



Do media consumers really dislike advertising? An empirical assessment of the role of advertising in print media markets[☆]

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ABSTRACT

This paper uses data on German consumer magazines observed between 1992 and 2004 to analyze the extent to which consumers (dis-)like advertising. We estimate logit demand models separately for the six most important magazine segments in terms of circulation. We find little evidence for readers disliking advertising. On the contrary, we show that readers in many magazine segments appreciate advertising. Readers of Women's magazines, Business and politics magazines as well as Car magazines – market segments where advertisements are relatively more informative – appreciate advertising while advertising is nuisance to readers of Adult magazines, a segment where advertisements are particularly uninformative. Demand for interior design magazines is not well identified. Our logit demand estimates are confirmed by logit demand models with random coefficients and by magazine-specific monopoly demand models.

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1. Introduction

The economics of two-sided markets have recently caught the attention of many economists. Such markets have the property that there are two distinct types of users, each of which wishes to interact on a common platform.

A prototypical example for a two-sided market is the media industry, as first explicitly noticed by [Sonnac \(2000\)](#). Media content producers need to attract two types of consumers: advertisers who value the medium more the more consumers it reaches and consumers who have a (dis-) taste for advertising.

This interdependency creates network effects whose consequences for pricing, efficiency and information supply is in the focus

of a rapidly growing body of theoretical papers. Most contributions – for example [Anderson \(2005\)](#), [Anderson and Coate \(2005\)](#), [Ambrus and Reisinger \(2005\)](#), [Choi \(2006\)](#), [Crampes et al. \(2004\)](#), [Gabszewicz et al. \(2004\)](#), [Kind et al. \(2003\)](#), [Kohlschein \(2004\)](#), [Kremhelmer and Zenger \(2004\)](#), [Peitz and Valetti \(2008\)](#), [Nilssen and Sørsgard \(2003\)](#) and [Reisinger \(2004\)](#) – assume that consumers dislike advertising. Exceptions are [Häckner and Nyberg \(2000\)](#), who assume that readers like advertising in a print media context, and [Sonnac \(2000\)](#), who considers feedbacks from advertising to circulation under the two alternative assumptions of consumer advertising aversion and advertising appreciation.

Whether consumers appreciate advertising or not has important implications for the pricing structure on two-sided markets. In markets where readers are advertising-neutral, the market collapses into a one-sided market with a network externality running from readers to advertisers. Market structure is truly two-sided when readers are not advertising-neutral (and advertisers appreciate more readers). Compared to a one-sided market setting, magazines charge lower advertising rates when readers appreciate advertising and higher advertising rates when readers dislike advertising. Independently of whether consumers like or dislike advertising, magazines always have incentives to charge copy prices that are lower than in

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a one-sided market to enhance advertising demand (as long as advertisers value readers). If advertisers have no appreciation for readers and readers are advertising neutral, media markets constitute a standard one-sided market.

The present paper estimates readers' taste for advertising. We use quarterly data on magazine circulation in Germany, the second largest print media market in the world (FIPP, 2004). We estimate consumer demand for the six most relevant magazine segments in terms of circulation and advertising revenue using a discrete choice demand model.

Since we estimate a consumer utility function, we can draw inference about consumer preferences based on the sign and magnitude of the corresponding characteristics coefficients. We treat both price and advertising as endogenous variables in our estimations, thereby recognizing that advertising share, defined as the ratio of advertising pages to content (non-advertising) pages, may be correlated with demand shocks or unobserved quality shocks.

Our main result is that there is little evidence for readers disliking advertising. On the contrary, we show that readers in most magazine segments actually appreciate advertising. Consumers of TV and Women's magazines appreciate advertising most, followed by consumers of Car and Business and politics magazines. Consumers of Adult magazines are indifferent with respect to advertisements. Demand for Interior design magazines is not well identified.

A supply side explanation is that each magazine segment carries advertisements that come with different degrees of informativeness. In order to explore this explanation further, we purchased samples of magazines from each segment and measured the degree to which advertising is informative, thereby using a methodology developed by Resnik and Stern (1977). We find that the degree to which advertising is informative is above average in the Women's, Car and TV magazine segments. This finding, combined with our estimation results, suggests that consumers appear to appreciate advertisements in segments with a high degree of advertising informativeness. We interpret this as consumers liking informative advertising.

These findings can be explained by both demand side and supply side factors. A demand side explanation is that consumers in different segments are heterogeneous with respect to their advertising preferences. For example, a typical TV magazine consumer may appreciate advertising more than a typical Car or Business and politics magazine consumer.

Our results suggest that assuming consumers dislike advertising may not be an appropriate assumption. Kaiser and Wright (2006) consider eight German duopoly markets for magazines and find positive effects of advertising on circulation as well. Bogart (1989) and Rosse (1980) consider US newspapers and provide a similar conclusion using simple linear (monopoly) demand models that do not account for potential endogeneity.

The rest of the paper is organized as follows: Section 2 presents our empirical model. Section 3 describes our data. Section 4 presents our empirical results. Specification tests follow in Section 5. Section 6 concludes.

2. Empirical approach

2.1. Empirical model

Our main empirical model maps the magazine characteristics such as copy price, the number of content pages and our variable of main interest, the number of advertising pages relative to the number of content pages, to magazine market shares. We estimate logit demand models separately for the six segments Women's, Business and politics, Car, Interior design, TV and Adult magazines.

The model assumes that magazines in the same segment are potential substitutes to one another. This assumption is substantiated by Dewenter and Kaiser (2006) who use second choice data from a

consumer survey to show that a magazine's best substitutes is a magazine from the same segment. We test this assumption in Section 5 by estimating cross elasticities using a log-linear demand model. However, we ignore possible complementarity between different segments.

We are aware of that the logit model we use has limited substitution patterns. That is, the own- and cross-price elasticities are solely determined by the price coefficient and market shares. Moreover, consumer heterogeneity is independent of magazine characteristics. Using random coefficients mitigates these limitations, but we are skeptical about identifying the random coefficient with our data set. Consumer distributions from multiple markets or micro choice data are commonly used to identify the random coefficient logit model (Nevo, 2001; Petrin, 2002). We do not, however, have micro choice data or even multimarket data at our disposal. Moreover, we observe the same market repeatedly over time so we would need to fix the consumer distribution for all periods. Despite our data restrictions we estimate the random coefficient logit model and report the corresponding estimation results in Section 5 to support the evidence generated by our logit model without random coefficients.

Our demand model defines indirect consumer utility as

$$u_{ijt} = x_{jt}\beta - \alpha p_{jt} + \gamma_t + \eta_j + \xi_{jt} + \varepsilon_{ijt}, \quad (1)$$

where x_{jt} denotes product j 's observed characteristics at time t , p_{jt} product j 's price at time t , γ_t time dummy variables, η_j a magazine-specific dummy variable, ξ_{jt} magazine-specific unobserved characteristics at time t and ε_{ijt} an idiosyncratic logit error term. The observed characteristics include a constant term, the number of content pages, advertising share and a dummy variable for magazines not published quarterly. The term η_j controls for magazine specific quality that does not vary over time. We include this dummy variable for magazines we observe for at least ten periods.

Our model requires the definition of "market size" which implicitly defines the demand for the "outside good". For Women's magazines we use the number of women above 14 years of age with German residency. For Adult magazines and Business and politics magazines we use the number of males above 14 years of age with Germany residency. For the other segments we use the number of German residents above 14 years of age.

2.2. Identification

We allow for two endogenous variables in our estimation. One is price and the other is advertising share. These two variables are likely to be correlated with demand shocks or unobserved magazine characteristics, the term ξ_{jt} in Eq. (1). We interpret ξ_{jt} as a content-related quality shock that consumers observe but the econometrician does not. All other things being equal, a positive quality shock is likely to increase price but decrease advertising share. So we expect an unobserved quality shock to be positively correlated with price and negatively correlated with advertising share. However, this unobserved quality shock is unlikely to be correlated across magazine segments.

We therefore use observed characteristics in other segments as instrumental variables. Our identifying assumption is that a magazine's unobserved quality shock in a given period is not correlated with observed magazine characteristics in the other segments in the same period. For example, a quality shock in the Women's magazine segment should not affect prices in the Adult magazine segment. For each magazine in a given period we compute its own publisher's average price and advertising share in the other five segments in the same period. We also compute the other publishers' average prices and advertising shares in the other five segments. This produces five own publisher's average prices, five own publisher's advertising

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