

Preliminary examination of expenditure patterns
and higher gasoline prices

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by

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During the 2003-2007 survey periods, average gasoline retail prices in the United States have increased. The average 2003 and 2004 retail price of regular gasoline was \$1.56/gallon and \$1.85/gallon, respectively. The 2005, 2006, and 2007 national average price for regular gasoline was \$2.27, \$2.58, \$2.79/gal., respectively. (EIA, August 2006, August 2007, August 2008). For the period 2003 to 2007, the all city average CPI-U recorded an inflation rate increase of 12.7 %; however, gasoline prices increased by 76 % over the same time period (BLS 2003 and 2007). During this same period, average expenditures by the consumer units surveyed also saw a 76 % increase in expenditures for gasoline (BLS 2008).

As gasoline prices have risen over the past several years at higher than the general inflation rate, the higher price will require consumers to reduce their gasoline consumption or make changes in their consumption patterns regarding other goods and services. This study is a preliminary examination of gasoline expenditures as percent of total annual expenditures and patterns of change in other expenditure items. Using consumer expenditure data from the 2003 *Consumer Expenditure Survey*, 2004 *Consumer Expenditure Survey*, 2005 *Consumer Expenditure Survey*, 2006 *Consumer Expenditure Survey*, and 2007 *Consumer Expenditure Survey* as reported by the Bureau of Labor Statistics, expenditures patterns will be compared as to gasoline and other items for general population, region of residence, and rural vs. urban. The data will be examined as to whether there are significant changes in expenditures patterns as well as selected differences among population groups (www.BLS.gov).

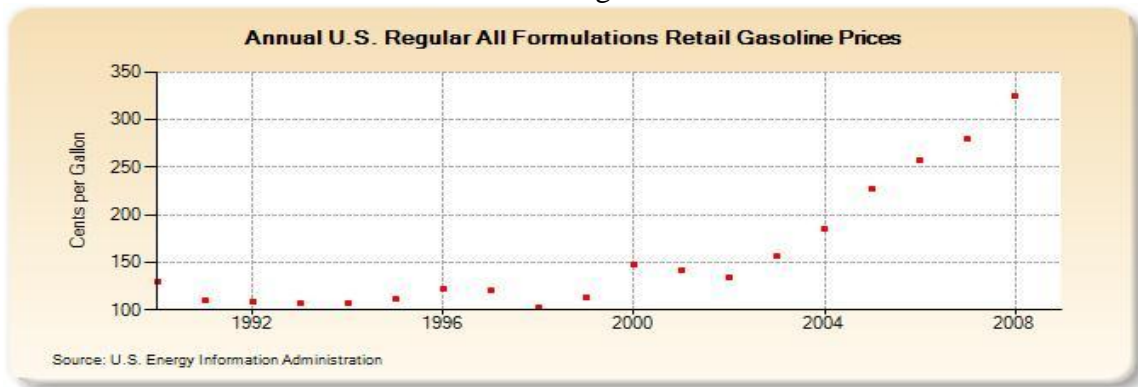
Table 1 shows basic demographic data for the consumer units surveyed during 2003-2007. Consumer units are interviewed on a 3-month interval. Participation is limited to 5 interviews per household. Consumer units are interviewed each quarter for major expenditures. A Diary Survey is used for 2 consecutive weeks to determine smaller purchases. Consumer units are basically formed by all those residing in the same household and sharing major expenditures.

Table 1
2003-2007 Survey Consumer Units

	2003	2004	2005	2006	2007
Number of consumer units	115,356	116,282	117,356	118,843	120,171
Mean income before taxes	\$51,128	\$54,453	\$58,712	\$60,533	\$63,091
Number of vehicles owned	1.9	1.9	2.0	1.9	1.9
% of least 1 vehicle owned	88%	88%	88%	88%	88%
Ave. annual expenditures	\$40,817	\$43,395	\$46,409	\$48,398	\$49,638
Ave. expenditure gasoline	\$1,333	\$1,598	\$2,013	\$2,227	\$2,384
Ave. % expenditure gasoline	3.27%	3.68%	4.34%	4.60%	4.80%

The 2003 – 2007 timeframe was chosen for this study due to the point of reference as to rapidly increasing gasoline prices. The graph below from the U.S. Energy Information Administration shows annual cost for regular gasoline over an 18 year period. The steep increase in gasoline average price started following 2003 (see Figure 1).

Figure 1



Percent of total expenditures for major categories

One question to examine is as consumer units have had to increase their expenditures for gasoline, what other expenditures items might have seen a decline? Higher expenditures for gasoline may result in opportunity cost as to other expenditures items. Table 2 shows the percent of total expenditures by consumer units for the major categories of food, housing, apparel, healthcare, personal insurance/pensions, and entertainment over the time period 2003 to 2007. The transportation category is shown along with the subcomponents of gasoline/motor oil, vehicle purchases, other vehicle expenses (insurance, maintenance), and public transportation.

Table 2
% of Total Expenditures by Categories

Category	2003	2004	2005	2006	2007
Food	13.1%	13.3%	12.8%	12.6%	12.4%
Housing	32.9%	32.1%	32.7%	33.8%	34.1%
Apparel	4.0%	4.2%	4.1%	3.9%	3.8%
Healthcare	5.9%	5.9%	5.7%	5.7%	5.8%
Personal Ins/Pensions	9.9%	11.1%	11.2%	10.9%	10.8%
Entertainment	5.1%	5.1%	5.2%	4.9%	5.4%
Transportation	19.1%	17.9%	17.9%	17.6%	17.7%
Gasoline/motor oil	3.3%	3.7%	4.3%	4.6%	4.8%
Vehicle Purchases	9.1%	7.8%	7.6%	7.1%	6.5%
New cars	5.0 %	4.0%	4.2%	3.7%	3.2%
Used cars	3.9%	3.6%	3.3%	3.2%	3.2%
Other Vehicle Expenses	5.7%	5.5%	5.0%	4.9%	5.2%
Public Transportation	0.9%	1.0%	0.9%	1.0%	1.0%

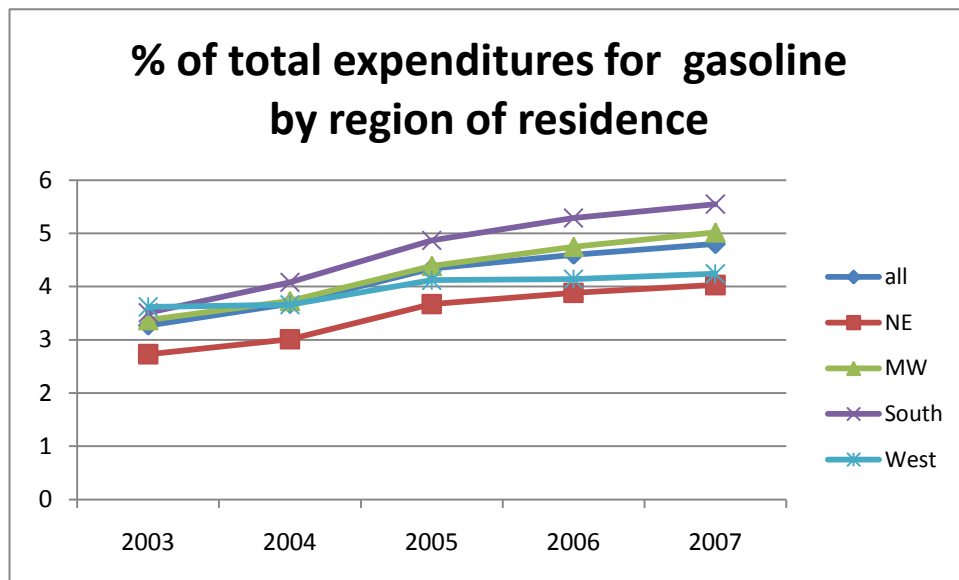
While overall transportation category has declined as percentage of total expenditures from a high of 19.1 % in 2003, gasoline/motor oil has seen a steady increase as percentage of expenditure during this same time period. The main category of transportation has not increased as a percentage of total expenditure as there has been a steady decrease in percentage for vehicle purchases while gasoline/motor oil was increasing. Examining the subcomponents shows a steady decline in percentage of expenditures for new car purchases.

Two major categories showing a steady decline as percentage of total expenditures for this time period are food and apparel while housing and entertainment had a slight percentage increase. The gasoline price increases may not have affected the other purchases as the overall transportation category was held to between 17 to 18 percent since 2003. By reducing the percentage of total expenditures from new cars, the overall transportation category was held fairly constant from 2004 to 2007.

Comparing the Percentage of Total Annual Expenditures Spent on Gasoline by Region of Residence

The EIA (May 2008) presented the average price of retail gasoline for 2007 by region. For regular grade gasoline the West Coast and Rocky Mountains areas had the highest average price (\$3.00 and \$2.80, respectively). The other regions in order of highest average cost to lowest were Midwest, Central Atlantic and New England (\$2.79), Lower Atlantic (\$2.73), and Gulf Coast (\$2.67). A comparison of regional expenditures for gasoline was done using Consumer Expenditure Surveys. The regions are composed of: Northeast, Midwest, South, and West. All regions had increased percentage of total expenditures for gasoline increase over the years 2003-2007 (see Figure 2). However, very little change was found for the West region after 2005.

Figure 2



In 2006, consumer units residing in the West region spent on average \$2,382 on gasoline, while in 2007 their average expenditure was \$2,389. The percentage of total expenditures for gasoline rose from 4.14% to 4.24% due to a decline in average total expenditures. The South region had the highest percentage for gasoline while the Northeast had the lowest percentage of total expenditures for gasoline. Table 3 shows both average absolute dollars as well as percentage of expenditures for gasoline by region of residence. The South region as defined by the BLS would include the areas included in the EIA report (May 2008) as Gulf Coast and Lower Atlantic which had the lowest average prices for gasoline in 2007.

Table 3
Ave. expenditures and % of total expenditures for gasoline by region

Region	2003	2004	2005	2006	2007	Ave %
All	\$1,333 (3.27%)	\$1,598 (3.68%)	\$2,013 (4.34%)	\$2,227 (4.60%)	\$2,384 (4.80%)	4.14%
NE	\$1,157 (2.74%)	\$1,386 (3.01%)	\$1,761 (3.67%)	\$1,910 (3.89%)	\$2,080 (4.03%)	3.47%
MW	\$1,357 (3.37%)	\$1,620 (3.74%)	\$1,975 (4.39%)	\$2,142 (4.75%)	\$2,408 (5.02%)	4.25%
South	\$1,321 (3.51%)	\$1,598 (4.08%)	\$2,069 (4.87%)	\$2,356 (5.29%)	\$2,522 (5.55%)	4.66%
West	\$1,479 (3.25%)	\$1,755 (3.67%)	\$2,180 (4.12%)	\$2,382 (4.14%)	\$2,389 (4.24%)	3.88%

Looking at percentages for gasoline expenditures for metropolitan areas in those regions over the 5 year time period, the areas with the highest percentage stayed fairly consistent. For the NE the highest was Philadelphia averaging 3.5%; for the MW the highest was Detroit averaging 4.4%; for the South the highest areas were Houston and Miami both averaging 4.5%; and for the West the highest was Los Angeles averaging 4.2% for percentage of total expenditures for gasoline. In absolute dollars, the highest of all metropolitan areas was Houston spending on the average \$2404 for gasoline from 2003-2007.

As the South had consistently higher percentage of their total expenditures for gasoline as compared to three other regions, the issue of rural versus urban was examined. As a separate classification rural consumer units had the highest percentage of total expenditures for gasoline during the 2003 to 2007 time period. Table 4 shows the percentages for rural versus urban.

Table 4
Percent of total expenditures for Urban vs. Rural Consumer Units

	2003	2004	2005	2006	2007	Ave. %
Urban	3.12%	3.51%	4.19%	4.44%	4.64%	3.98%
Rural	4.51%	5.06%	6.16%	6.83%	6.90%	5.89%

Overall for both urban and rural consumer units the percent of their total expenditures for gasoline increased over the 5 year period. The higher percentage of expenditures for rural would be expected due to greater travel distances and number of vehicles owned. The urban units had an average of 1.9 vehicles per unit as compared to 2.5 per unit for rural. Rural areas experiencing higher percentage of total expenditures for gasoline is similar to the findings by Cooper (2005) who examined rural versus urban areas from 1999 to 2005. Cooper's findings showed both higher total dollar expenditure and higher percentage of expenditures for rural consumer units for all years using the consumer expenditure data from the BLS.

Examining changes for rural units as to their percentage of expenditures for all major categories, the findings were similar to all consumer unit averages. While the percent for gasoline increased, they decreased their overall transportation percentage by 2.9% from 2003 to 2007. The biggest decrease in the subcomponents was a 4.9% decrease in Vehicle Purchases (-2.6% for new cars and -2.3% for used cars). This percentage decrease was greater than the decrease experienced for all consumer units.

Summary

Examining data for all consumer units over the time period 2003 to 2007 did show consistent increases in percentage of total expenditures for gasoline. However, since the transportation component was fairly constant as to percentage of total expenditure over this time period, there didn't seem to be an impact on other expenditures. This factor was due to the reduction in percent of expenditures in the subcomponent vehicle purchases.

A significant difference was found between regions of residence and urban versus rural as to percentage of expenditures for gasoline. During the time period examined the South had a higher percentage for gasoline as compared to the Northeast, Midwest, and West. When classifying consumer units as urban or rural, rural units had the highest percentage of expenditure for gasoline; on average rural units had 2% more of their total expenditures for gasoline as compared to urban units.

References

- Cooper, M. September 2005. "The impact of rising prices on household gasoline expenditures." Consumer Federation of America, Washington, D.C. <http://www.consumerfed.org/pdfs/CFA_REPORT_The_Impact_of_Rising_Prices_on_Household%20Gasoline_Expenditures.pdf>.
- EIA. "Annual retail gasoline prices." 23 February 2009. Energy Information Administration, Department of Energy, Washington, D.C. <http://tonto.eia.doe.gov/dnav/pet/hist/mg_rt_usA.htm>.
- EIA. "Energy Information Administration Brochures: A primer on gasoline prices." August 2006. Department of Energy, Washington, D.C. <http://www.eia.doe.gov/bookshelf/brochures/gasolinepriceprimer/eial_2005primerM.html>.
- EIA. "Energy Information Administration Brochures: A primer on gasoline prices." May 2008. Department of Energy, Washington, D.C. <<http://www.eia.doe.gov/bookshelf/brochures/gasolinepricesprimer/index.html>>.
- EIA. "U.S. Retail Gasoline Prices." 13 March 2007. Department of Energy, Washington DC. <http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html>.
- U.S. Bureau of Labor Statistics. "Consumer Expenditure Survey 2003-2004" U.S. Department of Labor, Washington DC. <<http://www.bls.gov/cex/csxann05.pdf>>.
- U.S. Bureau of Labor Statistics. "Consumer Expenditure Survey 2004-2006" U.S. Department of Labor, Washington DC. <<http://www.bls.gov/cex/csxann06.pdf>>.
- U.S. Bureau of Labor Statistics. "Consumer Expenditure Survey 2004-2005," U.S. Department of Labor, Washington DC. <<http://www.bls.gov/cex/2005>>.
- U.S. Bureau of Labor Statistics. "Consumer Expenditures in 2005," U.S. Department of Labor, Washington DC, February 2007, pp. 1-19.