



National  
Bureau of  
Economic  
Research

Studies in  
Income  
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Volume 64

# Scanner Data and Price Indexes

Edited by  
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and **Matthew D. Shapiro**

# Scanner Data And Price Indexes

**Naohito Abe**



## Scanner Data And Price Indexes:

*Scanner Data and Price Indexes* Robert C. Feenstra, Matthew D. Shapiro, 2007-11-01 Every time you buy a can of tuna or a new television its bar code is scanned to record its price and other information These scanner data offer a number of attractive features for economists and statisticians because they are collected continuously are available quickly and record prices for all items sold not just a statistical sample But scanner data also present a number of difficulties for current statistical systems Scanner Data and Price Indexes assesses both the promise and the challenges of using scanner data to produce economic statistics Three papers present the results of work in progress at statistical agencies in the U S United Kingdom and Canada including a project at the U S Bureau of Labor Statistics to investigate the feasibility of incorporating scanner data into the monthly Consumer Price Index Other papers demonstrate the enormous potential of using scanner data to test economic theories and estimate the parameters of economic models and provide solutions for some of the problems that arise when using scanner data such as dealing with missing data Generalized Fisher Price Indexes and the Use of Scanner Data in the CPI, 2001 Statistics Netherlands intends to use scanner data provided by retailers in compiling the CPI This has two important advantages First taking a sample of items to estimate the commodity group price index for a particular type of outlet becomes unnecessary Second the Laspeyres type index formula currently applied can be replaced by an index formula that is better suited for handling dynamic aspects such as commodity substitution and the introduction of new goods The present paper suggests the use of a so called generalized Fisher price index based on a set of goods that is variable through time This index contains prices of new and disappearing goods that cannot be observed directly and that should therefore be imputed The relation with quality adjustment procedures is addressed as well Key words Consumer price index Imputation New goods Quality adjustment Scanner data Substitution Consumer Price Index Manual International Monetary Fund, International Labour Office, Statistical Office of the European Communities, United Nations Economic Commission for Europe, Organisation for Economic Co-operation and Development, World Bank, 2005-06-30 The Theory publication and the companion on the practice of compiling consumer price indices CPIs is jointly published by the member agencies of the Inter Secretariat Working Group on Price Statistics IWGPS the Statistical Office of the European Union Eurostat the International Labour Organization ILO the IMF the Organisation for Economic Cooperation and Development OECD the United Nations Economic Commission for Europe UNECE and the World Bank The IMF managed the update of the Theory publication and the CPI Manual Drafting of this publication was led by Erwin Diewert with support from various authors The Theory publication will be translated into Spanish French Arabic and Russian A Practical Guide to Price Index and Hedonic Techniques Ana M. Aizcorbe, 2014-06-12 This book provides an accessible guide to price index and hedonic techniques with a focus on how to best apply these techniques and interpret the resulting measures One goal of this book is to provide first hand experience at constructing these measures with guidance on practical issues such as what the

ideal data would look like and how best to construct these measures when the data are less than ideal A related objective is to fill the wide gulf between the necessarily simplistic elementary treatments in textbooks and the very complex discussions found in the theoretical and empirical measurement literature Here the theoretical results are summarized in an intuitive way and their numerical importance is illustrated using data and results from existing studies Finally while the aim of much of the existing literature is to better understand official price indexes like the Consumer Price Index the emphasis here is more practical to provide the needed tools for individuals to apply these techniques on their own As new datasets become increasingly accessible tools like these will be needed to obtain summary price measures Indeed these techniques have been applied for years in antitrust cases that involve pricing where economic experts typically have access to large granular datasets

**Scanner Data, Time Aggregation and the Construction of Price Indexes** Lorraine Ivancic, Walter E. Diewert, Kevin J. Fox, 2009

**Price Indexes in Time and Space** Luigi Biggeri, Guido Ferrari, 2010-07-03 This book deals with many of the most relevant topics in price index numbers theory and practice The problem of the harmonization of CPIs and the time space integration of baskets is analyzed at the Eu zone level with methodological and actual proposals on how to proceed for an overall treatment of the matter Likewise the construction of sub indexes for households economic and social groups is investigated in order to obtain specific inflation measurement instruments Evidence from most updated databases is given The questions of the spatial comparisons of price levels through PPPs and the

**Price Index Concepts and Measurement** W. Erwin Diewert, John Greenlees, Charles R. Hulten, 2010-02-15 Although inflation is much feared for its negative effects on the economy how to measure it is a matter of considerable debate that has important implications for interest rates monetary supply and investment and spending decisions Underlying many of these issues is the concept of the Cost of Living Index COLI and its controversial role as the methodological foundation for the Consumer Price Index CPI Price Index Concepts and Measurements brings together leading experts to address the many questions involved in conceptualizing and measuring inflation They evaluate the accuracy of COLI a Cost of Goods Index and a variety of other methodological frameworks as the bases for consumer price construction

**Consumer Price Index Manual** International Labour Office, 2004-08-25 The consumer price index CPI measures the rate at which prices of consumer goods and services change over time It is used as a key indicator of economic performance as well as in the setting of monetary and socio economic policy such as indexation of wages and social security benefits purchasing power parities and inflation measures This manual contains methodological guidelines for statistical offices and other agencies responsible for constructing and calculating CPIs and also examines underlying economic and statistical concepts involved Topics covered include expenditure weights sampling price collection quality adjustment sampling price indices calculations errors and bias organisation and management dissemination index number theory durables and user costs

*Export and Import Price Index Manual: Theory and Practice* OECD, International Labour Office, International Monetary Fund, Statistical Office of the European

Communities, United Nations, The World Bank, 2010-04-06 A joint production by six international organizations this manual explores the conceptual and theoretical issues that national statistical offices should consider in the daily compilation of export and import price indices Intended for use by both Price Index Numbers Naohito Abe, 2025-03-14 This textbook offers a comprehensive yet concise introduction to the theory behind price indices covering the basics historical background necessary mathematical foundations and contemporary cutting edge theories For those looking to study price indices the most commonly used resources have traditionally been the comprehensive but voluminous CPI Manual which is aimed at statistical practitioners or Balk 2008 which while covering theory concisely requires advanced mathematical skills This book is distinctive in that it 1 places emphasis on the relationship between price indices and economic theory 2 presents cutting edge methods and topics such as multilateral indices using scanner data and price measurement using Engel curves and 3 provides explanations of essential mathematical techniques like functional equations thus enabling self study from the fundamentals to the forefront of modern index number theory **Food Price Dynamics and Price Adjustment in the EU** Steve McCorriston, 2015-10-08 This book addresses the important issue of food prices across EU Member States Although recent attention has focused on events in world commodity markets following the spikes in world prices in 2007 2008 and 2011 there has been comparatively little attention addressing food price dynamics at the retail level This volume addresses the characteristics of retail food price behaviour and the nature and drivers of price transmission across the EU There are several inter related features of the research reported here First the volume reports the characteristics of retail food inflation across the EU and the extent to which it differs from non food inflation Second given the different experience of food inflation across EU Member States it details the process of price transmission as shocks from upstream and world markets are passed through the food sector to the retail stage Third it addresses how the extent and nature of price transmission is determined by various aspects of competition throughout the domestic food sector and how the nature of vertical contracting between stages can determine the price transmission process Finally it outlines the potential of high frequency product specific scanner data to address price dynamics and adjustment issues and how scanner data can also be used to measure food price inflation The book will be of interest to researchers on price transmission and competition issues in the EU and given the wider interest on these issues coupled with the novel use of scanner data to researchers further afield The contributions will also be of interest to policymakers and stakeholders as they seek to make sense of and to address regulation issues as they relate to the food sector *Republic of Moldova* International Monetary Fund. Statistics Dept., 2024-03-22 New data sources are now available in many countries to supplement direct collection of prices for the consumer price index CPI This technical assistance mission supported the National Bureau of Statistics of the Republic of Moldova with incorporating scanner data from the State Tax Service of the Republic of Moldova electronic sales monitoring system into the CPI **Big Data for Twenty-First-Century Economic Statistics** Katharine G. Abraham, Ron S. Jarmin, Brian C. Moyer, Matthew D.

Shapiro,2022-03-11 The measurement infrastructure for the production of economic statistics in the United States largely was established in the middle part of the 20th century As has been noted by a number of commentators the data landscape has changed in fundamental ways since this infrastructure was developed Obtaining survey responses has become increasingly difficult leading to increased data collection costs and raising concerns about the quality of the resulting data At the same time the economy has become more complex and users are demanding ever more timely and granular data In this new environment there is increasing interest in alternative sources of data that might allow the economic statistics agencies to better address users demands for information Recent years have seen a proliferation of natively digital data that have enormous potential for improving economic statistics These include item level transactional data on price and quantity from retail scanners or companies internal systems credit card records bank account records payroll records and insurance records compiled for private business purposes data automatically recorded by sensors or mobile devices and a growing variety of data that can be obtained from websites and social media platforms Staggering volumes of digital information relevant to measuring and understanding the economy are generated each second by an increasing array of devices that monitor transactions and business processes as well as track the activities of workers and consumers Incorporating these non designed Big Data sources into the economic measurement infrastructure holds the promise of allowing the statistical agencies to produce more accurate more timely and more disaggregated statistics with lower burden for data providers and perhaps even at lower cost for the statistical agencies The agencies already have begun to make use of novel data to augment traditional data sources Modern data science methods for using Big Data have advanced sufficiently to make the more systematic incorporation of these data into official statistics feasible Indeed the availability of new sources of data offers the opportunity to redesign the underlying architecture of official statistics Considering the threats to the current measurement model arising from falling survey response rates increased survey costs and the growing difficulties of keeping pace with a rapidly changing economy fundamental changes in the architecture of the statistical system will be necessary to maintain the quality and utility of official statistics This volume presents cutting edge research on the deployment of big data to solve both existing and novel challenges in economic measurement The papers in this volume show that it is practical to incorporate big data into the production of economic statistics in real time and at scale They report on the application of machine learning methods to extract usable new information from large volumes of data They also lay out the challenges both technical and operational to using Big Data effectively in the production of economic statistics and suggest means of overcoming those challenges Despite these challenges and the significant agenda for research and development they imply the papers in the volume point strongly toward more systematic and comprehensive incorporation of Big Data to improve official economic statistics in the coming years

**The Unit Problem and Other Current Topics in Business Survey Methodology**

Mojca Bavdaž,Boris Lorenc,Paul A. Smith,2018-11-07 This volume brings together a selection of papers

presented at the 2017 European Establishment Statistics Workshop which have been revised and expanded here Several contributions will serve to deepen the reader's understanding of the unit problem in business statistics while further chapters showcase recent advances in business survey methodology and practice in areas such as linking and data integration sampling and estimation data collection from businesses measurement and mitigation of response burden in business surveys among others Written by leading experts in business statistics the volume offers detailed and up to date findings to survey methodologists and practitioners working with business statistics It will also be useful for readers in official statistics academia and the private sector

**Producer Price Index Manual** International Monetary Fund, 2004-09-03 The producer price index PPI measures the rate at which the prices of producer goods and services are changing overtime It is a key statistic for economic and business decision making and inflation monitoring The Producer Price Index Manual Theory and Practice provides clear up to date guidance on the concepts uses methods and economic theory of the PPI including information on classifications sources compilation techniques and analytical uses of the PPI The Manual supersedes the previous international guidance on PPIs available in the Manual on Producers Price Indices for Industrial Goods published by the United Nations Statistics Division in 1979 The Manual's conceptual framework derives from the System of National Accounts 1993 and recent developments in index number theory Preparation of the Manual was undertaken by the Intersecretariat Working Group on Price Statistics through a technical expert group chaired by the IMF and involving representatives from the ILO the OECD the UN Economic Commission for Europe the World Bank national statistical offices and academic institutions

*Interpreting Economic and Social Data* Othmar W. Winkler, 2009-08-12 Interpreting Economic and Social Data aims at rehabilitating the descriptive function of socio economic statistics bridging the gap between today's statistical theory on one hand and econometric and mathematical models of society on the other It does this by offering a deeper understanding of data and methods with surprising insights the result of the author's six decades of teaching consulting and involvement in statistical surveys The author challenges many preconceptions about aggregation time series index numbers frequency distributions regression analysis and probability nudging statistical theory in a different direction Interpreting Economic and Social Data also links statistics with other quantitative fields like accounting and geography This book is aimed at students and professors in business economics demographic and social science courses and in general at users of socio economic data requiring only an acquaintance with elementary statistical theory

**At What Price?** National Research Council, Division of Behavioral and Social Sciences and Education, Committee on National Statistics, Panel on Conceptual, Measurement, and Other Statistical Issues in Developing Cost-of-Living Indexes, 2002-03-25 How well does the consumer price index CPI reflect the changes that people actually face in living costs from apples to computers to health care Given how it is used is it desirable to construct the CPI as a cost of living index COLI With what level of accuracy is it possible to construct a single index that represents changes in the living costs of the nation's diverse population At What

Price examines the foundations for consumer price indexes comparing the conceptual and practical strengths weaknesses and limitations of traditional fixed basket and COLI approaches The book delves into a range of complex issues from how to deal with the changing quality of goods and services including difficult to define medical services to how to weight the expenditure patterns of different consumers It sorts through the key attributes and underlying assumptions that define each index type in order to answer the question Should a COLI framework be used in constructing the U S CPI In answering this question the book makes recommendations as to how the Bureau of Labor Statistics can continue to improve the accuracy and relevance of the CPI With conclusions that could affect the amount of your next pay raise At What Price is important to everyone and a must read for policy makers researchers and employers

**Hard-to-Measure Goods and Services** Ernst R. Berndt, Charles R. Hulten, 2009-02-15 The celebrated economist Zvi Griliches's entire career can be viewed as an attempt to advance the cause of accuracy in economic measurement His interest in the causes and consequences of technical progress led to his pathbreaking work on price hedonics now the principal analytical technique available to account for changes in product quality Hard to Measure Goods and Services a collection of papers from an NBER conference held in Griliches's honor is a tribute to his many contributions to current economic thought Here leading scholars of economic measurement address issues in the areas of productivity price hedonics capital measurement diffusion of new technologies and output and price measurement in hard to measure sectors of the economy Furthering Griliches's vital work that changed the way economists think about the U S National Income and Product Accounts this volume is essential for all those interested in the labor market economic growth production and real output

**Scanner Data-Based Panel Price Indexes** Chenhua Zhang, Eric A. Finkelstein, Shawn Karns, Ephraim Leibtag, 2020 We construct panel price indexes using retail scanner data that allow comparisons of consumption cost across space and time Two types of panel indexes are examined the rolling window panel extensions of the multilateral Cave Christensen Diewert index with the Tornqvist index as its elements and of the multilateral Gini Eltet Kovs Szulc index using the Fisher ideal index as its elements The rolling window method maintains the nonrevisability of published index numbers while allowing index numbers for new periods and locations to be calculated and the basket of items to be updated Meanwhile the multilateral structure of price comparison eliminates significant downward drift in standard chained indexes Using county level bilateral and panel indexes based on retail beverage scanner data we experimentally adjust for purchasing parity the portion of Supplemental Nutrition Assistance Program SNAP benefits that participants spend on beverages Accounting for temporal and spatial cost differences causes over 2% of SNAP allotment spent on beverages to be reallocated or approximately a 5% change in allotment on average for a county About 90% of the relocated SNAP fund is to adjust for spatial differences in food cost We also compare SNAP allotments implied by the retail scanner data indexes with those implied by indexes based on the USDA Quarterly Food at Home Price Database QFAHPD The treatment of unit values and product quality may have contributed to the significant differences observed between the



retail scanner data indexes and the QFAHPD indexes

## **Handbook on Residential Property Price Indices**

OECD, Eurostat, International Labour Organization, International Monetary Fund, The World Bank, United Nations Economic Commission for Europe, 2013-04-22 This Handbook provides for the first time comprehensive guidelines for the compilation of Residential Property Price Indexes and explains in depth the methods and best practices used to calculate an RPPI

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## **Table of Contents Scanner Data And Price Indexes**

1. Understanding the eBook Scanner Data And Price Indexes
  - The Rise of Digital Reading Scanner Data And Price Indexes
  - Advantages of eBooks Over Traditional Books
2. Identifying Scanner Data And Price Indexes
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Scanner Data And Price Indexes
  - User-Friendly Interface
4. Exploring eBook Recommendations from Scanner Data And Price Indexes
  - Personalized Recommendations
  - Scanner Data And Price Indexes User Reviews and Ratings
  - Scanner Data And Price Indexes and Bestseller Lists
5. Accessing Scanner Data And Price Indexes Free and Paid eBooks
  - Scanner Data And Price Indexes Public Domain eBooks
  - Scanner Data And Price Indexes eBook Subscription Services
  - Scanner Data And Price Indexes Budget-Friendly Options

6. Navigating Scanner Data And Price Indexes eBook Formats
  - ePub, PDF, MOBI, and More
  - Scanner Data And Price Indexes Compatibility with Devices
  - Scanner Data And Price Indexes Enhanced eBook Features
7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Scanner Data And Price Indexes
  - Highlighting and Note-Taking Scanner Data And Price Indexes
  - Interactive Elements Scanner Data And Price Indexes
8. Staying Engaged with Scanner Data And Price Indexes
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Scanner Data And Price Indexes
9. Balancing eBooks and Physical Books Scanner Data And Price Indexes
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Scanner Data And Price Indexes
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Scanner Data And Price Indexes
  - Setting Reading Goals Scanner Data And Price Indexes
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Scanner Data And Price Indexes
  - Fact-Checking eBook Content of Scanner Data And Price Indexes
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements

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