Valuing Housing Services in the Era of Big Data: A User Cost Approach Leveraging Zillow Microdata

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July 18, 2018

Extended Abstract

Historically, residential housing services or "space rent" has made up a substantial portion (approximately 10%) of U.S. GDP final expenditures. The current methods and imputations employed by the Bureau of Economic Analysis (BEA) rely primarily on designed survey data from the Census Bureau. In this study, we develop new estimates valuing housing services based on a user cost approach, utilizing a detailed microdata from Zillow (ZTrax), a "big data" set that contains detailed information on hundreds of millions of market transactions. The coverage of this data is representative of the United States' national housing market, initially containing 374 million detailed records of transactions across more than 2,750 counties over more than two decades, which includes information on each home's sale price, closing date, mortgage information, property taxes, and other information commonly disclosed by local administrative sources.

Methodologically, this dataset allows us to incorporate actual market prices into the estimates more directly, or transaction prices from comparable homes within neighborhoods (block groups) for property-level hedonic imputations. Further, we are able to include tax rate, interest rate, and other property-level information into the initial estimates, reducing potential measurement error associated with aggregation for a market that varies extensively by region and locality. To assess coverage and accuracy, we supplement our analysis with linked internal Census microdata, estimating interest rate costs and other costs more precisely for individual households where data coverage can be strengthened. Finally, we compare our method and estimates to the corresponding series of BEA statistics, which are based on a rental-equivalence approach, as we provide a path to show how BEA may be able to incorporate big data sources to improve the quality of a key component of GDP expenditures. Because the user-cost approach depends more on the market prices of homes, the initial results track aggregate home price indices more closely than approaches relying more on rental data and corresponding rental imputations.

Keywords: residential housing, Big Data, housing services, owner-occupied, space rent, home prices
JEL Classifications: E01, C80, R00

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