

## A Sensitivity Analysis of Capital and MFP Measurement to Asset Depreciation Patterns and Initial Capital Stock Estimates

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Capital measurement plays a fundamental role for national accounts and to better understand the sources of economic and productivity growth. Nevertheless, measuring capital is challenging because it implies estimating initial capital stocks and then cumulating and depreciating investment flows over time. This paper discusses the sensitivity of capital and multifactor productivity (MFP) to changes in asset depreciation patterns and initial capital stocks. As a synthetic way to compare heterogeneous practices across countries to account for capital depreciation, we suggest focusing on geometric approximations of cohort depreciation patterns. Applying the same geometric cohort depreciation rates in the US as in Canada and France would reduce the US private sector net capital stock by a third, and significantly increase CFC and decrease net investment. By contrast, the growth rates of capital stocks, capital services and MFP are less sensitive to changes in depreciation and retirement patterns. Regarding the estimation of initial capital stocks, usual methods involve stationarity assumptions on either investment growth rates or capital-stock-to-output ratios. The US example shows that assuming stationary investment growth rates may be particularly misleading for capital and MFP measurement, mainly because it fails to account for fluctuations and long-term trends in real-estate investment. Relying on cross-country averages of capital-stock-to-output ratios to estimate initial capital stocks works well for the US economy but given the wide dispersion in capital-stock-to-output ratios across countries, this result may not be universally true. Overall, this sensitivity analysis calls for a more frequent review of the methods used by statistical agencies to estimate the depreciation and retirement of assets, and for using all available sources of information to extend investment time series and estimate capital stocks.