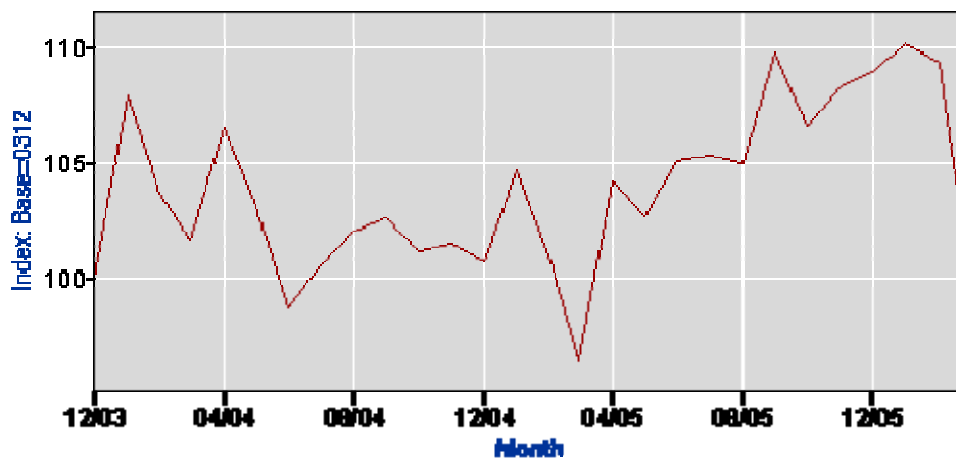


Addendum A - Data Analysis

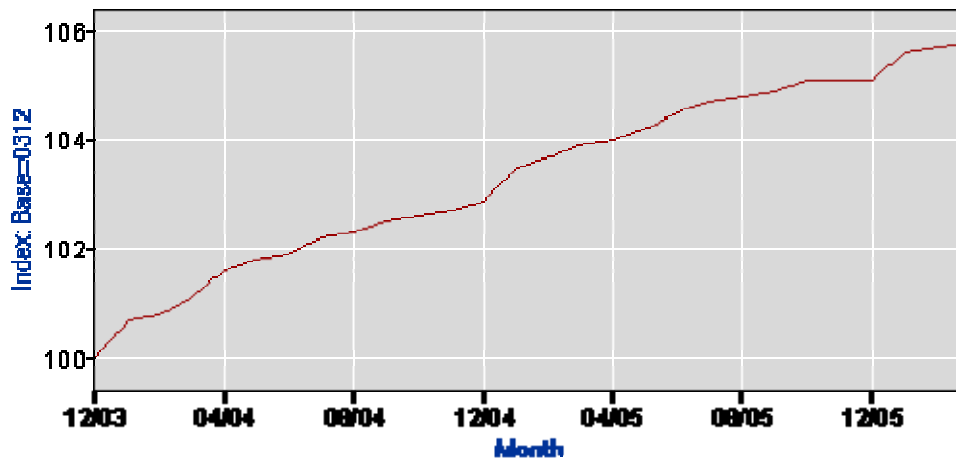
Industry Index Data

The following are a series of charts depicting the time series data for selected industries in the service sector. All data displayed are publicly available and published. For all these charts, the scale on the chart was the scale selected by the program. In some industries, the charts make the price movement appear very drastic but in reality, it is the relative sizes of the scale in those charts that make the indices appear volatile.

Series Id: PCU5221--5221--
Industry: Depository credit intermediation
Base Date: 0312



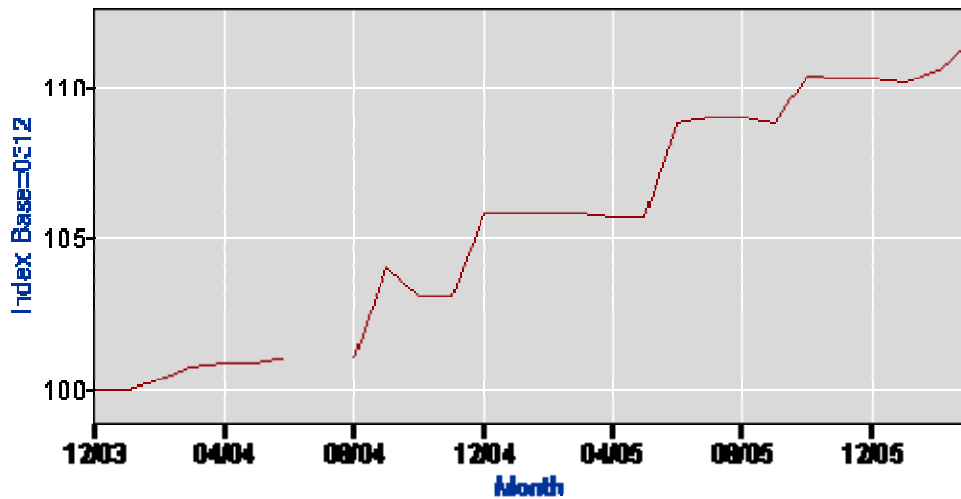
Series Id: PCU5241--5241--
Industry: Insurance carriers
Base Date: 0312



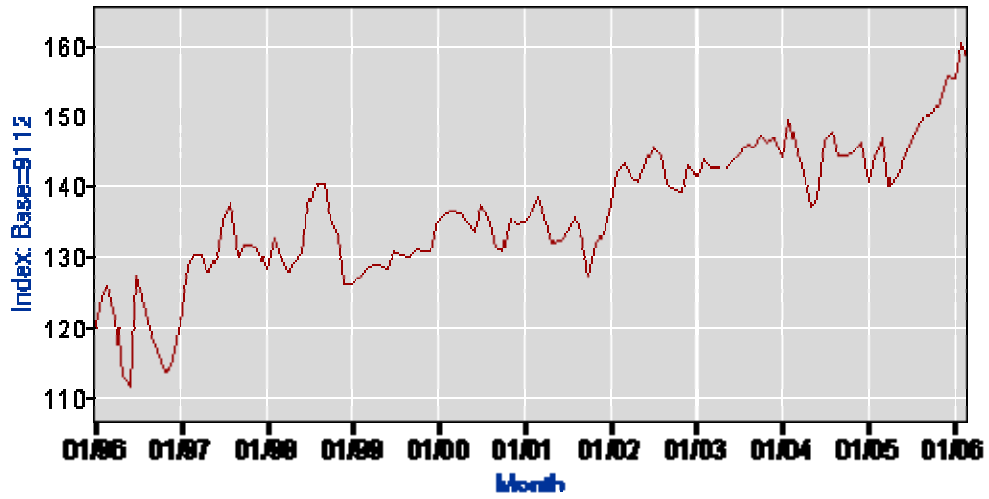
Series Id: PCU531120531120
Industry: Lessors of nonresidential bldg (excluding miniwarehouses)
Base Date: 9512



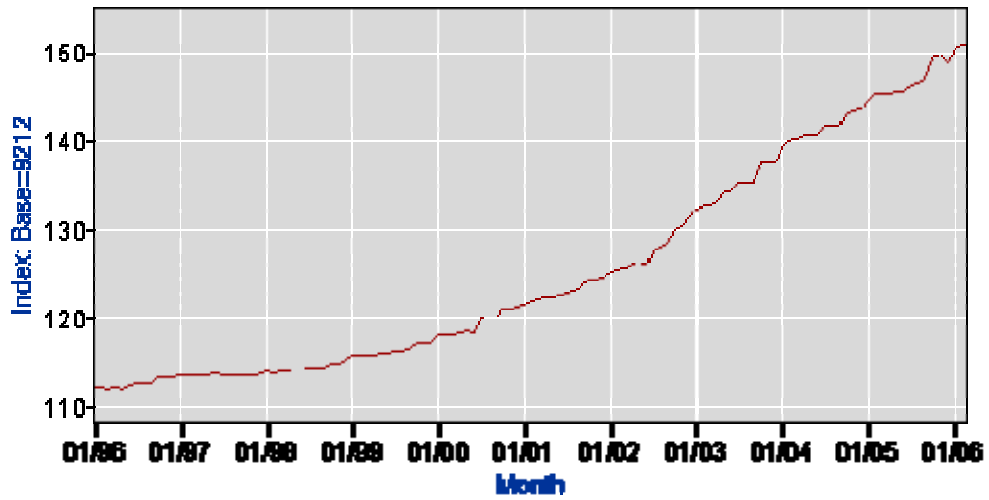
Series Id: PCU531210531210
Industry: Offices of real estate agents and brokers
Base Date: 0312



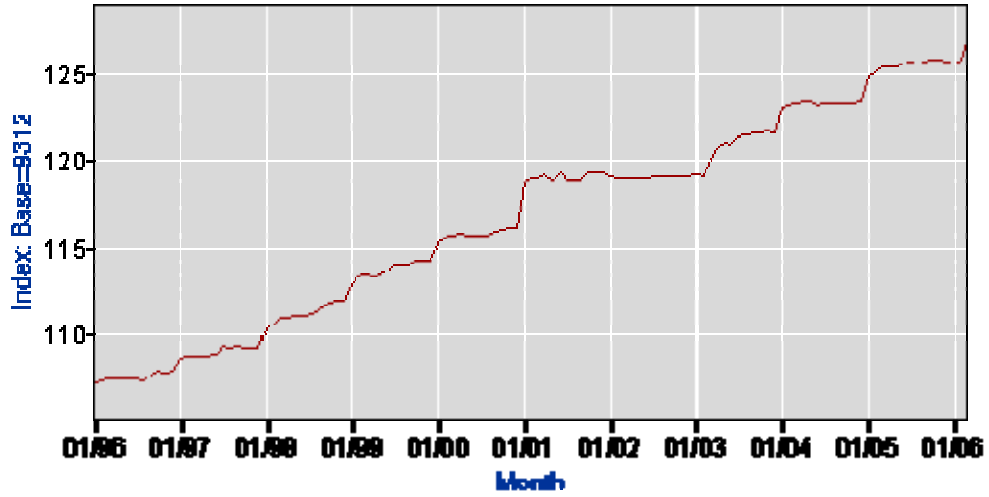
Series Id: PCU532111532111
Industry: Passenger car rental
Base Date: 9112



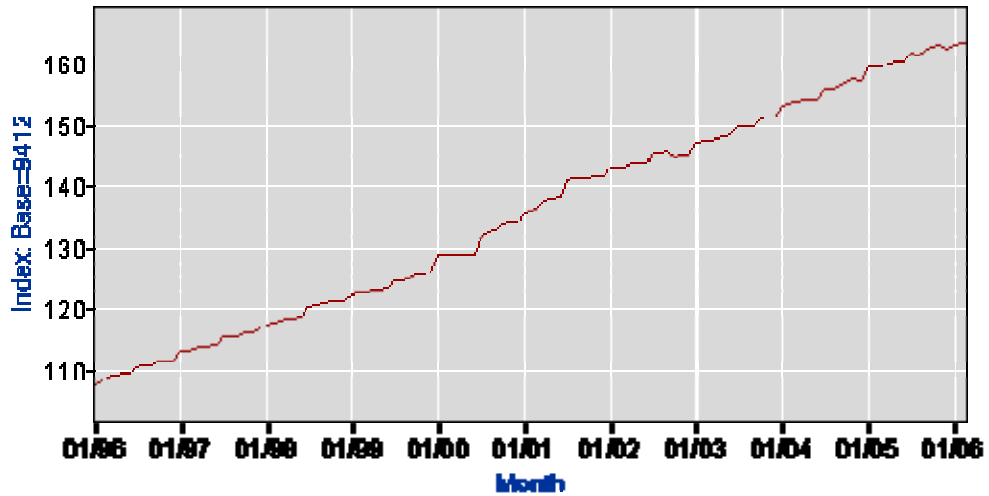
Series Id: PCU622---622---
Industry: Hospitals
Base Date: 9212



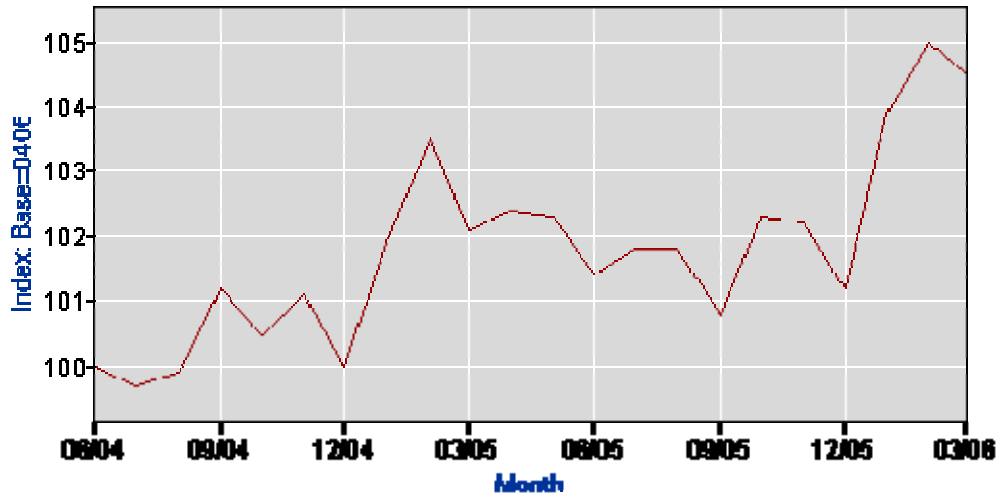
Series Id: PCU621111621111
Industry: Offices of physicians (excluding mental health)
Base Date: 9312



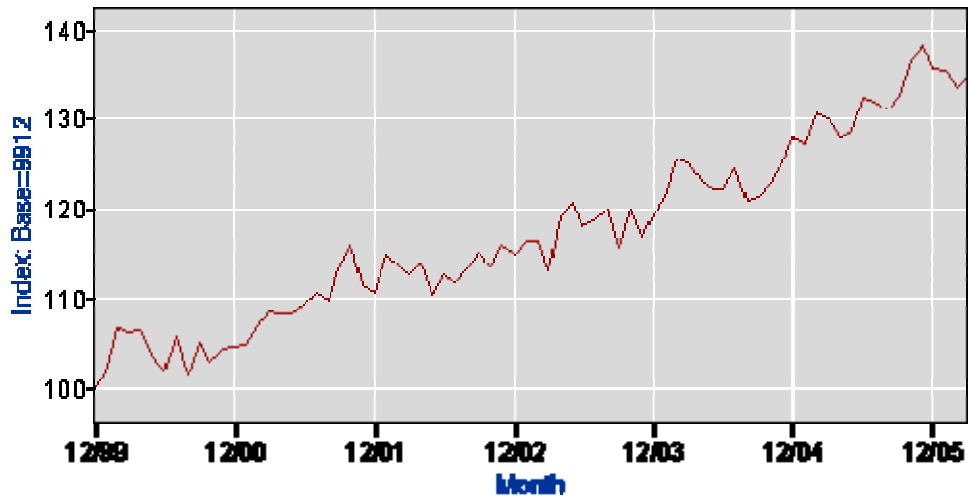
Series Id: PCU623110623110
Industry: Nursing care facilities
Base Date: 9412



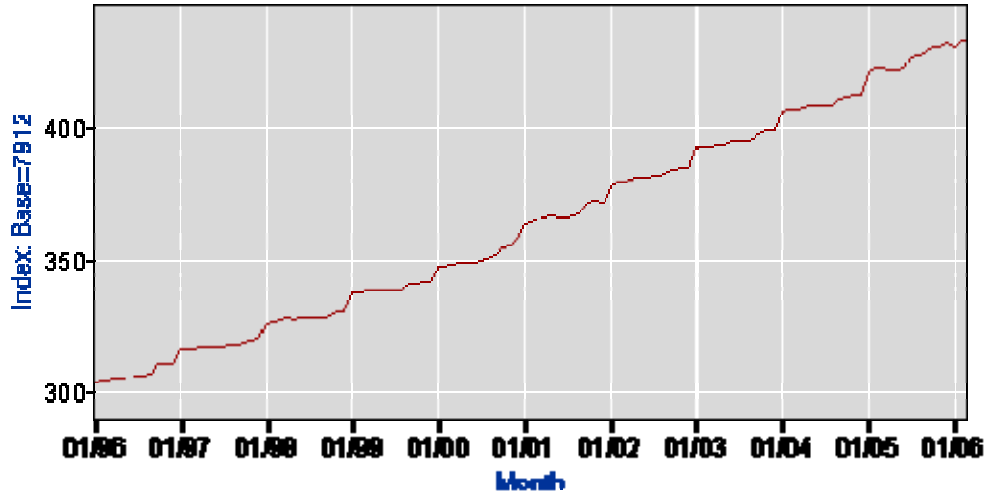
Series Id: PCU423---423---
Industry: Merchant wholesalers, durable goods
Base Date: 0406



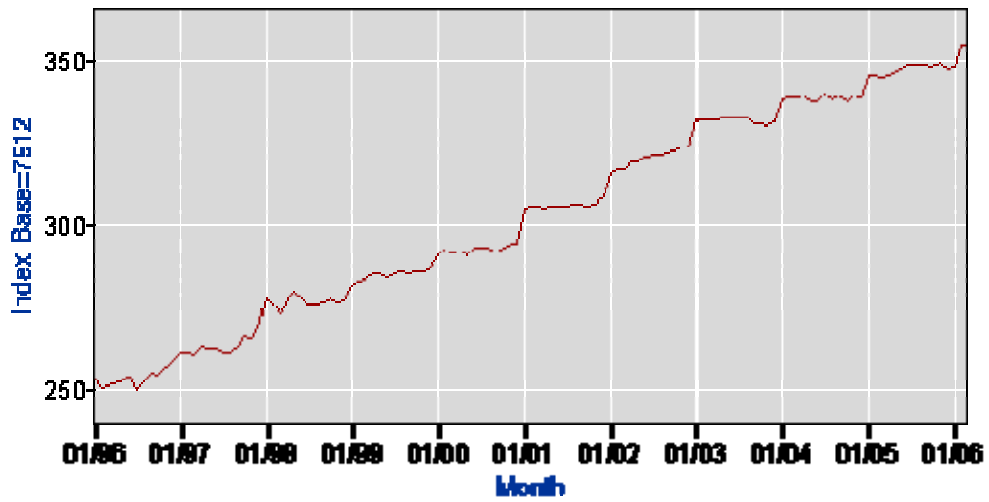
Series Id: PCU445110445110
Industry: Grocery (except convenience) stores
Base Date: 9912



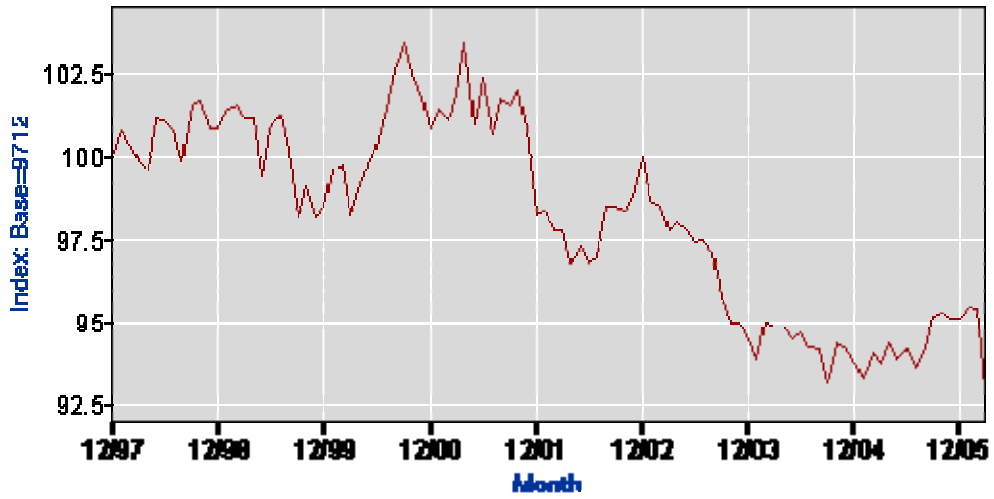
Series Id: PCU511110511110
Industry: Newspaper publishers
Base Date: 7912



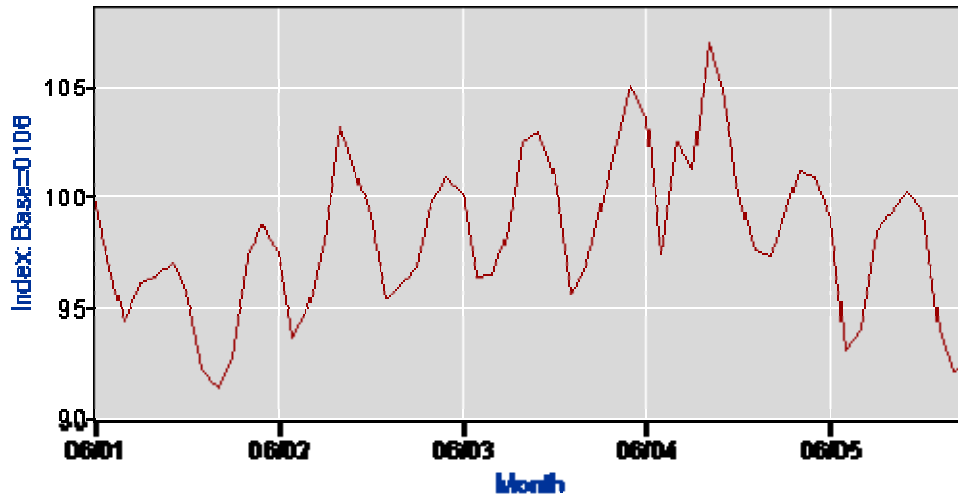
Series Id: PCU511120511120
Industry: Periodical publishers
Base Date: 7912



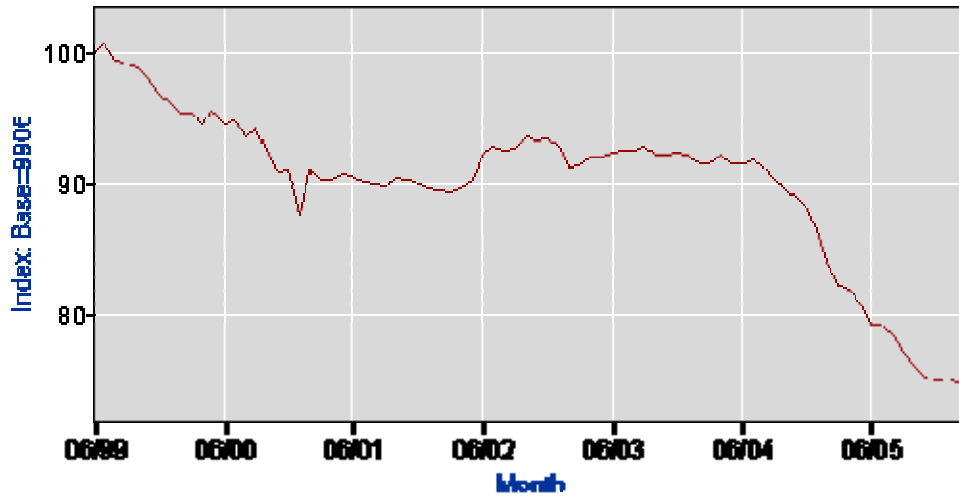
Series Id: PCU511210511210
Industry: Software publishers
Base Date: 9712



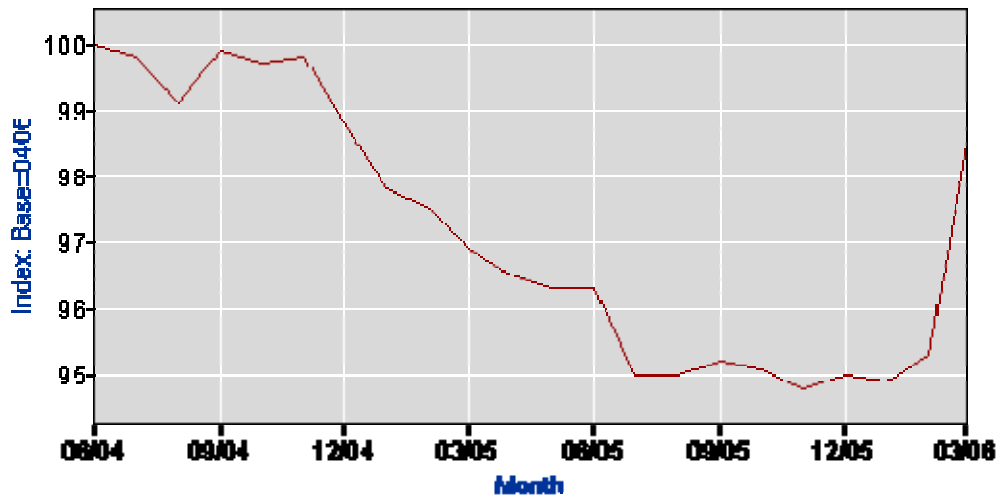
Series Id: PCU515120515120
Industry: Television broadcasting
Base Date: 0106



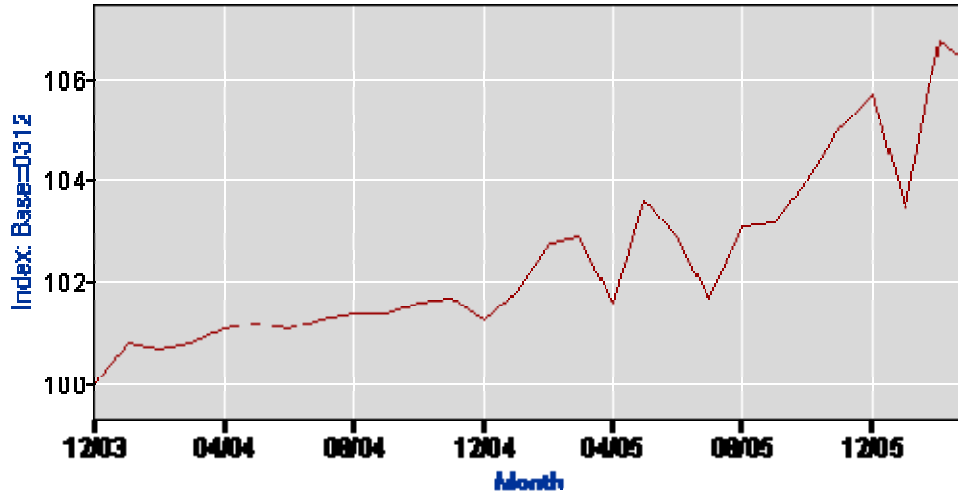
Series Id: PCU517212517212
Industry: Cellular and other wireless carriers
Base Date: 9906



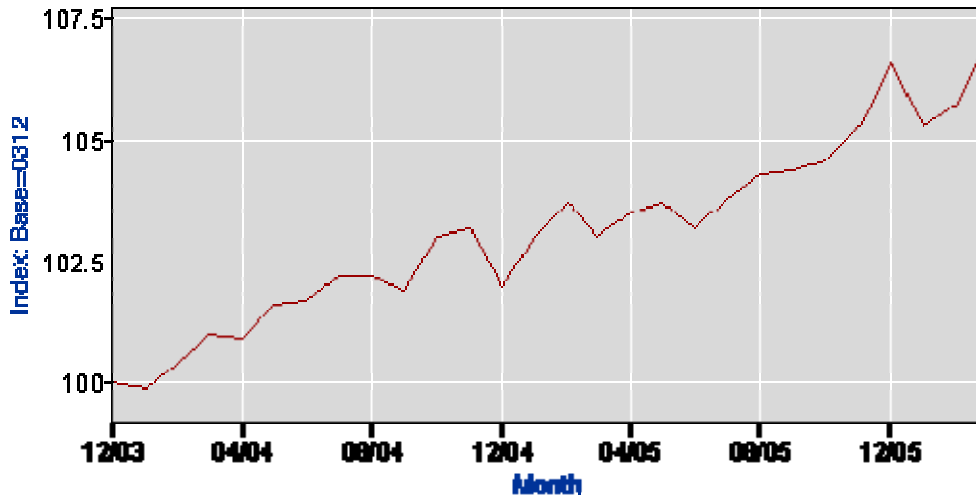
Series Id: PCU51811-51811-
Industry: ISPs and Web search portals
Base Date: 0406



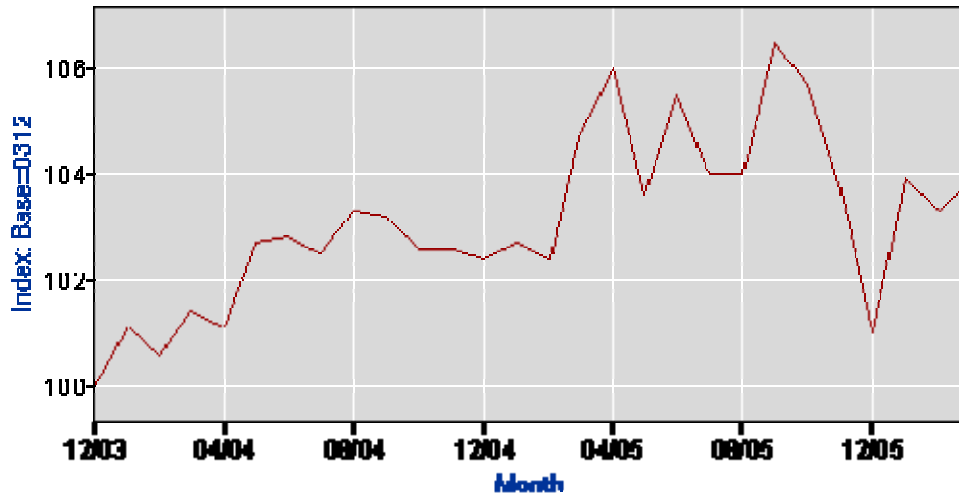
Series Id: PCU541211541211
Industry: Offices of certified public accountants
Base Date: 0312



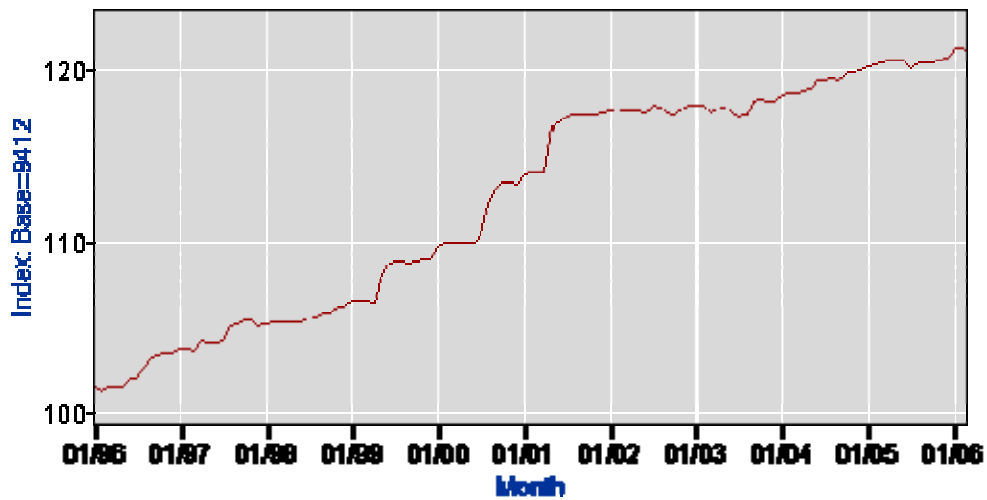
Series Id: PCU561320561320
Industry: Temporary help services
Base Date: 0312



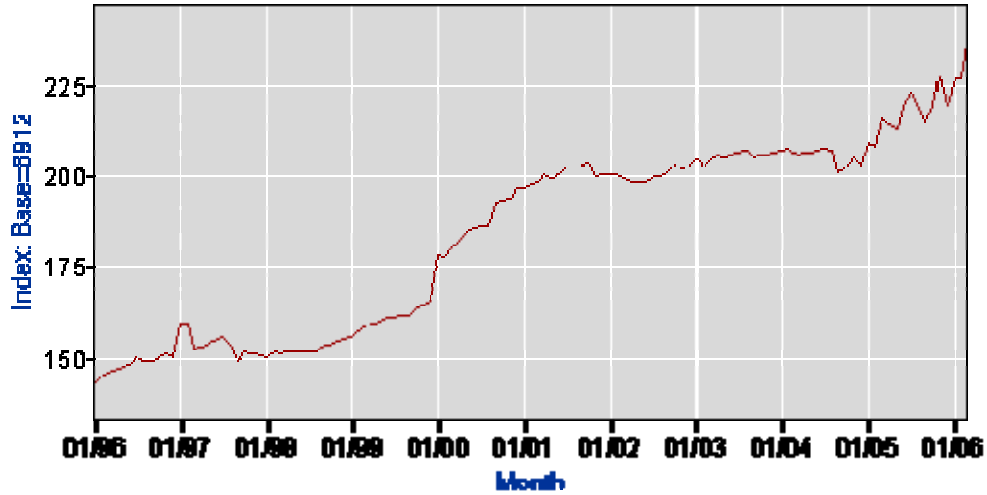
Series Id: PCU561310561310
Industry: Employment placement agencies
Base Date: 0312



Series Id: PCU561720561720
Industry: Janitorial services
Base Date: 9412



Series Id: PCU481111481111
Industry: Scheduled passenger air transportation
Base Date: 8912



Bureau of Economic Analysis Use of PPI Data Chart

This chart is from the November 2004 Survey of Current Business and shows the data used by BEA for deflation of the national accounts. Any changes since that time have been incorporated into the chart. This chart demonstrates the importance of the PPI program to the deflation of the national accounts.

Source Data and Methods for Current-Dollar GDP and Current-Dollar GDI

Component	Deflation, using price based on	Using quantity for extrapolation or direct valuation
Personal consumption expenditures		
Durable and nondurable goods	PPI, for military clothing	
Services Motor vehicle repair, rental, and other services; other repair services; other purchased intercity transportation; legal and funeral services; barbershops, beauty parlors, and health clubs; nursing homes; laundries; employment agency fees; accounting and tax return preparation services; recreation (except cable TV, parimutuel net receipts, lotteries and computer online services); hotels and motels; commercial business, trade, and correspondence schools; educational services not elsewhere classified; research organizations and foundations	PPI, for proprietary and government nursing homes and employment agency fees	
Physicians, dentists, and other professional medical services	PPI, for physicians, home health care, and medical laboratories	
Financial services furnished without payment by banks, other depository institutions, and investment companies	PPI, for investment companies' securities commissions	
Brokerage charges and investment counseling, bank service charges, intercity transportation except "other," and private higher education	PPI, for securities commissions	

Source Data and Methods for Current-Dollar GDP and Current-Dollar GDI

Component	Deflation, using price based on	Using quantity for extrapolation or direct valuation
<p>Services <i>continued</i></p> <p>Public education and hospitals, water and other sanitary services, and lotteries</p> <p>Insurance, private hospitals, religious activities, cable TV, electricity, natural gas, telephone, and local transport</p> <p>Fixed investment</p> <p>Nonresidential structures</p> <p>Power and communications</p> <p>Mining exploration, shafts, and wells</p> <p>Other structures</p> <p>Nonresidential equipment and software</p> <p>Equipment except those listed below</p> <p>New autos, new light trucks, and net purchases of used autos and used light trucks</p> <p>Software</p> <p>Residential investment</p> <p>Manufactured homes</p> <p>Brokers' commissions</p>	<p>PPI, for public hospitals</p> <p>PPI, for private for-profit hospitals</p> <p>PPI, for power excluding electric</p> <p>PPI, for casing, oil and gas well drilling, and oil and gas field services</p> <p>PPI, for brokers' commissions</p> <p>PPI, for most domestic components and for imported transportation equipment</p> <p>PPI, for new light trucks</p> <p>PPI, for prepackaged software; for own account and custom software</p> <p>PPI</p> <p>PPI</p>	<p>Quantity extrapolation. For medical care and hospitalization insurance, benefits deflated by PPI; for workers compensation, premiums deflated by PPI</p>

Source Data and Methods for Current-Dollar GDP and Current-Dollar GDI

Component	Deflation, using price based on	Using quantity for extrapolation or direct valuation
Change in private inventories		
Non-farm		
Purchased goods of all industries	PPI	
Work-in-process and finished goods, manufacturing	PPI	
Net exports of goods and services		
Exports and imports of goods	PPI, for gold; semiconductor exports, selected transportation equipment; selected agricultural foods, feeds, and beverages; and selected imports of refined petroleum	
Exports and imports of services	PPI, for selected other transportation BEA price indexes, CPI, PPI and implicit price deflator of final sales to domestic purchases	
Government consumption expenditures and gross investment		
Federal government		
National defense except consumption of general government fixed capital	PPI, for selected goods and services CPI and PPI, for utilities and communications	
Nondefense except consumption of general government fixed capital	PPI, for most goods and selected services For custom software, BEA index derived from nondefense compensation price index and PPI	
State and local government		
Consumption expenditures and gross investment except those listed below	PPI, for electricity, hospitals, most professional services, and goods	

Pricing Methods Chart

This chart lists the seven internationally accepted pricing methods and indicates which methods are used by the US PPI program for the various industry indices listed. If there are substantial numbers of the different methods for an industry, all those methods are checked for that industry. These seven methods were developed by a special OECD/Eurostat task force. This task force developed the Service Producer Price Index manual. A thesaurus for these pricing methods is being developed for use at the Voorburg Group meeting, a UN city group on services statistics. A draft version (Version 4) of this thesaurus is included as an addendum to this paper.

NAICS	Industry Title	Direct use	Unit value	Component pricing	Percentage fee	Model	Time-based	Contract
423000	Merchant Wholesalers, Durable Goods	X	X					
424000	Merchant Wholesalers, Non-durable Goods	X	X					
425120	Wholesale Trade Agents and Brokers				X			
441110	New Car Dealers	X	X					
441210	Recreational Vehicle Dealers	X	X					
441222	Boat Dealers	X	X					
441310	Automotive Parts and Accessories Stores	X						
441320	Tire Dealers	X						
442110	Furniture Stores	X						
442210	Floor Covering Stores	X						
443111	Household Appliance Stores	X						
443112	Radio, Television, and Other Electronics Stores	X						
443120	Computer and Software Stores	X						
443130	Camera and Photographic Supplies Stores	X						
444110	Home Centers	X						
444120	Paint and Wallpaper Stores	X						
444130	Hardware Stores	X						
444190	Other Building Material Dealers	X						
444220	Nursery, Garden Center, and Farm Supply Stores	X						
445110	Supermarkets and Other Grocery (except Convenience) Stores	X						
445210	Meat Markets	X						
445220	Fish and Seafood Markets	X						
445230	Fruit and Vegetable Markets	X						
445291	Baked Goods Stores	X						
445292	Confectionery and Nut Stores	X						
445299	All Other Specialty Food Stores	X						
445310	Beer, Wine, and Liquor Stores	X						
446110	Pharmacies and Drug Stores	X						
446130	Optical Goods Stores	X						
446191	Food (Health) Supplement Stores	X						

NAICS	Industry Title	Direct use	Unit value	Component pricing	Percentage fee	Model	Time-based	Contract
447110	Gasoline Stations with Convenience Stores	X						
447190	Other Gasoline Stations	X						
448110	Men's Clothing Stores	X						
448120	Women's Clothing Stores	X						
448140	Family Clothing Stores	X						
448210	Shoe Stores	X						
448310	Jewelry Stores	X						
448320	Luggage and Leather Goods Stores	X						
451110	Sporting Goods Stores	X						
451120	Hobby, Toy, and Game Stores	X						
451130	Sewing, Needlework, and Piece Goods Stores	X						
451211	Book Stores	X						
451220	Prerecorded Tape, Compact Disc, and Record Stores	X						
452111	Department Stores (except Discount Department Stores)	X						
452112	Discount Department Stores	X						
452900	All Other General Merchandise Stores	X						
453110	Florists	X						
453210	Office Supplies and Stationery Stores	X						
453220	Gift, Novelty, and Souvenir Stores	X						
453930	Manufactured (Mobile) Home Dealers	X	X					
454111	Electronic Shopping	X						
454112	Electronic Auctions	X						
454113	Mail-Order Houses	X						
454210	Vending Machine Operators	X						
454311	Heating Oil Dealers	X						
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers	X						
454319	Other Fuel Dealers	X						
481111	Scheduled Passenger Air Transportation		X					
481112	Scheduled Freight Air Transportation	X						
481211	Nonscheduled Chartered Passenger Air Transportation	X						
481212	Nonscheduled Chartered Freight Air Transportation	X						
482111	Line-Haul Railroads							X
483111	Deep Sea Freight Transportation	X						
483113	Coastal and Great Lakes Freight Transportation	X						
483211	Inland Water Freight Transportation	X						
484110	General Freight Trucking, Local	X						
484121	General Freight Trucking, Long-Distance, Truckload	X						
484122	General Freight Trucking, Long-Distance, Less Than Truckload	X						

NAICS	Industry Title	Direct use	Unit value	Component pricing	Percentage fee	Model	Time-based	Contract
484210	Used Household and Office Goods Moving	X						
484220	Specialized Freight (except Used Goods) Trucking, Local	X						
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance	X						
486110	Pipeline Transportation of Crude Oil	X						
486910	Pipeline Transportation of Refined Petroleum Products	X						
488119	Other Airport Operations	X						
488190	Other Support Activities for Air Transportation	X						
488310	Port and Harbor Operations	X						
488320	Marine Cargo Handling	X						
488330	Navigational Services to Shipping	X						
488510	Freight Transportation Arrangement	X						
491110	Postal Service	X						
492110	Couriers	X						
492210	Local Messengers and Local Delivery	X						
493110	General Warehousing and Storage					X		
493120	Refrigerated Warehousing and Storage					X		
493130	Farm Product Warehousing and Storage					X		
511110	Newspaper Publishers	X	X					
511120	Periodical Publishers	X	X					
511130	Book Publishers	X	X					
511140	Directory and Mailing List Publishers	X	X					
511191	Greeting Card Publishers	X						
511199	All Other Publishers	X						
511210	Software Publishers	X	X					
515111	Radio Networks		X					
515112	Radio Stations		X					
515120	Television Broadcasting		X					
515210	Cable and Other Subscription Programming	X						
517110	Wired Telecommunications Carriers		X					
517211	Paging		X					
517212	Cellular and Other Wireless Telecommunications					X		
517510	Cable and Other Program Distribution	X						
518111	Internet Service Providers	X	X					
518112	Web Search Portals	X	X					
518210	Data Processing, Hosting, and Related Services	X						
522110	Commercial Banking		X					
522120	Savings Institutions		X					

NAICS	Industry Title	Direct use	Unit value	Component pricing	Percentage fee	Model	Time-based	Contract
523110	Investment Banking and Securities Dealing	X	X		X	X		
523120	Securities Brokerage				X			
523920	Portfolio Management				X			
523930	Investment Advice	X				X		
524113	Direct Life Insurance Carriers					X		
524114	Direct Health and Medical Insurance Carriers					X		
524126	Direct Property and Casualty Insurance Carriers					X		
524210	Insurance Agencies and Brokerages				X			
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)		X					
531130	Lessors of Miniwarehouses and Self-Storage Units	X						
531210	Offices of Real Estate Agents and Brokers				X			
531311	Residential Property Managers				X			
531312	Nonresidential Property Managers				X			
531320	Offices of Real Estate Appraisers	X						
532111	Passenger Car Rental	X						
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	X						
532412	Construction, Mining, and Forestry Machinery and Equipment Rental and Leasing	X						
541110	Offices of Lawyers			X		X		
541211	Offices of Certified Public Accountants			X		X		
541219	Other Accounting Services			X		X		
541310	Architectural Services			X		X		
541330	Engineering Services			X		X		
541611	Administrative Management and General Management Consulting Services			X		X		
541612	Human Resources and Executive Search Consulting Services			X		X		
541613	Marketing Consulting Services			X		X		
541614	Process, Physical Distribution, and Logistics Consulting Services			X		X		
541618	Other Management Consulting Services			X		X		
541810	Advertising Agencies				X	X		
561310	Employment Placement Agencies	X						
561320	Temporary Help Services	X						
561330	Professional Employer Organizations	X						
561510	Travel Agencies	X			X			
561612	Security Guards and Patrol Services	X						
561720	Janitorial Services							X

NAICS	Industry Title	Direct use	Unit value	Component pricing	Percentage fee	Model	Time-based	Contract
562111	Solid Waste Collection	X						
611420	Computer Training	X	X					
621111	Offices of Physicians (except Mental Health Specialists)					X		
621511	Medical Laboratories	X						
621512	Diagnostic Imaging Centers	X						
621610	Home Health Care Services	X						
621991	Blood and Organ Banks	X						
622110	General Medical and Surgical Hospitals					X		
622210	Psychiatric and Substance Abuse Hospitals					X		
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals					X		
623110	Nursing Care Facilities	X						
623210	Residential Mental Retardation Facilities	X						
713110	Amusement and Theme Parks	X						
713910	Golf Courses and Country Clubs	X						
713940	Fitness and Recreational Sports Centers	X						
721110	Hotels (except Casino Hotels) and Motels	X	X					
721120	Casino Hotels	X	X					
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance					X		

Analysis of Index Quality Chart

This chart looks the various characteristics of a producer price index and rates these characteristics according to the particular data that is used in producing that index. The goal of the rating system is to provide a metric that can be used rate indices for a particular country and also to provide international comparisons between the different indices. This metric was developed for possible use at future Voorburg Group meetings. The metric and instructions for using the metric are included as an addendum to this paper. A subset of PPI services indices are displayed in this chart with their ratings.

Producer Price Index Quality Assessment Framework

Points	Assessment Category	NAICS 524	NAICS 5221	NAICS 517212	NAICS 515120
	Shipment price (weight =0.1) <i>Select A or B</i>	100	100	100	100
0	A. Order pricing (actual shipment may be different)				
100	B. Completion of service or proxy	x	x	x	x
	Current period production (weight = 0.10) <i>Select A or B</i>	100	100	100	100
50	A. No new products since reference period	x	x	x	x
0	B. Critical new products since reference period <i>Select C or D</i>				
50	C. Substitution/models updated regularly	x	x	x	x
0	D. No substitution/models not updated				
	Transaction price (weight = 0.25) <i>Select most prevalent in industry</i>	75	100	75	100
100	A. Real transaction price				
50	B. List price				
100	C. Unit value for homogenous group		x		x
50	D. Unit value for non-homogenous group				
75	E. Model price	x		x	
50	F. Input costs plus profit and overhead				
	Output price (weight = 0.25) <i>Select most prevalent in industry</i>	75	100	75	100
100	A. Actual transaction (or average)		x		x
75	B. Model transaction with all features	x		x	
50	C. Model with some features				
50	D. Price reflects some components				
50	E. Input costs with all features				
25	F. Input costs with some features				
0	G. Charge out rates				
	Monthly measure (weight = 0.10) <i>Select A or B</i>	75	50	50	50
50	A. Current month, not lagged	x		x	
0	B. Lagged <i>Select C, D, or E</i>		x		x
50	C. Average over entire month		x	x	x
40	D. Average of multiple measurements over portions of month				
25	E. Single point in time	x			
	Constant quality (weight = 0.20) <i>Select A or B</i>	100	100	100	100
100	A. Rapid changes not expected/explicitly adjust	x	x	x	x
0	B. Rapid changes expected/no explicit adjustment				
	TOTAL SCORE	85	95	82.5	95

Type A point range = over 90

Type B point range = 70 to 90

Type C point range = less than 70

Addendum B – SPPI Thesaurus

... you cannot use language to get in between language and reality. If you describe reality, you always uses words; so when you compare a concept with reality, you in fact compare only a concept with another concept.
 – Roger Scruton (after Wittgenstein)

1. Introduction

2. Guidance for terminology on SPPI’s in Voorburg Group documents

The Eurostat/OECD SPPI Guide provides extensive discussions on seven main pricing methods that are widely recognized. These seven pricing methods form the basis for descriptions of the pricing methods of individual SPPI’s in mini-papers and sector-papers. However, to describe an SPPI well and unambiguously, it has to be described with additional terms. Two main criteria are of importance to specify pricing methods: the *target of measurement* and the *data type in the survey*. Consequently, the best way to describe the pricing method of a particular SPPI is to determine and describe:

- which of the seven **Pricing methods** in the Eurostat/OECD SPPI Guide it is,
- what the **data type in the survey** is, and
- what the **target of measurement** is.

For instance, after describing an SPPI as using model pricing, it still has to be clarified what form of model transaction is used as target of measurement (fictitious or not, same or different for every respondent) and what the data type in the survey is. Likewise, for a unit value method, it has to be clarified whether the target of measurement is a regularly occurring transaction or only some output components, and more information about the data type in the survey.

The list of preferred terms consists of the terms in table 1: seven pricing methods, six types of data type in the survey, and four types of target of measurement.

Table 1. Preferred terms for SPPI’s (described further in section 3).

Data type in the survey	Pricing methods	Target of measurement
Percentages fees and related value	Direct use of prices of repeated services	Real transaction
List prices	Contract pricing	Model transaction
Input prices	Model pricing	Output components
Real transaction prices	Unit values	Hourly charge-out rates
Income and amount sold	Component pricing	
Expert estimate	Percentage fees	
	Pricing based on working time	

Additionally, it is of much interest to describe the pricing method of an SPPI in terms of three more aspects. This is especially interesting for international comparisons and discussion on the merits and quality of different options. This is the topic of section 4.

- 1) Length of delivery and length of the survey period
- 2) Relation between the moment of delivery and price recording in the index
- 3) Number of real transactions covered in one piece of price information

3. Preferred terms in describing pricing methods

3.1 The seven pricing methods from the SPPI Guide

Component pricing: a pricing method that divides the service into a number of key output components of which one or more are then priced separately as target of measurement. The data type in the survey for this pricing method concerns existing company data (real transaction prices, income and amount sold, list prices, input costs, etc.). The statistician enters all the prices on a worksheet or bill, resulting in an aggregate price. But this price is not (necessarily) an estimation of a transaction price. Component pricing thereby differs from model pricing, as in the latter a single price for an entire transaction is surveyed.

This method's best-known use is in telephony PPI's, where it is sometimes known by a synonym (the bill method), a term which should not be used to avoid confusion.

Contract pricing: a pricing method which uses real transaction prices of a special kind as the data type in the survey. They are special because the prices are charged for a same (or very similar) service that is repeated each survey period by the same producer for the same client. The word 'contract' in the name refers to the long-term and/or framework contracts that are established between client and producer. This pricing method may work if the pricing mechanism entails these contracts, for instance in cleaning, security services and freight transport. This pricing method can be regarded as a special case of the direct use of prices of repeated services.

Direct use of prices of repeated services: a straightforward pricing method which surveys a real transaction price or a list price, thereby acquiring directly the price of a service that occurs every survey period (a real transaction). This coincides with the PPI Manual's transaction pricing and is standard PPI and CPI practice. It is the preferred and easiest method because there is no difference between the surveyed prices and the target of measurement, no assumptions or calculations are necessary.

Model pricing: a pricing method in which a price is estimated for a standardised product, a model transaction, which is not transacted in the comparison period. A single fictitious service can be set as the re-pricable product for a group of respondents. Alternatively, the specifications of the standardised product can be based on an actual contract or bill in the past. Synonyms for this second type observed in the literature which should not be used to avoid confusion are: estimated net transaction price or billed method.

In another form of model pricing an expert of the respondent enterprise estimates a realistic transaction price. The expert can use real transaction prices, income and amount sold,

list prices, input prices as data type in the survey for calculating this price, (each of which may reflect prices for time worked). The resulting total price for the standardised product is always fully fictitious. Alternatively, the expert can use his subjective judgement based on the overall market situation, for instance by keeping recent bids in mind, resulting in a pure expert estimate.

The model pricing method is used for unique services, notably the professional business services for which hourly charge-out rates are also used often. It is often a challenge to make an adequate quality adjustment when the standardised product becomes outdated and is replaced by a new standardised product.

Model pricing differs from component pricing in that only the price for a model transaction is the target of measurement. Component pricing uses multiple prices which together do not necessarily reflect the price of a model transaction.

Percentage fees: a pricing method that estimates a price by multiplying a percentage and the value of the asset that the service and the percentage fee are tied to. This is only possible if the pricing mechanism uses these figures, for instance, the price for a service related to a specific piece of real estate uses the price of this real estate and a percentage fee. Other examples include placing advertisements and rental.

The target of measurement is usually a model transaction, sometimes an output component. For operational or practical reasons separate measurement of the change of the percentage fees and the asset prices can be preferred over e.g. model pricing.

Each data type in the survey (the percentage and the asset price) can be surveyed from a different source. Strictly speaking, the percentage can be taken from a list or be estimated by an expert or calculated as an average. Often, the price (index) of the asset is already available within the statistical institute, like the price index for a good rented.

A synonym, not to be used to avoid confusion is ad valorem price.

Pricing based on working time: a pricing method which surveys the money amount charged to a buyer of a service, for a standard amount (e.g. one hour) of work by an employee of the producer, contributing to the production (provision) of that service. It is only used in the professional business services where the pricing mechanism is such that the price of a service is largely based on the number and charge-out rate of the hours needed to produce the service (not to be mistaken for the employee's wage). The data type in the survey can differ highly:

1. unit values type information of turnover or income divided by number of hours worked (also known as realised hourly rates in the Netherlands and fee income per grade of worker in the UK),
2. list prices (also known as standard hourly rates),
3. input prices in the form of wages multiplied by or summed with a markup, or
4. expert estimate.

Pricing based on working time has usually as a target of measurement the hourly charge-out rate, but prices for working time can also be entered into a model transaction. If the price of a model transaction is highly determined by hourly rates, the OECD/Eurostat SPPI Guide recommends that the pricing method is classified as pricing based on working time, to make clear to users that the resulting SPPI has potentially a 'productivity bias', i.e. no correction for changing productivity or efficiency during the working time.

Unit values: a pricing method that uses income and amount sold as data type in the survey. The quotient of these two results in an average price over a large number of transactions, which may be regarded as a model transaction or an output component but it is usually an average price over a whole group of transactions, for instance, in telephony, the ‘local calling price’ is the total revenue from local phone calls divided by the total number of local phone calls. If heterogeneous products are added up, a bias can occur.

Besides as a pricing method, the term ‘unit value’ is often used for the data type in the survey, (for which we propose income and amount sold) and for the target of measurement. The term is often used for an ‘average price’ over multiple transactions and/or a survey period, being preferred over the alternative, a single price observation. In this sense, model transactions, lists of output components or hourly charge-out rates can use unit value type information. Note that other literature like the PPI Manual uses the term slightly differently, although not in contradictory ways.

3.2 Data types in surveys

Expert estimate: a data type in the survey which bases a price on the potentially subjective judgement of the expert in the responding company who fills in the survey form. The estimate can reflect different types of units, for instance only components of an entire service or prices per working time and per product. If an SPPI uses expert estimates, it effectively transfers the responsibility and burden of pricing to the expert. The price paid is less control over how the price that enters SPPI calculation is established.

Input prices: a data type in the survey which corresponds to the prices of all (or a number of) input components needed to make a set amount of output. The profit margin is always to be included as an important input component. If not included, input and output prices become unacceptably linked.

The pricing mechanism is sometimes such that an enterprise applies a markup factor to calculate an output price from an input price. Markup is best known from its use in the pricing method pricing based on working time which multiplies the markup factor with an hourly wage to arrive at an hourly charge-out rate. The other pricing method using this data type in the survey is model pricing.

Strictly speaking, the input prices can be taken from a list or be estimated by an expert or calculated as an average from real transactions, but an input price is set apart as it is not an output price, unlike every standard data type in the survey.

Income and amount sold: a data type in the survey in which the quotient of the two variables (income and amount sold) results in a price, which can be used in almost any pricing method. In calculating this price, the equation $Value (v) = Price(p) * Quantity(q)$ is re-written at the micro level into $p=v/q$.

List price: a data type in the survey in which the price of a product is quoted from the producer’s price list, catalogue, Internet site, and the like. It is generally the gross price exclusive of all discounts, surcharges, rebates, and the like that apply to an actual transaction. A list price is therefore inferior to a real transaction price or shipment price for PPI compilation, although from case to case the assumption of correspondence with a real transaction price can differ

significantly (i.e. from being a reasonable to a poor assumption). List prices for fixed mounts of working time are known as standard hourly rates. Another synonym which should not be used to avoid confusion is book price.

Percentage fees and related value: a data type in the survey, only to be used in the pricing method percentage fees. Strictly speaking, the percentage can be taken from a list or be estimated by an expert or calculated as an average from real transactions, but a percentage is set apart as it is not a price, unlike every other data type in the survey. The ‘related value’ (see the pricing method percentage fees) is an unusual data type as well.

Real transaction price: a data type in the survey in which the price was truly paid in the market, taken from a receipt, bank statement or electronic database with transactions.

3.3 Targets of measurement

Hourly charge-out rates: a target of measurement of the pricing method pricing based on working time, which accepts as the unit for periodic pricing one hour’s work by an employee of the producer which contributes to the production (provision) of a service.

Model transaction: a target of measurement in which a standardised service is frozen to allow meaningful price comparisons over time. A single fictitious service can be set as the re-pricable item for a group of respondents. Alternatively, the specifications of the standardised service can be based on an actual contract or bill in the past (e.g. the base period). In this case, each respondent has better insight in the product.

Output components: a target of measurement which constitutes of a number of (typically not all) components of a service, mostly used in component pricing. Either the prices of all components are added up and compared with the sum in each comparison period, or the price of each output component is compared separately with prices in comparison periods.

Real transaction: a target of measurement which occurs in the ideal situation. Every comparison period the same service is really provided and for this service a price is available. The main pricing method is direct use of prices of repeated services, including contract pricing, although perfect unit values could estimate a real transaction.

4. Three more aspects for describing a pricing method well

1) Length of delivery and length of the survey period

A discriminating aspect between pricing methods is the comparison of the lengths of service delivery and the survey period. Three situations can be imagined:

- start and finish of delivery within one survey period,
- delivery that lasts longer than one survey period because one contract (transaction) covers a repeated service (e.g. *daily cleaning*); each period the same or similar services are delivered.
- delivery that lasts longer than one survey period due to the nature of the service (e.g. *construction project*).

2) Relation between the moment of delivery and price recording in the index

A discriminating aspect between pricing methods is the comparison of the moment of delivery of the service and the moment that the price related to this service is recorded in the SPPI. A number of situations can be imagined:

- a. During delivery
 - i. As delivery progresses
 - ii. At the start
 - iii. At the end (e.g. shipment prices)
- b. Before delivery starts; when contract is signed (e.g. order prices)
- c. After delivery is finished (e.g. in *construction*)
- d. Depending on the moment of payment, which differs per transaction.

3) Number of real transactions covered in one piece of price information

For clarity's sake, it is useful to specify the number of transactions that are covered in one piece of price information as received from the respondent (One (e.g. contract pricing), More than one (e.g. unit value), None (e.g. model pricing), Unclear (e.g. indicator of general average price change, standard hourly rates))

5. Related terms

Amount: see income and amount sold. The quantity of (a component of a) service which is homogenous enough to be useful in calculations. E.g. the quantity of calling minutes is useful, the quantity of projects of an engineering firm is not useful.

Ad valorem price: see percentage fee and percentage fees and related value.

Average invoiced hourly rate: Swedish term. See pricing based on working time.

Average price per qualification: French term. See pricing based on working time.

Bill(ing) method: see component pricing

Billed method: see model pricing

Book price: see list price.

Data type in the survey: a description of the raw data surveyed by a statistician from a respondent. The pricing method transforms these data into a prices for the target of measurement.

Estimated net transaction price: see model pricing

Fee income per grade of worker: see pricing based on working time.

Fictitious service: a service that is devised for a price survey only, used in model pricing.

Function point: a unit in a system to quantify software used by the ABS.

Income: money paid to a producer, see income and amount sold. The same is sometimes meant by revenue and turnover.

Input components: a target of measurement which is based on the assumption that a selection of input prices can be an acceptable estimate of output prices. Although “input components” would amount to a preferred term (there is no better term), it is a highly *unpreferred* target of measurement and is therefore not listed with the preferred terms. Note that input prices can be used in a number of pricing methods which all lead to a better target of measurement. In the EU, National accounts are prohibited to deflate input and output with such similar (mutually dependent) figures.

An example is the use of truck write-off, driver’s wage and fuel costs to estimate an output price for road haulage.

Market price: see real transaction price.

Mark-up: see input prices.

Offered price: see tender(ed) price.

Order price: the price quoted at the time the order is placed by the purchaser. (From PPI manual). See also shipment price.

Pricing method: two descriptions are offered for this term:

A) the assumptions, modelling and calculations made to transform data of a certain data type in the survey into prices (for a certain type of target of measurement) that can be used further in regular calculation of price relatives and subsequent aggregation in SPPI compilation.

B) the use of a specific type of information on prices to represent the evolution of price in price index compilation. It is a procedure put in place by statisticians to make price data eligible to be entered in an index. The pricing method is largely determined by the characteristics of the data. (from *SPPI Guide*, OECD et al. 2005)

Pricing mechanism: the way prices come about in the market between producer and client.

Note: it differs largely from a pricing method.

Rate method: the price of a unit of which typically large numbers are bought. Mostly used for telephony, where a rate is e.g. a price per minute calling.

Realised hourly rates: see pricing based on working time.

Revenue: see income.

Service: a product which is not a good or commodity. See also service transaction.

Service transaction: any transaction which is not merely the change of ownership of a good or commodity.

Shipment price: the price at the time the order is delivered to the purchaser. (From PPI manual). See also order price.

Specification pricing: a term to be avoided, used in different and irreconcilable ways. The word 'specification' reflects that for good PPI compilation each product sampled has to be specified and its quality held constant.

Standard hourly rates: see pricing based on working time.

Target of measurement: the unit of which the price is estimated by a pricing method.

Tender(ed) price: a price that is offered and which may differ from the transaction price arrived at. List prices and model pricing may involve tendered prices.

Transaction: The buying and selling of a product on terms mutually agreed by the buyer and seller. (From PPI manual).

Transaction pricing: ideal pricing method which uses actually paid prices of individual transactions that are repeated in every survey period. (From PPI Manual). See direct use of prices of repeated services.

Turnover: see income.

Unique service: a type of service such that any two actually provided services of the type differ too much to allow meaningful comparison of their prices for acquiring a price relative. (Operational definition for services statisticians)

Addendum C - PPI Quality Assessment Procedures

Background

The quality assessment system allows the scoring of each NAICS or ISIC industry currently in publication by the national statistical office against a standardized framework. The assessment framework identifies six major concepts of fundamental importance to output price measurement.

1. Output price – This includes correct identification of the unique output generating activities of the industry and formulating an operational methodology that allows the pricing of the unique outputs.
2. Transaction price – This addresses how well the reported price reflects actual market transaction pricing.
3. Shipment price – This addresses whether the price reflects the completion and provision of the product to the customer.
4. Representative of current period production – This is an assessment of how closely the current item sample comes to reflecting current period production in the industry.
5. Constant quality – This is an assessment of how well the index movement reflects pure price change unaffected by product changes or terms of transaction changes.
6. Timely price measure – This includes an assessment of how well the reported price represents the entire reference period and how well the reported price adheres to the current period concept and avoids phenomena such as lags.

This assessment framework isolates each of the six concepts and allows the assignment of a quality score relevant to that specific concept. The advantage of this approach is that the specific limitation in the operational approach followed by the national statistical office is immediately evident from perusing the assessment form. Additionally, summing the individual scores permits a fairly objective assessment of the overall quality of the published data. The scoring ranges listed below define whether a given industry index is assessed as a Type A, B, or C deflator. Data users can then know the overall quality of the index and areas of deficiency.

Finally, this approach allows the identification of the specific strengths and weaknesses in a given pricing method. Let us assume that the pricing method for a wired telecommunications services index is a unit value price reflecting all transactions for a homogeneous product line such as residential long-distance telephony. Let us also assume that the reporters provide data for an entire period of such calls for all residential customers, but with a one-period lag. We can assess this pricing method against all six concepts. Since the data are lagged one period, the scoring will reflect that limitation. Rather than listing every possible combination of pricing

methods and speaking more broadly of quality, this approach readily identifies both the strengths and weaknesses of the pricing method captured in the survey statistic.

Procedures

1. The form should be filled out for a single ISIC or NAICS industry by a PPI practitioner familiar with the methodologies and collection results for the industry being assessed.
2. The scoring should strictly follow the assigned points for each item. For example, *3.b. The price is a list price not equal to the transaction price* scores 50 points. The person completing the framework would not judgmentally adjust the score because they felt that the price was close to the transaction price and deserved better than a 50.
3. The scoring should reflect the plurality pricing methodology used in the industry. It is understood that several different types of pricing methods may be encountered in a single industry.
4. Shipment price – The appropriate price for the PPI should be the price at the time there is a change in ownership from the producer to the buyer. The price at the time of shipment or provision of the service is, operationally, the closest one could come to this. Order prices are quoted at the time the customer places the order and while often the same as the shipment price, they may be different. This is especially true if a price escalator is used to adjust for cost increases over the life of the long-term contract. A price that serves as a proxy for the transaction price when the good is shipped, such as a model price, should be treated as a shipment price.
5. Representative of current period production – The sample of items actively being repriced in the current period should reflect current period production and not base period production. If new product lines have emerged in the industry after the index reference period, the item sample could no longer be viewed as representative. Additionally, new major product/service features may be important in the current period when they were not in the index reference period. Items a. and b. score this phenomenon. This contrasts with c. and d. because the real issue is sample representativeness being maintained over time. Item substitution, which generally occurs when a product is obsolete, is generally insufficient toward maintaining an up to date sample on a regular basis. Newer versions of a product with additional features generally enter the market place and co-exist with the earlier versions for quite some time before they fully replace the older version. This causes the item sample to be unrepresentative. Sample augmentation or resampling is the usual way of overcoming this problem. Items c. and d. deal more with products that have very minor or more evolutionary changes. Especially for model pricing, the specification should be periodically updated to reflect current practice.
6. Transaction price – In order for alternative a. Transaction price to be chosen, the good or service must be assumed to be transacted on a very regular basis. If the item is not transacted at least once every pricing period, then it is a model price. Alternative e. Model pricing refers to one of three pricing mechanisms:

- a) A transaction price in some or many periods, but requires price estimation occasionally due to somewhat irregular shipments.
- b) A transaction price was reported in the reference period, the item specification was frozen at that point, and price estimation occurs for all subsequent repricing.
- c) A model transaction was constructed in the reference period by the national statistical office, and was priced from the inception by estimation.

If the so called price is actually a cost of an input or inputs, with no adjustment for profit and overhead, then it is not a price at all. Such a statistic has no place in a PPI. There is no scoring option for this as such a statistic is out of scope of the PPI and cannot be considered a PPI eligible for any meaningful quality assessment.

7. Output price – This primarily attempts to evaluate how close to an actual good or service the priced item comes. That is, does the priced item truly reflect an actual unique output of the industry. Alternatives a. through f. refer to an item where both the detailed specification of the unique good or service is clearly described in the repricing form and the price directly relates to the description of the item. Alternative g. is the situation where the recorded price bears no relation to the item description. It refers to charges for unique services, such as the rate charged per hour for senior accountant services by an accounting firm, but does not directly relate to a given output. This does not allow for any productivity improvements affecting the price index.

8. Timely measure – Alternatives a. and b. refer to whether the price strictly relates to the current period or includes some portion of the previous period. It is especially difficult when pricing unit values to construct a pricing method that only encompasses transactions occurring in the current period. Reporters often compile average price information over a particular period and then require additional time to compile and report out the data. This prevents the price office from obtaining the data in time for the current period tabulation. Alternatives c, d, and e refer to the representativeness of the data – do they truly represent the entire time period. A price representing a single point in time may miss some very dynamic changes that could occur later in the period. This is often the case with pricing energy items.

9. Constant quality maintained – This refers to the ability of the price office to come up with a valuation of any quality change where such changes occur with some frequency. It does not reward the use of fallbacks such as overlap pricing. In an industry where change is encountered with some frequency, either a producer cost or hedonic method must be used to arrive at the value of the quality adjustment. There are industries where product change occurs at a very slow pace. This would also qualify as alternative a.

PPI Quality Assessment Framework

Points	Category and Questions	Score
	1. Shipment Price (Weight = .10)	
	<i>Select a. or b.</i>	
0	a. Price represents order pricing, actual price at shipment may well be different.	
100	b. Price represents the completion of service or a proxy measure for the completed transaction.	
	2. Representative of current period production (Weight = .10)	
	<i>Select a. or b.</i>	
50	a. Emergence of new product lines or critical new product features has not occurred since the index reference period or since sample augmentation last done.	
0	b. Emergence of new product lines or critical new product features has occurred since the index reference period or since sample augmentation last done.	
	<i>Select c. or d.</i>	
50	c. Product substitution usually occurs when an item becomes obsolete or, if model pricing applies, the models are regularly updated to reflect changes.	
0	d. Product substitution usually does not occur when an item becomes obsolete or, if model pricing applies, the models are not regularly updated to reflect changes.	
	3. Transaction price (Weight = .25)	
	<i>Select the one most prevalent in the industry</i>	
100	a. The price is the real transaction price or a list price that can always be assumed to be equal to the transaction price.	
50	b. The price is a list price not equal to the transaction price.	
100	c. The price is a unit value for a homogeneous group of products.	
50	d. The price is a unit value for a non-homogeneous group of products.	
75	e. The price is a model price.	
50	f. The price is constructed from input cost plus profit and overhead mark-up.	
	4. Output price (Weight = .25)	
	<i>Select the one most prevalent in the industry</i>	
100	a. Recorded price reflects an actual transaction or average of actual transactions.	
75	b. Recorded price reflects a model transaction incorporating the pricing of all features found in an actual transaction.	
50	c. Recorded price reflects a model transaction incorporating the pricing of only some of the features found in an actual transaction.	
50	d. Recorded price reflects some components of a transaction.	
50	e. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of all features found in an actual transaction.	
25	f. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of some of the features found in an actual transaction.	
0	g. Recorded price reflects charge out rates for fixed labor inputs not directly tied to a specific quantity of output.	

	5. Timely measure (Weight = .10)	
	<i>Select a. or b.</i>	
50	a. Pricing data reflect the service provision in the current period and are not lagged.	
0	b. Pricing data are lagged.	
	<i>Select c., d., or e.</i>	
50	c. Pricing data reflect an average over the entire period.	
40	d. Pricing data reflect an average of multiple measurements over a portion of the period.	
25	e. Pricing data reflect a single point in time.	
	6. Constant quality maintained (Weight = .20)	
	<i>Select a. or b.</i>	
100	a. Rapid changes to product specification are not expected or, if they are, a good method to explicitly quality adjust is in use.	
0	b. Rapid changes to product specification are expected and no explicit quality adjustment method is in use.	
	Total =	
	Type A point range = over 90	
	Type B point range = 70 to 90	
	Type C point range = less than 70	

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