

Research Spotlight

# How Diffusion of Product Quality Knowledge Impacts Measures of Price Change

January 7, 2025

There is a consensus that the bias associated with the entry of new merchants has nontrivial implications for measuring inflation. However, quantifying that bias has proven difficult, in part because little is known about how much of the price differences in goods and services sold by new versus old merchants represents differences in quality rather than pure price differences. A recent [working paper](#) by Daniel Ripperger-Suhler of the U.S. Bureau of Economic Analysis seeks to shed light on this topic with a novel approach examining rideshare and taxi data.

In the public transportation industry, measurement of quality is complicated by the accompanying technological change rideshare services represented. As with any new technology, consumers have faced uncertainty around the quality of rideshare services. Consequently, consumers' perceived quality of rideshare services changes over time, which makes the calculation of constant-quality price indexes even more challenging. Ripperger-Suhler's paper explores a new method for accounting for this bias by separately identifying changes in product price and quality over time. The author estimates multiple hedonic models to recover quality-adjustment factors for quality-adjusted unit value (QAUV) price indexes. One of these models uses measures of time-varying product quality derived from a structural demand model of endogenous consumer learning that explicitly models the diffusion of knowledge about the quality of rideshare services. The study compares the measurement of quality and pure price differences across modes of transportation and the implications they have for constant-quality price indexes and, consequently, the measurement of inflation.

Rideshare Versus Taxi Trips in New York City, 2015-2017



Note. Data compiled by the author from New York City's NYC OpenData and Taxi and Limousine Commission records. U.S. Bureau of Economic Analysis

The study uses a Bayesian updating mechanism to capture unobserved variation in demand that is exogenous to prices, which allows for the identification of unobserved quality-adjustment terms. The approach is assessed by computing price indexes for taxis and rideshare services in Manhattan using a variety of methods, which are then compared to the QAUV consumer learning price index. The price indexes computed using the proposed method exhibited consistent differences, across a variety of distinct time blocks, relative to the existing methods. Most notably, the compound annual growth rates calculated from the consumer learning model indicated differences in price growth estimates that were as large as 6.5 percent in some cases, depending on the QAUV method used in the comparison. This implies that the proposed method is algebraically different and that the difference is numerically meaningful. The author notes that this framework will be more useful when there are important unobserved quality characteristics that not only impact price but also change over the course of the sample. In settings where these issues are not substantial, the improvement over other methods is likely not large enough to justify the time-consuming estimation procedure.

This *Research Spotlight* was prepared by *Survey of Current Business* staff. It uses language from the working paper “Consumer Learning and Price Index Bias: How Diffusion of Product Quality Knowledge Impacts Measures of Price Change” by Daniel Ripperger-Suhler, published in November 2024. [The working paper is available in full on the BEA website.](#)

The views expressed in this *Research Spotlight* are those of the author(s) and do not necessarily represent the U.S. Bureau of Economic Analysis or the U.S. Department of Commerce.



**Subscribe to the SCB**

The *Survey of Current Business* is published by the U.S. Bureau of Economic Analysis. Guidelines for citing BEA information.

*Survey of Current Business*

bea.gov/scb  
scb@bea.gov