



# Advertising, brand loyalty and pricing

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## Abstract

I consider an oligopoly model where, prior to price competition, firms invest in persuasive advertising and induce brand loyalty in consumers who would otherwise buy the cheapest alternative on the market. This setting, in which persuasive advertising is introduced to homogeneous product markets, provides an alternative explanation for price dispersion phenomena. Despite *ex ante* symmetry, the equilibrium profile of advertising outlays is asymmetric. It follows that endogenously determined brand loyal consumer bases are not symmetric across firms. This raises a robustness question regarding Varian's "model of sales" where symmetry is exogenously assumed.

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## 1. Introduction

Significant amounts of money are spent every year on advertising. The largest 100 advertisers in the US laid out a total of USD 90.31 billion on advertising in 2003 (see Advertising Age, June 28, 2004). Noticeably, in many advertising-intensive markets the products are nearly homogeneous. This suggests that advertising could be used to redistribute buyers amongst sellers and not (only) to increase demand. Scherer and Ross (1990) note: "[d]ouble-blind experiments have repeatedly demonstrated that consumers cannot consistently distinguish premium from popular-priced beer brands, but exhibit definite preferences for the premium brands when labels are affixed-correctly or not." Although a vast literature spans the economics of advertising

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(see Bagwell, 2007), there are only a few theoretical models of persuasive advertising in non-differentiated good markets.

This article models homogeneous product markets where persuasive advertising creates subjective product differentiation and changes the nature of subsequent price competition. In particular, it studies the strategic effect of persuasive advertising in a two-stage oligopoly model where firms compete in non-price advertising and prices. Advertising induces brand loyalty in consumers who would otherwise purchase the cheapest alternative on the market. Firms first invest in advertising, and then compete in prices for the remaining brand indifferent consumers. Despite a priori symmetry of the firms, the advertising levels chosen by the firms are asymmetric in all subgame perfect equilibria of the two-stage game. One firm chooses a lower advertising level, while the other firms choose the same, higher level. In all pricing equilibria, at least two firms randomize on prices. The low advertiser prices more aggressively than the heavy advertisers in expected terms. The firms counterbalance their advertising and pricing decisions.

A related strand of literature deals with price dispersion phenomena in homogeneous product markets.<sup>1</sup> Varian (1980) constructs a “model of sales” where coexistence of fully informed and uninformed consumers results in equilibrium price dispersion. The uninformed (captured) consumers are evenly distributed across firms. The pricing stage in the current model is a modification of the model of sales, with asymmetric bases of captured consumers. In a variant of the model of sales, Rosenthal (1980) observes the existence of asymmetric pricing equilibria with at least two firms randomizing. Baye et al. (1992) fully characterize the asymmetric equilibria in the symmetric model of Varian. The current model builds up on a generalization of these results to asymmetric consumer bases. The two-stage game considered offers a way of endogenizing consumers’ heterogeneity. It turns out that the symmetric outcome does not obtain, raising a robustness question regarding Varian’s (1980) symmetric model.

The model offers a new perspective on the coexistence of price dispersion and advertising, taking a persuasive as opposed to an informative view of the latter. The advertising asymmetry prediction reconciles simple theoretical modeling with the empirical facts. Much empirical work explores whether homogeneous goods advertising is informative (increases industry demand) or is persuasive (affects selective/brand demand). The results are often contradictory, and vary across industries. Kelton and Kelton (1982) and Baltagi and Levin (1986) support the persuasive view in US brewery and cigarette industries, respectively.<sup>2</sup> Bagwell (2007) provides an up-to-date review of both empirical and theoretical studies on advertising.

The persuasive view of advertising goes back to Kaldor (1950). Friedman (1983) and Schmalensee (1976) deal with oligopoly models where advertising increases selective demand.<sup>3</sup> The latter explores the role of promotional competition in differentiated oligopoly markets where price changes are infrequent. In a model where advertising creates vertical differentiation, Sutton (1991) points out that differences in consumer tastes lead to the existence of two-tier markets. His study of the frozen-food industry illustrates the emergence of dual structures (where high-

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<sup>1</sup> Baye et al. (in press) review the literature on price dispersion in homogeneous product markets, including clearing-house models for virtual markets like Baye and Morgan (2001). The present setting also relates to online markets. With price-comparison sites, firms have incentives to engage (prior to price competition) in costly search-frustration activities, see Ellison and Fisher Ellison (2004).

<sup>2</sup> Lee and Tremblay (1992) find no evidence that advertising promotes beer consumption in the US. Nelson and Moran (1995) conclude that advertising serves to reallocate brand sales across alcoholic beverages.

<sup>3</sup> Von der Fehr and Stevik (1998) and Bloch and Manceau (1999) analyze the role of persuasive advertising in differentiated duopoly markets. Tremblay and Polasky (2002) show how persuasive advertising may affect price competition in a duopoly with no real product differentiation.

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