The Economic Impact of the Proposed Gasoline Tax Cut In Connecticut

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Introduction

This analysis estimates the effect of a decrease in the Connecticut gasoline excise tax financed by an increase in the State income tax on the Connecticut economy using the single-region (statewide) REMI input-output model. The REMI model is a sophisticated 53-sector replication of the state's economic structure, capable of projecting the economic impacts of various shocks up to the year 2035. Our objective is to measure the long run economic impact of the gasoline tax cut and personal income tax increase on the economy in terms of several key economic variables, including total employment, personal income and Gross State Product (GSP). The analysis looks at the impact over a period of eleven years (2000-2010).

Assumptions and Methodology

This analysis examines several questions:

1. What is the impact of a gasoline tax cut on the state budget? What will be the loss in state tax revenue as a result of a gasoline tax cut in the unbalance budget case?
2. If we assume a balanced budget, what will be the size of the state income tax increase necessary to offset the loss in state revenue? What will be the long-run economic consequences of the gasoline tax cut and offsetting income tax increase on the whole state?
3. What will be the long-run economic impact in the case of the unbalanced budget?
4. Finally, is it worth it for the state to reduce the gasoline tax?

We estimated the impact of the gasoline tax cut on the state budget based on a proposed 7 cents per gallon tax cut. Appendix 1 presents the data used in the model.

Appendix 2 presents a detailed description of our econometric estimations. The model suggested the own price elasticity of gasoline consumption was –0.512975, and the income elasticity of gasoline consumption was 0.367797. Using these estimates we calculated a projected increase in gasoline consumption after the tax cut, which then allowed us to find that the projected net loss in gas tax revenue to the state is $86.9 million.

Under the model of a balanced budget, we propose that the loss in the revenue from gasoline tax cut is offset by an equivalent increase in personal income taxes. We model the reduction in the gasoline tax by adjusting the Consumer Expenditure Price Index in REMI by an equivalent dollar amount. We offset this loss of tax revenue by an increase in income tax by the same amount. Because the average marginal federal income tax rate is 29%[1], the state income tax increase implies an increase in personal income tax of $61.7 million (71% of $86.9 million). In effect, the Federal government subsidizes state tax increases.

To see the long-run effects of the gasoline tax cut under the balanced budget scenario, we employed the REMI model using the $86.9 million reduction in gasoline prices and $61.7 million increase in personal income taxes derived earlier in the report. Table 1 in Appendix 3 shows the results.

Under the first model of an unbalanced budget, we capture the gasoline tax cut by reducing government expenditures on highways by $86.9 million and adjusting the Consumer Expenditure Price Index in REMI by an equivalent dollar amount.[2] Table 2 in Appendix 3 shows the results of this model.

[1] See "All Tax Cuts are Not Equal" by Fred V. Carstensen, *The Connecticut Economy*, Spring 1999, p. 8.
[2] We use revenues from the gasoline taxes for highway maintenance.

The second model of an unbalanced budget assumes that the gasoline tax cut will be offset by internal reallocation of funds and stretching out some payments. In this scenario we adjust the Consumer Expenditure Price Index in REMI by $86.9 million without any other changes in the budget. Table 3 in the Appendix 3 shows the results. In each case above the gas tax cut induces income and substitution effects because relative prices change. We expect substitution of Connecticut gas for nearby states' gas, because there are no material substitutes for gasoline. In the balanced budget case, the positive income effect of the gas price decrease matches somewhat the decrease in disposable income. In the unbalanced budget case, the income effect probably results in somewhat increased gas consumption perhaps manifested in SUV proliferation.

Results

The increase in the state income tax required to offset the proposed 7 cents per gallon gasoline tax cut can be achieved by an increase of the highest marginal tax rate from 4.5% to 4.5864%, which accounts for approximately $53 in additional tax per year for an average taxpayer in Connecticut earning $62,000 adjusted gross income. Assuming a conservative 20,000 miles per year for an average driver and 22 mpg for an average car, we get savings of approximately $64 from the gasoline tax cut, which leaves an average taxpayer almost indifferent to the proposed change.[3]

The tables in Appendix 3 summarize the REMI simulation results. The tables present five variables that measure the economic effects of impacts examined: gross state product (GSP), total employment, population, personal income, and real disposable

[3] For our purposes an average driver is an average taxpayer.

personal income. The tables show an average of the annual increases (or decreases) of these aggregate levels that flow directly and indirectly from the proposed gasoline tax cut and income tax increase over eleven years, compared to the baseline (status quo) forecast of the Connecticut economy's performance. For example, the value for GSP in the second column of Table 1 indicates that, on average, there will be an increase in GSP of $32.742 million per year over the REMI model's baseline forecast in the case of a 7 cents per gallon gasoline tax cut offset by an increase in state personal income taxes over 11 years.

The results of our analysis show that although the proposed 7 cents per gallon gasoline tax cut may leave an average taxpayer indifferent, the state economy will definitely benefit from it. Our results are relatively conservative and slightly underestimate true economic impact on the economy, as they do not take into consideration the capture of additional gasoline consumers resulting from the decrease in Connecticut's relative gasoline prices compared to our three neighboring states (New York, Massachusetts, Rhode Island). We assume that the fundamental gasoline price is the same in the four states and differences are due only to state taxes. The total state tax in each state is: 29.8 cpg for New York, 21.5 cpg for Massachusetts, 28 cpg for Rhode Island, compared to 35.3 cpg (32 cpg excise tax and 3.3 cpg – 5% gross earnings tax collected at wholesale) for Connecticut before the cut. After the reduction in Connecticut, the relative price is only substantially different for Massachusetts. We assume that Connecticut residents formerly going to New York or Rhode Island to buy gasoline will now be indifferent and probably buy their gasoline in Connecticut. People who formerly bought their gas in Massachusetts will likely continue to do so because

there is still some benefit to do so and habitual behavior is slow to change without substantial incentive. We assume that people in southwestern Connecticut did not travel to New York to buy gas, because of their high opportunity cost, and therefore the cut will not change their behavior much. We estimate that wealthy people will benefit less than poorer people will gain from this proposed policy change.

Appendix 1

Data on gasoline consumption, gasoline prices and income per capita in the State of Connecticut

Year	Consumption of gasoline	Price of gasoline	Income per capita
Jul-93	111,388,111	1.2344	31,206.32
Aug-93	109,152,965	1.2277	31,321.73
Sep-93	105,786,180	1.2301	31,453.01
Oct-93	108,883,889	1.2295	31,774.49
Nov-93	104,397,677	1.2449	31,806.73
Dec-93	110,924,341	1.2355	31,724.06
Jan-94	98,650,325	1.2473	31,244.99
Feb-94	91,796,576	1.2622	31,143.64
Mar-94	104,829,696	1.2541	31,138.51
Apr-94	104,432,182	1.2678	31,368.66
May-94	110,780,108	1.2594	31,451.68
Jun-94	111,774,989	1.2592	31,526.63
Jul-94	112,092,781	1.2718	31,546.51
Aug-94	113,791,424	1.2612	31,640.56
Sep-94	106,315,991	1.2340	31,761.78
Oct-94	115,838,038	1.2327	31,966.92
Nov-94	106,479,636	1.2402	32,099.93
Dec-94	114,338,786	1.2823	32,217.55
Jan-95	106,639,453	1.3083	32,335.59
Feb-95	99,300,912	1.3101	32,410.59
Mar-95	110,447,201	1.3106	32,458.34
Apr-95	108,195,550	1.3402	32,413.11
May-95	116,321,562	1.3425	32,455.69
Jun-95	116,342,333	1.3181	32,520.34
Jul-95	113,261,543	1.3160	32,629.35
Aug-95	118,559,940	1.3235	32,721.42
Sep-95	109,190,351	1.3373	32,818.84
Oct-95	113,873,780	1.3387	32,912.60
Nov-95	109,518,115	1.3410	33,027.49
Dec-95	109,537,301	1.3466	33,154.49
Jan-96	99,616,316	1.3497	33,315.61
Feb-96	97,617,365	1.3505	33,450.32
Mar-96	102,542,153	1.3701	33,580.63
Apr-96	101,657,207	1.3883	33,707.59
May-96	114,627,345	1.3444	33,828.34
Jun-96	112,436,106	1.3358	33,943.90

Year	Consumption of gasoline	Price of gasoline	Income per capita
Jul-96	114,065,956	1.3378	34,065.24
Aug-96	118,339,648	1.3553	34,162.24
Sep-96	106,446,676	1.3619	34,245.83
Oct-96	112,605,893	1.3924	34,272.23
Nov-96	104,987,894	1.3920	34,361.90
Dec-96	105,761,266	1.3812	34,471.02
Jan-97	100,045,880	1.3774	34,640.04
Feb-97	90,527,725	1.3704	34,757.77
Mar-97	101,563,898	1.3744	34,864.65
Apr-97	103,637,399	1.3650	34,954.58
May-97	115,823,620	1.3699	35,044.31
Jun-97	111,670,034	1.3605	35,127.74
Jul-97	118,812,557	1.3287	35,143.08
Aug-97	115,357,070	1.3905	35,260.28
Sep-97	104,999,775	1.3247	35,417.55
Oct-97	110,111,841	1.3195	35,700.65
Nov-97	105,177,798	1.3430	35,873.71
Dec-97	110,564,687	1.3366	36,022.51
Jan-98	100,068,567	1.3374	36,139.61
Feb-98	92,837,524	1.3534	36,245.45
Mar-98	104,242,838	1.3580	36,332.60
Apr-98	106,006,817	1.3550	36,336.65
May-98	116,608,802	1.3481	36,434.73
Jun-98	113,571,657	1.3611	36,562.42
Jul-98	124,759,831	1.3333	36,724.97
Aug-98	120,555,513	1.3063	36,907.97
Sep-98	114,202,166	1.3088	37,116.65
Oct-98	116,569,613	1.3113	37,483.85
Nov-98	109,242,880	1.3257	37,644.30
Dec-98	118,044,513	1.3561	37,730.81
Jan-99	103,353,663	1.3631	37,585.69
Feb-99	98,512,878	1.3687	37,642.62
Mar-99	114,970,435	1.3391	37,743.90
Apr-99	114,693,726	1.3195	37,945.80
May-99	122,401,959	1.3025	38,093.57
Jun-99	123,428,715	1.3185	38,243.49

Note: The data has been deflated by the Connecticut CPI.

Source: The data on gasoline consumption was provided by the State of Connecticut Department of Revenues Services.
The data on gasoline prices was provided by the Hartford office of AAA.
The data on income per capita was generated using the data from the Survey of Current Business by Bureau of Economic Analysis.

Appendix 2:

Estimation of the change in the state gasoline tax revenues:

Part 1. Estimation of price elasticity and income elasticity of gasoline consumption.

We constructed the following model for gasoline consumption:

$\ln C_t = \alpha_0 + \alpha_1 \ln P_t + \alpha_2 \ln I_t + \upsilon_t$

where $\upsilon_t = \rho \upsilon_{t-1} + \varepsilon_t$ and ε_t is $iid(0, \sigma_\varepsilon^2)$

C_t = deseasonalized consumption of gasoline

P_t = deseasonalized real price of gasoline

I_t = deseasonalized real income per capita

The model gives the following results:

Ep = price elasticity of gasoline consumption = -0.512975 (t: -1.736)

Ei = income elasticity of gasoline consumption = 0.367797 (t: 2.21)

R^2 = 0.663, DW = 1.64, = 0.644

Part 2. Estimation of the change in consumption of gasoline as a result of a gasoline tax cut.

P_{1999} = average price for 1998-1999 fiscal year = 1.3294.

ΔP = -0.07

Then the percentage change in gasoline price is

$\%\Delta P = \Delta P / P_{1999}$ = -0.052655

Then we find the percentage change in gasoline consumption as a result of a change in gasoline price:

$\%\Delta Cp = Ep * \%\Delta P$ = 0.02701

Now we find the predicted change in gasoline consumption as a result of a direct change in gasoline price:

$\Delta Cp = \%\Delta Cp * C_{1999}$ = 37,293,676

where C_{1999} = cumulative gasoline consumption for 1998-1999 fiscal year = 1,380,735,892

The examination of income per capita series suggests that they have a linear trend with the slope of 1.003283.

Therefore, the predicted percentage change in income per capita is

$\%\Delta I = 0.003283$

Then we find the percentage change in gasoline consumption as a result of a predicted change in income per capita:

$\%\Delta Ci = Ei * \%\Delta I = 0.0012075$

Now we find the predicted change in gasoline consumption as a result of a predicted change in income per capita:

$\Delta Ci = \%\Delta Ci * C_{1999} = 1,667,208$

Then the total predicted change in gasoline consumption is:

$\Delta C = \Delta Cp + \Delta Ci = 38,960,884$

Part 3. Estimation of the change in state gasoline tax revenues.

$$\Delta TR_t = C_t\tau_t - C_{t-1}\tau_{t-1} = \Delta C_t\tau_t + C_{t-1}\Delta\tau_t$$

Therefore,

$\Delta TR = 38,960,884 * 0.25 – 1,380,735,892 * (-0.07) = -\$86,911,291$

Appendix 3: REMI Simulation Results

Table 1. Annual average changes in selected economic variables from 7cpg decrease in gasoline tax financed by an increase in personal state income tax (2000-2010).

	Annual Average
Employment (Units)	739
GRP (Mil. 92$)	35.467
Personal Income (Mil. Nominal $)	23.764
Real Disposable Personal Income (Mil. 92$)	53.087
Population (Units)	1104

Table 2. Annual average changes in selected economic variables from 7cpg decrease in gasoline tax under the non-balanced state budget assumption with a decrease in government expenditures (2000-2010).

	Annual Average
Employment (Units)	581
GRP (Mil. 92$)	32.742
Personal Income (Mil. Nominal $)	6.826
Real Disposable Personal Income (Mil. 92$)	103.438
Population (Units)	1978

Table 3. Annual average changes in selected economic variables from 7cpg decrease in gasoline tax under the non-balanced state budget assumption without a decrease in government expenditures (2000-2010).

	Annual Average
Employment (Units)	1,531
GRP (Mil. 92$)	72.047
Personal Income (Mil. Nominal $)	65.394
Real Disposable Personal Income (Mil. 92$)	124.455
Population (Units)	2801