How to Use

Producer Price Index (PPI)

& other BLS Data for

Contract Price Adjustment

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Producer Price Index (PPI) Program

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U.S. Bureau of Labor Statistics

www.bls.gov

Including

*BLS does not recommend the use of particular indexes in escalation clauses, nor do we encourage or discourage their general use. The BLS does not directly assist in writing contracts nor do we provide advice on disputes arising from contract interpretation. The role of the BLS is to provide requested data and explain their underlying methodology and limitations. Contracting parties need to agree to types of wage or price increases that can be passed along and the extent to which these changes can be passed along.

SUMMARY: BLS Index Data Uses for Contract Price Adjustment

Employment Cost Index (ECI)

- Accounting for labor costs
- For service industries with CPI/PPI non-coverage (assuming labor cost is likely the main input)

Consumer Price Index (CPI)

- To track general inflation, use the CPI-U, all items
- Accounting for prices of goods and services households buy
- Areas of PPI non-coverage
- When the region influences long-run price changes

Import Price Index (MXP)

- For goods not or lightly covered by PPI
- Analysis of U.S. vs. foreign price competitiveness

Producer Price Index (PPI)

- Accounting for prices of nearly all goods and most services bought by households, businesses, and the government
- For general inflation, see the Final Demand-Intermediate Demand (FD-ID) PPIs
- Supply chain analysis

MATCH THE PRODUCT/SERVICE TO AN INDEX UNDER WHICH YOU'D SEARCH FOR DATA

EMPLOYMENT COST INDEX
WWW.BLS.GOV/ECT
NCSINFO@BLS.GOV
202-691-6199

CONSUMER PRICE INDEX
WWW.BLS.GOV/CPI
CPI_INFO@BLS.GOV
202-691-7000

IMPORT PRICE INDEX
WWW.BLS.GOV/MXP
MXPINFO@BLS.GOV
202-691-7101

PRODUCER PRICE INDEX
WWW.BLS.GOV/PPI
PPI-INFO@BLS.GOV
202-691-7705

Cars

Custom software development

Teachers

Cement

Employment Placement Services

iPhones

Uniform rental and delivery

Barbers

Construction

Rental of warehouse space

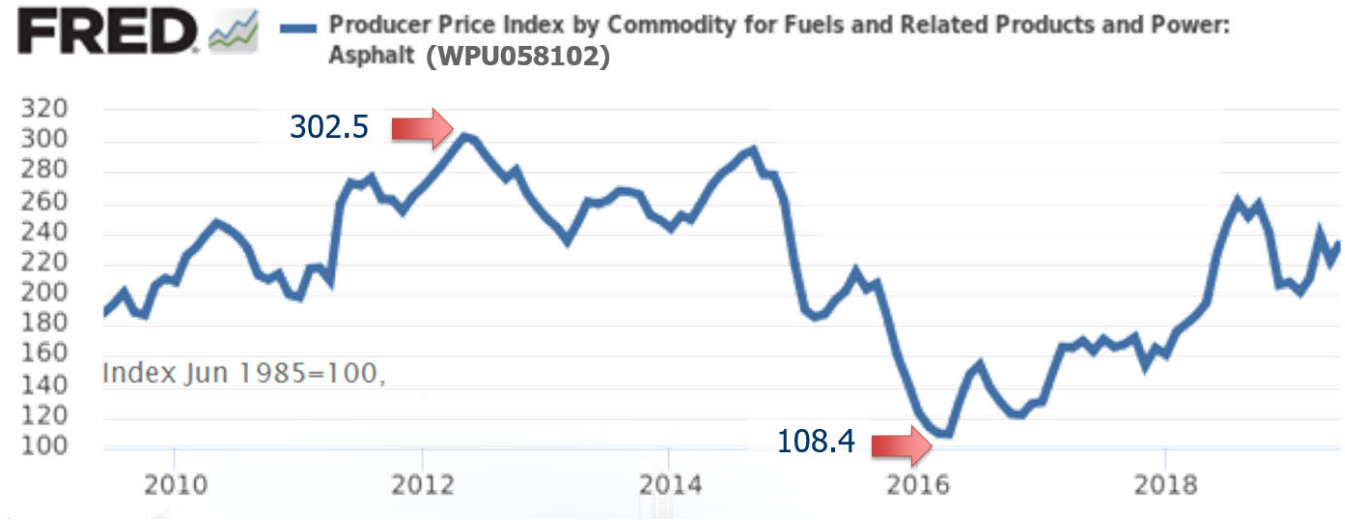
Police and Fireman Apparel

Agricultural machinery

PRACTICE: Index Percentage Change and Adjusted Price Calculations

What is a price/wage index?

A numerical level that you can compare to its level from another point in time (e.g. a month and year) to see how much, on average, the dollar prices/wages that it represents have changed. For example:



Online at https://fred.stlouisfed.org/graph/?g=or7a

How is an index interpreted?

Typically in percentage change terms. For example:

The PPI for asphalt showed the change in average prices for asphalt during 2015 was -45.5%.

Current Index Value = 142.3 (December 2015)
Base Index Value = 261.0 (December 2014)
[(142.3 – 261.0) / 261.0] x 100 = -45.5%

Practice Calculation:

What was the percentage change in the PPI for asphalt from peak (302.5) to low point (108.4) using the index levels marked on the chart above?

% Change = [(Current Value – Base Value) ÷ Base Value] x 100

How do I calculate price adjustment using an index?

Apply the percentage change in the index to the base contract price. For example:

*The PPI for asphalt showed the average change in prices for asphalt during 2015 was -45.5%. 45.5% of the base contract price ($5,500/ton) is $2503 (.455*$5,500). Subtract that from the original base contract price of $5,500. The new price is $2,998/ton. To use the index levels to directly calculate the price, use this formula (be careful using two different methods, because rounding differences can occur):*

Current Index Value = 142.3 (December 2015)
Base Index Value = 261.0 (December 2014)
(142.3 / 261.0) x $5500 = $2,998/ton

Practice Calculation:

If the contract price of asphalt, originally $5,500/ton as of December 2014, is $2,998/ton as of December 2015, what is the price of asphalt as of December 2016 if the index is at 128.4?

Hint: calculate from the base values

$ New Price = (Current Value ÷ Base Value) x $ Base Price

Step-By-Step Worksheet for Contracting with BLS Index Data

1. **CHOOSE AN INDEX OR INDEXES THAT REPRESENT THE COST OF PROVIDING THE GOOD/SERVICE SUBJECT TO PRICE ADJUSTMENT.**

   a. What changing costs does the supplier face for providing the good/service I'm buying?

   Resources:
   - The seller
   - Your procurement network
   - BEA.gov Input-Output table
   - Census.gov Industry input data
   - Web search

   b. Which PPIs are available tracking those costs? If PPIs are unavailable, which ECI, import index, CPI or other index data is?

   www.bls.gov/data →
   or contact us!

   https://www.bls.gov/ppi/getdata.htm

   c. It is advisable to look at historical data to assess data usefulness for your contract. Questions you might ask:

      i. Has the index published in the last 5 months?

      ii. Based on the consistency of the index publishing, what data will be available at the time of price adjustment? (Which data will be final or still preliminary?)

      iii. Over the time span for which the contract will allow adjustments (e.g. 12-month percent change), are the indexes volatile? Do they "jump around" a lot? Were there any noticeable outliers?

      iv. How do the historical price changes match with what I would expect?

      v. If the data is not what I expect, why might it have acted that way based on my research of the inputs to the product/service the index is for, the business environment, and what has been going on in economic news?

      vi. If the index movement doesn't make sense, at least does it track somewhat with the trends in the PPI for the finished product/service I'm buying?

      vii. If the index movement doesn't make sense, how does it compare to other economic data available related to the product/service (e.g. trade association reported prices, stock prices in the industry)?

      viii. What might I expect the index to do in the future? And would that be ok with my organization if we used it in the contract?

   d. Based on these answers, are there indexes I should rule out or consider limiting the percentage change?

   e. Which index or combination of indexes makes sense to use and how do I justify that?

   f. What are the positives and negatives of that index or combo of indexes? Which is "fair"?

   g. If I can't decide between indexes, which track most closely to price trends shown by an index for the product/service I'm buying?

Tools for Examining Data

DOWNLOAD data from BLS.gov using the series id codes and the Series Report tool at https://data.bls.gov/cgi-bin/srgate.

CHART the data using a program like MS Excel® or FRED® by the Federal Reserve Bank of St. Louis, online at https://fred.stlouisfed.org/.

2. SPECIFY CONTRACT TERMS.

a. Base selling price:

b. Base date (month and year/quarter/etc.) of data for price adjustment purposes:

c. If applicable, portion of the price subject to adjustment:

d. Frequency/date of future price adjustments:

e. For adjustment, date of index data to use (month and year/quarter/etc.):

f. If applicable, use of non-preliminary versus preliminary data:

g. If applicable, limits on price adjustments:

3. SPECIFY THE INDEX OR INDEXES WITH THE FULL SERIES ID, TITLE, AND DESCRIPTORS.

4. GIVE EXAMPLE PROCEDURES AND CALCULATIONS.

a. Official source of index data:

b. Formula and example escalation:

5. PROVIDE FOR MISSING OR DISCONTINUED INDEX DATA.

a. If a PPI is re-coded, the new index should be used in direct replacement.

b. What to do if the index is discontinued or data is missing:

Assign a proxy index?

Replace with a newly introduced index?

Use the next higher aggregate?

c. What to do about revised data (and when):

Only use non-preliminary data for regular adjustments?

Recalculate upon the release of a revision?

Recalculate upon revision only if the change is over a certain threshold?

Do nothing (if you always escalate from the base date and price, the next adjustment will make up for it)?

**Please note: this worksheet was not vetted by contracting experts. The info provided is based on PPI staff interaction with customers using PPI data for price adjustment. BLS does not assist in writing contracts. BLS staff can provide information on how to identify and obtain index data and explain what the data is measuring. Contracting parties need to agree to the terms of their contracts.*

PPI NEWS RELEASE Table 2. Producer price indexes and percent changes for intermediate demand by commodity type[1] [Nov. 2009=100, unless otherwise indicated]

Grouping	Other index base	Relative Importance Dec. 2018[2]	Unadjusted index			Unadjusted percent change to July 2019 from:		Seasonally adjusted percent change from:		
			Mar. 2019[3]	June 2019[3]	July 2019[3]	July 2018	June 2019	Apr. to May	May to June	June to July
Processed goods										
Processed goods for intermediate demand	00/82	100.000	199.6	199.1	199.6	-2.0	0.3	-0.2	-1.1	0.2
Materials and components for manufacturing	00/82	45.806	186.5	185.8	184.9	-2.0	-0.5	0.2	-0.2	-0.4
Materials for manufacturing		28.389	113.5	112.7	111.8	-3.9	-0.8	0.2	-0.4	-0.6
Materials for food manufacturing	00/82	3.928	194.5	197.3	197.1	1.1	-0.1	-0.2	-0.6	0.2
Materials for nondurable manufacturing	00/82	13.308	217.9	217.4	215.4	-5.1	-0.9	0.8	0.2	-0.6
Materials for durable manufacturing	00/82	11.153	207.5	203.4	201.5	-4.1	-0.9	-0.4	-1.0	-0.9
Components for manufacturing	00/82	17.417	155.4	155.7	155.7	1.1	0.0	0.1	0.0	0.1
Components for nondurable manufacturing		0.738	115.2	115.3	115.6	0.8	0.3	0.2	0.3	0.3
Components for durable manufacturing		16.679	110.0	110.1	110.2	1.1	0.1	0.1	0.0	0.0
Materials and components for construction	00/82	8.978	251.2	251.4	251.6	0.9	0.1	0.1	-0.2	0.2
Materials for construction		3.915	124.9	125.2	125.2	-0.8	0.0	-0.1	-0.1	0.1
Components for construction		5.063	123.4	123.4	123.5	2.2	0.1	0.2	-0.3	0.2
Processed fuels and lubricants for intermediate demand	00/82	18.597	181.0	179.8	184.5	-6.9	2.6	-1.4	-4.9	2.2
Processed fuels and lubricants to manufacturing industries	00/82	4.693	192.9	193.1	198.2	-5.1	2.6	-0.9	-3.7	1.5
Processed fuels and lubricants to nonmanufacturing industries	00/82	13.904	177.4	175.7	180.4	-7.4	2.7	-1.6	-5.3	2.4
Containers for intermediate demand	00/82	2.927	238.4	239.0	238.2	1.0	-0.3	0.5	0.2	-0.3
Supplies for intermediate demand	00/82	23.690	201.0	201.3	201.2	0.8	0.0	-0.1	0.0	0.0
Supplies to manufacturing industries	00/82	2.918	202.3	201.9	201.7	1.2	-0.1	0.0	0.0	-0.1
Supplies to nonmanufacturing industries	00/82	20.772	199.3	199.7	199.6	0.8	-0.1	-0.2	-0.1	0.0
Supplies to nonmanufacturing industries, feeds	00/82	1.645	177.8	177.3	175.1	-6.3	-1.2	-2.6	1.0	-1.8
Supplies to nonmanufacturing industries, other than feeds	00/82	19.127	203.0	203.5	203.6	1.4	0.0	0.0	-0.1	0.1
Unprocessed goods										
Unprocessed goods for intermediate demand	00/82	100.000	190.6	181.8	183.5	-10.4	0.9	-5.1	-3.3	1.6
Unprocessed foodstuffs and feedstuffs	00/82	35.130	164.0	167.4	165.3	-0.5	-1.3	-1.9	-0.1	-0.2
Unprocessed nonfood materials	00/82	64.869	200.9	183.4	187.8	-15.9	2.4	-6.9	-5.2	2.7
Unprocessed nonfood materials except fuel	00/82	38.744	249.6	231.6	244.9	-13.4	5.7	-5.2	-7.6	6.2
Unprocessed nonfood materials except fuel to manufacturing industries	00/82	37.017	230.5	213.0	225.8	-14.1	6.0	-5.5	-8.0	6.4
Unprocessed nonfood materials except fuel to nonmanufacturing industries	00/82	1.727	265.9	270.2	271.0	4.0	0.3	0.0	1.1	0.4
Unprocessed fuel	00/82	26.125	122.8	107.8	101.1	-22.5	-6.2	-11.3	1.4	-5.8
Unprocessed fuel to manufacturing industries	00/82	0.812	166.0	154.2	149.2	-12.8	-3.2	-7.3	1.1	-2.5
Unprocessed fuel to nonmanufacturing industries	00/82	25.313	123.8	108.5	101.6	-22.9	-6.4	-11.4	1.4	-6.0
Services										
Services for intermediate demand		100.000	120.9	121.7	121.4	2.0	-0.2	0.0	0.2	-0.2
Trade services for intermediate demand[4]		18.633	123.6	125.3	124.2	2.6	-0.9	-0.6	1.1	-0.8
Trade services for manufacturing industries	12/12	9.107	111.6	113.4	112.1	2.7	-1.1	-0.4	1.3	-1.1
Trade services for nonmanufacturing industries	12/12	9.526	111.3	112.4	111.7	2.7	-0.6	-0.4	0.8	-0.5
Transportation and warehousing services for intermediate demand		12.123	128.2	129.1	129.5	2.8	0.3	0.4	0.1	0.3
Transportation of passengers for intermediate demand		1.166	118.7	122.2	123.0	5.4	0.7	1.7	-0.6	1.4
Transportation of passengers for manufacturing industries		0.194	118.5	122.1	123.0	5.5	0.7	1.8	-0.6	1.5
Transportation of passengers for nonmanufacturing industries		0.972	118.7	122.2	123.0	5.4	0.7	1.7	-0.6	1.5
Transportation and warehousing of goods for intermediate demand		10.957	129.1	129.7	130.0	2.5	0.2	0.2	0.2	0.2
Transportation and warehousing of goods for manufacturing industries	12/12	1.688	107.6	108.6	108.8	2.4	0.2	0.4	0.3	0.2
Transportation and warehousing of goods for nonmanufacturing industries	12/12	9.269	115.2	115.7	115.9	2.5	0.2	0.2	0.2	0.3
Services less trade, transportation, and warehousing for intermediate demand		69.244	118.9	119.3	119.2	1.7	-0.1	0.0	0.1	-0.1
Services less trade, transportation, and warehousing for manufacturing industries		2.314	109.7	109.2	109.6	1.8	0.4	0.0	-0.4	0.4
Services less trade, transportation, and warehousing for nonmanufacturing industries		66.930	119.2	119.7	119.5	1.7	-0.2	0.0	0.1	0.0
Construction										
Construction for intermediate demand		100.000	118.8	120.3	120.7	4.0	0.3	0.8	0.3	0.3
Special groupings										
Processed materials less foods and feeds	00/82	91.656	200.5	199.8	200.4	-2.1	0.3	-0.2	-1.1	0.3
Processed foods and feeds	00/82	8.344	190.5	192.8	192.4	0.1	-0.2	-0.5	-0.3	-0.1
Processed energy goods	00/82	18.597	181.8	180.6	185.4	-6.9	2.7	-1.4	-4.9	2.2
Processed materials less energy	00/82	81.403	201.6	201.3	200.7	-0.7	-0.3	0.1	-0.2	-0.2
Processed materials less foods and energy	00/82	73.059	202.6	202.0	201.4	-0.8	-0.3	0.1	-0.1	-0.2
Intermediate distributive services[5]	04/10	29.590	123.2	124.5	123.9	2.6	-0.5	-0.2	0.7	-0.4
Processed goods plus intermediate distributive services	04/10	–	112.6	112.7	112.8	-0.7	0.1	-0.3	-0.5	0.1
Unprocessed materials less agricultural products	00/82	62.122	202.8	183.4	187.6	-17.1	2.3	-7.1	-5.9	2.4

See footnotes at end of table.

Table 2. Producer price indexes and percent changes for intermediate demand by commodity type[1] — Continued

[Nov. 2009=100, unless otherwise indicated]

Grouping	Other index base	Relative Importance Dec. 2018[2]	Unadjusted index			Unadjusted percent change to July 2019 from:		Seasonally adjusted percent change from:		
			Mar. 2019[3]	June 2019[3]	July 2019[3]	July 2018	June 2019	Apr. to May	May to June	June to July
Unprocessed energy materials[6]	00/82	43.256	150.0	135.2	138.7	-20.9	2.6	-8.2	-7.5	2.8
Unprocessed materials less energy	00/82	56.744	208.3	206.1	205.3	-2.5	-0.4	-2.9	-0.2	0.5
Unprocessed nonfood materials less energy[7]	00/82	21.614	339.6	317.3	321.2	-6.2	1.2	-4.5	-0.5	1.9

[1] Further information about the Final Demand-Intermediate Demand Aggregation system is available online at https://www.bls.gov/ppi/fdidaggregation.htm

[2] Comprehensive relative importance figures are initially computed after the publication of December indexes and are recalculated after final December indexes are available. Individual items and subtotals may not add exactly to totals because of rounding differences.

[3] The indexes for March 2019 have been recalculated to incorporate late reports and corrections by respondents. All indexes are subject to revision 4 months after original publication.

[4] Trade indexes measure changes in margins received by wholesalers and retailers.

[5] Includes intermediate trade, transportation, and warehousing services.

[6] Includes crude petroleum.

[7] Excludes crude petroleum.

"-" Data not available.

PPI Final Demand and Intermediate Demand (FD-ID) by Commodity Type Aggregation Structure and Definitions

Full article online at https://www.bls.gov/ppi/fdidbycomtype.htm

- **Final demand** buyers include consumers, government, and foreigners, as well as domestic industries that purchase the commodity as capital investment.
- **Intermediate demand** buyers consist of domestic industries that purchase the commodity as an input to production, excluding capital investment.

The Final Demand–Intermediate Demand by Commodity Type system consists of five major portions differentiated by the type of commodity and class of buyer. These categories are

- processed goods for intermediate demand
- unprocessed goods for intermediate demand
- services for intermediate demand
- construction for intermediate demand
- final demand

Visit FD-ID Aggregation System webpage (https://www.bls.gov/ppi/fdidaggregation.htm) for more info.

Final Demand

Types of Commodities and Class of Buyer

Final demand include all types of commodities (goods, services, and construction) consumed as personal consumption, by government, by businesses as capital investment, and as exports. See more: https://www.bls.gov/ppi/fdidbycomtype.htm

Processed Goods for Intermediate Demand

Types of Commodities and Class of Buyer

Processed goods include goods that have been subjected to a treatment or series of treatments that in some way alters the initial physical nature or function of the goods. Mixing goods or assembling components is considered processing because, though the good itself is not changed, its function or usefulness is altered.

Processed goods for intermediate demand include fabricated goods purchased by businesses as inputs to production, excluding capital investment.

Structure of Processed Goods for Intermediate Demand

Index Code	Title
ID61	**Processed Goods for Intermediate Demand**
ID611	**Materials and Components for Manufacturing**
ID6111	**Materials for Manufacturing**
ID61111	*Materials for Food Manufacturing*

Index Code	Title
ID61112	*Materials for Nondurable Manufacturing*
ID61113	*Materials for Durable Manufacturing*
ID6112	**Components for Manufacturing**
ID61121	*Components for Nondurable Manufacturing*
ID61122	*Components for Durable Manufacturing*
ID612	**Materials and Components for Construction**
ID6121	***Materials for Construction***
ID6122	***Components for Construction***
ID613	**Processed Fuels and Lubricants for Intermediate Demand**
ID6131	***Processed Fuels and Lubricants for Manufacturing Industries***
ID6132	***Processed Fuels and Lubricants for Nonmanufacturing Industries***
ID614	***Containers for Intermediate Demand***
ID615	**Supplies for Intermediate Demand**
ID6151	***Supplies to Manufacturing Industries***
ID6152	**Supplies to Nonmanufacturing Industries**
ID61521	*Supplies to Nonmanufacturing Industries, Feeds*
ID61522	*Supplies to Nonmanufacturing Industries, Other than Feeds*

Definitions of Processed Goods for Intermediate Demand

ID61111 MATERIALS FOR FOOD MANUFACTURING

contains partially processed food products that must undergo further preparation before reaching the final customer. Examples of materials for food manufacturing include milk products, canned or frozen fruits and vegetables, processed sugars, and certain chemicals.

ID61112 MATERIALS FOR NONDURABLE MANUFACTURING

contains partially processed products that will undergo further preparation or usage in the manufacture of goods which have a life expectancy of less than 3 years. Examples of materials for nondurables manufacturing include cotton yarn used for shirts and wood pulp used to make paper.

ID61113 MATERIALS FOR DURABLE MANUFACTURING

contains partially processed products that will undergo further preparation or usage in the manufacture of goods that have a life expectancy of more than 3 years. Examples of materials for durable manufacturing include textile materials, lumber, metals, and cement.

ID61121 COMPONENTS FOR NONDURABLE MANUFACTURING

includes products, such as buttons and springs that are completely finished except for installation or assembly into a larger nondurable item. Nondurable goods are considered to have a life expectancy of less than 3 years.

ID61122 COMPONENTS FOR DURABLE MANUFACTURING
includes products, such as pumps, valves, and fittings that are completely finished except for installation or assembly into a larger durable item. Durable goods are considered to have a life expectancy of 3 years or more.

ID6121 MATERIALS FOR CONSTRUCTION
includes partially finished products that will undergo further preparation into a construction product. This usage is specifically defined in the I-O tables. Examples include lumber, concrete pipe, and architectural coatings.

ID6122 COMPONENTS FOR CONSTRUCTION
includes completely finished products that will undergo installation into a construction product. This usage is specifically defined in the I–O tables. Examples include metal doors and water heaters.

ID6131 PROCESSED FUELS AND LUBRICANTS FOR MANUFACTURING INDUSTRIES
includes fuel and related products used in manufacturing industries to generate heat and power and for lubrication. Examples include industrial electric power, industrial natural gas, gasoline, diesel fuel, and greases and oils.

ID6132 PROCESSED FUELS AND LUBRICANTS FOR NONMANUFACTURING INDUSTRIES
includes fuel and related products used in nonmanufacturing industries to generate heat and power and for lubrication. Examples include commercial electric power, commercial natural gas, jet fuel, diesel fuel, and greases and oils.

ID614 CONTAINERS FOR INTERMEDIATE DEMAND
contains paper, wood, plastic, metal, & glass receptacles used to ease the transport of unwieldy items.

ID6151 SUPPLIES TO MANUFACTURING INDUSTRIES
includes products consumed in the manufacturing industries during the course of production or distribution of other items but not physically incorporated in those items. These products are distinguished from capital equipment in that they are not amortized. Examples of supplies for manufacturing industries include plastic packaging, small cutting tools, and machinery.

ID61521 SUPPLIES TO NONMANUFACTURING INDUSTRIES, FEEDS
includes feed products consumed by animals in the livestock industry. Examples of manufactured animal feeds include poultry feed, hog feed, vegetable cakes, and meal fee.

ID61522 SUPPLIES TO NONMANUFACTURING INDUSTRIES, OTHER THAN FEEDS
includes products used in the nonmanufacturing sector other than the animal feed industry, which are consumed during the course of production or distribution of other items but not physically incorporated in those items. Examples include sedatives for hospitals, tires, motor vehicle parts for auto repair shops, and photographic supplies.

Unprocessed Goods for Intermediate Demand

Types of Commodities and Class of Buyer

Unprocessed goods are goods that have undergone no fabrication. For PPI purposes, unprocessed goods can be subject to picking, sorting, washing, packing, or transporting.

Unprocessed goods for intermediate demand are goods that have undergone no fabrication and are purchased by businesses as inputs to production.

Structure of Unprocessed Goods for Intermediate Demand

Index Code	Title
ID62	**Unprocessed Goods for Intermediate Demand**
ID621	***Unprocessed Foodstuffs and Feedstuffs***
ID622	**Unprocessed Nonfood Materials**
ID6221	**Unprocessed Nonfood Materials, Except Fuel**
ID62211	*Unprocessed Nonfood Materials, Except Fuel to Manufacturing Industries*
ID62212	*Unprocessed Nonfood Materials, Except Fuel to Nonmanufacturing Industries*
ID6222	**Unprocessed Fuel**
ID62221	*Unprocessed Fuel to Manufacturing Industries*
ID62222	*Unprocessed Fuel to Nonmanufacturing Industries*

Definitions of Unprocessed Goods for Intermediate Demand

ID621 UNPROCESSED FOODSTUFFS AND FEEDSTUFFS

contains basic agricultural products that will undergo some processing prior to becoming completed food products, as well agricultural products consumed directly by the agricultural sector. Examples include fresh fruit that will be canned or raw corn consumed by livestock as animal feed. Other examples would be cattle, hogs, or chickens intended for slaughter, or raw cane sugar that will be refined.

ID62211 UNPROCESSED NONFOOD MATERIALS, EXCEPT FUEL TO MANUFACTURING INDUSTRIES

contains minerals, agricultural products, and scrap materials that are intended to be used in a manufacturing process other than manufacturing of foods. Raw cotton that will be turned into yarn, or aluminum base scrap that will end up as refined aluminum, are examples of this category. Crude petroleum is contained in this grouping rather than in Crude Fuels, because it is not used as a fuel in its crude state; it can be used as a raw material in manufacturing (for example, synthetic rubber or pharmaceuticals). Also included in the category are agricultural inputs to manufactures of pet foods and alcoholic beverages.

ID62212 UNPROCESSED NONFOOD MATERIALS, EXCEPT FUEL TO NONMANUFACTURING INDUSTRIES

includes products such as sand, gravel, and crushed stone primarily used in the construction industry.

ID62221 UNPROCESSED FUEL TO MANUFACTURING INDUSTRIES

contains unrefined energy sources, specifically coal and natural gas, used to generate heat and power in manufacturing industries.

ID62222 UNPROCESSED FUEL TO NONMANUFACTURING INDUSTRIES

includes coal and natural gas used to generate heat and power in nonmanufacturing industries.

Services for Intermediate Demand

Types of Commodities and Class of Buyer

Services include trade services; transportation and warehousing services; and services excluding trade, transportation, and warehousing. Trade services encompass both retailing and wholesaling services. The PPI views wholesalers and retailers as suppliers of distributive services (rather than as suppliers of goods), because little, if any, transformation of these goods takes place. This approach implies that the output of a wholesale or retail trade establishment is represented by the difference between its selling price of a good and the acquisition price for that same item. Gross margin prices, as collected by PPI, reflect the value added by the establishment for services such as marketing, storing, and displaying goods in convenient locations and making the goods easily available for customers to purchase. Transportation services include transportation of passengers, transportation of cargo, services related to transportation, and warehousing and storage of goods. Services less trade, transportation, and warehousing include all other types of services, such as health care services, professional services, financial services, entertainment services, etc.

Services for intermediate demand include trade services; transportation and warehousing services; and services less trade, transportation, and warehousing purchased by businesses as inputs to production.

Structure of Services for Intermediate Demand

Index	Title
ID63	**Services for Intermediate Demand**
ID631	**Services less Trade, Transportation, and Warehousing for Intermediate Demand**
ID6311	***Services less Trade, Transportation, and Warehousing for Manufacturing Industries***
ID6312	***Services less Trade, Transportation, and Warehousing for Nonmanufacturing Industries***
ID632	**Transportation and Warehousing Services for Intermediate Demand**
ID6321	**Transportation of Passengers for Intermediate Demand**
ID63211	*Transportation of Passengers for Manufacturing Industries*
ID63212	*Transportation of Passengers for Nonmanufacturing Industries*
ID6322	**Transportation and Warehousing of Goods for Intermediate Demand**
ID63221	*Transportation of Goods for Manufacturing Industries*
ID63222	*Transportation of Goods for Nonmanufacturing Industries*
ID633	**Trade Services for Intermediate Demand**
ID6331	***Trade Services for Manufacturing Industries***
ID6332	***Trade Services Nonmanufacturing Industries***

Definitions of Services for Intermediate Demand

ID6311 SERVICES LESS TRADE, TRANSPORTATION, AND WAREHOUSING FOR MANUFACTURING INDUSTRIES

includes services used by the manufacturing sector other than trade and transportation services. Examples include manufacturing services, such as contract work on textiles and metal coating and

allied services, as well as other types of services, including engineering services, truck rental, and software publishing.

ID6312 SERVICES LESS TRADE, TRANSPORTATION, AND WAREHOUSING FOR NONMANUFACTURING INDUSTRIES
includes services used by nonmanufacturing sectors other than trade and transportation services. Financial services, legal services, architectural services, consulting services, and telecommunication services are examples.

ID63211 TRANSPORTATION OF PASSENGERS FOR MANUFACTURING INDUSTRIES
ID63212 TRANSPORTATION OF PASSENGERS FOR NONMANUFACTURING INDUSTRIES
composed of business travel services, including railroad and airline passenger services, purchased by (non)manufacturing industries.

ID63221 TRANSPORTATION OF GOODS FOR MANUFACTURING INDUSTRIES
includes shipping, services related to shipping, and warehousing services for goods sold to manufacturing industries. Examples include pipeline transportation of petroleum products, long-distance motor carrying, and rail transportation of freight and mail.

ID63222 TRANSPORTATION OF GOODS FOR NONMANUFACTURING INDUSTRIES
includes shipping, services related to shipping, and warehousing services for goods sold to nonmanufacturing industries. Examples include U.S. Postal Service, air transportation of freight, courier and messenger services, and marine cargo handling.

ID6331 TRADE SERVICES FOR MANUFACTURING INDUSTRIES
contains retail and wholesale trade services for goods sold to manufacturing industries. For PPI purposes, trade services are a margin service, measured as the difference between selling and acquisition price of the good. Parts and supplies for machinery and equipment wholesaling; metals, mineral, and ores wholesaling; and paper and plastics wholesaling are examples of trade services for manufacturing industries.

ID6332 TRADE SERVICES FOR NONMANUFACTURING INDUSTRIES
contains retail and wholesale trade services for goods sold to nonmanufacturing industries. For PPI purposes, trade services are a margin service, measured as the difference between selling and acquisition price of the good. Examples include hardware and building materials and supplies retailing, chemicals and allied products wholesaling, and automotive parts retailing.

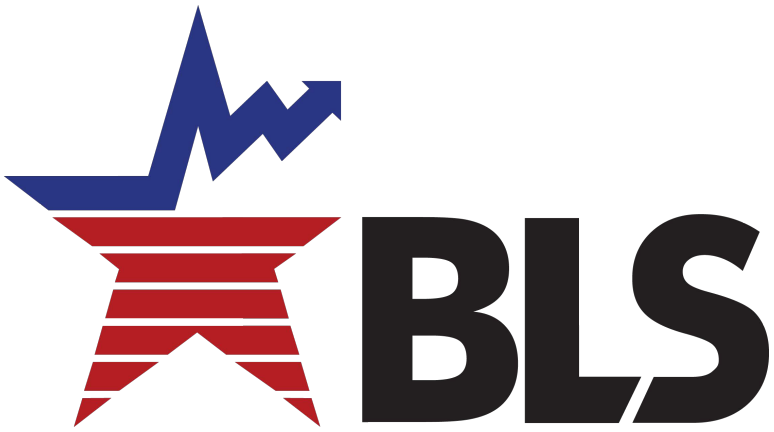
Construction for Intermediate Demand

Definitions of Construction for Intermediate Demand

ID64 CONSTRUCTION FOR INTERMEDIATE DEMAND
includes maintenance and repair construction purchased by businesses as inputs to construction. Note that all *new* construction is defined as capital investment and is included under final demand.

BLS Index Program
Contract Price Adjustment Guides

Available at www.bls.gov



U.S. Bureau of Labor Statistics

How to Use the Employment Cost Index for Escalation

The Employment Cost Index (ECI), published by the U.S. Department of Labor's Bureau of Labor Statistics (BLS), is a quarterly measure of the change in the cost of labor, free from the influence of employment shifts among occupations and industries. The compensation series includes changes in wages and salaries and employer costs for employee benefits. The wage and salary series and the benefit costs series provide the change for the two components of compensation.

The ECI is designated as a principal economic indicator. It is the only measure of labor costs that treats wages and salaries and total compensation consistently, and provides regular sub-series by occupation, industry, and region. The ECI is used by the Federal Reserve Board to monitor the effects of fiscal and monetary policies and in formulating those policies. According to Federal Reserve Board Chairman Ben Bernanke, "The ECI is indispensable to understanding America's economy. It ensures the accuracy of the statistics on employers' compensation costs that we rely on for economic policy making and successful business planning."

The ECI is particularly well suited as a vehicle to adjust wage rates to keep pace with what is paid by other employers for two reasons. First, it is comprehensive. It includes not only wages and salaries but also employer costs for employee benefits, and covers nearly all employees in the civilian (non-Federal) economy. Second, it measures the "pure" change in labor costs; that is, it is not affected by changes in relative employment of industries and occupations with different wage and compensation levels.

The following are general guidelines to consider when developing an escalation agreement using the Employment Cost Index:

SPECIFY the costs to be escalated (wages and salaries, benefits costs, or total compensation); indicate the specific occupations covered; indicate the month or year of the base labor costs; indicate the reference quarter to be used; and specify how long the contract will be in effect.

IDENTIFY an appropriate index and series. Choose the index and series to use that is reflective of the occupations you are trying to escalate (e.g., ECI for Total Compensation (not seasonally adjusted), private industry workers, service-providing industries). An important consideration when choosing a series for escalation is the sampling error. Series with smaller numbers of workers may have larger sampling error or may be dominated by a small number of employers. For example, local area indexes often exhibit greater volatility than the national index, although long-term trends can remain similar.

STATE the frequency of adjustment. Adjustments are usually made at fixed time intervals, such as quarterly, semi-annually, or most often, annually.

COMPUTE the percentage increase. Divide the index number for the most recent period by the index number for the prior period to determine the percentage increase. Multiply the percentage increase by the base labor cost to determine the escalated labor cost.

PROVIDE for missing or discontinued data. Procedures should be provided in the event that required data are missing or discontinued (although both are rare).

AVOID locking indexes used for escalation into any particular reference period (e.g. 1982=100).
Periodically, the ECI will change its index base. The index base to be used should be the one in effect at the time the adjustment is to be made, which may not be the one in effect when the contract was written.

Example of Escalator Clauses Suppose a collective bargaining agreement contains the following language:

"For years two and three of this contract, on July 1 of each year, basic hourly wage rates for each step and grade will be adjusted by the percentage change in the Employment Cost Index for private industry workers, wages and salaries (not seasonally adjusted), from March of the prior year to March of the current year. That is, the increase to go into effect on July 1, 2015 will be the increase in the ECI series between March 2014 and March 2015, while the increase to go into effect on July 1, 2016 will be the increase in the ECI between March of 2015 and March of 2016."

The cost to be escalated is: wages and salaries

The index to be used is: private industry workers, wages and salaries (not seasonally adjusted), March quarter

The frequency of adjustment is: annually

The calculation is: Assume that in December 2014 wage rates for three occupations, in the example, were as follows:

```
Carpenters . . . . . .$22.00
Janitors  . . . . . .12.00
Truckdrivers . . . . . 18.00
```

The ECI private industry wages and salaries index for December 2014 is 121.6 and for December 2015 is 124.2. Then the adjustments would be 124.2/121.6 = 1.021

```
 $22.00   *    1.021    =    $22.46
  12.00   *    1.021    =     12.25
  18.00   *    1.021    =     18.38
```

The ECI is published on a seasonally adjusted basis as well as on an unadjusted basis. Seasonal adjustment removes the effects of events that follow a more or less regular pattern each year. These seasonal adjustments make non-seasonal patterns easier to identify. The calculated data adjustments are for current economic analysis. In addition, the factors that are used to seasonally adjust the data are updated annually. Also, seasonally adjusted data that have been published earlier are subject to revision for up to 5 years after their original release. For these reasons, the use of seasonally adjusted data in escalation agreements is inappropriate. The Bureau of Labor Statistics neither encourages nor discourages the use of wage adjustment measures in contractual agreements. Also, while BLS can provide technical and statistical assistance to parties developing escalation agreements, we can neither develop specific wording for contracts nor mediate legal or interpretive disputes that might arise between the parties to the agreement.

For more detailed information on escalator clauses, view "Escalation in Employer Costs for Employee Compensation: A Guide for Contracting Parties" at **https://www.bls.gov/opub/mlr/cwc/escalation-in-employer-costs-for-employee-compensation-a-guide-for-contracting-parties.pdf** (Spring 1997).

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https://www.bls.gov/ECT | Telephone: 1-202-691-6199 | **ncsinfo@bls.gov**

How to Use the Consumer Price Index for Escalation

The Consumer Price Index (CPI) measures the average change in the prices paid for a market basket of goods and services. These items are purchased for consumption by the two groups covered by the index: All Urban Consumers (CPI-U) and Urban Wage Earners and Clerical Workers, (CPI-W).

Escalation agreements often use the CPI—the most widely used measure of price change—to adjust payments for changes in prices. The most frequently used escalation applications are in private sector collective bargaining agreements, rental contracts, insurance policies with automatic inflation protection, and alimony and child support payments.

The following are general guidelines to consider when developing an escalation agreement using the CPI:

Define the base payment

Define clearly the base payment (rent, wage rate, alimony, child support, or other value) that is subject to escalation.

Identify which CPI series will be used

Identify precisely which CPI index series will be used to escalate the base payment. This should include the population coverage (CPI-U or CPI-W), area coverage (U.S. City Average, West Region, Chicago, etc.), series title (all items, rent of primary residence, etc.), and index base period (1982-84=100).

Specify reference period

Specify a reference period from which changes in the CPI will be measured. This is usually a single month (the CPI does not correspond to a specific day or week of the month), or an annual average. There is about a two-week lag from the reference month to the date on which the index is released (that is, the CPI for May is released in mid-June). The CPIs for most metropolitan areas are not published as frequently as are the data for the U.S. City Average and the four regions. Indexes for the U.S. City Average, the four regions, nine divisions, two city-size classes, eight region-by-size classes, and three major metropolitan areas (Chicago, Los Angeles, and New York) are published monthly. Indexes for the remaining 20 published metropolitan areas are available only on a bimonthly basis. Contact BLS for information on the frequency of publication for the 23 metropolitan areas.

State frequency of adjustment

Adjustments are usually made at fixed intervals, such as quarterly, semiannually, or, most often, annually.

Determine adjustment formula

Determine the formula for the adjustment calculation. Usually the change in payments is directly proportional to the percent change in the CPI index between two specified periods. Consider whether to make an allowance for a “cap” that places an upper limit on the increase in wages, rents, etc., or a “floor” that promises a minimum increase regardless of the percent change (up or down) in the CPI.

Provide for revisions

Provide a built-in method for handling situations that may arise because of major CPI revisions or changes in the CPI index base period. The Bureau always provides timely notification of upcoming revisions or changes in the index base.

The CPI and escalation: Some points to consider

The CPI is calculated for two population groups: All Urban Consumers (CPI-U) and Urban Wage Earners and

Clerical Workers (CPI-W). The CPI-U represents about 93 percent of the total U.S. population and is based on the expenditures of all families living in urban areas. The CPI-W is a subset of the CPI-U and is based on the expenditures of families living in urban areas who meet additional requirements related to employment: more than one-half of the family's income is earned from clerical or hourly-wage occupations. The CPI-W represents about 29 percent of the total U.S. population.

There can be small differences in movement of the two indexes over short periods of time because differences in the spending habits of the two population groups result in slightly different weighting. The long-term movements in the indexes are similar. CPI-U and CPI-W indexes are calculated using measurement of price changes of goods and services with the same specifications and from the same retail outlets. The CPI-W is used for escalation primarily in blue-collar cost-of-living adjustments (COLAs). Because the CPI-U population coverage is more comprehensive, it is used in most other escalation agreements.

The 23 metropolitan areas for which BLS publishes separate index series are by-products of the U.S. City Average index. Metropolitan area indexes have a relatively small sample size and, therefore, are subject to substantially larger sampling errors. Metropolitan area and other subcomponents of the national indexes (regions, size-classes) often exhibit greater volatility than the national index. BLS recommends that users adopt the U.S. City Average CPI for use in escalator clauses.

The U.S. City Average CPIs are published on a seasonally adjusted basis as well as on an unadjusted basis. The purpose of seasonal adjustment is to remove the estimated effect of price changes that normally occur at the same time and in about the same magnitude every year (e.g., price movements due to the change in weather patterns, holidays, model change-overs, end-of-season sales, etc.). The primary use of seasonally adjusted data is for current economic analysis. In addition, the factors that are used to seasonally adjust the data are updated annually and seasonally adjusted data are subject to revision for up to 5 years after their original release. For these reasons, the use of seasonally adjusted data in escalation agreements is inappropriate.

Escalation agreements using the CPI usually involve changing the base payment by the percent change in the level of the CPI between the reference period and a subsequent period. This is calculated by first determining the index point change between the two periods and then determining the percent change. The following example illustrates the computation of a percent change:

CPI for current period	232.945
Less CPI for previous period	229.815
Equals index point change	3.130
Divided by previous period CPI	229.815
Equals	0.0136
Result multiplied by 100	0.0136 x 100
Equals percent change	1.4%

The Bureau of Labor Statistics neither encourages nor discourages the use of price adjustment measures in contractual agreements. Also, while BLS can provide technical and statistical assistance to parties developing escalation agreements, we can neither develop specific wording for contracts nor mediate legal or interpretive disputes which might arise between the parties to the agreement.

Additional information may be obtained from the Consumer Price Index Information Office at cpi_info@bls.gov or 202-691-7000. Information on the CPI's overall methodology can be found at https://www.bls.gov/opub/hom/pdf/cpihom.pdf

How to Use Import and Export Price Indexes for Contract Escalation

What is Contract Escalation?

Inflation is a general increase in the prices of goods or services over time. To manage the risks of long-term inflation, businesses often include a contract-escalation clause in their contracts. Contract escalation adjusts the price of goods or services covered in the contract based on an inflation index the parties to the contract agree on. The right index to use depends on the goods or services covered in the contract. When exporting or importing goods or services, many businesses use the Export and Import Price Indexes provided by the U.S. Bureau of Labor Statistics.

What are Export and Import Price Indexes?

The U.S. Bureau of Labor Statistics produces Export and Import Price Indexes. The indexes measure changes in the prices of nonmilitary goods and services traded between the U.S. and the rest of the world. These measures show how prices of a market basket of goods and services in international trade change from one period to the next. The indexes are based on nominal, not seasonally adjusted dollar values and do not account for swings in exchange rates between the U.S. dollar and other currencies.

General Guidelines for Creating a Contract Escalation Clause:

The steps outlined below are guidelines to escalate contracts and the tools necessary for doing so. Terms of contracts vary from firm to firm and product to product. The following guidelines are just one possible way to create a contract escalation clause.

1. Establish the base selling price for the contract items.
    - State whether the base price refers to a per-unit quantity or a certain volume of units.
    - State the effective month and year of the base selling price.
    - State how long the base price will remain in effect.
2. Select an appropriate index to use. Specify whether to use the Export Price Index or the Import Price Index for the contract escalation.
3. Specify the name of the index (such as a broad index or one for a specific good or service).
    - When selecting the index, clearly state the official name. BLS publishes several broad versions of the Export and Import Price Indexes based on different trade classification systems.
    - The classification systems for the indexes are the Harmonized Tariff Schedule of the United States Annotated (HTUSA), the Bureau of Economic Analysis End Use, and the North American Industry Classification System (NAICS).
4. State the frequency of the price adjustment. The escalation clause should clearly state how often (monthly, quarterly, annually, etc.) the price escalation will take place.
5. Establish a date for the price adjustments within each time period. The index used should always be the most recent version.

- The International Price Program revises indexes in each of the first 3 months after the indexes are first published.
- Indexes are not seasonally adjusted.

Table 1. Example of Contract Escalation Procedures

A coffee bean importer and a foreign producer agree to a contract worth $1,000. In the contract, the two parties decide to use the coffee, tea, mate and spices import price index under the Harmonized classification system for annual escalation. The terms of the contract specify that the $1,000 will be indexed based on the price index's March value each year beginning in 2014 as the base period. Below is an example using a simple percentage method on how to adjust the contract price for 2015.

(a)	Base price	$1,000
(b)	Index at time of calculation, March 2015	244.9
(c)	Index at time base price was set, March 2014	257.4
(d)	Divide (b) by (c)	0.9514
(e)	Multiply (d) by base price equals adjusted price	$951.44

The importer would pay $951.44 for 2015. This adjusted price would then serve as the base price while the March 2015 index value would serve as the base period index for the following year.

Other uses of the Export and Import Price Indexes:

Import and export price indexes are used for a variety of purposes:

1. To convert U.S. trade figures from current dollars to constant dollars in U.S. trade statistics. These statistics include the quarterly Gross Domestic Product from the U.S. Bureau of Economic Analysis and the U.S. Census Bureau's monthly U.S. trade statistics.
2. To assess the impact of international trade on domestic inflation and the competitive position of the United States.
3. As a tool for analyzing fiscal and monetary policy and measuring the impact of exchange rates.
4. To identify industry-specific and global price trends.

The Bureau of Labor Statistics neither encourages nor discourages the use of price adjustment measures in contractual agreements. Also, while BLS can provide technical and statistical assistance to parties developing escalation agreements, we can neither develop specific wording for contracts nor mediate legal or interpretive disputes which might arise between the parties to the agreement.

Last Modified Date: June 8, 2016

Producer Price Index (PPI) Escalation Guide for Contracting Parties

U.S. BUREAU OF LABOR STATISTICS

Last Updated - May 2014 **www.bls.gov**

Business firms in search of effective methods for coping with changes in prices often employ price adjustment (escalation) clauses in long-term sales and purchase contracts. BLS estimates that agreements with a lifetime worth in the trillions of dollars are currently escalated using the Producer Price Index (PPI) family of indexes, either alone or in conjunction with other sources of economic data.[1]

Because they measure price changes objectively, both at the aggregated level and for particular products, free from possible manipulation by either of the contracting parties, PPIs calculated by the Bureau of Labor Statistics (BLS) are widely recognized among business people, economists, statisticians, and accountants as useful in price adjustment clauses.

This document provides guidance on the development of escalation clauses in contracts that are to be tied to PPI data. Such clauses should be written with great care to avoid serious problems when contract adjustments are implemented. The information in this Guide is based on BLS staff experience in handling issues that have been brought to their attention in connection with actual escalation clauses.

The role of the BLS is to provide requested data and to explain their underlying methodology and limitations. The BLS does not encourage or discourage the use of price adjustment measures in purchase agreements, sales agreements, and contracts. The BLS does not directly assist in writing contracts, nor does it provide advice regarding disputes arising from contract interpretation. Because index methodology and publication conventions could be crucial in developing escalation clauses, this Guide is intended to alert users to potential problems arising in these areas.[2]

This Guide is divided into three sections. First, an overview of the PPI system describes the major categories and groupings of the several thousand indexes that are published each month. Then, guidelines for assisting in the development of escalation clauses are outlined. Finally, a practical example of provisions that might be incorporated into a contract is presented, based on the guidelines discussed, along with an example of the price adjustment calculations that would be needed to implement these provisions.

The Structure of Producer Price Indexes

Producer price indexes measure the average change in prices received by domestic producers for their output. A PPI is an output price index. That is, it measures price changes received by mining, manufacturing, services, and construction providers. It does not measure the cost of producing a good, providing a service, or building a structure, though costs do factor into the selling price. PPI data are based on selling prices reported by establishments of all sizes selected by probability sampling, with the probability of selection proportionate to size. Individual items and transaction terms from these firms are also chosen by probability proportionate to size sampling methods. PPIs are based on a monthly sample of over 100,000 prices.

PPIs are organized in three major structures:

(a) Final Demand-Intermediate Demand (FD-ID) System: The final demand portion of the FD-ID structure measures price changes for goods, services, and construction sold as personal consumption, capital investment, to government, and as exports. The intermediate demand portion of the FD-ID system tracks price change for goods, services, and construction products sold to businesses as inputs to production, excluding capital investment. The FD-ID system replaced the Stage-of-Processing system in January 2014;

(b) Commodity type: The commodity classification structure of the PPI organizes products by similarity of end use or material composition, irrespective of industry origin. Prior to January 2009, the commodity-type classification system included only goods-based price indexes. With the release of data for January 2009, PPI expanded the commodity classification structure to include services and construction products

(c) Industries and their products: The industry-based classification structure measures changes in prices received for industry outputs. At the industry and industry-group level, indexes track price changes for products and

services sold outside the industry of origin. These indexes reflect the price trends of a constant set of goods and services that together represent the total net output of industries, as defined in the North American Industry Classification System (NAICS) available at www.census.gov/eos/www/naics/.

For a more detailed description of these three index structures, see the Appendix to this document.

Within each of the three major structures, indexes are available at different levels of aggregation and detail. There are broad FD-ID indexes (for example, Materials and components for construction, Transportation and warehousing services for Intermediate Demand), broad industry indexes (for example, Total manufacturing industries, Selected health care industries), as well as indexes for specific industry products and commodities (for example, diesel fuel, steel mill products, motor vehicle parts, truck transportation of freight, and business wired telephone services).

Guidelines for developing escalation clauses

(1) Establish the base selling price subject to escalation.

The item price subject to escalation should be specified as precisely as possible. State whether the base price refers to a per-unit quantity or a certain volume of units. Give the effective month and year of the base selling price; this time period is often called the base period. Indicate the length of time the base price will remain in effect. (Note that BLS no longer publishes unit prices for any item within the PPI system. From the Program's inception until 1985, unit prices were published for selected index categories.)

(2) Select an appropriate index or indexes.

A high-level FD-ID index, such as Final demand, Finished goods, Processed goods for intermediate demand, or Services for intermediate demand indicate the general trend of inflation at a broad level that may be appropriate for the escalation agreement. There are detailed FD-ID indexes that exclude food, energy, and trade, for users wishing to avoid the effects of volatile price movements in these goods and services. Detailed Intermediate Demand indexes under the category for Processed goods for intermediate demand (formerly called the index for Intermediate materials, supplies, and components) may best indicate price trends for semi-finished goods, components, and supplies for business demand. Indexes for specific 4-, 6-, or 8-digit commodity indexes, or for industry-based indexes that reflect product or service lines or groupings of products or services, may better indicate price trends at a more detailed level. (See Appendix for more information about indexes and index structures.)

Contracting parties may want to escalate the base price by a single PPI series. Often, however, users prefer to escalate on the basis of several data series, including data from other Government statistical programs, to reflect changes in costs of a variety of inputs. In some contracts, for example, costs of major materials and supplies are escalated with one or more PPIs, while costs of labor are escalated with other BLS series such as the Employment Cost Index.[3] In such cases, the escalation clause should specify the percentage weight given to each index in calculating the total escalation amount. (See detailed discussion under guideline (9)(d).)

Contracting parties should choose an index or group of indexes representing the costs for providing a particular product or service, rather than an index for the product itself. For example, if an apparel manufacturer were contracting for long-term purchases with a producer of finished fabrics, it would be more advisable to tie the escalation clause to a PPI for synthetic fibers, processed yarns and threads, or greige fabrics (raw fabric), rather than to a PPI for a type of finished fabric. Otherwise, the parties could find themselves in a serious contracting problem that would be difficult from which to escape.[4]

Regarding the level of index aggregation or detail that might be chosen, it should be understood that while detailed indexes may target costs more specifically, they are also more likely to be permanently discontinued by BLS, or to have occasional gaps in data availability. Contracts should provide for these contingencies. This hazard can be minimized if contracting parties cite a commodity index that does not go below the 4- or 6-digit level of detail, or an industry-based product code that does not go below the 7-digit level.[5]

Even with the PPI program's nearly complete coverage of the mining and manufacturing sectors, not all products are included directly in the PPI sample or published in the PPI system. Sometimes related indexes or higher level indexes must be chosen as proxies to estimate price movements.

(3) Clearly identify the selected index and cite an appropriate source.

The escalation clause of a contract should identify the index or group of indexes selected by providing complete titles and identifying codes.

Please note that there is no single index titled "The Producer Price Index." The term "Producer Price Index" refers to a family of indexes compiled by the Bureau of Labor Statistics. Each index to be used should be cited specifically in the contract by referring to "the Producer Price Index for..." followed by the exact title and any identifying code number.

The clause should also cite an appropriate source for the index selected. The primary official source of PPI data is the BLS Website. From the PPI homepage, data may be obtained using various methods:

(a) Link to the PPI database (www.bls.gov/ppi/data.htm) to access various methods for downloading data. For an explanation of these database tools, link to the PPI Data Retrieval Guide (www.bls.gov/ppi/getdata.htm).

(b) The monthly periodical, *PPI Detailed Report*, available at www.bls.gov/ppi/ppi_dr.htm, includes all PPIs currently in publication, and is available online each month the day PPI data are released. This publication provides current month index values (first issued), previous month index values (first issued), 4 month prior index values (revised), as well as 1-month and 12-month rates of change

(c) The PPI news release, published monthly, provides index data, 1-month, and 12-month percent changes for a subset of more widely used PPIs. Link to www.bls.gov/schedule/archives/ppi_nr.htm for current and archived PPI news releases.

Contracting parties should not cite table numbers or table titles in their escalation contracts, since they are subject to change. BLS sources are preferable to secondary sources, such as other government publications or private firms. If contracting parties agree to obtain index values for escalation over the telephone from BLS staff members, the escalation clause should specify appropriate procedures and whether subsequent verification from a published source is necessary.

(4) Specify whether seasonally adjusted indexes or unadjusted indexes are to be used.

In general, seasonally adjusted indexes are not appropriate in escalation agreements. Because price adjustment clauses usually are intended to capture actual price changes, contracting parties normally would not want to remove seasonal price movements from their adjustment calculations.

(5) State the frequency of price adjustment.

The escalation clause should specify when price adjustments are to be made, such as quarterly, semi-annually, or annually, or some other period. To conform to the procedure described in guideline (9) below, price adjustments should be calculated over an interval whose beginning point is the contract's base period. This is the time period associated with the chosen base price. For a discussion of base price, see guideline (1).

Difficulties can be encountered with those contracts that do not designate a specific frequency for price adjustment, but rather state that the latest data available as of a certain date should be used for adjustment. Guideline (7) expands upon this issue.

Note that PPI data are published as monthly indexes and as annual averages for calendar years. Monthly PPIs are representative of the entire month and do not refer to a specific day of the month. Avoid wording such as "the index for aluminum mill shapes, PPI commodity code 102501, as of September 30," since several different and equally plausible interpretations are possible for such language. For example, "as of September 30" could refer to the index that was available on September 30, which would be the August figure. That phrase also could refer to the September index. It could even mean the October index, since the September index would be based on information supplied to BLS well before September 30.

(6) Provide for missing or discontinued data.

Occasionally, a PPI may be unavailable for a particular time period, usually because price information was not supplied by a sufficient number of survey respondents to meet BLS publication standards. Highly detailed indexes are more susceptible to this problem than indexes for broader groupings. For example, the PPI for Metal tanks and vessels, custom fabricated and field erected, code 1072-0152, was temporarily unavailable from July 2011 to September 2012. During that period, contracting parties might have used code 1072-01, Metal tanks, or some other series of their choosing. Escalation clauses should provide procedures for times when PPI data do not publish.

Sometimes an index is permanently discontinued if a product declines in market importance. This most commonly occurs at the time of periodic resampling of industries and their output. As is the case when an index fails to meet minimum publication standards, escalation clauses should provide guidance for successor indexes in cases when original indexes are discontinued. A default provision that calls for using the next higher-level series might be included in the contract.

Note that if BLS merely changes the title or recodes an index, it is considered to be the same series, and therefore, this situation should not necessitate any contract renegotiation. The online monthly periodical *PPI Detailed Report* routinely provides lists of recoded indexes each time there are sample changes. Normally, these lists appear in the January and July issues.

(7) Specify that calculations of price adjustments shall always use the latest version of the PPI data published as of the date specified for such calculations; this requires that contracting parties explicitly agree on the base and comparison months employed by the escalation, as well as the precise month and the approximate date that the price adjustment calculations are to be made.

Adherence to this principle and its implications will prevent many potential problems. Contracts that fail to incorporate this guideline will instead need to specify which version of PPI data should be used, because:

(a) BLS routinely revises PPI data 4 months after initial publication;

(b) PPI data are rebased at infrequent intervals; and

(c) on rare occasions, PPI data may be corrected.

Among other advantages, following guideline (7) should resolve any ambiguities arising due to the fact that all PPI not seasonally adjusted data are routinely subject to revision once, 4 months after original publication, to reflect late reports and corrections by respondents in the PPI survey. Revisions are usually small at the higher levels of index aggregation, but may be relatively large for detailed indexes. The version of any PPI published 4 months after its initial publication is considered final and will not change again, barring corrections or rebasing, a separate matter addressed in guideline (8).[6]

To follow guideline (7) effectively, it is essential to specify not only frequency/interval for escalation, but also the approximate date on which the price adjustment is to be made. Currently, PPI data are usually published between the 10th and the 18th of the month following the reference month in question. (However, the January data release in February might occur a few days later.) Therefore, a contract might state that parties to an escalation agreement should contact the PPI prior to the 10th of the month following the designated month for escalation in order to verify the date that data will be available to enact the price adjustment. All first-published indexes for a given month, as well as final indexes for the fourth month earlier, are considered officially published and are available on the day of release of those data.

The contracting parties' selection of the date for price adjustment should be made only after they have agreed on, (a) the base period reference month, (b) interval for price adjustment, and (c) whether the calculation is to be based on the first-published or the final index values for the escalation month. It is vital to address these matters ***before*** a contract is signed. Otherwise, disagreements may arise when the first-published and final versions of the selected index are different.

If contracting parties do not specify an exact date for making price adjustments, the contract should at least specify whether first-published or final data should be used for calculations. The final version of the data for the escalation month should be specified whenever feasible, because only final data will be rebased retroactively whenever BLS updates the PPI reference base. Contracting parties might choose to use first-issued indexes for the current period of the escalation if capturing more recent price movements is valued by the parties to the agreement.

Any procedure that departs from guideline (7) by failing to specify the version of the data or the date when the price adjustment is to be made, needs to be constructed so that it will be in harmony with the frequency of price adjustment, as specified elsewhere in the contract. This is discussed in guideline (5).

A contract should not refer to an index value associated with a base price, but instead to its month and year alone. For example, the following reference could prove problematic:

> *Divide the current index value by 103.9 (which is the value of the index for the base period January 2010) and then....*

Rather, it should be written:

> *Divide the index value which corresponds with the month associated with the contract escalation by the index value for January 2010, which represents the base period index value, and then....*

(8) Avoid locking indexes used for escalation into any particular reference base period.

Contracting parties should follow the principle of guideline (7) by calculating percent changes using indexes expressed on the index reference base period in use when the contract escalation is applied. For example, if a contract called for a price adjustment to be made using data for December 1987 published in January 1988 (which was just prior to the rebasing that became effective on February 12, 1988), indexes expressed on the old reference base of 1967=100 would have been used.

Comprehensive index base period changes to the PPI system have been routine, although infrequent. The most recent large-scale conversion occurred when the index reference base period was set to 1982=100 in early 1988. This was the first such rebasing since BLS adopted 1967 as the standard in 1971, and that in turn was the first rebasing since the 1957-59 base was adopted in 1962. Previously, the standard reference base period was updated roughly every 10 years.[7]

Relying upon a current index reference base period as set by BLS will not affect calculations, except for differences related to rounding. However, rounding could make a meaningful difference when the dollar amount of a contract is very large, or if the index prior to rebasing stood at a relatively high level.

Official PPI data based on the current reference base are not available on previous index reference base periods. Further, as a general rule, estimating a conversion of PPI data to an old base for the purpose of contractual price adjustment is inadvisable because such a method could well be challenged for referencing something other than official government data.

However, for parties wanting to look back to the prior index reference base, rebasing factors are only made available by BLS to convert data on the current standard reference base period to the immediately preceding one. For example, there are no official rebasing factors to convert data on the 1982=100 base back to the 1957-59 =100 index base.

Rebasing is not considered "revising," because the relative movements of any series over time are not affected, outside of rounding. The absolute level of any index has no intrinsic meaning other than relating a measurement to the base year, which is itself arbitrary to a degree.

Older contracts may specify use of originally published indexes, particularly since this was recommended by BLS in the September 1979 version of this Guide (BLS Report 570). BLS is now strongly discouraging such language in escalation contracts, in accordance with guidelines (7) and (8), recommending that the latest available version of index data be used. In addition, BLS does not maintain database records for originally published indexes. As a result, no official versions of such originally published indexes are readily available.

(9) Define the mechanics of price adjustment.

(a) Simple percentage method. One method of price adjustment is to have the base price changed by the same percentage as the percent change in a selected PPI. To illustrate, suppose that a contract escalation clause called for using the intermediate demand PPI titled Materials and components for manufacturing, not seasonally adjusted. Also suppose that the value of this index was 178.4 for December 2010, the month that corresponds with the base price for escalation, $1,000 per unit. Twelve months later, when December 2011 data were released and the first stipulated price adjustment was to be made, the index value for December 2011, published mid-January 2012, was 187.7. The percent change represents an increase of 5.2 percent in the index for Materials and components for manufacturing and a $52 per unit increase in the price for the escalated product. (See below.).

Index at time of calculation, December 2011	**187.7**
Divided by index at time base price was set, December 2010	**178.4**
Equals	**1.052**

Base price	**$1,000**
Multiplied by	**1.052**
Equals adjusted price	**$1,052**

In later years, this procedure could be applied again by taking the next year's December index value, dividing by the index value at the time the base price was set, and proceeding as described above. For example, let us assume that this contract continued through the year 2013. In mid-January 2013, the December 2012 index would be released by PPI. The ratio of price change would be derived by taking the December 2012 index and dividing by the December 2010 value, and multiplying this result by the base price of $1,000 to provide an updated price for 2013.

Index at time of calculation, December 2012	**187.2**

Divided by index at time base price was set, December 2010 ..... 178.4
Equals 1.049

Base price $1,000
Multiplied by 1.049
Equals adjusted price $1,049

(b) Escalation of a portion of the base price. Another procedure sometimes employed identifies a portion of the base price to be escalated by a selected PPI, while the balance remains fixed. To illustrate, suppose that an item has a base price of $1,000, of which $700 is to be escalated by the index, while the other $300 remains unchanged. To determine the "certain dollar amount" that is needed for citation in the contract, divide the designated variable portion of the base price ($700) by 100, in this case yielding $7 for each 1.0 percent movement in the index. Based on the prior example using the PPI for Materials and Components for Manufacturing, the base price would be escalated to $1,036.40 after one year.

Base price $1,000.00

Index at time of calculation, December 2011 ..... 187.7
Divided by index at time base price was set, December 2010 ..... 178.4
Equals percent change for 2011..... 5.2

Escalation adjustment ..... 5.2 x $7 = $36.40
Equals adjusted price: $1,000.00 (base price) + $36.40 (adjustment) = $1,035.00 (escalated price)

(c) Index points. Relatively few escalation clauses adjust contract prices on the basis of changes in index points. The BLS strongly discourages this practice, because changes in index levels do not reflect percent changes in prices when the values move away from their base level of 100. For instance, in the earlier example, an index point change of 9.3 reflected the 5.2-percent increase in prices for material and components for manufacturing from December 2010 to December 2011. Escalating by index point changes has the effect of overestimating the percentage change in prices when the index is above 100 and underestimating the percentage change in prices when the index level is below 100. In addition, contracts employing the index point method are subject to complications relating to index base date changes.

(d) Composite indexes. Some contracts provide for the construction of a composite index based on several series. The advantage of a composite index is that it may more accurately identify the appropriate change for a base price (see guideline (2)), since it would refer to several of the costs involved in producing the product or service in question. However, a composite index entails more calculations at the time of adjustment than the simpler procedures described earlier. Though these composite calculations often employ official BLS data, these composite indexes constructed by the contracting parties are not official BLS data.

The procedures for specifying a composite index to be used in an escalation agreement are illustrated by the following steps:

(i) Choose the indexes that will represent the different costs involved in producing the good or service. For example, indexes for energy, machinery and equipment, services, and labor might provide an appropriate mix.

(ii) Choose the appropriate weights for these indexes, in accordance with the proportion of the production budget which may be devoted to these various categories. The weights should be assigned as proportions and sum to 1.0, the equivalent of 100 percent coverage. For example, a producer might decide that for a specific escalation calculation, the appropriate weightings for energy, machinery and equipment, services, and labor might be 0.15, 0.25, 0.25, and 0.35, respectively.

(iii) The weights should be representative of the time period associated with the base price, which would be the base period for any calculations.

(iv) Once indexes have been chosen and relative proportions assigned, it is necessary to rebase all of the original index data to the contract's base period. This is done for each series by dividing the indexes that correspond to the escalation month and year by their index values in the base period, and then multiplying the result by 100. For this and following steps, note the detailed example in Table 1 that follows in the Example of Escalation Procedures *section.*

(v) Derive the value for the composite index by multiplying the relative weights for each cost category by the rebased index values for each index series. Then, sum the results.

(vi) Using the composite index values created in step (v), calculate the current adjustment in standard fashion; that is, using the procedure described in guideline (9)(a)*.*

(e) Limits for price adjustment. Escalation clauses sometimes reference *a floor, a ceiling,* or both, to limit the total price adjustment during the life of the contract. Contracts typically provide that an escalation is to apply in both an upward and downward direction. On occasion, however, contracts stipulate that the base price is a price floor and that prices can only rise. In addition, some contracts specify that no price adjustments are to be made until a minimum price change to the contract escalator has occurred..

Example of escalation procedures

Suppose a manufacturer of widgets enters into a long-term sales contract with a customer. The buyer and the seller agree to include an escalation clause that adjusts the selling price yearly, up or down, to account for changes in energy, machinery and equipment, business service, and labor costs. The following is an example of the terms that might be incorporated into such an escalation clause. The example assumes the use of the composite index method, discussed in section (d) of guideline (9).

(a) The base selling price for type A widget is set at $1,000 per unit as of December 2010, to remain in effect for 1 year. December 2010 is hereafter called the base period.

(b) The base selling price shall be adjusted in accordance with the percent changes of the composite index described in (D) below. The index shall be derived from the following component indexes:

(i) Energy: PPI code ID69113, Processed energy goods, database code WPUID69113,

(ii) Machinery and equipment: PPI code 114, General purpose machinery and equipment, database code WPU114,

(iii) Services: PPI code ID63, Services for intermediate demand, database code WPUID63,

(iv) Labor: Employment Cost Index (ECI) for Total Compensation (wages and benefits), private industry, goods producing industries, database code CIU201G000000000I. Note that this BLS index is published on a quarterly basis, and as such, 4th quarter values will be used for the escalation calculation.

PPI data can be obtained from www.bls.gov, by emailing the PPI at ppi-info@bls.gov, or by calling (202) 691-7705. To access data from the ECI, visit www.bls.gov/ncs/ect, submit a question via http://data.bls.gov/cgi-bin/forms/ncs, or call (202) 691-6199.

(c) The selling price shall be adjusted on or after February 1 of each year, beginning 12 months after the contract is initiated, for all years that the contract remains active, based on the percent change (up or down) in the composite index described below. The calculation will compare the base period (December 2010) with December of the most recent year. PPI data for December are typically released mid-January, and Employment Cost Index data for the fourth quarter are typically released by the end of January. Contact the PPI and the ECI each January to identify when December PPIs and the fourth quarter ECI data are scheduled for publication. All calculations shall be based on the latest versions of the PPI and the ECI available on or after February 1 when the December PPIs and the fourth quarter ECI are published. All indexes for this calculation are not seasonally adjusted.

(d) The composite index shall be derived in the following manner:

(i) The values for the current period for each of the 4 BLS index series specified in (b) above shall be rebased to the reference base period December 2010. This shall be done by dividing the current December value of each index by its value for the base period, and then multiplying the result by 100.

(ii) The rebased energy index shall be assigned a proportion of 0.15, representing 15%. The rebased machinery and equipment index shall be assigned a proportion of 0.25 (25%). The rebased services index shall be assigned a proportion of 0.25 (25%). The rebased labor index shall be assigned a proportion of 0.35 (35%). These proportions sum to 1.00 (100%), and correspond with the base period of December 2010.

(iii) Multiply the rebased current index for each component by its relative proportion.

(iv) The sum of these 4 values shall result in the composite index for the current time period.

(v) Divide the component index by 100 and multiply that result by the original base price. This final figure shall be the adjusted price for the current time period.

(e) If December ECI data are not available for any year, the ECI for the immediately preceding September shall be used as the basis for adjustment of the labor index. If December PPI data are not available for any year, the PPI data for the most recent immediately preceding month shall be used as the basis for adjustment. If no ECI or PPI data have been published for those months, then the contracting parties shall agree upon substitute series.

With these terms in effect, table 1 below is an example of the data and calculations which would have been made on February 1, 2012 to determine the new per unit selling price for type A widgets based on changes in specified BLS indexes from December 2010 to December 2011.

Table 1. Sample Calculation Procedures for a Composite Index Calculation

	Energy	Machinery and Equipment	Services	Labor	Composite Index
Base price = $1,000 per unit sold					
Escalation period index (Dec. 2011 / 4th qtr. 2011)	217.0	210.5	103.4	113.8	-
Divide by base period index (Dec. 2010 / 4th qtr. 2010)	195.7	202.1	101.4	111.1	-
Equals:	1.109	1.042	1.020	1.024	-
Multiply by 100 to yield the rebased index	110.9	104.2	102.0	102.4	-
Assigned proportion	0.15	0.25	0.25	0.35	-
Multiply rebased index by assigned proportion	16.6	26.1	25.5	35.8	-
Add components to obtain the composite index	-	-	-	-	104.0
Divide composite index by 100	-	-	-	-	104.0
Multiply the result by the base price to yield adjusted price	-	-	-	-	$1,040

On or after February 1, 2013, if this escalation agreement remained in effect, another adjustment would result. With the release of PPI data for December 2012 in mid-January 2013 and the release of ECI data for the fourth quarter of 2012 in late January 2013, replacing the December 2011 / fourth quarter 2011 values in the table with December 2012 / fourth quarter 2012 values would yield the updated escalation amount.

Pitfalls to avoid

- Vague citation of "the Producer Price Index" rather than a reference to a specific index by its title and identifying code. *See guideline (3).*
- Citation of the All Commodities index or the Industrial Commodities index rather than an index that mitigates or does not include multiple counting. *See the discussion of commodity indexes in the* Appendix*.*
- Use of unofficial estimates derived using rebasing factors rather than relying on official BLS data. *See guideline (8).*
- Ambiguous references to dates. *See guideline (5).*
- Lack of a provision for a successor index should the designated index be dropped from the PPI program, or become temporarily unavailable. *See guideline (6).*
- Locking indexes to a specific base period. *See guideline (8).*
- Using ambiguous terms. For example, referring to "actual" indexes. *See guideline (7).*

Appendix: An Overview of PPI Classification

Final Demand-Intermediate Demand (FD-ID) Indexes

The PPI FD-ID structure measures price change for goods, services, and construction sold to final demand and to intermediate demand. The FD-ID system replaced the PPI stage-of-processing (SOP) system as PPI's primary aggregation model with the release of data for January 2014. The FD-ID system expands coverage in its aggregate measures beyond that of the SOP system through the addition of services, construction, exports, and government purchases.

FD-ID indexes are constructed from commodity-based producer output price indexes. These commodity-based output price indexes are allocated to aggregate categories based on proportions of use by type of buyer. The main source of data used to determine buyer type is the table titled “Use of commodities by industries, before redefinition” from the Benchmark Input–Output Data Tables of the United States, produced by the U.S. Bureau of Economic Analysis (BEA). The two primary classes of buyers included in the FD–ID system are final demand (personal consumption, capital investment, government, export) and intermediate demand (business purchases, excluding capital investment). In many cases, the same commodity is purchased by different buyer types, so commodities are often included in several FD–ID indexes. For example, regular gasoline is purchased for personal consumption, export, government use, and business use. The PPI program publishes only one commodity index for regular gasoline, reflecting sales to all types of buyers. It is this index that is used in all FD–ID aggregations, regardless of whether the gasoline is sold for personal consumption, as an export, to government, or to businesses, with differences accounted for in the applicable weights to each aggregate FD or ID index. In some cases, buyer type is an important price determining characteristic, and results in commodity indexes being created on that basis. For example, within the PPI category for loan services, separate indexes for consumer loans and business loans were constructed. In this case, the commodity index for consumer loans would be included in the final demand index and the commodity index for business loans would fall under intermediate demand.

For more information relating to the construction of the FD-ID system, see *"A new, experimental system of indexes from the PPI program"* in the February 2011 *Monthly Labor Review* at *http://www.bls.gov/opub/mlr/2011/02/art1full.pdf* or visit the web page documenting the FD-ID Aggregation System at http://www.bls.gov/ppi/fdidaggregation.htm**.** More information about overall PPI methodology is available from the PPI chapter of the BLS Handbook of Methods at http://www.bls.gov/opub/hom/pdf/homch14.pdf.

Final demand

The final demand portion of the FD-ID system measures price change for commodities sold as personal consumption, capital investment, government purchases, and exports. The system is composed of six main price indexes: final demand goods; final demand trade services; final demand transportation and warehousing services; final demand services excluding trade, transportation, and warehousing; final demand construction; and overall final demand.

The final demand goods index measures price change for both unprocessed and processed goods sold to final demand. Fresh fruit sold to consumers and computers sold as capital investment are examples of transactions included in the final demand goods price index. The final demand trade services index measures changes in margins received for the retailing and wholesaling of merchandise sold to final demand, generally without transformation. (Trade indexes measure changes in margins received by wholesalers and retailers.) The final demand transportation and warehousing services index tracks price change for transportation of passengers, as well as, transportation of cargo sold to final demand, and also includes prices for warehousing and storage of goods sold to final demand. The final demand services less trade, transportation, and warehousing index measures price change for all services other than trade and transportation sold to final demand. Publishing, banking, lodging, and health care are examples of these services. The final demand construction index tracks price change for new construction and maintenance and repair construction sold to final demand. Construction of office buildings is an example of a commodity that would be included in the final demand construction index. Lastly, the overall final demand index tracks price change for all types of commodities sold to final demand by combining the five final demand component indexes described above.

Intermediate demand

The intermediate demand portion of the FD-ID system tracks price change for goods, services, and construction products sold to businesses as inputs to production, excluding capital investment. The system includes two parallel treatments of intermediate demand. The first treatment organizes intermediate demand commodities by type. The second organizes intermediate demand commodities into production stages, with the explicit goal of developing a forward-flow model of production and price change.

Intermediate demand by commodity type

The intermediate demand by commodity type treatment within the FD-ID system organizes commodities by similarity of product. The system is composed of six main price indexes: unprocessed goods for intermediate demand; processed goods for intermediate demand; intermediate demand trade services; intermediate demand transportation and warehousing services; intermediate demand services less trade, transportation, and warehousing; and intermediate demand construction. The grouping for processed goods for intermediate demand is equivalent to the SOP grouping for intermediate materials, supplies, and components, and the grouping for unprocessed goods for intermediate demand corresponds with the SOP grouping for crude materials for further processing.

The unprocessed goods for intermediate demand index measures price change for goods that have undergone no fabrication and are sold to businesses as inputs to production. Crude petroleum sold to refineries is an example of an unprocessed good sold to intermediate demand. The processed goods for intermediate demand index tracks price change for fabricated goods sold as business inputs. Examples include car parts sold to car manufacturers and gasoline sold to trucking companies. The index for trade services for intermediate demand measures changes in margins received for the services of retailing and wholesaling goods purchased by businesses as inputs to production. The intermediate demand transportation and warehousing index measures price change for business travel, as well as, transportation and warehousing of cargo sold to intermediate demand. The intermediate demand services less trade, transportation, and warehousing index tracks price change for non-trade and non-transportation services purchased by firms as inputs to production. Legal and accounting services purchased by businesses are examples of intermediate demand services excluding trade, transportation, and warehousing. Finally, the construction for intermediate demand index measures price change for construction purchased by firms as inputs to production. Since new construction is categorized in the final demand portion of the economy as capital investment, the construction for intermediate demand index tracks price change for maintenance and repair construction purchased by firms.

Intermediate demand by production flow

The production flow treatment of intermediate demand is a stage-based system of price indexes. These indexes can be used to study price transmission across stages of production and final demand. This system is constructed in a manner that maximizes forward flow of production between stages, while minimizing back flow of production. The production flow treatment contains four main indexes: intermediate demand stage 1, intermediate demand stage 2, intermediate demand stage 3, and intermediate demand stage 4.

Indexes for the four stages were developed by first assigning each industry in the economy to one of four stages of production, where industries assigned to the fourth stage primarily produce output consumed as final demand, industries in the third stage primarily produce output consumed by stage 4 industries, industries assigned to the second stage primarily produce output consumed by stage 3 industries, and industries assigned to the first stage produce output primarily consumed by stage 2 industries. Indexes for the stages track prices for the net inputs consumed by industries in each of the four stages of production. For example, the stage 4 intermediate demand index tracks price change for inputs consumed, but not produced, by industries included in the fourth stage of production. Hence, the index measures price change in the inputs to production of industries that primarily produce final demand commodities. The main sources of data used to develop these indexes were the BEA tables titled “Use of commodities by industries, before redefinition” and “Make of commodities by industries, before redefinition.”

Examples of heavily weighted goods-producing industries in stage 4 include the manufacture of light trucks and utility vehicles, automobiles, and pharmaceuticals. Retail trade, food service and drinking places, and hospitals are examples of heavily weighted service industries included in stage 4. Stage 4 also includes all new construction industries. Examples of goods consumed by stage 4 industries include motor vehicle parts, commercial electric power, plastic construction products, biological products, and beef and veal. Engineering services, machinery and equipment wholesaling, long distance motor carrying, and legal services constitute examples of services consumed by stage 4 industries.

Examples of highly weighted goods-producing industries included in stage 3 are motor vehicle parts manufacturing, animal (except poultry) slaughtering and processing, and semiconductor manufacturing. Services industries classified in stage 3 include wholesale trade; insurance carriers; architecture, engineering, and related services; and hotels and motels. Examples of goods consumed by stage 3 industries include slaughter steers and heifers, industrial electric power, and hot rolled steel bars, plates, and structural shapes. Services commonly consumed by stage 3 industries include commissions from sales of property and casualty insurance, business loans, temporary help services, and administrative and general management consulting services.

Petroleum refineries; electricity generation, transmission, and distribution; natural gas distribution; cattle ranching and

farming; and plastic materials and resin manufacturing are among the goods-based industries assigned to stage 2. Services industries that are heavily weighted in stage 2 include management of companies and enterprises; non-depository credit intermediation and related activities; insurance agencies, brokerages, and related activities; and services to buildings and dwellings. Goods commonly purchased by stage 2 industries include crude petroleum, natural gas, formula feeds, and primary basic organic chemicals. Services that are heavily weighted in the intermediate demand stage 2 index are legal services, business loans, and cellular phone and other wireless telecommunication.

Goods producing industries in stage 1 include oil and gas extraction, paper mills, and grain farming. Real estate, legal services, and advertising services are examples of highly weighted services industries included in stage 1. Examples of goods consumed by stage 1 industries are commercial and industrial electric power and gasoline. Services commonly consumed by stage 1 industries include solid waste collection, chemicals and allied products wholesaling, and guestroom or unit rental. All inputs purchased by stage 1 industries are by definition produced either within stage 1 or by latter stages of processing, leaving stage 1 less useful for price transmission analysis.

See http://www.bls.gov/ppi/industryflowstage.htm for more information.

Special groupings

In addition to the FD-ID structures described in the prior sections, a number of supplemental indexes have been developed in order to provide data users with index groupings not available through the primary FD-ID structures. Some examples of these special grouping indexes include:

Final demand

Final demand less foods, energy, and trade services
Final demand goods plus final demand distributive services
Final demand distributive services
Total finished (the personal consumption and private capital investment portion of final demand)
Finished goods
Total exports
Government purchased goods
Government purchased services
Personal consumption
Personal consumption goods plus personal consumption distributive services

Intermediate demand

Processed energy goods
Processed foods and feeds
Processed materials less foods and energy
Processed goods plus intermediate distributive services
Unprocessed foodstuffs and feedstuffs
Unprocessed energy materials
Unprocessed nonfood materials less energy
Total goods inputs to stage 4 intermediate demand
Total services inputs to stage 4 intermediate demand
Total goods inputs to stage 3 intermediate demand
Total services inputs to stage 3 intermediate demand
Total goods inputs to stage 2 intermediate demand
Total services inputs to stage 2 intermediate demand

To view the complete set of indexes included in the FD-ID system, see tables 1, 2, and 3 of the PPI News Release at http://www.bls.gov/ppi/news.htm.

Commodity Indexes

The commodity classification structure of the PPI organizes products by similarity of end use or material composition, regardless of their industry of origin. This system is unique to the PPI and does not match any other standard coding structure, such as the NAICS or the U.N. Standard International Trade Classification (SITC). The historical continuity of index series, the needs of index users, and a variety of ad-hoc factors were important in developing the PPI commodity classification. Prior to January 2009, the commodity classification system included only goods-based price indexes. With the release of data for January 2009, PPI expanded the commodity classification structure to include services and construction products. Table 9 of the *PPI Detailed Report* (*http://www.bls.gov/ppi/ppi_dr.htm*) includes data for commodity indexes, organized in a hierarchal structure, including major groupings, subgroups, product classes, sub-product classes, and individual items.

The commodity classification system is organized as a hierarchical structure that starts with major commodity groupings (2-digit level of aggregation). Major groupings 01 through 15 encompass commodity-based goods indexes. Major groupings 30 through 61 include services-based commodity indexes, and major group 80 encompasses construction-based commodity indexes. Each major commodity grouping includes (in descending order of aggregation) subgroups (3-digit level), product classes (4-digit level), subproduct classes (5- and 6-digit level), item groupings (7-digit level), and individual items (8-, 9-, and 10-digit levels).

Unlike many FD-ID indexes, some of the traditional commodity grouping indexes, such as the All Commodities index, the Industrial Commodities index, and 2- and 3-digit commodity grouping indexes, exhibit a *multiple counting* bias in reflecting

price changes. In brief, *multiple-counting* bias means that price changes for components that go through many stages of processing have an excessive influence on aggregate index series. This problem is common among highly aggregated PPI commodity groupings because they are calculated from price changes of commodities at several stages of the production process, where each individual price change is weighted by its total gross value of shipments in the weight-base year. This problem occurs because many products go through successive stages of fabrication or processing and have their price changes counted separately at each stage. The indexes for final demand, intermediate demand by production flow, and the net output of industries and industry groups eliminate the defect of multiple counting of price changes, while the intermediate demand by commodity type indexes mitigate, but do not eliminate, this defect.

To illustrate the multiple-counting problem, suppose that the price of cotton rises sharply. If the price increase is passed through by spinners of cotton yarn and thread, then by weavers of gray cotton fabric, then by producers of finished cotton fabric, and, finally, by shirt manufacturers, the single price increase for the raw material cotton would have been included five times in the All Commodities index and four times in both the Industrial Commodities index and the major commodity grouping index for textile products and apparel. Inasmuch as prices throughout the economy are always changing at different rates, multiple counting can result in rates of change for aggregated price indexes that are highly misleading, because prices of raw materials tend to be more volatile than prices of final demand goods and because gross output values are used as weights for major commodity groups. Specific, detailed commodity indexes, such as 6- and 8-digit commodity-based PPIs, and many 4-digit commodity codes, are effectively free of this multiple-counting defect.

Industry Indexes

A Producer Price Index for an industry is a measure of changes in prices received for the industry's output sold outside the industry (that is, its net output). Measures of price change classified by industry form the basis of sampling and data collection within the PPI. These indexes reflect the price trends of a constant set of goods and services that together represent the total output of an industry. Standardized industry-based index codes provide comparability with a wide assortment of industry-based data for other economic phenomena, including productivity, production, employment, wages, and earnings.

For about 25 years (from the late 1970s through 2003), the PPI program made use of the Standard Industrial Classification (SIC) system as the structure for the collection and presentation of industry-based price data. However, the SIC system received increasing criticism about its inability to handle rapid changes in the U.S. economy. Developments in information services, new forms of health care, expansion in services, and high-tech manufacturing are examples of industrial changes that could not be studied adequately under the SIC system.

The PPI program began publishing industry-based price data organized in accordance with the North American Industry Classification System (NAICS) with the release of data for January 2004. Developed in cooperation with Canada and Mexico, NAICS represents one of the most profound changes in statistical programs focusing on emerging economic activities. NAICS uses a production-oriented conceptual framework to group establishments into industries on the basis of the primary activity in which they are engaged. Establishments using similar raw-material inputs, similar capital equipment, and similar labor are classified under the same industry. The industry within which an establishment is classified is determined by those products which account for the largest share of the establishment's total value of shipments.

In addition to aggregate indexes tracking price changes for groups of industries and industries as a whole, in general, there may be as many as three kinds of product level indexes for categories within a given industry. Every industry has primary product indexes that show changes in prices received by establishments in the industry for the various products made primarily, but not necessarily exclusively, by that industry. For contracting parties looking to use industry based PPIs for escalation purposes, these indexes, which directly relate to the various types of primary production of an industry, are more appropriate for use in contracts. Two examples of primary production are cranes produced by construction machinery manufacturers (NAICS 333120), and financial auditing done by offices of certified public accountants (NAICS 521211). In addition to indexes for primary products of industries, most industries have secondary product indexes that show changes in prices received by establishments within an industry for products made chiefly by other industries. Some examples include mining machinery production and the selling of scrap done by construction machinery manufacturers, as well as management consulting services performed by accounting firms. Finally, some industries have miscellaneous receipts indexes that show price changes for other sources of revenue, such as resales of purchased products or collection of rents. Indexes for secondary products and miscellaneous receipts generally are not considered appropriate for contract escalation, since they reflect an undefined basket of goods or services. It is suggested that contracting parties looking for a high-level index for a specific industry consider using the industry's primary products aggregate index, which brings together the various products that constitute the primary production of that industry into a single aggregate index.

Footnotes

[1] See, *Highlights of the 2013 PPI User Survey*, Bureau of Labor Statistics, Beyond the Numbers, August 2013, Volume 2, No. 20, Joseph Kelley and Antonio Lombardozzi. Available at http://www.bls.gov/opub/btn/volume-2/pdf/highlights-of-the-2013-ppi-user-survey.pdf

[2] Data requests and technical questions concerning the PPI may be addressed to the PPI Section of Index Analysis and Public Information. They can be reached at telephone number 202-691-7705, or by e-mail at ppi-info@bls.gov. Please refer to the desired series by title and code, exactly as cited in the contract.

[3] The Employment Cost Index (ECI) is based on a quarterly survey typically published in the month that follows the completion of the calendar quarter. Because the ECI has relatively little industry detail, data users may have to use a higher level of aggregation than they do with PPI data. However, the Employment Cost Index is a highly useful measure of labor costs because it covers all workers (not just production and nonsupervisory workers) and because it includes not only wages and salaries but also employer costs for employee benefits. Like the PPI, the ECI is a fixed-weight index and is not influenced by employment shifts among industries and occupations with different wage and benefit levels. But unlike the PPI, ECI data are final when they are first published and are not subject to revision (except on a seasonally adjusted basis). The ECI Website is located at http://www.bls.gov/ncs/ect/, and they can be reached over the phone at 202-691-6199.

[4] From the seller's point of view, a contract which escalates the price of a product based on the change in the PPI for that same product might not provide an appropriate basis for changing the base price. If most companies reporting a product's price to BLS employed escalation clauses using the PPI for that same product, these firms would be unable to raise their prices until the PPI advanced; however, there could be no advance in the PPI until the companies were able to raise their prices. From the buyer's point of view, a reverse circularity is evident when the price of a product purchased is escalated by the PPI for the same product. A rise in the contract price may be reflected in a rise in the PPI, which would trigger yet another rise. In summary, contract escalators generally are put in place to cope with input cost volatility from the sellers' side of the transaction. Under certain conditions, sellers may not be able to provide the agreed to product or service if large increases in input costs are not mitigated. Similarly, buyers may feel little incentive to lock in a price over time of they perceive that a drop in input costs accrues only to the seller as a windfall.

[5] Sometimes, however, government agencies, laws, or regulations may dictate which index or level of detail must be cited.

[6] As an example of PPI practices, first-published PPI data for December 2012, as well as final data for August 2012, were released on January 15, 2013. Final data for December 2012 were released on May 15, 2013 with the first release of data for April 2013. Final data for all indexes appear in the *recalculated index* column of each table in each issue of the *PPI Detailed Report*, and are available online through LABSTAT. Contracting parties who want to use other BLS series for escalation in addition to PPIs should be aware that each BLS program has its own revision and correction policies.

[7] Most of the new FD-ID indexes have an index base of November 2009=100 or April 2010=100. However, the goods-based indexes of the FD-ID system that correspond with the previous SOP model have an index base of 1982=100. Some commodity-type indexes also have an index base of 1982=100, but other commodity-type indexes, as well as all of the industry-based indexes, have their base period set equal to the month and year of their introduction.

PRACTICE: CHOOSING AN INDEX OR INDEXES

Imagine you are planning to contract snow and ice removal services for sidewalks, stairways, and plazas for multiple County/City building locations including

- Contractor shall provide personnel, snow blowers, snow shovels, ice chippers, and ice melt products in adequate quantities to perform snow and ice removal services.
- Areas include sidewalks, entryways, stairways, roadways, parking areas, and plazas of assigned Government building(s).
- Contractor shall mobilize a work crew and all required equipment and materials, to each assigned building
- Contractor shall apply pretreatment chemicals to sidewalks, entryways, stairways, and plazas ahead of anticipated snow and ice storms
- Contractor shall provide adequate personnel to return to County Government building(s) for touchup removal of snow and ice and the reapplication of ice melt chemicals
- Contractor shall provide adequate supervision and inspection for any work effort in progress to insure the efficiency and safety of all Contractor personnel
- Time, materials, and delivery are all included

For what input costs do you want to account?	**In which index would you look (PPI, CPI, IMP, ECI)?**

List indexes to consider for assigned category:

_____

PRACTICE: SPECIFYING CONTRACT TERMS

The base selling price for a pallet of 1,000 1oz bags of snacks is set at $550.00 as of December 2013, to remain in effect for 1 year. December 2013 is hereafter called the reference base period. The base selling price shall be adjusted on March 1st of each subsequent year, based upon the percent changes (whether up or down) in the indexes described below, between the reference base period and December of the most recent year. All calculations for the index shall be based upon the latest version of data published as of February 20th each year.

Using the contract terms above, fill in the blanks below

Base selling price:	
Base date of index data for price adjustment purposes:	
Portion of the price subject to adjustment:	
Frequency and date of future price adjustment:	
Reference month/year/quarter of index data to use at the time of price adjustment:	

Does this contract use preliminary data? (circle one) YES / NO

Practical Formulas for Working with Index Data (continued)

Example Composite Escalations

A vendor is requesting an annual price adjustment for the sale of snack food you buy for public schools beginning Jan. 2014. Note that the data for December are preliminary at the time of adjustment so can be found in the PPI Detailed Report for historical purposes. The vendor tells you their main costs of producing the snack food consist of 50% labor, 20% food, 15% plastic packaging, and 15% energy (to power the plant). After analyzing indexes and calling BLS staff with questions about your choices, you and the vendor agree on:

Labor: ECI for Total Compensation for Private industry workers in Mfg, All workers, U.S. (CIU20130000000000I)
Food Inputs: PPI for Intermediate Demand Materials for food manufacturing (WPUID61111)
Plastic Pkg: PPI for Coated and laminated single and multi-web film (WPU09130322)
Energy: PPI for Industrial electric power (WPU0543)

You may choose as many indexes as you like to hone in on a "fair" price increase. But, to avoid confusion, it may be best to focus on what makes up the *main* costs of producing the product or service.

BASE PRICE = $550.00	LABOR	FOODS	PACKAG-ING	ENERGY	COMPOSITE
DEC 2014 (DATA AS OF FEB 20TH, 2015)	119.8	203.1	208.3	221.8	
÷ by BASE VALUE (DEC/4Q 2017)	117.0	199.7	206.3	200.5	
equals:	1.024	1.017	1.010	1.106	
x by ASSIGNED WEIGHT PERCENTAGE	50%	20%	15%	15%	
add together results:	51.20	20.34	15.15	16.59	103.28
÷ by 100 yields multiplier					1.0328
x Base Price = new price					$568.04

You are a county procurement specialist creating a contract for building cleaning services. You narrow down your cost categories using the BEA Input-Output table: 50% Labor, 40% Business services & other overhead expenses, and 10% Cleaning supplies. After analyzing choices, you and the vendor agree on:

Labor: ECI for Total compensation for Private industry workers in All Industries in Occupation: Office and administrative support (CIU20100002200000I)
Overhead: PPI for Intermediate Demand Services less trade, transportation, and warehousing for nonmanufacturing industries (WPUID6312)
Supplies: PPI for Soaps and detergents, commercial, industrial, and institutional (WPU06710401)

BASE PRICE = $2,000 PER MONTH	MATERIALS	OVERHEAD	LABOR	COMPOSITE
DECEMBER (PPI) OR 4TH QUARTER (ECI)	242.5	118.1	138.0	
÷ by BASE VALUE (DEC/4Q 2017)	238.6	115.1	133.3	100.0
equals:	1.016	1.026	1.035	
x by ASSIGNED WEIGHT PERCENTAGE	10%	40%	50%	
add together results:	10.16	41.04	51.75	102.95
÷ by 100 yields multiplier	shows a 2.95% increase in price →			1.0295
x Base Price = new price				$2,059

Practical Formulas for Working with Index Data

% Change = [(Current Value – Base Value) ÷ Base Value] x 100

$ Change in Price = [(Current Value – Base Value) ÷ Base Value] x $ Base Price

$ New Price = (Current Value x $ Base Price) ÷ Base Value

% CHANGE EXAMPLE: Calculate the 12-month % change in average prices for infant apparel for February 2014 using the PPI for infants' apparel (wpu03810654).

Data extracted on: July 27, 2015 from https://data.bls.gov/timeseries/wpu03810654

Series Id: WPU03810654
Not Seasonally Adjusted
Group: Textile products and apparel
Item: Infants' apparel
Base Date: 201112

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011												100.0
2012	100.0	100.0	94.3	94.3	94.3	94.3	94.3	94.3	94.3	94.3	94.3	95.8
2013	96.1	96.1	96.1	96.1	99.4	99.4	99.4	99.4	99.6	99.6	99.6	99.6
2014	100.3	100.3	100.7	100.7	100.7	100.9	100.9	100.9	100.9	100.9	100.9	100.9
2015	101.6	101.6	101.6(P)	101.6(P)	101.6(P)	101.1(P)						

P : Preliminary. All indexes are subject to revision four months after original publication.

Calculation: [(100.3-96.1) ÷ 96.1] x 100 = 4.370%

$ NEW PRICE EXAMPLE: Escalate a contract for road signs (base price=$1250/unit in Jan. 2012) using the PPI for aluminum sheet and strip, wpu10250105. Calculate the price beginning in Jul. 2015 using the latest data available as of Jul. 1, 2015.

Data extracted on: July 27, 2015 from https://data.bls.gov/timeseries/wpu10250105

Series Id: WPU10250105
Not Seasonally Adjusted
Group: Metals and metal products
Item: Aluminum sheet and strip
Base Date: 200312

Download: xlsx

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	126.3	129.2	130.6	129.7	126.5	125.6	124.2	123.3	125.3	127.9	125.8	126.8
2013	126.4	126.6	126.1	123.5	122.3	122.0	120.6	120.3	119.5	119.0	118.9	118.8
2014	120.3	123.2	122.2	123.4	124.0	124.5	127.4	131.6	133.1	131.3	133.1	133.5
2015	129.1	129.8	130.3(P)	128.0(P)	126.2(P)	121.5(P)						

P : Preliminary. All indexes are subject to revision four months after original publication.

NOTE: June data was released on July 15, so though it is available at the time data was retrieved, it was not available as of July 1 as the contract may state; therefore you should use May data for the escalation. A list of BLS release dates is available at https://www.bls.gov/schedule/news_release/

Calculation: $ New Price = (126.2 x $1250) ÷ 126.3 = $1249/unit

NOTE: The price actually fell slightly. If the contract uses the term "escalate" as in the example description, this may cause a dispute between contracting parties, be wary of this possibility!