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Real-time analysis on Japan's labor productivity

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ABSTRACT

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This paper analyzes the revision to Japan's labor productivity, measured using Japan's System of National Accounts (SNA) data. We draw three main findings from our analysis. First, SNA data has been substantially revised in and after the second comprehensive revisions, as well as at the earlier stage of revisions. We find that the past absolute revisions to the annual growth rate of labor productivity often went beyond 1% point. Second, the annual growth rate of labor productivity has been revised upward by 0.4% points on average. We show that part of its upward revisions reflects an underestimation of employment through an increase in 'non-response people,' people who do not respond in the Population Census. Third, revisions to source data such as the Population Census and the Employment Status Survey are helpful to predict revisions to labor productivity growth. Our regression results suggest that labor productivity is likely to be revised upward during expansions or with low real-time estimates of value added. We conclude that the three findings indicate that labor productivity during the 2000s will experience substantial revisions in the future. This conclusion takes into account the fact that the SNA after 2000 has experienced at most one comprehensive revision. The upcoming revisions to labor productivity can be positive rather than negative. *J. Japanese Int. Economies* 25 (2) (2011) 107–130. Bank of Japan, 2-1-1, Nihonbashi-Hongokuchō, Chūō-ku, Tokyo 103-8660, Japan.

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1. Introduction

Productivity is a fundamental concept in economic analysis. The evolution of mid-to-long-run economic growth—which is a crucial assumption of analyses, on fiscal sustainability, for instance—relies substantially on perspectives on productivity growth. Productivity is also important in the light of short-run economic dynamics. For example, when an economy grows, the desirable policy accompanied by a rise in productivity will be totally different from that without the rise. Considering monetary policy, immediate monetary policy tightening is not necessary if an economy grows with a rise in productivity and labor market conditions are not tight. By contrast, central banks should be cautious about economic growth without rising productivity, because economic bubbles and accelerated inflation are fairly likely to happen through economic overheating.

While it is widely recognized that productivity is conceptually important, measuring productivity is quite difficult. One challenge in measuring productivity is that productivity measured in real time will be revised due to revisions to its source data.

An experience of the Federal Reserve Board (FRB) shows how revisions to productivity can influence monetary policy. In the 1990s, the FRB continued discussions on whether the current productivity growth accelerated under high economic growth. Anderson and Kliesen (2005) use the FOMC transcripts to study what the FOMC members debated based on the FRB staff forecasts of labor productivity. In the 1990s, it is widely said that increased information and communications technology (ICT) investment from the early 1990s was accelerating productivity growth. Data available in real time, however, did not even hint at such a relationship. According to Anderson and Kliesen (2005), the FOMC members' primary concern at that time was whether increased investment in ICT was accelerating productivity growth. They continued to debate whether immediate monetary tightening was needed in response to the rapid economic growth. Eventually, the source data on labor productivity was revised so that the ex-post assessment of labor productivity was higher than its real-time estimates. Thus, the FOMC's decision in the 1990s to avoid an immediate reaction to rapid economic growth was found to be appropriate in terms of uncertainty around real-time data. This episode is often referred to today as an example of proper monetary policy conduct, since it took into account future data revisions.¹

With recognition of the importance of data revisions, organizations in the United States and Europe—mainly central banks and international institutions—have been constructing databases collecting real-time data.² Progress in developing real-time datasets has led to substantial accumulation of real-time data analysis.³ Among the series of real-time data analysis, there are various studies on real-time productivity, including Anderson and Kliesen (2005). For instance, Orphanides (2003) points out that a slowdown in productivity growth in the 1970s, which was not observed in real time, led to the Great Inflation via monetary policy that was excessively expansionary. Edge et al. (2007) measure a learning process for long-run trend of labor productivity of the United States based on real-time data and forecasters' real-time predictions for labor productivity.

In contrast to the United States and Europe, there is only one real-time dataset for Japan that is open to the public and regularly updated. It is provided by the OECD on its website, covering 21 variables collected in the OECD's *Monthly Economic Indicator* from February 1999 onward.⁴ Studies

¹ The former Federal Reserve chairman Greenspan later commented in his book, "By not being too quick to raise rates, we helped clear the way for the postwar period's longest economic boom." (Greenspan (2007)). Woodward (2000) and Greenspan (2007) describe the debates at the FOMC meetings during 1990s.

² For the United States, Real-Time Dataset for Macroeconomists (RTDSM) by the Federal Reserve Bank of Philadelphia is widely used (Croushore and Stark (2001)). Archival Federal Reserve Economic Data (ALFRED) by the Federal Reserve Bank of St. Louis contains real-time data for about 20,000 variables as of August 2009 (Anderson (2006)). For Europe, the European Central Bank (ECB) has developed a real-time database for the euro area (Giannone et al. (2010)). The Bank of England provides a real-time dataset for the United Kingdom (Castle and Ellis (2002)). Aside from these countries, the Reserve Bank of New Zealand has constructed a real-time database for New Zealand (Sleeman (2006)). Concerning international institutions, the OECD provides a real-time database for all OECD countries, the euro area, and several non-OECD countries.

³ Croushore (2009) provides a comprehensive list of more than 300 papers on real-time data analysis.

⁴ Another real-time database for Japan is provided by Yasuyuki Komaki and can be obtained from the following website: <http://www.eco.nihon-u.ac.jp/~komaki/RealTimeData-091121.html>.

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