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Comparison of generic advertising for a competitive industry to a monopolist

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ABSTRACT

This paper compares competitive output and generic (or check-off) advertising of the type commonly facilitated in agriculture to the levels of output and advertising under monopoly with the same industry cost structure and consumer preferences using the complementary preference approach developed by Becker and Murphy and others. Advertising is assumed to be seller-determined in the case of monopoly or by an industry advertising planner in the case of competition. The marginal benefit function of advertising in the case of competition is much different than for a monopolist with the same industry cost structure. Although of similar mathematical form in equilibrium, the resulting behavior and intuition are different, and neither achieves a social optimum. Conditions under which monopoly output and advertising are greater than under competition with generic advertising are derived.

1. Introduction

Many commodity producer organizations have experimented with generic advertising programs. Among the most recognizable are those in agriculture: e.g., the "Got Milk", "Cotton: The Fabric of Our Lives" and "Pork: The Other White Meat" campaigns. These are sanctioned in the US by federal marketing orders or other state/federal enabling legislation, and most commonly involve assessing what is called a check-off fee at the time of sale to fund the advertising (Williams & Capps, 2006). As

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well, generic advertising has been found in a wide range of nonagricultural commodity markets as a means of coordinated demand improvement, e.g., propane (Propane Education and Research Council) and natural gas (America's Natural Gas Alliance).

The welfare significance of advertising has been analyzed under a variety of market structures and ways of viewing advertising. This also has been controversial depending on whether advertising is viewed as persuasive, complementary, or informative (Bagwell, 2007; Becker & Murphy, 1993; Cardon & Pope, 2003; Dixit & Norman, 1978; Just & Pope, 2012). Our purpose is not to suggest a normative benchmark from which to value advertising, but to take a typical industrial organization approach to discover how market structure affects behavior (Zhang & Sexton, 2002). Other recent studies have focused on the potential of generic advertising to cause rotation of demand (e.g., Hamilton, Richards, & Stiegert, 2013) and how geographic supply controls interact with promotion in competitive industries, which are most notably used in Europe (Lence, Marette, Hayes, & Foster, 2007). However, to our knowledge, the simple and complete conceptual comparison of output and advertising behavior between monopolistic and competitive industries has not been done. The increasing prominence of generic advertising by competitive industries throughout the world compels an economic understanding of how these industries perform relative to benchmarks of monopolistic price, quantity, and advertising.[1]

We focus on typical industrial-organization (I-O) price-quantity questions. For example, under what conditions, if any, will an unconstrained generic advertising planner cause the behavior of a competitive industry to approximate the behavior of a monopoly? When might the competitive output or price be smaller or larger than a monopolistic firm's output or price? These are similar to the important I-O questions comparing monopoly output and price to the competitive solution without advertising presumably because of their implications for economic efficiency. In doing so, we contrast the difference between monopoly pricing premiums and price wedges imposed by a check-off under generic advertising. For this purpose, if the check-off is subject to a regulatory cap, we assume it is not binding.

The most difficult and novel part of our analysis identifies and explains the implication of the marginal benefit of advertising for a competitive industry. Somewhat surprisingly, we find a transparent way in which monopoly output can be larger than the competitive case. Further, a plausible but special case of preferences can yield exactly the same optimal output and advertising behavior as a monopolist and serves as a benchmark from which to consider alternatives.

2. Notation and preliminaries

We assume complete information and differentiability where the quantity of advertising, A, is determined by the advertiser rather than offered for consumption at a price.[2] For simplicity, we assume preferences are smooth and quasi-linear in the numéraire good Y, as is standard in much of the analysis of advertising. Thus, utility is $u(X, Y, A) = U(X, A) + Y$ where advertising is complementary to good X. The consumer's budget constraint is $PX + Y \leq I$, where, P is the relative price of X and I is income. Thus, the concentrated utility maximization problem can be written as $\max_{X>0} U(X, A) + I - PX$. The first-order condition, assuming an interior solution with non-satiation, is

$$U_X(X, A) - P = 0 \tag{1}$$

where, subscripts represent differentiation throughout. Accordingly, we denote an interior solution for demand in inverse form by $P = U_X(X, A)$ (see the Appendix for second-order conditions throughout).

[1] The literature on generic advertising is extensive. Much of this literature analyzes empirically its impacts on the distribution of profits (and, in some cases, social welfare under various normative schemes) without directly modeling preferences, e.g., Ward and Lambert (1993), Krishnamurthy (2000), and Hamilton et al. (2013). The latter considers strategic production choices. In an extended version of this paper, available upon request, a more extensive comparison between competition with and without advertising and monopoly is undertaken.

[2] See Becker and Murphy (1993) for the case where advertising is offered at a price.