

A Comparison of EIA-782 Petroleum Product Price and Volume Data with Other Sources

By Carol Joyce Blumberg

Highlights

The article “A Comparison of EIA-782 Petroleum Product Price and Volume Data with Other Sources” has appeared in *Petroleum Marketing Monthly* since 1989. It compares annual average prices reported from the EIA-782 survey series for residential No. 2 distillate, on-highway diesel fuel, retail regular motor gasoline, refiner No. 2 fuel oil for resale, refiner No. 2 diesel fuel for resale, refiner regular motor gasoline for resale, and refiner kerosene-type jet fuel for resale with annual average prices reported by other sources. In terms of volume, it compares EIA-782C Prime Supplier annual volumes for motor gasoline (all grades), distillate fuel oil, kerosene-type jet fuel and residual fuel oil with annual volumes from other sources. The other sources used for comparison in this article were the EIA-821 survey, EIA-878 survey, EIA-888 survey, *Petroleum Supply Annual*, Bureau of Labor Statistics (BLS) Consumer Price Indexes (CPI) and the Producer Price Index (PPI), OPIS (Oil Price Information Service), and Federal Highway Administration (FHWA). See Source Notes at the end of this article for more details.

For the years 1994 through 2006, it was found that the EIA-782 series is almost equivalent to other data sources for on-highway diesel fuel prices and motor gasoline (all grades) volumes. The EIA-782 series is meaningfully lower than its most comparable source for residential No. 2 distillate prices, retail regular motor gasoline prices, distillate fuel oil volumes, kerosene-type jet fuel volumes and residual fuel oil volumes. For the remaining values studied, which were all of the resale prices, it was necessary to transform the data into yearly growth rates for comparison periods. These yearly growth rates differed minimally between sources for all products. But the ratios between sources of the yearly growth rates were unstable.

The reasons for these meaningful differences for residential No. 2 distillate prices, retail regular motor gasoline prices, distillate fuel oil volumes, kerosene-type jet fuel volumes, and residual fuel oil volumes were investigated. For residential No. 2 distillate prices the most comparable source was the BLS CPI. The differences here may have been because BLS includes only urban areas in its data collection and includes local taxes and some specialized taxes at the State level that are impossible to remove for comparison with the EIA-782 series. For retail regular motor gasoline prices the most comparable source was the EIA-878 survey. The differences here may have been caused by the extreme difficulty of removing local taxes and State percentage taxes from the EIA-878 data. For distillate fuel oil volumes, kerosene-type jet fuel volumes, and residual fuel oil volumes the differences seem to be caused in part by the slight variations in the definitions used by each of the sources.

Introduction

The article “A Comparison of EIA-782 Petroleum Product Price and Volume Data with Other Sources” has appeared in *Petroleum Marketing Monthly* since 1989. This present version will compare annual average prices from the EIA-782 survey series for residential No. 2 distillate, on-highway diesel fuel, retail regular motor gasoline, refiner No. 2 fuel oil for resale, refiner No. 2 diesel fuel for resale, refiner regular motor gasoline for resale, and refiner kerosene-type jet fuel for resale with annual average prices from other sources. In terms of volume, it will compare EIA-782C Prime Supplier annual volumes for motor gasoline (all grades), distillate fuel oil, kerosene-type jet fuel and residual fuel oil with annual volumes from other sources. The EIA-782 survey series collects data on petroleum markets to fulfill Congressional mandates and to provide comprehensive information on market behavior. It includes three surveys: Form EIA-782A, “Refiners’/Gas Plant Operators’ Monthly Petroleum Product Sales Report;” Form EIA-782B, “Resellers’/Retailers’ Monthly Petroleum Product Sales Report;” and Form EIA-782C, “Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption.” These surveys are the basis for much of the information reported in *Petroleum Marketing Monthly* (PMM) and *Petroleum Marketing Annual* (PMA). The EIA-782A is a census of

approximately 100 refiners and gas plant operators. The EIA-782B is a sample of approximately 2,000 out of approximately 24,400 resellers/retailers identified through the EIA-863 quadrennial survey. The EIA-782C is a census of approximately 185 refiners, gas plant operators, importers, and inter-State resellers and retailers in the U.S. that are Prime Suppliers for local consumption. A Prime Supplier is “a firm that produces, imports, or transports selected petroleum products across State boundaries and local marketing areas, and sells the product to local distributors, local retailers, or end users” (EIA Glossary at <http://www.eia.doe.gov/glossary/index.html>.) The EIA-782C measures product delivery into each State for that State’s consumption. A company may be both a reseller and a retailer and indicates this when filling out the EIA-782C.

Data Sources

Only data for the EIA-782 surveys and other sources from 1994 onward are used because there was a major redesign of the EIA-782 surveys in 1993. More details on these sources are in the Source Notes section at the end of this article.

Sources of Price Data

Internal to EIA

- Form EIA-878, “Motor Gasoline Price Survey,” for retail prices of regular motor gasoline.
- Form EIA-888, “On-Highway Diesel Fuel Price Survey,” for retail prices of on-highway diesel fuel.

External to EIA

- The Bureau of Labor Statistics (BLS) Consumer Price Indexes (CPI) for retail prices of regular motor gasoline, on-highway diesel fuel, and residential No. 2 distillate.
- The BLS Producer Price Index (PPI) numbers for resale regular motor gasoline, No. 2 fuel oil, No. 2 diesel fuel, and kerosene-type jet fuel.
- Oil Price Information Service (OPIS) for retail prices of on-highway diesel fuel.
- Federal Highway Administration (FHWA) for taxes on retail on-highway diesel fuel and regular motor gasoline.

Sources of Volume Data

Internal to EIA

- Form EIA-821, “Annual Fuel Oil and Kerosene Sales Report,” for volumes of distillate fuel oil and residual fuel oil.
- *Petroleum Supply Annual (PSA)* for product supplied volumes of distillate fuel oil, motor gasoline (all grades), kerosene-type jet fuel and residual fuel oil.

External to EIA

- Federal Highway Administration (FHWA) for taxed retail volumes of motor gasoline (all grades).

Price Comparisons for Retail Sales

This section will compare EIA-782 data to data from other sources for retail prices for the years 1994 through 2006. The EIA-782 averages in the tables in this section will be given twice. First, the annual averages reported in *Petroleum Marketing Annual (PMA)* will be given. The EIA-782A and the EIA-782B collect both price and volume data. So, *PMA* computes weighted annual averages for retail prices by using total sales (in \$) for the year as the numerator and total volume (in gallons) for the year as the denominator. Second, an unweighted average (arithmetic mean) of the monthly prices reported in *PMA* will be given. This is done to make the EIA-782 data more comparable to other sources of published data, since the other sources of published data only collect price data and, thus, must use arithmetic means.

Throughout this section, references to tables from the *PMA*, *Weekly Petroleum Status Report (WPSR)*, and BLS will be made. The tables for *PMA* are on the EIA website at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_marketing_annual/pma.html. For *WPSR* they

are at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/wpsr.html. For both *PMA* and *WPSR*, the HTML versions of the tables were used since they contain the historical data. Tables for the BLS Consumer Price Indexes (CPI) are available from <http://data.bls.gov/PDO/outside.jsp?survey=ap>.

Residential No. 2 Distillate Prices

Table FE1 is the annual summary data for residential No. 2 distillate prices. In *PMA* the data are in Table 18 in the U.S. Average row. These are the numbers shown in the second column of Table FE1 in this article. The third column of Table FE1 is the arithmetic mean of the data reported for the 12 months of each year. It is this column that is then compared to the BLS data. The BLS CPI data are series APU000072511, U.S. city average for Fuel oil #2, per gallon. Figure FE1 shows the BLS and EIA-782 arithmetic means over time.

While the raw differences between the BLS and EIA-782 price data increased somewhat over the years, the BLS data were consistently higher than the EIA data by between 3.6 percent and 8.2 percent. These differences may be because the BLS data are collected only in 87 urban areas and include State and local taxes, while the EIA-782 data are collected over the entire United States and do not include taxes.

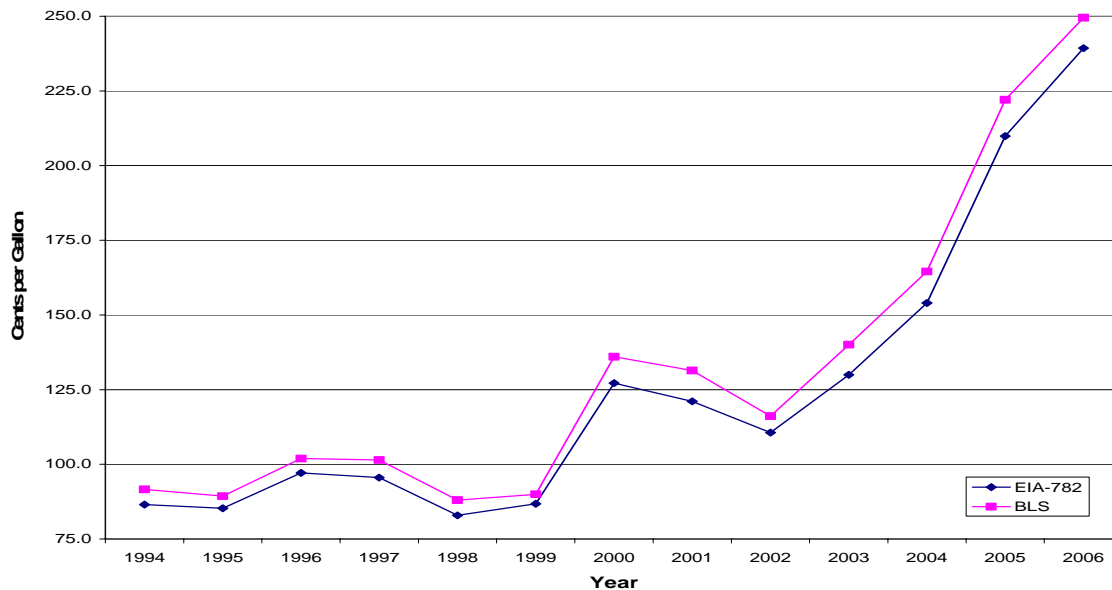
Table FE1. Residential No. 2 Distillate Prices, 1994-2006 (Cents per Gallon)

Year	EIA-782 Reported in PMA	Arithmetic Mean of EIA-782 Monthly Data	BLS	Differences BLS Minus EIA-782	Percentage BLS Divided by EIA-782
1994	88.4	86.6	91.6	5.1	105.8
1995	86.7	85.3	89.3	4.0	104.7
1996	98.9	97.2	101.9	4.8	104.9
1997	98.4	95.6	101.4	5.9	106.2
1998	85.2	82.9	88.0	5.1	106.1
1999	87.6	86.8	90.0	3.1	103.6
2000	131.1	127.2	136.0	8.8	106.9
2001	125.0	121.1	131.0	9.9	108.2
2002	112.9	110.7	116.2	5.5	105.0
2003	135.5	130.0	140.0	10.1	107.7
2004	154.8	154.1	164.5	10.5	106.8
2005	205.2	209.9	222.1	12.2	105.8
2006	236.5	239.3	249.5	10.2	104.3

Note: The EIA-782 reported annual U.S. averages from *Petroleum Marketing Annual* are the data in the second column of the table. The third column is the arithmetic means of the data for the 12 months of each year. It is this third column that is compared to the BLS data. Differences across columns may not add due to independent rounding.

Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 18; BLS: Bureau of Labor Statistics CPI, series APU000072511, U.S. city average for Fuel oil #2, per gallon.

Figure FE1. EIA-782 Arithmetic Means versus BLS Data for Residential No. 2 Distillate Prices, 1994-2006



Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 18; BLS: Bureau of Labor Statistics CPI, series APU000072511, Fuel oil #2, per gallon.

On-Highway Diesel Fuel Prices

Table FE2 is the annual summary data for on-highway prices for No. 2 low-sulfur diesel fuel. The EIA-782 data include sales, with all taxes removed, from all locations owned by respondents including truckstops, travel plazas, and gas stations. The data are in the Through Retail Outlets row under No. 2 Diesel Fuel Low Sulfur of Table 16 of *PMA*.

The comparable data sources here all include taxes. So, the taxes must be removed from these other sources to make them comparable to the EIA-782 data. The Federal taxes are from Table EN1 of *PMA*. For years where the Federal tax changed within a year, an average, weighted by the number of months each amount was in effect, was used. The State taxes are from the FHWA website and are a weighted average “based on net gallons taxed.” The Federal and State taxes per gallon were subtracted from the average price for the year for each of the non-EIA-782 sources. No adjustments were made for local sales taxes and other State and local fuel taxes because there was insufficient information available for making these adjustments. The EIA-888 and the BLS data include State (and in a few instances local) taxes based on a percentage of sales (see Table EN1 of *PMA* for details) in addition to the standard cents per gallon taxes. The number of States with these extra taxes was 24 in 1994, 19 in 2000, and 19 in 2006 and the percentages charged did not change much over these 12 years.

The EIA-888 collects prices as of 8:00 a.m. each Monday from its sample of 350 retail outlets. The weekly average prices are reported in the Diesel (On-Highway)—All Types row of Table 17 of *WPSR*. The OPIS data are sent to the Office of Oil and Gas of the EIA each Monday morning. They are the average of the prices “at more than 8,000 active truckstops and travel plazas in the U.S. and Canada...gathered by major fuel card companies [and] through direct feeds from major truckstop chains” on the day before (Sunday). See <http://opisnet.com/methodology.asp> for more details. An arithmetic mean of the prices from the report dates of the Mondays in each calendar year was used to form the annual values for both the EIA-888 and OPIS data. The BLS data are the arithmetic means of the monthly values from CPI, series APU000074717, U.S. city average for Automotive diesel fuel, per gallon.

Table FE2. On-Highway Diesel Fuel Prices, 1994-2006 (Cents per Gallon)

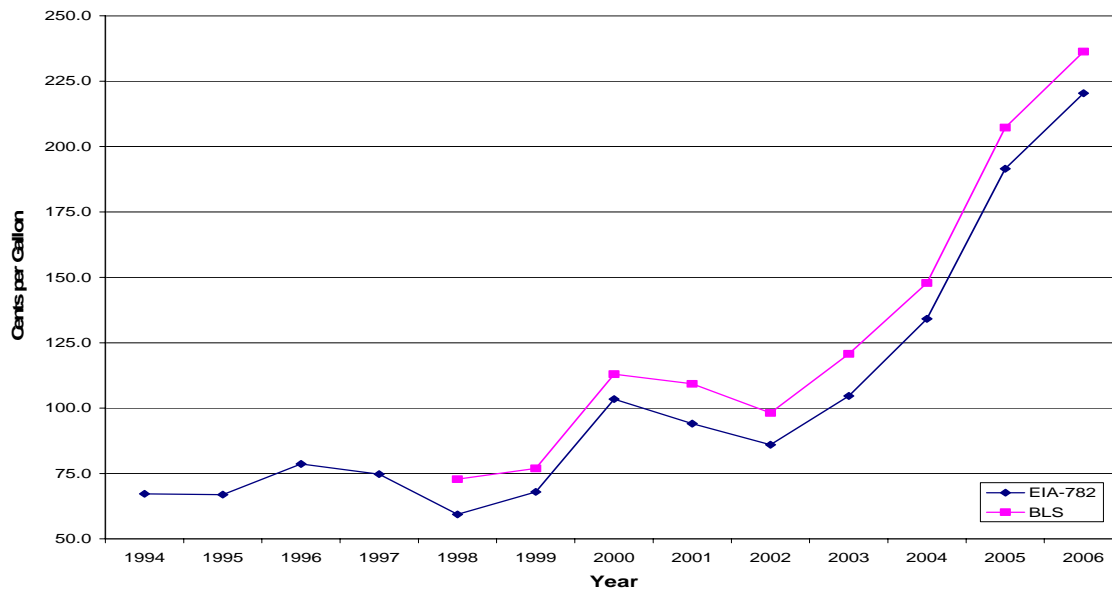
Year	Federal Taxes	Weighted Average of State Taxes	EIA-782 Reported in PMA	Arithmetic Mean of EIA-782 Monthly Data	EIA-888 Without Taxes	OPIS Without Taxes	BLS Without Taxes	EIA-888 Minus EIA-782	OPIS Minus EIA-782	BLS Minus EIA-782	EIA-888 Divided by EIA-782	OPIS Divided by EIA-782	BLS Divided by EIA-782
1994	24.4	18.9	67.3	67.2	68.1	66.2	--	0.8	-1.0	--	101.3	98.5	--
1995	24.4	19.0	67.0	66.9	67.6	66.1	--	0.6	-0.8	--	100.9	98.7	--
1996	24.3	19.0	78.8	78.6	80.2	79.0	--	1.6	0.4	--	102.0	100.5	--
1997	24.3	19.5	74.5	74.8	76.2	75.0	--	1.4	0.2	--	101.9	100.3	--
1998	24.4	20.2	59.3	59.4	59.9	58.7	72.8	0.6	-0.6	13.4	101.0	98.9	122.6
1999	24.4	20.0	68.5	67.9	67.6	66.5	76.9	-0.3	-1.4	9.0	99.6	97.9	113.2
2000	24.4	20.4	103.6	103.4	104.6	103.8	112.9	1.1	0.4	9.5	101.1	100.4	109.2
2001	24.4	19.7	94.3	94.1	96.3	95.3	109.3	2.2	1.2	15.2	102.4	101.3	116.2
2002	24.4	20.0	86.2	86.0	87.1	86.4	98.2	1.2	0.4	12.2	101.4	100.5	114.2
2003	24.4	19.4	104.4	104.6	107.0	106.1	120.7	2.4	1.4	16.1	102.3	101.4	115.4
2004	24.4	19.9	134.8	134.2	136.5	135.3	147.8	2.3	1.2	13.7	101.7	100.9	110.2
2005	24.4	20.4	193.3	191.5	195.1	193.4	207.2	3.6	1.9	15.7	101.9	101.0	108.2
2006	24.4	20.7	220.8	220.4	225.4	211.4	236.3	5.0	-9.0	15.9	102.3	95.9	107.2

Note: The EIA-782 reported annual U.S. averages from *Petroleum Marketing Annual* are the data in the fourth column of the table. The fifth column is the arithmetic means of the data for the 12 months of each year. It is this column that is compared to the other data sources. Differences across columns may not add due to independent rounding. The symbol -- stands for Not Applicable.

Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 16; EIA-888: *Weekly Petroleum Status Report*, Table 17; OPIS: Weekly report on Monday sent to EIA by OPIS (Oil Price Information Service) from the Retail Diesel Pricing daily survey; BLS: Bureau of Labor Statistics CPI, series APU000074717, U.S. city average for Automotive diesel fuel, per gallon; Federal tax information: *Petroleum Marketing Annual*, Table EN1; State tax information: Federal Highway Administration (FHWA), Table MF205 at <http://www.fhwa.dot.gov/policy/ohim/hs03/htm/mf205.htm> for 1994 to 2003 and Table MF-121T at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2004 to 2006.

From Table FE2 it can be seen that the EIA-782, EIA-888 prices without taxes and the OPIS prices without taxes are almost identical for all years except 2006. In 2006, the OPIS price without taxes was much lower than the EIA-782 and EIA-888 price. The BLS prices without taxes are, however, always higher than the other three. Also from 2000 to 2005, the EIA-782 prices were a few cents lower than the OPIS prices, which in turn, were a few cents lower than the EIA-888 prices. BLS only collects data in 87 urban areas and only at retail gas stations. So, they are mostly diesel sales for automobiles, whose prices are higher than on-highway sales to non-automobiles due to economies of scale. The OPIS data are only from truckstops and travel plazas. The EIA-782 and EIA-888 collect data from all types of retailers, with the vast majority of sales being non-automotive use. The EIA-782 and BLS annual means are shown graphically in Figure FE2. The figure does not include the EIA-888 and OPIS averages because they could not be distinguished graphically from the EIA-782 averages except for 2006.

Figure FE2. EIA-782 Arithmetic Means versus BLS Data for On-Highway Diesel Fuel Prices, 1994-2006



Note: The BLS values have cents per gallon Federal and State taxes removed from them.

Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 16; BLS: Bureau of Labor Statistics CPI, series APU000074717, U.S. city average for Automotive diesel fuel, per gallon; Federal tax information: *Petroleum Marketing Annual*, Table EN1; State tax information: Federal Highway Administration (FHWA), Table MF-205 at <http://www.fhwa.dot.gov/policy/ohim/hs03/htm/mf205.htm> for 1994 to 2003 and Table MF-121T at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2004 to 2006.

Retail Regular Motor Gasoline Prices

Table FE3 contains summary data for retail regular motor gasoline prices. The EIA-782 data include sales, without taxes, to end users through retail outlets owned by respondents including truckstops, travel plazas, and gas stations. The data are reported in the U.S. row of the Regular Gasoline, Through Retail Outlets version of Table 31 of *PMA*.

The comparable data sources here all include taxes. So, the taxes must be removed from these other sources to make them comparable to the EIA-782 data. The Federal taxes are from Table EN1 of *PMA*. For years where the Federal tax changed within a year, an average, weighted by the number of months each amount was in effect, was used. The State taxes are from the FHWA and are a weighted average “based on net gallons taxed.” The Federal and State taxes per gallon were subtracted from the average price for the year for each of the non-EIA-782 sources. No adjustments were made for local sales taxes and other State and local fuel taxes because there was insufficient information available for making these adjustments.

Table FE3. Retail Regular Motor Gasoline Prices, 1994-2006 (Cents per Gallon)

Year	Federal Taxes	Weighted Average of State Taxes	EIA-782 Reported in PMA	Arithmetic Mean of EIA-782 Monthly Data	EIA-878 Without Taxes	BLS Without Taxes	EIA-878 Minus EIA-782	BLS Minus EIA-782	EIA-878 Divided by EIA-782 (as a Percentage)	BLS Divided by EIA-782 (as a Percentage)
1994	18.4	18.5	69.4	69.2	70.5	74.3	1.3	5.1	101.9	107.3
1995	18.4	18.5	72.5	72.4	74.1	77.8	1.7	5.4	102.3	107.5
1996	18.3	18.7	81.2	80.8	82.9	86.1	2.1	5.3	102.6	106.5
1997	18.3	19.1	80.0	80.1	82.6	86.0	2.5	5.9	103.1	107.3
1998	18.4	20.0	62.5	62.6	64.6	67.6	2.0	5.0	103.3	108.0
1999	18.4	19.3	73.0	72.5	75.8	78.8	3.3	6.3	104.5	108.7
2000	18.4	20.2	106.6	106.1	110.0	112.4	3.8	6.3	103.6	105.9
2001	18.4	19.1	99.6	99.4	105.1	108.6	5.7	9.2	105.7	109.2
2002	18.4	19.1	91.6	91.2	96.5	98.2	5.3	7.0	105.8	107.7
2003	18.4	19.1	111.1	111.1	118.4	121.6	7.3	10.5	106.6	109.4
2004	18.4	19.5	140.1	139.6	147.0	150.1	7.4	10.6	105.3	107.6
2005	18.4	20.1	181.0	180.4	188.3	191.1	8.0	10.7	104.4	105.9
2006	18.4	20.3	210.0	209.2	218.2	220.2	9.1	11.0	104.3	105.3

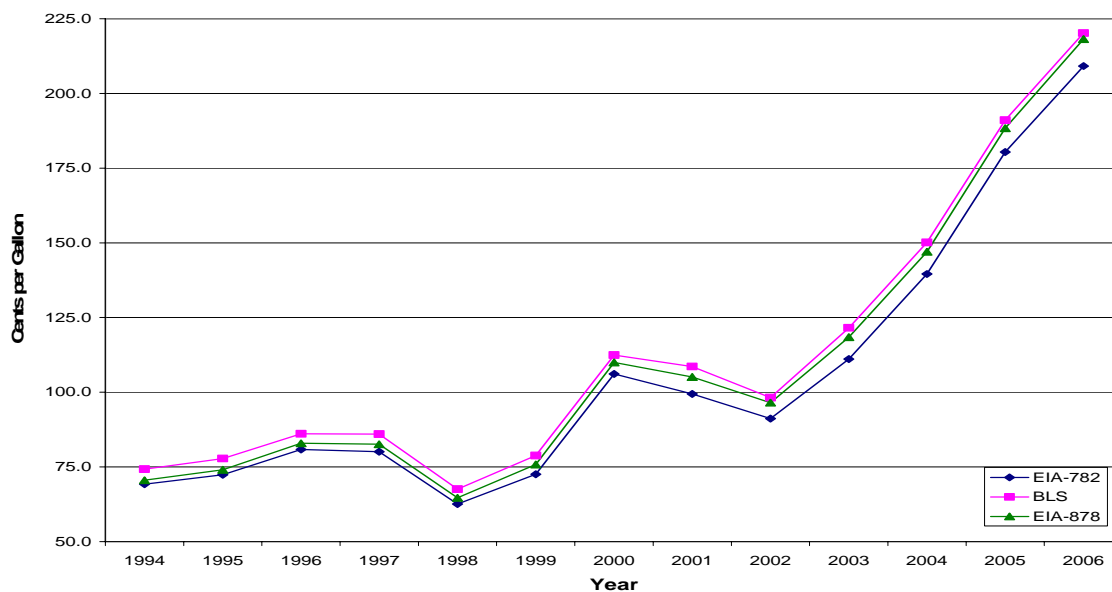
Note: The EIA-782 reported annual U.S. averages from *Petroleum Marketing Annual* are the data in the fourth column of the table. The fifth column is the arithmetic means of the data for the 12 months of each year. It is this column that is compared to the other data sources. Differences across columns may not add due to independent rounding.

Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 31; EIA-878: Energy Information Administration, *Weekly Petroleum Status Report*, Table 17; BLS: Bureau of Labor Statistics CPI, series APU000074714, U.S. city average for Gasoline, unleaded regular, per gallon; Federal tax information: *Petroleum Marketing Annual*, Table EN1; State tax information: Federal Highway Administration (FHWA), Table MF-205 at <http://www.fhwa.dot.gov/policy/ohim/hs03/htm/mf205.htm> for 1994 to 2003 and Table MF-121T at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2004 to 2006.

The EIA-878 collects prices as of 8:00 a.m. each Monday from its sample of approximately 1,200 retail gasoline outlets. The weekly average prices are reported in the Regular row under Gasoline-All Grades of Table 17 of *WPSR*. An arithmetic mean of the prices from the report dates of the Mondays in each calendar year was used to form the annual values for the EIA-878. The BLS CPI data are the arithmetic means of the monthly values from series APU000074714, U.S. city average for Gasoline, unleaded regular, per gallon.

From Table FE3 it can be seen that the raw differences between the EIA-782 means and the EIA-878 and BLS data are increasing over time. The EIA-878 and the BLS data include State (and in a few instances local) taxes based on a percentage of sales (see Table EN1 of *PMA* for details) in addition to the standard cents per gallon taxes. The number of States with these extra taxes was 24 in 1994, 20 in 2000, and 20 in 2006 and the percentages charged did not change much over these 12 years. As the price increases per gallon, the amount collected in per gallon percentage taxes increases automatically. For example, a 5 percent tax yields 10 cents when the pre-tax price is \$2.00 and 15 cents when the pre-tax price is \$3.00. This may be why the ratios between the EIA-878, BLS and EIA-782 prices have remained quite consistent since 2001. The annual means are graphed in Figure FE3.

Figure FE3. EIA-782 Arithmetic Means versus EIA-878 and BLS Data for Retail Regular Motor Gasoline Prices, 1994-2006



Note: The BLS and EIA-878 values have cents per gallon Federal and State taxes removed from them.

Sources: EIA-782: Energy Information Administration, *Petroleum Marketing Annual*, Table 31; EIA-878: Energy Information Administration, *Weekly Petroleum Status Report*, Table 17; BLS: Bureau of Labor Statistics CPI, series APU000074714, U.S. city average for Gasoline, unleaded regular, per gallon; Federal tax information: *Petroleum Marketing Annual*, Table EN1. State tax information: Federal Highway Administration (FHWA), Table MF-205 at <http://www.fhwa.dot.gov/policy/ohim/hs03/htm/mf205.htm> for 1994 to 2003 and Table MF-121T at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2004 to 2006.

Price Comparisons for Resale Transactions by Refiners

This section compares EIA-782A values to BLS PPI values. The EIA-782A is a census of all refiners and gas plant operators in the U.S. It includes, among other things, information on resale prices and volumes from refiners. The relevant EIA-782A weighted annual averages are reported in *PMA*. These weighted averages are computed by using total sales (in \$) for the year as the numerator and total volume (in gallons) for the year as the denominator. The EIA-782A averages in Tables FE4 to FE7 will be given twice. First, the annual averages reported in *PMA* will be given.

Second, unweighted averages (arithmetic means) of the monthly prices reported in *PMA* will be given since this makes the EIA-782A data more comparable to the BLS PPI (Producer Price Index numbers).

Throughout this section, references to tables of data from the *PMA* will be made. The tables for *PMA* are on the EIA website at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_marketing_annual/pma.html. The HTML versions of the tables were used since they contain the historical data. Tables for the BLS Producer Price Index (PPI) are available from <http://data.bls.gov/cgi-bin/srgate>.

The BLS PPI values are not price data; they are indices. Each index in the PPI program uses a base year (usually, 1982) as a value of 100 for that index. The indexes for other time periods are then weighted averages (with the weights being product specific and not available publicly) of prices for each time period divided by weighted averages for the corresponding time period in the base year. Data for the PPI were obtained from the BLS website. The data are reported as monthly values of the index. The annual index values computed by BLS are means of the 12 monthly values for each year.

To compare the EIA-782A prices in cents per gallon to BLS PPI values, year-to-year rates of change, which will be referred to in this article as percentage growth rates, must be used. A year-to-year percentage growth rate for year t

is defined as $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the

value for the previous year. For example, for refiner resale No. 2 fuel oil prices, the year-to-year percentage growth rate for the EIA-782A for 1995 is $\left(\frac{50.9}{50.5} - 1\right) * 100\%$ (see Table FE4).

The differences between the BLS and EIA growth rates are then computed. Further, ratios of the BLS growth rates divided by the EIA-782A growth rates are then calculated and reported as percents. These ratios of growth rates must be interpreted very carefully since when the denominator (here, the EIA-782A percentage growth rate) is close to zero, small changes in it can have large influences on the value of these ratios.

Refiner Resale No. 2 Fuel Oil Prices

Table FE4 provides the summary data for No. 2 fuel oil resale prices for refiners. In *PMA* the EIA-782A annual averages are in the No. 2 Fuel Oil row under Sales for Resale of Table 4. The BLS PPI numbers are from series WPU057302, Home heating oil and other distillates. There are two differences between the EIA-782A and BLS data collection methods. The EIA-782A collects refiners'/producers' prices for only resale sales. The BLS collects refiners'/producers' prices for all sales, of which resale is the vast majority. Second, the BLS data contain a small amount of other distillates such as No. 1 Distillate and Residual Fuel Oil. Figure FE4 shows the percentage growth rates over time. Despite the different data collection methods, the differences between the EIA-782A and BLS growth rates are minimal for all years.

Refiner Resale No. 2 Diesel Fuel Prices

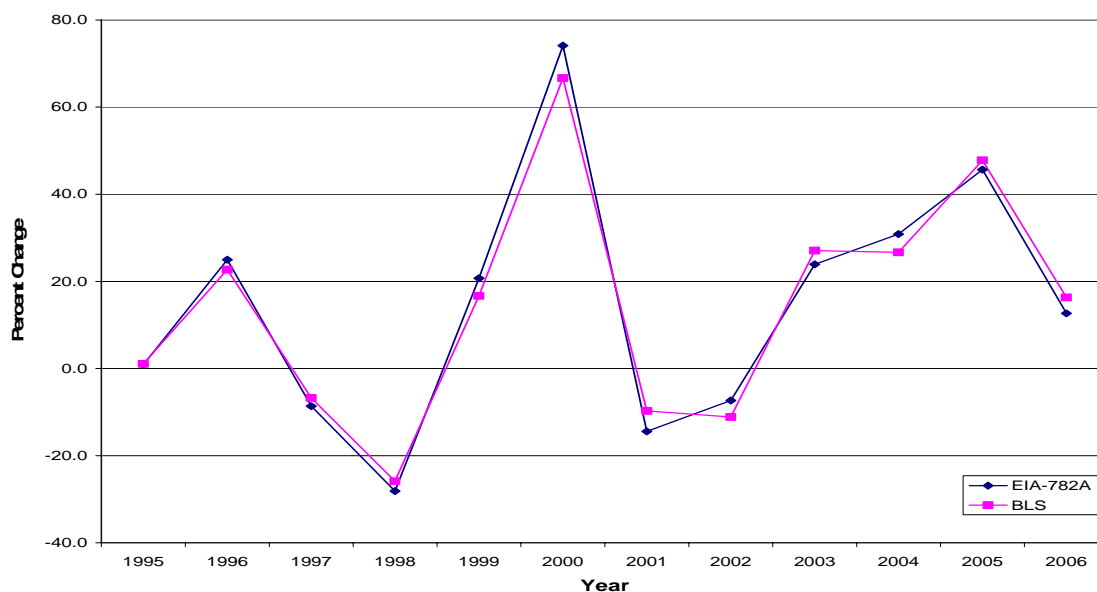
Table FE5 is the summary data for No. 2 diesel fuel resale prices for refiners. In *PMA* the EIA-782 data are in the No. 2 Diesel Fuel row under Sales for Resale of Table 4. The BLS PPI data are series WPU057303, #2 diesel fuel. There is one small difference between the EIA-782A and the BLS PPI data collection methods. The EIA-782A collects refiners' and producers' prices for only resale sales. The BLS numbers are based on refiners'/producers' prices for all sales, of which resale is the vast majority. Figure FE5 shows the percentage growth rates over time. The differences between the EIA-782A and BLS growth rates are minimal for all years.

Table FE4. Refiner Resale No. 2 Fuel Oil Prices and Percentage Growth Rates, 1994-2006

Year	EIA-782A Reported in PMA (Cents per Gallon)	Arithmetic Mean of EIA-782A Monthly Data (Cents per Gallon)	BLS	EIA-782A Percentage Growth Rate	BLS Percentage Growth Rate	BLS Growth Rate Minus EIA-782A Growth Rate	BLS Growth Rate Divided by EIA-782A Growth Rate (as a Percentage)
1994	50.6	50.5	56.0	--	--	--	--
1995	51.1	50.9	56.6	0.9	1.1	0.2	122.4
1996	63.9	63.7	69.5	25.0	22.7	-2.2	91.0
1997	59.0	58.2	64.8	-8.6	-6.7	1.9	78.1
1998	42.2	41.8	48.1	-28.1	-25.9	2.3	92.0
1999	49.3	50.5	56.1	20.7	16.7	-4.0	80.5
2000	88.6	87.9	93.5	74.1	66.7	-7.4	90.0
2001	75.6	75.2	84.4	-14.4	-9.8	4.7	67.5
2002	69.4	69.7	75.0	-7.3	-11.1	-3.8	151.9
2003	88.1	86.4	95.3	23.9	27.1	3.1	113.1
2004	112.5	113.0	120.7	30.9	26.7	-4.2	86.5
2005	162.3	164.7	178.4	45.7	47.8	2.1	104.7
2006	183.4	185.5	207.4	12.7	16.3	3.6	128.5

Note: EIA-782A reported annual averages are in the second column. The third column is the arithmetic means for the 12 months of each year. The fourth column is the BLS PPI index values, which are dimensionless. The fifth and sixth columns are percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year. Differences and ratios across columns may not agree due to independent rounding. The symbol -- stands for Not Applicable. Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057302, Home heating oil and other distillates.

Figure FE4. EIA-782A versus BLS Percentage Growth Rates for Refiner Resale No. 2 Fuel Oil Prices, 1995-2006



Note and Sources for Figure FE4 are on the top of the next page.

Note: The percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057302, Home heating oil and other distillates.

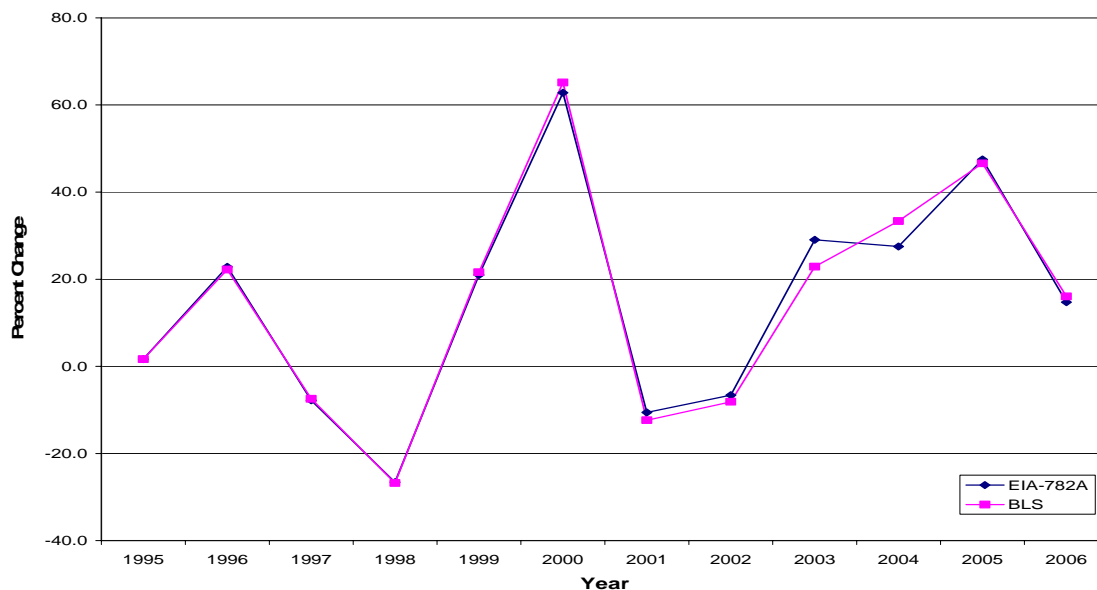
Table FE5. Refiner Resale No. 2 Diesel Fuel Prices and Percentage Growth Rates, 1994-2006

Year	EIA-782A Reported in PMA (Cents per Gallon)	Arithmetic Mean of EIA-782A Monthly Data (Cents per Gallon)	BLS	EIA-782A Percentage Growth Rate	BLS Percentage Growth Rate	BLS Growth Rate Minus EIA-782A Growth Rate	BLS Growth Rate Divided by EIA-782A Growth Rate (as a Percentage)
1994	52.9	52.9	56.0	--	--	--	--
1995	53.8	53.7	57.0	1.7	1.7	0.0	101.6
1996	65.9	65.7	70.0	22.2	22.9	0.6	102.8
1997	60.6	60.8	64.5	-7.4	-7.8	-0.4	105.1
1998	44.4	44.5	47.4	-26.8	-26.6	0.2	99.3
1999	54.6	54.2	57.3	21.6	21.0	-0.6	97.1
2000	89.8	89.5	93.3	65.2	62.8	-2.3	96.4
2001	78.4	78.4	83.4	-12.4	-10.6	1.8	85.5
2002	72.4	72.0	77.9	-8.1	-6.6	1.5	81.1
2003	88.3	88.5	100.5	22.9	29.0	6.1	126.8
2004	118.7	118.0	128.2	33.3	27.5	-5.8	82.6
2005	173.7	173.0	189.1	46.6	47.5	0.9	101.9
2006	201.2	200.8	216.9	16.1	14.7	-1.4	91.5

Note: EIA-782A reported annual averages are in the second column. The third column is the arithmetic means for the 12 months of each year. The fourth column is the BLS PPI index values, which are dimensionless. The fifth and sixth columns are percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year. Differences and ratios across columns may not agree due to independent rounding. The symbol -- stands for Not Applicable.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057303, #2 diesel fuel.

Figure FE5. EIA-782A versus BLS Percentage Growth Rates for Refiner Resale No. 2 Diesel Fuel Prices, 1995-2006



Note: The percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057303, #2 diesel fuel.

Refiner Resale Regular Motor Gasoline Prices

Table FE6 is the summary data for regular motor gasoline resale prices for refiners. In *PMA* the data are in Table 6 in the Sales for Resale (Average) row under Regular Gasoline. The BLS PPI data are series WPU057104, Unleaded regular gasoline. Figure FE6 shows the percentage growth rates over time. The differences between the EIA-782A and BLS growth rates are minimal for all years.

Refiner Resale Kerosene-type Jet Fuel Prices

Table FE7 is the summary data for kerosene-type jet fuel resale prices for refiners. In *PMA* the data are in Table 4 under Sales for Resale. The BLS PPI data are series WPU057203, Jet fuel. There is a small difference in data collection methods for the EIA-782A and BLS PPI. The EIA-782A collects refiners' prices for only resale sales. These are sales to FBOs (Fixed Base Operators) who then resell to private and corporate jets. The BLS PPI gives an average refiners'/producers' prices for all sales, of which resale is the vast majority. Figure FE7 shows the percentage growth rates over time. The differences are minimal over time through 2003. In 2004 to 2006, however, the growth rates differed.

Prime Supplier Annual Volume Comparisons

For this article, the EIA-782 series volume data used are only from the EIA-782C survey, which collects data at the State level from Prime Suppliers who make sales for local consumption. Prime Suppliers include refiners, gas plant operators, inter-State resellers and retailers, and importers. A company may be both a reseller and a retailer and indicates this when filling out the EIA-782C. The EIA-782C volumes will be compared with volumes from *Petroleum Supply Annual (PSA)* of EIA and, where applicable, to EIA-821 and Federal Highway Administration (FHWA) data. For *PSA* the comparable volumes to the EIA-782C volumes are the Product Supplied volumes, which are defined for each product by Product Supplied = (Field Production + Refinery and Blender Net Production + Imports + Adjustments) - (Stock Change + Refinery and Blender Net Inputs + Exports). Volumes from the EIA-821 reflect the transfer of product title from a seller to a buyer, whereas the EIA-782C measures sales into the States where the product is ultimately consumed. The FHWA does not collect actual sales data on gasoline and diesel fuel volumes. States report

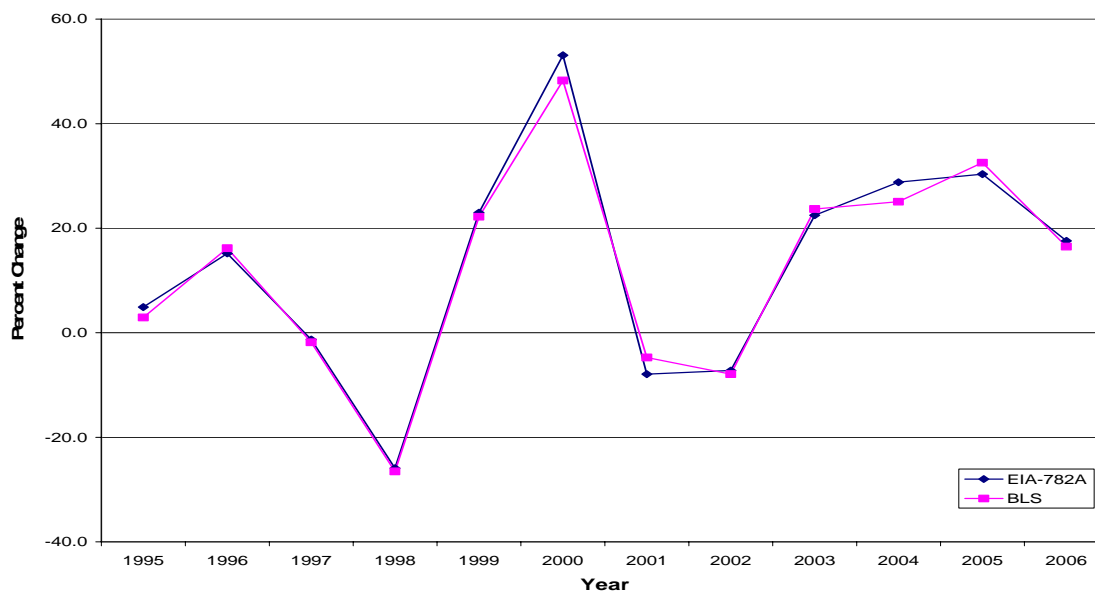
Table FE6. Refiner Resale Regular Motor Gasoline Prices and Percentage Growth Rates, 1994-2006

Year	EIA-782A Reported in PMA (Cents per Gallon)	Arithmetic Mean of EIA-782A Monthly (Cents per Gallon)	BLS	EIA-782A Percentage Growth Rate	BLS Percentage Growth Rate	BLS Growth Rate Minus EIA-782A Growth Rate	BLS Growth Rate Divided by EIA-782A Growth Rate (as a Percentage)
1994	56.6	56.4	59.2	--	--	--	--
1995	59.3	59.2	60.9	4.9	2.9	-2.0	59.5
1996	68.5	68.2	70.8	15.2	16.2	1.0	106.6
1997	67.3	67.3	69.5	-1.3	-1.8	-0.5	139.5
1998	49.9	49.9	51.1	-25.9	-26.5	-0.6	102.4
1999	62.0	61.3	62.4	23.0	22.2	-0.8	96.5
2000	94.2	93.9	92.5	53.1	48.3	-4.8	90.9
2001	86.5	86.4	88.1	-7.9	-4.7	3.2	59.7
2002	80.6	80.2	81.1	-7.2	-7.9	-0.7	109.9
2003	98.1	98.2	100.3	22.5	23.7	1.2	105.2
2004	126.9	126.5	125.5	28.8	25.1	-3.7	87.1
2005	165.4	164.9	166.3	30.3	32.5	2.2	107.2
2006	195.0	193.9	193.7	17.6	16.5	-1.1	93.8

Note: EIA-782A reported annual averages are in the second column. The third column is the arithmetic means for the 12 months of each year. The fourth column is the BLS PPI index values, which are dimensionless. The fifth and sixth columns are percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year. Differences and ratios across columns may not agree due to independent rounding. The symbol -- stands for Not Applicable.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 6; BLS: Bureau of Labor Statistics PPI, series WPU057104, Unleaded regular gasoline.

Figure FE6. EIA-782A versus BLS Percentage Growth Rates for Refiner Resale Motor Gasoline Prices, 1995-2006



Note and Sources for Figure FE6 are on the top of the next page.

Note: The percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 6; BLS: Bureau of Labor Statistics PPI, series WPU057104, Unleaded regular gasoline.

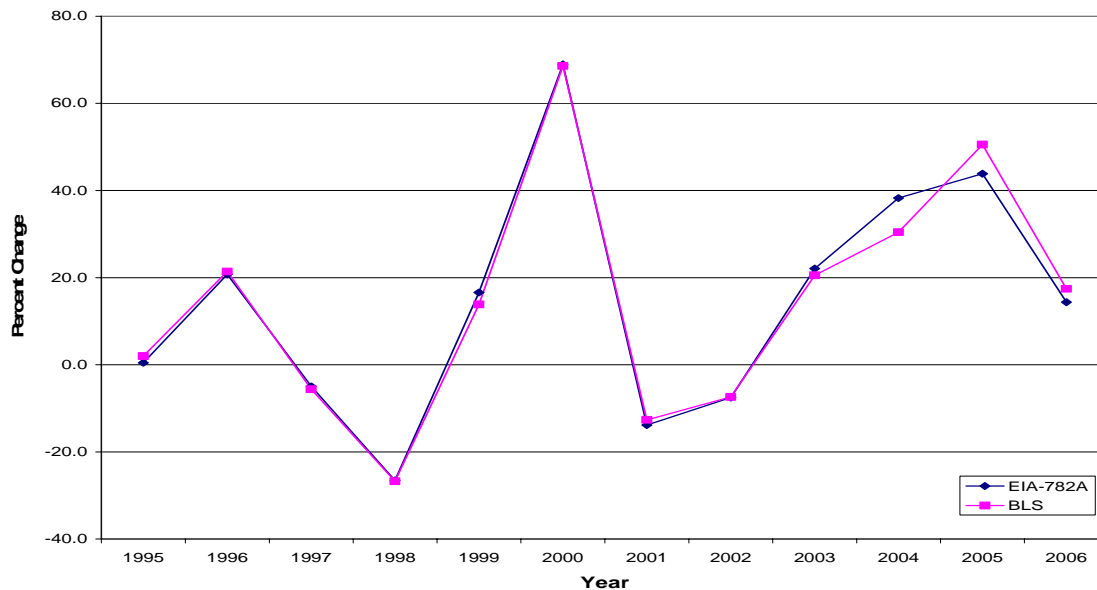
Table FE7. Refiner Resale Kerosene-type Jet Fuel Prices and Percentage Growth Rates, 1994-2006

Year	EIA-782A Reported in PMA (Cents per Gallon)	Arithmetic Mean of EIA-782A Monthly Data (Cents per Gallon)	BLS	EIA-782A Percentage Growth Rate	BLS Percentage Growth Rate	BLS Growth Rate Minus EIA-782A Growth Rate	BLS Growth Rate Divided by EIA-782A Growth Rate (as a Percentage)
1994	53.4	53.4	53.9	--	--	--	--
1995	53.9	53.6	54.9	0.5	2.0	1.5	440.7
1996	64.6	64.7	66.7	20.7	21.4	0.7	103.2
1997	61.3	61.5	63.0	-5.0	-5.6	-0.6	112.9
1998	45.0	45.2	46.1	-26.6	-26.7	-0.2	100.6
1999	53.3	52.7	52.5	16.6	13.9	-2.7	83.7
2000	88.0	89.0	88.6	69.0	68.6	-0.4	99.4
2001	76.3	76.7	77.3	-13.8	-12.7	1.2	91.5
2002	71.6	70.9	71.6	-7.5	-7.4	0.1	98.1
2003	87.1	86.6	86.3	22.1	20.5	-1.6	92.9
2004	120.8	119.7	112.6	38.2	30.5	-7.8	79.6
2005	172.3	172.2	169.6	43.9	50.5	6.7	115.2
2006	196.1	196.9	199.1	14.4	17.4	3.0	121.2

Note: EIA-782A reported annual averages are in the second column. The third column is the arithmetic means for the 12 months of each year. The fourth column is the BLS PPI index values, which are dimensionless. The fifth and sixth columns are percentage growth rates defined by $\left(\frac{P_t}{P_{t-1}} - 1\right) * 100\%$, where P_t is the annual value for the EIA-782A or BLS PPI for year t and P_{t-1} is the value for the previous year. Differences and ratios across columns may not agree due to independent rounding. The symbol -- stands for Not Applicable.

Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057203, Jet fuel.

Figure FE7. EIA-782A versus BLS Percentage Growth Rates for Refiner Kerosene-type Jet Fuel Prices, 1995-2006



Sources: EIA-782A: Energy Information Administration, *Petroleum Marketing Annual*, Table 4; BLS: Bureau of Labor Statistics PPI, series WPU057203, Jet fuel.

their volumes to the FHWA based on beginning inventory at terminal facilities minus exports plus shipments to the terminals during the reporting cycle.

The four sources use different units in reporting volumes. All volumes were converted to million gallons per year to make them comparable. On the Internet, *PMA* data are at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_marketing_annual/pma.html. The *PSA* data are at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html. The EIA-821 data are from *Fuel Oil and Kerosene Sales (FOKS)* at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/foks.html. For all three, the HTML files were used since they contain the historical data. The FHWA volumes were obtained from the Motor-Fuel Use tables (Tables MF21) at <http://www.fhwa.dot.gov/policy/ohpi/qffuel.htm> for 1994 to 2005 and from the Monthly Gasoline/Gasohol Reported by States (MF-33GA) at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2006.

Motor Gasoline (All Grades) Annual Volumes

Table FE8 gives the annual volumes for all grades of motor gasoline (including gasohol) in million gallons. The EIA-782C volumes are from the U.S. row of Table 48 of *PMA*. The *PSA* volumes are from Table 1 and are in the Finished Motor Gasoline row of the Products Supplied column under Disposition. The FHWA data for 1994 to 2005 are from the Total rows of the Total Consumption column under the main heading of Combined Gasoline and Gasohol on Tables MF21. For 2006 they are from the U.S. Total row of the Total column of Table MF-33GA published in August 2007.

Figure FE8 shows these volumes pictorially. Table FE8 shows that, with a few exceptions, the differences between the *PSA* and the EIA-782C annual volumes and between the FHWA and the EIA-782C annual volumes are at first negative (EIA-782C is larger), then near zero, and then positive (EIA-782C is smaller) with these two differences forming basically increasing sequences. The differences between the FHWA and the *PSA* annual volumes are, however, fairly constant over time (except for 2005 and 2006). The EIA-782C records only sales of finished motor gasoline (including gasohol), and not any sales of gasoline blending components, including Reformulated Blendstock for Oxygenate Blending (RBOB), or oxygenates, before they are blended into the gasoline. Because some sales measured by the EIA-782C occur before final blending, this is one reason the EIA-782C sales volumes may be the lowest in recent years.

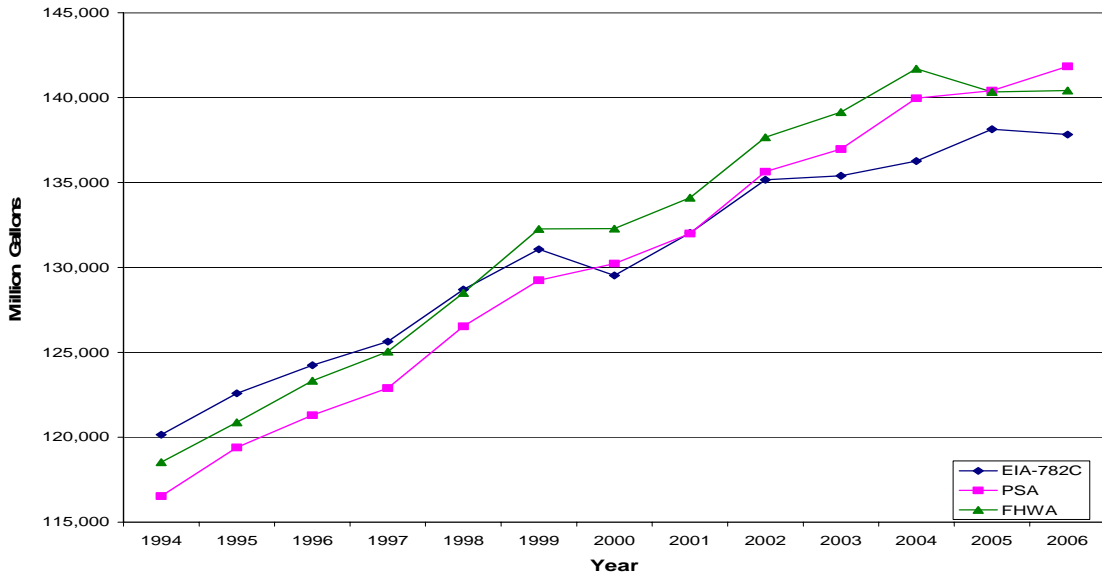
Table FE8. Motor Gasoline (All Grades) Annual Volumes, 1994-2006 (Million Gallons)

Year	EIA-782C	PSA	FHWA	PSA Minus EIA-782C	FHWA Minus EIA-782C	FHWA Minus PSA	PSA Divided by EIA-782C (as a Percentage)	FHWA Divided by EIA-782C (as a Percentage)
1994	120,151	116,529	118,531	-3622	-1620	2002	97.0	98.7
1995	122,582	119,400	120,876	-3182	-1706	1476	97.4	98.6
1996	124,243	121,294	123,327	-2949	-916	2033	97.6	99.3
1997	125,632	122,898	125,045	-2733	-587	2147	97.8	99.5
1998	128,696	126,525	128,504	-2171	-192	1979	98.3	99.9
1999	131,066	129,244	132,261	-1821	1195	3017	98.6	100.9
2000	129,527	130,233	132,280	705	2753	2047	100.5	102.1
2001	132,029	131,992	134,110	-37	2081	2118	100.0	101.6
2002	135,164	135,637	137,664	473	2500	2027	100.4	101.8
2003	135,393	136,972	139,150	1579	3757	2178	101.2	102.8
2004	136,266	139,968	141,700	3703	5434	1732	102.7	104.0
2005	138,143	140,412	140,339	2269	2196	-73	101.6	101.6
2006	137,827	141,841	140,422	4014	2595	-1419	102.9	101.9

Note: Differences and ratios across columns may not add due to independent rounding.

Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 48; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; FHWA: Federal Highway Administration website at <http://www.fhwa.dot.gov/policy/ohpi/qffuel.htm>, Tables MF21 for 1994 to 2005 and Table MF-33GA at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2006.

Figure FE8. EIA-782C versus PSA and FHWA Annual Volumes for Motor Gasoline, 1994-2006



Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 48; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; FHWA: Federal Highway Administration website at <http://www.fhwa.dot.gov/policy/ohpi/qffuel.htm>, Tables MF21 for 1994 to 2005 and Table MF-33GA at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2006.

Distillate Fuel Oil Annual Volumes

Table FE9 is the summary data for annual volumes for distillate fuel oil in million gallons. The EIA-782C volumes are the annual volume for No. 1 distillate, No. 2 fuel oil, No. 2 diesel fuel, and No. 4 fuel oil combined. This total is obtained by subtracting the Kerosene volumes in the U.S. row of the Kerosene product page from the U.S. row of the Total Distillate and Kerosene product page of Table 50 of *PMA*. The *PSA* volumes are from Table 1 and are in the Distillate Fuel Oil row of the Products Supplied column under Disposition. The EIA-821 data are the total for No.1, No. 2, and No. 4 distillate fuel oil and are given in the U.S. Total row of Table 1 of *FOKS*. Figure FE9 shows the volumes over time.

The differences and percentages between the EIA-782C annual volumes and the other volume measures are almost steadily increasing. Further, from 1994 to 1999 the differences between the *PSA* and the EIA-782C were close. But, from 2000 to 2005 both the *PSA* and EIA-821 volumes were more divergent from the EIA-782C volumes than they had been from 1994 to 1999. This divergence decreased in 2006, however, especially for the difference between the EIA-782C and EIA-821 values. Slightly different data collection methods used by the EIA-782C, EIA-821, and the surveys making up the data reported in *PSA* may cause some of these differences in annual volumes over the years.

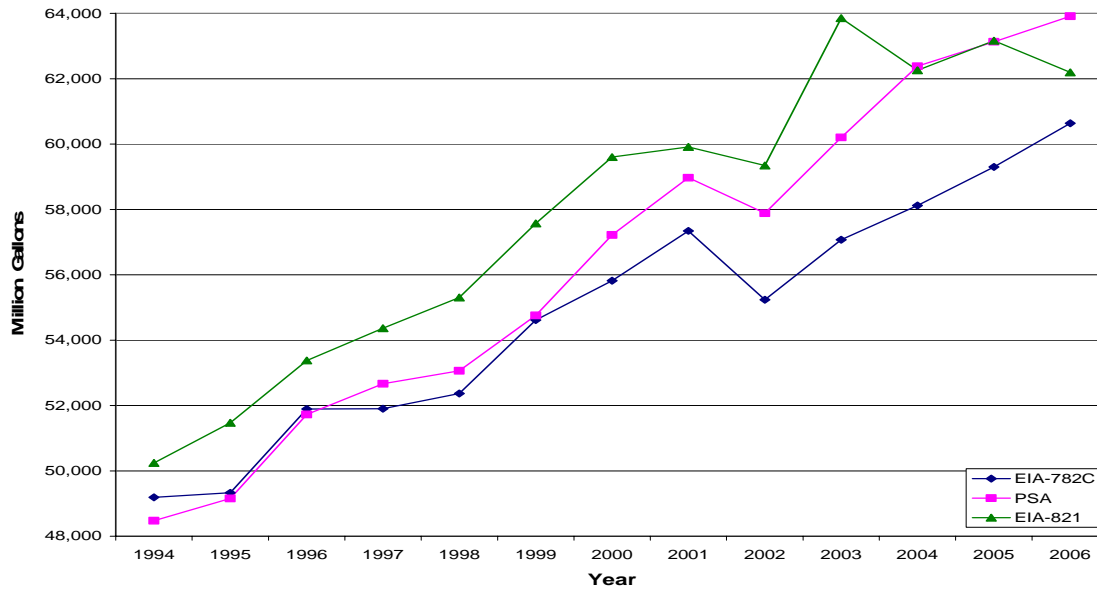
Table FE9. Distillate Fuel Oil Annual Volumes, 1994-2006 (Million Gallons)

Year	EIA-782C	PSA	EIA-821	PSA Minus EIA-782	EIA-821 Minus EIA-782	PSA Divided by EIA-782 (as a Percentage)	EIA-821 Divided by EIA-782 (as a Percentage)
1994	49,188	48,477	50,242	-710	1054	98.6	102.1
1995	49,332	49,158	51,469	-174	2137	99.6	104.3
1996	51,895	51,731	53,379	-165	1484	99.7	102.9
1997	51,903	52,665	54,366	763	2463	101.5	104.7
1998	52,371	53,064	55,306	693	2935	101.3	105.6
1999	54,614	54,759	57,573	144	2959	100.3	105.4
2000	55,822	57,217	59,601	1395	3779	102.5	106.8
2001	57,344	58,971	59,911	1627	2567	102.8	104.5
2002	55,237	57,885	59,343	2647	4106	104.8	107.4
2003	57,075	60,202	63,855	3127	6780	105.5	111.9
2004	58,123	62,384	62,258	4260	4135	107.3	107.1
2005	59,302	63,129	63,165	3827	3863	106.5	106.5
2006	60,635	63,913	62,192	3277	1557	105.4	102.6

Note: Differences and ratios across columns may not be equal due to independent rounding.

Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 50; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; EIA-821: Energy Information Administration, *Fuel Oil and Kerosene Sales*, Table 1.

Figure FE9. EIA-782C versus PSA and EIA-821 Annual Volumes for Distillate Fuel Oil, 1994-2006



Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 50; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; EIA-821: Energy Information Administration, *Fuel Oil and Kerosene Sales*, Table 1.

Kerosene-Type Jet Fuel Annual Volumes

Table FE10 and Figure FE10 give the kerosene-type jet fuel volumes in million gallons per year. The data for the EIA-782C are in the U.S. row of the Kerosene-Type Jet Fuel product page from Table 49 of *PMA*. The PSA volumes are from Table 1 and are in the Kerosene-Type Jet Fuel row of the Products Supplied column under Disposition.

There are several factors that may help explain some of the difference over the years between the EIA-782C and PSA data. First, the EIA-782C does not capture purchases by commercial aviation directly from other countries. Second, bonded kerosene-type jet fuel used for international flights is not measured by the EIA-782C. Third, kerosene-type jet fuel is blended into No. 2 distillate to enhance cold weather performance. Some of these sales are missed by the EIA-782C. Fourth, sometimes kerosene-type jet fuel is sold to the final consumer as kerosene. All of these four types of sales are captured in the PSA numbers as kerosene-type jet fuel sales.

Residual Fuel Oil Annual Volumes

Residual fuel oil volume includes all residual fuel oil regardless of sulfur content. Table FE11 and Figure FE11 give residual fuel oil annual volumes in million gallons per year. The data for the EIA-782C are from the U.S. row of the Residual Fuel Oil product page of Table 49 of *PMA*. The PSA volumes are from Table 1 and are in the Residual Fuel Oil row of the Products Supplied column under Disposition. The EIA-821 data are from the U.S. Total row of Table 2 of *FOKS*.

The volume of product that is residual fuel oil is small as compared to the other products discussed in this article. Hence, the differences between the EIA-782C and the PSA and EIA-821 are not as large as they appear. Further, some of the product originally sold as residual fuel oil can be further processed into other finished products by the buyer. Finally, some of the product, classified by the seller on the EIA-821 and surveys making up the PSA as residual fuel oil, is classified by the buyer (who then sometimes becomes the Prime Supplier) as unfinished crude oil, other oils, or miscellaneous. None of these are measured by the EIA-782C.

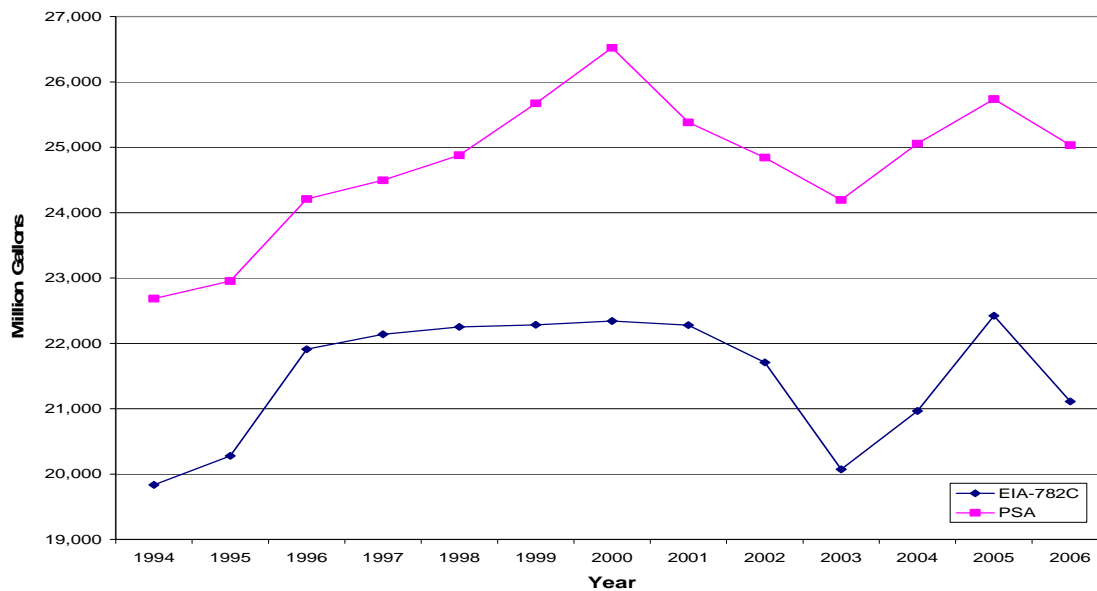
Table FE10. Kerosene-Type Jet Fuel Annual Volumes, 1994-2006 (Million Gallons)

Year	EIA-782C	PSA	PSA Minus EIA-782C	PSA Divided by EIA-782C (as a Percentage)
1994	19,834	22,686	2,852	114.4
1995	20,279	22,953	2,674	113.2
1996	21,910	24,208	2,298	110.5
1997	22,138	24,496	2,359	110.7
1998	22,252	24,879	2,627	111.8
1999	22,284	25,673	3,389	115.2
2000	22,343	26,522	4,179	118.7
2001	22,278	25,382	3,104	113.9
2002	21,709	24,843	3,133	114.4
2003	20,073	24,195	4,122	120.5
2004	20,967	25,055	4,088	119.5
2005	22,424	25,739	3,315	114.8
2006	21,112	25,032	3,921	118.6

Note: Differences and ratios across columns may not be equal due to independent rounding.

Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 49; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1.

Figure FE10. EIA-782C versus PSA Annual Volumes for Kerosene-Type Jet Fuel, 1994-2006



Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 49; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1.

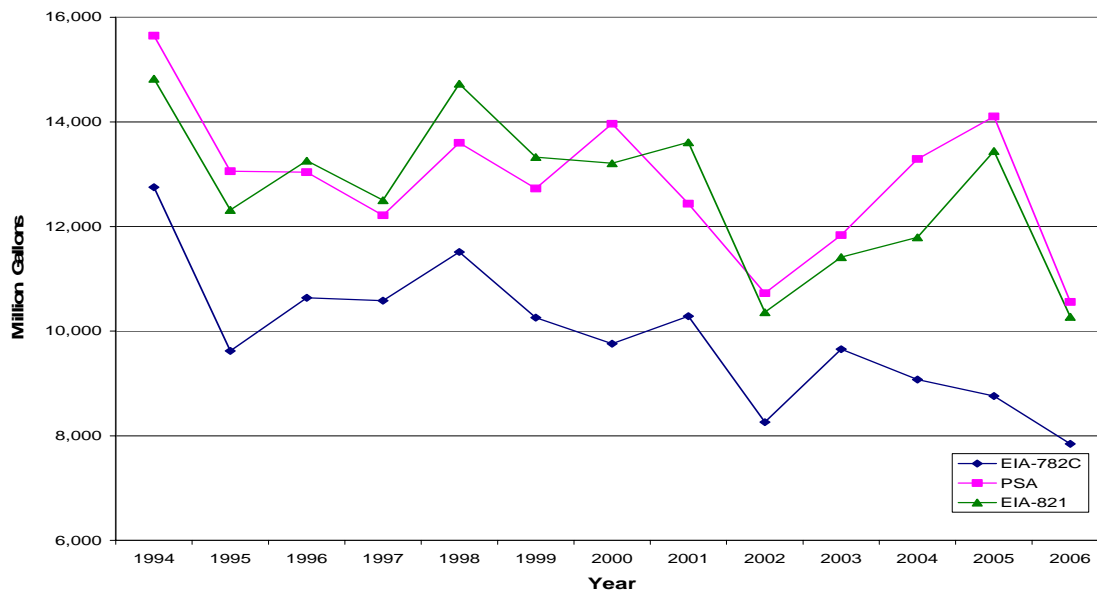
Table FE11. Residual Fuel Oil Annual Volumes, 1994-2006 (Million Gallons)

Year	EIA-782C	PSA	EIA-821	PSA Minus EIA-782C	EIA-821 Minus 782C	PSA Divided by EIA-782C (as a Percentage)	EIA-821 Divided by EIA-782C (as a Percentage)
1994	12,753	15,649	14,825	2,896	2,072	122.7	116.2
1995	9,623	13,058	12,318	3,435	2,695	135.7	128.0
1996	10,639	13,041	13,257	2,402	2,618	122.6	124.6
1997	10,583	12,213	12,504	1,630	1,921	115.4	118.1
1998	11,513	13,600	14,730	2,086	3,217	118.1	127.9
1999	10,259	12,726	13,328	2,467	3,069	124.1	129.9
2000	9,760	13,966	13,211	4,206	3,451	143.1	135.4
2001	10,285	12,435	13,609	2,150	3,324	120.9	132.3
2002	8,259	10,725	10,362	2,466	2,103	129.9	125.5
2003	9,655	11,837	11,413	2,182	1,758	122.6	118.2
2004	9,077	13,292	11,794	4,216	2,718	146.4	129.9
2005	8,762	14,103	13,442	5,342	4,681	161.0	153.4
2006	7,843	10,560	10,274	2,717	2,431	134.6	131.0

Note: Differences and ratios across columns may not be equal due to independent rounding.

Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 49; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; EIA-821: Energy Information Administration, *Fuel Oil and Kerosene Sales*, Table 2.

Figure FE11. EIA-782C versus PSA and EIA-821 Annual Volumes for Residual Fuel Oil, 1994-2006



Sources: EIA-782C: Energy Information Administration, *Petroleum Marketing Annual*, Table 49; PSA: Energy Information Administration, *Petroleum Supply Annual*, Table 1; EIA-821: Energy Information Administration, *Fuel Oil and Kerosene Sales*, Table 2.

Summary

The EIA-782 petroleum product prices and volumes for 1994 to 2006 were compared with data from other EIA surveys and from BLS, OPIS, and FHWA in this article. Table FE12 summarizes how the EIA-782 numbers compare to other sources when ratios are computed. All ratios, except for refiner resale price ratios, are the price or volume of the most comparable source divided by the EIA-782 price or volume. The refiner resale price ratios are the year-to-year percentage growth rate for the most comparable source divided by the year-to-year percentage growth rate for the EIA-782A prices. The mean ratios for these percentage growth rates for resale prices need to be interpreted very carefully. Many of them have EIA-782A percentage growth rates near zero in the denominator; small changes in these denominators can have large influences on the value of these ratios.

Means and standard deviations of the ratios for only the years 2002 to 2006 are included in Table FE12, since it is comparisons over these years that are most important in decision making for the near future. For this article two sources will be considered as almost equivalent if their mean ratio over the years is very close to 1 (being between 98 percent and 102 percent) and there is a standard deviation over the years of the ratios of less than or equal to 3 percent, since for a normal distribution with a standard deviation of 3 percent, 95 percent of the ratios will be between 94 percent and 106 percent when the true mean ratio is 100 percent.

Using this criterion for equivalence, from Table FE12 it can be seen that the EIA-782 is almost equivalent to other data sources for on-highway diesel fuel prices and motor gasoline (all grades) annual volumes. The EIA-782 is consistently lower than its most comparable source, in that its mean reported values are lower than the most comparable source and there is a standard deviation of less than or equal 3 percent in the ratios for residential No. 2 distillate prices, retail regular motor gasoline prices, distillate fuel oil volumes and kerosene-type jet fuel volumes.

For residual fuel oil, the EIA-782C reports much lower volumes than the EIA-821. Further, the ratios of the EIA-821 to the EIA-782C volume have a standard deviation larger than 3 percent. Even though this standard deviation is not small, from Table FE11 it appears that the underreporting of the EIA-782C is meaningfully significant.

All of the remaining products studied (refiner resale prices for No. 2 fuel oil, No. 2 diesel fuel, regular motor gasoline, and kerosene-type jet fuel) used percentage growth rates. No conclusions can be made based on the ratios of these growth rates because the ratios of the growth rates were unstable. However, the year-to-year differences in the percentage growth rates still can be compared. Table FE13 summarizes these differences and other important conclusions for each product.

Table FE12. Summary Table of Mean Ratios of Other Sources Divided by EIA-782 Data for All Products

Product	Table	Most Comparable Source	Other Sources	Mean Percent Ratio of Most Comparable Source to EIA-782 for 2002 to 2006	Standard Deviation of Percent Ratios for 2002 to 2006	Comments for the Years of 2002 to 2006
RETAIL PRICES						
Residential No. 2 Distillate	FE1	BLS CPI		105.9	1.4	BLS price is always higher than EIA-782 since BLS includes local and State taxes and only urban areas. BLS and EIA-782 closest in 2006.
On-Highway Diesel Fuel	FE2	EIA-888	OPIS, BLS CPI	101.9	0.4	OPIS had a mean percent ratio of 99.9 percent with a standard deviation of 2.3 percent. BLS prices 7.2 to 15.4 percent higher than EIA-782.
Regular Motor Gasoline	FE3	EIA-878	BLS CPI	105.3	1.0	BLS had a mean percent ratio of 107.2 percent with a standard deviation of 1.6 percent. Always EIA-782<EIA-888<BLS. BLS only in urban areas.
RESALE PRICES						
No. 2 Fuel Oil	FE4	BLS PPI		116.9	24.7	The percent ratios varied from 86.5 to 151.9 percent.
No. 2 Diesel Fuel	FE5	BLS PPI		96.8	18.7	The percent ratios varied from 81.1 to 126.8 percent.
Regular Motor Gasoline	FE6	BLS PPI		100.6	9.7	The percent ratios varied from 87.1 to 109.9 percent.
Kerosene-Type Jet Fuel	FE7	BLS PPI		101.4	16.9	The percent ratios varied from 79.6 to 121.2 percent.
VOLUMES						
Motor Gasoline (All Grades)	FE8	PSA	FHWA	101.8	1.1	FHWA had a mean percent ratio of 102.4 percent during these years. Both PSA and FHWA had only slightly higher volumes than EIA-782.
Distillate Fuel Oil	FE9	PSA	EIA-821	105.9	1.0	EIA-821 had mean percent ratio of 107.1 percent and standard deviation of 3.3. PSA and EIA-821 volumes always higher than EIA-782 values.
Kerosene-Type Jet Fuel	FE10	PSA		117.6	2.8	This ratio was consistently high and only varied between 114.4 percent and 120.5 percent.
Residual Fuel Oil	FE11	EIA-821	PSA	131.6	13.2	The ratios involving EIA-821 and PSA volumes were consistently high and varied from 118.2 to 161.0 percent.

Note: All ratios except the Resale Price ratios are directly the price or volume of the most comparable source divided by the EIA-782 price or volume. For Resale Prices it is the year-to-year percentage growth rate for the most comparable source divided by the year-to-year percentage growth rate for the EIA-782 for the product under consideration.

Table FE13. Summary Table of Important Results

Product	Table	Important Results
RETAIL PRICES		
Residential No. 2 Distillate	FE1	EIA-782 prices have stayed within 3.6 to 8.2 percent of BLS prices. Difference is probably due to BLS only covering urban areas and including some taxes that EIA-782 does not.
On-Highway Diesel Fuel	FE2	EIA-782, EIA-888 & OPIS prices are almost identical for all years. BLS prices (collected from 1998) higher by 7.2 to 22.6 percent due to only using urban "automotive" outlets.
Regular Motor Gasoline	FE3	Prices from other sources for 2002 onwards are consistently higher than the EIA-782 by 4.3 to 9.4 percent. Probably due to differences in which taxes are included.
RESALE PRICES		
No. 2 Fuel Oil	FE4	Only year-to-year growth rates can be discussed. The EIA-782A and the BLS growth rates are close for most years, with differences in the rates that vary from -7.4 to +4.7 percent.
No. 2 Diesel Fuel	FE5	Only year-to-year growth rates can be discussed. The EIA-782A and the BLS growth rates are close for most years, with differences in the rates that vary from -5.8 to +6.1 percent.
Regular Motor Gasoline	FE6	Only year-to-year growth rates can be discussed. The EIA-782A and the BLS growth rates are close for most years, with differences in the rates that vary from -4.8 to +3.2 percent.
Kerosene-Type Jet Fuel	FE7	Only year-to-year growth rates can be discussed. The EIA-782A and the BLS growth rates are close for most years, with differences in the rates that vary from -7.8 to +6.7 percent.
VOLUMES		
Motor Gasoline (All Grades)	FE8	The PSA and FHWA volumes were lower than EIA-782C from 1994 to 1998. From 1999 to 2006, PSA and FHWA volumes were higher than EIA-782C except for two instances.
Distillate Fuel Oil	FE9	Since 1997, PSA and EIA-821 were higher than the EIA-782C. The differences between the EIA-782C and the other sources grew larger until 2004 and now are slightly smaller.
Kerosene-Type Jet Fuel	FE10	PSA was consistently much higher than EIA-782C by 10.5 to 20.5 percent.
Residual Fuel Oil	FE11	PSA and EIA-821 were much higher than EIA-782C by 15.4 to 61.0 percent.

Source Notes

All quotes relating to EIA surveys are from <http://www.eia.doe.gov/oss/forms.html>. More details on each of the surveys can be obtained there. All information is for the 2007 to 2009 versions of the surveys. There have been, except for sample frame changes due to births and deaths of companies, only a few changes in the surveys since 1993.

EIA-863 Petroleum Product Sales Identification Survey

This is a quadrennial survey. It is sent to all petroleum companies known to EIA by past data collection or through other sources. It "collects information used to maintain a comprehensive frame file of No. 2 distillate and residual fuel oil dealers, motor gasoline resellers, and propane resellers. Information is collected on size, type, and geographic location of these firms. The firms surveyed, along with their associated volumetric data and tracking information, serve as the sampling frame for Forms EIA-821 (Annual Fuel Oil and Kerosene Sales Report), EIA-782B (Resellers'/Retailers' Monthly Petroleum Product Sales Report), EIA-877 (Winter Heating Fuels Telephone Survey), EIA-878 (Motor Gasoline Price Survey), and other ad hoc surveys..." (from EIA website.) It also asks if a company sells kerosene, No. 1 distillate, crude oil, other LPG, No. 4 fuel oil, aviation gasoline, jet fuel or other petroleum products. The number of active companies that were respondents in 2003 (the year that the sampling frames for the EIA-821, EIA-782B, EIA-877 and EIA-878 numbers for 2004 to 2006 come from) was approximately 24,400.

EIA-782A Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report

The EIA-782A collects “information on sales prices and volumes of certain petroleum products. This information is published at various aggregation levels and is used by EIA to perform analyses and make projections related to energy supplies, demand, and prices” (from EIA website.) The sampling frame is all refiners and gas plant operators. The number of respondents is approximately 100 each month. It collects data on finished motor gasoline (all grades separately for both conventional and reformulated), No. 2 diesel (separated by sulfur content), No. 2 fuel oil, propane (consumer grade), No. 1 distillate, kerosene, aviation gasoline (finished), kerosene-type jet fuel, No. 4 fuel oil and residual fuel oil (separated by sulfur content). It also asks the respondents to break their sales down by wholesale, retail, and other appropriate categories (which depend on the product being sold.)

EIA-782B Resellers'/Retailers' Monthly Petroleum Product Sales Report

The EIA-782B is sent to a sample of resellers and retailers of petroleum products. It collects volumes and prices for finished motor gasoline (all grades separately for both conventional and reformulated), No. 2 fuel oil, propane (consumer grade) and residual fuel oil (separated by sulfur content.) Respondents to the EIA-863 who are resellers and/or retailers are used as the sampling frame. There are approximately 2,000 respondents monthly for the EIA-782B. It also asks the respondents to break their sales down by wholesale, retail, and other appropriate categories (which depend on the product being sold.)

EIA-782C Monthly Report of Prime Supplier Sales of Petroleum Products Sold for Local Consumption

Any firm that “produces, imports, or transports product across State boundaries and local marketing areas and sells the product to local distributors, local retailers, or end users must complete Form EIA-782C. Respondents include refiners, gas plant operators, importers, petroleum product resellers, and petroleum product retailers” (from EIA website.) The EIA-782C collects volumes for finished motor gasoline (all grades separately for both conventional and reformulated), No. 2 diesel (separated by sulfur content), No. 2 fuel oil, propane (consumer grade), No. 1 distillate, kerosene, aviation gasoline (finished), kerosene-type jet fuel, No. 4 fuel oil and residual fuel oil (separated by sulfur content). There are approximately 185 respondents monthly.

Petroleum Marketing Monthly (PMM) and the Petroleum Marketing Annual (PMA)

Data collected on the Forms EIA-782A, EIA-782B, and EIA-782C are published in *PMM* and *PMA*. See the Explanatory Notes of PMA 2006 at http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/current/pdf/enote.pdf for more details on the EIA-782 surveys and other surveys/methods used in *PMM* and *PMA*. The *PMA* contains revisions of the data published in the *PMM* due to late submissions or other changes to the monthly data.

Petroleum Supply Monthly (PSM) and Petroleum Supply Annual (PSA)

PSM and *PSA* publish production, import, and export data based on a number of surveys done by EIA. The *PSM* and *PSA* numbers used in this article are based mostly on data from forms EIA-810—“Monthly Refinery Report” with approximately 156 respondents, EIA-811—“Monthly Bulk Terminal Report” with approximately 228 respondents, EIA-812—“Monthly Product Pipeline Report” with approximately 72 respondents, EIA-813—“Monthly Crude Oil Report” with approximately 141 respondents, EIA-814—“Monthly Imports Report” with approximately 257 respondents, EIA-815—“Monthly Terminal Blenders Report” with approximately 280 respondents, EIA-816—“Monthly Natural Gas Liquids Report” with approximately 398 respondents, and EIA-817—“Monthly Tanker and Barge Movement Report” with approximately 40 respondents. See the Explanatory Notes of *PSA 2006—Volume 1* at http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/current/pdf/psnotes.pdf for more details on these surveys and other surveys/methods used in *PSM* and *PSA*. The *PSA* contains revisions of the data published in the *PSM* due to late submissions or revisions to the monthly data.

EIA-821 Annual Fuel Oil and Kerosene Sales Report

“Form EIA-821 collects data on the annual sales of distillate and residual fuel oil and kerosene. The data, which are published by EIA, are used to determine current and projected fuel oil needs on national, regional, and State levels. The survey specifically covers sales of distillate and residual fuel oils and kerosene by end use and State of destination” (from EIA website.) The sampling frame for the EIA-821 is derived from the respondents to Form EIA-863. The number of respondents for the EIA-821 is approximately 4,334.

EIA-878 Motor Gasoline Price Survey

The EIA-878 is a weekly survey and “collects information on the retail cash price of self-serve, conventional and reformulated gasoline for all three grades of gasoline. ... Respondents are companies that own retail motor gasoline stations” (from EIA website.) The number of respondents is approximately 1,200.

EIA-888 On-Highway Diesel Fuel Price Survey

The EIA-888 is a weekly survey and “collects information on the retail cash price of self-serve, motor vehicle No. 2 diesel fuel sold for on-highway use.... Respondents are a scientifically selected sample of companies owning retail outlets which sell motor vehicle diesel fuel” (from EIA website.) The number of respondents is approximately 350.

Bureau of Labor Statistics (BLS) Consumer Price Indexes (CPI)

“The Consumer Price Indexes (CPI) program produces monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services” (from <http://www.bls.gov/cpi/>.) In terms of petroleum products, the CPI includes No. 2 fuel oil, gasoline (all grades) and automotive diesel fuel. “Prices for the goods and services used to calculate the CPI are collected in 87 urban areas throughout the country and from about 23,000 retail and service establishments” (from <http://www.bls.gov/cpi/cpiovrw.htm#item2>.) No sample sizes are given for the individual products.

Bureau of Labor Statistics (BLS) Producer Price Index (PPI)

“The Producer Price Index (PPI) is a family of indexes that measures the average change over time in selling prices received by domestic producers of goods and services. ... The PPI sample includes over 25,000 establishments ... per month. ... For most items, establishments report product selling prices for the Tuesday of the week containing the 13th of each month” (from <http://www.bls.gov/ppi/ppiover.htm>.) The PPI is an index. It does not report actual prices. In terms of petroleum products from the EIA-782 survey series, the PPI includes motor gasoline (all grades), kerosene, jet fuel, home heating oil and other distillates, No. 2 diesel fuel, and residual fuels. No sample sizes are given for individual products.

Federal Highway Administration (FHWA) Tax Information

Taxes are reported by the FHWA’s Office of Highway Policy Information in Table MF-205 for 1994 to 2003 and in Table MF-121T of its “Monthly Motor Fuel Reported by States” at <http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm> for 2004 and 2005. According to Footnote 1 of Table MF-121T, “This table shows motor-fuel tax rates in effect as of January 1, and any subsequent changes that have occurred through the date shown in the title. Only taxes that are levied as a dollar amount per volume of motor fuel are included.... Taxes that apply to all petroleum products without distinguishing motor fuels are omitted. Local option taxes are included only when they have been adopted uniformly Statewide.” The tables include both gasoline and diesel fuel tax information.

FHWA Motor Gasoline Volumes

The FHWA does not collect actual sales data on gasoline and diesel fuel volumes. States report their fuel volumes to FHWA based on the beginning inventory at terminal facilities minus exports plus shipments to the terminals during the reporting cycle. The FHWA reports these volumes in its Motor-Fuel Use tables (Tables MF21). See <http://www.fhwa.dot.gov/policy/ohpi/qffuel.htm> for more details.

Oil Price Information Service (OPIS) Retail Diesel Pricing

“OPIS surveys the current retail prices of No. 2 low-sulfur and ultra low sulfur diesel fuel from more than 8,000 active truckstops and travel plazas in the U.S. and Canada. Retail prices are gathered by major fuel card companies including Comdata and EFS as well as through direct feeds from major truckstop chains. OPIS reports wholesale fuel prices by products as defined by EPA standards more so than by any type of product use” (from <http://opisnet.com/methodology.asp#diesel>.)

Acknowledgments

Several colleagues at EIA helped the author in preparing this article. Carol French, Jennifer Lawhorn and Tammy Heppner made helpful comments on drafts of this manuscript. Charlie Riner helped with formatting.