Distributional Changes in Consumer Transportation Expenditures: 1972–1985

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From 1972 to 1985, there were two periods of substantial increases in energy prices and one period of price decreases. Along with other macroeconomic events and policies, the combined impact has altered the distribution of income and transportation expenditures. Using U. S. Department of Labor statistics, the expenditures by families of different incomes on new and used vehicles and gasoline and total transportation spending can be examined. It was determined that wealthier families continued to purchase new cars; poor families drove less energy efficient autos. Transportation recently consumed more than 50 percent of a poor family's cash income. The greatest beneficiaries of lower energy prices would be the poor.

During 1972–73, the average urban American family spent just over 14 percent of its pretax income on transportation, including new and used vehicles, finance charges, gasoline, insurance, repairs, licenses, and fares on other travel modes. The price of a barrel of oil was $3; inflation was running at just over 3 percent; the unemployment rate was about 5 percent. Energy supply shocks and other macroeconomic events intervened to substantially change all of these indicators. By 1981–82, spending on transportation exceeded 17 percent of income; oil prices peaked near $33 per barrel; inflation surged to 13 percent; unemployment exceeded 10 percent. Subsequently oil prices, inflation, and unemployment fell.

While the impact of these events can be measured on average, this method obscures the fact that different families have been affected to different degrees. It is possible to calculate how households at various income levels have reacted. It is the purpose of this paper to document and comment on these changes.

In the last 15 yr, there have been three energy crises. In reaction to the Yom Kippur War, members of the Organization of Petroleum Exporting Countries (OPEC) embargoed oil to the United States in October 1973. As a result, the price of oil quadrupled by early 1974. Consumers confronted gas lines and higher prices. The second crisis began with the fall of the Shah of Iran in early 1979. A cutoff of Iranian crude, reinforced by panic stockpiling, led to a further doubling of oil prices.

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Energy conservation gained increasing importance. In early 1986, a third energy crisis (from the viewpoint of most OPEC members and energy-producing states in the United States) contributed to a decline in oil prices under $15 per barrel.

Besides energy shocks, other macroeconomic events and governmental policies affected transportation expenditures. In 1972–73, the economy was distorted by price controls. As these were relaxed, inflation, in conjunction with the first energy crisis and a simultaneous food price supply shock (first in the grain, then in the beef markets), shot up. As monetary and fiscal policy were tightened in reaction, a recession ensued and unemployment rose. Just before the second energy crisis, another food price shock (in the meat market) contributed to an acceleration of price increases. Combating the resulting inflation through tightened monetary policy increased unemployment. The economy hit bottom at the end of 1982; subsequently, economic indicators improved. Inflation and unemployment fell; energy prices steeply declined and then rebounded somewhat.

Over the entire period, spending on gasoline, new and used vehicles, and other transportation expenditures have changed in ways that can be documented using the Bureau of Labor Statistics' (BLS) *Consumer Expenditure Survey* (CES) (*1–4*). This survey obtains comprehensive documentation of spending on different categories of goods and services by different household groupings. The CES was undertaken in 1972–73, then updated and made annual in 1980. By comparing consumer expenditures in 1972–73 with those in 1980–85, it can be determined how the macroeconomic events of that time period altered transportation spending. By focusing on the 1982–85 data, it is possible, with some educated guesswork, to explore the impact of the 1986 oil price decline.

The CES reports expenditures by consumer units (households) aggregated in various ways. Of interest for this analysis is a breakdown by income. Households will be ranked by population quintiles (20-percent intervals): quintile 1 will comprise the poorest 20 percent of all families; quintile 5, the richest 20 percent. Income, defined as money income before taxes (a definition that is somewhat broader than that of the Internal Revenue Service), includes unemployment compensation, public assistance, food stamps, and social security payments.

The post-1980 data are not strictly comparable to the original 1972–73 figures due to certain changes in collection procedures. The most important alterations include limitation of the sample to urban areas only (until 1985), utilization of a smaller sample, and the treatment of students living away from home as separate consumer units for the latter data periods. The BLS has revised some of the original 1972–73 data to make them comparable to the 1980–81 data with students excluded. Since the 1982–85 data include student consumer units, an adjustment of the BLS numbers is necessary so all years are reasonably consistent. Comparing the 1980–81 data without students to those years' data with students provides an adjustment factor applicable to each income quintile and each expenditure component that can be carried forth and used to adjust the 1982–85 data.

OBSERVATIONS

Data for income before taxes, total transportation, new vehicle, used vehicle, and gasoline expenditures for 1972–73 and 1980–85 for the average family in each of the five income quintiles are displayed in Table 1. Much of the increase is due to inflation; prices increased by almost 150 percent in this time period. Nominal income rose in each year reported for all families except those in quintile 1, where there was a decline over the 1982–84 period. Real income fell for all quintiles, but more so at lower income levels.

Total transportation expenditures (including vehicle purchases, finance charges, gasoline, maintenance, insurance, licenses, and spending on other modes) increased substantially from 1972–73 through 1980 and again after

TABLE 1 AVERAGE HOUSEHOLD INCOME AND TRANSPORTATION EXPENDITURES, 1972–73, 1980–85

	Quintile:				
Year	1	2	3	4	5
	Income				
1972–3	$2448	6336	10553	15335	27260
1980	3468	9576	16379	24269	42938
1981	3968	10591	17771	26381	46635
1982	4449	10923	18181	27937	50960
1983	4329	10936	18646	28952	53914
1984	3831	11153	19602	30608	58878
1985	3850	11136	19704	31243	60989
Total change	+57%	+76%	+87%	+104%	+124%
	Transportation Expenditures				
1972–3	524	1087	1733	2266	3149
1980	1325	2409	3329	4417	6134
1981	1301	2263	3488	4597	5969
1982	1201	2151	3327	4460	6558
1983	1379	2473	3632	4833	7323
1984	2046	2829	4039	5352	8272
1985	1952	2916	4301	5690	8460
Total change	+273%	+168%	+148%	+151%	+169%
	New Vehicle Expenditures				
1972–3	100	234	408	509	894
1980	233	345	536	916	1394
1981	197	275	522	898	1254
1982	72	276	450	862	1614
1983	103	385	720	1112	2280
1984	423	610	854	1193	2592
1985	307	569	966	1531	2686
Total change	+207%	+143%	+137%	+201%	+200%

TABLE 1 AVERAGE HOUSEHOLD INCOME AND TRANSPORTATION EXPENDITURES, 1972–73, 1980–85

	Used Vehicles Expenditures				
1972-3	93	177	311	372	411
1980	175	450	486	632	845
1981	200	362	628	809	731
1982	257	325	637	722	976
1983	325	496	691	782	934
1984	386	546	817	1137	1182
1985	403	573	929	1018	1248
Total change	+333%	+224%	+119%	+174%	+204%
	Gasoline				
1972-3	121	262	413	533	678
1980	498	877	1240	1576	1911
1981	458	878	1251	1519	1879
1982	431	777	1073	1387	1692
1983	475	787	1069	1323	1696
1984	567	775	1025	1322	1667
1985	568	800	1020	1317	1580
Total change	+369%	+205%	+147%	-147%	+133%

Note: Values are dollars unless otherwise noted.

Source: Bureau of Labor Statistics (1-4) and author's adjustments.

1982. This increase in percentage terms was at least as great as that of overall prices and much greater than that of income, across all quintiles. As a result, such expenditures now account for a higher percentage of income for all families. The impact has been especially significant on quintile 1 families; transportation expenditures in 1984 and 1985 amounted to more than 50 percent of income (versus just over 20 percent in 1972–73).

Looking at the individual components of transportation, the uneven impact of the recession of 1980–82 is evident in spending on new vehicles. Quintile 1 families cut back substantially; quintile 5 households were barely affected. The economic expansion that began in 1983 coincided with a rebound in new car purchases, particularly in the lowest quintile. This seems somewhat paradoxical in light of the decline in nominal income for this group over the time period. One may wish to question the accuracy of the data on new vehicle expenditures for quintile 1 given the substantial fluctuations.

The second energy crisis and the recession of 1980–82 are also reflected in used car expenditures. Those expenditures held up rather well during this time period, suggesting that many households purchased used cars instead of new cars. Finally, gasoline spending has in general declined since 1980, although more so for the middle and upper income groups.

It is interesting to observe how vehicle expenditure dollars were divided between new and used vehicles for each quintile. As displayed in Table 2, the distributional impacts of the events of the 1972–84 period are evident. The recession of 1980–82 caused quintile 1 families to substitute used for new car purchases. On the other hand, quintile 5 household expenditure patterns held constant during this period. Wealthier families were able to continue buying newer and more energy efficient vehicles; lower income families were forced to purchase "gas guzzlers."

New-versus-used-vehicle expenditure patterns may partially explain the share of gasoline expenditures accounted for by each quintile in each time period (Table 3). Even though gasoline prices have declined since 1981, the share of such expenditures accounted for by quintile 1 and 2 families has continued to increase. However, gasoline expenditures and percentages could also have been affected by the number of vehicles owned by each group. This information is presented in Table 4. Vehicles per household rose most noticeably for quintile 1 families; for other quintiles, the increase was less.

Computing gasoline expenditures per vehicle (Table 3 data divided by Table 4 data) suggests roughly equal figures across quintiles. At first glance, it would appear that auto ownership alone could explain difference in gasoline expenditures. However, data from the 1983–1984 Nationwide Personal Transportation Study (5) indicate that mileage driven per vehicle is related to income. The highest income group reported ($40,000 and over) had mileage

per vehicle that was 45 percent above that of the lowest income group (under $10,000) for 1983. These data confirm the suspicion that lower income groups owned less energy efficient vehicles at that time, since they spent almost as much on gasoline on a per vehicle basis.

IMPLICATIONS BEYOND 1985

With the price of energy falling substantially at the end of 1985 and the first half of 1986, when consumer expenditures on gasoline are reported for this period, the decline that began in 1981 should continue. With the short-run price elasticity of demand in the range of −0.2 to −0.4 (*6*), a 40-percent decrease in gasoline prices would lead to an 8–16-percent increase in quantity purchased; thus, total gasoline expenditures will decline. If the lower prices had lasted longer, they would have proven particularly beneficial to the poor, who are relying on less energy efficient vehicles. This benefit would have been reinforced over time as the gas guzzlers are scrapped from the car fleet and more efficient autos trickle down to lower income families. A strong new car sales trend, particularly in higher-price vehicles, should continue to be observed in the upper quintiles.

QUALIFICATIONS

Certain concerns need to be raised about the CES data. As with any survey, sampling inaccuracies are possible. However, comparisons with alternative data sources suggest the overall numbers are reasonable. For example, the CES aggregate figures on vehicles and gasoline expenditures

TABLE 2 NEW CAR EXPENDITURES AS A PERCENTAGE OF TOTAL VEHICLE EXPENDITURES

	Quintile:				
Year	1	2	3	4	5
1972-3	51.8%	56.9	56.7	61.3	68.5
1980	57.1	43.4	52.4	59.2	62.3
1981	49.6	43.2	45.4	52.6	63.2
1982	21.9	45.9	41.4	54.4	62.3
1983	24.1	43.7	51.0	58.7	70.9
1984	52.3	52.8	51.1	51.2	68.7
1985	43.2	49.8	51.0	60.1	68.3

TABLE 3 PERCENTAGE OF GASOLINE EXPENDITURES BY EACH QUINTILE

	Quintile:				
Year	1	2	3	4	5
1972-3	6.0	13.1	20.6	26.66	33.8
1980	8.2	14.4	20.3	25.8	31.3
1981	7.7	14.7	20.9	25.4	31.4
1982	8.0	14.5	20.0	25.9	31.6
1983	8.9	14.7	20.0	24.7	31.7
1984	10.6	14.5	19.1	24.7	31.1
1985	10.8	15.1	19.3	24.9	29.9

Note: Each row sums to 100 percent.

TABLE 4 VEHICLES PER HOUSEHOLD, 1972–73, 1980–81, 1985

	Quintile:				
Year	1	2	3	4	5
1972–73	0.6	1.2	1.8	2.4	2.9
1980–81	0.8	1.4	2.0	2.5	2.9
1985	1.1	1.5	2.0	2.5	3.0

were within 2–5 percent and 5–11 percent, respectively, of the personal consumption expenditures in the National Income and Product Accounts prepared by the U.S. Department of Commerce over the 1980–83 period. Beginning in 1980, the CES relied on a smaller sample, possibly leading to more volatility in results. The smallest sample size for any quintile for any year was 672 families. The 1985 sample included rural families; the previous data reported were for urban areas only. Finally, the dollar expenditure numbers are averages for each quintile. For example, if a cell contains 750 households, 10 percent of which spend $5,000 each on a used car (the other 90 percent not purchasing this item), the average family will be reported as spending $500 on used vehicles.

CONCLUSIONS

The major observations are summarized as follows:

- Over the 1972–85 period, expenditures on transportation increased more than income for all quintiles.
- Due to the second energy crisis and the resulting recession of 1980–82, lower income families substituted the purchases of used cars for new cars.
- Gasoline expenditures have in general been declining since 1981 for all quintiles except the first. Quintile 1 expenditures have not declined because used cars have lower fuel efficiency and because the number of vehicles per quintile 1 household has increased.
- Lower energy prices would benefit the poor more than they would benefit higher income groups.

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