

# Aggregate Productivity and the Level of Living, and Estimates for 1948-2016

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The purpose of GDP is to measure production, though it is often used as a broader indicator of economic well-being. The purpose of aggregate productivity (TFP) is to measure the change in aggregate output per unit of input and is often used to assess innovation, but it too is also used to proxy welfare change. GDP and TFP measures sit within the production account, but (Basu & Fernald, 2002) argues that changes in aggregate TFP are, in fact, directly proportional to changes in aggregate welfare (in their stylized closed economy representative agent model). Thus, they provide a clear conceptual link between the production account and welfare measurement. (Basu, Pascali, & Schiantarelli, 2012) demonstrates that the same basic approach shows that (modified) TFP growth measures aggregate welfare change in a more general economy, with international trade, taxation, and government spending.

This paper argues that once the stylized economy includes these features, changes in aggregate welfare (still within a stylized macro model) can be derived from the Income and Expenditure account (in constant prices). The production account yields measures of TFP, while in the Income and Expenditure account yields measures of the level of living (Jorgenson, 2010). This paper shows how the Income and Expenditure Account fits within the basic framework of the national accounts, but is currently not implemented as a part of the official statistics in the U.S. We assemble such an account for the U.S. by building off the official national income and product accounts and BEA-BLS integrated production account.

The empirical contribution of this paper is to present estimates of the level of living in comparison to aggregate TFP in the U.S. between 1947 and 2016. Estimates indicate that between 1948 and 2016, aggregate total factor productivity grew by 0.75% per year, while the level of living grew by 0.86% per year. Focusing on the more recent period that includes the productivity growth slowdown in the U.S., between 2007 and 2016 productivity grew at 0.15% per year, while the level of living grew by about 0.33% per year, though this does not take into account the various cyclical factors that affect measurement over the business cycle. Given the conceptual link between the level of living and welfare change, one way to increase the SNA's congruence with economic theory is to include the Income and Expenditure Account in current and constant prices, along with the level of living.