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Drobisch's Legacy to Price Statistics

By Ludwig von Auer, Trier

Summary

This paper attempts to establish a greater awareness among researchers for the noteworthy contributions to price index theory made by Moritz Wilhelm Drobisch (1802-1896), a German mathematician and philosopher at the Universität Leipzig. Few economists and statisticians are aware of the fact that neither Étienne Laspeyres nor Hermann Paasche originally devised the well-known price indices that presently carry their names. Moritz Wilhelm Drobisch was the first to publish them in 1871 in a treatise and, shortly thereafter, in an abridged version that appeared in this very journal. He rejected them, however, because in his view they were inappropriate measures of inflation. Instead, he devised the unit value index, which he regarded as superior to all other price index formulas. This paper contains a description of his pioneering scientific achievements together with a synopsis of his personal and professional life. Its purpose is to give credit where credit is due, but more importantly, it attempts to recognize these seminal contributions in light of the factors that have tarnished them in the recorded annals of price index history. It attempts to put them into their proper perspective.

Notes on Unit Value Index Bias

By W. Erwin Diewert, Vancouver, and Peter von der Lippe, Duisburg-Essen[*]

Summary

It is often the case that the value of a number of somewhat similar units (e. g., automobiles of a certain general type) is divided by the number of units in order to form a unit value price and these unit value prices are compared over two periods in order to form a unit value price index. This unit value price index or Drobisch price index can then be compared with other standard index number formulae and the bias in the index can be determined. The present paper presents most of the known results on this bias (and derives some new ones) in a coherent framework using a simple identity from the statistics literature. A related question first considered by Párniczky (1974) is also considered: does disaggregation of a unit value into more homogeneous subgroups reduce the unit value bias? The answer seems to be: probably yes.

Aggregate Indices and Their Corresponding Elementary Indices

By Jens Mehrhoff, Frankfurt a. M.

Summary

"Which index formula at the elementary level, where no expenditure share weights are available, corresponds to a desired aggregate index?" To answer this question, this paper develops a statistical approach. It proposes a theoretical framework which makes it possible to achieve numerical equivalence of an elementary index with the Laspeyres, Paasche or Fisher price index. Depending on the price elasticity, different elementary indices should be applied to different groups of goods in order to approach the desired aggregate index as closely as possible. Furthermore, the new statistical approach assures internal consistency between price and volume measurement.

Lowe and Cobb-Douglas Consumer Price Indices and their Substitution Bias

By Bert M. Balk, Rotterdam*

Summary

Catching the effect of substitution behaviour in a Consumer Price Index (CPI) as good as possible is a goal pursued by statistical agencies throughout the world. The difference between a CPI and a certain target cost-of-living index is called substitution bias. Balk and Diewert (2003) considered the substitution bias of a Lowe Consumer Price Index; see also CPI Manual (2004: Chapter 17). The present paper considers the substitution bias of a Cobb-Douglas (or Geometric Young) CPI, and compares the two price indices with respect to their substitution bias. It appears difficult to draw a clear-cut conclusion.

Reconsideration of Weighting and Updating Procedures in the US CPI

By John S. Greenlees and Elliot Williams, Washington*

JEL C430

Aggregation, Consumer Price Index, CPI, index numbers.

Summary

In 2002, the US Bureau of Labor Statistics (BLS) introduced a supplemental C-CPI-U employing a superlative formula to provide a closer approximation to a cost-of-living index (COLI). This paper focuses on whether the BLS can improve upon the headline CPI-U's current biennial weight update process, thereby reducing the CPI-U's growth rate and bringing the index closer to the C-CPI-U.

We begin by estimating superlative price indexes for 1999 through 2007 along with indexes based on the constant-elasticity-of-substitution demand model. Our analyses confirm that the consumer expenditure data underlying the CPI imply substantial consumer substitution, implying that the CPI-U's Lowe index formula yields higher inflation estimates than would a true COLI.

Simulating feasible weight update processes, we find that a Lowe index with two-year weight reference periods but annual updating rises by about 0.03 percentage points less per year than the CPI-U. Another 0.01 percentage point on average is subtracted by imposing annual revision with one-year base periods. Thus, indexes with more timely weights may offer improved representation of current price change, as well as closer approximations to a COLI.

User Costs versus Waiting Services and Depreciation in a Model of Production

By W. Erwin Diewert, Vancouver

JEL D24, D92

Production theory, user cost of capital, waiting services, depreciation, Austrian models of production, net versus gross investment.

Summary

The paper develops an extension of a one period model of production involving beginning and end of the period capital stocks along with output and input flows that is due to Hicks and Edwards and Bell. This generalized Austrian model of production takes into account that end of the period capital stocks result from: (i) purchases of new investment goods; (ii) internal construction of firm capital stock components and (iii) holdings of (depreciated) capital goods that were held by the firm at the beginning of the period. These different methods of creating end of period holdings of capital stocks generally have different resource requirements and hence the one period production possibilities set is more complex than the usual one. This general model of production is used to justify the decomposition of the Jorgensonian user cost of capital into separate waiting services and depreciation components.

Hedonic Price Indexes: A Comparison of Imputation, Time Dummy and 'Re-Pricing' Methods

By Jan de Haan, The Hague, The Netherlands

Summary

The main approaches to measuring hedonic indexes in the academic literature are the imputation approach and the time dummy approach. This paper compares both approaches, discusses an alternative method called hedonic re-pricing, and comments on a recent contribution by Diewert et al. (2009). The aim is to explain the differences between the various hedonic approaches as well as their similarities, and to point to the implications for statistical agencies. Hedonic price indexes can be weighted or unweighted and the paper addresses the issue of choice of regression weights. For unweighted indexes it is shown that the 'full' hedonic imputation approach and the time dummy approach implicitly leave the matched part of the indexes unaffected, just like 'single' and 'double' hedonic imputation do explicitly.

Housing Prices in Tokyo: A Comparison of Hedonic and Repeat Sales Measures

By Chihiro Shimizu, Chiba/Japan, Kiyohiko G. Nishimura and Tsutomu Watanabe, Tokyo/Japan*

Summary

Do indexes of house prices behave differently depending on the estimation method? If so, to what extent? To address these questions, we use a unique dataset that we compiled from individual listings in a widely circulated real estate advertisement magazine. The dataset contains more than 470,000 listings of housing prices between 1986 and 2008, including the period of the housing bubble and its burst. We find that there exists a substantial discrepancy in terms of turning points between hedonic and repeat sales indexes, even though the hedonic index is adjusted for structural changes and the repeat sales index is adjusted in the way Case and Shiller suggested. Specifically, the repeat sales measure signals turning points later than the hedonic measure: for example, the hedonic measure of condominium prices bottomed out at the beginning of 2002, while the corresponding repeat sales measure exhibits a reversal only in the spring of 2004. This discrepancy cannot be fully removed even if we adjust the repeat sales index for depreciation.

Regional Consumer Price Differences Within Germany

Information Demand, Data Supply and the Role of the Consumer Price Index

By Stefan Linz, Wiesbaden

Summary

Every month the Consumer Price Index for Germany (CPI) provides comprehensive and detailed information regarding the price development over time. However, when differences in the price level across regions in Germany have to be analysed at a given point in time, sufficient information is not available at present.

Interest in regional consumer price data is shown by both scientists and policy makers. Currently, this information demand is not met as regional consumer prices or regional price comparisons are not provided by the Federal Statistical Office in Germany.

Data available from the German Consumer Price Index is suitable to follow the price development over time but cannot be used directly to compare price levels of different regions because the goods tracked may be different from region to region.

The article first considers the information demand and gives an overview of existing price data. Its main part refers to an empirical study which was conducted to check if existing Consumer Price Index data can be used to calculate regional consumer price comparisons by ex-post selecting comparable products.