

Title: Price Indexes across Space and Time and the Stochastic Properties of Prices

Abstract: The availability of scanner data from large-scale retailers makes the construction of a continuously updated system of price indexes over space and time for an important share of household consumption expenditures possible. However, building a coherent (transitive) system of price indexes across space and time involves issues that are irrelevant for bilateral price indexes or multilateral price indexes only over space. Some of these issues were discussed by Hill 2004, but in my opinion the most important has been ignored. Indeed, it is very likely that the same commodity is differently priced across space, but in the long run the movements of its prices will be similar (stable) in space. So it is quite natural to ask price indexes for pairs of space situations not to diverge over time if the prices of each single commodity in the basket remain approximatively pairwise proportional in the two sites. In this work, we give a definition of the test of *\emph{stability preservation}*, starting from the stochastic properties that panels of price time series seem to obey to. Then, many different approaches to the construction of the system of indexes are analysed in order to identify those that pass the test. The selected systems are applied both to simulated and to real-world data collected in four supermarkets located in the city of Milan for a time span of 24 months