient should be positive. Instead, it was negative (-0.333), indicating that a higher three-firm share is associated with a lower for-profit to non-profit price ratio.

In summary, the EC Study recommendations are based on an assumption that one or more publishers of scientific journals can exercise market power over price. However, the only empirical support for that hypothesis comes from a single paper which (1) contains serious theoretical flaws; (2) presents empirical results that are directly contradicted by our own study of the relationship between mergers and journal prices; and (3) was not considered persuasive by either U.K. or U.S. antitrust authorities when they decided not to block recent mergers between publishers of academic journals.

IV. BARRIERS TO ENTRY AND BIG DEAL CONTRACTS

For 1999, the Institute for Scientific Information (“ISI”) listed a total of 8,764 active scientific, technical and medical (“STM”) journals that were published by approximately 2,290 organizations.³² “New” firms (*i.e.*, those that first published after January 1, 1990) accounted for approximately 26 percent of those 2,290 publishers; “new” journals (defined similarly) accounted for 44 percent (or 3,810) of the 8,764 total in 1999; and new firms accounted for 20 percent (or 706) of the 3,810 new journals.³³ Although new journals may have a relatively small share of citations and circulation,³⁴ these data belie any suggestion that there was not substantial growth in the number of scientific journals and publishers. However, the EC Study’s authors argue, in effect, that absent barriers to entry, they would expect new journals to have achieved an even larger market share and driven the price of each incumbent journal close to its average total cost.

³² Because some of the organizations identified by ISI are under common ownership, the number of independent publishers is an approximation.

³³ See Appendix B for a more complete description of the definitions and data.

³⁴ In markets with differentiated products, a new entrant frequently needs substantial time to match the market share of an established competitor. Also, it has been argued (Lieberman *et al, op cit*) that many new journals are intended to appeal to groups of “sub-specialists” (*e.g.*, industrial organization economists, molecular physicists or gastroenterologists). Therefore, one would expect them to have lower circulation than older journals that may appeal to wider audiences (economists, physicists and physicians).

1. Network Effects

The EC Study discusses two theoretical barriers to entry that the authors are concerned might confront new publishers. The first is referred to as “network effects” which the authors characterize as

commonplace in ‘two-sided markets’: Authors want to publish in journals that attract other good potential authors and therefore high interest from readers; in turn, readers want to read journals where good authors publish. This can lead to virtuous circles: Through the certification process, journals acquire reputation levels, which may make them ‘unavoidable’ for readers and very attractive for authors. These can be called ‘natural barriers to entry’. With the computation of impact factors and the increased reliance of such indicators in academic incentive schemes, the ‘unavoidability’ of highly-cited journals has been strengthened in recent years.³⁵

In effect, they argue that a new journal can succeed (or become “unavoidable”) only when various industry participants – authors, reviewers, editors, libraries, readers, tenure committees, and indexing services – all reach a consensus that it is high quality. Thus, the authors suggest a classic chicken and egg problem for high quality journals: The necessary players will not coordinate their efforts unless they expect a journal to be successful, but success cannot occur unless those players first coordinate their efforts.³⁶

A telling flaw in this argument is the implication that many industries, in which coordination is more difficult to achieve than in journal publishing, would never have developed in the first place because development required coordination among various producers, workers, investors and consumers. But markets have found ways to achieve

³⁵ EC Study, p. 22 (citations omitted). The authors offer no analysis or evidence of the type of direct or indirect network effects that are ordinarily characterized as a barrier to entry. Telephones provide the classic example of a direct network effect: each customer’s demand for a telephone company’s service increases with the number of other customers that use the same network, while software applications specific to a particular computer operating system are the standard example of an indirect network effect. This connection between demand and network size can cause network industries to “tip” toward monopoly, with virtually all customers eventually choosing the firm that has the largest share. In the scientific journal industry, however, neither direct nor indirect network effects appear to be present. It is clearly true that authors and readers both prefer quality journals, but there is no tendency for markets to tip. One reason may be that readers prefer having a quality spectrum of journals since that relieves them from the burden of identifying high quality articles themselves.

³⁶ As described, this purported “network” barrier to entry would appear to apply only to high quality journals that are “especially crucial for the final readers to have access to...”

coordination even in industries where the coordination problem for an entrant is far more serious than that facing a new journal.³⁷ For example, when producers in high technology industries need to coordinate around a technology they adopt standards, and when a manufacturer needs to educate consumers and others (*e.g.*, distributors and retailers) as to the value of its product, it advertises or offers a low introductory price. Compared to firms in other industries, participants in the market for journals are well informed and communicate on a regular basis, which makes predicting success and coordinating activities easier. Fundamentally, the EC Study ignores how effective markets have been in solving coordination problems.

Moreover, when market signals cannot coordinate participants at low cost, a classic solution to the problem is command and control through vertical integration. That is, the coordination necessary to introduce a new technology or product can be effected within a single, vertically integrated firm. Indeed, many participants in the journal market already are vertically integrated to some extent. For example, the academic community integrates university presses, consumers (faculties and students), authors, and even publishers and printers.³⁸

As a related matter, expectations concerning a new journal's reputation and, in turn, its ability to attract quality articles, are affected importantly by the reputations and networking capabilities of editors and members of the editorial board – individuals who typically are not employees of publishers and who often contribute to more than one journal. While editors frequently receive modest stipends, academics often demand no compensation for serving on editorial boards and frequently will provide their services to new publications. Thus, it is not unusual for editors and editorial boards to leave one publisher's journal and establish a new journal.

³⁷ The introduction of television offers a well-known example. It required coordinating production of sets by manufacturers with purchases of sets by consumers with broadcasting by networks and with production of shows. All of these involved fixed sunk costs which could not be recovered unless all other participants in the market played their roles.

³⁸ Vertical integration is not always formal. For example, SPARC encouraged the launching of new journals by “promising” them a minimum number of library subscribers, thus immediately resolving the market acceptance issues.

Further, even assuming that the EC Report’s assumption that a “certification process” leads to “natural barriers to entry” for high quality journals were correct, the authors have failed to address critical implications of that analysis. Do they mean to suggest, for example, that even more entry than already is occurring would make highly regarded journals less “unavoidable”? Or that new “unavoidable” journals from even more new publishers would reduce the prices of existing for-profit journals that are considered “unavoidable”? Our analysis indicates that the answer to both questions is “no,” and also that the Report fails to explain how an increase in the number of “unavoidable” journals would reduce the pressure on library budgets. Similarly, the authors leave unanswered questions raised by their warning (p. 22) that “it is important, if one wants to prevent markets from being captive, to avoid ‘strategic barriers to entry’, i.e. those that would be deliberately created by powerful incumbents from being erected.” Who are the powerful incumbents they have in mind – professional associations that the EC Study’s authors credit for publishing the highest quality and most unavoidable journals and that have launched relatively few new ones? And which of their recommendations is intended to address the alleged entry barrier created by the certification process?

2. Big Deal Contracts and Entry Deterrence

The EC Study argues that Big Deal contracts, which can take a variety of forms,³⁹ are potentially a second barrier to entry. According to the authors, “[t]here are clear advantages to the end user of having access to the whole electronic portfolio [of a given publisher], and publishers point out that big deal contracts emerged as a response to the demand of libraries. But there are reasons to fear that the pricing strategy in big deals raises barriers to entry and creates a lock in effect...”⁴⁰ The Report next offers a cursory

³⁹ According to the EC Study (p. 49), the characteristics of a bundle contract that raise entry concerns are: (1) the contract is long term; and (2) the contract commits the library to spend the historical amount on printed copies, thereby making cancellations less attractive.

⁴⁰ EC Study, p. 47. See also p. 9. “Since [Big Deal] contracts are moreover signed for significant periods of time, they tend to rigidify library budgets and make it difficult for potential entrants to profitably enter the market. This effect of bundling as a deterrent to entry turns out to be the key problem identified by the industrial economics literature.” However, industrial organization literature suggests that bundling creates a significant barrier to entry only under very restrictive conditions.

review of a small fraction of the economics literature devoted to the competitive effects of bundling or tying by dominant firms,⁴¹ and then concludes that

[e]ven if there are sometimes positive short run welfare effects [from bundling], the entry-deterrence effect can hardly be avoided once a bundle is in place, especially when as in the current system libraries have fixed and limited budgets and when big deal contracts for some publishers represent a significant portion of the available budget.⁴²

As a rationale for regulating the way that publishers structure their bundled contracts,⁴³ this analysis suffers from several critical infirmities. First, as discussed in the previous sections, there is no cogent or persuasive empirical evidence that “large” for-profit publishers have acquired the kind or level of market power that is generally accepted as a necessary condition for antitrust concerns about bundling. Although prices exceed average total cost for many journals, there is no systematic relationship between prices and either market structure or increases in concentration, and the accounting profits that prices generate are appropriately treated as economic rents. Many new scientific journals continue to be introduced each year, including some by non-profit organizations, and we are aware of no evidence that marginal journals launched by for-profit publishers can expect to earn more than a competitive return on investment.

Second, the EC Study fails to mention that most of the economics literature which addresses the potential exclusionary effects of bundling analyzes the possible threat posed by a single, dominant firm. The leading for-profit publisher of scientific journals, Reed Elsevier, has an industry-wide share on the order of 20-25 percent based on number of journals or articles, but that share does not come close to giving it a unilateral incentive to bundle in order to absorb a sufficiently large share of library budgets to reduce their ability to purchase journals from new entrants.

⁴¹ Much of the economics literature on exclusionary practices by dominant firms addresses the effect of *exclusive contracts* and *market share discounts* by a single dominant firm. The applicability of this literature to *bundling practices* by a non-dominant firm is questionable, at best.

⁴² EC Study, p. 50.

⁴³ The authors of the EC Study recommend (p. 9) regulating prices in three respects to limit entry barriers: “(i) there should be no penalties for net journal cancellations; (ii) prices of electronic access (within or without consortia) should not depend on the historical number of print subscriptions, but should instead be related to actual usage (or number of faculty and students) by institutions; (iii) increased usage over time should not lead to price increases if publisher costs do not increase as a result of the rise in usage.”

Any suggestion that Big Deal contracts are motivated by a desire to create an entry barrier must therefore be predicated on the assumption that an entire group of large, for-profit publishers will coordinate their decisions concerning both pricing and the number of new journals that each launches. Absent coordinated behavior of some kind, those publishers can be expected to compete for sales of bundles to libraries, and one dimension of that competition will be introducing new, high-quality journals to make each publisher's bundle more attractive.⁴⁴ However, any potential for coordinated behavior to limit the number of new journals is remote. In 2002, 15 large publishers in our database (including several non-profits) each published 30 or more scientific journals (see exhibit 1), and a recent, qualitative survey reported that eight of the nine publishers who were sampled each had pricing plans under which all of its journals could be accessed at a discounted rate.⁴⁵ The fact that smaller publishers and non-profits both offer bundles also provides evidence that bundling is efficient and will occur in the absence of any anticompetitive intent, and this would make it more difficult under U.S. antitrust law to label the contracts as anticompetitive even if there were a single dominant publisher.

Third, because it reduces the marginal cost of any journal in a publisher's portfolio, bundling can reduce the amount that a library is willing to pay for a new journal that, for some reason, it views as a close substitute to a journal in the bundle.⁴⁶ But lowering the price that libraries will pay for a new journal would not harm competition and benefit incumbents unless (a) too few libraries will buy a new journal, because the closest substitutes for it are all in bundles, to make entry by a new, independent publisher profitable, and (b) that entry would have induced incumbent

⁴⁴ Edlin and Rubinfeld concede (p. 156) that a foreclosure case against publishers' bundled contracts rests on the cumulative effect "of many firms that have independently instituted Bid Deals."

⁴⁵ Management Practice, Inc., "Report About PSP Journals Data from the AAP/MPI Qualitative Survey," April 4, 2006.

⁴⁶ In theory, bundling could affect the demand for a new journal through either substitution or income effects. With respect to substitution effects, however, suppose that absent bundling a library would not view one or more of the journals in the bundle as the closest substitute for a new journal. In that event, bundling would have no effect on the library's decision whether to purchase the new journal because the library would not have dropped a journal now in the bundle to purchase the new journal. And income effects would reduce the demand for a new journal only if bundling increased expenditure on the bundled firm's journals (but see discussion below) and the entrant journal would have been the library's next expenditure.

publishers to lower the prices of their bundles. However, beyond arguing that current bundles will absorb a large enough share of library budgets to deter entry by new publishers, the Study's authors never offer any indirect evidence concerning the potential entry-detering effects of Big Deal contracts, such as (1) the minimum viable scope (*i.e.*, number of journals) for a new publisher or the minimum viable scale (*i.e.*, number of subscribers) for a new journal;⁴⁷ or (2) the percentage of new journals for which the closest substitute is a journal that is currently part of a bundle and that would not have been purchased absent the bundle.⁴⁸ Nor do they offer any direct evidence as to whether libraries that have Big Deal contracts today are any less likely to purchase new journals than similar libraries which have eschewed those contracts. All these questions would need to be answered before anyone could reasonably argue that entry is deterred by Big Deal contracts because they leave libraries with insufficient funds to purchase new journals from new entrants.

The fact that many non-profit publishers control a small number of highly successful journals indicates that economies of scope are not especially large. For example, the American Economic Association publishes only three journals. Thus, a new publisher can enter by launching a small number of journals, and there is no evidence that an existing publisher needs a large number of journals in a new discipline to enter that discipline. Minimum viable scale, which is clearly related to price, also appears to be modest. For example, one of the publishers in a recent survey reported that on average 180 institutions subscribed to its journals,⁴⁹ indicating that a publisher needs relatively few subscriptions to cover the average total cost of a journal.

⁴⁷ Minimum *viable* scale is the minimum number of units that a journal must sell to break even. Minimum *efficient* scale is the number of units that minimizes average total cost.

According to the EC Study (p. 24) small publishers have been "taking advantage of the lower fixed cost of starting a journal with digital technologies." This suggests that, if anything, economies of scale have been declining, reducing any purported entry-detering effect from Big Deal contracts.

⁴⁸ Absent a budget constraint, a Big Deal contract cannot deter entry by a particular journal if it does not induce a library to purchase a close substitute for that journal.

⁴⁹ Management Practice, Inc., *op cit*. According to the same survey, journals published by associations reported the highest number of non-institutional subscribers. Among the publishers that reported an average number of non-institutional subscribers per journal, the low was 300 and the high was 4,000.

The EC Study makes no serious attempt to address either the share of library spending attributable to Big Deal contracts or the extent to which journals in bundles are the closest substitutes for new journals. It provides a single example – the Cornell University library, which at one time may have devoted 25 percent of its budget to one Big Deal contract.⁵⁰ This example is not even very enlightening with respect to whether Cornell could easily have purchased new journals without discontinuing subscriptions to other periodicals that were part of a bundle. If Cornell had no Big Deal contracts with any other publishers, then it could have reallocated funds from the remaining 75 percent of its library budget, or increased its budget for journals, as in fact libraries have done continually for some time.

Somewhat more information is available to us concerning libraries in the United Kingdom than those in the U.S. According to Reed Elsevier, in 2004 higher education libraries in the UK spent about 22 percent of their serials budgets on Elsevier’s journals – a figure close to Elsevier’s share of journals. Among 79 libraries that had Reed Elsevier’s Freedom Collection contracts, the share of serials spending on Reed Elsevier journals declined from 24.9% in 2002 to 22.7% in 2004. Among 23 libraries that did not have Freedom Collection, Reed Elsevier’s share increased slightly, from 19.8% to 20.0%. These figures would appear to suggest that Elsevier’s Freedom Collection contracts have, if anything, enabled libraries to spend somewhat less on its journals than they otherwise would have, even though the contracts give them access to more Elsevier journals.⁵¹

Because we do not know what share of their journal spending UK (or other) libraries allocate to other publishers’ Big Deal contracts, we do not know the total share of spending different libraries allocate to contracts under which they do not receive “full credit” when they cancel a subscription to an individual journal that is part of a bundle.⁵²

⁵⁰ EC Study, footnote 62. See also Edlin and Rubinfeld, *op cit*, p. 140, indicating that Reed Elsevier’s share of academic journal revenues is “roughly 25 percent”.

⁵¹ The UK institutions that have Big Deal Elsevier contracts are not “matched” against those that do not have contracts. Thus, some of the difference in the shares of spending and the changes in those shares may be attributable to differences in the libraries rather than to whether or not they had Big Deal contracts.

⁵² The EC Report’s authors, like those of other studies on which they rely, assume that library budgets are fixed, so that new journals can be purchased “penalty free” only by discontinuing an existing subscription to a journal not in a bundle. Like many other organizations, research institutions give libraries annual budgets. However, no study has presented evidence that those budgets are fixed, much less fixed for each

However, the underlying issue is whether Big Deal contracts have made libraries less likely to purchase new journals, and there are data that address this issue head on. Specifically, Reed Elsevier surveyed 51 libraries to examine the rates at which they subscribed to a randomly selected sample of new journals that were not published by Reed Elsevier. The survey revealed that those libraries which have had Reed Elsevier's Freedom Collection contract since it was first introduced in 2001 have purchased a larger share of the newly launched, non-Elsevier journals in the sample than have libraries which do not have an Elsevier Freedom Collection contract. It also appears to show that the rate at which libraries with Freedom Collection contracts purchased newly launched, non-Elsevier journals did not decline relative to the rate for other libraries after the Freedom Collection was introduced.⁵³ Thus, the survey clearly challenges the EC Study contention that Big Deal contracts discourage entry by reducing the share of library spending available for new journals.

V. CONCLUSION

The EC Study makes several recommendations to “promote pro-competitive pricing strategies” and prevent potential lock-in effects that it argues may develop in the future from Big Deal contracts. These recommendations include: (1) journals in a bundle should also be priced individually; (2) prices should be related to indicators such as usage or the number of faculty; and (3) prices should not increase with usage.

The Study's recommendations are based on the assumption that, individually or jointly, publishers will be able to wield market power and prevent entry that otherwise would drive the price of every journal close to its average cost. We have argued that, given the characteristics of the market for STM journals, no amount of entry will, in equilibrium, cause journals to be priced closer to their average costs. This is not attributable to market failure or to publishers acquiring market power through mergers or

field (as in McCabe's model), or that research institutions would not allocate more resources to libraries if that would help them to maximize their objective functions, whatever those might be. In short, the argument that libraries cannot purchase new journals without cancelling subscriptions to others and, therefore, that Big Deal contracts can have the effect of “taxing” new journals when they replace those in a bundle, is based on an unproven, fixed-budget assumption.

⁵³ See Appendix E for a detailed description of the underlying data and analysis.

strategic behavior. Instead, it is related to the fact that researchers do not view the articles in any journal as a very close substitute for the articles in any other journal.

We conclude that the Study's recommendations are based on two unsupported and implausible assumptions: (1) that Big Deal contracts pose a threat to future entry, and (2) that even more entry would drive journals' prices substantially closer to average costs. We also conclude that, if implemented, the recommendations would interfere with pricing policies that enhance efficiency in important respects (e.g., by substantially reducing the incremental cost to libraries of extending their collections of existing journals and by acquiring new journals launched by incumbent publishers.)