

Scanner Data, Chain Drift, Superlative Price Indices and the Redding-Weinstein CES Common Varieties Price Index

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Abstract

Scanner data are being increasingly integrated by national statistical offices into the compilation of the consumer price index. An appealing feature of scanner data is the availability of quantity data along with price quotations recorded at the point of sale which makes it possible to consider the full range of index number methods at the elementary level. Chain drift is a serious problem encountered in the application of superlative indexes like the Fisher and Tornqvist which is often resolved through the use of the Gini-Elteto-Koves-Szulc and the Geary-Khamis methods. These somewhat ad hoc solutions lack theoretical foundations and interpretation as cost of living indexes. In this paper we establish credentials of the exact *CES common varieties (CCV)* price index proposed in Redding and Weinstein (2020) by proving that the index is transitive and therefore eliminates chain drift when using high frequency data. We demonstrate the effectiveness of the index by applying the CCV index along with a raft of other indexes to Japanese scanner data. Empirical results suggest a bias associated with the use of Chained Sato-Vartia index is 5.89 percent at annual rate. The paper offers additional insights. First, we show that, unlike the Sato-Vartia index, the CCV index is monotonic with respect to current prices. Second, the implicit quantity index based on the CCV price index is a measure of welfare change. Finally, the paper resolves the problem of specification of normalization condition in Redding and Weinstein (2020) by providing a necessary and sufficient condition for the index to satisfy the commensurability property which ensures that the index is independent of units of measurement. The CCV index with these demonstrated properties may be considered superior to the Fisher ideal index. The paper also discusses some of the practical issues surrounding the presence of stocking behaviour, similar to that observed during the COVID-19 pandemic, and the application of the CCV price indexes.