

## CREATIVE PRICING IN MARKETS FOR INTELLECTUAL PROPERTY

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ABSTRACT. Technological changes over the past two decades have made it easier to distribute and to copy intellectual property. Creators and owners of intellectual property have responded to these changes with a variety of creative pricing strategies. The paper reviews some of these pricing innovations. Two broad categories of innovations are explored: those that facilitate price discrimination and those that exploit complementarities between different types of creative works.

Two decades ago, the photocopier, the audiocassette recorder and the videocassette recorder were the relatively new technologies that threatened to change the market for intellectual property. Economic analysis by Leibowitz (1985), Novos and Waldman (1984) and Johnson (1985) among others centered on the impact of these new technologies on consumers and producers and the possibility that the owners of intellectual property could indirectly appropriate the value created by their property when copied by someone who did not pay for it. In the intervening two decades, the digitization of most creative work and the advent of new technologies for the reproduction and transmission of digital information have, if anything, intensified the debate. Whole industries, such as the recorded music industry, feel themselves under attack by copying and distribution of unauthorized editions.

While some of the response to these technological changes is being played out in the legal arena, owners of intellectual property have also responded with innovations in pricing. This paper surveys some of those pricing innovations and shows how they can be interpreted as responses to the new technologies of reproduction and distribution. This paper does not attempt to assess whether the net effect of the new technologies on the market for intellectual property has been positive or negative. However, part of that assessment would have to include the pricing responses of the owners of intellectual property, responses that cushion the effects of and, in many ways, take advantage of opportunities presented by the new technologies.<sup>1</sup>

In my brief overview of pricing innovations, I divide the innovations into two categories: those that facilitate price discrimination and those that rely on complementarities among versions of creative works. Both of these strategies allow owners of creative works to capture more revenue and offset the revenue dissipation caused by unauthorized copying. Assuming that sellers of intellectual property do not undertake self-destructive behavior, these strategies must enhance the financial position of the sellers.

The paper takes no position on the welfare aspects of these pricing strategies. We are clearly in the world of the second best if not third best. Taking total surplus as

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<sup>1</sup>Shapiro and Varian (1999) present a comprehensive look at pricing strategies for intellectual property.

the ultimate goal of economic activity, these pricing strategies might well enhance welfare, especially if the effect on the supply of creative works is responsive to economic rewards, but even if it is not.

## 1. FACILITATING PRICE DISCRIMINATION

Information goods with large fixed costs and low marginal costs are especially suited to price discrimination as long as markets can be separated. Price discrimination is a way to offset the revenue dissipation of unauthorized copying. This section of the paper examines three creative applications of price discrimination to the market for intellectual property.

**1.1. Intertemporal Price Discrimination.** Since U.S. copyright law prohibits producers from practicing price discrimination between institutional buyers such as video rental stores and final customers (see Mortimer (2004)), studios practiced intertemporal price discrimination, pricing high at first release to capture the surplus of the rental stores and then reducing the price to attract individual customers. This, in effect, separates the high value institutional buyers and the lower value consumer buyers. A high price of media at release essentially restricts its sale to high value users, the rental stores. Subsequent drops in the price bring direct to consumer sales. The market is segmented over time between the high value rental stores and the lower value consumers.

Interestingly, the optimal pricing strategy for a particular movie will depend on the relative strength of customer demands for rentals as opposed to ownership. Certain categories of movies, such as children's movies, are felt to have greater relative demand for ownership. Price discrimination for those movies is not necessary because the rental store demand is lower relative to the consumer owner demand.

Also, of interest is the fact that intertemporal price discrimination has been much less common in the DVD format than it was in the VHS tape format. The reasons for this are not clear. One possibility, explored by Mortimer (2004), is that the quality of DVD's relative to VHS tapes is high enough to enhance the value to consumers of owning DVD's enough to eliminate the gain to intertemporal price discrimination. Recall that it is the ownership value relative to rental value that dictates price discrimination.

**1.2. Revenue sharing contracts – the *Blockbuster* solution.** Given the constraint imposed by copyright law, intertemporal price discrimination achieves some market separation but not a first best solution. In this environment, *Blockbuster*, a chain of video and DVD rental stores, and other video stores made innovative revenue sharing agreements with the producers of recorded video entertainment in the late 1990's. Before this type of contract, *Blockbuster* had purchased tapes and DVDs from the producers to rent to customers at a high initial price designed to capture some of the surplus from final consumers who are willing to pay a high price to rent a tape or DVD just released. When a movie is first released in recorded form, customer demand for rental is initially very high and typically many customers were unable to obtain a rental. *Blockbuster* could have solved the problem of insufficient supply of recorded media by buying more. However, that solution would require *Blockbuster* to invest heavily in an inventory of media that would rapidly become obsolete as customer demand for that particular release waned over time. Obviously, by its behavior, *Blockbuster* had revealed that when the only way

it can obtain media to rent is by purchasing them, it was not worth satisfying its customers' peak demand for rental at release.

The pricing innovation was to recognize the alternatives to purchase of physical media. The physical media are just vehicles for digital images, which are the real object of customer desire. *Blockbuster*, is, in effect, an intermediary between the producers of creative works and the customers who want to view them. When the transaction between the producers and *Blockbuster* is restricted to a purchase of physical media, mutually advantageous gains from trade are precluded.

The *Blockbuster* solution was to replace the purchase of physical media with the sale of consumer views. *Blockbuster* was provided with enough physical media to satisfy consumer peak demand, but the payment to the producers depended on the number of rentals. In other words, *Blockbuster* and the producers share the revenue from consumer rentals. In a way similar to the types of contracts between producers and movie theaters. As Dana and Spier (2001) have noted, revenue sharing contracts such as those in the video rental industry, can attain first best solutions under certain market conditions.

This type of contract requires accurate and verifiable monitoring of consumer rentals by the producers. *Blockbuster* apparently opened its accounting system to the producers to allow them to verify consumer rentals and enforce the revenue sharing contract.

**1.3. Broadway theater.** A final example of price discrimination strategies has been the emergence of sophisticated price discrimination in the Broadway theater. Theaters are like airlines with huge fixed costs and negligible short run marginal costs. A seat unsold is a pure loss. And theater owners have become more like the airlines in perfecting revenue management strategies that rely on third degree price discrimination. Just as the airlines rely on a correlation between consumer valuation and flexibility of scheduling, theater owners are reserving seats for high demanders who want the flexibility of being able to make decisions at the last moment. For example, tourists, for whom the cost of the play is a small part of the overall cost of their trip, might be high value consumers who also value the flexibility of being able to decide at the last minute.

At the same time, theaters attempt to fill all seats with paying customers by selling surplus seats at the last minute at lower prices. Obviously, it is crucial to separate the types of customers. Increasing price discrimination is consistent with evidence that the variance of prices of tickets actually sold for any particular theater performance has been rising over time.

## 2. COMPLEMENTARITIES

A second group of pricing strategies attempts to exploit the complementarities between versions of the creative product. Some of this exploitation is a response to the technological changes that have allowed consumers to obtain high quality unauthorized versions of certain creative products at very low cost.

**2.1. Live Concert Pricing.** Alan Krueger (2005) documents the rapid increase in the relative price of tickets to live concerts by popular musical performers since 1996. His preferred explanation for this rapid rise is that it is a response to the increasing availability of free-recorded music through peer-to-peer file sharing over the internet. The argument hinges on the complementarity between concert performance and

recorded music. Concerts whet the appetite of the audience for recordings, while at the same time recordings enhance the appeal of live concerts where consumers can see the performer in person.

When recordings could not be easily copied and shared, concert tours were used to enhance the demand for recordings. Low ticket prices would ensure exposure of large numbers of consumers to the live concert that in turn would stimulate sales of recordings. What Krueger argues is that as the unauthorized distribution of recordings became widespread, the role of concert and recording essentially flipped. That is, the “free” recordings are now what increase the demand for live concerts, so that an increasing share of revenue is made on the concert side of the business. This explanation has the virtue of being roughly consistent with the timing of the introduction of file sharing and its accompanying ease of obtaining unauthorized copies.

**2.2. Author Pays Journal Pricing.** Another example of complementarities in action is the introduction of author pays scholarly journals. Traditionally primarily the readers have paid for journals, although submission fees and page charges have contributed to journal revenues. Three forces have led to possible changes in that institutional framework. One change is the advent of digital technology and the Internet which have made it possible to “publish” articles and distribute them electronically at extremely low per user marginal cost. A second change has been the ability of consumers and producers of scholarly research to exchange articles without the intermediary of a journal. The third change has been the rise of profit-making scholarly journals and their very high subscription rates.

These changes have led scholars to investigate the possibility of author pays journals. Bergstrom and Bergstrom (2004) argue that author pays journals are viable. Part of the reason is the complementarity between article publication and the value of the author’s reputation. Just as performers may be willing to perform concerts to enhance the value of their recordings (or vice versa), researchers would be willing to pay to have their articles published in order to burnish their academic reputations. With the very low marginal cost per reader implied by paperless electronic delivery of digital files, and the easy reproduction of unauthorized copies, pricing readers is becoming less feasible and less efficient. Pricing authors may be the solution. McCabe and Snyder(2004) show that author pay journals are more likely to be adopted and to be socially efficient the lower the marginal cost of serving a reader and the greater the benefit to the author relative to the benefit to the reader.

This last ratio explains why author pay is likely to be observed in academic publications rather than general publications. While nonacademic authors may obtain some benefit from exposure in print, the benefits of the transaction go mainly to the reader. So-called vanity presses exist to serve that minority of publications whose benefits go mainly to the author. The complementarity between publication and the author’s academic reputation imply that author pay journals have the potential to solve the financial and economic problem posed to conventional journals by electronic publication. Free dissemination of journals to readers when authors pay for publication solves those problems.<sup>2</sup>

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<sup>2</sup>There will be, of course, moral hazard problems when authors pay to publish but these can be solved by reputational equilibria. Reputation seems to be a much stronger force in journal

**2.3. Free Dissemination of Partial Works.** A final application of the differential pricing of complementary goods is the case of free provision of parts of creative works to stimulate the consumer demand for the whole good, which one could take as being complementary to the part. As an example, Amazon.com puts sample pages of books and sample excerpts from recordings it sells on its website for consumers to browse. The part is provided to give consumers better information about the whole.

Shapiro and Varian describe some other activities along these lines including providing free searchable indexes to archived articles in many newspaper websites, but charging to look at the whole article, a strategy that again relies on complementarities. Musical performers can put a sample of their output on line for free to encourage sampling by consumers. The capacity of the Internet to support websites at very low cost probably implies a broadening of the horizontal variety of musical performance, just as cable television has led to a fracturing of the mass audience into many specialty audiences. This has led many observers to predict that file-sharing and Internet distribution would hurt the most popular performers but help those who cater to a narrower part of the taste spectrum. In economic terms, there may be redistribution regardless of the effect on overall welfare. Interestingly, the same types of technological forces that led Sherwin Rosen(1981) to describe the high earnings of superstars in the dimension of vertical quality may lead to more equality of earnings along the dimension of horizontal quality.

### 3. CONCLUSION

Digital media and the Internet have transformed the technological landscape over the past twenty years, but the basic lessons of the economic models of copying of that earlier era are still valid. The effects of copying technology on welfare depend on the nature of consumer demand and the elasticity of supply of creative works. Creative pricing can allow producers or upstream sellers to capture some of the benefits of downstream copiers. Those creative pricing behaviors will mute the cost imposed on producers by new copying and distribution technologies.

An optimist like Lessig (2004) would argue that producers have worried about unauthorized copying and the competition from new technologies before yet the markets for creative works broadly defined are bigger than ever. The net effect of technical changes that enable unauthorized copying and distribution will be impossible to predict ex ante.

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