Effect of updated weights on Producer Price Indexes

PPI data now reflect 1987 instead of 1982 shipment values in the weight structure; a broad economic recovery and increased oil production from 1982 to 1987 contributed to major weighting shifts

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Beginning with data for January 1992, the weights used to construct Producer Price Indexes (PPI) were updated to reflect 1987 shipment values of commodities. From January 1987 through December 1991, weights were based on 1982 shipment values. Most of the weight shifts reflected changes in the American economy during the 1982–87 period; however, some of the shifts are attributable to coincidental alterations in the structure or pricing procedures in the PPI.

Weights for individual products in the PPI are based on the shipment values of the commodity, as measured by the Census of Manufactures and other sources.[1] For categories broader than individual products, indexes are calculated using weighted averages of the components. Weights at all levels of aggregation and detail are implicitly adjusted each month in accordance with relative monthly price changes; that is, groupings or items whose prices are rising faster than average automatically attain proportionately increased weight, while weights for other categories simultaneously decrease. Over a period of years, however, such implicitly adjusted weights may no longer reflect contemporary production patterns. Therefore, it is occasionally necessary to revise the PPI weight structure by updating shipment values through what is called a major weight revision. Because the Census of Manufactures is conducted every 5 years, PPI weights ideally should also be updated on a 5-year cycle.

This latest major weight revision affected all PPI series derived from the commodity code system, including stage-of-processing, durability-of-product, and special commodity groupings. It did not affect the PPI series for the net output of selected industries and their products, whose weights are updated on an industry-by-industry basis as part of the periodic resampling process; most of these industry and product weights already are based on 1987 shipment values. The proportional allocations of commodity series to the various stage-of-processing categories continue to be based on 1972 input-output data.

Relative importance data

Each December, the Bureau of Labor Statistics publishes PPI weights in the form of relative importance data, representing the value of shipments for a good or grouping as a proportion of the value of shipments for all goods within a broader category. In concept, shifts in relative importance resulting from a major weight revision are prompted by the change in the volume of units produced for a commodity series, relative to the average change for the larger category, such as finished goods.

Because the aggregate shipment value of commodities comprising each of the three major stage-of-processing categories—finished goods, intermediate goods, and crude goods—increased about

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20 percent during the 1982–87 interval, an individual index whose shipment values also increased by 20 percent would show a revised relative importance approximately the same as its former relative importance. By the same logic, an item whose absolute shipment values remained unchanged over the 1982–87 period would show a sharp decline in relative importance after the shift to 1987 weights.

In a few cases, the shift in relative importance data for a PPI series was attributable not to any real-world economic change, but to the fact that BLS coincidentally made a technical change affecting that particular index at the same time that the major weight revision was made.

Example of weight shifts

The index for passenger cars (commodity code 141101) may serve as an example as to how and why PPI weights have changed. The December 1991 relative importance for passenger cars shifted from a 1982 weight of 5.616 with respect to Finished Goods (that is, with the weight for Finished Goods set equal to 100.000) to 7.759 on a 1987 weight basis, a climb of 38.2 percent. There were several economic reasons underlying this shift.

One important factor, which also played a role in many other weight shifts throughout the PPI, was the general economic rebound from the recession that dominated most of 1982. Consumer durables are unusually sensitive to the business cycle because during a recession, buyers tend to postpone purchases, such as new cars to replace their older models, and wait for the ensuing recovery before they reenter the market.

Another notable economic development during the 1982–87 period was that Japanese auto manufacturers began building production plants in the United States. Although vehicles from such plants were produced by foreign manufacturers, the fact that they were now being built in this country meant that their weight would henceforth be included in the PPI series; production in other countries, even by American-owned firms, is, by definition, excluded from the PPI weight universe.

The relative increase in domestic auto production was also partly a result of the movement of international exchange rates. The value of the American dollar fell from an average of 249.06 Japanese yen in 1982 to 144.60 Japanese yen in 1987, a 42-percent drop.[2] This produced higher prices for some imported Japanese cars, thus prompting a shift in consumer preference towards domestically made cars. The trend towards construction of foreign-owned plants in this country also reflected this *de facto* devaluation of the dollar. In addition, tight controls on unit labor costs in the auto industry, based on improvements in productivity and continued wage restraints, facilitated industry expansion.

Overview of weight shifts

An overview of the weight changes, illustrated in chart 1, shows that in each major stage-of-processing category, weights contracted in the energy sector while expanding in the "core" component (that is, excluding foods and energy). (Note that for finished goods, the core category is divided between consumer goods and capital equipment.) Weights for the foods components declined for finished goods and intermediate goods but advanced for crude goods. Table 1 shows the relative importance for December 1991 for many detailed series within the three major stage-of-processing categories before and after the shift to 1987 weights and the percentage change between the 1982-based weights and 1987-based weights.[3]

Many of the weight increases for various commodity categories indicate increased production in response to rising demand during the economic recovery following the two recessions of the early 1980's. This happened, for example, for transportation equipment, metals, publishing, and construction materials. In addition, several other industries—computer, chemical, and plastic products, among others—expanded because technological developments created greater demand for their products. The greater use of computers prompted a larger demand for paper, thereby increasing weights for that category as well.

In contrast, some categories registered a diminished relative importance after the weight shift. For example, increased production of crude petroleum by foreign producers during the 1982–87 period diminished this country's share of marketable oil. This slowed production growth for domestic petroleum and also prompted declines for oil drilling services and equipment. Additionally, weight declines for food and farm products and for agricultural equipment were partly prompted by a drop in agricultural exports from about $39 billion in 1982 to nearly $28 billion in 1987.[4] The decrease in weight for apparel reflected the contraction of that industry as imports made substantial inroads into the domestic market during the 1982–87 period.

The largest weight shift attributable to changes to the PPI structure that coincided with the major weight revision occurred for many series previously classified under commodity code 114, general purpose machinery and equipment, now reclassified to commodity code 116, special industry machinery and equipment. Other catego-

(Text continues on page 43.)

Chart 1. **Changes in composition of PPI weight structure, by stage of processing, December 1991**

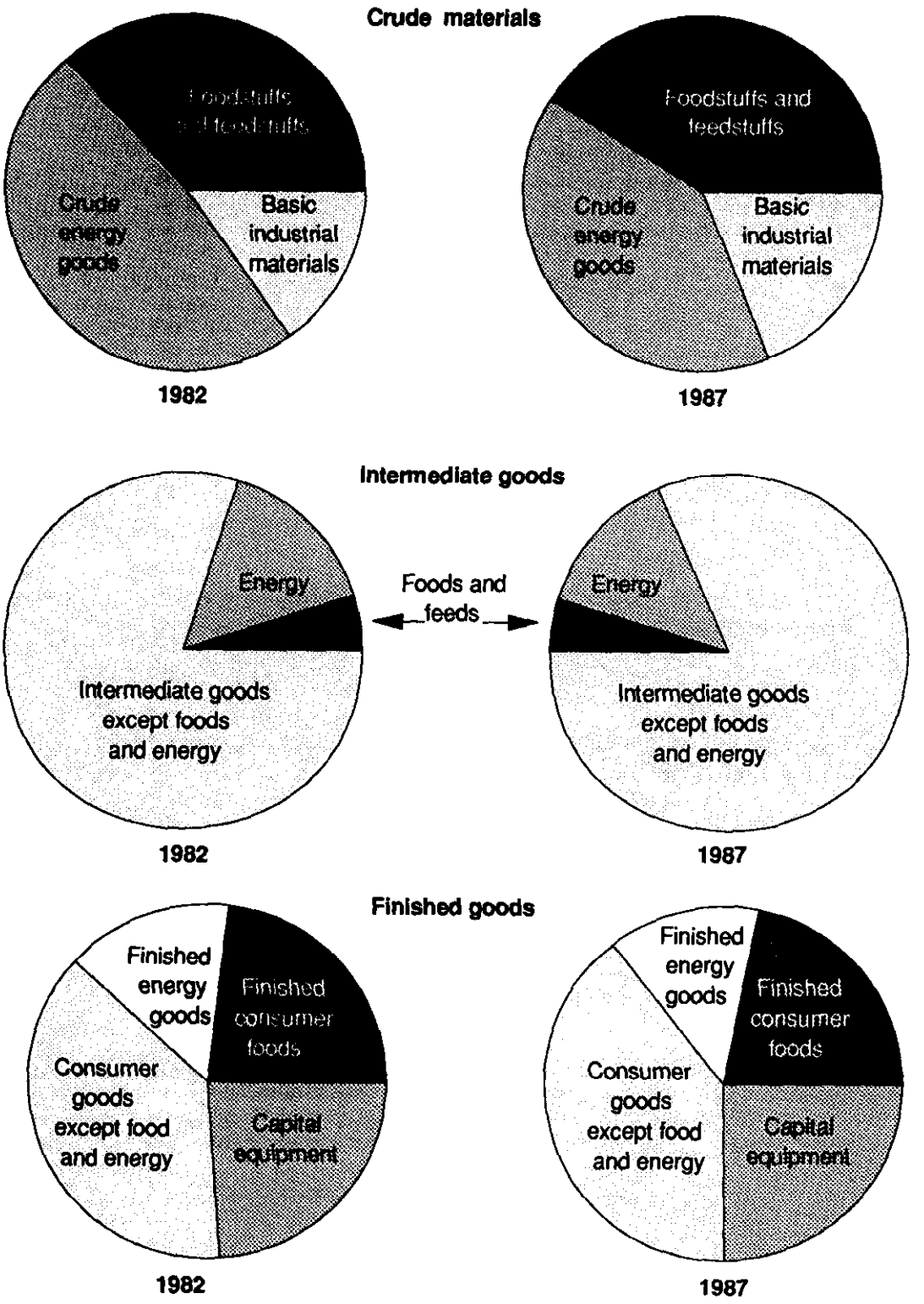

Table 1. **Relative importance of Producer Price Index commodity groupings by stage of processing, based on 1982 and 1987 weights**

Commodity code	Grouping	Relative importance, December 1991[1]		Percent change
		1982 weights	1987 (revised) weights	
	Finished goods	100.000	100.000	....
01	Farm products	1.297	1.113	–14.2
011	Fresh and dried fruits and vegetables	0.804	0.744	–7.5
016	Fluid milk	.061	.061	0
017	Eggs	.341	.307	–10.0
019	Other farm products	.091	.000	....
02	Processed foods and feeds	24.653	23.276	–5.6
021	Cereal and bakery products	3.267	3.227	–1.2
022	Meats, poultry, and fish	5.919	5.669	–4.2
023	Dairy products	3.507	2.898	–17.4
0231	Fluid milk products	1.915	1.345	–29.8
023103	Packaged fluid milk and related products	1.705	1.140	–33.1
024	Processed fruits and vegetables	1.760	1.742	–1.0
025	Sugar confectionery	1.335	1.192	–10.7
026	Beverages and beverage materials	4.899	4.563	–6.9
027	Fats and oils	.473	.379	–19.9
028	Miscellaneous processed foods	2.883	3.082	6.9
029	Prepared animal feeds	.612	.524	–14.4
03	Textile products and apparel	6.062	5.530	–8.8
032	Processed yarns and threads	.031	.033	6.5
033	Gray fabrics	.048	.048	0
034	Finished fabrics	.115	.126	9.6
038	Apparel and other fabricated textile products	5.869	5.324	–9.3
0381	Apparel	5.180	4.555	–12.1
04	Hides, skins, leather, and related products	.946	.658	–30.4
043	Footwear	.659	.406	–38.4
044	Other leather and related products	.287	.252	–12.2
05	Fuels and related products and power	15.207	13.831	–9.0
051	Coal	.002	.001	–50.0
053	Gas fuels	.622	.600	–3.5
054	Electric power	6.167	6.301	2.2
055	Utility natural gas	3.219	2.285	–29.0
057	Petroleum products, refined	5.114	4.547	–11.1
057102	Leaded regular motor gasoline	.709	.184	–74.0
058	Petroleum and coal products, n.e.c.	.083	.096	15.7
06	Chemicals and allied products	4.777	4.711	–1.4
061	Industrial chemicals	.022	.030	36.4
062	Paints and allied products	.032	.035	9.4
063	Drugs and pharmaceuticals	2.142	2.003	–6.5
065	Agricultural chemicals and chemical products	.101	.074	–26.7
067	Other chemicals and allied products	2.479	2.570	3.7
07	Rubber and plastic products	.709	1.350	90.4
071	Rubber and rubber products	.544	.483	–11.2
072	Plastic products	.165	.867	425.5
0728	Consumer, institutional, and commercial products, n.e.c.	.125	.819	555.2
08	Lumber and wood products	.094	.110	17.0
081	Lumber	.022	.030	36.4
082	Millwork	.063	.070	11.1
083	Plywood	.009	.010	11.1
09	Pulp, paper, and allied products	3.885	3.926	1.1
091	Pulp, paper, and products, except building paper	1.687	1.686	–.1
092	Building paper and building board mill products	.025	.023	–8.0
093	Publications and printed matter	2.173	2.218	2.1
10	Metals and metal products	.954	.859	–10.0
101	Iron and steel	.002	.002	0
102	Nonferrous metals	.019	.021	10.5
103	Metal containers	.003	.003	0

See footnotes at end of table.

Table 1. **Continued—Relative importance of Producer Price Index commodity groupings by stage of processing, based on 1982 and 1987 weights**

Commodity code	Grouping	Relative importance, December 1991[1]		Percent change
		1982 weights	1987 (revised) weights	
104	Hardware	0.129	0.132	2.3
106	Heating equipment	.040	.040	0.0
107	Fabricated structural metal products	.456	.316	-30.7
108	Miscellaneous metal products	.304	.346	13.8
11	Machinery and equipment	13.045	12.399	-5.0
111	Agricultural machinery and equipment	.982	.499	-49.2
112	Construction machinery and equipment	.746	.673	-9.8
113	Metalworking machinery and equipment	1.489	1.268	-14.8
114	General purpose machinery and equipment	1.621	1.435	-11.5
115	Electronic computers and computer equipment	.750	1.230	64.0
116	Special industry machinery and equipment	1.569	1.578	.6
117	Electrical machinery and equipment	3.723	4.119	10.6
118	Miscellaneous instruments	.768	.741	-3.5
119	Miscellaneous machinery	1.396	.856	-38.7
12	Furniture and household durables	5.471	6.022	10.1
121	Household furniture	1.554	1.714	10.3
122	Commercial furniture	.992	1.174	18.3
123	Floor coverings	.484	.588	21.5
124	Household appliances	1.168	1.232	5.5
125	Home electronic equipment	.398	.430	8.0
126	Other household durable goods	.876	.884	0.9
13	Nonmetallic mineral products	.102	.111	8.8
131	Glass	.035	.034	-2.9
133	Concrete products	.021	.030	42.9
138	Glass containers	.007	.005	-28.6
139	Other nonmetallic minerals	.039	.043	10.3
14	Transportation equipment	14.901	19.186	28.8
141	Motor vehicles and equipment	9.080	13.621	50.0
1411	Motor vehicles	8.451	12.652	49.7
141101	Passenger cars	5.616	7.759	38.2
141105	Trucks, 10,000 lbs. GVW and under	2.037	3.473	70.5
141106	Trucks, over 10,000 lbs. GVW	.641	1.267	97.7
142	Aircraft and aircraft equipment	4.056	4.108	1.3
143	Ships and boats	1.476	1.222	-17.2
144	Railroad equipment	.202	.121	-40.1
149	Transportation equipment, n.e.c.	.087	.114	31.0
15	Miscellaneous products	7.896	6.916	-12.4
151	Toys, sporting goods, small arms, etc.	1.039	.838	-19.3
152	Tobacco products, including stemmed and redried	3.631	2.854	-21.4
1521	Cigarettes	3.452	2.713	-21.4
153	Notions	.017	.012	-29.4
154	Photographic equipment and supplies	1.008	.915	-9.2
155	Mobile homes	.449	.421	-6.2
156	Medical, surgical and personal aid devices	.541	.632	16.8
157	Industrial safety equipment	.009	.008	-11.1
159	Other miscellaneous products	1.202	1.238	3.0
159901	Fire extinguishers	.006	.006	....
	Intermediate materials, supplies and components	100.000	100.000	....
02	Processed foods and feeds	5.091	4.786	-6.0
021	Cereal and bakery products	.442	.362	-18.1
022	Meats, poultry, and fish	.876	.790	-9.8
023	Dairy products	.521	.751	44.1
024	Processed fruits and vegetables	.120	.111	-7.5
025	Sugar confectionery	.636	.601	-5.5
026	Beverages and beverage materials	.336	.266	-20.8
027	Fats and oils	.391	.323	-17.4
028	Miscellaneous processed foods	.218	.227	4.1
029	Prepared animal feeds	1.551	1.356	-12.6
03	Textile products and apparel	4.423	4.605	4.1

See footnotes at end of table.

Table 1. **Continued—Relative importance of Producer Price Index commodity groupings by stage of processing, based on 1982 and 1987 weights**

Commodity code	Grouping	Relative importance, December 1991[1]		Percent change
		1982 weights	1987 (revised) weights	
031	Synthetic fibers	0.615	0.750	22.0
032	Processed yarns and threads	.920	.974	5.9
033	Gray fabrics	.949	.887	–6.5
034	Finished fabrics	1.196	1.159	–3.1
038	Apparel and other fabricated textile products	.587	.707	20.4
039	Textile fibers, yarns and fabrics, n.e.c.	.156	.129	–17.3
04	Hides, skins, leather, and related products	.292	.218	–25.3
042	Leather	.227	.174	–23.3
043	Footwear	.006	.003	–50.0
044	Other leather and related products	.060	.041	–31.7
05	Fuels and related products and power	15.143	13.654	–9.8
052	Coke oven products	.112	.089	–20.5
053	Gas fuels	.525	.485	–7.6
054	Electric power	7.143	6.857	–4.0
055	Utility natural gas	2.298	1.686	–26.6
057	Petroleum products, refined	4.985	4.449	–10.8
058	Petroleum and coal products, n.e.c.	.080	.088	10.0
06	Chemicals and allied products	11.333	11.523	1.7
061	Industrial chemicals	4.349	4.272	–1.8
062	Paints and allied products	1.343	1.403	4.5
063	Drugs and pharmaceuticals	1.026	1.097	6.9
064	Fats and oils, inedible	.066	.066	0.0
065	Agricultural chemicals and chemical products	1.204	.914	–24.1
066	Plastic resins and materials	1.574	1.901	20.8
067	Other chemicals and allied products	1.770	1.870	5.6
07	Rubber and plastic products	5.093	5.523	8.4
071	Rubber and rubber products	1.476	1.466	–.7
072	Plastic products	3.618	4.057	12.1
0726	Plastic parts and components for manufacturing	.249	1.052	322.5
072602	Other parts and components for manufacturing	.111	.411	270.3
0729	Other plastic products	1.850	.567	–69.4
08	Lumber and wood products	2.940	3.846	30.8
081	Lumber	.938	1.220	30.1
082	Millwork	.975	1.432	46.9
083	Plywood	.397	.484	21.9
084	Other wood products	.346	.344	–.6
086	Prefabricated wood buildings and components	.140	.187	33.6
087	Treated wood and contract wood preserving	.144	.179	24.3
09	Pulp, paper, and allied products	11.278	11.850	5.1
091	Pulp, paper, and products, except building paper	6.691	6.612	–1.2
092	Building paper and building board mill products	.152	.194	27.6
093	Publications, printed matter and printing materials	4.435	5.044	13.7
10	Metals and metal products	18.735	17.578	–6.2
101	Iron and steel	5.311	4.554	–14.3
102	Nonferrous metals	4.412	4.189	–5.1
103	Metal containers	1.108	.866	–21.8
104	Hardware	.730	.782	7.1
105	Plumbing fixtures and brass fittings	.247	.324	31.2
106	Heating equipment	.301	.290	–3.7
107	Fabricated structural metal products	3.242	2.795	–13.8
108	Miscellaneous metal products	3.384	3.779	11.7
11	Machinery and equipment	13.832	13.257	–4.2
111	Agricultural machinery and equipment	.252	.126	–50.0
112	Construction machinery and equipment	.212	.167	–21.2
113	Metalworking machinery and equipment	.969	.876	–9.6
114	General purpose machinery and equipment	3.318	2.881	–13.2
115	Electronic computers and computer equipment	.255	.401	57.3
116	Special industry machinery and equipment	.304	.264	–13.2
117	Electrical machinery and equipment	5.535	6.145	11.0
118	Miscellaneous instruments	.532	.488	–8.3

See footnotes at end of table.

Table 1. **Continued—Relative importance of Producer Price Index commodity groupings by stage of processing, based on 1982 and 1987 weights**

Commodity code	Grouping	Relative importance, December 1991[1]		Percent change
		1982 weights	1987 (revised) weights	
119	Miscellaneous machinery	2.455	1.909	–22.2
12	Furniture and household durables	0.847	0.947	11.8
121	Household furniture	.053	.054	1.9
122	Commercial furniture	.146	.176	20.5
123	Floor coverings	.253	.328	29.6
124	Household appliances	.187	.188	0.5
125	Home electronic equipment	.047	.049	4.3
126	Other household durable goods	.161	.154	–4.3
13	Nonmetallic mineral products	3.896	4.186	7.4
131	Glass	.412	.531	28.9
132	Concrete ingredients and related products	.314	.303	–3.5
133	Concrete products	1.200	1.439	19.9
134	Clay construction products except refractories	.123	.147	19.5
135	Refractories	.130	.125	–3.8
136	Asphalt felts and coatings	.213	.231	8.5
137	Gypsum products	.098	.137	39.8
138	Glass containers	.542	.365	–32.7
139	Other nonmetallic minerals	.863	.909	5.3
14	Transportation equipment	5.222	6.236	19.4
141	Motor vehicles and equipment	3.485	4.329	24.2
1412	Motor vehicle parts	3.271	4.062	24.2
141203	Motor vehicle parts, new	3.180	3.975	25.0
142	Aircraft and aircraft equipment	1.482	1.720	16.1
143	Ships and boats	.136	.096	–29.4
144	Railroad equipment	.097	.062	–36.1
149	Transportation equipment, n.e.c.	.023	.029	26.1
15	Miscellaneous products	1.876	1.790	–4.6
151	Toys, sporting goods, small arms, etc.	.080	.065	–18.8
152	Tobacco products, including stemmed and redried	.242	.133	–45.0
153	Notions	.060	.044	–26.7
154	Photographic equipment and supplies	.291	.281	–3.4
156	Medical, surgical and personal aid devices	.517	.590	14.1
157	Industrial safety equipment	.101	.083	–17.8
159	Other miscellaneous products	.584	.595	1.9
	Crude materials	100.000	100.000	....
01	Farm products	37.886	42.011	10.9
011	Fresh and dried fruits and vegetables	1.000	1.747	74.7
0119	Tree nuts	.708	.562	....
012	Grains	6.038	7.852	20.6
0122	Other grains	4.403	5.856	33.0
012202	Corn	4.044	5.001	23.7
013	Livestock	16.157	16.883	4.5
0131	Cattle	13.284	14.222	7.1
013101	Slaughter steers and heifers	9.981	12.052	20.7
013102	Slaughter cows and bulls	2.886	1.921	–33.4
014	Live poultry	2.619	3.502	33.7
0141	Chickens	2.005	2.633	31.3
014102	Slaughter broiler/fryers	2.005	2.588	29.1
015	Plant and animal fibers	.728	0.902	23.9
016	Fluid milk	5.967	6.084	2.0
017	Eggs	.248	.552	122.6
018	Hay, hayseeds and oilseeds	3.411	3.716	8.9
019	Other farm products	1.719	.774	–55.0
02	Processed foods and feeds	.687	.893	30.0
022	Meats, poultry, and fish	.236	.459	94.5
025	Sugar confectionery	.451	.434	–3.8
04	Hides, skins, leather, and related products	.515	.505	–1.9
05	Fuels and related products and power	48.088	40.028	–16.8
051	Coal	8.240	7.522	–8.7

See footnotes at end of table.

Table 1. **Continued—Relative importance of Producer Price Index commodity groupings by stage of processing, based on 1982 and 1987 weights**

Commodity code	Grouping	Relative importance, December 1991[1]		Percent change
		1982 weights	1987 (revised) weights	
0512	Bituminous coal	8.154	7.464	-8.5
051203	Contract sales of prepared bituminous	5.209	4.474	-14.1
053	Gas fuels	21.124	16.025	-24.1
056	Crude petroleum (domestic production)	18.724	16.480	-12.0
06	Chemicals and allied products	0.288	0.322	11.8
062	Paints and allied products	.056	.072	28.6
065	Agricultural chemicals and chemical products	.231	.250	8.2
07	Rubber and plastic products	.023	.015	-34.8
08	Lumber and wood products	3.585	4.663	30.1
085101	Softwood logs, bolts and timber	2.882	3.706	28.6
09	Pulp, paper, and allied products	.622	.421	-32.3
10	Metals and metal products	5.769	7.750	34.3
101	Iron and steel	2.867	3.377	17.8
1012	Iron and steel scrap	2.290	2.911	27.1
101211	Carbon steel scrap	1.837	2.444	33.0
102	Nonferrous metals	2.902	4.374	50.7
1023	Nonferrous scrap	1.914	2.922	52.7
102302	Aluminum base scrap	.499	1.070	114.4
13	Nonmetallic mineral products	2.538	3.392	33.6
132	Concrete ingredients and related products	1.977	2.813	42.3
139	Other nonmetallic minerals	.561	.578	3.0

[1] Relative importance data for commodity groupings include only these subproduct classes allocated to the respective stage-of-processing grouping. The revised weight structure (based on 1987 shipment of values) includes the effects of sample changes in January 1992, while the old weight structure does not include these sample changes.

n.e.c. = not elsewhere classified.

ries, such as fresh fruits and vegetables, were subject to internal weight shifts when series newly added in January 1992 forced a reduction in weights for series that were already included. These internal shifts allow weights for broader category totals to remain approximately the same before and after the introduction of the new series.

Finished goods

Within the PPI for Finished Goods, weights increased for the durable goods categories (consumer durable goods and capital equipment) and declined for the nondurable goods categories (consumer nondurable goods excluding foods, finished energy goods, and finished consumer foods).

The weight for the consumer durable goods category increased about one-fifth as a result of the major weight revision, registering a relative importance of 17.281 as of December 1991 with respect to the total weight for finished goods. Before the weight revision, consumer durables had a relative importance of 14.373 in that same month. In addition to the sizable weight increase for passenger cars described earlier, the weight for the light motor trucks category expanded 70.5 percent, partly because of the growing popularity of vans and pickups as second vehicles for families.

In addition, renewed consumer demand which accompanied the economic recovery boosted domestic production from 1982 to 1987 for many other items that are sensitive to the business cycle. As a dramatic example of this trend, the weight for the boats category and for motor homes on purchased chassis both increased nearly 70 percent as demand for recreation-oriented durable goods increased during the economic rebound. In the wake of increased demand for housing, weights for household furniture and tufted broadloom carpeting also climbed. Other substantial weight increases within the consumer durable goods category were recorded for lawn and garden equipment excluding tractors, double-wide residential mobile homes, refrigeration equipment, medical instruments and equipment, and television receivers.

In contrast, the relative importance of toys and games declined 40.8 percent. This category had experienced a strong boost in sales just before and

during 1982 when video games first appeared in commercial markets. By 1987, however, initial fads had waned. Production figures thus appeared much smaller than they did in 1982, resulting in a lower PPI weight.

The relative importance for single-wide residential mobile homes fell more than 30 percent as consumer interest shifted to multi-section residential mobile homes, for which the PPI weight increased. Other considerable weight declines were registered for small household appliances and for textbooks.

The weight for the capital equipment index rose 4.1 percent, registering a relative importance of 24.745 based on 1987 weights. As previously noted, sizable increases were registered in the weights of passenger cars and light motor trucks, which represent a major portion of the capital goods grouping as well as the consumer durables category. Weights nearly doubled for the heavy trucks index and increased nearly 60 percent for truck trailers; these shifts reflected increased demand during the mid-1980's, prompted by both the recovery and the deregulation of the trucking industry. The relative importance of electronic computers increased more than 60 percent as a result of the shift from 1982 to 1987 weights; industry sales expanded greatly as the recently developed personal computer increasingly became a staple for consumers and businesses. The weight for commercial furniture rose nearly 20 percent as office space increased with the rise of commercial construction during the recovery.

By contrast, the relative weight of agricultural machinery dropped nearly 50 percent, with sharper declines registered for wheel-type farm tractors and harvesting machinery. As farmers were unable to make large purchases because of excess debt and other factors, sales for new agricultural machinery plummeted. In addition, a 37.0-percent decline occurred in the PPI weight for ships, as production moved offshore and military expenditures were cut back. The weight for the oil field and gas field machinery grouping plunged nearly 80 percent. The industry suffered a severe reversal in the early 1980's as exploration came to a virtual halt when the worldwide price of petroleum plummeted. The relative importance of metal cutting machine tools fell by more than half despite the broad economic expansion because of the influx of imports.

Several items within the office and stores machines and equipment category experienced a substantial decline in weight. A decrease was noted for typewriters and word processors, as demand for these items shifted to personal computers. The calculator and adding machine industries saw much of their production move offshore, and many domestic producers were displaced by increased competition from Japan. Among other categories, the weight for power cranes fell considerably as sales for drag lines, a major product of the industry, declined markedly. Decreases also occurred for pumps, compressors, and equipment; railroad equipment; transformers and power regulators; and industrial material handling equipment.

The weight for the consumer nondurable goods excluding foods category decreased 6.8 percent, showing a relative importance of 36.041 in December 1991 after the weight update. The weight for the apparel grouping fell 12.1 percent, as competition from foreign producers increasingly crowded out domestic production. This encouraged manufacturers to move the assembly of finished garments offshore; such products are not counted as part of domestic production. Weights for the women's apparel category fell 17.5 percent, but declined only 6.2 percent for men's and boys' apparel, reflecting the fact that the domestic women's apparel industry was more affected by import competition than was the domestic men's apparel industry. The relative weight for footwear declined almost 40 percent, chiefly because of intensified import penetration, particularly from China, Taiwan, and South Korea. The weight for women's footwear dropped 45.0 percent, whereas the weight for men's footwear fell 28.2 percent. Relative to women's footwear, men's footwear is more expensive to produce, is more durable, and is subject to fewer style changes; accordingly, the men's footwear industry is less vulnerable to import competition.

Weights for prescription drugs dropped 15.0 percent, but rose 22.1 percent for over-the-counter drugs. During the 1980's, a number of drugs formerly sold by prescription were approved by the Food and Drug Administration for over-the-counter sales. In addition, a number of cheaper generic drugs appeared on the market when long-standing patents expired. Other considerable weight declines were registered for pet food and tires.

In contrast, the relative importance of the plastic products grouping expanded to more than 5 times its previous level after the major weight revision, chiefly because plastic products were increasingly replaced by metal, wood, and glass in the packaging, construction, and automotive industries. Within the packaging industry, end uses for specialty packaging produced a strong demand for plastics. The automakers' need to reduce costs in an increasingly global marketplace, as well as Federal Government pressure on the automakers to establish greater fuel efficiency by producing lighter weight vehicles, both enhanced the trend toward greater use of plastics.

The weight for the cosmetics and other toilet

preparations index moved up, largely because of stronger sales for sunscreen oils and lotions and for hair care and skin care products. Weight increases were also registered for the circulation of periodicals and for textile housefurnishings.

The weight for the finished energy goods index dropped 9.1 percent, recording a relative importance of 13.831. Weights for petroleum products decreased in response to major shifts in international markets, as increased production in the world market decreased many nations' share of marketable oil. Among other influences were the rise in world production capacity, which reflected expanded North Sea oil production; a boost in exports from countries with troubled economies needing to service their overseas debts; and higher production from Iran and Iraq, both seeking export revenues to finance their long war. All these factors contributed to a breakdown of production discipline within the Organization of Petroleum Exporting Countries (OPEC) and the consequent lessening of each producer's share of marketable oil. In this country, figures for domestic crude petroleum field production, rigs in operation, and drilling of new wells declined during the 1982–87 period.[5]

Within the gasoline category, there was a major shift from leaded gasoline to unleaded grades as more of the older motor vehicles, which were the sole users of leaded gasoline, were no longer in use. (Leaded-gasoline vehicles were increasingly retired from use after unleaded-gasoline vehicles became required under government environmental regulations created in the 1970's.) A drop in natural gas production prompted a decrease of 29.0 percent in relative importance for residential natural gas. The phaseout of government price controls on natural gas during the late 1970's and early 1980's led initially to much higher prices, which dampened demand and thereafter resulted in lower production.

The weight for the finished consumer foods category declined 5.5 percent to a relative importance level of 21.933. The index for fluid milk products dropped nearly 30 percent in weight. Consumption of whole beverage milk and cottage cheese was reduced, partly reflecting a relative decline in the proportion of young people. The weight for cola excluding diet cola fell 27.7 percent as many consumers switched to diet cola and noncarbonated drinks. The beef and veal category weight decreased 9.2 percent, mostly because of lower commercial cattle and calf slaughter rates, as consumers shifted to poultry products. The production and consumption of pork also decreased as consumer preferences moved from pork to poultry; accordingly, the weight for pork fell 12.4 percent.

The relative weight for roasted coffee declined almost 20 percent, partly because of poor coffee bean harvests in the 1980's. Other sizable weight decreases were registered for fresh and dried vegetables, fish, bakery products, condensed and evaporated milk, and dry milk products. By contrast, the relative importance of processed poultry expanded 19.6 percent. Other considerable weight increases within the consumer foods category were recorded for noncarbonated soft drinks, frozen specialties, and canned fruit juices.[6]

Within the overall finished goods category, one of the most important technical changes that coincided with the major weight revision was largely responsible for the 20-percent drop recorded in the weight of the cigarettes index. The relative importance of the cigarettes index had been revised upward each year before 1991 because of sharp price increases for cigarettes. However, until December 1991, cigarette prices collected for the PPI did not include export prices, which increased at a slower pace than did domestic prices. The value of shipments data which underlie the relative importance statistics have always been based on commodities both for export and domestic use. Therefore, the new relative importance figure appeared to decline because the previous statistics were based on data that failed to capture the slower rate of increase for export prices.[7]

Intermediate goods

Although the Intermediate Goods Price Index encompasses more commodities than does either the Finished Goods Price Index or the Crude Goods Price Index, the weight shifts within the intermediate stage of processing categories were milder than for those within either of the other two major stage-of-processing categories. The most prominent increases in relative importance occurred in the categories for construction materials and for manufacturing components. Advances were also recorded in the categories for both durable and nondurable manufacturing materials. In contrast, the relative importance dropped in categories for energy goods, containers, and supplies for nonmanufacturing industries.

The weight for the construction materials category expanded 9.1 percent, registering a relative importance of 13.462 as of December 1991. A vigorous revival in both residential and nonresidential construction activity played a major part in the economic recovery of the 1980's. The resurgence of residential construction was prompted by a decrease in mortgage rates, as 30-year conventional fixed mortgage rates fell from 16 percent in 1982 to 10 percent in 1987.[8] Housing starts advanced 53 percent during this interval, reaching a peak of more than 1.8 million units in 1986. There was a stronger demand for larger homes, as well as a

trend toward remodeling and repairing older homes. In response, lumber production expanded 50 percent during this period.[9] In nonresidential construction markets, the total floor space for newly constructed commercial and other nonresidential buildings rose 46 percent and the value of new nonresidential building construction moved up 23 percent from 1982 to 1987.[10] Changes in tax laws facilitated this boom in nonresidential construction.

The mid-1980's witnessed the increased use of plastic construction products in place of metal pipes and other construction products made from metal; the weight for plastic construction products accordingly jumped 81 percent. Substantial increases in relative importance were also observed for millwork products, softwood lumber, concrete products, lighting fixtures, floor coverings, unitary air conditioners, and mineral wool for insulation.

In contrast, a decline of 23 percent was noted in the weight for structural metal products. Production figures for these items had in fact remained steady because demand for these products is dependent on long-term contracts for civil engineering projects. The PPI weight for structural metal products declined relative to the increase of about 20 percent in the total value of shipments for intermediate goods that resulted from the shift to 1987 shipment values. (This is an example of what was discussed earlier in "Relative importance data.")

The relative importance of the components for manufacturing index increased 5.2 percent, registering a relative importance of 19.569 as of December 1991. Increased demand for plastic parts and components for manufacturing prompted that category to more than quadruple its previous weight. The following categories also expanded substantially: new motor vehicle parts; electronic components and accessories; automobile stampings and other miscellaneous metal products; aircraft parts and auxiliary equipment; engine electrical equipment; aircraft engines and parts; and hardware products. In contrast, weights for miscellaneous plastic products and for steam and hydraulic turbines dropped to about one-third of their previous levels. Declines were also registered for industrial controls, internal combustion engines, rubber tires, mechanical power transmission equipment, and motors and generators.

The weight for the durable manufacturing materials index rose 3.3 percent, registering a relative importance of 11.089. Notably, the relative importance for flat glass rose 48 percent. This surge was attributable to several factors, including the increase in exports to Canada and Mexico during the 1982–87 interval; the rise in demand from the automobile industry, in line with the recovery; and for natural gas, a major input to glass processing. The weight for copper and brass mill shapes advanced by nearly a third. The copper industry had contracted much more than most other industries during the recessions of the early 1980's; thus, the increase in PPI weight reflected a larger rebound for that industry. Advances of less than 10 percent were noted for aluminum mill shapes, hot rolled steel sheet and strip, and prepared paint.

In contrast, weights declined for most steel mill products and other metal products. Steel mills were greatly affected by the downsizing of U.S. cars and by the declines in demand for new oil and gas operating rigs, for general machinery, and for railroad equipment. Substantial decreases were registered for steel pipe and tubes, foundry and forge shop products, primary nonferrous metals, hot rolled steel bars, plates and structural shapes, secondary nonferrous metals, rough hardwood lumber, and gold and silver mill shapes.

The weight for the nondurable manufacturing materials index edged up 0.8 percent; many component items within this category, however, showed substantial advances or declines. Among advances, the increased demand for plastic products prompted a weight expansion for plastic resins and materials and for related petrochemicals. Sales for American-made synthetic fibers were boosted when China suspended its shipments for that product in the early 1980's. Demand for fabricated textile products (car seat covers, awnings, and so forth) increased as the automotive and housing industries rebounded. Weight increases of more than 20 percent were registered for styrene monomer, plastic resins and materials, synthetic fibers, industrial and other fabricated textile products, biological products, printing ink, and adhesives and sealants. Cotton yarns expanded nearly 68 percent, reflecting increased consumer preferences for natural fibers, as well as decreased imports from China as inclement weather lowered its cotton production.

Weights for several nondurable manufacturing materials showed significant declines, however. Production of pesticides and related products was lower, partly because of increasing environmental restrictions on their end use. Declines of greater than 20 percent were noted for agricultural chemicals and chemical products, fiber and composite cans, miscellaneous converted paper and board products, synthetic broadwoven gray and finished fabrics, stemmed tobacco, and leather. Decreases closer to 10 percent were registered for converted paper and paperboard products; paper, plastic, and foil bags; machine shop products; and synthetic yarns.

The weight for intermediate energy goods dropped 9.8 percent, showing a relative impor-

the following indexes declined considerably: natural gas for commercial, industrial, and electric utility use; premium grade motor gasoline; residual fuels; and finished lubricants. Weights for industrial and commercial electric power fell about 4 percent. Leaded gasoline dropped to one quarter of its previous weight level, and the weight for diesel fuel decreased 9 percent. Expansions were noted, however, for jet fuels and for unleaded regular and mid-premium gasolines.

The category for nonreturnable containers showed a drop of 14.2 percent in weight. Weights for steel cans and glass containers both declined about 33 percent. Demand for cans shifted from steel to aluminum as effective programs for aluminum recycling lowered costs and influenced consumer preference. Glass containers were increasingly replaced by plastic containers.

The weight for the supplies for nonmanufacturing industries index fell 3.5 percent. Substantial decreases were registered for steel pipe and tubes, agricultural chemicals, formula feeds, farm machinery parts, and farm tractor parts. The weight for miscellaneous publishing, however, increased by more than half as the telephone book industry expanded. Organizational and other specialized telephone books were developed and successfully marketed, and competition in yellow pages publications intensified. Other advances were noted for plastic packaging, advertising printing, medical instruments and equipment, and agricultural equipment parts. The weight for consumer, institutional, and commercial plastic products increased sixfold.

Among series for intermediate foods and feeds not already mentioned under the supplies for nonmanufacturing industries category discussed earlier, declines were noted for refined sugar, flour, beef and veal, and condensed and evaporated milk. The weight of the category for confectionery materials, however, expanded 26 percent.

Within the overall intermediate goods category, a technical change affected the 41-percent drop in the weight of the PPI for pumps and compressors. This represented a reallocation of many pump and compressor series to several special industry machinery categories. In the industrial chemicals area, improved techniques of weight estimation prompted declines in relative importance for aluminum oxide and miscellaneous organic chemicals.

Crude goods

The crude materials category showed a sizable shift in weight from energy as a result of the major weight revision. Crude oil and natural gas weights declined, while weights for scrap metal and construction-related commodities advanced.

The relative importance of crude energy materials fell 16.8 percent to a level of 40.028. The weight for natural gas to pipelines led this contraction, dropping 24.1 percent. Prices and production of natural gas decreased from 1982 to 1987 as consumers shifted to other energy sources. The weight of crude petroleum dropped 12.0 percent in response to the world market pressures discussed earlier. During the 1982–87 period, domestic field production for crude oil dropped 3.5 percent, oil wells drilled fell 58.5 percent, and oil and gas rotary rigs in operation declined 70 percent. The weight for contract sales of prepared bituminous coal fell 14.1 percent, as many older and less efficient mines were forced to shut down.

The weight for the index for crude nonfood materials less energy advanced 24.0 percent as a result of the weight update, with a relative importance of 18.629 as of December 1991. The weight of the aluminum scrap index doubled. Aluminum scrap became an increasingly valuable commodity during the 1980's, largely because the energy costs for reclaiming aluminum from used aluminum beverage cans was much less than the cost associated with producing primary aluminum. In addition, demand for aluminum products increased from the aerospace, automotive, and construction industries. The weight for copper scrap was driven 40.4 percent higher, chiefly by intensified demand for copper products from the residential construction sector and by increased exports of copper scrap to resource-poor countries such as Japan and Taiwan.

Weight increases for sand and gravel (about 42 percent) and for forestry products (about 29 percent) were prompted by higher demand from the construction sector. The weight for gold ores more than tripled as a result of the discovery of large ore deposits in northern Nevada which were amenable to inexpensive open pit mining. With these new mines in place, the United States expanded from the world's fourth largest producer of gold to the second, trailing only South Africa. The weight for pulpwood grew by more than two-thirds largely in response to the growing demand for newsprint. The relative importance of raw cotton expanded more than 25 percent as Americans increasingly preferred cotton garments to those made with synthetic fibers.

In contrast, weights for wastepaper, leaf tobacco, and iron ore decreased. The decline of nearly one-third in weight for the wastepaper index was prompted by the additional cost of separating different types of paper for recycling, which made wastepaper prices increasingly uncompetitive. The weight decrease of 23.5 percent for leaf tobacco resulted from a decline in planted acreage which was in response to the increased proportion of imported leaf tobacco used in domestic blends to manufacture tobacco prod-

ucts. The weight of the iron ore category decreased 19.2 percent, as old-style steel mills increasingly gave way to minimills which smelted scrap instead of ore.

The weight of the crude foodstuffs and feedstuffs category climbed 11.9 percent, reaching a relative importance level of 41.228. The weight for corn expanded by 23.7 percent, and that for alfalfa hay by nearly 30 percent. Carry-in stocks for corn and hay were much less in 1982 than in 1987, largely because of poor harvests at the beginning of the decade. Also rising in weight were slaughter chicken broilers and fryers, eggs, and slaughter turkeys. Higher production of slaughter broilers, fryers, and turkeys was prompted by a shift in consumer tastes.

In contrast, the weight of the category for milk for manufacturing fell 40 percent as improved storage and transportation facilitated a quicker conversion of fluid milk to a variety of dairy products. The weight for slaughter barrows and gilts fell 8.1 percent in tandem with the shift in consumer preferences away from pork towards poultry products. □

Footnotes

[1] For a detailed analysis of the concepts underlying PPI weights and a description of the previous PPI weight revision, see Andrew Clem and William Thomas, "New weight structure being used in Producer Price Index," *Monthly Labor Review*, August 1987, pp. 12–21. Also, see *BLS Handbook of Methods*, Bulletin 2414 (Bureau of Labor Statistics, September 1992), Chapter 16, "Producer Prices."

[2] *Federal Reserve Bulletin*, June 1985 and June 1988, table 3.28 (Foreign Exchange Rates).

[3] A comprehensive listing of the revised (1987) and former (1982) weights can be found in the tables of relative importances which appear in *Supplement to Producer Price Indexes Data for 1991* (Bureau of Labor Statistics, September 1992). This supplement includes three tables of relative importance data. Table 10 of the *Supplement* provides the relative importance of subproduct classes by the detailed stage of processing category; table 11 shows the relative importance of commodity groupings by the major stage of processing category; and table 12 lists the relative importance of commodity groupings and individual items with respect to the all commodities index.

[4] *Agricultural Statistics* (Washington, DC, U.S. Department of Agriculture, 1989).

[5] *Monthly Energy Review* (Washington, DC, U.S. Department of Energy, Energy Information Administration, May 1992).

[6] One of the technical changes that affected weights within the consumer foods category was the split of the PPI for white potatoes (commodity code 011304) into two new series as of January 1992. One new series, "Irish potatoes for consumer use," retained the old series code number (011304) while the other new series, "Irish potatoes for processing," was assigned a new commodity code 011305. The consumer use series appears to register a strong decline and the processing series shows an increase (or a positive weight where there was no weight before). Superficially, these might appear to reflect large changes in these markets. However, the only substantial change in this case has been in the definition of the index series and not in the markets those series represent. Another coincidental technical change affected the chicken eggs indexes. A new series (017108) was created in January 1992 to account for the increasing importance of eggs used by the processed food industry. A significant part of the weight for eggs that had been allocated to finished goods was accordingly moved to crude materials.

[7] In another technical change that coincidently occurred in December 1991, the weight for photographic equipment, excluding photocopy rose immensely because the index for photocopy equipment was eliminated at that time and its weight was then imputed (that is, re-assigned) to the photographic equipment category. A technical factor of a different sort underlay the large weight increases recorded for communication-related equipment; coverage within the PPI system for these commodities expanded when the PPI Revision program first introduced this industry in 1986.

[8] Information from the Federal Home Loan Mortgage Corporation.

[9] *Current Industrial Reports* (U.S. Department of Commerce, Bureau of the Census, Economics and Statistics Administration, 1991).

[10] *Current Construction Reports* (U.S. Department of Commerce, Bureau of the Census, 1992).