

Three Essays on Pricing and Inequality in the Pharmaceutical Market

I specialize in health economics, applied econometrics, and health services research, with solid training in public health and strength in quantitative analysis and modeling of individual and organizational behaviors. My dissertation examines pharmaceutical pricing strategy and also considers racial and ethnic disparities in patterns of drug use. This research is briefly summarized below.

Entry Pricing and Product Quality: The Case of Antidepressant Drugs (*Job Market Paper I*)

The rising prices of pharmaceuticals have generated considerable, and often acrimonious, debate. Yet, there is little theoretical work or empirical evidence on pharmaceutical entry-pricing strategies or on the time paths of the prices of new entrants versus incumbents.

The present study provides a model that demonstrates the interplay between quality and product differentiation in determining the optimal pricing strategy. In particular, higher (lower) quality products will engage in price skimming (market penetration) strategies in markets where products are sufficiently differentiated, but will choose a market penetration (price skimming) strategy in markets that are less differentiated. The reason is that in less differentiated markets, price competition is more important than quality competition for gaining market share and higher-quality firms are better able to garner greater market share through price cuts.

I test this model using a unique database that combines information on drug price and quality for antidepressant drugs during the years 1999-2002. Based on quality perceptions by physicians, the antidepressant market is a relatively homogeneous drug class, which consisted largely of selective serotonin reuptake inhibitors (SSRIs). The results indicate that higher quality antidepressants engage in a market penetration strategy, charging initially lower prices that rise over time. Five years post-entry, I find that prices of all antidepressant drugs examined tend to converge. These findings are consistent with a market in which product differentiation is modest and consumers learn which drug works best for them through experience.

Who Pays for Drug Quality?

Pharmaceutical costs have increased at double digit rates in recent years. Controlling further pharmaceutical cost increases seems urgent and cost sharing will play a critical role in such efforts. This study examines how pharmaceutical costs are shared among consumers and insurers and how drug quality affects these costs. This study provides a model which delineates the tradeoff between paying more for higher quality drugs to reduce future medical costs in determining the optimal copayment strategy for the third party payers. In particular, if insurers

believe they can save on future medical cost by offering the drug at a lower copayment, they are more likely to do so to encourage consumers to take the drug. Otherwise, they will charge a higher copay to reduce their current pharmaceutical costs.

The model is tested using two large drug therapeutic classes: brand name antidepressants and non-steroidal anti-inflammatory drugs (NSAIDs). These two drug classes are interesting to study because they differ in the degree of variation in product quality. While there is little quality differentiation among the antidepressants studied, quality varies by more among the NSAIDs; hence, quality differences are more readily discernible. The results indicate that consumers' out-of-pocket payments are larger for high quality antidepressants, while insurers pay less for these drugs. In contrast, for the higher quality NSAIDs, insurers share the drug cost together with the consumers. These findings suggest that insurers shift the drug costs associated with higher quality onto consumers when there is little perceived quality variation among drug alternatives but share in the costs of higher quality drugs when there is greater perceived variation in drug quality.

Racial and Ethnic Disparities in Antidepressant Drug Use (*Job Market Paper II*)

In this paper, I seek to determine the extent to which disparities reflect differences in observable population characteristics versus heterogeneity across racial and ethnic groups in antidepressant drug use employing Blinder-Oaxaca decomposition technique. Using Medical Expenditure Panel Survey (MEPS) data from 1996-2003, I estimate individual out-of-pocket payments, total prescription drug expenditures, drug utilization, the probability of taking generic versus brand name antidepressants, and the share of drugs that are older, lower quality types of antidepressants (e.g., TCAs and MAOIs) for Caucasian, African American, and Hispanic individuals.

I find that substantive racial and ethnic disparities exist in all dimensions of antidepressant drug use examined. Observable population characteristics account for most of the differences in drug expenditures, with health insurance and education key factors driving differences in spending. Observable characteristics are also important in explaining racial and ethnic disparities in the probability of purchasing generics and in the quality of antidepressant drugs used. In contrast, differences in total utilization are not well-explained by observable characteristics, and may reflect unobserved differences in knowledge and cultural factors, which tells us that to limit differences in overall antidepressant drug use, policymakers must take into account cultural factors. Thus, differences in observable characteristics (notably health insurance and education) explain racial and ethnic disparities in expenditures and patterns of use (e.g., brand vs. generic), but not disparities in total utilization.