

Detering Fraud: The Role of Resale Price Maintenance*

Introduction

The economics of fraud, like the economics of information itself, enjoys a limited but growing literature. While economists since Alfred Marshall have recognized the importance of brand name capital and reputation in protecting consumers against fraud (Marshall 1949, 4:xi), only recently has the profession been able to build rigorous models for analyzing market transactions in which the quality of traded goods is subject to uncertainty and deception.

In a pioneering paper, George Akerlof (1970) presented a model in which buyer skepticism about the quality of privately offered used cars becomes so intense that all potential sellers of nonlemon used cars are driven from the market, leaving it entirely populated with lemons. As analyzed by Michael Spence (1973), this phenomenon may occur because nonlemon owners lack adequate signaling mechanisms, specifically, "an effective signal would be an activity or character-

Using a model like that of Klein and Leffler's, we demonstrate theoretically that a manufacturer's desire to signal relative quality differences by relative retail price differences may be thwarted by the misleading markups of independent retailers. Resale price maintenance is one instrument that a manufacturer can use to avoid this problem. We present empirical evidence from a recent antitrust case in which forcing a manufacturer to drop resale price maintenance did lead to misleading (and also higher) markups.

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istic which (a) costs more, the lower the quality of the car, [such that] (b) the costs do not simply swamp the gains from signaling quality to the consumers." While a cheaply enforceable warranty from an established used car dealer can fit these criteria, one from a random private party may not.

As shown in recent papers by Benjamin Klein (1980) and Klein and Keith Leffler (1981), the qualitative differences between privately and commercially offered used cars originate in the weaker incentives of commercial used car sellers to make fraudulent quality claims. This result does not depend on the ability of deceived parties to sue for, win, and collect legal damages. In the Klein and Leffler model (1981) firms perpetually honor their quality claims entirely because the quasi rent gained from fraudulently substituting inferior models is smaller than the present value of forgone future sales at high-quality prices, which become unsustainable once the ruse is detected.

We use the Klein and Leffler approach to consider the special problems of the multiple related product firm reaching consumers through independent retailers with incentives of their own. Specifically, the paper examines a retailer strategy involving free riding on the manufacturer's brand name capital to the detriment of consumers. It will be demonstrated that resale price maintenance (r.p.m.) can deter this strategy. Finally, some empirical evidence concerning the model will be examined.

The Limitations of Conventional Resale Price Maintenance Models

The starting point of the analysis must begin with the observation that the traditional theories do not adequately explain much resale price maintenance in the real world. Until recently, only three well-developed models have been presented (Posner 1976), namely, the retail cartel model, the manufacturer cartel model, and the Telser special services theory.

In the retail cartel model, resale price maintenance is imposed by a manufacturer acting for a retail cartel. In this model the manufacturer's enforcement of the price policy—necessarily against his interests—serves to police and stabilize the cartel. In practice, the number of retailers, the ease of entry into retailing, and the absence of suitable collusive mechanisms such as trade associations do not often favor this model.

In the manufacturer cartel model, collusion has been achieved at the factory level, and resale price maintenance is imposed as a policing device. According to one version of this model (Posner 1976, p. 67), the manufacturer who cheats the cartel by secretly cutting price to retailers gains the sale of no added units. This is said to follow because the price that the consumer pays—and hence the number of units sold at both

levels—is invariant under resale price maintenance. Since price cutting by the manufacturer cannot increase the units sold, the incentive to break the cartel is weakened and perhaps destroyed.

However, the incentives for retail stores to carry and promote the chiseler's product at the expense of colluding rivals weaken the ability of r.p.m. to stabilize a manufacturer cartel. In any case, this model of r.p.m. must be rejected in the common situation when only one or a few manufacturers maintain retail prices (Overstreet 1983, pp. 83–105).

A model of resale price maintenance that frequently has been considered benign has been proposed by Lester Telser (1960).¹ In Telser's model, retailers are the least-cost means of delivering valuable information regarding a manufacturer's product to potential buyers. Yet, even though consumers value this information more than the cost of providing it, a suboptimal flow of information will be supplied without r.p.m. This outcome occurs because retailers cannot charge for the information they supply. Thus nothing prevents a consumer from receiving product information supplied at a cost by one retailer and subsequently buying the product from a discounter that is selling at low prices solely because it supplies no information. Under such circumstances, the retailer providing consumer information cannot recoup his costs, so product information is supplied at suboptimal levels if at all. Resale price maintenance, on the other hand, directs all competition into nonprice modes. Thus, retailers will compete by providing valuable but otherwise unavailable information.

When applied to complicated and/or search goods such as stereo equipment, personal computers, or furniture, the special services theory appears potent.² But Telser's special services theory cannot readily account for the purely vertical r.p.m. of many relatively simple repeat-purchase items involved in recent Federal Trade Commission complaints, among them Florsheim shoes, London Fog raincoats, Levi-Strauss jeans, Pendleton shirts, See's candies, Gant shirts, and others.

Recently, research on resale price maintenance has both extended Telser's work and introduced new rationales for r.p.m. (Bittlingmayer

1. William Comanor (1985) and F. M. Scherer (1983) dissent. They argue that information may be more valuable to marginal consumers. Thus, manufacturers who can control information services through r.p.m. may oversupply such services.

2. For all its insight, Telser's seminal paper fell prey to three sources of confusion that bedevil the literature to this day. First, r.p.m. is rarely, if ever, the substitute for retailer selection, which the paper makes it; typically, manufacturers that impose r.p.m. are also extremely selective about their retail networks. Rather, the practice should probably be viewed as a policing device for ensuring that the selected retailers adhere to the manufacturer's policies. Second, r.p.m. need not be imposed by means of the fair-trade laws. Measuring the effect of the fair-trade laws does not measure the effect of r.p.m. Third, Telser implies that the manufacturer needs consciously to understand his model in order to impose the policy wisely. The manufacturer needs only to know the ultimate relation between r.p.m. and profits.

1983; Mathewson and Winter 1983*a*, 1983*b*, 1984; Overstreet 1983; Marvel and McCafferty 1984).

The first of these, the quality/style certification model of Marvel and McCafferty, focuses on retail stores that carefully screen potential products for quality and style, carrying only those that meet its high standards. Screening comes at a cost, however, and always with the danger that competing retailers that do not screen can simply copy the product assortment at the high-quality store and sell for less because they do not bear screening costs. By assuring that screening stores do not have to meet price competition from others that do not screen, the threat is reduced under r.p.m.

The Mathewson-Winter papers explore the problem of monopoly or market power at the retail level. In such a situation r.p.m., by functioning as a price ceiling rather than as a price floor, can prevent the retailer from charging his own monopoly markup. Thus r.p.m. can benefit both consumers and manufacturers by limiting retailers' exercise of market power. This problem also is briefly mentioned by Overstreet (1983, pp. 39-41) and by Bittlingmayer (1983). Of course, the avoidance of a two-stage monopoly markup often has been cited as a private and social gain of vertical integration (Allen 1971).

Bittlingmayer similarly posits r.p.m. as a private and socially beneficial form of price regulation. However, Bittlingmayer stresses that r.p.m. may be imposed to achieve equilibrium, which in practice means to avoid chaos and instability in the downstream sector. He presents some interesting historical examples that seem to fit his theory. Thus there may be a basis for the fear that businessmen sometimes express of competition in complementary or downstream sectors, where ordinary economic analysis would predict that such competition would make them better off.

The Misleading Markups Model of Retailer Free Riding

The new model that can account not only for some otherwise puzzling resale price maintenance but also for some full-line forcing can be constructed as follows. For simplicity we assume that a manufacturer produces two different versions of one good with differing quality. While the quality of particular versions of the product is assumed to be known to the manufacturer and to retailers, it is unknown to consumers until after purchase and use. Quality in this sense has been labeled an "experience" characteristic by Phillip Nelson (1974). Durability is an example of such a trait, but a number of others can be imagined, depending on the product. The higher-quality good costs more to produce.

In the absence of Spencian signaling (warranties and so forth), consumers regard models offered at identical retail prices as qualitatively

equal regardless of stylistic differentiations. In addition, consumers are assumed to have prior favorable beliefs concerning the brand's expected quality in relation to its retail price. In other words, *ex ante* they expect future purchases of the manufacturer's products to be what Nelson calls a good buy. These expectations are rational and change in response to changes in relative prices and to changes in quality that are observed only after purchase and use.

As Klein and Leffler note, one temptation faced by a vertically integrated manufacturer is to trick consumers by substituting inferior goods for its better products. However, doing so is not necessarily profitable. In the Klein and Leffler analysis, the integrated manufacturer continues the "honest" policy by providing high-quality goods as long as

$$\frac{QR_F^M}{QR_H^M} \leq \frac{1+r}{r}, \quad (1)$$

where QR_F^M is the one-period quasi rent from using a fraudulent or misleading price (selling the lower-quality good at the higher price), QR_H^M is the perpetual quasi rent from the honest pricing policy, and r is the interest rate for the period necessary for consumers to become informed.

Rewriting in terms of the additional quasi rents collected for one period of trickery, ΔQR^M , the condition for honest policy can be expressed as

$$\frac{QR_H^M + \Delta QR_F^M}{QR_H^M} \leq \frac{1+r}{r},$$

or, more simply,

$$\frac{\Delta QR_F^M}{QR_H^M} \leq \frac{1}{r}. \quad (1')$$

The quasi rents of honesty depend on price and salvageable marginal costs. If prices are too low, condition (1') cannot be met and honesty does not pay. Therefore, in equilibrium, the higher-quality good will not be provided. Klein and Leffler demonstrate that a price sufficiently above salvageable production costs to make honesty the best policy is likely to exist (although it may not be sustainable as an equilibrium price).

Introducing another layer of distribution by an independent retailer alters things. To simplify, we assume that one retailer behaves perfectly competitively except for possibly using misleading markups. We initially assume that all the manufacturer's goods are priced at retail so that the prices reflect quality across the entire line in the retail outlet. We demonstrate that the incentives of independent profit-maximizing retailers can make this desirable situation an unstable one.

One retailer strategy, which we can call the misleading markup strategy, consists of pricing the lower-quality models identically to the higher-quality ones from which they are *ex ante* undistinguishable. To the extent that the lower-quality-lower-wholesale price models are retailed at higher-quality prices, the retailer captures a rent. Since the brand name is associated with the manufacturer, he is blamed by the consumer, not by the retailer.

This is an example of the general problem that manufacturers have in policing the behavior of retailers who have no stake in the firm-specific asset used in production yet who can influence quality of the final product as received by consumers. The retailer faces an externality. A single retailer will continue the honest pricing (markup) policy only if

$$\frac{\Delta QR_I^R}{QR_H^K} \leq \frac{1}{r}, \quad (2)$$

where the retailer's quasi rents are defined analogously to the manufacturer's in equation (1'). Even if there were no externality among the retailers, there is an externality here between the retailer and the manufacturer. The retailer, by adopting misleading markups, harms the manufacturer's future quasi rents as well as his own. Thus the extra quasi rents for the manufacturer or for one retailer are identical, being simply the extra price obtained for the lower-quality goods. However, the sacrificed future stream of quasi rents, QR_H , under the honest pricing or markup is lower for the retailer than they would be for an integrated manufacturer. Thus,

$$\frac{\Delta QR_I^R}{QR_H^K} > \frac{\Delta QR_I^M}{QR_I^M}, \quad (3)$$

and a single retailer would be more likely to use a misleading policy than would an integrated manufacturer.

When we consider large numbers of independent retailers, the externality problem becomes substantially worse. If, for simplicity, we suppose that consumers' choice of retailers is purely random with equal probabilities and that quasi rents are proportional to sales, we can relate the quasi rents of the one retailer to those with n retailers:

$$\Delta QR_I^r = \frac{1}{n} \Delta QR_I^R, \quad (4)$$

$$QR_H^r = \frac{1}{n} QR_H^K, \quad (5)$$

where the lowercase r superscript refers to the individual retailer when there are many. However, with random choice of retailers, any one individual retailer no longer sacrifices all the future quasi rents of the honest policy by one period of using the misleading markup. The future

lost quasi rents are spread equally among all retailers because the manufacturer is blamed by disappointed customers. The future losses over all retailers as a group resulting from one retailer's dishonest markup are $(1/n)QR_H^R$. Therefore, the lost future stream of quasi rents for any one retailer is one- n th of that, or $(1/n)^2 QR_H^R$. Thus the condition for honest policy, if there are many retailers, becomes

$$\frac{\frac{1}{n}\Delta QR_F^R}{\left(\frac{1}{n}\right)^2 QR_H^R} \leq \frac{1}{r}, \quad (6)$$

or, simply,

$$\frac{n\Delta QR_F^R}{QR_H^R} \leq \frac{1}{r}. \quad (6')$$

Obviously, the incentive to cheat with the misleading markup rises as the number of retailers rises.

Realistically, there are many other considerations. Some moderate the fraudulent markup problem, and some intensify it. These are discussed below.

Discussion

Under misleading markup pricing some revenues will be lost from consumers who would have been willing to buy the lower-end models at a low price but who will buy nothing under the higher misleading markup price. Since we have assumed that consumers expect the quality-price ratio to be constant for a given manufacturer, these shoppers will now select the brands of other manufacturers.³

But, because comparison shopping involves search costs, especially when the models are also differentiated in ways unrelated to quality (style, color, and so on), few sales may be lost to other stores whose prices continue to track quality.⁴ In the present, therefore, the retailer will find profits decidedly rising under the misleading markup strategy.⁵

3. Of course, some consumers who would have bought the lower-quality-lower-price model when both options were present in the store will buy the low-quality marked-up model when it is the only option offered.

4. Once the consumer has expended the cost of arriving at a particular store, the marginal search cost of screening a few competing products within the same store is frequently trivial compared to that of finding the same brand and model at a competing store (Steiner 1984). As such, the retailer who loses some sales of particular brands under misleading markup pricing may find solace in the sale of competing brands within his store.

5. Here our model radically differs from that of Marvel and McCafferty. In their world, a retailer's reputation is an input into a consumer's decision to buy the product, and brand-name capital rests primarily with the retailer rather than with the manufac-

Ex post, those consumers who buy the lower-quality models will be disappointed at making a bad buy, that is, quality will be less than they expected. In the future they will rationally expect a reduced quality-price ratio for the brand, even if they discover the retailer's trick.

Of course, those consumers who learn of the retailer's deception will rationally buy fewer goods with unknown qualitative features from the same retailer in the future. Nonetheless, if such consumers truly behave as if sunk costs are sunk, they will not withhold future purchases of goods of known quality. But, perhaps most important, very few consumers will discover the subtle fraud.

Loss of future purchases of other products by customers who do not discover the fraud are clearly zero. Their disappointment with their poor buy does not damage the credibility or reputation of the retailer when the ruse goes undetected. On the contrary, the unsuspecting consumer will rationally project his disappointment with the quality of the product onto the manufacturer.⁶

While the retailer will lose future sales of the manufacturer's products from disappointed but unsuspecting consumers, the store itself will suffer only a portion of the entire sales loss caused by its conduct. Much of the rest will be borne by competing retailers stocking the brand. Had the deceitful retailer sustained the entire loss, the fraud would not have been as profitable, especially if the retailer's capital for the manufacturer's goods was very specific.⁷ But it still might be profitable.

Two separate mechanisms affect other retailers. The downward adjustment of consumers' quality/price expectations will cause an overall loss of demand that will be shared by all vendors of the product. But to the extent that misleading markups lower the average price of the manufacturer's line within a store (even as lower-end prices rise), competing honest retailers can develop false reputations for being expensive overall. It is easier for consumers to make interstore price comparisons among strongly branded items than among the host of weakly branded unadvertised products that stores typically also carry (Steiner

turer. This situation is most likely to arise when there are a large number of differentiated goods and/or a rapidly changing fashion element (Steiner 1984). In such cases, search costs can be drastically reduced when the consumer can rely on the good name and reputation of selected vendors. In our model, however, it is the manufacturer, not the retailer, who carries the greater brand-name capital. Circumstances vary, but we think that the empirical facts favor our view for most observed uses of r.p.m. For example, most resale price maintenance cases involve very familiar brands. (Overstreet 1983, pp. 84-105, 177-98). It is hard to believe that consumers rely on the screening and assurances of local retailers that these products are worth purchasing.

6. On the other hand, following Marvel and McCafferty, if the product is weakly branded, the disappointment over a poor buy will rationally be projected onto the retailer.

7. This may be one explanation for the high degree of brand-specific investment that many strongly branded goods ask of their authorized retailers.

1984). If interstore search costs exist and if consumers see relatively high prices on strongly branded items at a particular store, they will rationally (if incorrectly) conclude that the store in question is simply relatively expensive overall.

Such a store has two potential defenses. The simplest is to drop the product in question. However, as Marshall recognized, retailers must handle certain strongly branded items because consumers expect them. If they are to do so without loss of overall reputation and competitive position, the alternative may be the competitive, as opposed to the fraudulent, induction of misleading markups.

Thus, in yet another variant on the classic free-rider problem, policies that may be harmful for retailers as a whole may be quite profitable for individual stores. Over the long run, as consumers reduce their prepurchase expectations of quality, sales of the higher-end lines will decline. The situation approaches that of the Akerlof lemon market, in which consumer uncertainty regarding quality becomes so great that only lemons remain. Here the victim's average quality level may sink to that of his lowest models, which may, of course, be well above lemon, or even average, quality for the industry.

The Role of Resale Price Maintenance

Resale price maintenance, especially when implemented through factory preticketing with the maker's logo, represents a manufacturer's counterstrategy against such misleading markups. In a word, r.p.m. can deter retailer free riding on manufacturer brand-name capital. The consumer, viewing differing factory preticketed prices for a company's models, has received a message from the manufacturer that quality levels differ, outward appearances notwithstanding. In effect, preticketed prices from a company with brand-name capital stake the good name of the company on the claim that the given model is in a distinct price/quality category. In this view, the manufacturer supplies not only the products themselves but also quality-grading services.⁸

Under resale price maintenance, the store pursuing the misleading markup strategy must remove the preticketed price and substitute its own. Manufacturers can and do make this a costly and laborious process by appending tamper-resistant price labels, thereby deterring misleading markups.

Further, as Mathewson and Winter (1983a) and Bittlingmayer (1983)

8. While these two functions are usually combined, they need not be. The company that sells under its own trusted brand name products made by an unknown firm may be supplying little more than a grading service, e.g., Winchester rifles made by Olin Koden-sia of Japan. This can economize on consumer resources, especially when consumers are poorly informed about the characteristics of particular products. This also explains the sale of unrelated products by the same manufacturer as a consumer information device.

note, r.p.m. imposed as a price floor can radically reduce the price variation both above and below the maintained price. For example, suppose that a price floor is imposed somewhere in the midst of a retail price distribution. Price cutters will readily come to the manufacturer's attention through the complaints of competing retailers. These deviants can be brought into line through some form of disciplinary action. On the other hand, charging above the preticketed price advertises that the store in question is relatively expensive. For the reasons we have already cited, this can be a particularly disastrous signal when the item in question is strongly branded. We think it is rarely, if ever, done.

On the other hand, margins maintained under r.p.m. are frequently low for the industry and product class. At least two mechanisms are at work. First, heavily branded items turn over relatively fast, so retailers' capital costs per unit sold are low. Moreover, if the product is so heavily branded that consumers insist on seeing it in virtually every retail outlet, manufacturers can further squeeze retail margins—often far below those of customary unbranded goods.⁹

To whatever extent threshold effects come into play, full-line forcing can further undermine the incentives for free riding, especially when the full line is enforced in some fixed proportion. For example, the ultimate implementation of misleading markups is for a retailer to stock only the lower-end products and to advertise heavily low prices on "famous maker" products. "Brand X for Less" would be an example of the type of advertising we have in mind. By reducing the relative number of units on which misleading markups can be taken, full-line forcing can serve to deter the strategy.¹⁰

Alternative Manufacturer Strategies

A skeptic may ask, "But why resale price maintenance? After all, the manufacturer has alternative methods actually in use for deterring misleading markups." This is true, but the alternatives can be less efficient. Further, most other methods can be used in conjunction with r.p.m. They are not necessarily substitutes.

One such counterstrategy, namely, that of grading the models in the

9. It is entirely possible that average retail prices would rise in the absence of preticketing and retail price maintenance even when some retailers willingly discount below the preticketed retail price. Discounting a strongly branded item below the prevailing maintained price levels can bring so many shoppers into a store that it can often pay to take substantial losses on such an item. Yet negative or minuscule margins cannot be sustained by retailers as a whole. Conversely, in the absence of preticketing and maintained prices, retailers may revert to the heftier standard percentage markup typically observed in the trade.

10. Strictly speaking, the manufacturer need not force the entire line but only limit the relative quantity of lower-end products.

factory as good, better, and best, is inappropriate when the quality classes exceed three and/or when the entire line is well above average quality. But more important, unlike suggested pricing schemes, ordinal rankings yield no information concerning quality in relation to price; proportionate pricing suggests proportionate qualitative differences, while "good, better, and best" leave the matter moot.

The importance of relative price in signaling relative quality is underscored by Klein and Leffler. Consumers view the price differences as reflecting quality differences partly because the price differences themselves provide the additional quasi rents necessary to give sellers the incentive to continue the honest, high-quality policy. Thus, rational consumers may distrust some other quality indicators if they are not accompanied by the appropriate relative price differences. Consumers realize that manufacturers will not continue in the long run to provide the higher-quality goods unless they can recover at least their higher production costs.

An alternative channel of consumer information is that of Spencian signaling. But, as mentioned earlier, an effective signal is a product attribute whose cost is negatively correlated with product quality. As Spence notes, effective signals may be unavailable or too costly in many cases. For instance, a shoe manufacturer, making two quality classes of shoes, one of which is easier to keep polished, may lack adequate signals. While warranties may be good signals for durability (because the cost of warranties varies inversely with the quality of durability), they are irrelevant for the quality just postulated. Likewise, signaling problems may exist for lawn mowers that require reduced routine maintenance or for garments with long-lasting dyes. Thus, for many categories of goods, signaling unobservable qualitative differences may be impossible (as in the used car market) or prohibitively expensive compared to r.p.m. And, even for easily measured characteristics, warranties are costly to provide.

Vertical integration into retailing represents a third alternative but an impractical one in the great majority of cases. The market is too thin for, say, a lightbulb store: yet, imaginably, r.p.m. may provide a useful qualitative index for a manufacturer of lightbulbs.

Still another possibility is fragmentation of the product line, that is, the development of separate brand names over the product assortment. This can solve the problem of misleading markups at the loss of economies of scope and scale in manufacturing, advertising, and distribution. Still it is sometimes observed, particularly in the consumer nondurables industries.

A final counterstrategy against misleading markups is to restrict distribution to extremely high margin retailers with truly exceptional community reputations, for example, the shops on Rodeo Drive in Beverly Hills. Should the manufacturer select this counterstrategy, however,

long-run retail margins are likely to be higher and the number of retail outlets lower than under r.p.m. Consumer welfare and the manufacturer's profits may suffer. The results under this counterstrategy sharply contrast with the predictions of all three traditionally accepted r.p.m. models but especially with those of the Telser special services model, which links r.p.m. to both higher margins and restricted channels of retail distribution. Paradoxically, the absence of minimum r.p.m. can mean even higher retail prices as the manufacturer seeks less efficient alternative means of protecting consumers from retailers. Such differences notwithstanding, the present model can complement the special services model: r.p.m. can simultaneously both induce retailer services and provide consumers with indices of unobserved quality over a manufacturer's product line.

The Famous Shirtmaker Antitrust Case

Some interesting empirical tests of the misleading markup model have originated from a series of recent r.p.m. antitrust cases against a well-known shirtmaker of high reputation. Under the terms of a consent agreement negotiated with the government, the shirtmaker agreed to discontinue all preticketing and suggested prices for several years. In addition, the consent decree also required the shirtmaker to notify its authorized dealers in writing of their right to set retail prices. As a consequence, data embodying the effects of free pricing became available to us.¹¹

Although the famous shirtmaker produces hundreds of products, its strength appears very concentrated in only four "basic" shirts, each sold with scores of color and pattern variations. None of these models are distinguished by any recognizable model name but only by a combination of seven numeric and alphabetic characters. Although all the maker's shirts are apparently of exceptionally high quality compared to competing brands, one of the four (model D hereafter) is inferior to the others in the basic series. While model D is almost indistinguishable in the store, the coarseness of its weave renders it relatively uncomfortable in actual use. Table I shows the history of pricing under r.p.m.

As one can see, the manufacturer was setting margins at about 92%, below the traditional "keystone" markup of 100%.¹² Further, the shirtmaker was maintaining a \$1.00 spread at retail between the lower-quality model D and his other basic shirts, models A, B, and C, from

11. These data were the donation of a government agency, which, because of litigation in progress, has not authorized us to identify further the product. The data reported in this paper were collected in two field surveys of prices and in one larger telephone survey.

12. Depending on turnover rates, retail markups are often a "standard" multiple of the manufacturer's price. For high-quality, weakly branded apparel, the ratio of the two prices often is 2.0. This markup is known as "keystoning" in the trade.

TABLE 1 History of Pricing and Markups: Famous Shirtmaker Basic Models

Season	Manufacturer's Price (\$)		Retail Price (\$)		Markup Ratio	
	Models A, B, C	Model D	Models A, B, C	Model D	Models A, B, C	Model D
1973-74	11.00	10.15	20.00	18.50	1.818	1.823
1974-75	13.20	11.65	24.00	22.00	1.818	1.889
1975-76	13.25	12.15	25.00	23.00	1.887	1.893
1976-77	13.50	13.00	26.00	25.00	1.926	1.923
1977-78	15.05	14.55	29.00	28.00	1.927	1.924
1978-79	16.10	15.60	31.00	30.00	1.925	1.923
1979-80	18.00	17.00	...	...	...	...
1980-81	20.00	19.25	...	...	...	...
1981-82	22.00	21.25	...	...	...	...

NOTE.—Missing data indicate that r.p.m. was dropped, following consent decree.

1976-77 on. The manufacturer relied on the retail price difference, making no other effort to distinguish the models.

Misleading Markups

We also have information on pricing, after r.p.m. was ended, in the form of three pricing surveys taken in 1981. Two field surveys, shown in tables 2 and 3, provide direct evidence in support of the misleading markup model. The larger of the two surveys, shown in table 2, was taken in the summer of 1981. Fully 18 of 21 stores were charging identical prices for model D despite its lower quality, lower wholesale price, and history of lower preticketed retail prices. The average price difference is \$0.19, while under r.p.m. the difference would have been \$1.40 or \$1.50. These price differences are significantly different at much better than the 0.9995 level, implying that the odds of this occurring by chance are much less than one in 2,000.¹³

The same story is indicated by table 3, where eight of the 12 stores sampled charged identical prices for all models, regardless of quality. These data are much noisier because of the single large \$10.00 price difference, so the null hypothesis cannot be rejected. That \$10.00 observation apparently represents either an error, a special promotion not noted by the investigator, or a sale on a few shopworn shirts.

Pooling the data in the two tables allows another test. Here the mean price difference is \$0.57. This price difference is significantly less than the \$1.40 implied by honest pricing at the 0.995 level, implying that the odds of the misleading markup occurring by chance are about one in 200.¹⁴

13. The calculated *t*-statistic is 11.31, while the tabled *t* for the 0.9995 level is 3.85 on the basis of a one-tailed test.

14. The calculated *t*-statistic is 2.69.

TABLE 2 Summer 1981 Price Field Survey: Famous Shirtmaker Basic Models*

Store	Model		Difference
	A and/or B and/or C (\$)	D (\$)	
1	32.99 [†]	32.99 [†]	.0
2	40.00	40.00	.0
3	44.00	44.00	.0
4	40.00	40.00	.0
5	40.00	40.00	.0
6	44.00	44.00	.0
7	40.00	38.50	1.5
8	44.00	44.00	.0
9	36.00 [‡]	36.00 [†]	.0
10	44.00	44.00	.0
11	40.00	40.00	.0
12	40.00	40.00	.0
13	40.00	39.00	1.0
14	40.00	40.00	.0
15	39.00	39.00	.0
16	40.00	40.00	.0
17	39.00	39.00	.0
18	44.00	42.50	1.5
19	40.00	40.00	.0
20	40.00	40.00	.0
21	39.95	39.95	.0
Mean	40.33	40.14	.19
S.D.	2.69	2.65	.49
N	21	21	21

* Data contain a mixture of 1980-81 and 1981-82 stock and prices. Hence comparison of absolute prices across stores may be misleading.

[†] Investigator reported a sale in progress.

TABLE 3 Fall 1981 Price Field Survey: Famous Shirtmaker Basic Models*

Store	Model		Difference
	A and/or B (\$) [†]	D (\$)	
1	44.00	42.50	1.5
2	44.00	43.00	1.0
3	45.00	45.00	.0
4	44.00	42.00	2.0
5	44.00	34.00	10.0
6	44.00	44.00	.0
7	44.00	44.00	.0
8	44.00	44.00	.0
9	44.00	44.00	.0
10	44.00	44.00	.0
11	44.00	44.00	.0
12	44.00	44.00	.0
Mean	44.08	42.88	1.20
S.D.	.29	2.91	2.86
N	12	12	12

* Retailers not stocking model D have been eliminated. Stores do not correspond by number between tables 2 and 3.

[†] Model C not offered this season.

These *t*-tests are sensitive to outliers, a problem especially apparent in the smaller survey. Alternatively, one can calculate the probability of so many small (dishonest) price differences if the stores were equally likely to underprice or overprice the inferior model. For the table 2 survey, the odds of 19 or more fraudulent markups, given an unbiased distribution, is 1.11×10^{-4} , or about one in 9,000. For the smaller survey of table 3 the probability of nine or more misleading markups is 0.073, or about 7%. For the pooled sample, the probability of 28 or more is only 3.31×10^{-5} , or roughly one in 30,000. In sum, it seems very unlikely that the observed pattern of misleadingly high markup for the inferior model D could have arisen by pure chance.

Higher Markups

The second empirical finding is that free pricing led to higher retail markups, not to the lower ones envisioned in most of the literature. This finding provides support for the analyses of Bittlingmayer (1983) and Mathewson and Winter (1983a, 1983b, 1984). Applying the most recent r.p.m. markup ratio of 1.925 and 1.923 to the 1981–82 manufacturer's prices of \$22.00 and \$21.25 for models A, B, and D, respectively, one arrives at \$42.35 and \$40.86 as estimates of what retail prices would have been under r.p.m. If, to be very conservative, we allow both prices to be rounded up to the next dollar, the predicted prices are \$43.00 and \$41.00. Of 35 possible retail prices, in table 3, 34 exceed these prices. For models A and B, two prices exceed keystone, none is below, and the rest are at keystone. For model D, one is below keystone, one is at keystone, and 10 exceed it, typically by \$1.50. Further, on this issue of the absolute price level, another survey with a larger sample can be brought to bear.

Table 4 shows the results of a telephone survey, focusing entirely on the prices of higher-quality models, that was taken in the fall of 1981. No enquiries about sales or promotions were made. The mean price of these models was \$43.89, or \$0.89 above the highest possible maximum retail price under the r.p.m. policy. If we, conservatively, take the maximum of the suggested range as the null hypothesis, the observed mean is statistically significantly greater at well over the 0.9995 level, so the odds of this happening by chance are less than one in 2,000.¹⁵ Performing the binomial sign test and conservatively assuming an equal chance of exceeding \$43.00 and pricing at \$43.00 or below, we find that the probability of observing 66 or more stores exceeding the maximum r.p.m. markup is 1.57×10^{-9} , or about one in 637 million. It seems clear that the r.p.m. policy reduced margins slightly below keystone and that free-pricing margins are mostly at or above keystone.

15. The calculated *t*-statistic is 5.37.

TABLE 4 **Fall 1981 Telephone Survey: Famous Shirtmaker Higher-Quality Basic Models**

	Price (\$)	Frequency (Number of Stores)	Cumulative
"Discount" range	{ 38.50	1	1
	{ 39.95	1	2
	{ 40.00	3	5
	{ 41.00	1	6
	{ 41.50	1	7
"Suggested" range*	{ 42.00	3	10
	{ 42.50	1	11
	{ 42.95	1	12
	{ 43.00	2	14
Keystone range	{ 43.98	1	15
	{ 44.00	42	58
Beyond keystone	{ 45.00	19	76
	{ 46.00	3	79
	{ 48.00	1	80
Mean	43.89	...	...
S.D.	1.48	...	...
N	80	...	...

* What the retail price would have been under r.p.m.

Conclusion

At least in principle, several other tests of the misleading markup hypothesis could be formed. Other things constant, orders from retailers for the lower-quality lines and inventories of higher-quality models should rise relatively, while the manufacturer's profits should decline in a period of free pricing by retailers.

While our findings are tentative, they do establish that free pricing can injure consumers by allowing retailers to post misleading (and higher) markups.

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