

**Micropayments for Intellectual Properties: Price
Discrimination, Unbundling, Both, or Neither?**

Stan J Liebowitz

**University of Texas at Dallas
Very Very Preliminary**

6/30/2005

One topic that is likely to receive increasing attention in the next few years is digital rights management (DRM). DRM is a nascent technology that protects intellectual property from unauthorized copying or use.

Digital rights management seems to mean different things to different people, but clearly it includes some sort of restrictions on copying. For example, a DRM system generally restricts which device a purchased downloaded song might be allowed to be copied to. If you happen to own an iPod and you want to purchase music to put on your iPod, you can only go to Apples iTunes site to legally complete this transaction. The iPod and iTunes sites have a form of DRM (Apple's "fairplay"). Of course, there are ways around this restriction by the user, particularly because the iPod also allows MP3 files to be played. But Apple could have chosen to close the system further, but that would likely have impeded sales of iPods.¹ Ringtones have more stringent DRM systems and it is far more difficult to purchase or download a ringtone from sources outside the DRM system.

A potential component of DRM known as micropayments is often discussed as if it is tied to DRM. Micropayments for intellectual products would take the form of charging consumers for each use of a song, movie, or book. Although not necessarily part and parcel of DRM, the impact of micropayments is the topic that I wish to address in this paper. Since books and movies are often only consumed once, the potential role for micropayments is far greater in the case of music, where a single work might be heard dozens or hundreds of times by a single consumer over some time interval.

¹ Real Audio attempted to break into Apple's closed DRM system by providing files on its download site that were compatible with Apple's DRM. This led to ****

The concept of DRM, and particularly micropayments, has been extremely contentious. A good deal of the debate concerns the impact of DRM on legal norms such as fair use. Some of the debate, however, has focused on the economic impact of DRM. This small literature is concerned with whether DRM enhances or retards social welfare. The negative views of many are summed up in this quote from an article from the New York Times:

In opposition to the cultural commons stands the "permission culture," an epithet the Copy Left uses to describe the world it fears our current copyright law is creating. Whereas you used to own the CD or book you purchased, in the permission culture it is more likely that you'll lease (or "license") a song, video or e-book, and even then only under restrictive conditions: read your e-book, but don't copy and paste any selections; listen to music on your MP3 player, but don't burn it onto a CD or transfer it to your stereo. The Copy Left sees innovations like iTunes, Apple's popular online music store, as the first step toward a society in which much of the cultural activity that we currently take for granted -- reading an encyclopedia in the public library, selling a geometry textbook to a friend, copying a song for a sibling -- will be rerouted through a system of micropayments in return for which the rights to ever smaller pieces of our culture are doled out. "Sooner or later," predicts Miriam Nisbet, the legislative counsel for the American Library Association, "you'll get to the point where you say, 'Well, I guess that 25 cents isn't too much to pay for this sentence,' and then there's no hope and no going back." ²

Although the above quote is not explicitly economic in nature, the overtone of great welfare loss is abundantly clear. Would such a system of micropayments lead to great losses, or would it instead enhance efficiency and promote freedom of action?

In the following material I will attempt to put the impacts of micropayments in some economic perspective. The previous literature has suggested that micropayments may create an extreme form of price discrimination, possibly approximating perfect

² New York Times (2004)

discrimination. In the case of micropayments for intellectual products, the very concept of price discrimination will be seen to be very difficult, if not impossible to define. A more useful exercise will be to examine the nature of the pricing itself. As will be seen, micropayments radically transform the nature of payment system in the market. They transform the market from what is sometimes known as a ‘buffet,’ ‘admission fee’ or lump-sum-payment regime into an a-la-carte payment regime (or possibly a two part tariff regime).

Some economic definitions

There is a well known literature on bundling, as well as a smaller literature on two part tariffs. There seems to be very little written, however, on the issue of divisibility per se. A single product can be finely divisible or sold in lumpy units. Gasoline is normally sold in finely divisible units whereas wine is normally sold in lumpier units (bottles). Combinations of products can be sold in a far wider assortment of combinations. They can be sold in fixed amounts and fixed proportions (a bundle of a fixed combination of printer ink cartridges or a fixed price menu with no choices) or in fixed amounts in variable proportions (a Chinese fixed price dinner with a choice of selections from column A or column B), or fixed payments for variable amounts and variable proportions (a typical buffet restaurant) or variable payments for variable amounts of variable proportions (a buffet restaurant that charges by weight of food eaten).

A single recording of a song charges a fixed price for a variable quantity consumed. It is like a typical buffet restaurant with one dish. A CD is more like a buffet with 10 dishes (songs). You pay a fixed price and then consume as much or as little of each dish as you like.

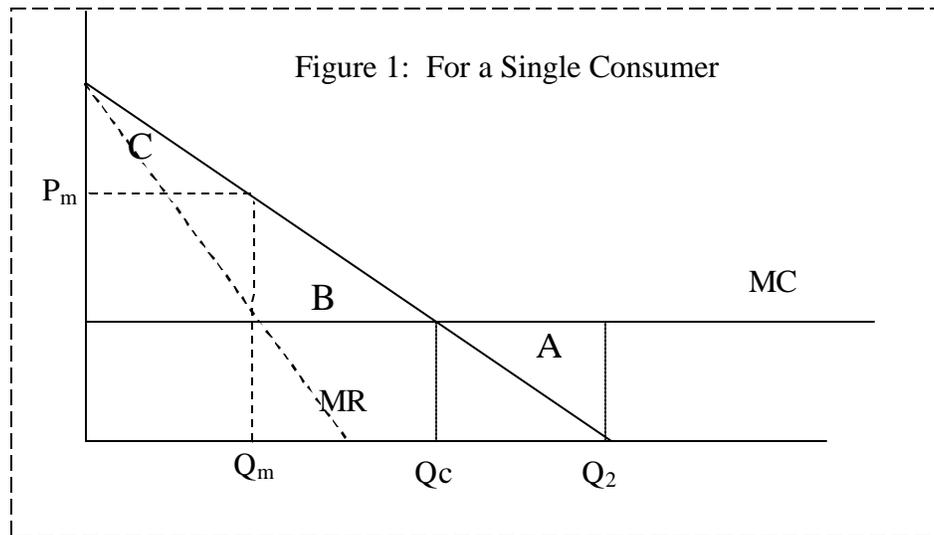
The main economic attribute of the buffet model, as used here, is that consumers pay a fixed fee for a product, independent of their usage. Thus two consumers who go into a buffet restaurant pay the same price even if they eat very different quantities. A-la-carte models, on the other hand charge for each additional unit. Most real world a-la-carte restaurants are not completely a-la-carte, however. McDonald's would appear to be a-la-carte, but it is not completely so. You cannot buy French fries by the pound or even one at a time the way you can buy gasoline, say, one drop at a time. Unless a restaurant weighs its food and charges by weight, it is not completely a-la-carte.

Nevertheless, I will assume, from this point on, that a-la-carte allows complete divisibility of the products with pricing depending entirely on the amount of the product consumed. A micropayment system for music consumption based on the number of seconds spent listening to music would be classified as complete a-la-carte. Alternatively, the buffet model will assume that there is a fixed admission price and that consumption then has no impact on payment. This would be true for the download and purchase of a recording, or a CD, or a monthly subscription service such as Rhapsody or Napster to go, where the consumer pays a fixed amount and then has access to a very large number of songs with zero restrictions on the amount of listening time spent on any or all songs.

The basic analysis of a-la-carte versus buffet

In general, a-la-carte models under competition are thought to be efficient whereas buffet models (of which there is practically no analysis except for the fine 1999 paper by Nahata et. al., who examine when transaction costs might make buffets profitable) would seem to be inefficient since buffets would appear to lead to wasteful over-consumption since consumers face a zero marginal price for costly goods. Since there is usually a cost in

providing additional output to consumers, efficiency normally requires that consumers pay more as they use more of a product. A-la-carte, unlike the buffet, provides consumers with incentives to use additional units of the product only up to the point where the marginal value of an additional unit stops being greater than the price they pay, which ideally is equal to the marginal cost of production. Sometimes metering is too costly to make it worthwhile to provide this incentive to consumers, as in the case of food buffets or private parking lots in areas with low land values where the cost of collecting the revenues are greater than the revenues that could be generated. Nevertheless, efficiency is usually promoted when consumers are given incentives to economize on their use of resources.



A typical welfare analysis is shown in Figure 1 which represents the demand of a single consumer (perhaps with the added assumption that all consumers are identical). We begin with the more familiar monopoly case although it is familiar from analyses of two part tariffs and not just the admission-fee systems which is my focus here.³ In an a-la-carte

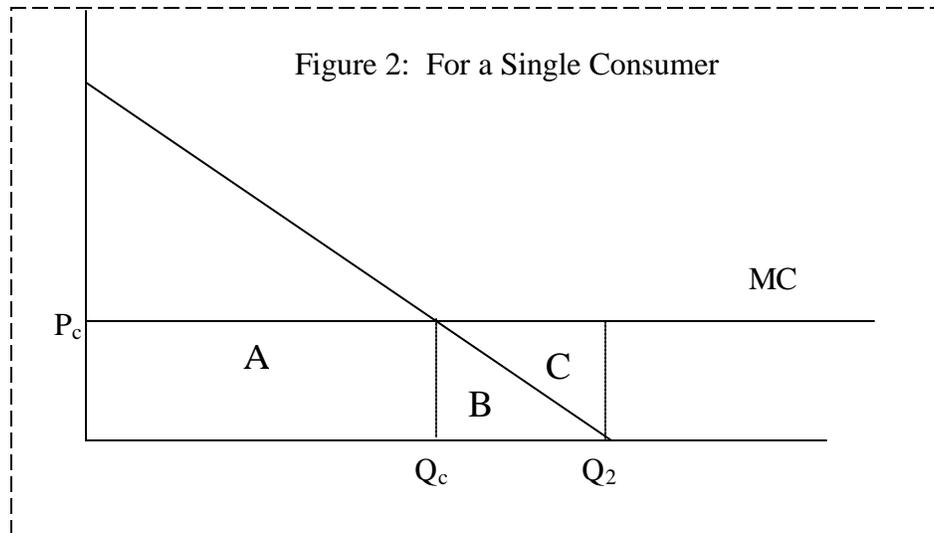
³ Walter Oi's 1971 article on the subject is the classic reference although the reader should examine Schmalensee's 1981 paper as well.

world this product is sold at a price of P_m which is the profit maximizing price. The output is Q_m which generates a typical deadweight loss from the monopoly restriction on quantity shown as triangle B. A buffet model is like having only one part of the two part tariff. In this case the admission fee is the entire area under the demand curve up until output Q_2 . Consumers, as you expect in a buffet, eat too much and the wasteful consumption is indicated by the deadweight loss of area A. Compared to an a-la-carte monopoly, it is not clear whether a buffet is more or less efficient. The answer, ignoring other costs of operation, depends on whether deadweight loss A or deadweight loss B is greater. The buffet will be more profitable if the sum of areas B and C is greater than area A since B and C are additions to profit from switching to the buffet but area A reduces profits and needs to be subtracted from the sum of B and C.

Certainly, for restaurants at least, buffets exist in markets which appear to be very competitive. The monopoly power that is often claimed to be required for the implementation of price discrimination would be lacking in the case of these small restaurants.⁴ The analysis of this competitive case is found in Figure 2. Here we assume a competitive market driving the price to P_c . In an a-la-carte world, this consumer consumes Q_c units, which is the efficient output. If this seller switches to a buffet pricing system, competition continues to ensure that economic profits are zero. The admission fee that can be charged by the competitive seller is rectangle A plus triangles B and C, which just covers the costs of production (fixed costs are assumed to be zero). A deadweight loss of C is created because the opportunity cost of producing output $Q_2 - Q_1$ is

⁴ Reference to Lott and Roberts.

greater than the value of that output (B). The consumer would be unwilling to accept this buffet if he had an a-la-carte alternative since his surplus would fall by area C.



The existence of real world competitive buffets can be best explained by appealing to one of two stories. First, a buffet setting allows lower costs due to the buffet restaurant not needing waiters to bring out food, not needing the kitchen to be able to prepare on command a wide range of dishes typically found on a menu, and not needing as much attention in calculating the total bill. These cost savings might work out to more than area C per consumer. Alternatively, real buffets might increase demand by allowing for greater variety than can be had in real a-la-carte restaurants (since they are not continuously a-la-carte, contrary to the assumptions here) and this extra value could more than compensate for the deadweight loss. Nevertheless, with our theoretical assumptions, true a-la-carte beats admission fees when it comes to efficiency in competitive markets.

Fortunately, the payment for most products is of the a-la-carte variety, a function of usage. When we buy gasoline for our automobiles, the amount that we pay depends entirely on the amount that we have used. There are, nevertheless, some potential

divisibility issues. The food we buy is often available in units that require multiple uses, particularly when that food has a long shelf life, but for perishable items the size is usually similar to the use of the product over its short lifetime, or can be purchased by weight. If this weren't the case, consumers would be throwing out a great deal of what they purchase, which would be inefficient and which we do not see happening. The market for used durables helps to alleviate divisibility problems.

Dueling vices for intellectual products: the lumpiness of the buffet versus the underconsumption of a-la-carte

Lumpiness, or indivisibilities, can be a serious impediment to efficiency. If gasoline were sold only in twenty-gallon units, lawn mowers, motorcycles, and small cars would operate at a considerable disadvantage and might be entirely priced out of the market, to say nothing of those drivers with half a tank who expect not to encounter another gas station for several hundred miles and who would need to pay for a whole tank to just fill up the empty half. Similarly, if we only had all you can eat buffets, some individuals with either small appetites or already filled stomachs would be deterred from accompanying their friends to restaurants since they would be unable to only order a snack or coffee. Lumpiness is also often neglected in economic analyses, being assumed away in part because markets have created methods (such as short term rentals) to overcome lumpiness issues, and in part because it is difficult to use calculus to describe large discrete units.

A la carte pricing eliminates the lumpiness of a product. You can go to the gas station even if you only want half a gallon of gasoline without worrying about paying a price penalty.

Buffets suffer from lumpiness, or indivisibilities. A-la-carte does not. As we saw in the previous section, from a welfare perspective buffets are inferior to a-la-carte when we have competitive markets. In monopoly markets the lumpiness might work to the advantage of buffets since a-la-carte is not efficient.

Intellectual products, however, have a characteristic that turns the usual efficiency virtue of a-la-carte on its head.⁵ Intellectual products, such as music, are non-rivalrous. This means that to achieve efficiency in consumption, every consumer whose valuation of the good is greater than the costs of transmitting that good should be allowed to consume the good. In other words, for efficient consumption, any consumer with a positive value for that music should be allowed access to zero cost digital copies. The only a-la-carte price that achieves this result is a price of zero. Such a price, however, makes it impossible to generate any revenue with which to pay for the creation of the intellectual product in the first place. A-la-carte models require a price in excess of marginal costs in order to generate revenues to provide for the creation of the music. But this positive price in excess of marginal costs creates inefficiencies in that consumers are given incentives to limit their music consumption in an economically inefficient manner. Since a-la-carte retail models need to generate revenues to pay for the fixed cost of the intellectual product, this means that relative to a buffet, individual consumers in an a-la-carte market will tend to consume too little. A-la-carte models, therefore, fall prey to the traditional underconsumption problem associated with non-rivalrous goods which makes sense since

⁵ Intellectual products that are protected by intellectual property laws are sometimes modeled as monopolists and thus one might claim that this improves the welfare position of bundles versus a-la-carte pricing. I do not believe it is correct to view most products protected by intellectual property law as monopolies since (in the case of copyright at least, which is my major concern) there is free entry into the market and little chance of monopoly power being exercised by most producers. See Kitch (2000) and Yoo (2004) for discussions of competition in markets with copyrighted products.

the traditional model is the a-la-carte model. Although some consumers might be priced out of the market entirely by a-la-carte pricing, it is likely that most consumers will purchase some quantity of the music, just not enough of it.

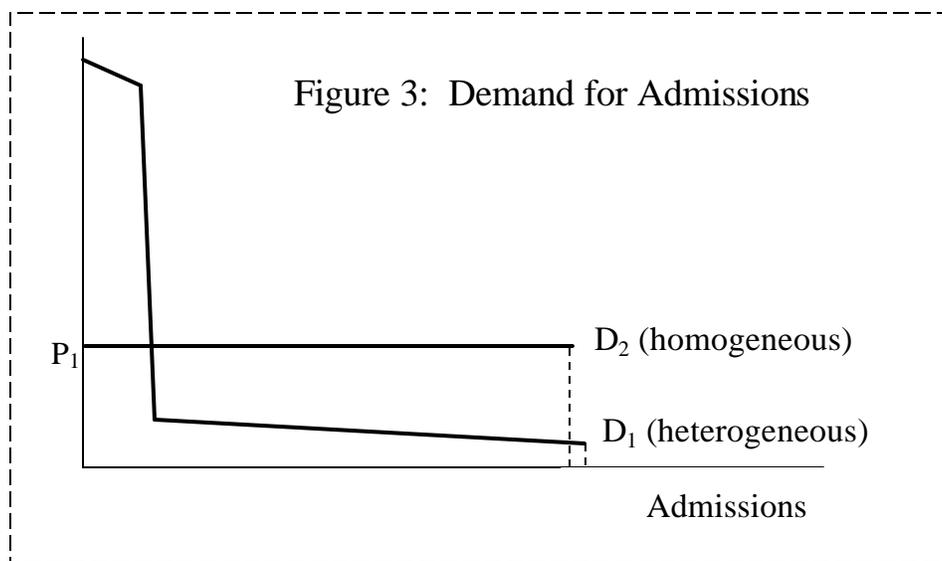
The buffet model allows consumer who pay the admission fee to consume as much as they want. So each consumer consumes the efficient quantity. The negative side of the buffet model is that it keeps some consumers out of the market altogether.

From an efficiency perspective, there is a new tradeoff that is entirely a function of the consumption market since in both instances we have abstracted from the production difficulties of non-rivalrous goods. Put simply, there is a potential harm in keeping individuals from the market at all, and there is another potential harm in deterring the individuals who do purchase the product from consuming the efficient amount. Buffets eliminate the traditional underconsumption problem for those consumers who pay the admission fee. But that doesn't necessarily make buffets more efficient.

It is an empirical issue which of these two pricing methodologies would lead to greater efficiency.

If, for example, everyone had the identical areas under their demands for a particular piece of music, then a buffet model would be ideal. Everyone would have the same willingness to pay for the buffet. As long as the sum of those values is equal to or greater than the cost of producing the music, a buffet price will be found where the music is produced. Everyone will pay the admission fee and everyone will consume the optimal quantity of this music. By comparison, at any positive a-la-carte price everyone consumes less than the ideal level. This would be clearly inferior to the buffet model. This is

illustrated in Figure 3 (which shows two buffet scenarios) where the market demand represent the aggregation of all consumers' willingness-to-pay for admission. D_2 is drawn to be horizontal to be consistent with the assumption that the willingness-to-pay for admission is the same for all consumers. It is easy to find an admission price (P_1 , say) that provided sufficient revenue to allow the product to be created and also allows all consumers to consume the good in unlimited quantities. There is no welfare loss in this case. If the areas under individual demand curves were similar but not identical the market demand for admission would be flat although not horizontal, but the story would be similar.

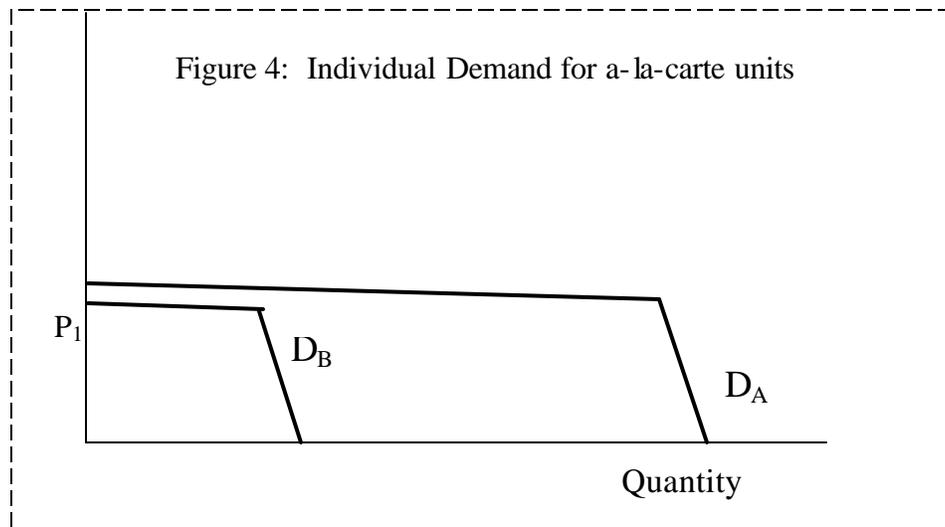


Alternatively, one might imagine a situation where there was a very wide dispersion in the areas under individual demand curves. For example, one might imagine a very large number of consumers with small demands and a small number with large demands. This is illustrated by demand curve D_1 in Figure 3 which represents a very uneven willingness-to-pay for admissions among consumers.

It is immediately apparent that the seller, who can only charge a single admission fee, must choose between a high price to the small number of high priced consumer or a much lower price which will attract a much larger number of consumers. If the cost of creating the music is a relatively large percentage of the entire area under the market demand for admissions there might be no admission fee that would generate sufficient revenues to allow the music to be created—a high fee would only allow the small number of intense users in, but the revenues would be insufficient, and a low fee would not provide sufficient revenues either because it left too much surplus with the large users.

Would an a-la-carte system be superior in this latter case? It could, if the demand for units of the underlying product are flat enough and at similar heights for different individuals. Figure 4 illustrates such a situation. Individuals of type A have a very high willingness to pay admission fees, and are those found on the left hand side of Figure 3 under the high portion of D_1 . Individuals of type B, of whom there are many more than type A individuals, are found on the long right hand component of Figure 3's curve D_1 . An a la carte price of approximately P_1 for each unit of the good would generate most of the potential revenue and lead to very small welfare losses.

The conclusion from this analysis is that neither a-la-carte (perfectly divisible) nor buffet based (lumpy) obviously dominate one another when we are in a world of zero marginal cost.



Price discrimination and DRM

In the small economics literature on DRM, it has been suggested that DRM and micropayments will lead to price discrimination and this has been hailed as a positive step by some (Liebowitz, Bell) and decried as a potentially horrifying result by others (Samuelson, Fisher). The current analysis raises doubts that DRM and micropayments should or could be classified as price discrimination at all.

The price discrimination claim is simple enough. Without DRM everyone pays the same price for a song or CD.⁶ DRM (assumed to include micropayments) allows the seller of the music to charge users based upon the amount of listening in which they are engaged. Heavy users of a song pay more than light users do. In this sense, DRM allows music sellers to charge music consumers in a manner that seems very similar to various tie-in mechanisms that monitor the usage of the product and increase the payments from the more intense users. As demonstrated in Liebowitz (1983), this monitoring version of tie-

⁶ Obviously, not everyone pays the same transaction price. But CDs (and downloadable songs) tend to sell for similar prices in most stores and the variation in the time spent listening to particular songs would seem to be much greater than the variation in prices paid for the songs. That this is true will be an assumption throughout the rest of the paper.

in sales is largely incorrect. Nevertheless, DRM appears to allow sellers to choose fine distinctions in setting price, and such distinctions would appear capable of fostering price discrimination.

Micropayments moves the market from a buffet to an a-la-carte solution. And it clearly forces different individuals to pay different amounts for their different uses, which appears as a form of price discrimination on first (and maybe even second) glance. But if we examine buffets and a-la-carte models more generally, we get the opposite result.

The buffet model for restaurants (where all consumers are charged the same admission fee) is clearly a case of price discrimination and in general we would expect buffet models to result in price discrimination. The price discrimination explanation is readily at hand in the case of buffet models in restaurants because the ratio of price to marginal cost clearly differs between customers who eat different quantities of food. Two customers come in, eat different amounts of food, and pay the same price. The price is the same, but the marginal cost is higher for the heavy eater, since additional food has a marginal cost to the restaurant and to society. This is price discrimination just as surely as if two customers came in, ate the same amount of food, yet paid different prices. Nor is there any cost difference between the customers that would justify charging a lower price per unit of food to the heavy eater. For buffet restaurants and most other buffet based markets, we can say that price discrimination is technically occurring although it is almost certainly not the likely motivation for the choice of buffets in restaurants, as already explained. Nor am I aware of vendors using this model being accused of price discrimination although technically they are doing just that.

As a general rule, buffets always lead to price discrimination when the admission fee is the same for everyone. A-la-carte pricing only leads to price discrimination when individuals pay different prices for units of the good. For goods with a positive marginal cost, some form of a-la-carte pricing is required for an absence of price discrimination. That does not mean, however, that all forms of a-la-carte pricing are non-discriminatory.

In every case, however, buffet pricing appears to be inconsistent with price discrimination as normally defined. Since CDs are currently sold on a buffet model, and DRM promises to convert that to an a-la-carte model, does that mean that DRM removes price discrimination, which is the complete opposite of the claim that has usually been made for DRM's impact on price discrimination?

The answer is 'not quite'.

Again, the typical results are altered, if not completely turned around, by the non-rivalrous attribute of intellectual products. The non-rivalrous nature of the product combined with the ability of technology to distribute the product at zero cost makes the marginal cost of providing the product virtually zero. At a zero marginal cost it is impossible to calculate the ratio of P/MC . If you cannot calculate this ratio you cannot determine whether consumers are the recipients of the differential ratios that indicate price discrimination. If food has no cost it is impossible to state whether the all you can eat buffet charging everyone the same admission price but a different price per unit of food, or the a-la-carte restaurant, charging everyone the same price per unit but different total prices, is guilty of price discrimination.

Of course, if there is a marginal cost in providing the intellectual product, even a very low cost, then the buffet is price discriminating and a-la-carte is not. This means that micropayments would eliminate the price discrimination that is otherwise found in the old fashioned CD or record.

Complications – depreciation and ownership

Divisibility is not only a function of the choice of pricing, as described above. It also depends on the nature of the ownership and the product itself. Up until this point I have assumed that music was kept in digital form at zero cost. That assumption has not been true in the past and is not true in many instances in the present. In this section I assume that there is a physical fixation of the digital product (on a CD, say), that this physical product is costly to produce, and that it might depreciate with use.

There are two questions that arise here. First is the nature of the depreciation of the physical representation of the music, which most recently has been on a CD but previously was on less durable vinyl records, which for the sake of realism we will use in the following example. If the physical manifestation (record) wore out with use (assume a 1:1 relationship) then it will make no difference whether the payment for the record was a function of the music consumed or a fixed amount per record.⁷ The two systems would result in identical payments by each consumer. This situation is equivalent to an a-la-carte result even when consumers pay only a single fixed payment for the record.

⁷ Since it requires scarce resources to produce records, a proper a-la-carte model would have a fixed cost for the CD independent of use and then a second payment that depended on the amount of use. Although this would look like a two part tariff it would actually be consistent with competitive pricing.

Take the case where the physical representation (fixation) of the music wears out with use, as was the case with vinyl records. Assume, first, that the music is sold in buffet style, meaning that there is a single fixed price per record. In this instance, those consumers who listened to particular albums with greater frequency than other consumers would need to purchase more versions of the album when the old records wore out. As long as the life of a record was short relative to the number of plays of the record undertaken by the typical consumer, the number of copies purchased of the same record would closely reflect the number of times the album was listened to, and the results would be the same as if the consumer paid for each individual instance of listening to this recorded music. The depreciation of the album, therefore, imparts to the music a form of a-la-carte pricing even when it is sold buffet style.

Since the CD has some cost of production it is efficient to charge for additional CDs. Since the music was already purchased, however, and the price of the CD is meant to mainly cover the cost of creating the music with the cost of the CD a fairly trivial component of the price, one might argue that replacement CDs should be sold at the cost of the CD, and thus at a much lower price than original CDs which .

Nevertheless, replacement records (or CDs) have not historically been sold at lower prices than initial purchase records. This means that if records had short enough lives music would historically have been sold in an a-la-carte mode.⁸

If the CD is immutable, or for practical purposes longer-lived than the usage to which consumers will put it, then we are back to a buffet model for the music.

⁸ If records last on average for more plays than most users are ever likely to give them then for those customers music consumption would still be a buffet model.

To put it another way, if the music is contained in pure digital form that does not deteriorate with use, then we have a somewhat more delicate question. There are then two products—the music and the vessel in which it is contained.

[to be completed]

The Role of Owning Versus Renting.

The buffet model versus the a-la-carte model plays an important role in the literature on tie-in sales. Durable goods, such as photocopy machines and printers, provide a bundle of potential outputs. The tie-in literature usually assumes that intensive users get more out of their machines than less intensive users and that sellers would like to find a way to charge them for this greater use. Textbook analyses discuss how tie-in mechanisms, such as requiring the photocopy machine purchaser to also purchase high priced toner, or requiring the purchaser of calculating machines to buy high priced hollerith cards, are forms of metering users that lead to price discrimination. Liebowitz (1983) demonstrates that this is often not the case, and that in many instances such tie-in sales are incapable of leading to any type of price discrimination.

This buffet versus a-la-carte model is playing out in a slightly different way in the digital download market. There are two competing models, one based on purchase (such as iTunes or Napster) and the other based on rental (Napster to go and xx).⁹ The tradeoffs appear to be largely the same as the tradeoff found in the cable television or restaurant example. Rental allows the listener to access an entire library of music for one fixed price, providing a far wider variety of products than could be achieved by any sort of

⁹ Rental has always been a possible option for sellers of products who wanted to simulate an a-la-carte model when it appeared that they might be forced into a buffet model.

purchase system at typical budgets. The downside of the download music buffet model, however, is somewhat different than for the typical buffet. Music tends not to get stale or cold, as do food buffets. Nor is the menu of selections in buffet music limited in the way that most food buffets are—one can order exactly the music that one wants, in any combination. The music buffet, therefore, would seem to enjoy the advantages of both markets—the consumption variety of a buffet and the precise choice of products as in an a-la-carte environment. What is still true for the buffet, however, is a failure to have a linkage between consumption and pay.

Application to Cable Television

What can this analysis tell us about another newsworthy market that is facing similar choices, the cable television industry? The same voices arguing to not unbundle music are arguing that cable should be unbundled. The current bundling of channels is decried by some as a monopolistic attempt by firms to generate more revenue from consumers (and profits to themselves) by using bundles instead of letting consumers pick and choose which stations they wish to watch.¹⁰

[to come]

¹⁰ See for example, Gene Kimmelman Dr. Mark Cooper Before the Federal Communications Commission Washington, DC 20554 MB docket No. 04-207 In the Matter of a La Carte and Themed Tier Programming and Pricing Options for Programming Distribution on Cable Television And Direct Broadcast Satellite Systems, Reply Comments of Consumers Union and The Consumer Federation Of America

Conclusions

[to come]

- Tom W. Bell Fair Use Vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine” 76 N. Carolina L. Rev. 557 (1998).
- Eric Schlacter, The Intellectual Property Renaissance in Cyberspace: Why Copyright Law Could Be Unimportant to the Internet, 12 Berkeley Tech L J 15, 38 (1997).
- David Friedman, In Defense of Private Orderings: Comments on Julie Cohen’s “Copyright and the Jurisprudence of Self-Help”, 13 BERKELEY TECH. L.J. 1151, 1168-71.
- Maureen A. O’Rourke, Copyright Preemption after the ProCD Case: A Market-Based Approach, 12 BERKELEY TECH. L.J. 53, 62, 70-71 (1997) .
- Yannis Bakos, et al., Shared Information Goods, 42 J.L. & ECON. 117, 119-48 (1999).
- Julie E. Cohen “Copyright and the Perfect Curve” 1800 VANDERBILT LAW REVIEW [Vol. 53:6:1799-1819.
- New York Times, “The Tyranny of Copyright?” Robert S. Boynton, January 25, 2004.
- Neil Weinstock Netanel, “Copyright and a Democratic Civil Society”, 106 YALE L.J. 283, 282-386 (1996).
- Tom W. Bell ‘Fair Use Vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine” 76 N. Carolina L. Rev. 557 (1998).
- Nahata, B., Ostaszewski, K., and Sahoo P., “Buffet Pricing” *Journal of Business* vol. 72, no. 2, 1999 215-228.
- Oi, W. "A Disneyland Dilemma: Two Part Tariffs for a Mickey Mouse Monopoly, Quarterly J. of Economics, Feb. 1971.
- Schmalensee. R. 1981. “Monopolistic two-part pricing arrangements” Bell Journal of Economics 12:445-66.
- Kitch, Edmund W. “Elementary and Persistent Errors in the Economic Analysis of Intellectual Property” November, 2000 53 Vanderbilt Law Review 1727.
- Yoo, Christopher S. "Copyright and Product Differentiation," 79 N.Y.U. L. Rev. 212 (2004)