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# Cigarette advertising regulation: A meta-analysis<sup>☆</sup>

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## Abstract

This paper presents a synthesis of cigarette advertising elasticities derived from econometric studies for the US and other countries. Summaries are presented using fixed- and random-effects weighted means and weighted regressions. The regressions account for heteroscedasticity, non-homogeneity, independence, and random effects. After accounting for random effects, the meta-analysis indicates that advertising elasticities are very small and not statistically significant regardless of the time period. The paper also reviews 50 years of regulation of cigarettes by the Federal Trade Commission and conducts a meta-analysis of four important regulatory events: the 1953 health scare; 1964 Surgeon General's Report; 1967–1970 Fairness Doctrine; and the 1971 ban of broadcast advertising. The effect of the 1971 broadcast ban, which directly affected advertising, is not statistically significant.

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## 1. Introduction

Advertising is often singled out as an important causal determinant of cigarette consumption (U.S. Surgeon General, 1989, 1994, 2000). This view rests on the assumption that brand advertising has an important spillover effect on smoking behaviors and aggregate consumption. For example, the US tobacco industry spends more than \$1 billion annually

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<sup>☆</sup> The author consults with a law firm that represents the tobacco industry. The paper was independently prepared by the author and was not reviewed by the law firm prior to submission for publication. I wish to thank two anonymous referees for helpful comments on an earlier draft. The usual caveats apply.

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on brand advertising and non-price promotions (FTC Report, 2004), and critics argue that this fact alone demonstrates that cigarette advertising must be important for smoking behaviors—otherwise the industry would not spend so much on advertising.<sup>1</sup> This negative view of advertising is reflected in tobacco policies in the United States and other countries, including bans of broadcast and billboard advertising; restrictions on advertising messages and placements; public reporting requirements for advertising expenditures; requirements for package warning labels; and attempts to further limit promotions or packaging that might appeal to adolescents and young adults (Kessler et al., 1997; State Attorneys General, 1998; DOJ, 2005; FDA, 1996; WHO, 2003). Little systematic analysis exists, however, on the effectiveness of many of these policies.

This paper provides cumulative evidence on the size and significance of the advertising elasticity of demand for cigarettes and associated federal regulations. For several reasons, estimation of demand elasticities for cigarettes is a frequent application of econometrics: for example, the policy issues are important; aggregate consumption and advertising data are readily available; and several important regulatory events have occurred, including the 1971 ban of broadcast advertising. As a result, numerous econometric studies estimate elasticities for cigarette advertising and other factors that might affect consumption, such as price and income effects, “health hazard” events, and package labeling laws. However, empirical estimates vary by time period, country, data interval, model specification, and econometric methods. As a consequence, considerable uncertainty exists regarding the significance and magnitude of the advertising elasticity. Reducing this uncertainty is important for public policy and provides information that might guide future research efforts. Similar uncertainty exists regarding the possible effects of regulation—a topic that previous literature summaries largely ignored. The objective of this paper is to use meta-analysis to synthesize available information on cigarette advertising elasticities and four associated regulatory events: the 1953 health scare; 1964 Surgeon General’s Report; 1967–1970 Fairness Doctrine anti-smoking ads; and the 1971 broadcast ban. Advertising elasticities are obtained from 25 US studies and 13 non-US studies. Regulatory impacts for the US are obtained from 19 studies. These estimates are combined or synthesized using weighted means and generalized least-squares regression analysis.

The technique of meta-analysis has been widely used to obtain formal combinations of research results from multiple studies (Farley & Lehmann, 1986; Stanley & Jarrell, 1989). A meta-analysis proceeds as follows (Lipsey & Wilson, 2001): first, the problem is stated such that it can be studied using a common quantitative “effect size” (e.g. scale-free advertising elasticities). Second, all available studies that provide *comparable* estimates are collected. Third, each study is evaluated and samples of estimated effect sizes and standard errors are obtained. Fourth, other relevant information is obtained on each study’s sample and methods, such as time span, data interval, explanatory variables, and econometric methods. Potentially, this information can be used to explain the variation in the sample of elasticities. Fifth, the elasticities are synthesized or combined, and a single best “cumulative estimate” may be presented. This step is often controversial because the sample of observations

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<sup>1</sup> I have stated this proposition in the manner that it has appeared in the public health literature. A study by Tye, Warner, and Glantz (1987) attempts to demonstrate a causal connection based on the magnitude of cigarette advertising expenditures; see also Saffer (2000), Sullum (1998, pp. 102–03), and Boddeyn (1986).

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