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Rather bait than switch

Deceptive advertising with bounded consumer rationality

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This paper reviews some of the theory [e.g. Posner (1973)] on the incentives of firms to advertise deceptively. It argues that the widely held belief that these incentives are small and are outweighed by important disincentives is based on unjustified assumptions about consumer rationality. The paper presents a model of advertising and consumer reactions in which consumers manifest a form of bounded rationality. Given this, it is demonstrated that, under cogent assumptions about parameter values, some firms will have an incentive to advertise deceptively, causing a net welfare loss to society in the absence of corrective policy.

1. Introduction

An excellent economic parable can be found in the 1987 movie *Tin Men*. Here, we are introduced to a world of shrewd aluminium siding salesmen and their credulous clientele. The salesmen will say anything to sell their product: one makes a bogus promise of a free set of storm windows with the sale of his company's siding while another promises a couple that their house will be featured in *Life* magazine if they purchase his product. These men are invariably believed, and the transactions take place, to the apparent satisfaction of both seller and buyer. Nobody calls to complain or demands a refund after the purchase. The only threat to the equilibrium of this Edenic market is the gradual infiltration of the Home Improvement Commission, which is bent on eliminating deceptive sales practices. One almost wonders why.

But the answer comes soon enough if one thinks about it. The consumers seem to be satisfied, but actually they are stuck with a product they did not want. Having fallen prey to deceptive tactics, they are worse off, even if, for the sake of pride, they refuse to admit this to others or to themselves.

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Although the situation posed by *Tin Men* is contrived, it has realistic elements. Consumers do not always make decisions as carefully as economists assume: sometimes they make them intuitively, rendering themselves vulnerable to the deception of advertisers and other salesmen. Furthermore, for reasons of pride (or, more generally, cognitive dissonance),[1] they may react to the suspicion that they have been deceived by refusing to admit their deception, letting the deceiver go uncensured and causing their own suffering to be protracted. These realizations about consumer behavior imply that deception can and will occur and that it can inflict significant injury on consumers.

On an aggregate scale, such injury may add up to large welfare losses. In 1979, the last year with available data, advertising expenditures comprised 2.02 percent of GNP in the United States and 1.74 percent of GNP in the United Kingdom. Television and radio, the media most infamous for their deceptive potential because of their emphasis on image rather than information, accounted for 40.9 percent and 22.9 percent of the advertising totals in the two countries respectively [Starch INRA Hooper (1980)]. These data suggest that if firms have incentives to advertise deceptively, then this poses a potentially sizable problem, worthy of the attention of economists and policy-makers.

This paper reviews some of the theory on firms' incentives to advertise deceptively. It argues that the widely-held belief that these incentives are small and outweighed by important disincentives to deception is based on the naive assumption that consumers can be effortlessly rational in all their decision-making all of the time. The paper presents a model of advertising and consumer reactions in which full rationality entails a cost to the consumer and in which consumers have cognitive dissonance reactions. Under these assumptions and some cogent assumptions about parameter values, it is shown that firms will advertise deceptively, causing a net social welfare loss. A public policy effectively preventing deception will improve social welfare.

Section 2 of the paper considers the claims of Posner (1973) and Nelson (1974) regarding disincentives for deceptive advertising and elaborates a rebuttal. Section 3 presents the model. Section 4 considers public policy alternatives. Section 5 concludes.

2. Discussion

In order to discuss the incentives and disincentives for advertising

[1]Cognitive dissonance, a psychological phenomenon observed by Festinger (1957), may be described as the internal conflict that results when an individual receives information that contradicts basic ego-supporting beliefs. An economic characterization of cognitive dissonance due to Akerlof and Dickens (1982) will be furnished later on.

deceptively, one first needs a workable definition. Let us define *deceptive advertising* as any practice used in selling products which seeks to misrepresent to the consumer her expected utility from using a product. It follows that such practices directly conflict with advertising's information role, which is to help consumers discern their true utility from the use of various products so that they may decide among them optimally.

Posner (1973) notes that the seller's goals are not generally compatible with the proper informational role of advertising:

> The seller's general purpose is to provide information that, if believed, will induce consumers to buy his product in preference to other sellers' products. He may therefore be expected to be interested in the truth of the claims only insofar as it bears on their believability (p. 4).

Posner claims, however, that there are four mechanisms, outside regulation by public agencies, which deter sellers from trying to deceive potential buyers: (1) the knowledge and intelligence of the consumer; (2) the cost to a seller of developing a reputation for dishonesty; (3) competition among firms resulting in rival firms rebutting each other's deceptive advertising statements; and (4) private legal actions by consumers (Posner, p. 5). Let us consider the arguments for each of these mechanisms.

Regarding the first, Posner contends that many false claims that a firm could make about its products would not be worth making simply because consumers know better than to believe them (p. 5). Nelson (1974) implicitly concurs: '. . . The amount of deceptiveness in advertising can be easily exaggerated if one simply looks at the incentives of advertisers to deceive without considering the incentives of consumers not to be deceived' (p. 749).

Regarding his second mechanism, Posner says that sellers cannot realistically expect their false claims to go undetected indefinitely, so those depending on repeat sales to the same buyers would find a deceptive advertising policy shortsighted and unprofitable. After all, he argues, buyers will take their business elsewhere after they discover a fraud (Posner, p. 5).

The discovery of deception itself is hastened by Posner's third mechanism, according to which competing sellers expose each other's deceptive advertising schemes. Posner contends that firms have incentive to expose their rivals' deceptions because they will both obtain the goodwill of the consumers they 'save' and reduce the long-term competitiveness of their rivals.

The fourth mechanism maintains that the nuisance posed by private lawsuits may deter firms from advertising deceptively. Victimized buyers, individually or in groups, can enter fraud complaints, forcing sellers to face the threat of penalties even in the absence of agency regulation of advertising.

The essentials of these mechanisms have received some treatment in the literature on imperfect competition. Much of the discussion has focused on

the second mechanism. In his 'lemons' paper, Akerlof (1970) argues that 'answerability' of the seller is vital to the integrity of transactions. If sellers are not individually answerable for the quality of their goods and uncertainty exists over quality at the time of purchase, only low-quality goods will be offered. Heal (1976) links seller answerability to repeated interaction with buyers; in situations of repeated interaction, he argues, sellers would have to be shortsighted to persist in passing off low-quality goods. Klein and Leffler (1981) claim that brand names cause firms to maintain high quality, since firms selling brand-name goods risk losing a 'reputation rent' if they deviate from an expected level of service. These articles argue that under regimes of brand-name goods or repeated selling, sellers bear the costs of their quality choices or, equivalently, of their attempts to perpetrate fraud. Akerlof's 'lemons' counterexample is admittedly a limited case in developed economies where brand-name goods are the norm. Most advertised products would seem to come under the governance of Posner's second mechanism.

However, there are factors limiting the effect of Posner's second mechanism. Shapiro (1982) points out that reputation probably functions with a lag, so incentives may exist for those behaviors which reputation works to suppress. We shall examine shortly how cognitive dissonance also lessens the effect of Posner's second mechanism.

Meanwhile, arguments given by Fellner (1949) and Henderson (1954) cast doubt on Posner's third mechanism. Fellner suggests that competitive success with advertising depends upon a scarce resource called 'inventiveness', such that a sufficiently inventive ad is difficult for competitors to rebut. Henderson observes that non-price competition differs from price competition in that rivals can react to each other only after a delay, so the effectiveness of responses is lessened.

Although these arguments are meaningful, all of Posner's four mechanisms stand on the strength of the first, the knowledge and intelligence of the consumer. More precisely, they rely upon an underlying assumption that not only are consumers intelligent, but they actively use their full intelligence in all their decision-making; that is, they are *fully rational.* Only with full consumer rationality do sellers need to fear developing a reputation for dishonesty, being rebutted by rival firms, or being sued by customers. However, theories and evidence imply that consumers are not fully rational. Rather, consumers demonstrate intuitive decision-making (a priori bounded rationality) and cognitive dissonance (a posteriori bounded rationality).

Simon's (1957) theory of bounded rationality motivates our view of consumers making choices through intuition rather than using their full resources. Simon notes that an individual must assimilate large amounts of information in order to make a decision in a manner consistent with full rationality. Given the great number of decisions that individuals must make every day, it is impossible for them to devote the mental energies necessary

to behave rationally with respect to every one (p. 198). Consequently, there are opportunity costs to attending to a given decision in a fully rational manner, and for many decisions individuals must fall back on less mentally-taxing problem-solving methods.[2] The implication for consumer theory is that consumers fall back more or less on simple intuition for many product choices and so may respond intuitively, hence naively, to advertising messages. But responding thus to advertising exposes consumers to the possibility of being deceived. Thus the a priori bounded rationality of consumers makes deceptive advertising a potentially effective strategy for firms.

It should be noted that a priori bounded rationality implies a cost to using mental energies independent of the ease of obtaining information. That is, even in an environment of zero search costs and freely available information, individuals still face the opportunity costs of attending to and processing information due to the limits on their mental faculties.

But a priori bounded rationality alone does not guarantee sellers' incentives for deception. If consumers realize after purchasing a product that they have been deceived, they may immediately seek a refund and switch brands, leaving firms little to gain from deception. However, there is reason to believe that consumers are boundedly rational ex post as well as ex ante. Cognitive dissonance theory suggests that consumers who have been deceived actually may have an incentive to remain deceived even once they are fully informed with regard to their errors.

Akerlof and Dickens (1982) give the folowing economic characterization of cognitive dissonance:

> We think the theory of cognitive dissonance can be fairly represented in economists' terms in three propositions. First, persons not only have preferences over states of the world, but also over their beliefs about the state of the world. Second, persons have some control over their beliefs; not only are people able to exercise some choice about belief given available information, they can also manipulate their own beliefs by selecting sources of information likely to confirm 'desired' beliefs. Third, it is of practical importance for the application of our theory that beliefs once chosen persist over time (p. 307).

This characterization might manifest itself in the setting of the consumer's product choice problem as follows. When a consumer makes a choice, she would prefer to believe that she has chosen wisely. If the pain of realizing that a poor choice was made is great enough, the consumer will opt to convince herself that she chose correctly and will continue to believe this for

[2]Experimental evidence supporting our notion that individuals commonly use intuitive problem-solving methods is offered by Kahneman and Tversky (1973).

some period of time. Cognitive dissonance, then, may be a 'sticking mechanism' for the consumer, causing her to stick with an unwanted product because her ego will not permit an admission of error. The 'sticking' of consumers allows firms to profit from deceptive practices, as deceived consumers may be retained for a period of time.

Empirical evidence supports the view of cognitive dissonance as a 'sticking mechanism'. Ehrlich et al. (1957) found that consumers affected by post-purchase dissonance selectively read ads which convince them they have made the right choice. Moreover, Middlestaedt (1969) discovered a correlation between level of post-purchase dissonance and repeat purchase behavior. This second finding suggests that cognitive dissonance may suppress over a long period the consumer's potential for switching away from an undesired product, causing her not only to stick with her initial purchase of that product but to convince herself to continue purchasing it after the initial trial.[3]

In addition to serving as a 'sticking mechanism', cognitive dissonance may weaken the effect of Posner's second mechanism. In order for a firm to develop a reputation for dishonesty, its victims must realize that they have been duped and must spread this knowledge to others. Cognitive dissonance retards both processes. Since consumers prefer to believe themselves capable of choosing products without being duped, they will admit to themselves that they have been deceived only after a lag, if at all. Once the consumer has made this admission to herself, she may still be reluctant to make it to others for fear of their disapproval. It makes sense, then, that the reputation of a deceiving firm will suffer to a lesser extent and only after a prolonged lag when cognitive dissonance affects consumers.

Posner's third and fourth mechanisms are also weakened by cognitive dissonance. Rival firms stand to gain less from rebutting each other's false advertising statements when dissonance disposes consumers to reject these rebuttal messages out of hand. Private law remedies are less likely to be sought by consumers affected by dissonance, since persons reluctant to admit they have been deceived will be slow to take action against a deceiver.

3. A model

3.1. Preliminary description of the model

This section presents a simple model to show the incentives for deceptive

[3]Middlestaedt's finding also implies that cognitive dissonance may be viewed properly as causing a switching cost like those discussed by Klemperer (1987), whereby consumers face disincentives to switching to a new brand of product once an initial choice has been made. Unlike Klemperer's examples of switching costs, cognitive dissonance cannot be linked to a tangible sunk cost or transaction cost, suggesting that it is in a new class of switching cost phenomena. The implications of cognitive dissonance as a source of switching costs deserve future investigation.

advertising that arise when consumers face both a priori and a posteriori bounded rationally. There are two competing brands of a product and two consumers, with one consumer preferring one of the brands and the other consumer preferring the other. Faced with ex ante uncertainty, each consumer must try to determine which is her preferred brand. In doing so, she can be fully rational and incur a 'rationality cost' (i.e. the opportunity cost of her mental energies), or she can be intuitive at no cost. If intuitive, she risks being tricked by deceptive advertising into thinking the wrong product is her best choice. The consumer will select the option giving her the highest expected utility.

Consumers have cognitive dissonance reactions. As a result, when a consumer chooses the wrong product she will not return it immediately for a refund as we might expect if she were rational ex post, but will return it after a lag. Thus, a consumer who buys the wrong brand receives substantially less utility than she would if she had chosen correctly at the outset. Consumers have perfect foresight with regard to their cognitive dissonance reactions.

A firm has the option of using deceptive advertising, which tells both consumers that the firm's brand is their best choice, or non-deceptive advertising, which does not make such false claims. Deceptive advertising entails an added 'inventiveness' cost to the firm, due perhaps to costly tactics needed to attract the second consumer. Also, when a deceived consumer returns her purchase for a refund, the firm pays a transaction cost. The firms act simultaneously; each selects the option that maximizes its expected profits.

The model gives the following results: (1) the firms practice deception with positive probability under likely parameter values, (2) there is a net social welfare loss due to deception, and (3) there is a role for the policy-maker to reduce the welfare loss through several possible policies.

The rest of this section is divided into three subsections. Subsection 3.2 presents the model's assumptions, subsection 3.3 derives the equilibrium of the model, and subsection 3.4 considers the model's welfare results.

3.2. Assumptions of the model

Two risk-neutral consumers, A and B, face two technologically-identical competing firms which produce a common product at zero marginal cost. Each firm produces a single brand of the product, and the two brands are differentiated. Each consumer wants to buy at most one unit of her preferred brand, called her 'best choice'. The consumers each have a reservation price of r for the first unit of best choice, and 0 for any additional units or for any units of the other brand. They face a utility function $U_j = R_{ij} - p_i$, where R_{ij} is the reservation price of brand i for consumer j, and p_i is the price of brand i. Each tries to maximize her utility. If $U_j < 0$ for both brands for consumer j,

then j would wish to buy no units of the product. The utility functions and reservation price schedules are the common knowledge of all.

We have depicted the industry as a duopoly with zero substitutability between brands, so that the firms set prices wihout regarding each other's behavior. The zero substitutability assumption removes price effects from the model, allowing us to view other welfare results of deceptive advertising more clearly. The price effects of deceptive advertising could be important, however, and future work involving a more general model with substitutability [perhaps following Salop (1979)] would be desirable.

It is common knowledge that each of the brands is the best choice for exactly one consumer, but no one knows ex ante who prefers which. The consumer may try to determine her best choice *rationally* or *intuitively*. Rational consumers incur a *rationality cost* while intuitive consumers incur no cost. The rationality costs faced by A and B are c_A and c_B, respectively, where we assume $c_A > c_B > 0$. This assumption embodies the intuition that some consumers may find it easier to attend rationally to choosing products than others, a precedent for which can be found in Salop and Stiglitz (1977).

Each firm advertises its brand and can make its advertising *deceptive* or *non-deceptive*. A firm that chooses deceptive advertising pays an *inventiveness cost*, $\eta \geqq 0$. A firm that chooses non-deceptive advertising pays no cost.

The consumers' rationality costs are assumed constant with respect to the number of firms advertising deceptively, meaning that it is just as hard to make a product choice rationally whether any firms are advertising deceptively or not. This can be justified by considering that rational consumers would probably disregard advertising as not the best source of information about a product, so that the amount of deceptive advertising would have no influence on the difficulty of their decision process. Robustness with regard to relaxing this assumption will be discussed at the end of subsection 3.3.

Rational consumers always determine their best choice correctly. In the absence of deceptive advertising, intuitive consumers also choose correctly; this is because when there is no deception, advertising gives a reliable representation of each brand, we assume, so that intuitive prediction based upon it will yield the same result as fully rational prediction. However, an intuitive consumer risks getting deceived into thinking that the wrong brand is her best choice when that brand is advertised deceptively. She faces a *probability of deception*, $P_D \in (0, 1]$, in that case.

Consumers do not observe whether a given firm is advertising deceptively; they observe only the *number* of firms advertising deceptively, for one might suppose that consumers can casually observe only the general intensity of deception risk. Therefore, they assess their own risk of deception as follows. When both firms are deceiving, the consumer knows that her non-preferred brand is being advertised deceptively, and her expected probability of deception is P_D. When just one firm is deceiving, she does not know whether

the deceiving firm produces her best choice or the other brand, so she perceives her probability of deception to be $P_D/2$. Similarly, we assume that the firms observe the number of rational consumers but do not observe whether a given consumer is rational, so they assess their chances of successfully deceiving their rival's consumer in an analogous manner to the consumer's method of assessing deception risk.

After purchasing, the consumer observes whether the brand she purchased was her best choice or not. If it was not, she may return it for a full refund and then buy her best choice. However, consumers have cognitive dissonance reactions, as described previously, so they will put off their opportunity to switch brands. This enters as a *lag factor*, $\delta \in [0, 1]$, applied to the utility gained from switching. The more serious the dissonance reaction, the closer δ will be to zero.[4]

When a firm processes a return, in addition to paying the refund to the consumer it forfeits a *transaction cost*, $t \geqq 0$. This reflects the fact that dealing with returns is not costless and accords with Williamson's (1989, p. 142) notion that there are 'frictions' of transfer across economic interfaces. The cost t can be viewed broadly as including the litigation costs for a complaint brought against a deceiving firm by its victim.

3.3. Equilibrium of the model

The firms can deceive or not deceive; the consumers can be rational or intuitive. Payoffs to the 'players' are conditioned on these *strategies* alone, since all other choices made by the parties follow trivially from the assumptions. In this subsection we first write the expected payoffs that the firms and consumers receive given their strategies. Then we find their Nash equilibrium strategies under all possible values of the parameters.

Table 1 displays the expected payoffs, consisting of the expected profits to the firms and the expected utility of the consumers. The payoffs reflect the fact that the firms always price at r, since they cannot do better with any other price given the consumers' utility functions and reservation prices. Two more points should be made about these payoffs and their presentation. First, regarding the consumers' payoffs, one might argue that since the consumers can never do better than to earn zero utility and could indeed do much worse, they will never buy the product. This is just an artifact of the allocation between the consumers on one hand and the firms on the other. The firms could lower their price until the consumers are willing to buy the product; such a change would have no effect on the welfare results of our model. Second, the table does not show a column 'B intuitive, A rational'

[4]Rather than letting δ be a lag factor, one could view it as a probability of returning the purchase. The notion is equivalent in its effect, but we will maintain through the rest of the model the idea of cognitive dissonance as creating a lag.

Table 1
Expected payoffs to firms and consumers.

No. of firms deceiving	Consumers' decision methods		
	Both consumers rational	A intuitive, B rational	Both consumers intuitive
0	$(r, r; -c_A, -c_B)$	$(r, r; 0, -c_B)$	$(r, r; 0, 0)$
1	$(r-\eta, r; -c_A, -c_B)$	$\left[r+\frac{P_D(1-\delta)r}{2}-\frac{P_D\delta t}{2}-\eta,\ r-\frac{P_D(1-\delta)r}{2};\ \frac{-P_D(1-\delta)r}{2}, -c_B\right]$	$\left[r+P_D(1-\delta)r-P_D\delta t-\eta,\ r-P_D(1-\delta)r;\ \frac{-P_D(1-\delta)r}{2}, \frac{-P_D(1-\delta)r}{2}\right]$
2	$(r-\eta, r-\eta; -c_A, -c_B)$	$\left[r-\frac{P_D\delta t}{2}-\eta, r-\frac{P_D\delta t}{2}-\eta;\ -P_D(1-\delta)r, -c_B\right]$	$[r-P_D\delta t-\eta, r-P_D\delta t-\eta;\ -P_D(1-\delta)r, -P_D(1-\delta)r]$

Note: Payoffs: (deceiving firm, non-deceiving firm; A, B) if there is only one deceiving firm; (either firm, either firm; A, B) otherwise.

because this strategy set would never occur. Since A's rationality cost exceeds B's, any deception risk big enough to make A want to expend her rationality cost would also make B want to expend hers. Conversely, if B chooses to be intuitive, then A will also be intuitive.

Now let us turn to the question of which strategies will be chosen by the players in equilibrium. We use the Nash concept, which is best suited to this non-cooperative context. To determine the Nash equilibria, one first considers for each player what set of parameter values will make him choose one strategy over another given the other players' strategies. Bringing together the results of this over all players enables one to find sets of parameter values where a given Nash equilibrium holds. For some sets of parameter values, there is no equilibrium in pure strategies. In these cases, *mixed* strategy Nash equilibria exist, where both firms and one consumer set positive probabilities on (i.e. 'mix') both their possible strategies while the other consumer plays a pure strategy.[5] Seeking both pure and mixed

[5]There are no mixed strategies where both consumers mix, because never will both consumers be indifferent between their two pure strategies. For instance, if A is indifferent between her two strategies, B will prefer to be strictly rational because her rationality cost is lower than A's, making rationality a more desirable option. Therefore, she will never opt for intuition with

strategy equilibria, one determines the Nash equilibria that hold for all values of the parameters. These calculations are carried out in the appendix.

The search for equilibrium strategies reveals certain important facts, which we shall state as a proposition and two corollaries.

Proposition. The strategy preferences of the firms are mutually independent.

Proof. This can be shown case by case, referring to table 1. When both consumers are rational, neither firm wants to deceive, regardless of what the other firm is doing. When only A is intuitive: if the other firm is not deceiving, a firm will want to deceive if and only if

$$r+\frac{P_D(1-\delta)r}{2}-\frac{P_D\delta t}{2}-\eta>r,$$

that is, if

$$\frac{P_D(1-\delta)r}{2}-\frac{P_D\delta t}{2}-\eta>0,$$

If the other firm is deceiving, the firm will want to deceive if and only if

$$r-\frac{P_D\delta t}{2}-\eta>r-\frac{P_D(1-\delta)r}{2},$$

which again is when

$$\frac{P_D(1-\delta)r}{2}-\frac{P_D\delta t}{2}-\eta>0.$$

When both consumers are intuitive, the same argument applies except that deception is preferred if and only if $P_D(1-\delta)r-P_D\delta t-\eta>0$ rather than if

$$\frac{P_D(1-\delta)r}{2}-\frac{P_D\delta t}{2}-\eta>0. \qquad \square$$

Corollary 1. Either both firms will deceive, neither will deceive, or both will be indifferent between the two strategies.

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positive probability, hence will not choose to mix.

Furthermore, it is perfectly general to say that both firms mix in all mixed strategy equilibria; why this is so will be made clear by Corollary 1 below.

Table 2
Equilibrium summary.

	$(1-\delta)r > \frac{c_A}{P_D}$	$\frac{c_A}{P_D} > (1-\delta)r > \frac{c_B}{P_D}$	$\frac{c_B}{P_D} > (1-\delta)r$
$\frac{\eta}{P_D} + \delta t >$ $(1-\delta)r$	No deception; Both consumers intuitive	No deception; Both consumers intuitive	No deception; Both consumers intuitive
$\frac{\eta}{P_D/2} + \delta t >$ $(1-\delta)r >$ $\frac{\eta}{P_D} + \delta t$	Firms mix; A intuitive, B mixes	Firms mix; A intuitive, B mixes	Deception; Both consumers intuitive
$(1-\delta)r >$ $\frac{\eta}{P_D/2} + \delta t$	Firms mix; A mixes, B rational	Deception; A intuitive, B rational	Deception; Both consumers intuitive

Note: Each box contains: Firms' strategy;
Consumers' strategies.

Proof. This follows from the proof of the proposition. □

Corollary 2. Whenever $\eta > 0$ and both firms opt to deceive, they are in a prisoners' dilemma situation.

Proof. Checking the payoffs of the firms in the last row of table 1 reveals that they are less than r as long as $\eta > 0$. (In the case of the last two columns, η need not be greater than 0 as long as both $\delta > 0$ and $t > 0$.) This means that although each firm chooses to deceive under sets of parameter values mentioned in the proof of the proposition, both will be worse off when they do so. □

Corollary 1 simplifies our equilibrium derivation by showing that we do not need to consider for a possible Nash solution any strategy combination in which only one firm deceives. Corollary 2 demonstrates that although it may be individually rational for one firm to use deceptive advertising, the firms jointly would prefer that deception be prevented. The welfare and policy implications of this outcome will be discussed further in subsection 3.4 and in section 4.

Table 2 summarizes the Nash equilibria of the model into nine cases covering all possible values of the parameters. Six of the nine cases have a unique pure strategy equilibrium. Each of these equilibria is unique because one party executes a dominant strategy – that is, a strategy that would be

chosen regardless of what the opposing party chooses – and the other party or parties respond in a unique way. The remaining three cases comprise non-unique mixed strategy equilibria, where multiple mixed strategy combinations by the firms are compatible with the unique consumer strategies that make up each equilibrium. These equilibria can be derived using a reaction function technique for two-person games [see, for example, Thomas (1984, p. 59)], but we will not derive them here, since we are not interested in the specific equilibria so much as their form, which is written in the boxes.

Table 2 shows that the firms advertise deceptively with positive probability whenever

$$\frac{\eta}{P_D} + \delta t < (1-\delta)r. \tag{1}$$

This says, essentially, that whenever the expected costs involved in advertising deceptively are outweighed by the expected profit it generates, firms will choose to deceive with at least some likelihood.

Whether (1) holds depends critically on parameters describing the bounded rationality of consumers. If the probability of deceiving an intuitive consumer is large enough and cognitive dissonance serious enough, then (1) will hold even if η and t, parameters unrelated to consumer rationality, are not so small. Moreover, η and t probably are not large. First, developing a deceptive ad should not be very costly per unit product relative to a non-deceptive ad. Second, firms should not face high costs on the average in dealing with deceived consumers who have realized their errors; almost all such consumers would seek at most a refund since they probably face high transaction costs of their own regarding further measures. So, under bounded rationality and sensible assumptions about the values of η and t, we obtain our first main result: that the firms will advertise deceptively with positive probability.

Our result appears to be robust to variations in the assumptions and in the market under study. Consider the proposition that deceptive advertising occurs only for smaller purchases because consumers care enough about correctly choosing more costly purchases not to be intuitive regarding them. Clearly this argument is invalid if being rational is cognitively more costly for a more expensive product, given the typical complexity of decisions involving larger purchases. But let us assume rationality costs do not rise with the cost of products; then, more costly products entail only a higher r, so as the product studied becomes more costly we move toward the southwest corner of table 2. All the regimes in that corner imply a positive probability of deception, confirming that the deception result holds for costly purchases.

Our result is also robust to relaxing our assumption that rationality costs remain constant as the deception risk increases. If these costs rise with the number of firms deceiving, then consumers would generally have less incentive to be rational than we observed in the model. This means the firms will deceive with greater likelihood, strengthening our result.

3.4. Welfare results

In our model, deceptive advertising results in welfare losses. First of all, the consumers are worse off under deception; this fact is easily seen in table 1 by comparing the consumers' zero utility in the first-best case (i.e. when no firms deceive and both consumers are intuitive) with their negative utility under all other cases. The loss to consumers consists of some combination of the cost incurred by rational consumers and the expected utility forfeited by intuitive consumers who choose the wrong brand because they are deceived. Moreover, as Corollary 2 points out, the firms are also worse off under deception. What drives this outcome is that, for the chance of stealing away its rival's consumer, each firm expends the inventiveness cost, η, and takes a risk that it will have to pay the transaction cost, t. When both firms deceive at once, the benefit each expects from being able to steal a consumer is exactly nullified by the loss each expects from having its consumer stolen. This leaves the net result that the firms have wasted their investments in the costs η and t.

The total welfare loss may be quite large. As a numerical example, let us let $P_D = 0.2$, $c_A = 0.2$, $c_B = 0.15$, $\delta = 0.3$, $t = 0.5$, $\eta = 0.08$, and $r = 1$. These are modest assumptions: for instance, it does not seem unreasonable to think that it costs a consumer in cognitive energies one-fifth the value of a purchase to make the purchase fully rationally. Using these values, we find our case in table 2 to be 'deception; both consumers intuitive'. Table 1 shows that the welfare loss in this case relative to the first-best is 0.5. The two units produced by the firms have a total value-added of 2, so the welfare loss is one-quarter of the value-added – large indeed.

4. Public policy

The model presented above is not the first model of advertising to predict a welfare loss; see Adams and Yellen (1977) and Dixit and Norman (1978), among others. What is special about our model is that it predicts a welfare loss from a specific form of advertising rather than the over-provision of advertising in general. Thus it suggests that policy-makers must concern themselves with the nature of advertising, not just with how much is provided. This entails a serious public policy challenge, as we shall observe.

Before turning to policy considerations, we should note that, since deceptive advertising results from a prisoners' dilemma problem in the context of competing firms, it may be averted through private action by the firms themselves. Heal (1976) and others have reasoned that repeated interaction gives parties the leverage they need to cirumvent prisoners' dilemma outcomes even without being able to coordinate. Perhaps firms play 'tit-for-tat' strategies, as Heal recommends, not deceiving unless their rivals do so first. Where this is the case, public policy against deceptive advertising is not needed. However, if the loss borne by the firms through deception is small or if firms are sufficiently shortsighted [see Heal (1976, p. 502)], tit-for-tat strategies will break down, and deception will continue, with possibly serious welfare consequences for consumers even when firms do not bear large losses.

It behooves us, then, to consider public policy alternatives. If the government could simply force firms not to use deceptive advertising, then there would be no chance of consumers being deceived in equilibrium, all of them would predict intuitively, and the first-best would result. Unfortunately, a lack of serviceable all-encompassing guidelines as to what constitutes a deceptive ad as opposed to a non-deceptive ad makes it impossible to implement a simple proscriptive policy so easily in reality.

In the United States, the law on deceptive advertising is defined through several separate sections of the U.S. Code. 15 U.S.C. 45 states that the Federal Trade Commission shall prevent use of 'unfair methods of competition' and 'unfair or deceptive acts or practices in or affecting commerce'. 15 U.S.C. 52 adds that it is unlawful to disseminate any false advertisement. Finally, 15 U.S.C. 55 contributes a definition of false advertising. However, the definition is neither workable nor intended as such, for the section bears, as do all sections of the U.S. Code on deceptive advertising, the following quote: 'What constitutes false, misleading or deceptive advertising . . . subject to action by FTC' (65 ALR2d 225). Lack of clarity in the law is scarcely assuaged by supplementary guidelines. Sections 16 CFR 13 and 16 CFR 15 of the Code of Federal Regulations once offered a reference for prohibited trade practices and a catalog of past judgments regarding deceptive advertising, but these were removed from the books in 1990. Only guides regarding deceptive pricing (16 CFR 233) and bait advertising (16 CFR 238), two special cases of deceptive advertising, remain.

The lack of guidelines poses two major problems for regulatory policy. First, it causes regulatory action to be extremely slow. The FTC has had to regulate on a case-by-case basis, rarely attempting to regulate across a whole industry or type of ad. Second, it discourages the production of beneficial advertising. Oxendale (1986) emphasizes that without a 'uniform standard' for advertising regulation, firms do not have a 'well-defined arena in which to operate' (p. 693). Thus, there will be a suboptimal amount of the sort of non-

deceptive, informative advertising that increases social welfare by helping consumers to make more informed choices.

Given the problems that riddle the present policy of proscribing deceptive advertising, a new approach would be desirable. Our model suggests such an approach. In identifying some of the sources of welfare loss, the model motivates policies that use economic forces to curtail the losses. We shall consider three such policies: encouraging coordination, educating consumers, and increasing deceiver transaction costs.

We have noted that when firms are short-sighted or have little to gain from quitting deception, they will probably not succeed at doing so with a non-cooperative strategy. However, if firms are allowed to coordinate, they will eliminate deception whenever there is any mutual benefit to doing so. Jeuland and Shugan (1983) provide an example of the potential for coordination to solve a prisoners' dilemma problem in the context of a marketing channel. They show that any practice effecting profit-sharing among the parties involved will internalize the externality responsible for a prisoners' dilemma.

Allowing competing firms to coordinate their advertising or to achieve a limited profit-sharing agreement could eliminate deceptive advertising, but such a policy might also conflict with current antitrust laws. In fact, advertising agencies and the media, fearing that coordination among advertisers would lead to the cooperative buying of advertising generally, would probably try to bring a legal challenge to a coordination policy under these laws. Clearly, the legality of coordination needs to be assessed. It appears, however, that advertising coordination policies would not pose a problem under current U.S. law as long as they could effectively insure against price fixing by coordinating firms. Moreover, 16 CFR 15.269 (1989) cites a precedent that the pooling of advertising allowances by retailers for joint advertising is permissible, implying that the antitrust authorities should have no quibble with advertiser coordination or even profit-sharing.

Unfortunately, coordination policies are not successful in every context. Namely, where there is no interfirm prisoners' dilemma, firms may benefit from the dissemination of fraud, hence they will have no interest in coordinating to eliminate it. In these cases, the policy-maker must resort to other means.

Educating consumers about the risks posed by deceptive advertising and about the forms it often takes would help to reduce welfare losses. In our model, such a program would manifest itself in the reduction of rationality costs or the probability of deception, since education could make consumers more aware of deception risks with less cognitive effort. An education campaign could include 'caveat emptor' advertisements, pamphlets, and television programming by the policy authority. Naturally, the success of such a program would depend critically upon how effectively it could point

out deception risks and give the consumer real ammunition against deceptive advertisers.

Alternatively, increasing deceivers' transaction costs would discourage firms from advertising deceptively. In fact, the model shows that sufficiently high values of t completely eliminate deception. The key to increasing the transaction costs borne by deceivers is in reducing those borne by consumers bringing complaints. The policy authority could accomplish this latter by offering free legal advice or representation to those bringing suits against deceivers. The policy-maker could also facilitate alternative dispute resolution methods to reduce costs for plaintiffs. Both these policies would increase the number of complaints actually brought against deceiving firms, ensuring that the firms bear higher expected costs from deception. In effect, they would validate Posner's fourth mechanism, helping to balance the handicap that consumers bear in cognitive dissonance.

5. Conclusion

In this paper we have seen that both the profitability and the welfare effect of deceptive advertising depend critically on our assumption of bounded consumer rationality. Evidence that individuals fail to make fully rational decisions in a variety of circumstances has been found by multiple psychological studies. These findings imply that making alternative assumptions to rationality in our models is not preposterous. This is particularly true as our proposed alternatives do not assume consumers to be irrational; rather they contend, as the model in this paper has, that consumers show *bounded* rationality of some sort. The basic rationality paradigm is not forsaken. It is merely modified by adding certain costs which allow us to account for the bounds we are proposing for rationality.

The paper has offered insights into how accessory features of deceptive advertising can open new public policy alternatives for dealing with the problem. Given that proscription policies have met with only mixed success, new policy ideas tailored to the specifics of the problem are desirable. Policy that expressly recognizes the economic explanations for deceptive advertising can perhaps work more effectively and with fewer side effects than policy that just says 'no'.

Appendix: Derivation of table 2

The Nash equilibrium strategies displayed in table 2 are calculated as described in subsection 3.3 before the proposition. We use the payoffs from table 1 for these calculations. Also, we use the labor-saving information from Corollary 1 that both firms will always prefer the same option: deception, non-deception, or mixing.

A.1. Strategies preferred by both the firms

(1) When both consumers are rational: non-deception always preferred – $r \geqq r - \eta$ when $\eta \geqq 0$.

(2) When A intuitive, B rational: deception preferred iff

$$\frac{P_D(1-\delta)r}{2} - \frac{P_D \delta t}{2} - \eta > 0 \text{ (see Proposition proof)} \Rightarrow$$

$$\frac{P_D}{2}\left[(1-\delta)r - \delta t\right] > \eta \Rightarrow (1-\delta)r > \frac{\eta}{P_D/2} + \delta t. \tag{A.1}$$

(3) When both intuitive: deception preferred iff

$$P_D(1-\delta)r - P_D \delta t - \eta > 0 \text{ (see Proposition proof)} \Rightarrow$$

$$P_D[(1-\delta)r - \delta t] > \eta \Rightarrow (1-\delta)r > \frac{\eta}{P_D} + \delta t. \tag{A.2}$$

A.2. Strategies preferred by consumers

(1) When no deception: both A and B always prefer to be intuitive – $0 > -c_B > -c_A$.

(2) When deception: A will prefer to be intuitive iff

$$-P_D(1-\delta)r > -c_A \Rightarrow (1-\delta)r < c_A/P_D. \tag{A.3}$$

B will prefer to be intuitive iff

$$-P_D(1-\delta)r > -c_B \Rightarrow (1-\delta)r < c_B/P_D. \tag{A.4}$$

Given that $c_A > c_B$, $\eta \geqq 0$, and $P_D > 0$, (A.1)–(A.4) allow us to partition the parameter space into nine exhaustive and mutually exclusive regions, depending upon whether both (A.1) and (A.2) are true, only (A.2) is true, or neither is true, and whether both (A.3) and (A.4) are true, only (A.3) is true, or neither is true. These regions are represented by the nine boxes in table 2. Given the preferences exhibited above, we can derive the equilibrium for each of these nine boxes in turn.

Row 1, All columns. Neither (A.1) nor (A.2) true, so firms never deceive $\Rightarrow$ both consumers always intutiive.

Rows 2 and 3, Column 3. (A.3) and (A.4) both true, so consumers always intuitive. $\Rightarrow$ (A.2) true, so firms deceive.

Row 2, Column 1. (A.2) true but (A.1) not true, so deception preferred only when both consumers intuitive. Neither (A.3) nor (A.4) true, so no consumers prefer to be intuitive unless no deception. ⇒ No pure stgrategy equilibrium exists. The mixed strategy equilibrium must involve either A intuitive and B mixing or A mixing and B rational because $c_A > c_B$ (see footnote 5 above). Assume it is the second: then there must exist $p_A^* \in [0,1]$ such that:

$$r = p_A^*(r-\eta) + (1-p_A^*)\left[r + \frac{P_D(1-\delta)r}{2} - \frac{P_D\delta t}{2} - \eta\right]. \tag{A.5}$$

That is, A must have a mixed strategy where B is rational that will make the firms want to mix (i.e. that will make them indifferent between deceiving and not deceiving). Solving (A.5) for p_A^* yields

$$p_A^* = 1 - \frac{\eta}{\frac{P_D(1-\delta)r}{2} - \frac{P_D\delta t}{2}}, \tag{A.6}$$

which is in $[0,1]$, only if (A.1) holds. Since (A.1) does not hold in the case we are considering, A mixing and B rational cannot be part of the mixed strategy equilibrium. It must consist of A intuitive and B mixing.

Row 2, Column 2. Deception preferred only when both consumers intuitive as above. (A.3) true but (A.4) not true, so A prefers to be intuitive under deception but B does not. ⇒ No pure strategy equilibrium exists. Mixed strategy equilibrium consists of A intuitive, since A would be intuitive even under deception, and B mixing.

Row 3, Column 1. Both (A.1) and (A.2) true, so deception preferred if at least one consumer intuitive. Neither (A.3) nor (A.4) true, so no consumer prefers intuition unless there is no deception. ⇒ No pure strategy equilibrium exists. Mixed strategy equilibrium consists of A mixing and B rational, since firms would purely deceive if either consumer were purely intuitive.

Row 3, Column 2. Deception preferred if at least one consumer intuitive, as above. (A.3) true but not (A.4), so A wants to be intuitive under deception but B does not. ⇒ We have a pure strategy equilibrium.

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