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Librarians and the terrible fix: economics of the Big Deal

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Librarians, when purchasing academic journals, are in a peculiar position. Normal shoppers choose a product, use it, and pay for it. Librarians choose journals that are used by others and that are paid for by yet a third party, the university. Although this situation is unusual, it is not unique. Physicians choose drugs and treatments that are administered to patients and that are typically paid for by insurance companies. College professors choose textbooks, which are used by students and often paid for by the students' parents.

There are compelling informational reasons for physicians and college professors to select products for their clients. Physicians usually know more than their patients about diagnosis and appropriate treatments. College professors usually know more than their students about the suitability of various textbook options. Librarians lack this advantage. Librarians are not likely to know as much about what their scholar-clients need to read as the scholars themselves. If surveyed, faculty researchers are likely to exaggerate their need for journals that someone else pays for. This problem of delegated selection is magnified by the fact that major publishers have contrived to sell their product in the form of bundled collections of thousands of journals spread across hundreds of academic disciplines. Neither librarians, nor anyone else in a university is well-equipped to determine the value of such a package to the community. Acquisitions librarians typically have only the vaguest notion of their fallback position if they should refuse to accept a publisher's Big Deal price and thus are ill-equipped to bargain over price.

In a market with delegated purchasing, unreliable signals of valuation,

and a complex, difficult-to-evaluate product, the quantity demanded is likely to be quite unresponsive to price. Economists define demand to be price-inelastic if an increase in price results in a less than proportionate decrease in quantity. A market with price-inelastic demand is a paradise for monopolists and oligopolists. In the absence of sufficient competition, sellers can raise their prices far above their unit costs without greatly reducing sales. In such markets, there is a strong incentive for firms to merge in order to reduce price competition within the industry. We see this in the examples we have mentioned. After a series of mergers, four publishing companies in the United States control about 70 percent of college textbook sales. Over the past twenty years, textbook prices have risen at approximately twice the rate of inflation. (Typical introductory textbooks with large markets are now priced at about $200, far above their production costs.) Pharmaceutical companies have been consolidating rapidly in recent years, and though this industry is less concentrated than book publishing or academic journal publishing, many market niches within pharmaceuticals are dominated by a very small number of companies. It is not news to the library community that with a series of recent mergers, the commercial academic journal publishing industry has become ever more highly concentrated and that the prices of academic journals, either singly or bundled have been rising at more than twice the annual rate of inflation.

The effects of price inelastic demand by consumers who do not pay for what they use were dramatically illustrated by the California electricity crisis of 2000 and 2001. The state guaranteed to supply electricity to consumers at a price no higher than a specified maximum. If the wholesale price should exceed the maximum retail price, the state was pledged to pay the wholesale price for as much electricity as consumers demanded and to sell it to consumers at the retail price cap. Since increases in wholesale prices could not be passed on to consumers, this made the demand for electric power extremely inelastic to the wholesale price charged by sellers. The electrical power industry in California was concentrated among a small number of suppliers (which included Enron). The power suppliers realized that if they reduced the quantity of power supplied even slightly, there would be a very large increase in the wholesale price of power. These suppliers took advantage of the situation by shutting down power plants for unneeded "maintenance" during periods of peak demand. The effect was to drive the wholesale price of electricity far above the price paid by consumers and to force the state of California to pay the difference.

Until the late 1990's, almost all journals were available only in print. Publishers charged the same subscription price to great universities as to small colleges. Large research universities subscribed to multiple copies of major journals and had single subscriptions to less-used journals. Smaller colleges and universities typically had single subscriptions to major journals, but had neither budget nor shelf-space for lesser journals. The arrival of electronic editions of academic journals changed costs dramatically and led to a major change in the pricing policies of the large publishers. The marginal cost to a publisher of extending electronic access to an additional subscriber was reduced to almost zero. Moreover, electronic access to a journal does not require any handling or shelf space at a university library.

The new technology of electronic journal access allowed major academic journal publishers to devise a clever new pricing strategy, which has come to be known as the Big Deal. A typical Big Deal was a five-year contract or a site license that would allow all faculty and students at a subscribing university to access the electronic versions of essentially all of the publisher's journal offerings. In the first year of the contract, the university library would pay the publisher a total of about 15% more than the university's previous annual expenditure on the publisher's paper journals. (The library would also continue to receive paper subscriptions to its previously subscribed journals.) In subsequent years of the contract, the annual payment to the publisher would increase at an annual rate of about 7%. The Big Deal contracts proved to be a remarkably effective method of price discrimination. The publisher already knew that the library was willing to pay at least the amount it had previously spent on paper subscriptions for access to its journals. It also knew that although a library was not willing to pay the list price of those journals that it did not subscribe to. It could be confident that access to the non-subscribed journals would be of some value to scholars at the university and that this additional value would be roughly proportional to the library's current journal expenditure. Therefore the publisher could expect (a) that libraries would accept the terms offered and (b)that the implicit discount offered on journals not previously subscribed would not deprive it of paid subscriptions that would have been purchased at full price.

Bundled pricing has the additional advantage of helping large publishers to maintain their market power by discouraging entry by new journals from competing publishers. A survey of British libraries by Jill Taylor-Roe [3] reports that about 40% of the surveyed libraries spend more than half of their serials budgets on big deals. If the price increases built into multi-

year big deal contracts exceed the rate of increase of library serials budgets, libraries are in a poor position to add new subscriptions from independent publishers and frequently must cut existing subscriptions from independent publishers.[1]

The first round of Big Deal contracts with Elsevier were signed shortly before the turn of the millennium. As these contracts expired, the Big Deals were not as compelling a bargain as they had been when first signed. The 7% compounded annual increase built into these five-year contracts meant a 40% increase in the subscription price over the life of the contract. Over the same period, from 1999-2004, the U.S. consumer price index rose by only 13%. Meanwhile, researchers had become accustomed to the convenience of online access. When the time for renewal arrived, many librarians despaired of driving a hard bargain on their renewed contract. An acquisitions librarian informed me that "We are in no position to bargain. Our faculty is addicted to online access. We can't 'Just say No."' Most universities, it appears, did not drive hard bargains on their second contracts. Based on observations of a sample of Elsevier contracts, it appears that most second-round Big Deal contracts specified continued annual price increases of between 5% and 6% per year for another 5 years.[2] Thus, a library that signed its first Big Deal contract in 1999, would be paying about 80% more in 2009 than it did in 1999. Over the same time period, the U.S. consumer price index increased by about 29%. Many libraries have now embarked on a third five-year contract, committing themselves to annual 5% increases until 2012, 2013, or 2014. By the end of this period, these universities will be paying almost twice as much in real terms as they paid for the Big Deal in 1999.

[1]Taylor-Roe reports that in the past two years,the Newcastle library has been able to fulfill only about 20 percent of faculty requests for new subscriptions to journals not included in Big Deals.

[2]There are some interesting exceptions. In 2003, at the time of renewal of their original Elsevier Big Deal contract, the California Digital Library, acting for the 9 campuses of the University of California system, took a hard bargaining stance and hired professional negotiators. As a result, they paid 9% less in 2004 than in 2003 and secured an agreement to annual price increase caps of 2% in 05, 3% in 06, 4% in 07 and 5% in 08. (More details about the CDL contract negotiations are found at http:\\www.econ.ucsb.edu\∼tedb\Journals\ucbigdealpage.html) The University of Wisconsin refrained from signing a Big Deal contract with Elsevier until very recently. In 2009 it signed an agreement to purchase Elsevier's Freedom package at a p rice of $1.21 million. This compares with prices of more than $2 million paid by comparable state universities such as Michigan, Illinois, and Minnesota.

In the current recession, many libraries face decreases in their serials acquisitions budgets, but are committed by long term contracts to big deal subscriptions whose prices are increasing by 5% per year. This budgetary pressure did not faze the large commercial publishers. Elsevier and Springer increased their 2009 subscription prices by an average of about 5% for 2010. In contrast, many non-profit societies responded by freezing 2010 prices at the level of the previous year or even reducing prices.[3]

So what can be done? Is there a way for universities to free themselves from exploitation of their inelastic journal demands? Economists have a stock answer for situations like this, which is "If you want to allocate resources efficiently, you should use the price system. Let users pay for what they get. They will economize if they are using their own money."

Can this advice be applied to the academic journal market? It certainly was on target for the California electricity crisis. Indeed the problem was remedied very quickly when the price ceilings were removed and consumers were required to pay the true market cost of the electricity they purchased. Demand became price elastic and the oligopolists could no longer profit by their little tricks of shutting down power plants to restrict supply. The advice seems less appropriate for medical treatment or college textbooks. Patients usually do not know as well as the doctor what treatment is good for them. There is good reason for using health insurance to reduce the financial risk of illness. College instructors are usually better able to judge textbook quality than their students, and it is useful to have all students in a class reading the same textbook.

But why do we delegate choice of journal access to librarians? It is not likely that researchers need the advice of librarians or university budget officers about which articles are worthwhile for them to read. In the days of

[3]The Medical Library Association has posted a list of 44 publishers who held their 2010 prices at 2009 levels. http:\\www.mlanet.org\resources\publish\sc_2010-prices.html This list includes, among others, the American Anthropological Association, the American Chemical Society, the American Medical Association, the American Mathematical Association, Annual Reviews, the Institute of Physics, Karger, MIT Press, the National Academy of Sciences and Optical Society of America. The SPIE (Society of Photographic Instrumentation Engineers) reduced their subscription prices by about 10%. The Big Deal publishers can afford to continue increasing their prices without fear of substantial subscription losses because a large fraction of their customers are locked into multi-year contracts. Libraries with reduced acquisitions budgets must make their cuts at the expense of independently marketed journals, moderately priced society journals and competing start-up journals

print journals, there was a clear role for librarians as coordinators of joint demand. A single paper copy of a journal had to be shared among several users. Although a single researcher would be the best judge of the value to her of any particular article, she would not be in a good position to know whether there are sufficiently many potential readers of the journal in which this article is found to justify a subscription for the university library.

With the emergence of online journals, it is time to ask whether libraries still have a useful role to play in the provision of journal access. There is no physical reason for researchers to go to the library to look at paper journals. Nor is there a compelling logistic reason that university libraries should serve as tollgates for commercial publishers. Journal publishers currently offer online access to individual journal articles on a pay-per-view basis any reader who has a computer connected to the internet. In an article published in the Proceedings of the National Academy of Sciences [1], Carl Bergstrom and I argued that the scholarly community would probably be better off if all universities simply got out of the business of providing site licenses for commercial publishers that charge prices that much greater average cost. In this article, however, we make a case that university purchases of site licenses at prices close to average cost can be justified as an efficient method of supply.

Let us begin by considering the likely outcome if universities were to stop purchasing site license subscriptions. If access to journal articles were purchased individually by users, the problems of delegated purchasing, unreliable signals of value, and complexity of the product would all disappear. The buyer would be the user, paying with his own money, or his own grant money. The choice the buyer makes is a simple one, whether to purchase a single article on a subject that is of interest to the buyer. There is no need to evaluate a subscription to an entire journal, let alone a bundled purchase of thousands of journals in hundreds of disciplines.

If articles were purchased directly by users, demand for journal articles would be much more price-elastic than the demand of libraries for subscriptions to bundled journals. The profit-maximizing response of sellers to price-elastic demand for a good whose marginal cost is close to zero is to reduce prices. Commercial publishers currently charge about $30 per article for pay-per-view access. At these prices, the prospect of pay-per-view access is unattractive. But the reason that publishers charge such high prices for pay-per-view is that they collect almost all of their revenue from institutional site-license subscriptions. In today's environment, they keep their pay-per-view prices high so that libraries will continue to buy institutional subscrip-

tions. If libraries refused to purchase high-priced site licenses, publishers would be faced with a price-elastic demand for pay-per-view, and since the marginal cost of supplying an additional reader is nearly zero, it would be in the interest of commercial publishers to reduce pay-per-view prices to much lower levels.

If journal supply were competitive, and users paid the subscription costs, then we'd expect free entry and competition to drive prices down so as to just about to cover average cost. But a large portion of the publishing industry is not competitive. Copyright law and the costs of co-ordination ensure a monopoly position for publishers of prestigious established journals. Profit-maximizing publishers would still be able to price above average cost even with pay-per-view. Thus even if there were no library subscriptions, there would still be profits in journal publishing for the commercial publishers. But these profits would be much lower, because they would face a much more price elastic demand for their product and would have to reduce prices accordingly.

Although large commercial publisher journals have taken advantage of the price inelasticity that results from library purchases of institutional site licenses, a good case can be made that institutional site licenses for journals published by non-profit societies are efficiency enhancing. The marginal cost of allowing access to an article for an additional reader is nearly zero. If a reader imposes no cost on others by reading an article, efficiency dictates that she should be allowed to do so for free. A fee for reading articles would exclude readers who would value reading the article, but not enough to pay the fee. But if there is no charge to readers, someone needs to cover a journal's "first-copy" costs, the cost of handling submissions, managing the refereeing process and editing papers? The sale of institutional site licenses to non-profit journals solves this problem. All users at subscribing universities have free access to the journal's articles. The revenue from institutional subscriptions covers costs. Non-profit institutions have no incentive to charge prices significantly higher than average costs, even if demand is price inelastic.

An alternative method of allowing free access to users while covering first-copy costs is the author-pays open access model, in which authors pay a fee to the publisher, who makes the article freely available online. When the author pays the fees directly, there is no problem of delegation and we can expect competitive pressure to prevent exorbitant fees. Things are less clear in the case where an author's university or funding agency pays the author fees. There is potential for the same kind of delegation problems

and consequent price elasticity that have allowed commercial publishers to exploit universities by means of high subscription prices.

I have argued that the university community at large would be better off if all libraries would refuse to subscribe to journals that were priced far above average cost. But individual libraries have to make their decisions in an environment where the Big Deal is widespread and publishers maintain artificially high prices for pay-per-view and individual subscriptions so as to keep libraries tied to the Big Deal. A single library's defection from the Big Deal will not change these pricing policies. But even with current pricing policies, great research universities such as Stanford and California Institute of Technology have found it advantageous to avoid Big Deals.

Librarians should be aware that since every library pays a different price for its Big Deal contract, every contract is the result of a bargain between two parties.[4] Librarians must realize that "if you are going to bargain, you have to be ready to walk." To be ready to walk, a bargainer should have a clear idea of what she would do if no agreement is reached. In the case of Big Deals, a librarian needs to contemplate the best outcome from that the library could achieve without a Big Deal and to estimate the value of concluding a Big Deal relative to that fallback position.

If one drops the Big Deal, it does not mean that the university's faculty loses access to all of that publisher's journals. The library could maintain subscriptions to those journals in that publisher's list that are relatively good buys. It could use money saved from Big Deal purchases to substitute subscriptions to independently supplied journals that offer better value per unit of cost. Stanford University, for example, has found it worthwhile to subscribe to fewer than one fourth of the journals offered by Elsevier. On the relatively few occasions that faculty request articles from unsubscribed journals, Stanford supplies them with pdf copies of these articles obtained from a third party supplier. In some disciplines, free copies of most published articles can be found on the author's websites[5] Copies of articles that are not available on the web can usually be obtained quickly by dropping an email

[4]Publishers may try to convince you that they have no flexibility in the terms of the contract and that your fees are tightly tied to your "historic spend. It is of course in their interest for you to believe this.

[5]From a sample of 33 economics journals in 2006, Bergstrom and Lavaty [2] found that the median percentage of articles from the 16 most prestigious journals that were available for free on the web was 90%. he corresponding median for the 17 less prestigious journals was about 50%.

message to the author, who will be delighted to find another reader. A more expensive option is for a university to partially subsidize pay-per-view access to articles in unsubscribed journals. So long as the researchers must pay a non-trivial share of the price for pay-per-view articles, they will economize on their usage. In order to be able to estimate the costs of dropping a Big Deal contract, university libraries should insist on obtaining detailed download information at the article level from Big Deal publishers. Remarkably, some major publishers currently refuse to divulge this information to their subscribing libraries.

In recent months, two fellow economists, Paul Courant of the University of Michigan, and Preston McAfee of Yahoo! and I have been collecting copies of big deal contracts from US libraries. These are typically guarded by secrecy clauses, so in order to get them we had to send state Freedom of Information Act requests to librarians throughout the country. Elsevier didn't like this very well. They sued Washington State University to prevent them from releasing the contracts. Elsevier lost that suit and we have now collected a large number of contracts from several big publishers. We plan to release summary information about these contracts, both the total cost and on details of the contracts.

We find a great deal of difference in the amounts that universities pay, controlling for such measurable characteristics as enrolment, size of faculty, number of doctorates granted, and amount of federal grants received. Much of this difference can be explained by historical accidents such as whether a university had several specialized libraries or whether its collection was more centralized. Some universities chose to clear out small libraries and reduce their number of subscriptions before signing their big deal package. Others seem to have dropped their big deal packages, cut subscriptions, and then rejoined to get a better deal. We find a great deal of variation and strong hints that hard bargaining has saved a lot of money for some libraries. If you fail to reach a Big Deal bargain, the result is not catastrophe. A university could do worse than to emulate Stanford and Caltech.

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