Essays on Consumer Search: A Look at Advertising, Market Intervention, and Medicare Choice

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1 Research Summary

Pioneered by Stigler’s Economics of Information in 1961, the consumer search literature first developed as an explanation for observed price differences in seemingly identical markets. Authors then extended these models to include price controls, taxes, information spillovers, and advertising, just to name a few. Even more recently, empirical search models have been developed that attempt to measure the unobserved costs that consumers spend throughout their search process. My research addresses these last two issues and consists of three main research questions.

First, we study advertising intensity and welfare in an equilibrium search model. To do so, we develop a theoretical model where two firms compete in a market with bilateral heterogeneities in production and search costs in which firms can advertise by announcing price and location. We study existence, stability, and comparative statics in such a setting, compare the market advertising level to the socially optimal level, and find conditions in which firms advertise more or less than the social optimum.

Our analysis provides intuitive sufficient conditions such that market advertising intensity is above or below that of a planner. In general, firms over-advertise when the indifferent consumer’s search cost is sufficiently low and under-advertise when this search cost is sufficiently high relative to the cost of production. For symmetric search cost distributions, this implies that firms over-advertise when the majority of consumers do not search. We express this result in terms of production and advertising costs, the consumer’s maximum willingness to pay, and advertising effectiveness—all of which relate to the tradeoff between advertising and search as a means to disseminate information to consumers.

Intuitively, under-advertising results for two reasons. One, the firm only cares about attracting inactive searchers. Since this portion of the market decreases as the indifferent consumer’s
search cost increases, the firm has less incentive to advertise. Two, the planner’s advertising decision is based partly on saving search costs. Since this savings increases with the indifferent consumer’s search cost, the planner advertises more intensely. Similar intuition holds for over-advertising when the indifferent consumer’s search cost is low. Since inactive searchers make up a relatively large portion of the market, the firm has more incentive to advertise. In addition, the search costs paid by consumers are generally lower, which decreases the planner’s advertising incentive. The planner also understands that an increase in advertising converts some marginal consumers from active searchers—where they pay their search cost—to inactive searchers—where they may buy from the high cost firm. This implicit cost of sending a few small search cost consumers to the high cost firm further dulls the planner’s advertising incentive.

Second, we simulate pure-strategy and mixed strategy Nash equilibria in a sequential consumer search model with a finite number of buyers and sellers. We do so with a genetic algorithm (GA) similar to that used in Price (1997) in which the best prices for a given firm spawn new generations of prices until convergence. Consumers adopt an optimal sequential search rule, which firms take as given. We compute such equilibria for both homogeneous and heterogeneous costs of production and discuss the effects of changes in market size as well as the underlying search cost distribution. We then extend this algorithm to compute mixed strategy equilibria.

There are two main contributions to these simulations: One, we estimate equilibrium outcomes under highly discrete scenarios, and two, we derive comparative statics results in areas that generally cannot be studied in a standard theoretical setting. Specifically, we compute equilibrium prices (for pure strategies) and price densities (for mixed strategies) and illustrate comparative statics with regard to the number of firms in the market, the number of buyers, (potentially heterogeneous) costs of production, price ceilings, proportional sales taxes, and the search cost distribution.

Finally, we develop an empirical search model for medicare choice. In this model, beneficiaries have complete knowledge of only some characteristics and must search across plans to gain knowledge of other characteristics. But since eligibles have different search costs, not all of them find it beneficial to search. Uninformed beneficiaries therefore purchase the plan that provides them the maximum utility based on the common-knowledge characteristics, while informed beneficiaries choose the plan that offers them the best utility possible.

A general goal in this paper is to combine the discrete choice and search literatures. Although this issue has been somewhat addressed by Sorensen (2001), his data did not allow horizontal differentiation among products. With specific data on medicare plan choice, as well as beneficiary demographic variables and other data relevant to search behavior, we extend the random coefficient multinomial probit model to allow for an “all or nothing” search process.
This is particularly interesting from an applied standpoint as we can study how different types of eligibles value different attributes as well as what factors most strongly influence a beneficiary’s information structure. We can determine, for instance, which groups or types of people are less likely to be appropriately informed prior to making their decisions. This will allow us to better direct any efforts to inform future eligibles. As a simple example, consider a case where there are two general groups of beneficiaries. If one group most likely belongs to the lower end of the search cost distribution, then efforts to inform this group would be less beneficial—from both a welfare and profit standpoint—than informing the other group.