

## **Inflation Measurement with Scanner Data and an Ever-Changing Fixed Basket\***

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### **Key Question**

Statistics Sweden uses scanner data in several parts of the Swedish Consumer Price Index (CPI). Regarding daily consumer products, the applied methodology, the monitoring of a small sample of representative items (a fixed basket), kept constant as far as possible, is rather conventional. Although this does not take advantage of the considerable amount of data possible to use, the traditional manual quality/quantity control ensures comparability over time: package size changes are always subject to explicit price adjustments to shield hidden inflation. The issue is then of the trade-off between the sample size related variance (limited sample) and the risk of bias from disregarding quality/quantity adjustments which might result from a more extensive use of scanner data.

### **Methodology**

The variance in the daily consumer products index is estimated through a jackknife estimator applied to the actual scanner data used in the Swedish CPI. It is contrasted with the potential bias in the CPI basket that would result from not adjusting for changes in items' package size. Biases from improper quantity adjustments are illustrated through three numeric examples based on real changes occurred in the Swedish market of daily necessity products.

### **Main Results**

- The average standard error for the monthly index for daily necessities is found to be approximately 0.168 index units for year 2016. For instance, for a monthly index value of 102 (the current month's prices compared with the base month, i.e. December the preceding year), the 95% confidence interval is [101.67, 102.33].
- Potential biases would result from not adjusting prices to quantity changes. For the three product categories which package have changed in quantity (simple downsizing, grams for liters, or number of units contained), taken as examples in a hypothetical computation, the changes would account for up to 0.1 percent of the basket weight. If not explicitly adjusted for, the consequence would be hidden inflation.

### **Message**

Scanner data offer the undeniable advantage of increasing the coverage in the CPI and to gain precision. However, this should not come at the cost of risking to impair survey quality if quantity changes are not subject to explicit price adjustments. Specifically, uncontrolled mechanical approaches can be questioned, not in terms of coverage but because the price index they generate may mask inflation if quantity changes are ignored. Yet there is substantial methodological progress in the field of accommodating large datasets in the CPI; it remains to examine such new methods for the future, keeping in mind that the production of statistics requires to assess the quality of the complete production process, not only the data.