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ALASKA

REVIEW OF

BUSINESS AND ECONOMIC

CONDITIONS

UNIVERSITY OF ALASKA, INSTITUTE OF SOCIAL, ECONOMIC AND GOVERNMENT RESEARCH, Jan. 1976, Vol. XIII, No. 1

ALASKA'S GROWTH TO 1990

ECONOMIC MODELLING AND POLICY ANALYSIS FOR A RAPIDLY CHANGING NORTHERN FRONTIER REGION

THE MAN-IN-THE-ARCTIC PROGRAM

The U.S. North—Alaska—and its adjacent seas are now viewed as the nation's greatest storehouse of the energy resources required to meet national needs and policy goals during the next decade or more. But rapid development of Alaska's oil and gas resources, while critical to national energy policy, potentially conflicts with other national as well as state values and objectives, including environmental preservation, social and economic equity, and local self-determination. This in essence outlines the major events and goals that define the setting, purposes, and significance of the Man-in-the-Arctic Program (MAP). The basic reason for the program is that scientifically grounded policy-oriented research is needed to help guide public and private decision-makers at the state and national levels. MAP is thus designed both as a program of basic research to contribute to the development and testing of social science theories and methods, and as a program of policy research and applications to assist in dealing with current social and economic problems of northern development.

The first phase of the Man-in-the-Arctic Program has been carried out by the University of Alaska's Institute of Social, Economic and Government Research under grant funding from the National Science Foundation, with support from the State of Alaska and other sources. This phase, which is now nearing completion, has consisted of a series of basic economic and demographic studies, which have been used to construct computer models to simulate the behavior of the Alaska economy. The models have been used to make projections of the various growth paths which Alaska might follow as a result of alternative policy choices. The models have been designed specifically to trace out the implications of different policy actions and of changes in outside forces. On the basis of information concerning factors such as (1) location, size, and timing of petroleum leasing, development, and production; (2) petroleum prices; and (3) state fiscal policies, the models project through 1990 such things as the growth in gross state product, personal income, industry output and employment, and population. Projections of economic activity and population are made on both a statewide and regional basis.

A second phase of the Man-in-the-Arctic Program has been designed to build upon and extend the results of the first phase of MAP. The Phase II research will expand the capacity for detailed policy analysis—particularly concerning the *distribution* of the economic and social benefits and costs produced by energy development in Alaska. Further, it will incorporate community studies dealing with prospective patterns of urbanization and human settlement. The community studies will also examine community responses to the actual and/or perceived impacts of Alaska's future development. Phase II will extend the MAP demographic and manpower studies, and they will provide a major link between the more detailed economic models and the community studies.

STRUCTURE OF THE MAP MODELS

Economic Model

The structure of the MAP economic model is illustrated in simplified form in Figure 1. Although

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Robert W. Hiatt—President, University of Alaska
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Author: David T. Kresge

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separate models have been developed for statewide and regional analysis, the basic structure is the same in both cases. In very general terms, the model proceeds sequentially to estimate industrial output, industry employment, wages and salaries, and finally real disposable personal income. However, the output of certain industries is itself dependent on the level of personal income. Because of these interrelationships, output and income are simultaneously determined in the model.

It should be stressed that the MAP models are specifically designed to analyze the long-run growth path of the Alaska economy. They are not appropriate, without further modification, for studying short-term cyclical fluctuations or for making detailed short-run forecasts. There are many factors such as seasonality, salmon cycles, and supply bottlenecks which are important in the short run but which tend to average out over the long run. Such factors can appropriately be omitted from a growth model even though they may be among the key elements in a short-term forecasting model.

The determination of industrial output is a key element in the model, and determining relationships vary significantly from one industrial sector to another.

The output of the petroleum industry is determined outside the economic model as part of petroleum development scenarios, which are comprehensive sets of assumptions specifying alternative patterns of petroleum

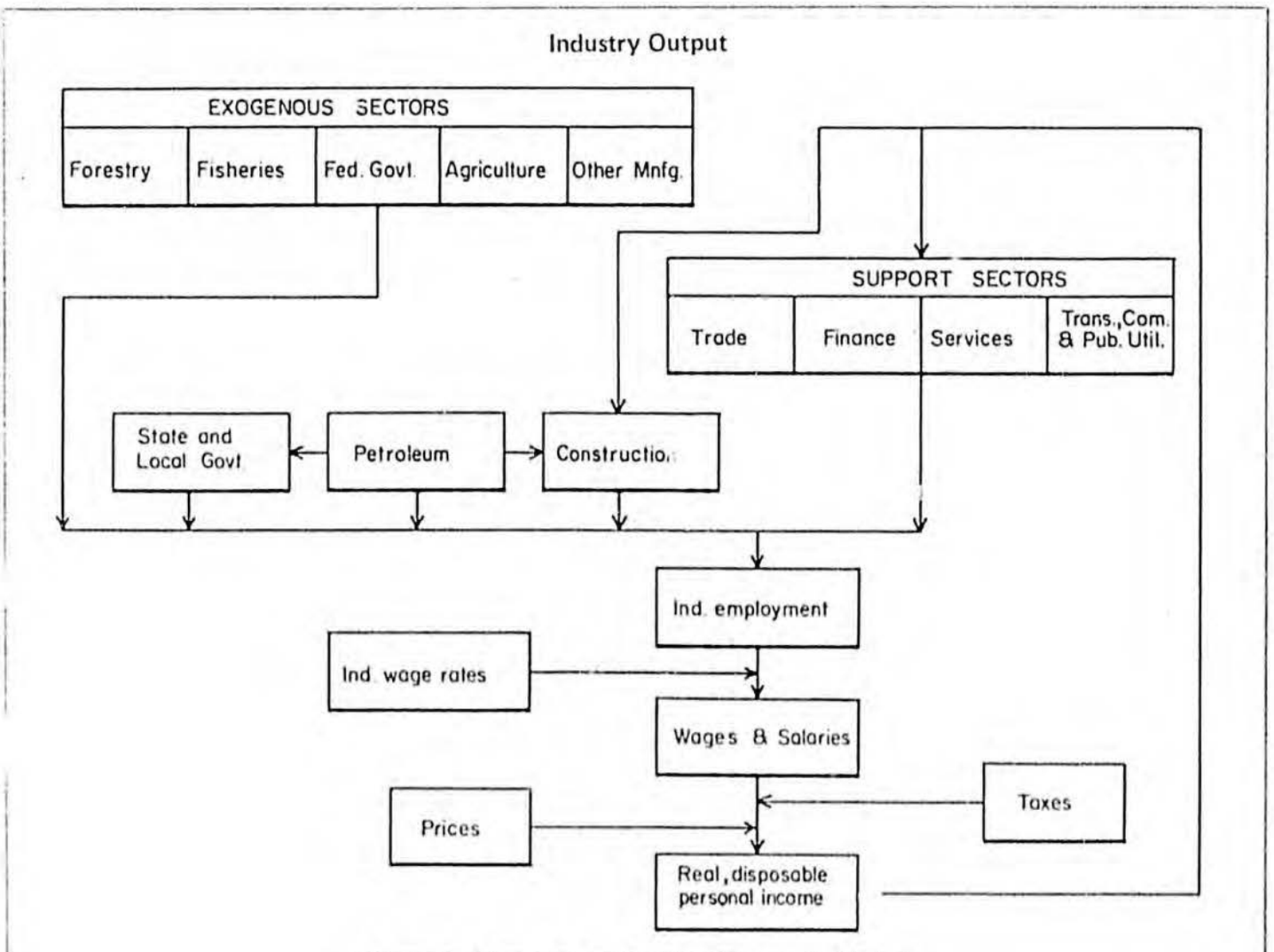


Figure 1. Structure of the MAP Economic Model.

development. In contrast, the output of the support industries (trade, finance, services, transportation, communication, and public utilities) is produced to meet local demands and thus responds to changes in the level of economic activity in Alaska. To reflect this, support sector output is generally made a function of Alaska real disposable personal income.

The output of the construction industry is determined by a combination of internal and external factors. Part of construction activity is designed to supply the needs of the expanding Alaska economy. As in the support sector, this portion of construction output is made a function of real disposable personal income. Over the foreseeable future, there will, in addition, be construction activity involved in building pipelines, terminals, and other facilities required for petroleum production. This portion of construction output is exogenously determined in accordance with the relevant petroleum development scenarios.

Employment and output in the state and local government sector is determined by the level of state and local expenditures, which are, in turn, a function of available revenues. To be precise, expenditures are equal to total revenues minus that portion of petroleum revenues which is assumed to be saved and placed into an investment trust fund. The output of state and local government is thus responsive both to changes in the level of economic activity, which affect general revenues, and to changes in petroleum production, which affect petroleum revenues. The remaining industrial sectors are assumed to have their output determined by exogenous factors. These factors include such things as prices on world markets, demand for export commodities, supplies of natural resources, and policy decisions of the Federal Government.

Once output has been determined in each of the major industrial sectors, the next step in the model is to determine industry employment. In general, a statistical relationship derived from the Alaska data is used to project industry employment as a function of industry output. Industry wage rates are then calculated as a function of projected wage rates in the U.S. and/or relative prices in Alaska. The projections of industry employment and wage rates are then combined to estimate wages and salaries.

Wages and salaries are generally the largest component of personal income, and this is particularly true in Alaska. Sources of income other than wages and salaries are a much smaller component of personal income in Alaska than in the rest of the U.S. Total personal income in Alaska is estimated as a function of total wages and salaries and disposable personal income is estimated as a function of personal income.

Since virtually all consumer goods are imported from the "Lower 48" and wage rates in Alaska are closely related to comparable wages in the U.S., relative prices in Alaska are projected as a function of the U.S. consumer price index. As the Alaska economy expands, there will be a certain amount of import substitution and economies of scale that will tend to lower costs in some industries. As a result, prices in Alaska over the long run are expected to increase somewhat less rapidly than prices in the rest of the U.S. The price and personal income projections are combined to estimate Alaska real disposable personal income in terms of constant 1967 U.S. prices.

As shown by the feedback loop in Figure 1, real disposable personal income is a principal determinant of output in the support sector and in the construction industry. Thus, anything which affects personal income will affect support sector and construction output, and anything which affects support sector and construction output will affect personal income. Industrial output and personal income are thus simultaneously determined in the model.

Although the statewide and regional economic models have similar basic structures, the regional model includes somewhat greater industry detail and does, of course, take into account differences in regional activity patterns. In particular, the behavioral relationships for the Anchorage and Fairbanks regions are quite different from those for the other regions (the model uses seven regions in all, see Figure 2). The statewide model, though less detailed than the regional model, is

Figure 2: Seven Alaska Geographic Regions

nonetheless adequate for certain types of aggregate analysis and has the advantage of being easier to operate.

Demographic Model

Alaska's future population growth will result from two distinct factors: (1) net migration into the state and (2) natural increase, or the excess of births over deaths. The factors determining net migration, births, and deaths are quite different, and therefore, the MAP demographic model treats these events separately. On the other hand, the events are linked through the

age-sex distribution of the state's population, which is strongly influenced by net migration and which in turn influences births and deaths.

The basic structure of the MAP demographic model is illustrated in Figure 3. As shown there, net migration to Alaska is determined by the employment opportunities and by real per capita income in Alaska relative to the U.S. average. In making projections, these factors are among the outputs produced by the economic model. Estimates of births and deaths are derived from information concerning the age-sex distribution of the population, fertility rates, and mortality rates. The estimates of births and deaths are used to calculate natural increase, and this is combined with the estimate of net migration to determine the change in Alaska's civilian population. The level of military personnel and military dependents is assumed to be determined by exogenous factors.

At present, the demographic model uses the estimate of state population to derive estimates of regional populations. The state population is allocated

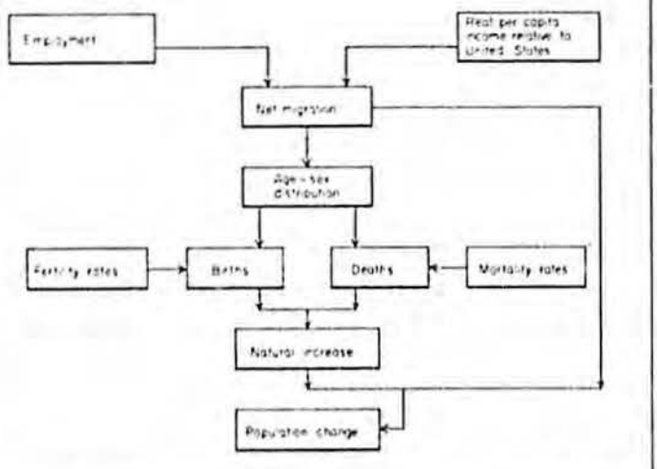


Figure 3. Structure of the MAP Demographic Model.

to each of the seven regions on the basis of the projected employment growth in the region. The regional population model thus requires as inputs the projections of regional employment which are generated by the regional economic model.

PROJECTIONS OF ALASKA'S GROWTH TO 1990

Implementation Procedures

The economic and demographic models are made operational by empirically determining the quantitative relationships involved. In general, the relationships are estimated through statistical analysis of the economic and demographic data for Alaska. As part of the MAP research, a set of economic accounts has been compiled which contains data on gross state product, wages and salaries, employment, prices, population, personal income, and government budgets. The statewide data set covers the period from 1961 to the present and the regional data set goes from 1965 to the present.

In making projections of Alaska's prospective growth, it is assumed in most cases that the behavioral relationships empirically observed in the recent past will continue to apply in the future. There are, however, several areas in which there are strong reasons for expecting future behavior patterns to differ from those in the past. In these instances, the relationships used in making the projections incorporate the anticipated structural changes. A particularly important example of this is in the area of state fiscal policy, which is discussed below.

Once the quantitative relationships in the models have been specified, the major remaining step in preparation for making the projections is to set values for the exogenous variables. Those variables represent the factors influencing Alaska's growth, which are either determined by outside forces or which are the result of policy decisions. In the present Alaskan situation, the most important exogenous factors are the pattern of future petroleum development, state fiscal policies, and potential growth in the resource-based industries. Each of these is discussed separately below; other exogenous factors are assumed to maintain the *status quo* either by remaining constant, as in the case of federal employment in Alaska, or by continuing past trends, as in the case of projected inflation in the U.S. as a whole.

Petroleum Scenarios

Over the foreseeable future, the pace at which Alaska's petroleum resources are developed is likely to be the primary determinant of the state's economic growth. There are, in addition to Prudhoe Bay, a number of promising areas that can be opened up for petroleum exploration and development. Some such developments are almost certain to occur since Alaska plays a central role in national policies to meet U.S. energy needs. There are obviously a very large number of specific actions which might be taken with regard to petroleum leasing, exploration, and development. For purposes of analysis, these individual actions are brought together into so-called "petroleum development scenarios," which are comprehensive, internally consistent sets of actions. The purpose of the scenarios is not to predict the future developments, but to provide a systematic, quantitative basis for generating the relevant ranges for the alternative rates of petroleum development. The projections to 1990 have been carried out using three alternative petroleum scenarios which were designed to reflect sets of policy actions leading to limited, accelerated, or maximum development of Alaska's petroleum resources.

1. Limited Petroleum Development. In this minimum case, present developments would be carried forward, a few additional fields would be opened near

existing areas, and the federal OCS (outer continental shelf) leasing program would be limited to the Gulf of Alaska. Some small amounts of Native corporation oil lands adjacent to the trans-Alaska pipeline would be brought into production. Total oil production, most of it from Prudhoe Bay, would reach 2 million barrels a day by 1980, over 3 million barrels in 1985, and 4 million barrels in 1990. Petroleum-related employment would be 5,000 in 1980 and 7,200 in 1990. Assuming a wellhead price of $5 per barrel, the state would receive petroleum revenues of $1.1 billion in 1980 and $1.7 billion in 1990.

2. Accelerated Petroleum Development. Under accelerated development policies, in addition to the production included in the limited case, new petroleum areas would be opened in the northwest, both onshore and offshore, and a second North Slope oil pipeline would be constructed. This would primarily result from federal leasing of oil-lands in Naval Petroleum Reserve No. 4 in northwest Alaska. As this area comes into production, Alaska's output of oil would rise to 5 million barrels a day in 1985 and to 7.7 million in 1990. Petroleum-related employment would reach nearly 12,000 in 1990 and state revenues would total $2.3 billion.

3. Maximum Petroleum Development. This scenario approximates the maximum rate of petroleum development that might plausibly occur in Alaska. Although there is some question about the technological and logistical feasibility of the scenario, the projected rate of development is comparable to that incorporated in the Federal Government's plan for "Project Independence." In addition to all of the developments in the previous scenarios, it is assumed that the Federal Government would open major new regions by leasing heavily in the Bering and the Chukchi seas. This, in turn, would necessitate construction of oil and gas pipelines running from north to south in western Alaska. Availability of the pipelines and processing facilities would then make additional leasing feasible in the new western areas for Native corporations and the state. With maximum development policies, Alaska's oil production would reach 5.2 million barrels a day in 1985 and nearly 10 million barrels in 1990. Petroleum-related employment would soar to 18,000 in 1985 and to over 23,000 in 1990. State petroleum revenues, on the other hand, would rise only moderately to $3 billion in 1990, since most of the new developments would be in Federal areas.

A critical factor in the construction of the scenarios is the assumed price of oil. The projections made using the MAP models employ three alternative prices of oil: $3, $5 and $7 per barrel at the wellhead. After taking transport costs into account, these wellhead prices correspond to refinery prices of about $7, $9, and $11 a barrel. The revenue figures cited above in presenting the scenarios are all based on a wellhead price of $5 a barrel.

Fiscal Policy

In light of enormous amounts of revenues that will be accruing to the state, and since petroleum is a nonrenewable resource, it seems likely that the state government will set aside at least some portion of petroleum revenues for use in the future. For example, some of the revenue might be placed into an investment trust fund, the interest from which would then be spent for such purposes as the promotion of Alaska's renewable resource industries. In the projections made here, it is assumed that 25 percent of recurrent petroleum revenues are saved and 50 percent of petroleum lease bonuses are saved. These savings rates are applied only after 1978 when the North Slope oil first starts to flow.

The level of total state expenditure is then determined by the revenues available and by the assumed fiscal savings rates. The distribution of the total expenditure among particular expenditure categories is assumed to be determined on the same basis as in the past. At this point in the analysis, no redistributive policy actions have been included.

Resource-Based Industries

Growth in the fisheries industry is expected to be effectively constrained by the availability of marine resources. As a result, real output in Alaska's fishing industry is projected to expand at just 1 percent a year. Likewise, the output of the forest products industry will be determined primarily by the supply of timber, which is a function of the amount of exploitable forest land and the federal policies governing allowable cut in Alaska's national forests. The forest products industry is projected to nearly double its output by 1990, but the industry growth rate declines from 6 percent in the early part of the projection period to 2.5 percent by the end. By 1990, the industry is expected to be approaching the maximum long-run sustainable yield.

Agriculture and nonpetroleum mining are the remaining resource-based industries in Alaska. While specific developments in these industries may be of local importance, their impact on the total state economy is likely to be quite minor. Because of the contraints imposed by the Alaskan climate, the availability of suitable lands and high transport cost, nonpetroleum mining and agriculture are projected to increase only slightly in the future. The growth in mining and agriculture could, of course, be much more substantial if the government should choose to subsidize the development of these industries.

1990 Projections — Statewide Model

The statewide economic model has been used to project the growth of the Alaska economy and population to 1990. This has been done for each of the three alternative petroleum development scenarios and

for each of the three different prices for oil (nine cases in all). The results for five of the cases are summarized in Figures 4 and 5 and the table of selected variables (Table 1). The five cases include the extreme cases (limited development at $3 a barrel and maximum development at $7 a barrel) and the three scenarios at $5 a barrel. Summary excerpts from the computer printout are also shown for the case of accelerated petroleum development at $5 a barrel (Table 2).

By 1990, assuming a wellhead price of $5 a barrel, the projections of Alaska personal income range from $10.5 billion under limited development to $16.1 billion under maximum development; Alaska personal income in 1973 was $2.0 billion. The corresponding projections of Alaska population are 627,000 under limited development and 908,000 under maximum development. If the extreme cases are considered, the projected population ranges from 574,000 to slightly over a million persons in 1990.

While the three scenarios produce wide differences in aggregate growth, the effect on the income of the typical household in Alaska is much less pronounced. As shown in Table 1 (and considering the scenarios at $5 a barrel) total personal income under maximum development exceeds personal income under limited development by more than 50 percent; but the difference in personal income per capita is only 6.6 percent. And when taxes and prices are taken into account, the difference in real disposable personal income per capita is just 3.4 percent. The basic reason for these results is that when income and employment increase in Alaska, migrants are attracted into the state, and the gains are spread over a larger population. Since there are no effective, or constitutional, means of preventing migration into the state, there can be only limited increases in per capita personal income.

The differences on an individual level are, however, somewhat larger when one also takes into account differences in state and local government expenditures and the associated differences in the level of public services being provided. As Table 1 shows, state and local government expenditures in 1990 are $8.3 billion under maximum development and $4.9 billion under limited development, a difference of 71 percent. On a per capita basis, the difference is smaller but still significant; it amounts to over $1,400 per person or 18 percent. If state and local government expenditures per capita are added to disposable personal income per

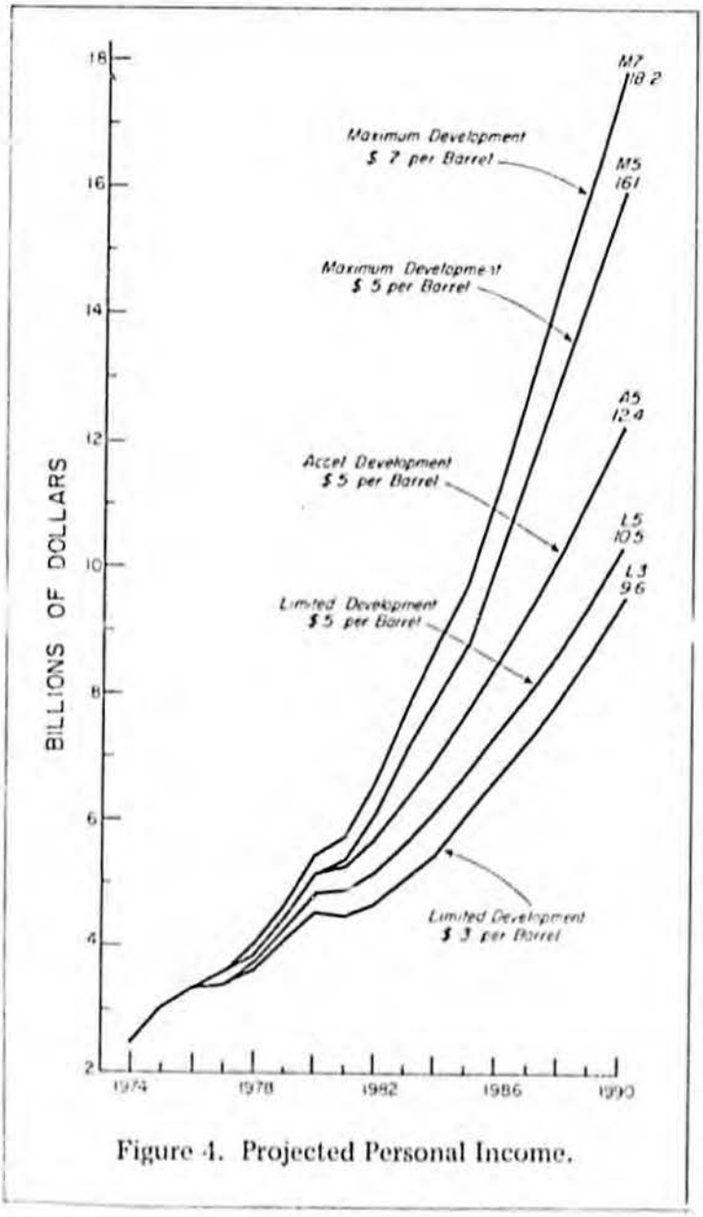


Figure 4. Projected Personal Income.

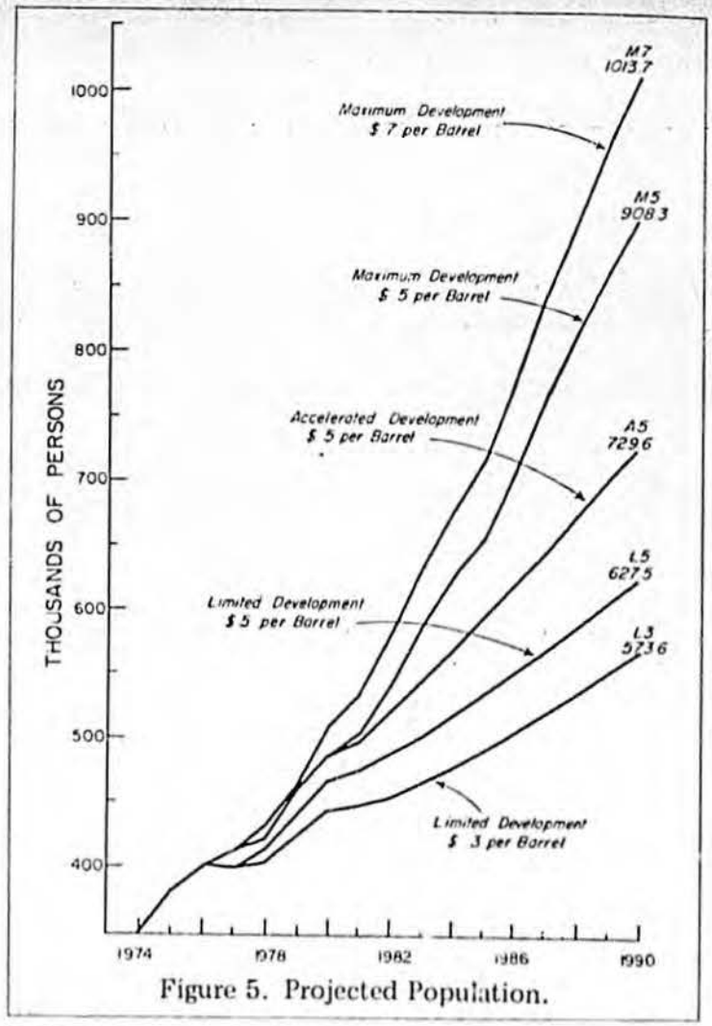


Figure 5. Projected Population.

TABLE 1

PROJECTED 1990 VALUES FOR SELECTED VARIABLES

VARIABLES	UNITS	Limited Development		Accelerated Development	Maximum Development	
		$3 per barrel	$5 per barrel	$5 per barrel	$5 per barrel	$7 per barrel
Total Output (X)	(Millions of 1958 $)	3,920.8	4,123.4	5,728.4	10,047.2	10,550.9
Total Employment (E)	(Persons x 1,000)	274.4	301.0	356.7	465.3	528.0
Total Population (POP)	(Persons x 1,000)	573.6	627.5	729.6	908.3	1,013.7
Personal Income (PI)	(Millions of $)	9,553.2	10,461.5	12,391.5	16,136.8	18,216.1
Personal Income Per Capita (PIPC)	($)	16,654.0	16,672.2	16,983.6	17,765.9	17,970.4
Real Disposable Personal Income Per Capita (DIRPA)	(1967 $)	3,290.3	3,273.4	3,296.2	3,386.2	3,396.9
State Government Total Petroleum Sector Revenue (RP9S)	(Millions of $)	1,087.0	1,685.0	2,339.0	2,940.0	3,964.0
State-Local Government Expenditures (SLGEXP)	(Millions of $)	3,949.6	4,852.1	6,190.9	8,305.5	10,169.9
State Government General Fund Balance (GFBAL)	(Millions of $)	4,094.5	5,694.3	6,807.5	7,490.8	9,633.3
State-Local Government Expenditures Per Capita (SLGEXP/POP)	($)	6,885.6	7,732.4	8,485.3	9,144.0	10,032.5
Real Disposable Personal Income plus Real State-Local Government Expenditures Per Capita $\left(\text{DIRPA} + \frac{\text{SLGEXP/POP}}{\text{RPI}} \right)$	(1967 dollars)	5,162.9	5,376.3	5,603.9	5,873.0	6,125.3

KEY TO VARIABLES USED IN TABLES 2 AND 3.

ABBREVIATIONS	DEFINITIONS
AFF	Agriculture, Forestry, Fisheries
DIRPA	Real Disposable Personal Income Per Capita
DPI	Real Disposable Personal Income
E	Employment
E99L	Local Government Total Expenditure
E99S	State Government Total Expenditure
EC	Civilian Employment
EMOT	Employment Other than Wage and Salary Employment
FIR	Finance, Insurance, Real Estate
GFBAL	State Government General Fund Balance
GSL	State and Local Government
PI	Personal Income
PIBAR	Real Personal Income
PIPC	Personal Income Per Capita
PIRPC	Real Personal Income Per Capita
POP	Population — Total
POPC	Population — Civilian
POPM	Population — Military
POPN	Population — Native
R99L	Local Government Total Revenue
R99S	State Government Total Revenue
RINS	State Government Interest Revenue
RPI	Alaska Relative Price Index
RP9S	State Government Total Petroleum Sector Revenue
RSTL	Local Government Revenue from State Government
RTIS	State Individual Income Taxes
SLGEXP	State and Local Government Expenditures
WR	Wage Rate
WS	Wages and Salaries
X	Real Output

TABLE 2

SUMMARY OF ALASKAN STATE ECONOMIC MODEL

(Accelerated Growth with Oil at $5/Barrel)

VARIABLE X MILLIONS OF 1958 DOLLARS

	MINING	CONSTR	MANUFAC	TRAN	COMM	PUB UTIL	TRADE	FIR	SERVICE	FED GOVT	GSL	AFF	TOTAL
74	313.547	98.584	130.200	113.920	95.632	57.390	196.378	129.911	101.126	217.775	91.728	20.000	1566.189
75	313.547	136.910	135.300	132.749	97.827	71.748	235.202	153.951	119.844	217.775	113.239	26.100	1754.190
76	331.363	135.759	140.700	140.055	98.607	77.585	250.545	163.384	127.190	217.775	125.004	32.100	1840.067
77	632.400	101.203	146.100	142.742	98.885	79.767	256.223	166.867	129.902	217.775	138.032	32.500	2142.595
78	1082.890	99.673	152.800	148.416	99.459	84.438	268.277	174.245	135.647	217.775	126.189	32.900	2622.707
79	1141.472	105.583	159.400	165.127	101.046	98.669	304.255	196.153	152.707	217.775	139.396	33.300	2814.882
80	1759.721	112.692	166.300	184.397	102.713	115.919	346.555	221.718	172.616	217.775	160.416	33.700	3594.522
81	1921.317	110.018	171.900	182.186	102.530	113.897	341.661	218.770	170.320	217.775	170.204	34.000	3754.577
82	2010.435	117.499	178.100	189.138	103.101	120.296	357.090	228.055	177.551	217.775	182.540	34.200	3915.780
83	2265.122	122.801	184.400	202.246	104.131	132.658	386.457	245.664	191.264	217.775	191.719	34.600	4279.031
84	2298.600	122.788	191.300	214.439	105.039	144.493	414.081	262.156	204.109	217.775	203.563	35.000	4413.340
85	2488.753	128.045	198.500	227.874	105.990	157.897	444.849	280.450	218.355	217.775	212.820	35.300	4716.598
86	2522.587	133.415	206.400	241.717	106.921	172.092	476.890	299.421	233.130	217.775	222.366	35.400	4868.305
87	2710.086	139.333	214.700	255.958	107.833	187.091	510.201	319.044	248.429	217.775	229.364	36.000	5175.824
88	2934.672	145.836	223.900	271.036	108.753	203.396	545.835	339.994	264.730	217.775	236.077	36.400	5528.391
89	2957.884	152.312	233.300	286.222	109.636	220.244	582.083	361.202	281.248	217.775	243.267	36.800	5681.961
90	2882.564	158.185	243.700	300.137	110.410	236.049	615.604	380.746	296.470	217.775	249.462	37.200	5728.289

VARIABLE E THOUSANDS OF WAGE EARNERS

	MINING	CONSTR	MANUFAC	TRAN	COMM	PUB UTIL	TRADE	FIR	SERVICE	FED GOVT	GSL	EMOT	AFF	TOTAL
74	2.1	12.8	9.9	7.5	2.8	1.2	21.3	4.8	17.9	44.7	24.8	14.7	1.1	165.6
75	2.1	17.9	10.5	8.4	2.8	1.4	25.0	5.7	21.8	44.7	30.8	16.5	1.1	188.8
76	2.3	17.8	11.0	8.7	2.9	1.5	26.5	6.1	23.4	44.7	34.0	17.1	1.1	197.0
77	3.8	13.3	11.5	8.8	2.9	1.5	27.1	6.2	24.0	44.7	37.7	17.3	1.1	199.1
78	6.0	13.1	12.0	9.1	2.9	1.5	28.2	6.5	25.2	44.7	34.4	17.5	1.1	202..
79	6.2	14.0	12.5	9.8	2.9	1.7	31.6	7.4	28.9	44.7	38.1	18.7	1.1	217.7
80	8.9	15.0	13.0	10.6	3.0	1.9	35.6	8.4	33.4	44.7	43.9	20.3	1.1	239.9
81	9.6	14.7	13.6	10.5	3.0	1.9	35.1	8.3	32.9	44.7	46.7	20.5	1.1	242.5
82	9.9	15.7	14.1	10.8	3.0	2.0	36.6	8.7	34.5	44.7	50.2	21.2	1.1	252.4
83	10.9	16.5	14.6	11.4	3.0	2.1	39.3	9.4	37.6	44.7	52.7	22.2	1.2	265.6
84	11.1	16.5	15.1	11.9	3.0	2.2	41.8	10.1	40.6	44.7	56.1	23.1	1.2	277.3
85	11.8	17.3	15.7	12.4	3.1	2.3	44.6	10.8	43.9	44.7	58.7	24.0	1.2	290.6
86	11.9	18.1	16.2	12.9	3.1	2.5	47.5	11.6	47.4	44.7	61.4	24.9	1.2	303.6
87	12.7	18.9	16.8	13.5	3.1	2.6	50.5	12.4	51.0	44.7	63.4	25.9	1.2	316.9
88	13.5	19.9	17.5	14.0	3.2	2.8	53.7	13.3	55.0	44.7	65.3	26.9	1.2	331.0
89	13.6	20.8	18.2	14.6	3.2	2.9	57.0	14.2	59.0	44.7	67.3	27.9	1.2	344.6
90	13.3	21.7	18.9	15.1	3.2	3.0	59.9	15.0	62.7	44.7	69.1	28.7	1.2	356.7

FISCAL SUMMARY MILLIONS OF DOLLARS

	E99S	R99S	RTIS	RP9S	RINS	GFRAL	F99L	R99L	RSTL	SLGEXP
74	578.665	428.665	54.613	48.000	46.011	567.300	320.476	247.478	105.626	793.515
75	797.884	505.884	71.749	62.000	39.711	375.300	416.906	337.306	145.414	1069.375
76	952.367	745.367	93.378	236.000	26.271	243.300	490.738	430.226	170.885	1272.221
77	1167.010	967.010	106.179	416.000	17.031	118.300	551.625	505.804	205.640	1512.994
78	1104.484	1278.234	115.860	695.000	8.281	367.050	558.874	523.031	191.321	1472.037
79	1333.456	1594.206	128.515	943.000	25.693	702.800	630.304	604.564	229.811	1733.949
80	1648.291	1974.541	154.585	1205.000	49.196	1104.050	759.401	744.549	280.514	2127.178
81	1810.825	2110.075	186.904	1197.000	77.283	1478.300	898.709	885.504	305.310	2404.224
82	2127.655	2512.405	194.038	1539.000	103.481	1938.050	971.661	959.589	353.358	2745.958
83	2377.002	2907.752	214.704	1723.000	135.663	2443.799	1183.704	1074.680	389.873	3070.834
84	2661.720	3136.970	246.204	1901.000	171.066	2994.045	1240.974	1234.403	430.735	3471.959
85	2930.067	3442.067	278.694	2048.000	209.583	3581.042	1402.561	1400.166	468.209	3864.416
86	3213.448	3758.948	317.442	2182.000	250.673	4201.539	1592.086	1595.303	507.074	4298.457
87	3465.338	4028.588	359.710	2253.000	294.108	4839.785	1795.682	1805.692	540.899	4720.117
88	3719.355	4293.855	407.533	2298.000	338.785	5489.285	2026.283	2044.831	574.504	5171.133
89	3990.504	4574.004	461.922	2334.000	384.250	6147.785	2290.555	2319.873	609.926	5671.133
90	4255.582	4840.332	520.548	2339.000	430.345	6807.535	2578.754	2620.877	643.919	6140.414

AGGREGATE STATISTICS

	X	E	EC	PI	PIRAR	PIPC	PIRPC	DPI	DPIR	DIMPA	WS	WR	RPI	POP	POPM	POPC	POPN
74	1566.2	165.6	138.1	2472.5	1281.0	7050.9	3653.1	1970.2	1020.8	2911.0	1966.7	13035.	193.0	350.7	27.5	323.2	56.1
75	1754.2	188.8	161.3	3028.4	1487.2	7878.5	3869.1	2379.9	1168.8	3040.6	2446.2	14199.	203.6	384.4	27.5	356.9	57.2
76	1840.1	197.0	169.6	3343.2	1568.2	8298.0	3892.4	2609.6	1224.1	3038.3	2718.5	15109.	213.2	402.9	27.5	375.4	58.4
77	2142.6	199.8	172.4	3575.5	1602.4	8624.3	3865.2	2778.1	1245.1	3003.2	2919.6	15995.	223.1	414.6	27.5	387.1	59.5
78	2622.7	202.2	174.7	3872.5	1670.1	9120.1	3933.3	2992.5	1290.6	3039.5	3133.8	16966.	231.9	424.6	27.5	397.2	60.7
79	2814.9	217.7	190.2	4464.1	1853.0	9400.6	4109.6	3416.3	1418.1	3145.0	3560.7	17892.	240.9	450.9	27.5	423.4	61.9
80	3594.5	239.9	212.5	5166.6	2063.8	10593.7	4231.6	3914.5	1563.6	3206.1	4172.3	18997.	250.3	487.7	27.5	460.2	63.2
81	3754.6	242.5	215.0	5317.7	2044.0	10594.3	4072.1	4021.1	1545.6	3079.2	4471.5	20176.	260.2	501.9	27.5	474.5	64.4
82	3915.8	252.4	224.9	5748.6	2126.2	10998.6	4068.1	4323.8	1594.2	3059.8	4942.1	21379.	270.4	522.7	27.5	495.2	65.7
83	4279.0	265.6	238.2	6387.4	2273.0	11677.9	4155.6	4769.8	1697.3	3103.1	5501.0	22599.	281.0	547.0	27.5	519.5	67.0
84	4413.3	277.3	249.9	7026.9	2407.0	12325.2	4221.9	5213.1	1785.7	3132.1	6061.4	23837.	291.9	570.1	27.5	542.7	68.4
85	4716.6	290.6	263.1	7767.6	2560.3	13044.2	4299.5	5723.2	1886.4	3167.9	6711.5	25180.	303.4	595.5	27.5	568.0	69.8
86	4868.3	303.6	276.1	8552.2	2712.6	13768.3	4367.1	6260.0	1985.6	3196.6	7401.2	26564.	315.3	621.1	27.5	593.7	71.1
87	5175.8	316.9	289.4	9414.7	2873.3	14537.6	4436.7	6846.1	2089.4	3226.3	8160.7	28046.	327.7	647.6	27.5	620.2	72.6
88	5528.4	331.0	303.5	10367.8	3045.2	15348.4	4508.1	7489.6	2199.8	3256.6	9001.4	29602.	340.5	675.5	27.5	648.0	74.0
89	5682.0	344.6	317.1	11366.6	3212.3	16162.6	4567.7	8159.6	2306.0	3279.0	9883.7	31207.	353.8	703.3	27.5	675.8	75.5
90	5728.3	356.7	329.3	12390.2	3369.7	16983.3	4618.8	8842.1	2404.7	3296.1	10789.2	32895.	367.7	729.6	27.5	702.1	77.0

capita, the combined difference in real terms is nearly $500 per person or 9.2 percent. Thus, when public services are taken into account, the differences in individual benefits, though still not overwhelming, are significantly larger than when only personal income is considered.

Although petroleum revenues are the key driving force in the system, less than a third of the increase in the state and local government expenditures are directly financed out of petroleum revenues. Under maximum development, petroleum revenues in 1990 are $1.3 billion higher than under limited development, while state and local government expenditures are $3.5 billion higher. The Alaska economy is projected to grow so much faster under the maximum development scenario that the sources of state revenue other than petroleum are generating much larger funds. In fact, one of the possible policy responses to the accelerated growth would be to reduce revenues by cutting taxes.

1990 Projections – Regional Model

An example is also provided of the computer printout from the regional economic model (Table 3). The projections shown in the printout are for the accelerated development scenario with oil prices at $5 per barrel.

The state totals produced by the regional model are very similar to those produced by the statewide model. For example, projected state employment and population are 365,000 and 731,000, respectively, in the regional model and are 357,000 and 730,000 in the state model. Differences in some of the earlier years are larger but in no case do they exceed about 7 percent. While it is encouraging to have the two models producing similar results, there is no reason to expect them to produce identical projections. The regional model incorporates a wealth of detail not included in the statewide model. Changes in the industrial and regional composition of economic activity are reflected in the regional model projections but not in the statewide projections.

In the sample output which has been included, Anchorage is projected to have a 1990 population of nearly 400,000 people, about 54 percent of the total population in the state. Currently, Anchorage's population is estimated at about 165,000, or 44 percent of the state's total estimated population of 378,000. The regional projections thus show Anchorage continuing and strengthening its role as the commercial and service center for the state. Nearly half of the projected increase in employment between 1974 and 1990 is in the trade, finance, and service industries, and those are the industries which tend to be concentrated most heavily in the Anchorage area. Those three industries account for 62 percent of the projected growth in Anchorage employment. Thus, although almost no petroleum developments are located in the Anchorage area, the economic growth which is caused by those developments tends to be concentrated there.

MAP POLICY APPLICATIONS

The initial set of projections carried out using the MAP models concentrated on analysis of alternative petroleum development scenarios. There are, of course, a variety of other types of policy actions which can be analyzed through use of the models. The projections presented here provide four illustrative examples of policy applications using the MAP models.

The first policy application considers the implications of placing varying proportions of the state petroleum revenues into an investment trust fund for use in the future. The second application projects the impact of using petroleum revenues to eliminate personal income taxes in Alaska. The third application estimates the economic impact of a proposed state lease sale in the Beaufort Sea. This is an example of how the MAP models can be used to evaluate a very specific policy action or project. The fourth and final policy application is also a type of project analysis. It analyzes the economic impacts of the alternative proposed gas pipelines bringing natural gas from the North Slope. The gas pipeline analysis is carried out using the regional economic models rather than the statewide model which was used in the first three policy applications.

Alternative Fiscal Saving Policies

It is apparent that the growth of the Alaska economy will be influenced significantly by the fiscal policies of the state government. A key policy decision that must be made concerns the amount of money, if any, that is to be saved out of the massive petroleum revenues accruing to the state. In the projections used to analyze the alternative petroleum development scenarios, it was assumed that the fiscal savings rate was a fixed proportion of petroleum revenues. In particular, it was assumed that 25 percent of recurrent revenues were saved and 50 percent of petroleum bonuses were saved. The saving took the form of deposits into an investment trust fund, the interest from which was then used to finance current expenditures.

The projections presented here will examine the implications of alternative fiscal saving rates. A high savings rate case is considered in which 75 percent of recurrent revenues are saved and 100 percent of bonuses are saved; the low (or zero) savings rate case assumes that none of the petroleum revenues are saved; and the medium savings rate case uses the same rate as in the previous projections, namely 25 percent of recurrent revenues and 50 percent of bonuses.

In all, five separate projections are made. All of them assume a wellhead price for oil of $5 a barrel. Three of the projections are based on the accelerated petroleum development scenario used in conjunction

TABLE 3
SUMMARY OF ALASKAN REGIONAL ECONOMIC MODEL
(Accelerated Growth with Oil at $5/Barrel)

AGGREGATE STATISTICS

	XX	EM	EMCV	PI	PIMAR	PIPC	PIRPC	DPI	DPIR	DIRPA	WS	WR	RPI	PDP	PDPM	PIPC	PIPN
74	1494.5	159.9	132.4	2369.7	1227.8	6757.7	3501.5	1893.8	981.3	2798.3	1879.7	12940.	193.0	350.7	27.5	323.2	56.1
75	1661.3	179.9	152.4	2881.8	1415.4	7414.7	3739.9	2272.4	1146.1	2949.1	2321.6	14162.	203.6	374.5	27.5	351.0	57.2
76	1735.6	187.6	160.2	3173.4	1488.7	8047.1	3775.0	2485.9	1166.2	2957.2	2573.3	15047.	213.2	394.3	27.5	366.9	58.4
77	2037.1	192.6	165.1	3409.9	1528.4	8381.3	3756.6	2658.1	1191.4	2928.3	2777.2	15832.	223.1	406.8	27.5	379.4	59.5
78	2496.2	193.8	166.3	3676.4	1585.7	8884.0	3831.8	2851.1	1229.7	2971.6	2966.3	16805.	231.8	413.8	27.5	386.4	60.7
79	2644.6	205.1	177.7	4185.4	1737.5	9657.6	4009.2	3217.2	1335.6	3081.7	3322.1	17767.	240.9	433.4	27.5	405.9	61.9
80	3198.4	224.6	197.2	4827.0	1928.3	10382.5	4147.7	3674.3	1467.8	3157.2	3879.9	18907.	250.3	464.9	27.5	437.5	63.2
81	3349.9	233.6	206.2	5067.7	1948.1	10441.8	4013.9	3844.7	1477.9	3045.2	4264.3	19974.	260.1	485.3	27.5	457.9	64.4
82	3479.5	248.5	221.0	5584.5	2065.8	10928.0	4042.4	4238.7	1556.9	3046.5	4802.9	21131.	270.3	511.0	27.5	483.6	65.7
83	3746.1	262.6	235.1	6227.8	2216.4	11619.1	4135.1	4658.6	1658.1	3093.2	5366.5	22330.	281.0	536.0	27.5	508.5	67.0
84	3852.9	275.0	247.6	6858.8	2349.7	12252.4	4197.4	5096.8	1746.1	3119.1	5919.4	23508.	291.9	559.8	27.5	532.3	68.4
85	4118.2	289.0	261.6	7598.7	2504.9	12970.9	4275.8	5607.2	1848.4	3155.2	6570.3	24815.	303.4	585.8	27.5	558.4	69.8
86	4272.0	303.0	275.5	8388.6	2661.0	13698.5	4345.5	6148.3	1950.4	3185.0	7264.0	26162.	315.2	612.4	27.5	584.9	71.1
87	4516.8	317.4	289.9	9264.8	2827.9	14476.0	4418.4	6744.6	2058.6	3216.5	8036.7	27612.	327.6	640.0	27.5	612.6	72.6
88	4806.1	333.2	305.8	10252.6	3011.7	15303.0	4495.2	7412.1	2177.3	3249.8	8909.3	29135.	340.4	670.0	27.5	642.5	74.0
89	4981.6	349.0	321.5	11303.6	3194.9	16138.1	4561.3	8117.5	2294.3	3275.6	9839.0	30710.	353.8	700.4	27.5	673.0	75.5
90	5097.8	364.7	337.3	12435.3	3382.3	17001.3	4624.2	8872.0	2413.1	3299.2	10839.9	32360.	367.7	731.4	27.5	704.0	77.0

CIVILIAN NON-NATIVE POPULATION THOUSANDS OF PERSONS

		MALE	FEMALE			MALE	FEMALE			MALE	FEMALE
1974	0-1	2.849	2.748	1975	0-1	3.330	3.212	1976	0-1	3.954	3.815
	1-4	10.574	10.333		1-4	11.259	11.072		1-4	11.931	11.719
	5-9	11.630	11.473		5-9	12.301	12.187		5-9	12.789	12.681
	10-14	11.540	11.341		10-14	12.073	11.968		10-14	12.316	12.244
	15-19	12.330	10.981		15-19	14.378	12.088		15-19	14.766	12.464
	20-24	14.319	13.895		20-24	19.438	17.369		20-24	20.555	17.895
	25-29	10.106	12.028		25-29	12.686	14.540		25-29	14.692	15.936
	30-34	8.354	8.885		30-34	9.217	9.895		30-34	10.094	10.966
	35-39	7.571	7.547		35-39	7.947	8.227		35-39	8.272	8.713
	40-44	6.994	6.285		40-44	7.068	6.507		40-44	7.201	6.819
	45-49	6.677	5.777		45-49	6.687	5.847		45-49	6.710	5.946
	50-54	5.646	5.033		50-54	5.779	5.145		50-54	5.885	5.247
	55-59	4.614	3.856		55-59	4.735	4.053		55-59	4.856	4.232
	60-64	3.244	2.590		60-64	3.414	2.793		60-64	3.570	2.990
	65+	3.849	3.290		65+	4.171	3.646		65+	4.499	4.025
1977	0-1	4.169	4.022	1978	0-1	4.260	4.110	1979	0-1	4.180	4.032
	1-4	12.960	12.694		1-4	13.806	13.472		1-4	14.841	14.502
	5-9	13.284	13.161		5-9	13.842	13.676		5-9	14.715	14.539
	10-14	12.517	12.458		10-14	12.640	12.566		10-14	13.160	13.116
	15-19	14.734	12.638		15-19	14.163	12.545		15-19	15.060	13.114
	20-24	20.552	17.679		20-24	19.083	16.472		20-24	21.107	17.912
	25-29	16.208	16.781		25-29	16.952	16.849		25-29	18.305	17.942
	30-34	11.101	12.031		30-34	12.065	12.949		30-34	13.302	13.929
	35-39	8.663	9.241		35-39	9.113	9.764		35-39	9.808	10.618
	40-44	7.372	7.164		40-44	7.586	7.545		40-44	7.845	7.951
	45-49	6.754	6.087		45-49	6.823	6.269		45-49	6.921	6.488
	50-54	5.974	5.349		50-54	6.053	5.457		50-54	6.129	5.579
	55-59	4.973	4.394		55-59	5.081	4.542		55-59	5.182	4.681
	60-64	3.714	3.181		60-64	3.848	3.362		60-64	3.974	3.533
	65+	4.832	4.425		65+	5.167	4.844		65+	5.501	5.279

GROSS PRODUCT - XX MILLIONS OF 1958 DOLLARS

	RGN 1 (NW)	RGN 2 (SW)	RGN 3 (SE)	RGN 4 (SC)	RGN 5 (Anch.)	RGN 6 (Int.)	RGN 7 (Fbnks.)	STATE
74	47.366	79.788	191.881	319.369	606.450	78.382	171.241	1494.476
75	50.500	83.707	207.890	346.391	665.919	112.201	194.735	1661.343
76	55.479	86.797	220.140	352.639	703.243	116.421	200.916	1735.635
77	99.015	89.120	231.831	462.740	753.805	203.409	197.218	2037.138
78	98.295	89.092	366.803	673.313	784.499	287.426	196.797	2496.224
79	99.160	91.548	402.894	701.034	846.284	297.871	205.802	2644.592
80	377.522	104.028	451.904	749.637	940.359	350.906	222.008	3198.364
81	428.111	121.505	534.903	733.154	985.540	314.846	231.807	3349.866
82	461.802	137.936	632.954	658.830	1055.866	287.241	244.855	3479.485
83	491.287	156.235	840.826	602.613	1140.581	258.595	255.937	3746.074
84	417.840	184.064	955.317	564.927	1216.110	247.551	267.095	3852.904
85	375.974	213.163	1109.332	573.979	1305.041	262.234	278.452	4118.172
86	317.327	243.717	1188.178	575.139	1392.299	264.953	290.358	4271.969
87	330.160	284.924	1253.284	570.908	1490.602	284.643	302.306	4516.824
88	353.353	327.947	1333.246	571.034	1601.945	303.351	315.184	4806.055
89	338.102	333.038	1405.105	567.650	1709.549	299.335	328.855	4981.633
90	329.627	317.918	1420.785	576.150	1819.412	290.283	342.965	5097.836

EMPLOYMENT - EM THOUSANDS OF AGE EARNERS

	RGN 1	RGN 2	RGN 3	RGN 4	RGN 5	RGN 6	RGN 7	STATE
74	4.085	10.655	24.631	17.931	72.483	5.344	24.774	159.903
75	4.480	11.194	27.061	21.524	79.365	8.692	27.576	179.892
76	4.758	11.569	28.632	22.052	83.834	8.403	28.356	187.604
77	5.455	11.993	30.428	20.891	89.548	6.103	28.150	192.567
78	5.299	11.922	31.228	20.735	90.414	6.563	27.606	193.768
79	5.566	12.359	33.323	21.501	96.825	6.989	28.543	205.106
80	8.027	13.125	36.254	22.928	106.284	7.663	30.342	224.624
81	8.803	13.676	38.248	23.869	111.101	6.532	31.385	233.614
82	9.616	14.364	41.030	25.106	118.734	6.748	32.863	248.460
83	10.012	15.007	44.312	25.958	126.690	6.545	34.039	262.564
84	9.445	15.785	46.955	26.757	134.768	6.169	35.166	275.045
85	9.348	16.518	49.566	27.792	143.205	6.373	36.247	289.049
86	9.138	17.285	51.690	28.855	152.143	6.468	37.390	302.968
87	9.406	18.116	53.478	29.802	161.368	6.747	38.465	317.382
88	9.766	18.970	55.402	30.792	171.665	7.046	39.596	333.237
89	9.884	19.488	57.364	31.846	182.476	7.126	40.783	348.967
90	10.039	19.803	58.898	32.999	193.877	7.149	41.964	364.727

TABLE 3
SUMMARY OF ALASKAN REGIONAL ECONOMIC MODEL (Cont.)
(Accelerated Growth with Oil at $5/Barrel)

WAGES & SALARIES - WS MILLIONS OF DOLLARS

	RGN 1	RGN 2	RGN 3	RGN 4	RGN 5	RGN 6	RGN 7	STATE
74	48.1	109.1	290.6	197.9	851.4	92.8	289.9	1879.7
75	56.6	124.0	344.4	265.6	1006.3	168.1	356.6	2321.6
76	64.4	137.2	389.9	286.1	1135.2	168.8	391.6	2573.3
77	83.2	152.3	443.4	276.5	1294.8	117.0	410.1	2777.2
78	85.9	160.0	488.9	291.9	1382.4	132.6	424.5	2966.3
79	94.9	175.9	553.6	317.9	1565.8	148.2	465.6	3322.1
80	168.4	199.2	639.3	358.4	1817.5	169.2	527.9	3879.9
81	199.5	220.7	716.7	394.3	2007.1	145.4	580.5	4264.3
82	232.7	246.4	816.6	437.1	2265.3	158.1	646.6	4802.9
83	255.3	273.5	939.9	475.4	2552.0	159.1	711.3	5366.5
84	244.3	305.8	1056.5	515.4	2864.2	153.4	779.8	5919.4
85	250.4	339.8	1183.7	566.2	3210.4	166.4	853.5	6570.3
86	252.0	377.3	1306.8	621.4	3595.5	176.7	934.3	7264.0
87	274.3	419.6	1430.6	678.3	4019.4	194.4	1020.2	8036.7
88	302.3	465.8	1568.2	740.7	4504.0	214.0	1114.3	8909.3
89	320.8	505.3	1717.6	809.5	5041.1	227.0	1217.7	9839.0
90	342.7	541.3	1863.5	887.2	5637.4	238.7	1329.2	10839.9

REAL WGS - WS/RPI MILLIONS OF DOLLARS

	RGN 1	RGN 2	RGN 3	RGN 4	RGN 5	RGN 6	RGN 7	STATE
74	24.9	56.5	150.6	102.5	441.2	48.1	150.2	974.0
75	27.8	60.9	169.2	130.5	494.2	82.5	175.1	1140.2
76	30.2	64.4	182.9	134.2	532.6	79.2	183.7	1207.2
77	37.3	68.3	198.7	123.9	580.3	52.5	183.8	1244.8
78	37.0	69.0	210.9	125.9	596.2	57.2	183.1	1279.4
79	39.4	73.0	229.8	132.0	650.0	61.5	193.3	1379.1
80	67.3	79.6	255.4	143.2	726.1	67.6	210.9	1550.0
81	76.7	84.8	275.5	151.6	771.6	55.9	223.1	1639.2
82	86.1	91.2	302.1	161.7	838.0	58.5	239.2	1776.6
83	90.8	97.3	334.5	169.2	908.2	56.6	253.1	1909.9
84	83.7	104.8	361.9	176.6	981.2	52.5	267.2	2027.9
85	82.6	112.0	390.2	186.6	1058.3	54.9	281.3	2165.9
86	79.9	119.7	414.5	197.1	1140.6	56.1	296.4	2304.3
87	83.7	128.1	436.7	207.0	1226.8	59.3	311.4	2453.0
88	88.8	136.8	460.7	217.6	1323.0	62.8	327.3	2617.1
89	90.7	142.8	485.5	228.8	1424.8	64.1	344.2	2780.9
90	93.2	147.2	506.8	241.3	1533.3	64.9	361.5	2948.4

POPULATION THOUSANDS OF PERSONS

	RGN 1	RGN 2	RGN 3	RGN 4	RGN 5	RGN 6	RGN 7	STATE
74	13.498	27.561	48.616	45.284	153.120	8.561	54.018	350.659
75	13.752	27.644	51.526	53.661	164.073	9.965	57.830	378.451
76	14.121	28.108	54.092	55.272	173.457	9.903	59.397	394.350
77	14.903	28.620	56.999	52.646	185.350	8.929	59.396	406.844
78	14.943	28.936	58.926	52.951	189.50	9.276	59.294	413.826
79	15.198	29.288	61.919	54.896	201.78	9.474	60.817	433.382
80	17.271	29.887	66.014	58.506	219.765	9.770	63.707	464.920
81	17.977	30.562	69.340	61.401	230.803	9.325	65.919	485.326
82	18.552	31.116	73.250	64.639	245.663	9.439	68.367	511.024
83	18.832	31.627	77.796	66.903	261.161	9.351	70.329	536.000
84	18.486	32.245	81.483	69.081	277.059	9.180	72.255	559.789
85	18.468	32.847	85.176	71.939	293.915	9.309	74.172	585.826
86	18.375	33.465	88.226	74.895	311.823	9.384	76.202	612.369
87	18.639	34.162	90.959	77.674	330.780	9.563	78.236	640.013
88	18.956	34.847	93.830	80.549	351.721	9.744	80.326	669.974
89	19.097	35.290	96.696	83.558	373.510	9.815	82.463	700.429
90	19.258	35.591	98.979	86.813	396.368	9.856	84.566	731.430

STATE REVENUE MILLIONS OF DOLLARS

	RTIS	RTCS	RSGS	RMQS	RINS	RSFS	REDS	RPQS	RQQS
74	54.6	9.6	36.7	53.1	46.0	25.7	155.0	48.0	428.7
75	67.9	12.2	42.6	65.5	39.7	33.7	170.0	62.0	493.6
76	87.6	16.2	50.6	83.7	26.3	46.4	180.0	236.0	726.8
77	99.2	18.6	55.2	94.5	17.0	54.3	190.0	416.0	944.8
78	108.9	20.6	58.8	103.4	8.3	61.1	200.0	695.0	1256.1
79	120.1	23.0	62.8	113.6	25.7	69.0	210.0	943.0	1567.3
80	142.2	27.7	70.5	133.7	49.2	85.3	221.0	1205.0	1934.6
81	171.1	34.1	79.9	159.9	77.3	107.7	232.0	1197.0	2058.9
82	182.3	36.6	83.5	169.9	103.5	116.6	243.0	1539.0	2474.3
83	206.8	42.1	91.0	191.9	135.7	136.6	255.0	1723.0	2782.0
84	238.2	49.3	100.2	220.0	171.1	163.2	268.0	1901.0	3110.9
85	270.1	56.6	109.1	248.3	209.6	191.0	281.0	2048.0	3413.7
86	308.5	65.7	119.5	282.3	250.7	225.7	295.0	2182.0	3729.4
87	350.8	75.8	130.4	319.6	294.1	265.3	310.0	2253.0	3999.0
88	399.1	87.5	142.4	362.0	338.8	311.9	326.0	2298.0	4265.7
89	455.3	101.3	155.7	411.0	384.2	368.0	342.0	2334.0	4551.6
90	516.8	116.7	169.8	464.5	430.3	431.5	359.0	2339.0	4827.6

Table 4

ALTERNATIVE FISCAL SAVING POLICIES

PROJECTED 1990 VALUES FOR SELECTED VARIABLES

VARIABLES	UNITS	Accelerated Development			Maximum Development	Limited Development
		Med. Savings	High Savings	Zero Savings	Zero Savings	High Savings
Total Output (X)	(Millions of 1958 S)	5,728.2	5,510.8	5,843.3	10,253.0	4,015.2
Total Employment (E)	(Persons x 1,000)	356.7	328.7	371.4	490.9	286.7
Total Population (POP)	(Persons x 1,000)	729.5	665.4	762.8	957.0	587.2
Personal Income (PI)	(Millions of S)	12,390.0	11,442.4	12,887.2	16,988.1	9,972.4
Personal Income Per Capita (PIPC)	(S)	16,983.3	17,195.1	16,895.7	17,751.0	16,983.9
Real Disposable Personal Income Per Capita (DIRPA)	(1967 S)	3,296.1	3,355.5	3 270.3	3,371.5	3,345.6
State Government Total Petroleum Sector Revenue (RP9S)	(Millions of S)	2,339.0	2,339.0	2,339.0	2,940.0	1,685.0
State-Local Government Expenditures (SLGEXP)	(Millions of S)	6,190.3	5,280.9	6,662.0	9,074.3	4,361.4
State Government General Fund Balance (GFBAL)	(Millions of S)	6,807.5	18,136.0	1,093.3	1,093.3	14,896.3
State-Local Government Expenditures Per Capita (SLGEXP/POP)	(S)	8,485.7	7,936.4	8,733.6	9,482.0	7,427.4
Real Disposable Personal Income Plus Real State-Local Government Expenditures Per Capita $\left(\text{DIRPA} + \frac{\text{SLGEXP/POP}}{\text{RPI}} \right)$	(1967 S)	5,603.9	5,513.9	5,645.5	5,950.2	5,365.6

with the three alternative fiscal saving rates. The other two projections are extreme cases: the first uses the maximum development scenario in conjunction with the zero fiscal saving rate, and the second uses the limited development scenario in conjunction with the high fiscal saving rate.

As would be expected, the high savings rate produces a slower growth in the Alaska economy, and the zero savings produces more rapid growth. Some selected summary measures for the five different projections are shown in Table 4 and the population projections are shown in Figure 6. In 1990, under the accelerated development scenario, the high fiscal savings rate produces a projected population which is 64,000 persons lower than under the medium fiscal savings rate. The zero fiscal savings rate produces a projected population which is 33,000 persons larger in 1990.

Most measures of aggregate economic activity display very similar patterns of change in response to changes in the fiscal savings policy. Under the accelerated petroleum development scenario, the zero fiscal savings rate produces 1990 increases of 4.6 percent in population, 4.1 percent in employment, 4.0 in personal income, and 3.7 percent in disposable personal income. The induced expansion in total employment in 1990 was 14.7 thousand persons; of this, trade, finance, and services accounted for 47 percent and state and local government accounted for another 37 percent.

When one moves from aggregate measures to per capita measures, the impact of the zero fiscal saving appears in a very different light. Real disposable personal income per capita is actually lower with zero fiscal savings than it was with medium fiscal savings. However, public sector expenditures per capita are higher under the zero savings rate. On balance, these two changes very nearly cancel out. As shown in Table 4, real disposable personal income plus real state and local government expenditures per capita are just slightly higher, about 0.7 percent, under the zero fiscal savings than under the medium savings. Thus, for the typical individual living in Alaska, the use of all petroleum revenues for current expenditures produces an insignificant increase in real economic benefits.

A further point which should be stressed is that by the end of the period, the projected rate of growth is

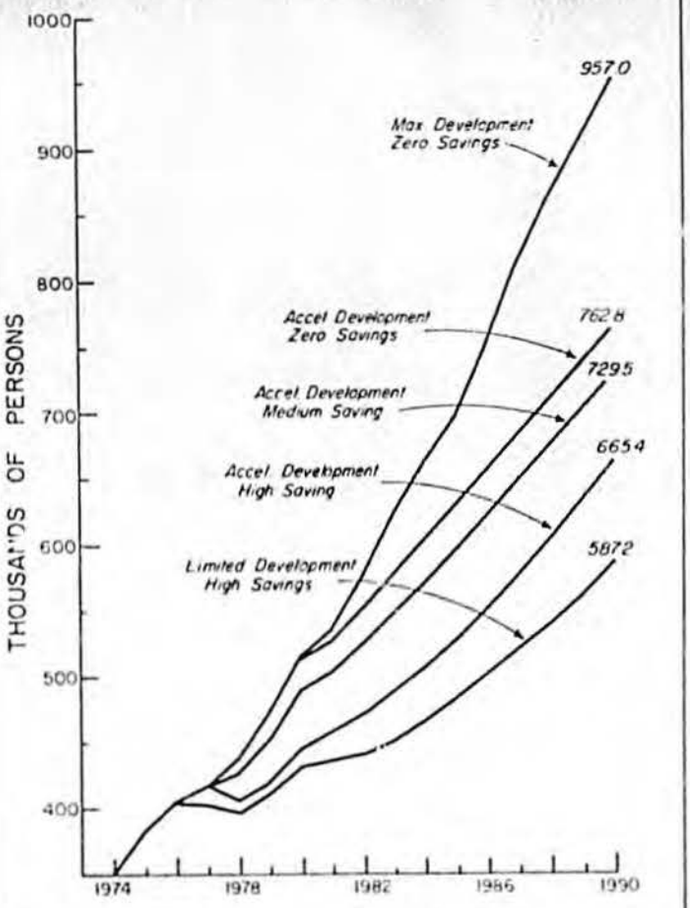


Figure 6. Alternative Fiscal Saving Policies Projected Population.

actually slower under the assumption of zero fiscal savings than under the medium fiscal savings. This is attributable to the difference in the accumulated general fund balance and in the interest accruing on that balance. As Table 4 shows, by 1990 the medium fiscal savings produces a general fund balance of $6.8 billion while the zero fiscal savings case produces a general fund balance of only $1.1 billion. (The accumulated general fund balance in the zero fiscal savings case is viewed as a general contingency reserve and is accumulated out of nonpetroleum revenues. This type of fiscal savings is held at the same level in all the cases considered.) Because of the larger general fund balance, the state interest income in 1990 is nearly $360 million larger under medium fiscal savings than under zero fiscal savings. Furthermore, the difference in interest income is tending to widen over time. As a result, state government expenditures, though at a lower level, are growing more rapidly in the medium savings case. This, in turn, induces a more rapid growth in general economic activities. Thus, a key impact of fiscal savings is to shift some of Alaska's rapid economic growth from the early years of the period to the later years of the period. Selection of the appropriate set of fiscal saving policies is one way of smoothing out Alaska's petroleum-induced "boom-bust" cycle.

The impact of implementing a high fiscal savings policy is roughly the mirror image of the impact of the zero fiscal savings policy. That is, under high fiscal saving the magnitude of the expansion in the Alaska economy is smaller, but in the later years of the period, the growth rate is substantially higher. By 1990, the high fiscal saving policies produce a general fund balance in excess of $18 billion and an annual interest income for the state of $1.1 billion.

The two extreme cases included in the projections serve to illustrate the degree to which fiscal policies and petroleum policies are interactive rather than simply additive. For example, under the maximum petroleum development scenario, the zero fiscal saving case produces a 1990 population projection of 957,000 persons. That is 49,000 persons more than the comparable projections under the medium fiscal savings case. In contrast, under the accelerated petroleum development scenario, shifting from medium to zero fiscal savings produced an increase in projected population of only 33,000 persons. The change in fiscal policy has a larger impact under the maximum petroleum development scenario because the change is applied to a larger amount of petroleum revenue. Conversely, a given change in the fiscal savings rate has a smaller impact under the limited petroleum development scenario.

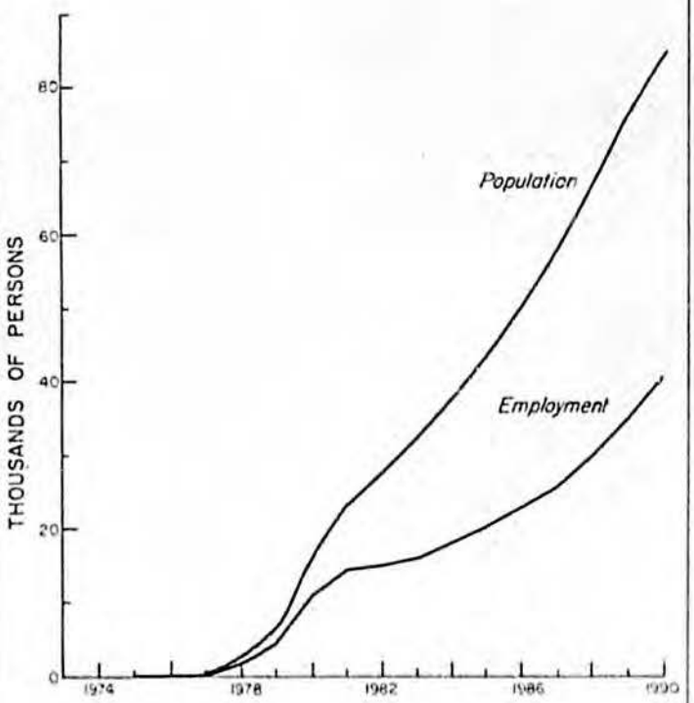
Impact of a Reduction in State Personal Income Taxes

A reduction in state personal income taxes is frequently suggested as an appropriate use of the petroleum revenues that will be accruing to the State of Alaska. In the projection presented here, it is assumed that state personal income taxes are reduced by 25 percent in 1978, by 50 percent in 1979, and are eliminated completely from 1980 on. It is further assumed that this tax cut is financed through a reduction in state fiscal savings rather than through a reduction in state expenditure. Except for these policy changes, the assumptions are the same as those used in the accelerated petroleum development scenario with the price of oil at $5 a barrel. Figures 7 and 8 show the differences in population, employment, and personal income between that scenario and the projection made after implementing the cut in state personal income taxes.

As shown in Figure 7, the 1990 increase in projected employment is 40.4 thousand, and the increase in population is 86.7 thousand persons. As would be expected, the increase in personal income has produced an increase in job opportunities in Alaska and has induced a substantial increase in migration into the state. From 1980 on, net migration into the state is from three to eight thousand persons more per year than was the case in the absence of the tax cut.

It is particularly noteworthy that with an increase in

Figure 7. Population and Employment Impact of a Reduction in State Personal Income Taxes.*



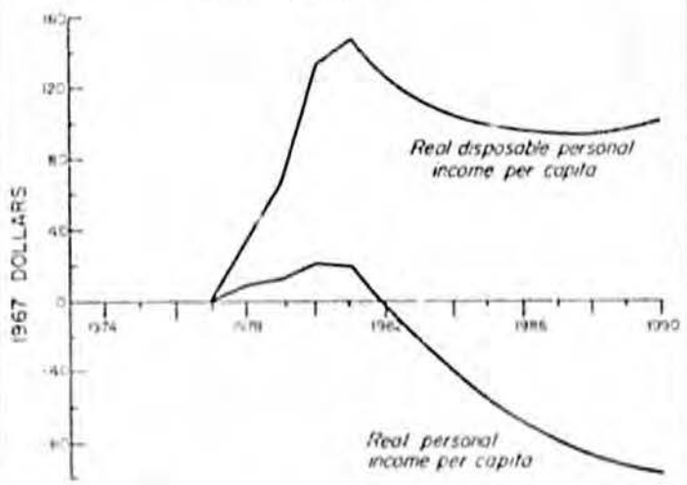
*The impact is measured as the change from the results obtained in the absence of the tax reduction.

total employment of over 40,000 in 1990, less than 2,800 of this is in state and local government. Thus, the use of petroleum revenues to cut personal income taxes serves to focus more of Alaska's growth on the private sector rather than on the public sector. Much of the growth induced by the tax cut is concentrated in the support sector and particularly in the trade, finance, and service industries. The projected gain in employment in those three industries in 1990 is over 29,000 persons or about 72 percent of the total increase in employment. As before, the increase referred to is relative to the employment projected in the absence of the tax cut.

The cut in state personal income taxes naturally has the effect of increasing disposable personal income much more than personal income. Thus, in 1990, real personal income increases by 9.6 percent while real disposable personal income increases by 15.4 percent. On a per capita basis, the contrast between the two measures is even sharper. With the tax cut, real personal income per capita is actually lower in 1990 by 2.1 percent, while real disposable personal income per capita is higher by 3.2 percent (see Figure 8).

The increase in population induced by the gain in disposable personal income is so large that state and local government expenditures per capita decline substantially; they are over 7 percent lower in 1990. Thus, the increase in population more than offsets the increase in total state and local government spending. Furthermore, real disposable personal income plus real state and local government expenditures per capita are lower by 1.1 percent in 1990. This implies that for the typical individual in Alaska, real personal income plus real public services are, on balance, lower after the tax cut than they were before the tax cut. While the analysis is by no means conclusive at this point, it does raise some questions concerning the efficacy of across-the-board tax cuts as a means of distributing the benefits of Alaska's economic growth.

Figure 8. Personal Income Impact of a Reduction in State Personal Income Taxes.*



*The impact is measured as the change from the results obtained in the absence of the tax reduction.

Impact of Beaufort Sea Lease Sale

The State of Alaska has recently proposed making a petroleum lease sale in the Beaufort Sea just north of Prudhoe Bay. Although not required by law to do so, the state has, in preparation for such a sale, prepared a draft environmental assessment of the impacts of the sale. As part of this environmental assessment (EA), the state estimated the economic impact that would be caused by the exploration, development, and production in the Beaufort field. In the projection presented here, the MAP models are used to carry out somewhat more comprehensive analysis of the impact of the Beaufort lease sale.

The economic impact of the Beaufort lease sale can be attributed to three different types of direct effects: (1) the bonus from the lease sale, (2) the recurrent state revenues due to production in the Beaufort field, and (3) the direct employment required to develop and operate the Beaufort field. The method of analysis used here makes a projection based on a petroleum development scenario which excludes the Beaufort lease

sale. The petroleum development scenario is then expanded to include the lease sale. A second projection is made, and the results of the two projections are compared. Since the only difference in the input data for the two projections is the direct effect of the Beaufort lease sale, the differences in the results are measures of the total impact of the lease sale.

The base from which the impacts are measured consists of a set of projections derived from the limited petroleum development scenario with two modifications: (1) the Beaufort lease sale has been excluded from the scenario and (2) petroleum revenues other than bonuses have been increased by an amount equal to the lease sale. The second modification is designed to reflect the existing situation in Alaska. Until the North Slope oil starts to flow, the state is confronted with a "fiscal gap"; that is, state revenues are not sufficient to support current expenditure levels. Since it is unlikely that the state will cut back on spending, additional sources of revenue will have to be found to close the fiscal gap. The Beaufort lease sale is one possible source of additional revenue. However, if the Beaufort lease sale is not made, some alternative source of revenue will be necessary. In practice, the recently enacted tax on petroleum reserves is likely to provide the necessary gap-closing revenue. The assumption made here is that if the Beaufort lease sale is not made, some alternative means of raising an equivalent amount of revenue will be found, so that the net revenue impact of the bonus from the lease sale will be negligible.

In adding the Beaufort lease sale to the petroleum development scenario, two different sets of estimates of employment and revenue impacts are used. The first set is the one that has been included in the MAP scenario, and the second set is derived from the state EA. Both sets of estimates are shown in Table 5. In general, the direct impact as estimated by the EA is substantially larger than the direct impact included in the MAP scenario.

The Beaufort lease sale impacts on employment and population as projected by the MAP model are shown in Figures 9 and 10. The figures also show estimates of the total impacts which were included in the EA itself.

The total impact of the Beaufort lease sale as estimated by the EA is very low despite the fact that the EA includes high estimates of direct employment and revenue. There are two reasons underlying the seemingly contradictory results. First, the analysis in the EA looks only at short-run impacts; it does not take into account the cumulative long-run growth effects of the Beaufort lease sale. Second, the EA ignores the effects of the revenues generated by production in the Beaufort area. The MAP models do, of course, take into account the long-run growth effects and the effects of the additional revenues.

When the MAP models are used in conjunction with the state's estimates of direct employment and revenue, the Beaufort lease sale is projected to increase Alaska's 1990 employment by 14,000 persons and population by 30,000 persons. In contrast, the MAP estimates of direct employment and revenues produce projected impacts of

Table 5

BEAUFORT LEASE SALE:
DIRECT EMPLOYMENT AND REVENUE IMPACTS

	Petroleum Construction and Mining Employment		Recurrent Revenues	
	EA[a]	MAP[b]	EA	MAP
1976	0.3	0	—	—
1977	0.6	0.8	—	—
1978	0.7	0.8	—	—
1979	1.0	0.9	—	—
1980	2.1	0.9	1.4	13.0
1981	2.8	0.7	1.6	40.0
1982	3.0	0.6	166.2	77.1
1983	2.6	0.4	175.8	107.9
1984	2.8	0.4	185.0	123.4
1985	2.3	0.4	195.0	138.8
1986	1.7	0.3	205.0	154.2
1987	1.0	0.3	205.0	154.2
1988	1.0	0.3	205.0	154.2
1989	1.0	0.3	205.0	154.2
1990	1.0	0.3	205.0	154.2

a. Environmental Assessment
b. Man in the Arctic Program Model

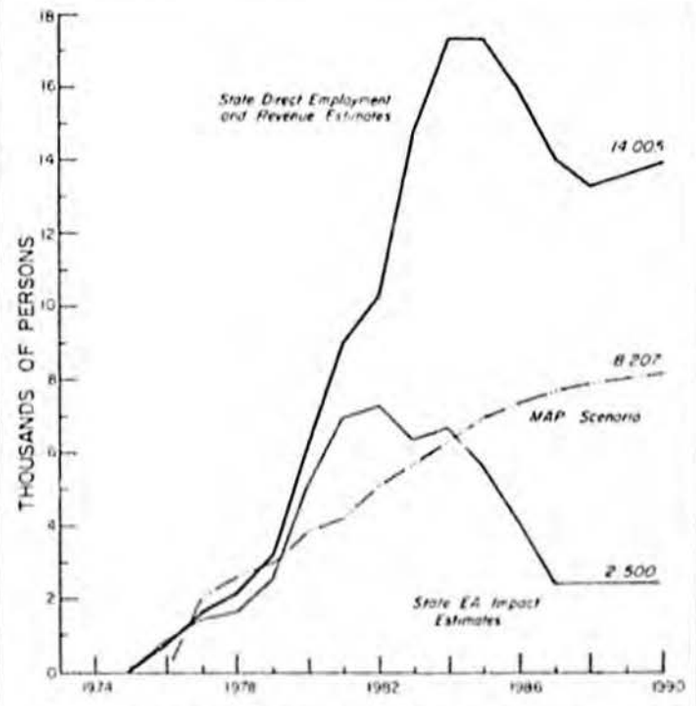


Figure 9. Impact of Beaufort Lease Sale on Employment.

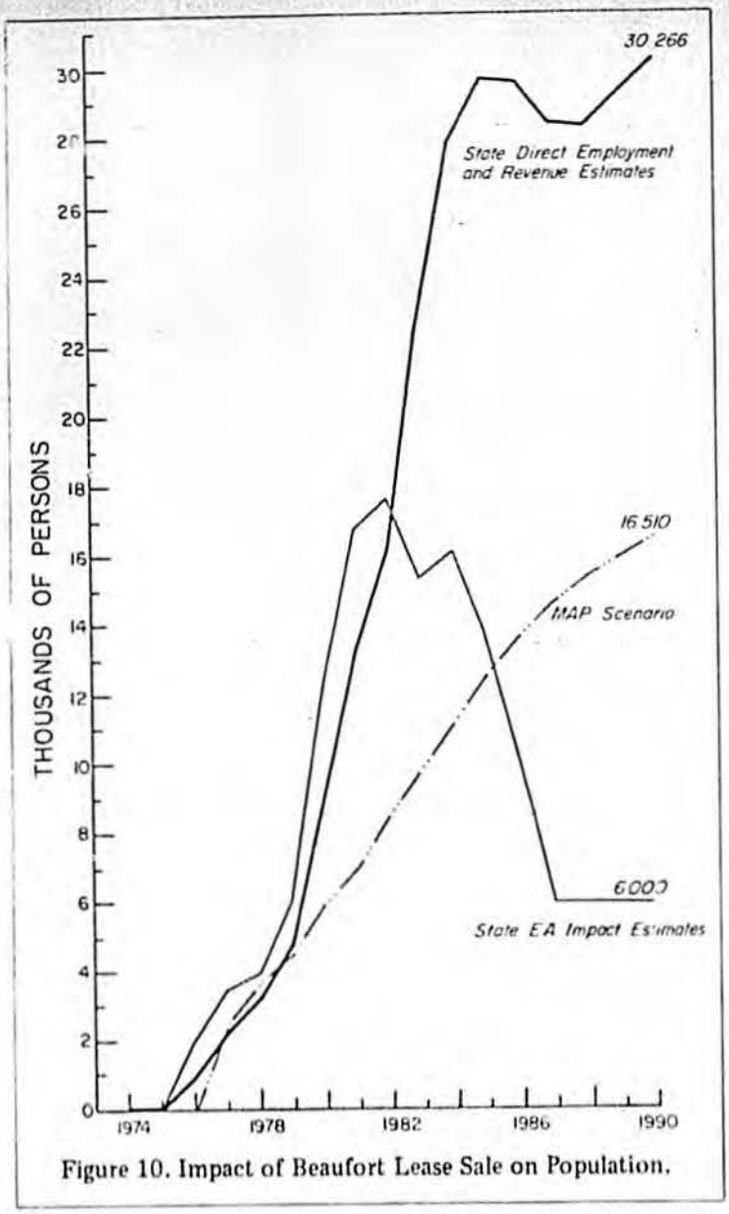


Figure 10. Impact of Beaufort Lease Sale on Population.

just 8.2 thousand and 16.5 thousand, respectively. However, even the lower impacts are several times as large as the total impacts shown in the EA.

Impacts of Alternative Gas Pipeline Routes on the Alaskan Economy

There are at present two principal proposed systems for transporting natural gas from Alaska's North Slope to the continental United States. The first system, proposed by the Arctic Gas consortium, would be an all-land pipeline leading from Prudhoe Bay through Canada to the midwestern United States. The second system, proposed by the El Paso Alaska Company, would consist of a trans-Alaska pipeline and then shipment by a liquid natural gas tanker to the U.S. West Coast.

Clearly, the alternative proposed gas transportation systems would have significantly different impacts on the Alaskan economy. The MAP regional economic-demographic model makes it possible to evaluate the economic impact on Alaska in terms of the induced change in total employment, industrial production, population, wages, personal income, and government revenues for each region and the state as a whole. The estimates of the differing impacts can be made in the context of the overall growth and development of the Alaska economy.

Figures 11 and 12 and Table 6 show the differing regional and state impacts of the El Paso and Arctic pipelines for population, employment, wages and salaries. Because of its much larger magnitude, the impact of the El Paso project is much greater in all regions than is the impact of the Arctic Gas project. Perhaps the most notable feature of the regional projections is that the bulk of the impact occurs in Anchorage, even though neither project passes through Anchorage itself. This emphasizes just how important Anchorage is as the commercial center of Alaska.

Except during the peak of the El Paso boom, well over half of the total impact is concentrated in the Anchorage region.

The El Paso proposal would increase Anchorage's 1990 population by almost 17,000 persons, and the

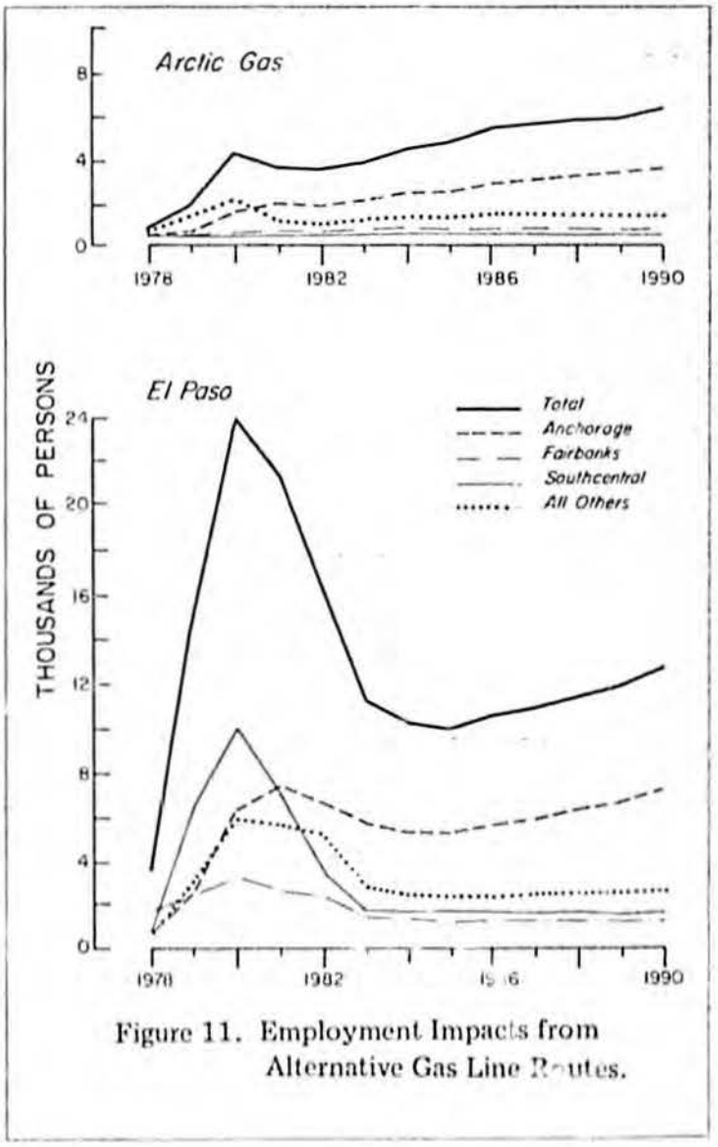


Figure 11. Employment Impacts from Alternative Gas Line Routes.

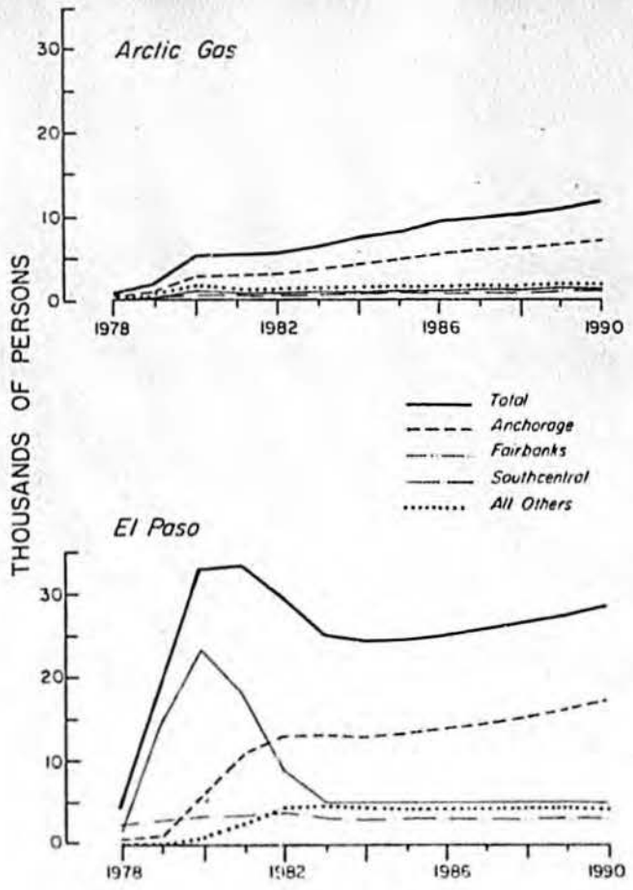


Figure 12. Population Impacts for Alternative Gas Line Routes.

Table 6

REAL WAGES AND SALARIES
(MILLIONS OF 1958 Dollars)

ARCTIC GAS

	Total	Anchorage	Southcentral	Fairbanks	All Other
1978	3.7	0.7	0.1	0.1	2.8
1979	14.2	2.1	0.3	0.3	11.5
1980	32.0	9.6	1.8	2.2	18.4
1981	23.4	11.3	2.4	3.0	6.7
1982	23.1	11.2	2.4	2.9	6.6
1983	26.9	13.4	2.7	3.4	7.4
1984	31.8	16.1	3.2	3.9	8.6
1985	34.3	17.5	3.4	4.2	9.2
1986	32.9	20.6	3.8	4.7	10.1
1987	41.9	22.2	4.0	5.0	10.8
1988	44.2	23.7	4.2	5.2	11.1
1989	46.6	25.4	4.3	5.4	11.5
1990	49.7	27.6	4.5	5.7	11.9

EL PASO

1978	29.6	4.0	6.5	13.2	5.9
1979	118.5	16.6	53.1	21.0	27.9
1980	194.0	41.7	83.5	26.0	42.8
1981	116.5	51.2	57.9	20.3	37.2
1982	124.2	45.9	26.7	18.8	32.8
1983	83.7	39.7	12.8	11.2	20.0
1984	76.7	36.7	12.1	10.1	17.8
1985	76.7	37.0	12.1	10.1	15.5
1986	82.7	40.9	12.6	10.7	18.5
1987	87.2	43.7	13.0	11.1	19.4
1988	92.1	47.1	13.4	11.5	20.1
1989	98.2	51.1	13.9	12.0	21.2
1990	105.5	56.2	14.4	12.7	22.2

Arctic Gas proposal would increase the population by 7,000 persons. As shown in Figure 11, the El Paso Anchorage employment impact peaks at 7,000 persons in 1981, declines to 5,000 persons in 1984, and then rises gradually as the Alaskan economy grows. Although these changes are not insignificant, they should be measured against projections of Anchorage's early 1980s population of 250,000, and a labor force above 100,000.

Both the absolute and relative magnitudes of the differences between the two gas pipeline proposals are much more significant in the Southcentral region. The construction of the El Paso facilities creates a boom-bust cycle in the Southcentral region, while the Arctic Gas project has almost no effect. During the peak construction year of 1980, the Southcentral employment impact of the El Paso project would be 10,000 persons, an increase of more than one-third in the regional labor force. This impact falls rapidly to just 1.6 thousand persons by 1983.

FUTURE MAP RESEARCH

The first phase of MAP research has concentrated on the development of the economic and demographic data bases and models required for policy studies. The analysis and policy applications have generally been at a rather aggregative level, though there has been a significant amount of regional disaggregation. The second phase of MAP research will extend the capacity for detailed analysis of alternative policies and development patterns. There will be three major components in the second phase program: economics, demography and manpower, and community studies. The principal projects, models, and policy applications within the three areas are shown in Figure 13. That figure also illustrates the relationships among the various program elements.

Economics Program

The economic models developed in Phase I of MAP will be refined to focus on the distributional aspects of energy development in Alaska. Studies of earnings in specific industries and occupations will extend the models' capabilities to estimate the impact of economic

growth on the distribution of income among different population groups and regions. In the area of fiscal policy, tax models will be constructed to project the effects of tax changes on income distribution. On the expenditures side, the distribution of costs and benefits of different types of expenditure programs—such as health, education, and resource development—will be examined. Price studies will be aimed at determining the causes of changes in the level of prices and of changes in Alaska prices relative to the rest of the nation. Links with the models being developed within ISEGR's Alaska Transport Systems Development Study (funded by the U.S. Department of Transportation) will be particularly important in the price studies.

Energy studies will update the inventory of Alaska energy resources and will use the more detailed economic models to examine the impacts of alternative energy development scenarios designed to bring Alaska's energy resources into production to meet national needs. An Alaska energy system model will be constructed and links will be made with national energy models. Particular strength will be brought to these studies through the energy research being carried on at the National Bureau of Economic Research's Computer Research Center. The various energy systems models will be used to explore possible Alaska responses to national and local energy demands and to examine the broad economic, environmental, and social trade-offs involved in energy development.

Demography and Manpower Program

This program, a principal link between the economic studies and the community studies, will consist of three components: basic studies of population change and migration, manpower studies, and special studies of Alaska Native mobility and manpower problems.

Population and migration studies are, essentially, important refinements of Phase I work, which will result in disaggregated regional population models. Regional labor force participation rates will be developed and interregional migration as well as patterns of migration to and from Alaska will be examined in detail.

Manpower studies will be necessary to the economic program's study of income distribution as well as to other elements of this and the community studies program. Regional economic growth will be translated into schedules of occupational demands (via the industry/occupation matrix developed in Phase I), and labor supplies will be projected by combining population projections with occupational participation rates. Supply-demand imbalances will be key inputs to manpower planning.

Alaska's Native population responds generally to different factors than does the non-Native population and requires a special study focus. Thus, projections of regional population and labor supply will need to be disaggregated by race. Also, additional information, through survey research to be undertaken as part of the community studies, will be required about Native mobility patterns and related socioeconomic characteristics. These data, combined with projections from the economic and demographic models, will be used to produce projections of Native population movements and indications of their economic and social effects on Native villages, which is one major concern of the community studies program.

Community Studies Program

Economic and demographic change models, and the energy, migration, manpower, and related studies, will provide the broad development context and specific data inputs to the community studies component of MAP. Community studies, in turn, will:

- Provide policy alternatives that can be tested by the models.
- Contribute greater refinement to economic and population (especially migration) analyses.
- Add an important qualifying perspective to projections of an apparently smooth path of economic and population growth.

The community studies program consists of two projects: urbanization and human settlement, and community behavior in response to rapid economic growth.

The urbanization and human settlement project will be closely linked to the demographic program, and analyses will reflect the effects of alternative rates and likely locations of growth projected by the economic models and energy development scenarios. In addition to statewide analyses and development of an urbanization model, studies will focus on:

- The effects of economic and demographic changes in Alaska's metropolitan center (Anchorage).
- Prospective changes in the pattern and character of Native village communities.
- Alternative patterns of resource development communities.

The latter will pay particular attention to special environmental factors related to arctic and subarctic environments.

Community behavior studies will examine:

- The effects of the oil boom on specific communities.
- The oil boom impact on Native villages.
- Post-boom community readjustment.

Particular attention will be given to studying the accuracy of predictions of boom and post-boom problems, Native employment and migration, effects on allocation of resources, and effectiveness of alternative policy responses.

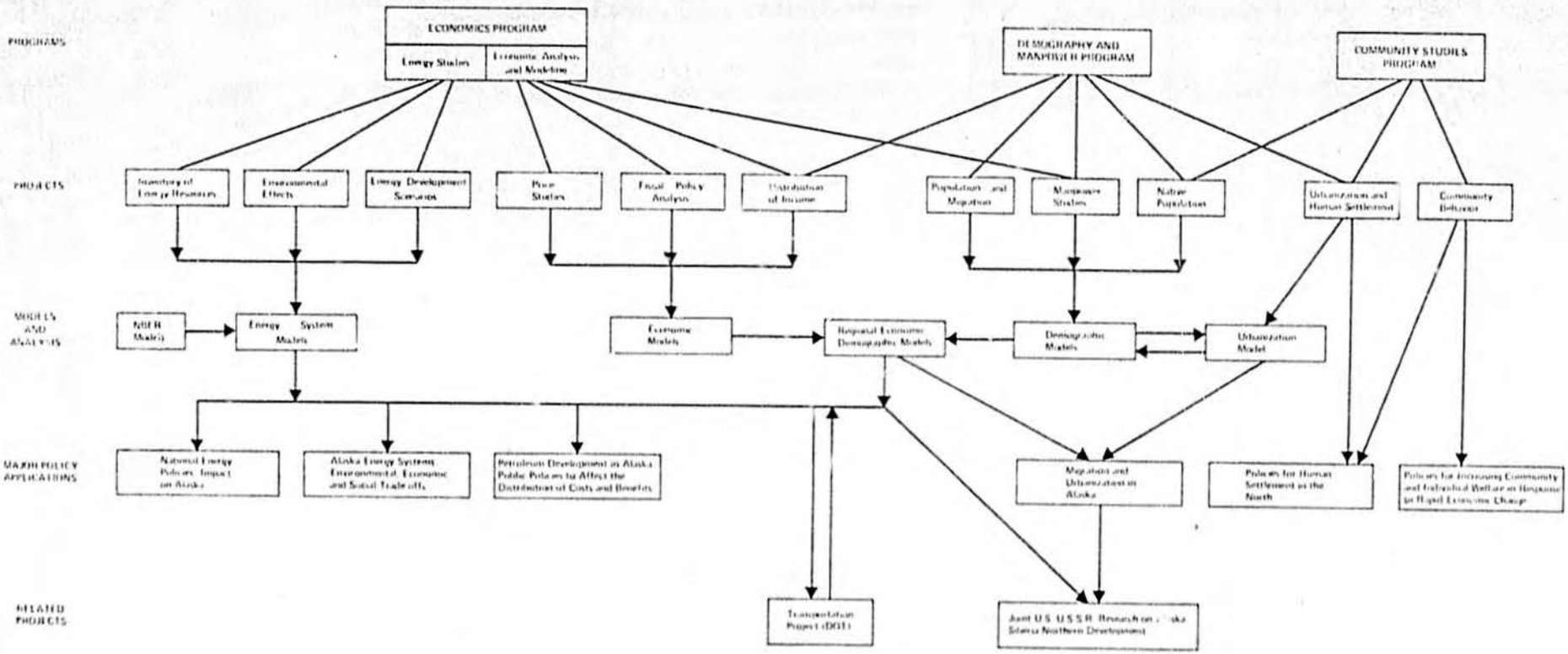


Figure 13. Man in the Arctic Program — Phase II Program Structure.

RECENT INSTITUTE PUBLICATIONS

The Institute of Social, Economic and Government Research was established in 1961 for the purpose of conducting interdisciplinary research in the social sciences and related fields. The institute is part of the University of Alaska and is located on the Fairbanks campus. In addition to the *Alaska Review of Business and Economic Conditions*, the institute publishes ISEGR *Reports*, *Occasional Papers*, *Research Notes*, and other special publications. Recent institute publications are listed below:

REVIEWS

(Free subscription upon request)

- "Oil and Gas Regulation in Alaska," Tim Bradner
- "Age and Race by Sex Characteristics of Alaska's Village Population," Ron Evans and Peggy Raybeck
- "Estimated Gross State Product for Alaska," David T. Kresge and Monica Thomas
- "Alaska Economic Growth, 1961-1972," David T. Kresge
- "Consumer Prices, Personal Income and Earnings in Alaska," Arlon R. Tussing and Monica Thomas
- "Estimates of Alaska Gross Product By Region, 1965-1973," Monica E. Thomas and Earlene Goodwin
- "Fiscal Data for Alaska," Neville O. Beharie

OCCASIONAL PAPERS

- *Wildlife Management and Alaska Land Use Decisions*, Robert B. Weeden $1.00
- *Equalization of Local Government Revenues in Alaska*, Richard W. Garnett, III. $1.00
- *Northern Eskimo Law Ways and Their Relationships to Contemporary Problems of "Bush Justice,"* Arthur E. Hippler and Stephen Conn $1.00
- *Patterns of Village Growth and Decline in the Aleutians*, Dorothy M. Jones $1.00

REPORTS

- *Alaska Public Policy*, edited by Gordon S. Harrison $5.00
- *Alaska Pipeline Report*, Arlon R. Tussing, George W. Rogers, and Victor Fischer ... $5.00
- *Alaska Fisheries Policy*, Arlon R. Tussing, Thomas A. Morehouse, and James D. Babb, Jr. $10.00
- *Effective Teachers of Indian and Eskimo High School Students*, Judith Kleinfeld $2.00
- *Land Claims and Native Manpower*, Judith Kleinfeld $2.00
- *An Electoral Profile of Alaska*, Thomas A. Morehouse and Gordon S. Harrison $3.00
- *A Long Way From Home - Effects of Public High Schools on Village Children Away From Home*, Judith Kleinfeld $5.00
- *Alaska Natives in Higher Education*, Karen Kohout and Judith Kleinfeld $3.00
- *The Subarctic Athabascans - A Selected Annotated Bibliography*, Arthur E. Hippler and John R. Wood $15.00
- *Bristol Bay - A Socioeconomic Study*, David T. Kresge, Susan R. Fison, and Anthony F. Gasparro $5.00
- *The Urban Native Encounters the Social Service System*, Dorothy M. Jones $3.00
- *Alaska's Constitutional Convention*, Victor Fischer $1.00

RESEARCH NOTES

(Free upon request)

- *The Population of Russian America (1799-1867)*, Svetlana G. Federova
- *Using Nonverbal Warmth to Increase Learning: a Cross-Cultural Experiment*, Judith Kleinfeld
- *Alaskan Population Growth and Movements, 1960-1972*, Daniel A. Seiver and Susan R. Fison