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Background information for presentation at Meeting of the Group of Experts on Consumer Price Indexes

Session 3: “Adjusting CPI (and related government statistics) for potential biases from quality change and new goods in an age of digital technologies”

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In spring 2016, three senior staff members from the US Bureau of Labor Statistics (BLS) began a collaboration with two senior leaders from the US Bureau of Economic Analysis (BEA) to co-author a paper that was published in the spring 2017 issue of the Journal of Economic Perspectives (JEP). As one of the co-authors, I have posted a PDF of that article for this session (article is entitled “How Government Statistics Adjust for Potential Biases from Quality Change and New Goods in an Age of Digital Technologies: A View from the Trenches”\(^1\)) on the CPI Experts Meeting website. It is the motivation for my presentation, which provides an overview of the work covered in the JEP article before turning to focusing on an update on developments since publication of the article. Most prominently, this includes improvements we have been working on in the US CPI program in the area of quality adjustment with respect to goods and services in the digital economy.

The JEP piece could be seen in part as a response to a concern in some quarters that measurement problems related to quality changes and new goods have likely caused growth of real output and productivity to be so understated that it is a primary source of the pattern of slower growth seen in recent years. A focus of this criticism (as notably embodied in the article authored by Martin Feldstein in the same JEP issue) is the notion of growing upward bias in price indexes, especially the CPI. While the co-authors recognize and discuss measurement problems, we present our view that challenges in measuring price change and real output are far from new and, based on the magnitude and timing of recent changes, are unlikely to account for the pattern of slower growth seen in recent years.

The paper focused a great deal on approaches toward measuring quality change in price indexes including the reasons why some approaches are not feasible for the US CPI. There is also focus on the issue of introduction of new products. We also discussed some of the ongoing work at BLS and BEA to reduce potential biases and further improve measurement. Even before the JEP article was published, both agencies were focusing particularly on product areas related to the digital economy\(^2\). This work

\(^1\) The authors are Erica L. Groshen, who served as BLS Commissioner from January 2013 through January 2017 and is currently a Visiting Senior Scholar at ILR School of Cornell University; Brian C. Moyer, the current Director of BEA; Ana Aizcorbe, Senior Research Economist at BEA; Ralph Bradley, who retired as Chief of the BLS Division of Price and Index Number Research in June 2017; and David M. Friedman, the current BLS Associate Commissioner for Prices and Living Conditions.

\(^2\) BLS has not so much focused on the term ‘digital economy’ as rather on specific issues that others mention when they talk about the digital economy, e.g. measurement of prices for high-tech goods and services, measurement of “shared services”, Gig work, etc. The working definition used by BEA in its work on creating a satellite account on the digital economy tends to set the stage for all US statistical agencies: “The goods and services that serve as the basis for or that use information and communications technologies and computer networks to facilitate production and consumption.” This is in turn consistent with the OECD Advisory Group’s work on “Measuring GDP in a Digitalized Economy”. BEA preliminary estimates indicate that the “digital economy” accounts for about 6%
has begun to result in introduction of some new improvements in production of the CPI (as well as the PPI though the latter is not covered in this presentation).

This addendum to the presentation and the JEP article directs readers to where they can find more information about the improvements and practices noted in the presentation:

- **Recent and upcoming methodology changes** – This notice currently posted to the BLS/CPI website includes information about the improvements made related to Smartphones.
- **Measuring Price Change in the CPI: Telephone hardware, calculators, and other consumer information items** – This factsheet contains a section on CPI’s approach to quality adjustment for Smartphones.
- **How the Consumer Price Index Measures Price for Telephone Services** – This factsheet includes updated information for how CPI measures price change for wireless telephone services.
- **CPI Factsheets** – CPI has a series of factsheets that covers how the program measures price change in selected item categories. Several of them have information on use of special procedures for handling quality change and new products, including especially the ones for personal computers and peripheral equipment, cable and satellite television and radio, leased cars and trucks, new vehicles, and parts of the medical care sector (drugs in particular).
- **Quality Adjustment in the CPI** – This provides an overview of quality adjustment practices in the CPI including a list of items for which hedonic adjustments are utilized and a hyperlink to a series of frequently asked questions (FAQs) concerning the use of hedonic quality adjustment in the CPI. Note that it will be updated soon to reflect the addition of smartphones as one of the product areas where CPI has begun using hedonic quality adjustment methods.

Finally, I draw your attention to three articles published in August 2012, August 2008, and May 2006 respectively. Although they do not reflect the most recent improvements in addressing quality change and/or the introduction of new products in the CPI, I believe they are still excellent sources of information on how BLS approaches the issue of measurement error in the CPI, both of the sampling and non-sampling variety. The articles include:

- **Beyond The Numbers: Consumer Price Index quality: how accurate is the U.S. CPI?** – This article by Stephen Reed and Darren Rippy provides a concise overview of CPI’s measurement of sampling error and how the program has dealt with the issue of bias, especially that mentioned in the famous 1996 Boskin Report (substitution bias, quality change bias, & new goods bias).
- **Monthly Labor Review: Addressing misconceptions about the Consumer Price Index** – This MLR article by John Greenlees and Robert McClelland attempts to address a number of longstanding myths or misconceptions about the US CPI with an eye toward increasing public understanding of this key economic indicator. Topics include Substitution, Quality adjustments & hedonic models, rental equivalence, and discussion of whether CPI understates inflation.

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of current dollar GDP in the US from 2009-2015 and gross output increased on average about 3.2%, outpacing the overall 2.2% growth in GDP over the period. Source: Presentation at [December 2017 meeting of Federal Economic Statistical Advisory Committee](https://www.bls.gov/ces/2017meeting.php) by Erich Strassner.
• **Monthly Labor Review: Price measurement in the United States a decade after the Boskin Report**
  – This MLR article by David S. Johnson, Stephen B. Reed, and Kenneth J. Stewart reviews changes made to improve the CPI since publication of the Boskin Report in December 1996. Although there been more improvements since 2006, this article is an excellent discussion of the major improvements to the CPI in the first decade after the Report.

If you have any questions, feel free to contact me at [Friedman.David@bls.gov](mailto:Friedman.David@bls.gov).