

# Producer Price Indexes for the U.S. Wholesale Trade Industries NAICS Sector 42

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## Introduction

This paper describes the practices and experiences of the United States in creating and maintaining Producer Price Indices for Wholesale Trade industries. The paper covers the usual areas required for a Voorburg sector paper including definition and methods, overview of the industry, classification practices and challenges, pricing methodology, and evaluation of comparability with turnover/output measures. The U.S. Producer Price Index program began publishing indices for Wholesale Trade in July 2005 including coverage for durable goods merchant wholesalers, nondurable goods merchant wholesalers, and wholesale trade agents and brokers. Data goes back to June 2004 for durable goods merchant wholesalers and wholesale trade agents and brokers and to December 2004 for the nondurable goods merchant wholesalers. With July 2009, the U.S. PPI published added detail for the two merchant wholesaler subsectors.

### 1. Definition of the service being priced

Wholesale output can be defined as the efficient transfer of goods from the manufacturer to another party for the strict intention of resale. Sample units that produce this output have two primary functions including:

- the creation of utility (or efficiency); and
- a channeling function.

The utility function has several parts to it including the creation of time and place utility, namely making products available when and where customers are likely to find them. Wholesalers also create possession utility, allowing their customers to take ownership of products as needed. Finally, wholesalers also provide information utility, providing details about the products that they sell.

The other primary function, channeling, is not as easy to describe. The channeling function has many parts to it whereby the wholesaler performs one or more of the following activities:

- a. Selling and promoting- wholesalers' sales force help manufacturers reach small customers at a low cost. In this channeling function activity, the wholesaler has more contacts and is more often trusted by the buyer than the distant manufacturer.
- b. Buying and assortment building- wholesalers can select items and build assortments needed by their customers, thereby providing a "one stop shop" for a buyer.
- c. Bulk breaking- wholesalers save their customers money by making large volume purchases and breaking these large lots into smaller quantities.
- d. Warehousing- wholesalers hold inventory, thereby reducing the inventory costs and risks of suppliers and customers.
- e. Transportation- wholesalers typically provide quicker delivery to buyers because they are closer to the buyers than the manufacturer.
- f. Risk bearing- wholesalers absorb risk by taking title and bearing the cost of theft, damage, spoilage, and obsolescence.
- g. Market Information- wholesalers give information to suppliers and customers about competition, new products, and price developments.
- h. Management services and advice- wholesalers often help customers train their sales clerks, improve store layouts, and displays, and set up accounting and inventory control systems.

Wholesalers also may perform installation services, equipment repair work, as well as warranty repair work for the manufacturer. These services are generally not bundled with the wholesaling function and, while occasionally performed by a wholesaler, are not included as part of the primary output of these firms.

According to the 2007 North American Industry Classification System (NAICS), the Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The definition is identical to the 2002 NAICS definition used to collect information for the U.S. Producer Price Index for Wholesale Trade industries.

The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers are organized to sell or arrange the purchase or sale of:

- goods for resale (i.e., goods sold to other wholesalers or retailers);
- capital or durable non consumer goods; and
- raw and intermediate materials and supplies used in production.

Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. These warehouses and offices are characterized by having little or no display of merchandise. In addition, neither the design nor the location of the premises is intended to solicit walk-in traffic. Wholesalers do not normally use advertising directed to the general public. Customers are generally reached initially via telephone, in-person marketing, or by specialized advertising that may include Internet and other electronic means. Follow-up orders are either vendor-initiated or client-initiated, generally based on previous sales, and typically exhibit strong ties between sellers and buyers. In fact, transactions are often conducted between wholesalers and clients that have long-standing business relationships.

Wholesalers act as one of the intermediaries between the manufacturer and the final customer. Wholesalers act as marketing intermediaries that neither produce nor consume the finished product, but instead sell to retailers, other merchants, and /or to industrial, institutional, and commercial users or other institutions that use the product for mostly resale. There are some situations whereby the sale of an item is to the final consumer especially if the product is used for business purposes in the physical construction of a product. They store goods that neither manufacturers nor retailers can store until consumers require them. Wholesalers provide businesses a nearby source of goods made by many different manufacturers; they provide manufacturers with a manageable number of customers; and they allow manufacturers, businesses, institutions, and governments to devote minimal time and resources to transactions by taking on some sales and marketing functions.

There are three types of wholesale trade firms. The most prevalent type, Wholesaler-distributors, also known as merchant wholesalers, purchase goods in large quantities, take title to the goods, store them, and then sell them to retailers, manufacturers, other wholesalers, or other customers. The second type of wholesaler, sales branches and offices of manufacturing operations are local offices of manufacturers. They market their own products and coordinate distribution directly from the producer to the buyer. The third type of wholesaler, wholesale agents or brokers, coordinate the sale of goods from one party to another—usually from manufacturers without taking title to or handling goods in the process. Included in this category are auction companies and commission merchants.

## **2. Pricing unit of measure**

There is a value associated with the output of trade services that are a result of the wholesaling services provided to the consumer. However, it is inherently difficult to observe and directly measure this value. Therefore, it is difficult to define what would constitute a unit of output for this bundle of services other than in terms linked to the units of the physical commodities sold.

Given that the output of trade industries cannot be directly observed and quantified, the U.S. PPI measures the output of the services using margin prices. In accordance with the definition of gross margin in the National Accounts, margin prices are calculated as the selling price of a good(s) less the cost of replacing the good(s) sold. If replacement cost is unavailable, the price paid by the trade entity for the good (or set of goods) is accepted. In addition, the margin price should reflect all rebates and allowances. Margin prices are, in effect, a residual calculation and the resulting price indexes represent the value-added by the wholesaler.

In most cases gross margin is used to measure output in Wholesale Trade, particularly for merchant wholesalers. In those cases where the wholesaler doesn't take title to the goods, monetary value of commissions per unit received for a particular product or product line is the price for the services provided. Commissions are the most common type of price in the Wholesale Trade Agents and Brokers industry.

The unit of measure may vary within the Wholesale Trade industries. Although transactions often occur as bulk sales, the unit of measure in the PPI wholesale trade indexes is "per unit" due to the preferred average gross margin pricing methodology.

An issue with the unit of measure particularly for some nondurable goods merchant wholesalers is that some goods may not be transacted on a regular basis. This situation often occurs with fashion or seasonal apparel merchandise such as high fashion jeans or swimming-suits. Wholesalers selling items that are not transacted on a regular basis become a problem when they sell whatever is currently popular, where the transaction is not repeated for a significant amount of time. When producing a monthly price index, products and/or services must have been wholesaled in the reference period, or have close substitutes in order to be considered an acceptable item to be used in the index. Establishments that sell high fashion and seasonal apparel items such as fashion jeans and swimming-suits generally sell products that are "comparable" over time. Referring back to the output definition for wholesale trade, it is important to note that it is the service performed (i.e. the efficient transfer of goods to another party), that the margin price measures and not a specific product. Similar products are considered comparable if marketed to the same target demographics, under the same set of conditions. For instance, all high fashion blouses marketed to adult women would be comparable.

### 3A. Size of industry

The following table based on information from the 2002 U.S. Economic Census summarizes the Wholesale Trade Sector, providing data based on six digit NAICS, where available. The 2007 Economic Census information containing gross margin information for wholesale trade is scheduled to be published in the fourth quarter of 2010, which is too late for inclusion in this version of the paper. The table provides information on both sales and gross margins for each NAICS within the Wholesale Trade Sector; note that a "D" indicates data was withheld to protect respondent confidentiality.

2002 NAICS code	Meaning of 2002 NAICS code	Number of estabs	Sales on own account	% of total sales	Gross margin (\$1000)	% of gross margin	Gross margin as % of sales
42	Wholesale trade	384,330	2,826,129,075	100.0%	630,416,849	100.0%	22.3
423	Durable goods merchant wholesalers	249,937	1,415,208,502	50.1%	367,766,753	58.3%	26
4231	Mtr vehicle & parts & supplies merchant wholesalers	25,827	251,392,803	8.9%	51,447,477	8.2%	20.5
423110	Automobile & other mtr vehicle merchant wholesalers	6,800	168,724,493	6.0%	28,935,291	4.6%	17.1
423120	Mtr vehicle supplies & new parts merchant wholesalers	14,239	68,446,787	2.4%	19,227,671	3.0%	28.1
423130	Tire & tube merchant wholesalers	2,193	11,773,426	0.4%	2,199,052	0.3%	18.7
423140	Motor vehicle parts (used) merchant wholesalers	2,595	2,448,097	0.1%	1,085,463	0.2%	44.3
4232	Furniture & home furnishing merchant wholesalers	13,799	53,091,679	1.9%	17,631,566	2.8%	33.2
423210	Furniture merchant wholesalers	5,995	22,079,289	0.8%	6,637,258	1.1%	30.1
423220	Home furnishing merchant wholesalers	7,804	31,012,390	1.1%	10,994,308	1.7%	35.5
4233	Lumber & other const material merchant wholesalers	16,650	94,903,409	3.4%	19,492,508	3.1%	20.5
423310	Lumber, plywood, & wood panel merchant wholesalers	8,366	63,605,574	2.3%	10,513,505	1.7%	16.5
423320	Brick, stone, & const material merchant wholesalers	3,022	9,311,086	0.3%	3,200,455	0.5%	34.4
423330	Roofing, siding, & insul mat merchant wholesalers	2,351	13,946,980	0.5%	3,281,951	0.5%	35.6
423390	Other construction material merchant wholesalers	2,911	8,039,769	0.3%	2,496,597	0.4%	29

2002 NAICS code	Meaning of 2002 NAICS code	Number of estabs	Sales on own account	% of total sales	Gross margin (\$1000)	% of gross margin	Gross margin as % of sales
4234	Prof & commercial equip & supp merchant wholesalers	35,676	271,777,994	9.6%	74,830,731	11.9%	31.1
423410	Photo equip & supp merchant wholesalers	1,071	D		D		35.8
423420	Office equipment merchant wholesalers	5,510	27,027,003	1.0%	11,425,356	1.8%	27.5
423430	Comp & perphl equip & software merchant wholesalers	12,879	150,288,855	5.3%	32,899,383	5.2%	D
423440	Other commercial equipment merchant wholesalers	4,715	13,815,991	0.5%	4,351,133	0.7%	18.4
423450	Med, dental, & hosp equip & supp merchant wholesalers	7,608	52,885,926	1.9%	16,115,944	2.6%	31.5
423460	Ophthalmic goods merchant wholesalers	1,347	5,341,687	0.2%	2,477,778	0.4%	30.5
423490	Other professional equip & supp merchant wholesalers	2,546	D		D		31.1
4235	Metal & mineral (exc petrol) merchant wholesalers	10,232	81,258,922	2.9%	17,168,471	2.7%	D
423510	Metal service centers & other metal merchant wholesalers	9,741	75,412,617	2.7%	16,260,445	2.6%	D
423520	Coal & other mineral & ore merchant wholesalers	491	5,846,305	0.2%	908,026	0.1%	14.7
4236	Electrical goods merchant wholesalers	30,919	222,312,480	7.9%	56,652,339	9.0%	15.5
423610	Elec appar & equip & wiring supp merchant wholesalers	12,482	57,668,937	2.0%	16,460,786	2.6%	D
423620	Electric appliance, TV & radio merchant wholesalers	2,989	47,112,157	1.7%	9,535,669	1.5%	25.5
423690	Other electronic parts & equip merchant wholesalers	15,448	117,531,386	4.2%	30,655,884	4.9%	28.5
4237	Hrdwr, plumb & heat equip & supp merchant wholesalers	18,452	69,878,356	2.5%	20,256,694	3.2%	26.1
423710	Hardware merchant wholesalers	6,659	26,732,845	0.9%	7,976,673	1.3%	29.5
423720	Plumbing & heating equip & supp merchant wholesalers	5,281	21,170,604	0.7%	6,450,737	1.0%	29
423730	Warm air heating & AC equip merchant wholesalers	5,180	17,417,026	0.6%	4,627,533	0.7%	29.8
423740	Refrigeration equipment & supp merchant wholesalers	1,332	4,557,881	0.2%	1,201,751	0.2%	30.5
4238	Machinery, equipment, & supplies merchant wholesalers	62,309	225,235,899	8.0%	65,882,258	10.5%	26.6
423810	Const & mining machinery & equip merchant wholesalers	4,819	33,015,624	1.2%	8,934,798	1.4%	26.4
423820	Farm & garden machinery & equip merchant wholesalers	8,617	D		D		29.3
423830	Industrial machinery & equipment merchant wholesalers	29,843	91,507,262	3.2%	28,924,542	4.6%	D
423840	Industrial supplies merchant wholesalers	10,494	31,402,347	1.1%	10,133,360	1.6%	35.6
423850	Service estab equipment & supp merchant wholesalers	5,527	D		D		25.1
423860	Trans equip & supp (exc mtr veh) merchant wholesalers	3,009	23,009,804	0.8%	5,292,329	0.8%	32
4239	Miscellaneous durable goods merchant wholesalers	36,073	145,356,960	5.1%	44,404,709	7.0%	23
423910	Sporting & rec goods & supplies merchant wholesalers	5,413	20,001,087	0.7%	8,267,892	1.3%	28.2
423920	Toy & hobby goods & supplies merchant wholesalers	2,850	D		D		30.5
423930	Recyclable material merchant wholesalers	7,098	28,518,933	1.0%	7,701,493	1.2%	41.3
423940	Jewelry, watch, prec stone, & prec metal merchant wholesalers	8,250	32,368,772	1.1%	7,254,188	1.2%	8.8
423990	Other misc durable goods merchant wholesalers	12,462	D		D		22.4
424	Nondurable goods merchant wholesalers	134,393	1,410,920,573	49.9%	262,650,096	41.7%	33.2
4241	Paper & paper product merchant wholesalers	12,472	72,421,164	2.6%	17,655,612	2.8%	25.8
424110	Printing & writing paper merchant wholesalers	1,602	20,242,567	0.7%	3,325,373	0.5%	D
424120	Stationery & office supplies merchant wholesalers	6,424	24,900,516	0.9%	7,610,251	1.2%	24.4
424130	Industrial & personal serv paper merchant wholesalers	4,446	27,278,081	1.0%	6,719,988	1.1%	16.4

2002 NAICS code	Meaning of 2002 NAICS code	Number of estabs	Sales on own account	% of total sales	Gross margin (\$1000)	% of gross margin	Gross margin as % of sales
4242	Drugs & druggists' sundries merchant wholesalers	7,326	245,339,302	8.7%	48,967,206	7.8%	30.6
424210	Drugs & druggists' sundries merchant wholesalers	7,326	245,339,302	8.7%	48,967,206	7.8%	24.6
4243	Apparel, piece goods, & notions merchant wholesalers	17,475	105,412,016	3.7%	33,815,785	5.4%	20
424310	Piece goods, notions, oth dry gd merchant wholesalers	4,296	12,433,607	0.4%	3,828,541	0.6%	13
424320	Men's & boys' clothing & access merchant wholesalers	4,384	30,241,321	1.1%	8,990,286	1.4%	30.8
424330	Women's & child clthng & access merchant wholesalers	7,084	43,036,184	1.5%	13,699,674	2.2%	35.9
424340	Footwear merchant wholesalers	1,711	19,700,904	0.7%	7,297,284	1.2%	29.7
4244	Grocery & related product merchant wholesalers	32,776	384,975,750	13.6%	63,794,395	10.1%	31.8
424410	General line grocery merchant wholesalers	3,204	115,307,881	4.1%	16,291,628	2.6%	37
424420	Packaged frozen food merchant wholesalers	3,393	57,660,096	2.0%	7,902,258	1.3%	11.1
424430	Dairy prod (exc dried/canned) merchant wholesalers	2,152	22,472,980	0.8%	3,307,863	0.5%	15.3
424440	Poultry & poultry prod merchant wholesalers	720	7,326,369	0.3%	970,416	0.2%	14.7
424450	Confectionery merchant wholesalers	2,075	11,120,662	0.4%	2,387,522	0.4%	13.2
424460	Fish & seafood merchant wholesalers	2,500	D		D		13
424470	Meat & meat product merchant wholesalers	2,846	30,113,653	1.1%	4,127,603	0.7%	21.5
424480	Fresh fruit & vegetable merchant wholesalers	5,397	49,373,117	1.7%	9,204,387	1.5%	D
424490	Other grocery & related products merchant wholesalers	10,489	D		D		13.7
4245	Farm products raw materials merchant wholesalers	7,563	103,208,239	3.7%	14,757,144	2.3%	44.4
424510	Grain & field bean merchant wholesalers	5,415	85,569,246	3.0%	12,415,405	2.0%	23.8
424520	Livestock merchant wholesalers	1,100	7,045,641	0.2%	733,917	0.1%	14.3
424590	Other farm product raw materials merchant wholesalers	1,048	10,593,352	0.4%	1,607,822	0.3%	14.5
4246	Chemicals & allied products merchant wholesalers	13,133	67,177,815	2.4%	18,518,731	2.9%	17.9
424610	Plastics materials & basic forms merchant wholesalers	3,242	15,679,910	0.6%	3,975,665	0.6%	15.1
424690	Other chemicals & allied prods merchant wholesalers	9,891	51,497,905	1.8%	14,543,066	2.3%	27.6
4247	Petroleum & petroleum products merchant wholesalers	7,044	192,526,775	6.8%	14,413,501	2.3%	28.2
424710	Petroleum bulk stations & terminals	4,018	96,902,486	3.4%	7,653,580	1.2%	43
424720	Petrol & petrol prod merchant wholesalers (exc bulk)	3,026	95,624,289	3.4%	6,759,921	1.1%	11.6
4248	Beer, wine, & alcoholic beverage merchant wholesalers	4,259	79,096,987	2.8%	20,907,705	3.3%	5
424810	Beer & ale merchant wholesalers	2,541	D		D		7.1
424820	Wine & alcoholic beverage merchant wholesalers	1,718	D		D		26.4
4249	Miscellaneous nondurable goods merchant wholesalers	32,345	160,762,525	5.7%	29,820,017	4.7%	D
424910	Farm supplies merchant wholesalers	7,146	39,523,400	1.4%	6,794,898	1.1%	D
424920	Book, periodical, & newspaper merchant wholesalers	3,256	23,117,770	0.8%	4,840,981	0.8%	17.2
424930	Flowers & florists' supplies merchant wholesalers	4,844	9,847,376	0.3%	3,441,087	0.5%	16.6
424940	Tobacco & tobacco product merchant wholesalers	1,550	55,561,638	2.0%	4,962,502	0.8%	20.9
424950	Paint, varnish, & supp merchant wholesalers	2,041	4,993,028	0.2%	1,736,695	0.3%	34.9
424990	Other misc nondurable goods merchant wholesalers	13,508	27,719,313	1.0%	8,043,854	1.3%	8.9

D – Withheld to protect confidentiality of information

As can be seen in the above table, “sales dollars” is not a good proxy for margin revenue in the merchant goods wholesale trade industries. For example, at the aggregate level within merchant wholesalers, Durable goods merchant wholesalers represent 50.1 percent of total merchant wholesale sales, but 58.3 percent of the margin dollars of all merchant goods wholesale trade industries. An even larger divergence in the overall size measure can be seen in the case of NAICS 424720, Petroleum and petroleum products merchant wholesalers, where sales account for 3.4 percent while margin accounts for only 1.1 percent of the total of all wholesale.

The 2002 Economic Census also publishes commissions-received information for wholesale trade electronic markets and for agents and brokers. The following table reflects the relatively small size of this portion of the wholesale trade sector.

2002 NAICS code	Meaning of 2002 NAICS code	Number of establishments	Sales (\$1,000)	Sales on account of others (%)	Commissions received (\$1,000)	Commissions received (%)
425	Wholesale electronic markets and agents and brokers	32,415	483,159,855	97.9	18,761,343	4
4251	Wholesale electronic markets and agents and brokers	32,415	483,159,855	97.9	18,761,343	4
42511	Business to business electronic markets	95	2,764,616	98.9	94,648	3.5
425110	Business to business electronic markets	95	2,764,616	98.9	94,648	3.5
42512	Wholesale trade agents & brokers	32,320	480,395,239	97.9	18,666,695	4
425120	Wholesale trade agents & brokers	32,320	480,395,239	97.9	18,666,695	4

### 3B. Special conditions

#### Classification of the sample unit by three digit NAICS

Publication of Wholesale Trade Producer Price Indices were initially developed at a three digit NAICS level (called subsectors) and therefore sample units in the wholesale trade industries were classified by the three digit NAICS for a variety of reasons including budgetary constraints. One reason why wholesale trade was not captured at the six digit industry level (which is typical for the majority of the U.S. PPI) was the possibility that a unit could easily change production from one six digit NAICS to another within the three digit subsector. To illustrate the flexibility this three digit sampling and collection strategy allowed, if a sample unit provided services across a number of nondurable goods industries according to the 2002 NAICS, it was only necessary that a plurality of revenue was earned through the wholesaling of nondurable goods to be included in NAICS 424. Classification of sample units for Wholesale Trade industries was based on plurality of margin/commission revenue (not sales) according to the subsector. The NAICS originally published were 423000 – Merchant Wholesalers, Durable Goods, 424000 – Merchant Wholesalers, Nondurable Goods, and 425120 – Wholesale Trade Agents and Brokers. Note that collection of information and the publication of NAICS 425110, Business to Business Electronic Markets have been delayed indefinitely. Development of price indexes for this industry is hampered by the boom and bust nature of the service. Marketing retail products via electronic means has continued to expand in the United States at a steady pace from the 1990’s until today. However, Business to Business Electronic Markets experienced a rapid expansion in the 1990’s, only to be followed by a precipitous decline. Given the highly volatile nature of the industry, it would be very difficult to maintain a sample of companies that provide this service.

With the publication of the July 2009 PPI, the U.S. PPI expanded publication of the Wholesale Trade industries to include selected indexes at the four-digit NAICS level. In order to publish at the more detailed level, each sampled unit had to be evaluated and classified within a specific 6-digit wholesale trade industry. The expanded structure is shown in Section 4. This change was made to accommodate the needs of the Bureau of Economic Analysis at the U.S. Department of Commerce as further explained in Section 6 of this paper.

#### Classification of manufacturing activity for Wholesale Trade sample units

It is common for some manufacturing activity to take place at Wholesale Trade establishments. In most cases, the activities are separable. Records, revenues, and employees are generally separable by wholesale activity and

manufacturing activity. The units are treated as separate Profit Maximizing Centers (PMCs). The PMC closely corresponds to the economic concept of the firm, the unit whose behavior is explained in economic theory. If a merchant wholesale organization takes title and sells a manufactured product made by the parent company, an intra-company transfer price is collected as the supply source price.

Determining whether a sample unit is classified in wholesaling or manufacturing can sometimes be difficult. Establishments in the manufacturing sector are engaged in the transformation of materials into new products as their output is a new product. Wholesalers *generally* are engaged in breaking of bulk and redistribution in smaller lots, including packaging, repackaging, or bottling of products or chemicals, customized assembly of computers, mixing paints to order, and cutting metals to customer order. In these types of services, the wholesaler produces a modified version of the same product, not a new product. These activities are generally considered incidental to the sale of the good. Some activities in the United States are notable in the way that they are classified. The most prominent activities are outlined below:

1. Bottling beverages. The bottling of purchased purified water is classified in NAICS 424490; the bottling of purchased malt beverages is classified in NAICS 424810; the bottling of purchased wine is classified in NAICS 424820; the bottling of liquors made elsewhere is classified in NAICS 424820. However, the bottling of soft drinks is classified in the manufacturing sector as NAICS 312111. The pasteurizing and bottling of milk is classified in NAICS 311511.
2. Metal Service Centers are included in NAICS 423510. These service centers maintain inventory and may perform functions, such as sawing, shearing, bending, leveling, cleaning, or edging on a custom basis as part of sales transactions.
3. Wholesaling versus Manufacturing Cheese. If an establishment purchases cheese, cuts or grates it, and mixes it with other cheeses for packaging, this activity is wholesale trade. However, aging and moisture reducing are classified as manufacturing activity because they change the properties of the product not just its physical appearance.

The U.S. PPI for Wholesale Trade does not include establishments that contract with other establishments to process their materials for them. Under NAICS, these units are included as manufacturing activity. There is no margin price associated with this activity.

### **Classification of retail activity**

NAICS classifies any units with retail selling space as Retail Trade regardless of the amount of retail activity. NAICS defines this sector as comprising establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. In short, a retail establishment engages in the process of buying goods for resale. This sector includes establishments engaged in selling merchandise for personal or household consumption and rendering services incidental to the sale of goods. In NAICS, retail establishments are classified by kind of business according to the **usual trade designation** or principal lines of commodities sold. A retail store may also sell goods to businesses but as long as an establishment markets itself to the general public or is “known as” retail in the trade, it is classified in Retail Trade. **This guideline holds even if the majority of the establishment’s sales receipts are from wholesale transactions.** For example, home centers that earn a plurality of their revenue from the sale of construction materials to contractors market themselves as (and are known as) retailers; therefore, they are classified in Retail Trade.

By contrast, establishments in Sector 42, Wholesale Trade, also engage in the buying of goods for resale, but these wholesalers do not serve the general public. Selling goods to the general public distinguishes retail establishments from those in Wholesale Trade. Wholesalers supply institutional, industrial, wholesale, and retail clients and typically operate from a warehouse or office. Neither the design nor the location of these premises is intended to solicit a high volume of walk-in traffic. Once a unit is classified in Wholesale Trade, all margin priced transactions are considered wholesale transactions. While it may be possible for a consumer to make a purchase on a walk in basis at a wholesale facility, these transactions are considered wholesale activity. They are treated as primary to wholesale trade even if the margin realized is different for the walk in traffic.



### **Classification of manufacturers' sales and branch offices**

Manufacturer's sales and branch offices are included in Wholesale Trade, even though their prices may be set by the manufacturing arm of the company. In most cases, title is held by the manufacturing arm of the company until the sale is complete. Manufacturers' sales branches and sales offices engaged in selling tangible products for other than personal or household consumption are classified as operating establishments in Wholesale Trade.

While the service performed more closely resembles that of Wholesale Trade Agents and Brokers (NAICS 425120), the output of Manufacturer's sales and branch offices is classified in Merchant Wholesaling, NAICS 423 and 424. Even though the production function of some Manufacturer's offices that receive commission payments is somewhat different than that of merchant wholesalers, detailed National Accounts data would have been lost had these activities not been included together in the same industry.

### **Recyclable Material Merchant Wholesalers (NAIC 423930)**

Producers from this industry were not included when the sample was drawn for Durable Goods Merchant Wholesalers. Historically, in the U.S. PPI, the Recyclable Material Merchant Wholesalers were viewed as more closely related to a manufacturing industry than a service industry. (This closely corresponds to ISIC Rev. 4 code 3830. See Section 5 Evaluation of standard classification structure.) This accounts for their long historical inclusion in the PPI Commodities Indexes that use selling prices to measure output as opposed to margin pricing generally found in wholesale trade industries. Recyclable Material Merchant Wholesaler industry indexes are also currently published separate from the rest of wholesale trade as PPI code 429930. The PPI publishes an aggregate index for Total Wholesale Trade Industries that does not include Recyclable Material Merchant Wholesalers.

### **3C. Record keeping practices**

Most companies within Wholesale Trade industries maintain pricing records and make pricing decisions at a headquarters location. Therefore, information was collected at these locations rather than an individual establishment location. Some problems collecting prices did occur in the case of manufacturers' sales and branch offices. However, the problems mostly concerned whether records were separable for the manufacturing arm of the company versus the wholesaling arm. In many cases, respondents considered the manufacturers' sales and branch offices merely an extension of the manufacturing facility and not a separate Profit Maximizing Center.

In Wholesale Trade industries, what is being priced is the service the wholesaler provides to the purchaser of the goods. The output of this wholesaling service is measured most accurately by the average gross margin per unit for a comparable product line. This average gross margin is defined as the difference between the price that a wholesaler pays for a product line and the price that would have to be paid by the wholesaler to replace that same product line at the time it is sold. Most respondents were able to provide this information.

Comparable product lines contain homogeneous groupings of products that, in the view of the respondent, are marketed under the same set of conditions to the same (target) demographic market. For example, the sale of a computer printer is not comparable to the sale of a computer monitor, nor is the sale of all computers a homogeneous grouping. However, the sale of all "high" end computers could be considered a homogeneous grouping of products.

When it was not possible to collect the average gross margin for a product line, individual item product margin was collected as a fallback.

One problem with using the margin price of an individual product occurs when a product is sold for less than its purchase price. This most commonly occurs in the Retail Trade industries when retail stores sell a product or group of products at a highly publicized low price in order to entice customers into the store. In some cases, the price is so low that the store is actually selling the item for a loss (known as a "loss leader"). In Retail Trade industries, loss leaders are often used as marketing tools so that the customers will not only purchase the loss leader, but also a number of other products with positive margins. Loss leaders are not very common in Wholesale Trade industries, but negative prices occur, albeit very rarely when products are sold at clearance. Clearance prices can be equal to or

even less than the original cost of the product, thereby creating a negative price. This often happens when a new model of a product comes out after a certain amount of time, and the old model must be sold. For example, a computer may be discontinued after six to twelve months, as new models tend to be much more advanced in terms of technology and efficiency. Since it is difficult for respondents to value products on a replacement cost basis that are no longer manufactured and sold to them, clearance priced items sold by wholesalers have no economic consequence and are not collected in the U.S. PPI. Recordkeeping practices indicate that these products do not account for a large amount of company revenue and are often not carried forward in the accounting books of companies.

#### 4. Standard classification structure

Whereas virtually all U.S. Bureau of Labor Statistics PPI's correspond with and are published at the six-digit NAICS level, the U.S. PPI for Wholesale trade was initially published at the three digit level. As mentioned previously, with the July 2009 release, the U.S. PPI expanded publication of the wholesale trade industries to include selected indexes at mostly the four-digit NAICS level as shown below. This effort was done to accommodate the needs of the Bureau of Economic Analysis and was accomplished without resampling the sector. The indices are reflective of the original sampling constraints as each line of publication represents a product line sold by any establishment that is within the respective area – durable or non durable goods. Therefore, other receipts represent sales outside of the respective durable and non durable wholesale trade areas. They would include manufactured goods, usually as the result of including additional data from units originally sampled as manufacturing units that were misclassified into wholesale trade, services, or wholesaling outside of the respective area.

423000 Merchant wholesalers, durable goods

423000-P Primary services

423000-A Wholesale distribution of motor vehicle and motor vehicle supplies

423000-2 Wholesale distribution of furniture and home furnishings

423000-3 Wholesale distribution of lumber and other construction materials

423000-4 Wholesale distribution of professional and commercial equipment and supplies

423000-45 Wholesale distribution of medical, dental, and hospital equipment and supplies

423000-48 Wholesale distribution of other professional and commercial equipment

423000-5 Wholesale distribution of metals and minerals (except petroleum)

423000-6 Wholesale distribution of electrical and electronic goods

423000-7 Wholesale distribution of hardware, and plumbing and heating equipment and supplies

423000-8 Wholesale distribution of machinery, equipment, and supplies

423000-SM Other receipts

424000 Merchant wholesalers, nondurable goods

424000-P Primary services

424000-2 Wholesale distribution of drugs and druggists' sundries

424000-3 Wholesale distribution of apparel, piece goods, and notions

424000-4 Wholesale distribution of grocery and related products

424000-5 Wholesale distribution of farm product raw materials

424000-6 Wholesale distribution of chemicals and allied products

424000-8 Wholesale distribution of beer, wine, and distilled alcoholic beverages

424000-9 Wholesale distribution of miscellaneous nondurable goods

424000-SM Other receipts

425120 Wholesale trade agents and brokers

425120-P Primary services

425120-1 Wholesale trade brokerage fees and commissions

**(Note: For the BLS-created codes above, the seventh digit corresponds to the last digit of the NAICS industry group. We used the BLS-created codes in case users want to look at the indexes online.)**

## 5. Evaluation of standard classification structure

The structure represents a compromise, providing more detailed product line indexes useful for deflation of National Accounts (See section 6 below), while remaining within existing budget and sampling constraints.

The structure also accommodates classification of establishments based on production. Establishments that contract with other establishments to process their materials for them are classified as manufacturing establishments according to NAICS and therefore the U.S. PPI for Wholesale Trade does not include prices from these establishments. The U.S. has addressed the issue of global outsourcing in the supporting documents for the Federal Register Notice published May 12, 2010. The Economic Classification Policy Committee (ECPC) is recommending that factoryless goods producers be specifically classified in manufacturing. The following is the link to the supporting documents: <http://www.census.gov/eos/www/naics/fr2010/supporting.html>. A working group from US statistical agencies is currently coordinating implementation of the ECPC recommendation, which will become part of the guidance in the 2012 revision of NAICS.

The U.S. PPI structure most closely compares to ISIC Rev.4 Division 46. In general, ISIC 4 is not as detailed as the NAICS structure and doesn't have the same aggregation structure. ISIC Groups 462, 463, and Class 4661 most closely compare to NAICS 424. ISIC Group 461 most closely compares to NAICS 425120. A major difference between the ISIC 4 structure and the NAICS structure regards motor vehicles. The ISIC structure combines wholesale and retail motor vehicle sales and parts along with service and repair in ISIC 45. NAICS 423 includes only the wholesaling of motor vehicles, parts and service. Otherwise, ISIC Groups 464, 465, along with Classes 4662 and 4663 most closely compare to NAICS 423.

As previously mentioned, Recyclable material merchant wholesalers, NAICS 423930, was excluded from the U.S. PPI for wholesale trade as the production function of these establishments has historically been considered more closely related to a manufacturing activity than a wholesaling activity due to the inclusion of further processing of recyclable materials (such as metals). ISIC Class 3830 – Materials recovery specifically includes “processing of metal and non-metal waste and scrap into secondary raw materials, usually involving a mechanical or chemical transformation process” and compares most closely to some of the activities that are included in NAICS 423930. The collecting, sorting, and separating metal and non-metal waste activities included in ISIC Class 4669 Wholesale of waste and scrap and other products n.e.c., most closely compares to NAICS 562920 but there is currently no comparability within the U.S. PPI for this activity. The following table summarizes a comparison of the activities included in wholesaling of scrap.

Service	ISIC 4 Classification	NAICS Code
Wholesaling of scrap without further product transformation	4669	423930
Sorting and separating metal and non – metal waste	3830	562920
Processing of metal and non – metal waste into secondary raw materials usually involving a mechanical or chemical transformation process	3830	423930

## 6. National accounts concepts

The national accounts are handled in the U.S. by the Bureau of Economic Analysis (BEA) at the U.S. Department of Commerce. The BEA publishes measures of industry output, input, and value added at roughly the 3-digit NAICS level of detail for all private industries and government. The BEA uses lower level data to calculate information that is aggregated to the three digit published level. Most of the services PPI's published by the U.S. Bureau of Labor Statistics are used to deflate these industries' outputs and inputs. The additional detail published by the BLS for Wholesale Trade in 2009 could significantly improve the accuracy of BEA's quantity and price measures for this industry sector. BEA typically analyzes both the PPI index methodology and any historical price movements before deciding to use the particular index to calculate value added measures for use in the gross product originating

national account. In this case, BEA specifically requested the additional wholesale trade detail to use on lower level information.

## **7. Pricing methodology**

Margin prices are the most prevalent type of price for merchant wholesalers. Since most wholesale trade is dominated by merchant wholesalers, the dominant price is a margin price. Dollar value of commission based on a percent of sales is the most prevalent type of price for manufacturers' sales and branch offices that do not take title to a good and for wholesale agents and brokers.

### **MARGIN PRICES (Merchant wholesalers)**

The type of price collected in merchant wholesale is typically an unlagged average margin price. Margin is a combination of two different parts; one is the incoming acquisition price (replacement cost) and the other is the selling price to the next level buyer; the difference between these two prices is called the gross margin. The acquisition price represents the direct cost of the wholesaled goods and should exclude freight whenever possible (freight should be FOB or if delivered based on a minimum). The price should include point-of-sale incentives (taken as discounts) that may be applied to the merchandise whenever possible.

There are five different acceptable margin prices collected in Wholesale Trade, prioritized below.

- 1. Average gross margin per unit for a comparable customer class and/or supplier class for all sales within a comparable product line.*
- 2. Average gross margin per unit for all customers and/or suppliers for a comparable product line.*
- 3. Average gross margin per unit for a particular customer class and/or supplier class for all sales of a particular product.*
- 4. Average gross margin per unit for all customers and/or suppliers for all sales of a particular product.*
- 5. Gross margin for a single specific product transaction.*

Manufacturers' sales or branch offices or agents and brokers that also take title to a good can also have margin price transactions.

### **DOLLAR VALUE OF COMMISSION PRICES (Manufacturers' sales and branch offices, and agents and brokers)**

Manufacturer's sales and branch offices and agents and brokers typically receive a commission fee for their service. The commission is the amount of money that the sales office receives (not an individual agent) for performing the service. At the time that this sector was sampled, five percent of the per unit sales prices was a typical sales office commission percentage, although this can vary. Since revenue figures are typically recorded in terms of sales dollars for this industry, the total dollar value of commissions is a result of multiplying total sales dollars by the average commission percentage. Note that the Census Bureau publishes commission dollars received and commission percentages for wholesale trade electronic markets and agents and brokers (see Section 3A).

There are five different types of dollar value of commission prices in Wholesale trade, prioritized below.

- 1. Average dollar value of commission per unit for a comparable customer class for all sales within a comparable product line.*
- 2. Average dollar value of commission per unit for all customers for a comparable product line.*
- 3. Average dollar value of commission per unit for a particular customer class for all sales of a particular product.*
- 4. Average dollar value of commission per unit for all customers for all sales of a particular product.*
- 5. Dollar value of commission for a single specific product transaction.*

Merchant wholesalers including manufacturers' sales and branch offices do not typically price their services based on a flat fee commission price. However, in the event that they did, a flat fee for a single specific transaction is collected.

In some cases, it is difficult to define a specific comparable product line. The respondent must view a comparable product line as a grouping of goods, each of which could be substituted for each other while, at the same time, being sold on the same per unit basis. Comparable product lines contain homogeneous groupings of products that, in the view of the respondent, are marketed under the same set of conditions to the same (target) demographic market. An example of a comparable product line would be all sales of a specific brand and package size of soda. An example of a non-comparable product line is one that mixes different package sizes of a specific brand of soda.

## **8. Quality Adjustment**

Theoretically, quality adjustments should be performed when marketing characteristics are changed. A change in marketing characteristics, such as the area of the selling space, or the distance from the nearest competition, may affect the margin prices of the products sold. However, unless a hedonic model is developed, it is difficult to quantify the amount of price change due to the changes in marketing. Alternatively, unless an analyst received information from the reporter that a price change was a direct result of the change in marketing, no quality adjustment for changes in marketing can be made.

An advantage of using average margin prices on a per unit basis is that discounting is readily captured in these prices and the need for respondent contact as the result of product substitution is diminished. Minor changes in product generally result in a direct comparison of margin prices for the product as long as the service provided for the product has not significantly changed. However, a lack of quality control is also introduced as a result of such a methodology for pricing. This creates an unknown degree of error maintaining constant quality for transactions occurring in the Wholesale Trade industries. However, the advantages of the average pricing are believed to far outweigh the disadvantages given the perceived degree of error associated with maintaining constant quality for transactions.

Price change is not shown for substitute products which have significant changes or those which are completely discontinued.

Marketing services most likely to change are installation, invoicing, computer services, conducting educational seminars and “missionary” work, whereby employees are sent on missions to prospective or existing customers to increase business. Some of these fees are charged for separately and therefore can be given a separate chance of selection and do not affect the sale of a product. If there are not separate fees for these services, it becomes difficult to quantify changes when they occur.

## **9. Evaluation of comparability with turnover/output measures**

Every five years, ending in 2 and 7, the U.S. Census Bureau calculates and publishes a large amount of detail for the output of the Wholesale trade industries in the Economic Census. (See sales and margin data on pages 4-6.) Data for margin output is available at the six-digit NAICS level for both the Durable and Non durable goods wholesale subsectors. In some cases, margin output information is available at a seven-digit product grouping level and even at an eight-digit level. The PPI Wholesale trade data as published in 2009 conforms with the Economic Census data at the four-digit NAICS level, with additional five-digit detail for NAICS 4234. The only exception, as mentioned previously, is the exclusion of NAIC 423930 from NAICS 423.

In addition, output data are available for Wholesale trade agents and brokers at a five-digit level that corresponds to PPI information at this level. Census also publishes output information at an eight digit level (that essentially corresponds to the same products found in the four digit groupings in durable and non durable goods). The U.S. PPI has no plans to provide additional detail that would match this Census data.

The U.S. Census also conducts a voluntary Monthly Wholesale Trade Survey that tabulates sales and inventory information at the six digit NAICS level from merchant wholesalers. This survey does not include information from agents, brokers, electronic markets, or information from manufacturers’ sales and branch offices. Although not as detailed as the Economic Census, this survey provides important near term economic insight on the Wholesale Trade Sector. In addition the U.S. Census Bureau conducts a mandatory Annual Wholesale Trade Survey that includes not only merchant wholesalers, but also agents, brokers, electronic markets and manufacturers’ sales and branch offices.

This survey provides estimates on annual sales, end-of-year inventories, inventory valuation, purchases, operating expenses and e-commerce data.

## Summary

The U.S. PPI for Wholesale trade was the first attempt by the U.S. BLS to collect average price information for homogeneous groupings of products in the trade industries. Post collection analysis showed approximately sixty-five percent of the respondents providing such information. There were also only limited cases where there were lagged averages. The success of the approach taken for the Wholesale trade was then implemented for Retail trade on an industry by industry basis<sup>1</sup>. (For more information on PPI Retail Trade indexes, see the Fact Sheets available on the PPI public website: <http://www.bls.gov/ppi/#publications>.)

The average price approach has been well received by respondents as they often have information in this format and also believe that this information is more likely indicative of the pricing of their firms. It is a particularly attractive approach in industries where product change is rapid or where there is seasonal change. These include wholesale distribution of apparel products and electronic products.

A cautionary note is made regarding average prices for homogeneous groupings of products. Anecdotal evidence suggests that the average price approach is a more accurate measure of output in trade industries as compared to pricing a single item in a single transaction. Therefore, while it is tempting to expand such an approach to larger product groupings, thus accounting for larger amounts of output, this approach needs to be tempered by the unknown degree of error introduced due to lack of homogeneity.

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<sup>1</sup> Although development of retail trade producer price indices predated the development of wholesale trade price indices in the US PPI, early efforts to obtain margin prices had mixed results. The notion of average margin pricing for homogeneous product groupings was a concept that was developed for potential use in all distributive trades in part as a response to the problems encountered in retail trade but was first used with success for wholesale trade. The latter informed its adoption over time as the primary pricing methodology for retail trade as well.