Real Consumption in Real-time: Online Prices for International Comparisons

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For the past 50 years, global comparisons of income and consumption have relied on periodic comparisons of prices in the International Comparison Program (ICP). The ICP has allowed for great advances in our understanding of economic development, including on topics such as poverty and inequality (Deaton and Heston, 2010) and cross-country income convergence (Barro, 2015). Over the years, the ICP has grown in importance and scope, covering more than 180 countries in the most recent global comparison, for 2011, but some of its drawbacks have also come into sharper focus. For one, the results of the 2011 global comparison were not available until World Bank (2014) and the results for the subsequent, 2017 round will not be available until late 2019 at the earliest. Second, the need to rely on the efforts of individual countries that can refuse to participate (e.g., Argentina for ICP 2011) or lack transparency regarding their data and methods (see Feenstra et al. 2013) raise concerns on the usefulness of the ICP results

The growing availability of 'big data' sources provides an opportunity to complement official ICP efforts with more timely estimates of relative prices for consumer products – and thus real-time estimates of real consumption across countries. In this paper, we introduce a new dataset of relative consumption prices based on online prices, collected through the Billion Prices Project (BPP) at MIT. By scraping the websites of retailers with an online (and offline) presence, prices for a large number of products is collected automatically on a daily basis. These online prices cover the important consumption areas of food, energy and electronics and data will be available for 15 countries, including advanced economies such as Japan and the United States, and emerging economies such as Argentina, China and South Africa.

Data collection and subsequent computations correspond closely to ICP procedures and one important element of this paper will be to validate the resulting estimates of relative prices:

how well do the results align with ICP estimates? In which type of products is alignment stronger? Are there systematic differences between ICP's national average prices and the online prices estimated for particular products and countries? In this paper, we will build on the initial results of Cavallo, Diewert, Feenstra, Inklaar and Timmer (2018). The first set of questions can be answered based on recent advances in estimating cross-country prices and their associated standard errors (Rao and Hajarghast, 2016).

A second question is to what extent changes in relative prices can be predicted more reliably. With each of the recent ICP releases, the change in relative prices was not well-approximated by relative inflation trends (Deaton and Aten, 2017; Inklaar and Rao, 2017). Even after accounting for all methodological changes, important differences remain, which suggests that sizeable revisions to relative consumption and income levels can also be expected in the future. In product categories with real-time relative prices the need for prediction greatly diminishes, but the online price data are not comprehensive, so predictions will remain necessary for some categories. To advance our understanding of this area, we will exploit the fact that the BPP data we use for international comparisons is a subset of the full universe of products that is used for computing (daily) inflation, which tends to track official CPI movements closely. Comparing price movements in the international comparisons sample to price movements for all products should shed light on the predictability of relative price changes.

We will use the results from both major analyses to develop real-time estimates of relative prices for all of household consumption and thereby to enable real-time comparisons of real consumption per capita. Thereby, we will achieve a more reliable and up-to-date overview of economic development.

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