

**SETTING PRICES IN AN ONLINE WORLD:
WHEN PRICE CUSTOMIZATION WORKS
(...AND WHEN IT DOESN'T)**

by

W. J. REINARTZ*

2001/28/MKT

* Assistant Professor of Marketing at INSEAD, Boulevard de Constance, 77305 Fontainebleau, Cedex, France.

A working paper in the INSEAD Working Paper Series is intended as a means whereby a faculty researcher's thoughts and findings may be communicated to interested readers. The paper should be considered preliminary in nature and may require revision.

Printed at INSEAD, Fontainebleau, France.

Setting Prices in an Online World: When Price Customization Works (... and When it Doesn't)

Abstract

Pricing is how a company transforms the benefits that it provides to consumers into the profits it receives. The most important pricing change on the Internet is a dramatic rise in consumers' ability to track prices and comparison shop. This rising transparency provides a challenging backdrop for organizations to implement dynamic price adjusting schemes (for example through auctions or sophisticated yield management solutions). Companies' desire to maximize profits by adjusting their prices to customers' willingness-to-pay must be tempered against the potential consumer backlash of perceived unfairness. For example, Amazon's customers were irate when it became public that Amazon charged different prices for the same DVD - depending on the purchase history of a customer. This article outlines the new challenges and opportunities with respect to price customization, both from a firm's and from a customer's perspective, and discusses the implications that arise in the online space.

By
Werner J. Reinartz

April 2001

Werner J. Reinartz is an Assistant Professor of Marketing at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France, Phone +33-1-6071-2648, Email werner.reinartz@insead.fr

This article has benefited from the comments of Professor Ron Adner, Professor Markus Christen, and Professor Subramanian Rangan – all at INSEAD.

Setting Prices in an Online World: When Price Customization Works (... and When it Doesn't)

It's a cloudy day in Manhattan – the weather forecast calls for a 60% chance of showers. Sidewalks are filled with people and business continues as usual. Umbrella vendors have put themselves up at street corners, lifting some of their umbrellas in the air. Just \$5 buys you an umbrella, at least as long as it doesn't drizzle. However, this price rockets to \$15 as soon as the first drops start falling. Nevertheless, people happily buy at the higher price ...

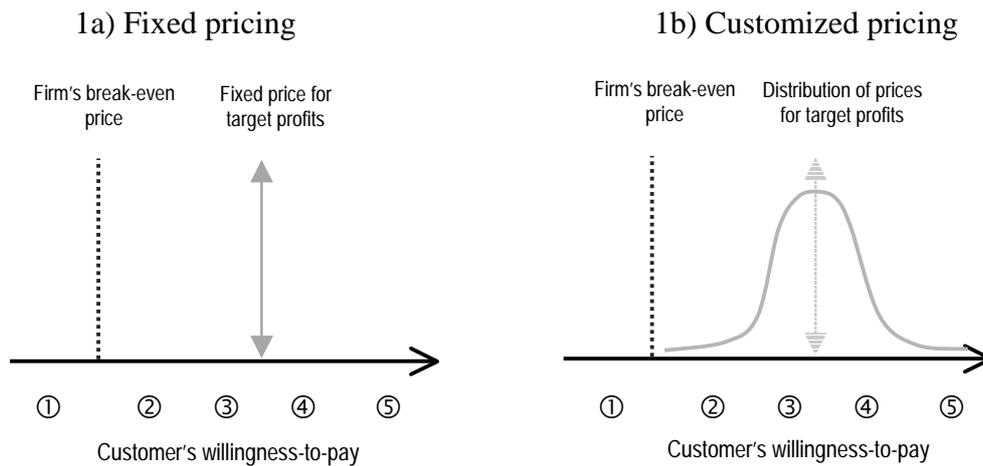
This situation probably depicts the concept of dynamic pricing at its best. Dynamic pricing is the dynamic adjustment of prices to consumers depending on the value these customers attribute to a good. In the Manhattan example, as long as it doesn't rain, people's willingness-to-pay is rather low. There is no need to buy now, which is correctly reflected in the prices vendors charge. However, as soon as it starts raining, the benefit of having an umbrella surges dramatically which is again picked up in vendors' price.

Underlying the concept of dynamic pricing is what marketers call *price customization*. Price customization is the charging of different prices to end consumers based on a discriminatory variable. In the above example, the key variable that allows for the pricing differential is the weather. For example, The Coca Cola Company is experimenting with dynamic pricing in the form of vending machines that automatically raise the price if the outside temperature rises and that offer a discount once it starts to chill. Another factor that has a long tradition of justifying price customization is for example the purchase quantity. Discounts are given to those buyers who buy in volume. A third type of price customization is made possible through obvious consumer segments. For example, price sensitive students receive discounts on software packages, in the hope that they will continue to buy, once they leave university. A fourth, classical type of price customization uses time as the focal variable. For example, public utilities vary their energy rates to commercial users by time of the day. A special form of time pricing is yield pricing, which is typically used by airlines. The closer the departure date of an airline flight, the higher the price charged for the ticket. Relatively less-price sensitive customers such as business buyers prefer the added flexibility of booking late, at the expense of a higher ticket price.

This overview shows nicely that price customization has become an important component of today's pricing practices and is hardly questioned by consumers. The most *ideal*

form of price customization, however, has not been implemented so far. Economists view the buyer's willingness-to-pay as the ultimate discriminatory variable (in economic terms *first degree price customization*). At least theoretically, this approach maximizes firm profits in economic terms and is therefore superior to all the other methods mentioned above (Armstrong and Vickers, 1999). Consider the theoretical situation depicted in Figure 1:

Figure 1: The Effect of Price Customization on Firm Profits



In the fixed pricing case 1a) the firm does business with customer 4 and 5 since their willingness-to-pay exceeds the firm's market price. Compare this with the customized pricing case 1b). Here, the firm does business with customers 2, 3, 4, and 5 since their willingness-to-pay exceeds the firm's break-even price. Instead of a single fixed price we now have a distribution of prices with the mean converging to the target price. However, profits will be much higher in case 1b).

Given that the system is so appealing in theory – what's the catch? The downside of customized pricing based on customers' willingness-to-pay looms large: implementation is extremely difficult. Besides finding out about individual willingness-to-pay, the sheer administrative cost of establishing individual prices proved to be prohibitive so far. Haggling and dealing may be common in a Middle-eastern Kasbah, but has proved prohibitively impractical in modern Western retail facilities.

However, according to believers, all this is going to change in an online environment: the Internet facilitates breaking down the traditional barriers towards price customization. As

Forrester's Carrie Johnston (July 17, 2000) believes, the time has come for firms to personalize prices to individuals. Likewise, Jupiter Communications predicts that Ecommerce involving dynamic pricing will leap to \$7 billion by 2004. One-to-one pricing is supposedly just around the corner.

For example, based on technology from @The Moment Inc., a San Mateo based company, the Seattle Mariners experimented with a new system to sell tickets to three Mariners baseball games. By creating an online marketplace they allowed the price of the tickets to fluctuate with the demand for the tickets. Baseball fans could check out the marketplace and find out what the game tickets were selling for at any given moment. They could either purchase right away or they could enter a lower reservation price at which the tickets were automatically purchased in case the price fell to that level. Without yielding any specific numbers, management claimed higher revenues as compared to the tickets' face value.

However, in spite of these promises, the first casualties can be observed. For example, in September 2000 Amazon experimented with prices on more than half of its top-100 DVD's. Depending on the particular movie and the discount offered Amazon offered, one customer could pay up to \$15 more for a DVD than another customer. Customers found out about this practice and the news spread like wildfire in Internet newsgroups. They expressed their anger at the company, saying that they felt hoodwinked by the random prices. Thus, by experimenting with one of the new wonder-tools of E-commerce, Amazon suddenly found itself in a defensive position in the press. Earlier in the year, customers found out that Amazon was experimenting with prices for a popular MP3 player – offering discounts randomly to different customers. After the latest event, the E-tailing Meister has promised to ban blind price fluctuations.

Thus, while the new technology liberates certain constraints of the offline world, the power of the consumer to look through elaborate new pricing schemes is on the rise as well. Without doubt, while the concept of online dynamic pricing has received significant attention, implementation can obviously become quite tricky. The goal of this article is therefore to analyze *when* and *how* it becomes a serious tool to consider as part of the online marketer's tool chest. We want to develop some boundary conditions as to when dynamic pricing makes managerial sense (and nonsense!) in an online environment.

For any type of price customization to work, five conditions must hold – regardless of whether the context is Old- or New-Economy. The conditions are that

- customers must be heterogeneous in their willingness-to-pay,
- that the market must be segmentable,
- the limited potential for arbitrage exists,
- that the cost of segmenting and policing must not exceed revenue increases due to customization, and
- that it must not breed violations of perceived fairness.

We want to discuss in what way the advent of the Web impacts on firm's ability to effectively employ price customization and thus be able to inch closer to dynamic pricing.

Condition 1: Customers must be heterogeneous in willingness-to-pay.

The most basic condition requires that there are in fact differences among customers in the market in terms of willingness-to-pay. That is, there are customers who have a higher willingness-to-pay and there are those who are only buying the product at the lowest price available. These differences in willingness-to-pay can have multiple reasons, some of which are: opportunity cost of time, the necessity to extend search efforts, product risk people are willing to assume, or perceptual differences in brand names. For most markets this condition is probably given. The condition is particularly strong in markets where brand name products and generic products co-exist (e.g. many groceries, apparel, tires). Another situation is given where markets are inefficient which is expressed by the fact that the price range (lowest to highest price for a particular product) is broad and consequently, search efforts in these markets are rewarded. Markets in which the condition of heterogeneity in willingness-to-pay holds the least are typically undifferentiated product markets such as commodities.

The question arising in an online environment would be whether online buying would lead to greater or smaller heterogeneity in willingness-to-pay. The current (limited) empirical evidence points to the fact that we are seeing more heterogeneity in willingness-to-pay. This is of course due to the increased price sensitivity of consumers when shopping online. For example, several studies have indicated that customers exhibit a higher sensitivity towards prices in comparison to offline shopping (Rangaswamy et al. 1999, Bakos and Brynjolfsson 2000). Furthermore, abundance of information and the fact that only a portion of the population has online access leads to greater heterogeneity in willingness-to-pay. This view is

echoed by Porter (2001) who contends that the Internet will likely lead to more competitive markets with lower profit margins.

Condition 2: The Market Must Be Segmentable.

While any product market might exhibit considerable latitude in customers' willingness-to-pay, it's a very different issue altogether to extract this from the market. For example, any mass-market doesn't lend itself well to price customization since all customers are treated the same. Pre-loyalty program grocery markets are an example: every customer pays the same for a particular product because the organization has no means of recognizing customers who have a higher willingness-to-pay. Two factors have helped firms in the Old-Economy to alleviate this problem. One is the ability to establish a linkage with a unique customer, typically in the form of a specific customer account number or the customer's address. For example, Florida-based Catalina Marketing Inc. has developed a system that tracks people's grocery purchases over time using their credit card number. The system tracks the content of the shopping-baskets and thereby builds an individual's purchase history over time. Manufacturers can now utilize Catalina's database for micro-targeting coupons to say the loyal buyer of the competitor's brand. Remember, offering coupons is one way to price-discriminate between different customers. The coupon is printed out at the checkout register and can be utilized on a later purchase occasion.

Figure 2: Catalina Checkout Coupon



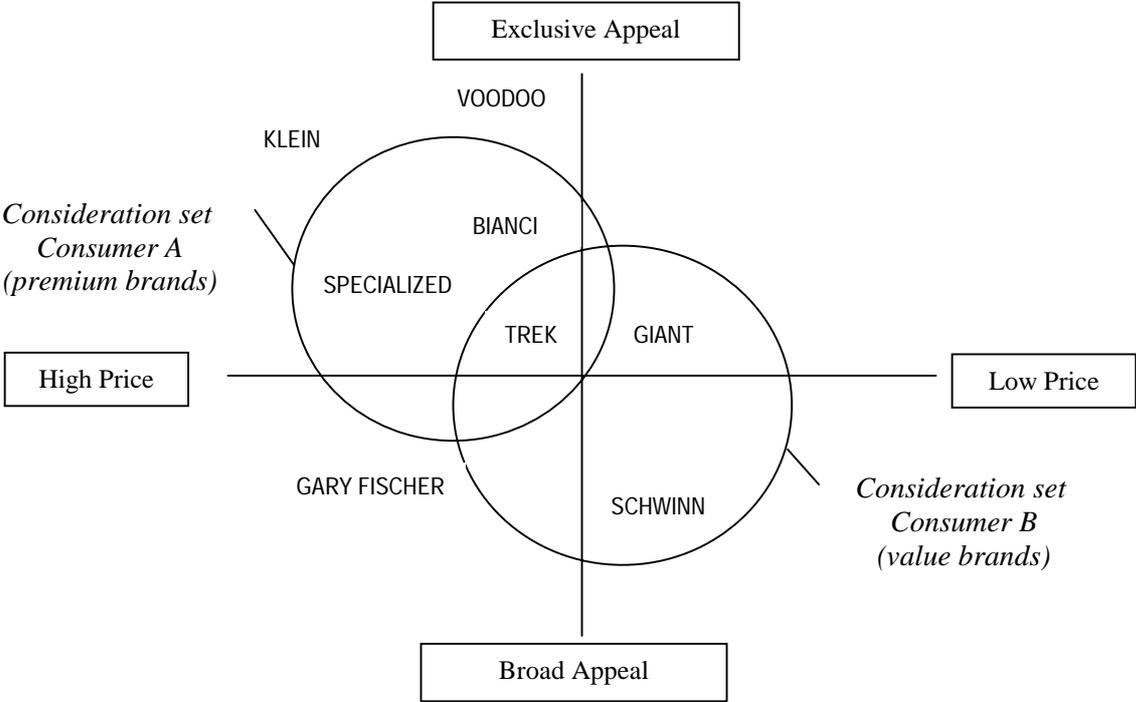
The other factor that has helped Old-Economy firms to alleviate the problem of segmentation is that of self-selection. In many buying situations, consumers may identify themselves as being a target candidate for price customization. Industries where self-selection is possible lend themselves to price customization. For example, by selecting the advance booking date for an airline ticket, customers reveal their degree of flexibility in terms of time and thereby in part their willingness-to-pay.

The advent of the Web has had a vital impact for the firm's ability to segment a market in terms of willingness-to-pay. An immense advancement is that a firm can now, regardless of industry, track individual customer purchases on the Web. Building up profiles over time allows firms to assess consumers' price sensitivity and to then start marketing campaigns either to individuals, or more likely, to segments that have varying degrees of willingness-to-pay. For example, while a price-sensitive online grocery customer might always sort products by price before choosing, non-sensitive customers might employ choice strategies that are driven by brand name, nutritional content, or another non-price variable. Furthermore, calculating average prices paid by product category and linking this over time is reasonably easy. Using this information, the supermarket can build relevant target profiles for new premium brand introductions versus cent-off coupons.

Consideration Set Marketing. A much more profound effect can be achieved through the so-called *consideration set marketing*. The rather small consideration set (as opposed to rather large awareness set) is the set of products that a shopper might consider nearly equally for including in her shopping basket. After going through an evaluation routine of the products in the category, shoppers reduce the possible choices to the consideration set. For example, consideration sets in the packaged goods industry have been shown to commonly consist out of 2-5 products. One reason why marketing in the Old-Economy is so inefficient is precisely because the consideration set of consumers is not known to the manager. The only thing that is typically known to the vendor is choice, i.e. the product the consumer actually bought. When a store knows something about a customer's consideration set it could direct its marketing effort with much more precision. Consider for example two customers who are in the market for a mountain bike (see Figure 3). Both customers have come down to choose a model by TREK, a quality-oriented manufacturer of mass-market bikes. Knowing only the outcome, one would not be able to distinguish the buyers in any fashion and would treat them as equal. However, their search behavior has a tremendously revealing effect about their

choice context. While Consumer A ends up choosing the brand out of a premium brand context, consumer B’s choice context was that of a value-oriented context. The inference is that consumer A’s willingness to pay is in all likelihood higher than that of consumer B.

Figure 3: Consideration Set Map for Bike Choice



Tracking the information search and browsing path of the two buyers is a mere by-product on the Web. Knowing the choice context via the consideration set gives managers an immediate benefit: it allows them to shed light on customers’ willingness-to-pay! Thus, firms’ inability to extract information about willingness-to-pay in the Old-Economy suddenly becomes much less of a problem using consideration set marketing in the online world.

Moreover, even without choosing any product, as is the example when people search for information about products, tracking the browsing path yields very valuable information about the consideration set. It’s a snap for CDNOW to suggest CD’s to their customers based on the CD’s these customers’ looked at previously. Again, knowing the type of products people look at, allows for inferences with respect to price sensitivity and willingness-to-pay.

Condition 3: Limited Arbitrage

The third condition for customized pricing to work specifies that consumers’ ability to arbitrage is limited. That is, a person who bought a product at a lower price should not be able to resell it for a profit to customers who have a higher willingness-to-pay. If this condition

does not hold, firms do not have an incentive to price discriminate. For example, since a cheap airline ticket, loaded with restrictions, is made out to a specific person, it cannot be resold at higher prices, thus effectively curbing arbitrage. In many categories, arbitrage is not a problem because the cost of doing so is not worth the effort, for example for groceries.

While the advent of the Web doesn't change the arbitrage criterion, we can observe some situations under which the Web effectively *creates* conditions that allow for potential arbitrage. For example, the UK electricals retailer Comet has a policy of matching competitors' prices in a given region. The company employs price customization based on geographical location: having a very low price for a washing machine in one region does not prevent it from having a higher price for the same appliance in another region. However, given that consumers typically do not know about the prices in other regions, arbitrage does not present a problem. The company now faces the quandary of pricing its products in its online store Comet.com. Given the boundary-less nature of the Internet, should they charge the lowest price of ALL regions on the Web? Clearly, this is an undesirable strategy. Thus, by creating transparency, online environments can actually help to *destroy existing well-oiled price customization schemes*. Consequently, firms must be acutely aware that the Internet not only creates opportunities for price customization but that it also may destroy them.

Condition 4: Cost of Segmenting and Policing Must not Exceed Revenue Due to Customization.

The fourth criteria that is necessary for a functioning price customization scheme is a reasonable cost of implementation. In an Old-Economy context, many potential price customization schemes were shot down by this criterion. They simply were not cost-efficient to implement. Airlines probably have some of the most sophisticated price customization schemes (the so-called yield management) which cost millions of dollars to implement. They have had huge success because these schemes lead to higher load-factors and to greater revenues than before. Other industries have only recently followed – the example of Catalina Marketing in the grocery industry was already quoted. The underlying driver that makes the cost efficiency of a price customization scheme less of a factor is technology advancement. This driver clearly plays in the favor of the online environment.

We suggest that many programs that were killed on a cost-efficiency basis so far will see a second chance on the Web. Priceline.com may serve as an example. Priceline.com allows travelers to name their price for an airline ticket booked at the last minute and get for example a \$290 ticket from Houston to Los Angeles as opposed to a \$1,200 full fare ticket.

Founder Jay Walker uses complex software that shops bids to major airlines and that gives an opportunity to fill unsold seats at marginal revenues. While there has been constant buzz about the price pressure that Internet-based businesses create for existing organizations, there are in fact many aspects about Priceline.com's business model that are quite attractive for the airlines. One is that Priceline.com constitutes an agent for the airlines through which they can generate additional revenues on seats that would have gone unfilled previously. Another aspect is that transactions through Priceline.com do not damage buyers with high willingness-to-pay since a number of serious restrictions are attached to those tickets. For example, travelers cannot specify an airline and they must be flexible with respect to departure times and stopovers. Probably the fundamental reason for Priceline.com's success is something else: it is its ability to keep the transaction between airline and customer a private matter. From a firm's perspective, Priceline.com effectively limits the Internet's detrimental effects of increased customer transparency. We will develop this key argument further in the next section.

A key reason why we have seen various organizations implementing the first versions of dynamic pricing schemes rests on the fact that the cost of segmenting and policing a price customization scheme has decreased due to new technology solutions. @TheMoment Inc., Catalina Inc., and Priceline.com are all examples of companies that have shifted the feasibility frontier of dynamic pricing schemes. Since the implementation efficiency was a considerable hurdle, we project that based on this condition alone, we will see a host of new price customization schemes in the future.

Condition 5: Must not Breed Violations of Perceived Fairness.

The fifth condition that must hold for a customization program to work hinges upon the fairness that a buyer perceives when she's dealing with a vendor. Perceived fairness is the degree to which the buyer recognizes that both parties in a transaction gain. If a buyer perceives the transaction as fair then she is satisfied with the outcome, if not, dissatisfaction is the result. For example, in the process of buying a used car the buyer often perceives unfairness because she lacks important information on the car's history in order to make an educated judgment.

Perceived fairness plays a pivotal role when discriminating on willingness-to-pay. However, as we explained in the introduction, price customization based on willingness-to-pay was virtually non-existent in the Old-Economy and thus, the role of perceived fairness

was not really a factor to consider. This is about to change dramatically. Since firms are in the starting blocks to utilize price customization based on willingness-to-pay, this condition receives a whole new meaning. This is contrary to the trend that other conditions (e.g. the condition of cost efficiency) are becoming less of an issue in online environments.

We argue that, by not observing the condition of perceived fairness, managers will be putting a customized pricing program at great danger. We furthermore contend that this is a *necessary condition*. This means that even if all the other four conditions are met, if perceived fairness is not taken care of, the program will be doomed. In order to explain this claim, an additional aspect needs to be taken into account: whether the supply of a good or a service is limited or not. For example, a seat on a particular airline is certainly a perishable item and thus limited in supply. The plane has only x number of seats and once these seats are sold or once the plane takes off, these seats are forever unavailable. On the contrary, a particular mountain bike or a packaged grocery good has a much more flexible supply. Notwithstanding certain distribution bottlenecks or production stops, these goods are available on an unlimited basis, at least theoretically.

We suggest that the implementation of a price customization scheme based on willingness-to-pay becomes much more feasible when a product is limited in supply than when it is not. Remember the case of the airline pricing (and increasingly also with hotel rooms and rental cars). A traveler has come to accept the fact that a seat neighbor has paid a price maybe half or even double of the own price paid. While we feel happy if we've gotten a bargain, we typically do not carry a grudge against the airline if the own price is on the higher side. This is simply because the individual seats and the prices attached to them are different. Whereas a 21-day in advance booking with a cancellation penalty may cost \$400, a 7-day in advance, no cancellation penalty ticket might cost three times as much. Even though the physical seat and flight features are exactly the same for the two tickets, the restrictions do vary considerably. Furthermore, people know that seats on a particular flight are limited in supply and that the price increases the fewer seats are available. It is these restrictions to which a consumer attributes the price differences and, as a result, perceives the price to be fair.

In contrast, consider the example where Amazon.com charged different consumers different prices for exactly the same DVD. The physical product is the same – as is the airline seat. However, with DVD's, supply is unlimited which makes all the difference from the airline example. Knowing that Amazon sells at different prices conjures up the image of a ruthless profit taker – something that is very incompatible with the notion of perceived

fairness. Even though customers don't know any specifics about Amazon's profit margin, they know at least that Amazon's purchase price probably didn't vary for a single batch of DVD's. Consequently, shoppers cannot help it but feeling deceived once they find out that they paid a higher price for the same product at the same store. One can even speculate that this effect might even be stronger with Amazon because the company has an image of being very customer-oriented. Thus, it is not surprising at all that Amazon's buyers were irate once the practice of charging different prices for the same DVD became apparent.

Fortunately, everything is not lost. Even if supply is not limited, companies have a chance of implementing differential pricing. A key strategy for the firm is to keep the transaction between customer and firm a private matter. If this can be achieved, there is chance for successful implementation. For example, in the case of Catalina Marketing, rebates for one customer are completely unknown to other buyers. Likewise, in the case of Priceline.com, the price paid is known only to the customer, Priceline, and the airline. It doesn't become in any way publicly known. This is key for the airlines because they don't want to alert the customers that paid higher prices. Although Amazon's transactions are theoretically only between a specific shopper and Amazon, they became public nevertheless. This was probably due to the anger of the high-price paying shoppers and the ease with which consumers can spread their opinion online. For example, for many large consumer goods companies there exists at least one site that acts as a consumer opinion market for that firm (e.g. Starbucked.com, Walmartsurvivor.com, ...). Thus, if companies are starting price customization schemes they should be aware of an age-old adage in marketing: relationships must be built over time but they can be destroyed in a single transaction.

A second strategy for firms to employ is the separation of offline and online operations. An example of a firm that recognized the danger of hurting existing customer relationship by charging differential prices for the same good is BN.com, the online subsidiary of bookseller Barnes & Noble Inc. When Barnes and Noble established its online subsidiary in 1997, it separated it completely from the mother – legally and operationally. While Barnes & Noble has been subject to much doubt for separating the two operations and thus for not being able to cross-promote and to leverage its brand name, the decision was entirely prudent in terms of not alienating its customers. Because BN.com charged lower prices than Barnes & Noble for the same books, they had no other option but to split. Thereby, they avoided their customers losing faith with Barnes & Noble because they would have perceived a lack of fairness.

A third strategy to cope with the increased transparency is to engage in product versioning. Versioning is the process of offering product line variations on the same underlying good (Shapiro and Varian 1998). The same holds for unique items, for example, used goods that are sold on online auctions. Online auctions, such as QXL or Ebay are nothing but price customizers on the basis of willingness-to-pay. Perceived fairness is much less of an issue in these situations because virtually no purchase can be replicated as is – thus justifying possible varying prices.

The fourth strategy is to put limits on the product's temporal availability or to make a product 'perishable'. If supply for a product is limited or if a product is perishable, then it can make much more sense to employ discriminatory pricing schemes based on willingness-to-pay. For example, this strategy has been working in the travel industry for decades already. Now there might be potential for other industries to use it as well.

Forms of Dynamic Pricing

We have outlined five general conditions that must be met for the implementation of price customization strategies. Based on the degree to which the five conditions are satisfied, firms can consider the implementation of two different versions of dynamic pricing: the weak form and the strong form.

Weak form of dynamic pricing. In the weak form of dynamic pricing, prices do change over time but they do not change across customers. That is, a product market becomes closer to a stock market where the price changes as a function of supply and demand. The earlier example of ticket pricing for Seattle Mariners baseball games fits this category. The fact that prices change over time is publicly stated and customers do know about this property. Furthermore, customer animosity is avoided by the fact that all shoppers pay the same price if they purchase at a given time. Thus, the issue of perceived fairness (or the lack thereof) is much easier to deal with. The only perceived unfairness issue that might arise is that shoppers might wonder, "What would I have paid if I had bought earlier/later?" That is, attribution of fairness in the mind of the buyer might occur along a single dimension.

The key issue for companies lies in the technological execution of auction-type or yield management-type solutions and in the compatibility of their products with this approach. As already discussed, products that are limited in supply, perishable, or versioned are best suited for this approach.

Strong form of dynamic pricing. In the strong form of dynamic pricing, prices change over time *and* across customers. From a buyer's point of view the situation becomes much more random. Amazon.com's DVD pricing experiment fits this category. The fact that prices change is withheld from the consumer and subject to secrecy. Certainly, animosity would be created if buyers would find out about this practice at any given time. Thus the issue of perceived fairness becomes fundamental as compared to the weak form. The attribution of perceived fairness (or the lack thereof) now occurs along two dimensions: prices may change over time *and* across customers. Thus, it becomes a potential double whammy!

The key for companies lies again in the technological execution. But more importantly, firms must ask themselves about the significance of durable customer relationships in their particular business. If relationship building is key to your firm's business, then the strong form of dynamic pricing is probably not for you.

Implications

The arrival of price customization schemes has multiple implications on managerial practice. The following discussion highlights the multi-layered repercussions.

- Internet technology will serve as a great enabling tool for making dynamic pricing accessible to many industries. However, while a technological implementability is a necessary condition it is no justification in and of itself: feasibility does not necessarily mean that it is also beneficial. Amazon can tell you a lesson about this.
- Price customization is not for everybody. If the bulk of your business depends on repeat transactions with a loyal customer base, you are likely to run into severe difficulties if you want to customize based on willingness-to-pay. Consider instead the numerous other price customization options that are at your disposal (e.g. time based, volume based, segment based, etc).
- Walk before you run. Before implementing a full-fledged strong price customization scheme, get your (and your customer's) feet wet with the weak version. In case of a snafu, possible damages are easier to limit.

- Ask yourself: how easy is it for the customer to find out? If you can't reliably conceal your dynamic pricing policy then you should rather switch to the weak form where everybody knows that prices do change. Also, be aware that, as the use of dynamic pricing will proliferate across firms, customers will become in general much more aware of this phenomenon. As a consequence, your prices may be subject to much more scrutiny from existing and new customers in the future.
- An additional difficulty is that consumers' willingness-to-pay is not fixed. Depending on the purchase occasion, this may change significantly. For example, while mostly buying goods for oneself, once in a while everybody shops for gift items. For example, buying a CD from a music category that doesn't fit one's own preferences clearly has an impact on what the online vendor suggests to the customer on subsequent visits. Unfortunately, these suggestions might be worth nothing if based on gift purchases. In the same vein, information on a customer's willingness-to-pay gets considerably distorted by relying on pricing information from higher priced gift items.
- One lesson from the preceding discussion is that one solution might be to create artificial limits on product availability. If you want to establish dynamic pricing, product differentiation based on limited availability is helpful. For example, increasingly, firms are selling 'versioned' items or 'limited editions' of the same product. The extreme case is of course the *limited edition of one*, which for example is practiced by Dell. Every computer they sell is unique because it reflects the unique set of choice options exercised by each buyer. When products become unique, they are also hard to compare on pure price terms.
- We will see a dramatic impact of dynamic pricing practice on price comparison engines (for example Bestbookbuys.com, Shopper.com). When price offerings vary by consumer, which price does the search engine pick up? Or – even more interesting, price comparison engines might develop a feature that runs multiple searches per query and yields the absolute lowest price. This would put a whole new threat to dynamic pricing schemes.

Given the multi-layered impact of customized and dynamic pricing on managers' practices, we summarize the available strategies in the following table.

Factors impacting the decision to adopt price customization	Implication for price customization	Possible resulting strategy
<ul style="list-style-type: none"> Firms capability of tracking buyer's browsing and buying path 	<ul style="list-style-type: none"> Key enabler of discriminatory pricing Capability of tracking <i>individual-level</i> interactions 	<ul style="list-style-type: none"> Establishment of weak and strong price customization Successful implementation of consideration set marketing Need to consider purchases that are made for different reasons (e.g. own use vs. gift)
<ul style="list-style-type: none"> Customer's capability of establishing maximum transparency in B-to-C interactions 	<ul style="list-style-type: none"> Formidable counterforce to firms' information tracking capability 	<ul style="list-style-type: none"> If possible, attempt to keep transactions 'private'. Track consumer opinions actively (consumer opinion sites, chatboards) Develop 'versioned' or 'perishable' items in order to justify price differences.
<ul style="list-style-type: none"> Purchase behavior of typical customer is based on repeat transactions 	<ul style="list-style-type: none"> For repeat transactions, price customization based on willingness-to-pay is tough to implement 	<ul style="list-style-type: none"> Consider other generic forms of price customization
<ul style="list-style-type: none"> Overall use of price customization schemes 	<ul style="list-style-type: none"> The more organizations start using elaborate price customization schemes, the higher the educating effect will be on consumers. 	<ul style="list-style-type: none"> Search engines conducting multiple price searches will arrive Consumer comparison shopping will prevail even more Independent advice engines will gain more popularity

Online pricing is still a young science and companies need to develop a clearer understanding of the tools at their disposal. Overall however, there seems to be a readiness in the market to adopt dynamic pricing policies. Managing the most advanced form of price customization, the one based on customers' willingness-to-pay, is everything but easy. Managing the tension between the increase in the firm's ability to effectively price customize and the customer's ability to see through these measures is essential. It's certainly not as straightforward as some make-believers suggest and more importantly, it is not for every situation. The good news is that by applying existing rules from marketing and economics, we can detect and specify the appropriate business contexts for making dynamic and discriminatory pricing schemes work.

References

Armstrong, Mark and John Vickers, "Competitive Price Discrimination," Technical Report, Nuffield College, Oxford (1999).

Carrie Johnston, "Personalized Pricing Vendors: Not Ready for Retail," The Forrester Brief. (July 2000).

Michael Porter, "Strategy and the Internet" Harvard Business Review, (March 2001).

Venkatesh Shankar, Arvind Rangaswamy, and Michael Pusateri, "The Online Medium and Customer Price Sensitivity," (1999), Working Paper.

Carl Shapiro and Hal R. Varian, "Information Rules" (1998), Cambridge: HBR Press.

Michael Smith, Joseph Bailey, and Erik Brynjolfsson, "Understanding Digital Markets: Review and Assessment," in Understanding the Digital Economy. (2000), Cambridge: MIT Press.