

## Taking Account...

### Paper measures constant-quality drug prices

To assess the importance of innovation and productivity in the health care sector, an understanding of how new technologies affect the quality of treatment and individual welfare is essential. Many economists would agree that new technologies lead to higher expenditures on medical care as well as higher quality treatment, which improves patient welfare and lowers the total costs of treatment. But measuring prices in a way that accounts for shifts in the quality of treatments has long presented challenges for economists. In cases of rapid innovation and new product launches, these challenges are multiplied.

A recent paper by Abe Dunn, economist at the Bureau of Economic Analysis, takes a look at the impact of innovations in the market for high cholesterol drug treatments, a market that has experienced a relatively high number of new product introductions accompanied by a large increase in expenditures.

The paper—“Drug Innovations and Welfare Measures Computed from Market Demand: The Case of Anti-Cholesterol Drugs”—uses a demand model to construct a price index for anti-cholesterol drugs that accounts for quality changes stemming from new product introductions. Dunn’s approach has been used previously to assess the value of new goods in several industries, such as autos,

computers, and breakfast cereals. A few papers have also applied these techniques to medical products, including the CT scanner market and various other drugs.

Much of the previous work examining innovation in the health care sector relied on aggregate data. However, Dunn’s paper relies on detailed, nationally representative individual-level data that includes information on health conditions, demographics, health insurance, drug insurance, and individual-specific drug choices. The main source of data was the Medical Expenditure Panel Survey (MEPS) from 1996 to 2007.

Substitution patterns in medical treatments are important when aiming to measure prices of new treatments. Dunn’s model accounts for the flexible substitution patterns that are affected by the health conditions and demographics of individuals in the market. His model is particularly well suited for estimating the welfare for new medications since the effectiveness of drugs and their side effects may vary depending on the severity of the condition, the specifics of the disease, and the demographics of the individual. Using individual-level information on drug insurance coverage, Dunn was also able to control for potential insurance effects that may distort the market valuation of anti-cholesterol drugs. Although choices are modeled using detailed individual-level

information, a key advantage of the model is that it is relatively simple to implement and may be applied to other drug classes with readily available health care databases.

The results indicate that the quality-adjusted price of anti-cholesterol drugs has fallen considerably since 1996. The impact of innovation on welfare is measured using a price index that holds quality fixed. The price index that holds the quality of treatments constant fell 5 percent from 1996 to 2005. This contrasts sharply with the average price, which increased 37 percent over this period.

These results were confirmed by a hedonic index that Dunn also calculated, which controlled for quality by looking at product characteristics. This index showed a price increase of just 4 percent, far below the average price and closer in magnitude to Dunn’s index.

Dunn also examined the hypothetical impact of the introduction of statins in the market on quality-adjusted prices for those with heart disease and those without to show how innovations impact different populations.

Conservative estimates suggest that for those without heart disease, the launch of statins in 2007 would be equivalent to a 26.5 percent reduction in quality-adjusted prices, while the price reduction for those with heart disease would be 30.5 percent.