Estimating Capital Services in the U.S.: An Empirical Assessment of Implementation Differences

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Paper Abstract: While there is broad consensus in the growth accounting literature that capital service measures should reflect the productive capital stock and the implicit annual user cost of capital, conceptual and implementation issues persist. This paper uses detailed source data from the Bureau of Labor Statistics (BLS), which publishes the official productivity statistics, and the Bureau of Economic Analysis (BEA), which publishes the detailed fixed asset data and income measures, to empirically assess two alternative measures of capital services that span many of the conceptual and implementation issues. The first approach uses the methodology of the official capital services estimates that are produced by the BLS. This methodology assumes hyperbolic depreciation and uses either the internal or external (when implicit rental rates are negative) (Harper, Nakamura, Zhang 2012). The second approach follows the methodology in (Jorgenson, Ho, and Stiroh 2007), and assumes geometric depreciation and asset-specific and industry fixes for negative implicit user costs. In addition to comparing the capital measures themselves, we evaluate the broader impact of the difference in capital methodologies by re estimating the BEA- BLS integrated industry level production account in Rosenthal, Russell, Samuels, Strassner, and Usher (2014). So far, we have compared the productive capital stocks, wealth stocks, and capital services generated by the two approaches. We found that, although year-to-year growth rates differed somewhat, the long-run average growth rates of productive capital stocks and wealth stocks were remarkably similar under the two methodologies. In contrast, when we compared capital services measures at the industry level, we found greater differences. For most industries, capital services growth rates were similar. But for others, the differences warrant additional investigation into how the capital service price equations are implemented. For example, there appear to be differences in the treatment of negative rental prices, the calculation for noncorporate capital income, and the treatment of land. We will examine these and other differences in implementation and quantify their effects on the growth of capital services and MFP.