

THE RELATION OF NON-PETROLEUM REVENUES  
TO PERSONAL INCOME IN THE MAP MODEL  
SIMULATION OF ALPETCO IMPACT

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The ISER report on the impact of the Alpetco project met with a flurry of criticism regarding one of its main conclusions--that the project would result in greater additional expenditures by the state than the increases in revenue the State would receive. While major portions of the increased revenues were exogenous inputs to the MAP model which was used for the simulations, e.g., Alpetco's estimates of corporate income tax liabilities, some of the revenue increases were derived by the model.

The model categorizes State revenues as petroleum-related, federal transfers, income from the permanent fund, and endogenous, meaning those related to general economic activity. All petroleum revenues are exogenous to the model; the latter categories are computed by the model.

In Table II.7 from the Alpetco report (appended) the ratio of endogenous revenues to personal income (RENSRAT) declines from 9.8% in fiscal year 1977 to 5.8% in FY 2000 in the base case simulation. The report states "the slight downward trend in this proportion over time is indicative of the fact that the structure of government revenues in Alaska does not respond proportionately to an increase in economic activity."

Table I (appended) displays historical figures for personal income, some major non-petroleum unrestricted revenues, and total non-petroleum unrestricted revenues excluding investment income. The latter category should approximate that of endogenous revenues used in the MAP model which appears to include special fund revenues as well as unrestricted.

Table 2 (appended) displays the revenue figures from Table I as percentages of personal income. For the period 1961 to 1978, the ratio for total revenues increased from 5.5% to 7.6%. There is a sub-period from 1965 to 1974 during which the ratio of total revenues to personal income steadily declined, but upon construction of TAPS, the ratio jumped to a new high of 8.8% in 1977. Of course, the TAPS project being of unparalleled magnitude relative to Alaska's economy may mean that that high may not be reached again.

However, examination in Table 2 of the main component of endogenous revenues, the personal income tax, reveals a more definite upward trend in its ratio to personal income. This is logical, given that individual incomes have been rising and that the personal income tax structure is progressive. Indeed, this fact of an upward trend is reflected in recent efforts to index income taxes to avoid an increasing percentage government take due to inflation.

It appears that personal income in proportion to endogenous State revenue in the base case simulation (Table II.7) in 1977, 9.8%, is correct, allowing for special funds. However, whether this ratio should decline over time as in the simulation is open for question.

There will be a one-time downtick in State endogenous revenues due to the repeal of most of the business license tax. The Department of Revenue estimates this will drop business license revenues from \$21.3 million in FY 79 to \$4.1 million in 1980.

Also, the upward trend in the ratio for personal income will certainly be held in check for the next few years by tax credits enacted into law in 1978. However, it should resume its climb thereafter barring indexation (not unlikely - SB 76 and HB 268 were introduced for this purpose in 1977) or further tax reduction measures. The movement of the personal income tax should be more determinate of the trend in endogenous revenue in the future since by FY 1978, it accounted for 48% of all endogenous revenue up from 28% in 1961.

Of course, what was of concern in the Alpetco report was not the way the model's assumptions worked themselves out in the base case, but their depiction of Alpetco's impact. In Table 3 (appended), the increases in personal and non-petroleum corporate income taxes generated by Alpetco are compared to increases in personal income stemming from the project. These figures are derived from Tables III.4 and III.6 in the Alpetco report (appended). Alpetco's estimated corporate income taxes are excluded from non-petroleum corporate income taxes.

From this last table, it appears that the increase in non-petroleum corporate income taxes relative to increases in personal income is at the level of recent historical averages, .7%, over most of the simulation while that for the personal income tax ranges well below the historical averages in Table 2. In the absence of legislation, the ratio for personal income taxes in Table 3 should increase over time due to the effect of a progressive tax structure on increasing incomes, both nominal and real.

However, the ratios in Table 3 are measures of the marginal responsiveness of taxes to increases in personal income and should be judged for reasonableness by looking, not at the average ratios in Table 2, but by some marginal measures that can be derived from Table 1. For example,

<u>Fiscal Year</u>	<u>Change in Personal Income Tax as a % of Change in Personal Income</u>	<u>Change in Non-Petroleum Corporate Income Tax as a % of Change in Personal Income</u>
1975	5.2%	1.8%
1976	6.7	.8
1977	20.2	1.3
1978	83.1	2.6

Certainly these marginal rates for the pipeline construction years are only relevant to the construction phase for Alpetco. Yet, the highest marginal rate of personal income tax to personal income increases during Alpetco construction is only 3%. Given the cavalier expenditure of funds for TAPS construction, a proper ratio for Alpetco would perhaps be less than those experienced during TAPS construction.

The model might be improved by making income taxes more responsive to inflation and changes in wage rates, as well as re-evaluating the direction and degree of a trend, if any, in the relation of endogenous revenues to personal income.

Table II.7.

INDICATORS OF STATE FISCAL POSITION  
BASE CASE

	SIMP	RENSRAT	EXBITES	VIABL2
1977	246.672	0.098	0.222	0.748
1978	149.935	0.082	0.257	0.658
1979	435.177	0.078	0.257	0.636
1980	814.892	0.072	0.236	0.633
1981	824.85	0.066	0.219	0.61
1982	981.842	0.067	0.232	0.568
1983	903.154	0.072	0.263	0.539
1994	1390.42	0.07	0.255	0.549
1985	1545.1	0.068	0.247	0.551
1986	1591.33	0.067	0.246	0.545
1987	1416.	0.066	0.243	0.54
1988	1185.46	0.065	0.24	0.533
1989	948.255	0.064	0.237	0.526
1990	702.368	0.063	0.237	0.516
1991	469.357	0.062	0.234	0.509
1992	221.125	0.062	0.235	0.5
1993	-15.101	0.061	0.233	0.495
1994	-276.078	0.06	0.23	0.49
1995	-567.083	0.059	0.227	0.484
1996	-918.563	0.059	0.228	0.475
1997	-1304.77	0.058	0.227	0.47
1998	-1716.03	0.058	0.226	0.465
1999	-2158.43	0.058	0.225	0.462
2000	-2654.8	0.058	0.224	0.459

SIMP = general fund revenues minus general fund expenditures (million \$)  
 RENS RAT = endogenous revenues as a percentage of personal income (percent)  
 EXBITES = state total expenditures as a percentage of personal income (percent)  
 VIABL2 = non-petroleum revenues (not including permanent fund earnings)  
 as a percentage of general fund expenditures (percent)

TABLE I

NON-PETROLEUM UNRESTRICTED REVENUES  
(\$ millions)

<u>Fiscal Year</u>	<u>Personal Income (1)</u>	<u>Personal Income Tax (2)</u>	<u>Non-Petroleum Corporate Income Tax (3)</u>	<u>Business license Tax (2)</u>	<u>Selected Sales &amp; Gross Receipts Taxes (4)</u>	<u>Licenses, Fees and Permits (2)</u>	<u>Total Non-Petroleum Unrestricted Revenue Excluding Investment Income (2,3)</u>
1961	657	10	1	1	8	3	36
1962	651	12	2	1	11	4	42
1963	693	13	2	2	11	5	43
1964	745	14	2	2	11	4	51
1965	842	16	2	3	11	5	64
1966	886	19	4	3	13	6	62
1967	972	23	3	3	13	6	63
1968	1066	23	4	4	15	7	68
1969	1163	25	4	4	17	7	75
1970	1350	32	5	5	19	8	89
1971	1470	36	6	6	20	9	95
1972	1618	39	6	6	21	9	104
1973	1840	43	6	7	23	10	115
1974	2165	49	7	8	25	11	132
1975	2900	87	20	11	31	14	204
1976	3774	146	27	19	41	16	287
1977	4091	210	31	23	40	16	362
1978	4014*	146	29	22	44	19	305

Sources:

- (1) U.S. Dept. of Commerce, Bureau of Economic Analysis (fiscal year basis)
- (2) Alaska Dept. of Revenue, "Revenue Sources"
- (3) Alaska Dept. of Revenue, unpublished data
- (4) Includes fuel, alcoholic beverage, tobacco products, insurance premiums and electric and telephone utilities taxes

\*Based on Commerce & Economic Development estimate for 4th quarter 1978

TABLE 2

## NON-PETROLEUM UNRESTRICTED REVENUES AS A % OF PERSONAL INCOME

<u>Fiscal Year</u>	<u>Personal Income Tax</u>	<u>Non-Petroleum Corporate Income Tax</u>	<u>Business License Tax</u>	<u>Selected Sales &amp; Gross Receipts Taxes</u>	<u>Licenses, Fees, and Permits</u>	<u>Total Non-Petroleum Unrestricted Revenue Excluding Investment Income</u>
1961	1.5%	.2%	.2%	1.2%	.5%	5.5%
1962	1.8	.3	.2	1.7	.6	6.5
1963	1.9	.3	.3	1.6	.7	6.2
1964	1.9	.3	.3	1.5	.5	6.8
1965	1.9	.2	.4	1.3	.6	7.6
1966	2.1	.5	.3	1.5	.7	7.0
1967	2.4	.3	.3	1.3	.6	6.5
1968	2.2	.4	.4	1.4	.7	6.4
1969	2.1	.3	.3	1.5	.6	6.4
1970	2.4	.4	.4	1.4	.6	6.6
1971	2.4	.4	.4	1.4	.6	6.5
1972	2.4	.4	.4	1.3	.6	6.4
1973	2.3	.3	.4	1.3	.5	6.3
1974	2.3	.3	.4	1.2	.5	6.2
1975	3.0	.7	.4	1.1	.5	7.0
1976	3.9	.7	.5	1.1	.4	7.6
1977	5.1	.8	.6	1.0	.4	8.8
1978	3.6	.7	.5	1.1	.5	7.6

TABLE 3

ALPETCO IMPACT  
RESPONSIVENESS OF INCOME TAXES TO INCREASES IN PERSONAL INCOME

<u>Fiscal Year</u>	<u>Increase in Personal Income Tax as a % of Increase in Personal Income</u>	<u>Increase in Non-Petroleum Corporate Income Tax as a % of Increase in Personal Income</u>
1979	1.1%	-
1980	1.4	.1%
1981	1.4	.2
1982	1.9	.4
1983	2.1	.5
1984	3.0	.7 (or 1.0%)*
1985	2.5	.8
1986	2.2	.7
1987	2.0	.6
1988	2.0	.6
1989	2.0	.6
1990	1.8	.6
1991	1.8	.6
1992	1.6	.6
1993	1.7	.6
1994	1.7	.6
1995	1.8	.6
1996	2.0	.8
1997	1.9	.7
1998	1.9	.7
1999	1.8	.7
2000	1.8	.7

\*Depends on whether a negative tax liability for Alpetco for this year as shown in the simulation is deducted from state tax receipts.

Table III.4.

## IMPACT OF ALPETCO ON INCOME AND PRICES

	PI	PINRPC	RPI	PRAT
1977	0.	0.	0.	0.
1978	0.	0.	0.	0.
1979	71.844	39.084	0.538	0.003
1980	247.141	110.383	1.834	0.009
1981	757.109	272.281	5.013	0.022
1982	1020.05	290.375	4.691	0.028
1983	1167.77	308.207	7.823	0.032
1984	697.16	83.859	5.796	0.022
1985	512.164	19.605	4.205	0.015
1986	448.848	-7.918	3.594	0.013
1987	440.695	-20.168	3.404	0.011
1988	456.371	-26.223	3.38	0.011
1989	486.73	-29.762	3.428	0.01
1990	522.66	-31.324	3.51	0.01
1991	566.383	-32.109	3.616	0.01
1992	612.32	-31.937	3.734	0.01
1993	666.082	-31.652	3.866	0.01
1994	726.457	-31.758	3.998	0.009
1995	799.941	-31.805	4.143	0.009
1996	739.168	-45.789	3.66	0.008
1997	737.668	-51.824	3.509	0.007
1998	762.18	-53.855	3.476	0.007
1999	803.055	-54.277	3.499	0.006
2000	830.598	-55.316	3.458	0.006

PI = personal income (million \$)  
 PINRPC = real per capita personal income (deflated by RPI)  
 RPI = relative price index for Alaska (1967US = 100)  
 PRAT = ratio of RPI to U.S. CPI

Note: All variables measured as the difference from the base case.

Table III.6.

IMPACT OF ALPETCO ON INDIVIDUAL COMPONENTS  
OF STATE ENDOGENOUS REVENUES

	RENS	RT98	RTCSX	RTCTS	RTBSX	RTBS	RTIS
1977	0.	0.	0.	0.	0.	0.	0.
1978	0.	0.	0.	0.	0.	0.	0.
1979	0.961	0.961	0.	0.	0.	0.006	0.769
1980	7.904	6.936	0.4	0.757	1.4	1.697	3.549
1981	22.307	18.945	0.6	1.894	2.3	3.339	10.927
1982	45.899	35.537	0.5	4.641	2.4	5.619	19.802
1983	58.785	44.643	0.5	6.362	2.6	7.015	24.33
1984	58.116	41.681	-2.	4.826	3.9	8.785	21.317
1985	39.724	30.044	0.	4.039	5.8	8.41	13.31
1986	55.935	48.855	24.	26.929	6.5	8.345	10.244
1987	69.812	63.617	40.4	42.965	6.8	8.379	9.258
1988	76.745	70.648	47.2	49.754	7.2	8.743	9.177
1989	83.509	77.164	52.7	55.391	7.6	9.195	9.529
1990	90.458	83.648	57.8	60.745	7.9	9.618	10.09
1991	98.101	90.737	63.2	66.435	8.3	10.154	10.782
1992	106.314	98.275	68.8	72.404	8.7	10.732	11.563
1993	115.378	106.62	75.	78.984	9.2	11.406	12.436
1994	123.253	113.651	79.7	84.151	9.6	12.025	13.42
1995	134.21	123.649	87.	91.979	10.1	12.769	14.557
1996	144.523	132.796	94.4	100.062	10.6	13.589	14.623
1997	150.057	139.266	102.3	107.511	11.1	13.777	13.75
1998	159.44	148.66	111.	116.31	11.7	14.378	13.753
1999	170.755	159.564	120.4	125.989	12.3	15.062	14.197
2000	182.79	170.923	129.9	135.935	12.9	15.828	14.682

RENS = total endogenous revenues' (million \$)  
 RT98 = taxes net of petroleum production (million \$)  
 RTCSX = Alpetco corporate income taxes (million \$)  
 RTCTS = total corporate income taxes (million \$)

RTBSX = Alpetco business license taxes (million \$)  
 RTBS = total business license taxes (million \$)  
 RTIS = personal income taxes (million \$)

Note: All variables measured as the difference from the base case.