February,1979

SOUTHCENTRAL ALASKA'S ECONOMY AND POPULATION, 1965 - 2025: A Base Study and Projections

A REPORT OF THE ECONOMICS TASK FORCE
Prepared by University of Alaska

Institute of Social and Economic Research

SOUTHCENTRAL
ALASKA WATER
RESOURCES
STUDY
(Level B)

ALASKA
WATER STUDY
COMMITTEE

Southcentral Alaska's Economy and Population, 1965-2025: A Base Study and Projection

Report of the Economics Task Force
Southcentral Alaska Water Resources Study (Level B)
to the
Alaska Water Study Committee

prepared by

Michael J. Scott
Assistant Professor of Economics

and

Staff, Institute of Social and Economic Research
University of Alaska
Anchorage Fairbanks Juneau

January 31, 1979

Alaska Water Study Committee

SOUTHCENTRAL WATER RESOURCES STUDY (Level B)
P.O. Box 3276 DT
Anchorage, Alaska 99510

February 2, 1979

Memorandum

To: Frank J. Urabeck, Director, Southcentral Alaska Water Resources Study

From: E. Allen Robinson, Chairman, Economic Task Force

Subject: Economic Task Force Final Report

On behalf of the Economic Task Force I am pleased to submit to you our final report which is intended to provide the basis for analyzing and projecting future use of water and related land resources in Southcentral Alaska. This report, reflecting the joint effort of the Task Force, was prepared by Michael J. Scott, Assistant Professor of Economics, and other staff of the Institute of Social and Economic Research, University of Alaska.

Your attention is called to the Introduction, particularly some of the concerns expressed there relative to the use of the economic data and to the need for periodic updating of regional and subregional projections in light of new developments.

Numerous key economic decisions now pending, some to be made external to Alaska, will affect future employment, incomes, and population. Therefore, I recommend that the Task Force continue to meet at least annually to review events as they might relate to the regional economic forecasts prepared for the Level B study. An important event will be the 1980 decennial Census. Another will be when the proposed natural gas pipeline is actually started. The necessity for a periodic update is underlined by the fact that many agencies are keying their activities and program planning to the Level B data.

cc:
Economic Task Force

Introduction

This report is a joint effort of several economists, planners, and agency experts who were members of the Economics Task Force of the South-central Alaska Water Resources Study (Level B) being conducted by the Alaska Water Study Committee. This final report of the Economics Task Force is the result of numerous meetings held in Anchorage over the past year and one-half. As the attached list of members indicates, the Task Force has been composed of representatives of seven Federal agencies, eight state agencies, four local governments (one municipality and three boroughs), and four Native corporations.

The Task Force was charged with producing an economic base study and set of projections for the three study subregions--Cook Inlet, Kodiak-Shelikof, and the Gulf of Alaska. Initially, two projections were done, one corresponding to high economic development and one corresponding to low economic development. Population and employment were projected for these scenarios for each of the subregions in five-year intervals from 1975 to 2025 in this report. Supplementary data are available at a more aggregated level--for Anchorage and the remainder of Southcentral--to the year 2000. A third, or intermediate case was done about six months after the first two and appears in an addendum to this volume.

The projections reported relied on two long-run econometric models devised by economists at the University of Alaska Institute of Social and Economic Research (ISER) and MIT-Harvard Joint Center for Urban Studies. Funding was originally provided by the National Science Foundation for ISER's Man in the Arctic Program (MAP). The two specific models used here are modifications of the Alaska state and regional models developed under that program. The models produced estimates of gross output, employment, income, and population for the years 1975-2000. Population and employment were disaggregated and extrapolated to the year 2025 by ISER researchers under Economics Task Force direction, and using a methodology developed jointly by the Task Force and ISER and described in Chapter 2 of the study.

There are various strengths and limitations to using the models and methodology outlined in the report. Because of restrictions imposed by the timetable of the study, it was necessary to do the estimates with regional and statewide econometric models which were not matched to each other because only the state model had been updated through 1976. Time did not permit a complete update, so a series of patching routines were used to force plausible results. If the reestimate of these results is to become a routine event, an updated regional model is now available to run side by side with the state model, both incorporating 1976 data. It will still be necessary to do a careful review of the results even with later versions of the models, however, at least partly because the models were built with impact analysis rather than forecasting in mind.

The Task Force has found that critical review and modification of assumptions and the models themselves is an essential part of the projection process. For example, it was necessary to revise the projections late in the study process when Alaska Petrochemical Corporation (Alpetco) decided to locate their petrochemical facility at Valdez rather than at Kenai, as had originally been anticipated.

Because many political decisions and business decisions made outside of Alaska will undoubtedly affect employment, incomes, and population in the future, the Task Force recommends that it meet at least once a year hereafter to review these developments. One important development occurring in a little over one year is the 1980 decennial Census which will provide a benchmark for new projections. The proposed Northwest natural gas pipeline may or may not be constructed. These and other factors will require a continued update. Because many Federal and state agencies will be using these projections in their studies and operations, it is obviously important that they be restudied annually or as major events require.

The population projection for the year 2000 in the intermediate scenario for the total Southcentral region is 543,200. The four subregions are then projected to have 424,900 in Anchorage (the municipality), 78,400 in Other Cook Inlet, 14,600 in the Gulf of Alaska, and 25,300 in Kodiak-Shelikof. If transportation facilities are improved in the coming years (rail, bus, or car) between Anchorage and the Matanuska-Susitna Valley, it is possible that population increases in Anchorage will be somewhat lower and those in Other Cook Inlet will be correspondingly higher. The report concludes that growth in the Southcentral region is likely to be substantial in any of the cases, with low case year 2000 population equal to 425 thousand and 2025 population equal to 501 thousand (compared to about 230 thousand in 1975), and high case year 2000 and 2025 population equal to 680 thousand and 963 thousand, respectively. These projections were intended to be used as control totals for projections of local and regional population in the planning process. The user should not become too dependent upon the specific projections, however, since the assumptions which went into developing these numbers are at least as important as the numbers themselves. It should also be kept in mind that the art of economic projection is analogous to shooting at a moving target from a moving platform in a dense fog--one is happy to be somewhere near the mark. Planners and others using these numbers should therefore be alert for opportunities to do contingency planning rather than plan for only one set of possible futures. Users of this report will doubtless have the benefit of some additional hindsight with which to judge the plausibility of these projections. As this data becomes available, it should be incorporated, posthaste, into the planning process.

Michael J. Scott
Assistant Professor of Economics
Principal Investigator, ISER

Task Force Participants

Federal

E. Allen Robinson, Chairman
Housing and Urban Development

Robert Cross/Don Shira
Alaska Power Administration

John Hopkins/Neil Michaelson
Bureau of Land Management

Clyde Stewart
U.S. Dept. of Agriculture

Donald Blasko
U.S. Bureau on Mines

Tom Warren
Dept. of Interior
Alaska Outer Continental Shelf
Office

Charles Welling/Ken Steele
U.S. Army Corps of Engineers

Sterling Powell/Paul Feglestad
Soil Conservation Services

Gary Hickman/Gary Stackhouse
U.S. Fish and Wildlife Service

State

Ed Busch
AK Community and Regional Affairs

Calvin Dauel/Calvin Hanson
Alaska Dept. of Labor

Michael Scott
University of Alaska
Institute of Social and
Economic Resources

Vince Wright
AK Dept. of Revenue

Nat Goodhue/Hope Reed
AK Dept. of National Resources,
Div. of Parks

Charlette Chastain/Glenn Akins
Environmental Conservation

Jim Wiedeman/Fred Muller
AK Commerce and Economic Development

Bruce Baker
Office of the Governor
Div. of Policy Development and Planning

Brent Petrie/Greg Doggett
AK Div. of Land and Water Resources

Edward L. Phillips
AK Dept. of Natural Resources
Div. of Minerals and Energy Management

Local

Barbara Withers
Municipality of Anchorage

Michael Brogan
Kenai Borough

Harry Milligan
Kodiak Borough

David Simpson
Mat-Su Borough

Native

Gene Sundberg
KONIAG, Inc.

Kirk McGee
Cook Inlet, Region Inc.

Wilson Justin
AHTNA, Inc.

Carl A. Propes, Jr.
Chugach Natives Inc.

Other

Frank J. Urabeck
Director, Management Team

Chuck Lone Wolf
AK Federation of Natives, Management Team

Dan Wilkerson
DEC/State Representive, Management Team

Sue Reisinger
Management Team

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

List of Tables

List of Tables (continued)

List of Tables (continued)

List of Tables (continued)

List of Figures

EXECUTIVE SUMMARY

The report of the economic task force of the Southcentral Alaska Water Study (Level B) was to provide two major pieces of information for water resource planners: (1) it was to provide a summary of historical growth of the economy and population of Southcentral Alaska, to show the reasons behind past economic growth and population growth in the region, and to identify possible future trends; (2) it was to provide a set of control projections of the economy and population through the year 2025 to be used by resource planners in identifying future demands for water and related land resources in the Southcentral region and its three major subregions--Cook Inlet, Gulf of Alaska, and Kodiak-Shelikof. (See map, Figure A.) The base year for the projections was 1975.

Chapter 1 traces the regional economy during the years 1965 to 1975, a period of rapid growth for both the State of Alaska and the region. Total employment in Alaska grew by over 100 percent, while Southcentral employment grew by 130 percent. Total real income increased at three times the U.S. rate in Alaska, and per capita incomes rose at twice the U.S. rate, bringing Alaska from among the "poor" states to among the wealthier in per capita terms. The Alaskan economy, which had been quite seasonal in the past, became significantly less so over the period, largely as a result of increased employment in the so-called support sector--trade and services, finance, insurance, real estate, transportation, communications, and utilities. Part of the impetus for this growth came from major oil and gas development on the Kenai Peninsula and the North Slope, and from the associated construction projects such as the Trans-Alaska Oil Pipeline Project. Much of the rest of the support sector growth was a result of the growth of state and local government, which was funded heavily by taxes and other revenues of the oil and gas industry.

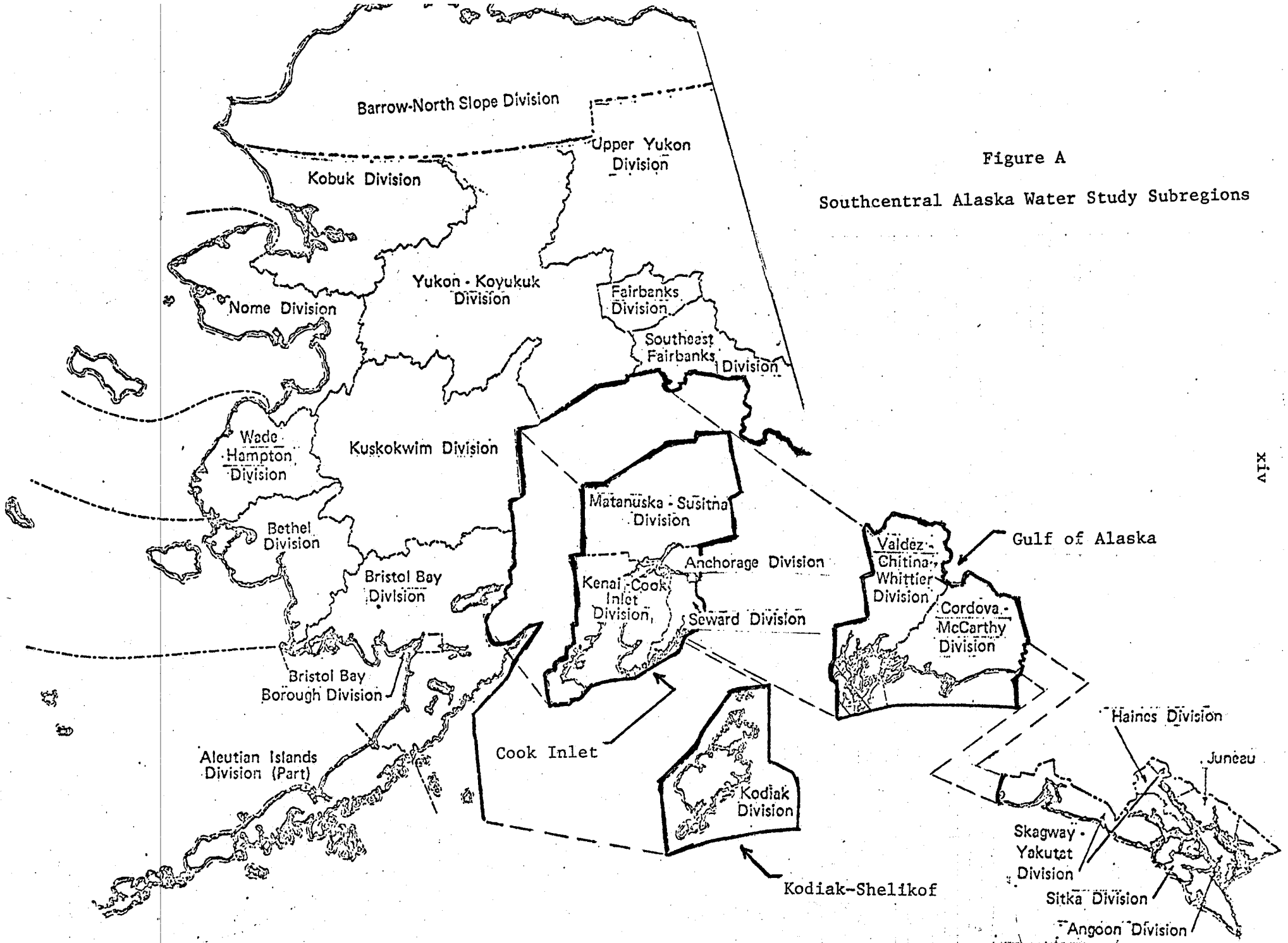


Figure A

Southcentral Alaska Water Study Subregions

Southcentral Alaska went through three distinct phases of growth between 1965 and 1975, distinguished by the primary causal factor. Between 1965 and about 1970, a major driving force in the economy was the development of the Kenai Peninsula and Upper Cook Inlet oil fields. During this period, wage and salary employment grew at a rate of 6.3 percent per year, population at a rate of 4.3 percent, income at 8.3 percent. Nineteen sixty-nine marked the beginning of a new period of growth. A $900 million mineral lease sale of lands at Prudhoe Bay, and a subsequent rapid increase in state budgets supplied much of the impetus for growth between 1970 and 1973. During this period, employment grew at 6.7 percent per year, population at 4.8 percent, and income at 7.0 percent. Finally, beginning in 1974, the construction of the Trans-Alaska Oil Pipeline took place, superimposing a large construction boom on top of an economy already expanding fairly rapidly. The average annual 1973-1975 growth rate in employment was 18.4 percent per year; population, 10.3 percent per year; and income, 18.0 percent.

There are at least four distinct but interlinked economies in the Southcentral region, and each of the four grew at a different rate, largely because of the major influences creating economic growth in Alaska over the period 1965 to 1975. The Cook Inlet subregion is dominated by Anchorage which, as the major trade, transportation, and financial center of the state, grew fairly rapidly in each of the three subperiods. The remainder of Cook Inlet grew rapidly during the 1965-1970 period, and during the expansion between 1973 and 1975, the latter a result of the suburbanization of Anchorage and the pipeline project. Gulf of Alaska showed hardly any growth until the pipeline, and rapid growth thereafter. Kodiak-Shelikof was relatively untouched by major development activity and maintained a low rate of growth in employment. Figure B summarizes the employment growth process in the regional economies for the period 1965-1975.

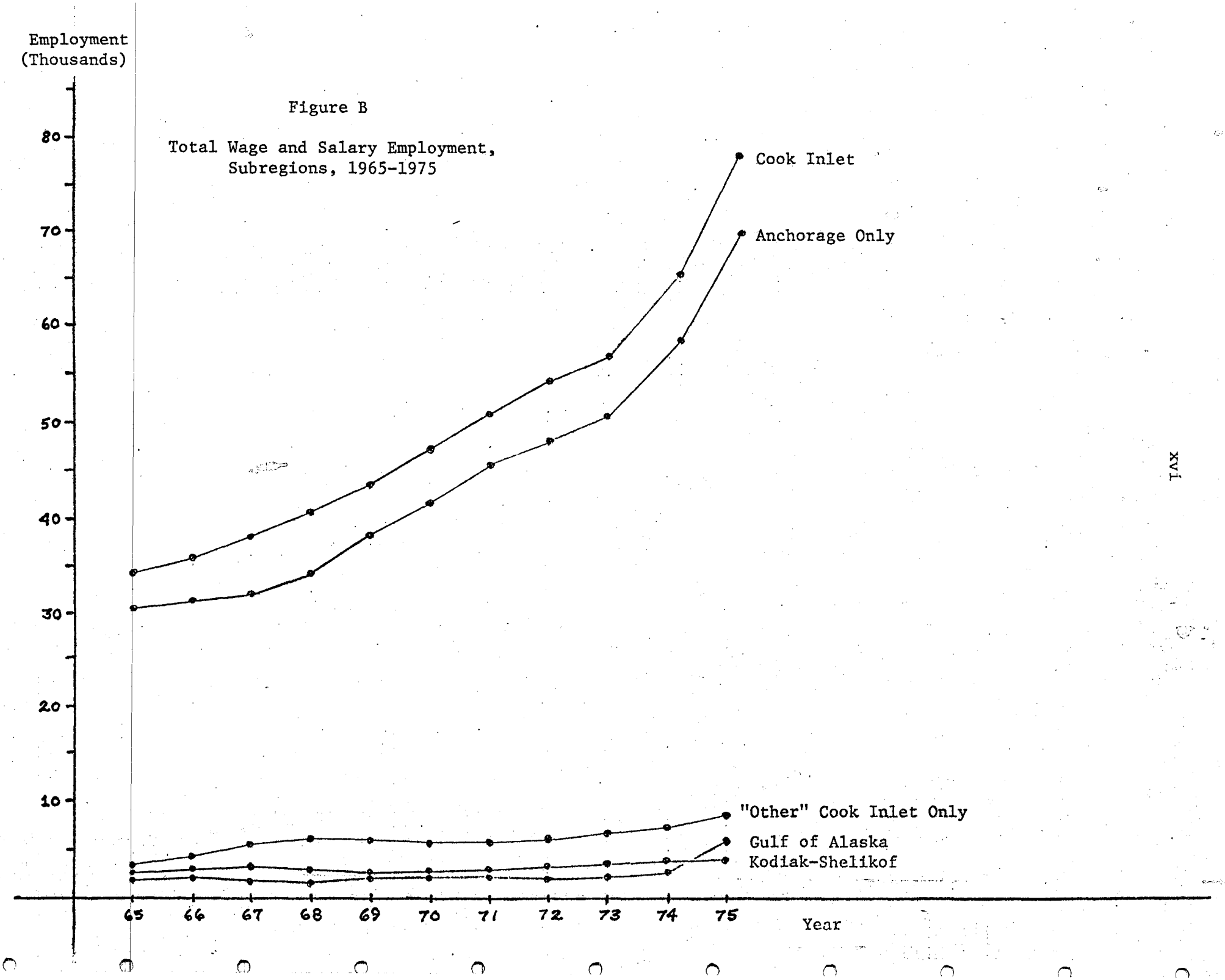


Figure B

Total Wage and Salary Employment,
Subregions, 1965-1975

Chapter 2 deals with the methodology and data used to project the growth of the Southcentral economy between 1975 and 2025 for two scenarios--high development and low development--while the methodology and assumptions for the intermediate case appear in the first section of the intermediate case addendum to the report. Those not interested in the details of the econometric models which were used may wish to skip the discussion of these models on pages 46 to 56 in the text. The procedure followed to the year 2000 was to estimate the highest, lowest, and an intermediate range of employment and/or output which could be expected for each of the basic industries for the state, Anchorage, and the remainder of Southcentral Alaska and to use the models to estimate nonbasic (support sector) employment and population. The combination of all high-range projections gave the high development scenario, the combination of all the low-range projections gave the low range scenario, and the combination of all intermediate-range projections, the intermediate scenario. The future total basic industry employment is shown in five-year increments in Tables A, B, and C on pages xxv, xxvii, and xxix for the high, low, and intermediate cases and is summarized in Figure C. The methodology used to disaggregate the assumptions and results for the subregional level can be found on pages 69 to 72 in the text, and pages AD-8 to AD-10 in the addendum.

The resulting output for civilian employment and population appears in Chapter 3, and in the third section of the intermediate case addendum. Briefly, the results are as follows: In Anchorage, the total population in the high case reaches 501 thousand in the year 2000, and 660 thousand by 2025. The corresponding levels in the intermediate case are 425 thousand and 534 thousand, and they are 375 thousand and 421 thousand in the low case. Anchorage population is shown in Figure D. A model run was also done to test the effect of removing the Northwest Alaska gas pipeline from the list of development projects in the intermediate case (pp. AD-26 to AD-28). Since Anchorage population depends upon economic development all over the state, the growth rates are substantial in spite of the fact

Figure C

Basic Sector Employment
Southcentral Alaska, 1975-2025

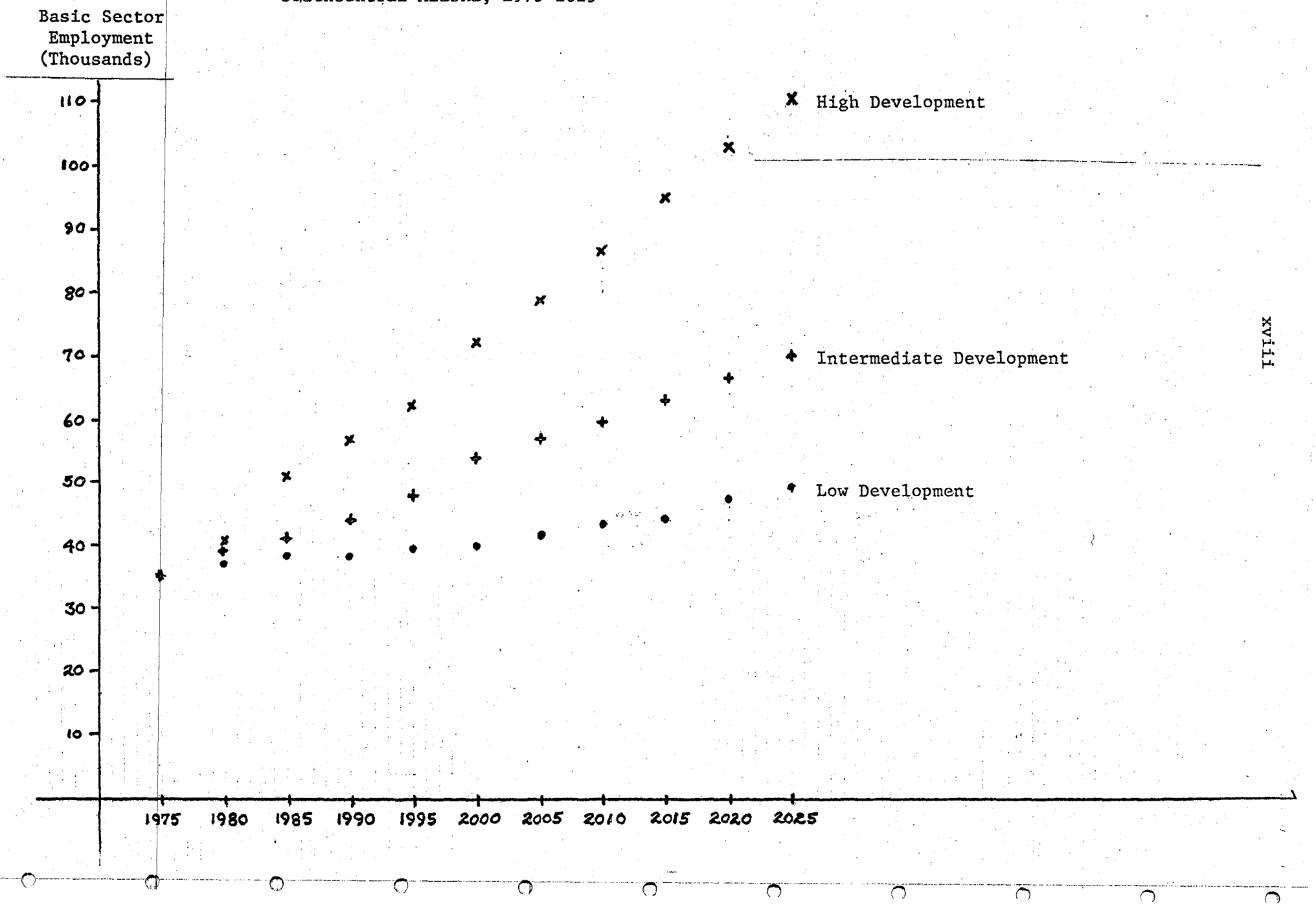
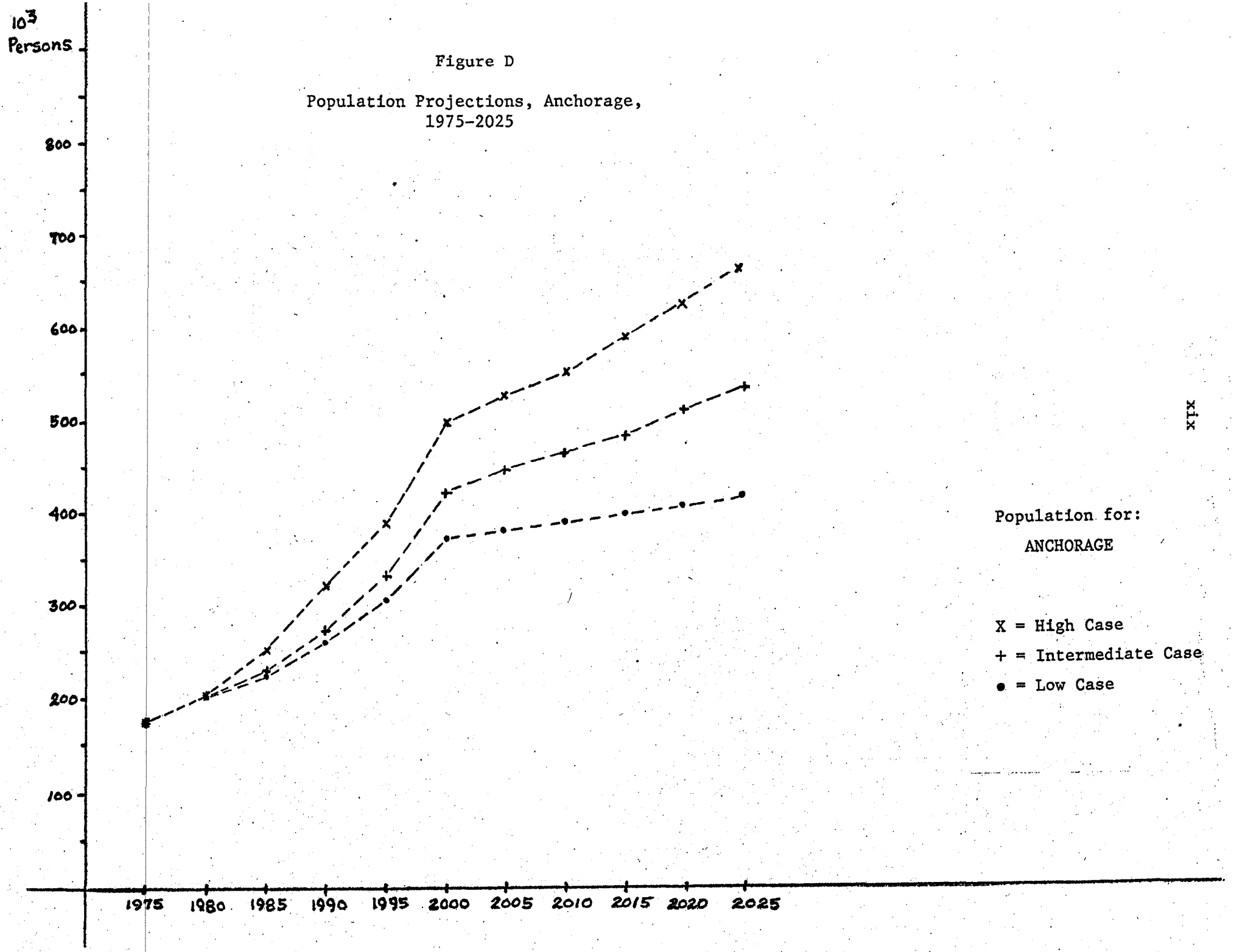


Figure D

Population Projections, Anchorage,
1975-2025



that very little of the projected development other than government growth occurs in Anchorage. Removing the gas line makes little difference.

The remainder of Cook Inlet is illustrated in Figure E. Several large projects, including the Pacific LNG plant, oil development in Lower Cook Inlet, coal development at Beluga, the state capital move, and agricultural and fisheries development are tentatively planned for this region. Consequently, there is considerable disparity among the three cases, depending upon the level of development. The chief differences between the high and intermediate cases are the level of government growth, which is much lower in the intermediate case, and the fact that only about half the fisheries and agricultural development programmed for the high case takes place in the intermediate case. The low case features still lower government growth (no capital move), essentially no fisheries and agricultural development, and reduced employment associated with oil and gas. Although not shown here, some of the population estimated for Anchorage may actually appear in this region because of increasing suburbanization of the Anchorage metropolitan area into the Matanuska-Susitna Borough. The entire region outside of Anchorage is relatively insensitive to the Northwest gas project, showing about 1,300 fewer people without the project by the year 2000, so no attempt was made to disaggregate the impact of the sensitivity run to the three subregions. Sensitivity estimates for the Southcentral economy are shown in Table AD.8 on page AD-27 of the addendum.

Gulf of Alaska is featured in Figure F. In the high case, the major driving forces in the economy are the Alpetco petrochemical refinery, employing about 1,900 people, plus fisheries and government and oil and gas development in the Gulf of Alaska. In the intermediate case, there is an Alpetco project, but it is a fuels refinery which employs only about 400 people. In addition, there is less fisheries development, and oil and gas is not found in the Gulf of Alaska. The low case features only a little government and support sector growth and no oil and gas, fisheries, or Alpetco project.

Figure E

Population Projections, Other Cook Inlet
1975-2025

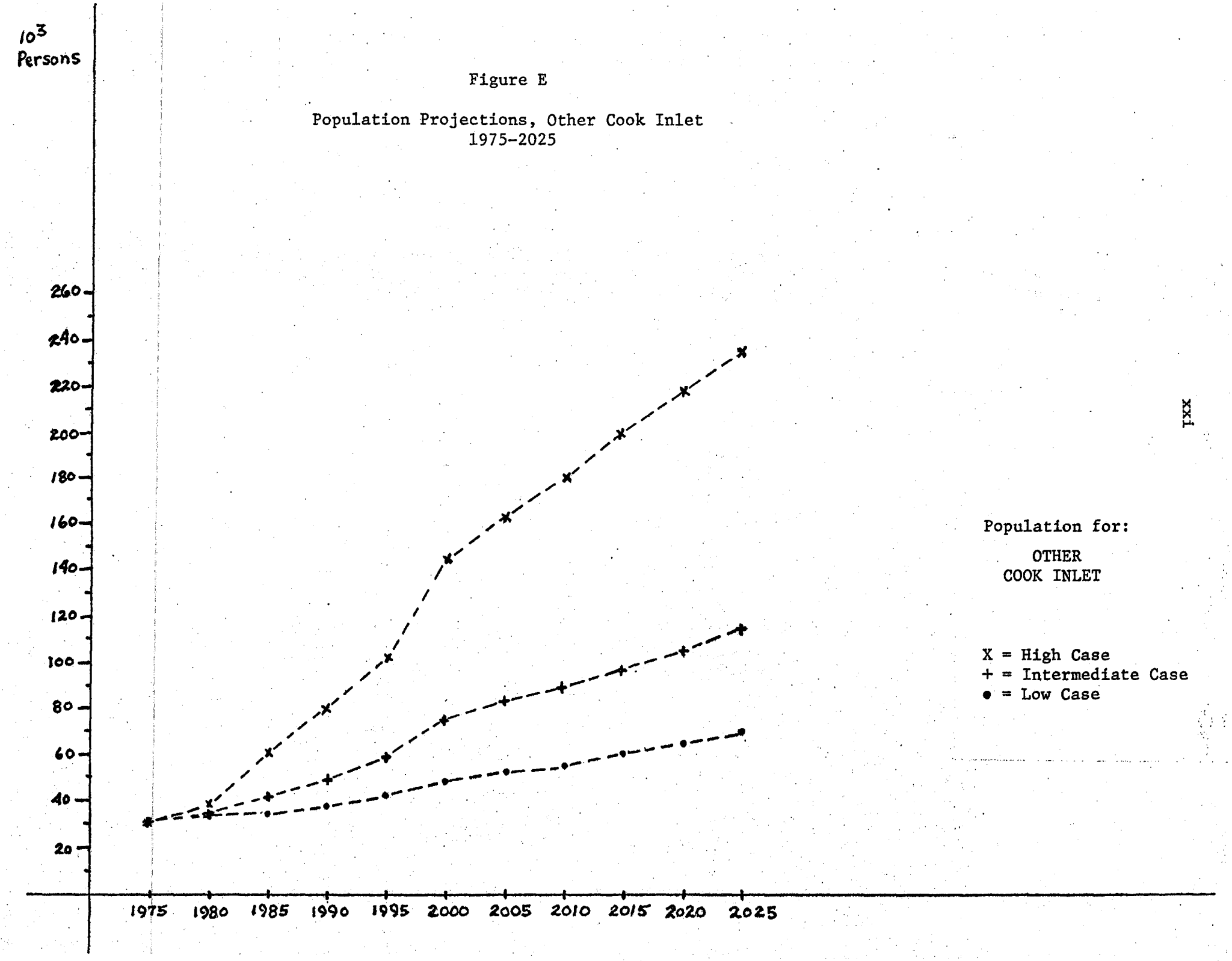
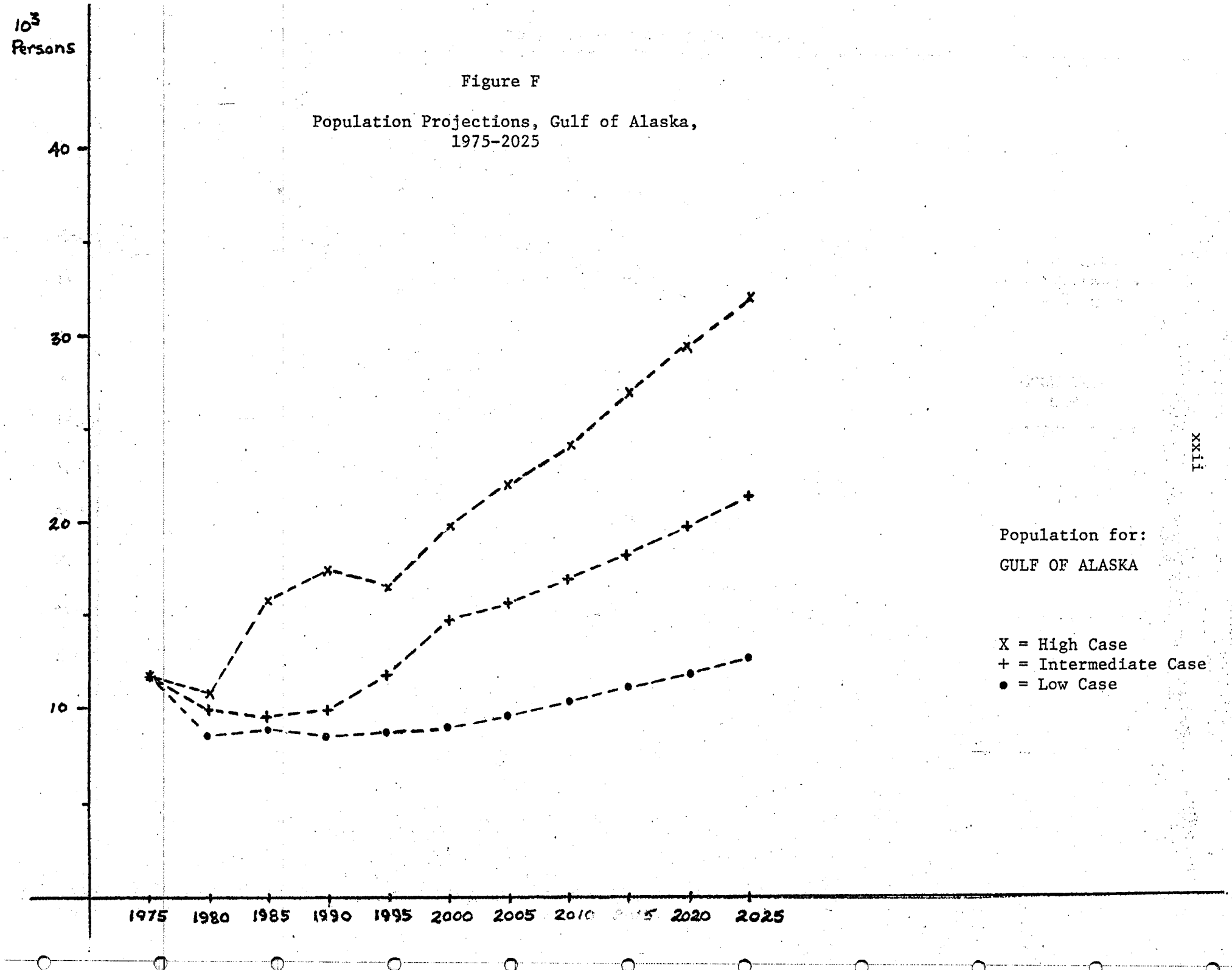


Figure F

Population Projections, Gulf of Alaska,
1975-2025



Finally, Kodiak-Shelikof population is depicted in Figure G. In the high case, there are two major driving forces--fisheries development and Western Gulf of Alaska oil and gas. In the intermediate case, there is no discovery of oil and gas in the Western Gulf and the level of bottomfish development and additional development of current fisheries is cut in half. In the low case, there is no development of either oil and gas or fisheries, and the major source of growth is government employment.

The following tables summarize the economic task projections for the high, intermediate, and low case. They are repeated in the text of the report.

Figure G

Population Projections, Kodiak-Shelikof,
1975-2025

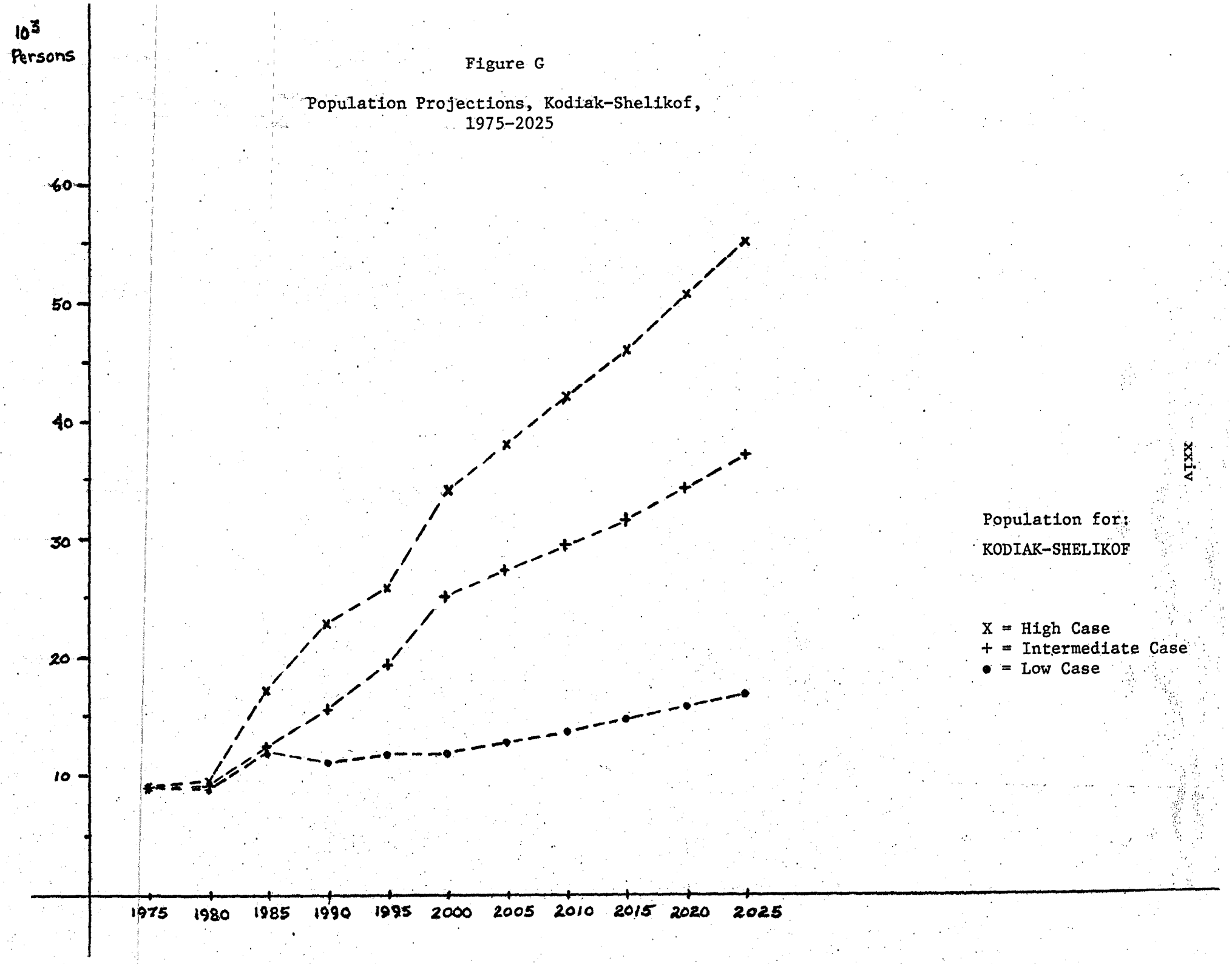


Table A

Southcentral Water Study
High Case Projections (HIGHSC3)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	206.0	39.0	10.8	9.7	265.5
85	255.2	61.1	15.8	17.6	349.8
90	324.1	79.2	17.4	22.7	443.4
95	391.9	103.1	16.5	25.8	537.4
2000	500.6	145.6	19.7	34.0	699.8
05	525.5	162.1	21.9	37.9	747.3
10	557.5	179.6	24.2	41.9	803.2
15	589.3	199.5	26.9	46.6	862.3
20	625.1	218.2	29.4	51.0	923.7
2025	659.5	236.1	31.9	55.1	982.6
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary					
1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian					
1975	23.239	4.901	4.134	3.188	35.462
80	25.179	7.875	4.097	3.800	40.951
85	26.569	12.781	5.732	6.261	51.343
90	28.834	14.917	5.991	7.761	57.503
95	30.999	17.491	5.381	8.373	62.244
2000	33.364	21.987	6.084	10.659	72.094
05	35.577	24.502	6.780	11.878	78.737
10	38.862	27.171	7.518	13.172	86.723
15	41.928	30.199	8.356	14.640	95.124
20	45.482	33.022	9.137	16.009	103.650
2025	48.581	35.706	9.880	17.310	111.477

High Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	59.421	8.920	2.048	1.828	72.218
85	82.925	15.901	3.726	3.237	105.789
90	114.826	21.858	4.194	4.315	145.193
95	145.947	30.809	4.036	5.007	185.799
2000	199.482	48.221	4.867	6.864	259.434
05	209.356	53.739	5.424	7.649	276.168
10	221.726	59.592	6.015	8.483	295.816
15	234.155	66.234	6.685	9.428	316.502
20	248.049	72.425	7.310	10.309	338.093
2025	261.648	78.310	7.904	11.147	359.008
Total Civilian Employment (Excludes Self-Employed, except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment:					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment:					
1975	69.645	9.186	5.953	4.614	89.398
80	84.600	16.795	6.146	5.628	113.169
85	109.494	28.682	9.458	9.498	157.132
90	143.659	36.775	10.185	12.076	202.695
95	176.946	48.300	9.417	13.380	248.043
2000	232.846	70.208	10.951	17.523	331.528
05	244.933	78.241	12.204	19.528	354.905
10	260.588	86.763	13.533	21.655	382.538
15	276.083	96.433	15.041	24.068	411.626
20	293.531	105.447	16.447	26.318	441.743
2025	310.229	114.016	17.784	28.457	470.485

Table B

Southcentral Water Study
Intermediate Case Projections (INTSC10)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	205.2	35.6	10.0	9.3	260.1
85	232.0	42.6	9.5	12.4	296.5
90	276.0	49.5	9.8	15.9	351.2
95	334.2	59.3	11.8	19.3	424.6
2000	425.0	75.5	14.6	25.3	540.4
05	444.5	84.2	15.7	27.2	571.6
10	465.1	90.8	16.9	29.3	602.1
15	486.5	98.0	18.2	31.6	634.3
20	509.4	106.1	19.8	34.2	669.5
2025	534.2	115.1	21.4	37.2	707.9
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary					
1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian					
1975	23.239	4.901	4.134	3.188	35.462
80	24.611	7.401	3.635	3.458	39.105
85	25.683	8.427	3.369	4.282	41.761
90	27.203	9.438	3.296	4.251	44.188
95	28.879	10.379	3.707	5.132	48.097
2000	30.634	12.242	4.374	6.842	54.092
05	32.124	12.890	4.606	7.204	56.824
10	33.701	13.635	4.872	7.620	59.828
15	35.365	14.441	5.160	8.071	63.037
20	37.143	15.348	5.484	8.578	66.553
2025	39.069	16.372	5.850	9.150	70.441

Intermediate Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	54.418	8.153	1.812	1.663	66.046
85	71.833	10.124	2.189	2.214	86.360
90	91.332	13.147	2.307	2.364	109.150
95	119.551	16.958	2.780	3.069	142.358
2000	166.544	23.581	3.499	4.406	198.030
05	174.586	25.584	3.796	4.780	208.746
10	182.996	27.864	4.134	5.206	220.200
15	191.774	30.381	4.508	5.677	232.340
20	200.989	33.194	4.925	6.202	245.310
2025	211.000	36.370	5.397	6.796	259.563
Total Civilian Employment (Excludes Self-Employed, Except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment					
1975	69.645	9.186	5.953	4.614	89.398
80	79.029	15.554	5.447	5.121	105.151
85	97.516	18.551	5.558	6.496	128.121
90	118.535	22.585	5.603	6.615	153.338
95	148.430	27.337	6.487	8.201	190.455
2000	197.178	35.823	7.873	11.248	252.122
05	206.710	38.474	8.402	11.984	265.570
10	216.697	41.499	9.006	12.826	280.028
15	227.139	44.822	9.668	13.748	295.377
20	238.132	48.542	10.409	14.780	311.863
2025	250.069	52.742	11.247	15.946	330.004

Table C

Southcentral Water Study
Low Case Projections (LOWSC6)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	205.0	34.2	8.6	8.8	256.6
85	226.7	34.2	8.8	12.0	281.7
90	261.1	38.1	8.4	11.1	318.7
95	309.7	43.3	8.6	11.5	373.1
2000	375.2	49.2	8.9	11.8	445.1
05	383.7	53.1	9.6	12.7	459.1
10	392.4	57.3	10.4	13.8	473.9
15	401.3	61.5	11.1	14.8	488.7
20	410.5	65.9	11.9	15.8	504.1
2025	420.7	70.4	12.7	16.9	520.7
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary 1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian 1975	23.239	4.901	4.134	3.188	35.462
80	24.964	7.133	2.659	3.221	37.977
85	25.238	6.640	2.679	3.791	38.348
90	25.900	6.456	2.361	3.286	38.003
95	26.631	6.573	2.377	3.310	38.891
2000	27.331	6.747	2.393	3.337	39.808
05	28.101	7.256	2.573	3.589	41.519
10	28.893	7.812	2.771	3.864	43.340
15	29.708	8.345	2.960	4.127	45.140
20	30.546	8.884	3.151	4.394	46.975
2025	31.459	9.426	3.343	4.662	48.890

Low Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	59.522	7.836	1.170	1.440	69.968
85	68.451	8.362	1.179	1.695	79.687
90	83.114	9.947	1.039	1.469	95.569
95	107.071	12.089	1.046	1.480	121.686
2000	141.162	14.709	1.053	1.492	158.416
05	144.131	15.820	1.133	1.605	162.689
10	147.131	17.033	1.219	1.728	167.111
15	150.164	18.194	1.302	1.846	171.506
20	153.229	19.369	1.387	1.965	175.950
2025	156.669	20.551	1.471	2.085	180.776
Total Civilian Employment (Excludes Self-Employed, except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment:					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment:					
1975	69.645	9.186	5.953	4.614	89.398
80	84.486	14.969	3.829	4.661	107.945
85	93.689	15.002	3.858	5.486	118.035
90	109.014	16.403	3.400	4.755	133.572
95	133.702	18.662	3.423	4.790	160.577
2000	168.493	21.456	3.446	4.829	198.224
05	172.232	23.076	3.706	5.194	204.208
10	176.024	24.845	3.990	5.592	210.451
15	179.872	26.539	4.262	5.973	216.646
20	183.775	28.253	4.538	6.359	222.925
2025	188.128	29.977	4.814	6.747	229.666

CHAPTER 1

SOUTHCENTRAL ALASKA'S ECONOMY 1965-75

Between 1965 and 1975, Alaska's economy grew quite rapidly, and one of the fastest growing areas was Southcentral Alaska. There is no single summary measure of growth which is useful for all purposes, because economic growth is a multi-dimensional process. Therefore, this chapter presents several measures which together describe the general growth of Southcentral Alaska's economy and many of the changes which occurred in it during the ten-year period 1965 to 1975.

The first section of this chapter discusses the economy of Southcentral Alaska as a single unit and relates economic growth in Southcentral to growth in the entire Alaska economy and to growth in the United States as a whole. The second section discusses the growth of individual sectors of the Southcentral economy, and the third section compares and contrasts economic growth in three principal subregions of Southcentral Alaska: the Cook Inlet subregion, the Gulf of Alaska subregion, and the Kodiak-Shelikof subregion. These regions roughly correspond to the following Census Divisions from the 1970 Census of Population:

Southcentral Alaska

- Cook Inlet: Anchorage, Kenai-Cook Inlet, Matanuska-Susitna, Seward
- Gulf of Alaska: Cordova-McCarthy, Valdez-Chitina-Whittier
- Kodiak-Shelikof: Kodiak

A map from the 1970 Census of Population appears as Figure 1, which allows the reader to identify the study region. In order to make the text more readable, only summary tables appear in the text. More detailed data appear in the Appendix.

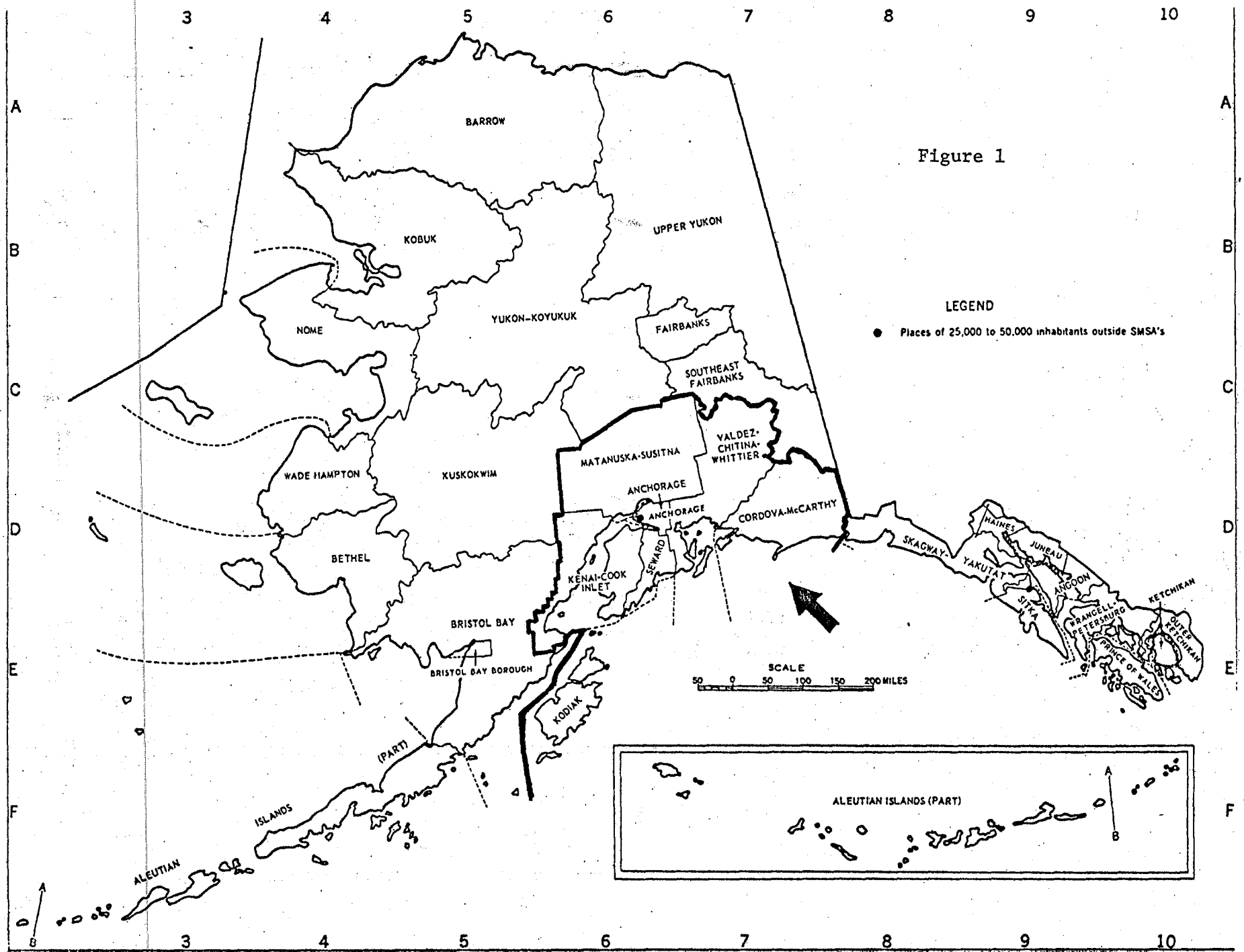

3
4
5
6
7
8
9
10
A
B
C
D
E
F
BARROW
KOBUK
UPPER YUKON
NOME
YUKON-KOYUKUK
FAIRBANKS
SOUTHEAST FAIRBANKS
MATANUSKA-SUSITNA
VALDEZ-CHITINA-WHITTIER
WADE HAMPTON
KUSKOKWIM
ANCHORAGE
ANCHORAGE
CORDOVA-McCARTHY
BETHEL
KENAI-COOK INLET
SEWARD
SKAGWAY-YAKUTAT
HAINES
JUNEAU
SITKA
ANGOON
WRANGELL-PETERSBURG
KETCHIKAN
OUTER KETCHIKAN
PRINCE OF WALES
BRISTOL BAY
BRISTOL BAY BOROUGH
KODIAK
ALEUTIAN ISLANDS (PART)
LEGEND
Places of 25,000 to 50,000 inhabitants outside SMSA's
SCALE
50 0 50 100 150 200 MILES
ALEUTIAN ISLANDS (PART)

Figure 1

Growth of Southcentral Economy

The growth of the Alaska economy can be conveniently summarized by examining changes in the value of economic output, employment, incomes, population, and prices brought about through the growth process. All five measures increased substantially during the period 1965 to 1975. The real (inflation adjusted) value of output in Alaska went up at about three times the average U.S. rate, while Southcentral Alaska rose even faster. Employment in Alaska increased by over 100 percent during these years, and Southcentral employment grew 130 percent. There was also a marked reduction in the seasonality of employment during much of the period. Real incomes of Alaskans rose much faster than those of most Americans between 1965 and 1975: total real income increased at almost three times the U.S. rate, while per capita income increased at almost twice the U.S. rate. Partly as a result of the rapid growth of the economy, the population of the state rose about 53 percent between 1965 and 1975, while the Southcentral region's population grew about 73 percent. Prices, as measured by the Consumer Price Index, increased at a rate one to two percent less than the U.S. average, with the exception of the pipeline construction years.

One of the more useful measures of economic growth is gross product, which is the total value at final sale of the goods and services produced by an economy. The Institute of Social and Economic Research has produced annual estimates of Alaska gross product since 1974. The Institute also has constructed historical series on a statewide level back to 1961 and regional series as far back as 1965.[1] These series are comparable to similar estimates provided on a national scale by the U.S. Department of Commerce. Since the Institute began preparing these estimates, the U.S. series has been converted to 1972 constant dollars. The Alaska

---

[1] Gross product estimation methodology is outlined in Kresge and Thomas [1] and Thomas and Goodwin [2].

series has been adjusted in Table 1 to account for this change, while the original Alaska series by detailed industry group appears as Table A.1 in the appendix. As can be seen from the table, the value of real output produced by the Alaska economy grew at a substantially faster rate than that of the U.S. as a whole. The Southcentral economy grew even faster over the ten-year period, while the pipeline construction years 1974 and 1975 show faster growth in the state than in Southcentral. In 1965, Southcentral produced 53.1 percent of all goods and services produced in Alaska. By 1973, the ratio had risen to 63.3 percent, and it was still 57.2 percent in 1975, even though the rest of the state had begun to overtake the Southcentral region. (The latter probably was a transitory phenomenon caused by pipeline construction.)

Economic growth offers increased opportunities for employment. Table 2 shows the rate of growth in nonagricultural wage and salary employment for Southcentral Alaska and the State of Alaska, which is the most consistent indicator of growth in total employment available in the state. Estimates of other types of employment--self-employed, unpaid family workers, and agricultural workers and fishermen--are troublesome, particularly because of changing coverage for fishermen under the state's unemployment insurance laws. Separate estimates of persons employed statewide (mostly Southcentral) in agriculture and in Southcentral region fishing are presented in Table 3. Since the reporting source and area covered is different in each case, and the definitions of who is employed vary, the reader is cautioned against adding the figures in Tables 2 and 3 to obtain an estimate of total employment. Finally, it should be noted that employment in Alaska has been quite seasonal in the past, so that the estimated annual average employment shown in these tables tells only part of the story. Accordingly, in Table 2 the ratio of average employment in the highest quarter to average employment in the lowest quarter of the year is reported to show how seasonality in employment has varied, both over time and between Southcentral Alaska and the state as a whole.

Table 1

Comparison of the Growth in Constant Dollar Real Output: Southcentral Alaska, Alaska, and United States 1965-1975

(Millions of 1972 Dollars)

Year	Southcentral Gross Product[1]	Alaska Gross State Product[1]	U.S. Gross National Product
1965	666.6	1,256.3	925,900
66	753.7	1,369.3	981,000
67	906.1	1,513.7	1,007,700
68	1,101.3	1,759.0	1,051,800
69	1,177.3	1,975.9	1,078,800
70	1,264.3	2,075.5	1,075,300
71	1,330.4	2,106.6	1,107,500
72	1,283.4	2,032.5	1,171,100
73	1,338.4	2,115.1	1,235,000
74	1,546.4	2,508.2	1,217,800
75	1,838.3	3,214.8	1,202,100
Average Annual Rate of Growth 1965-1975	10.7%	9.9%	2.6%

[1]Adjustment Factor = 1.514, the ratio of 1958 GNP in 1972 dollars to 1958 GNP in 1958 dollars.

Table 2

Civilian Non-Agricultural Wage and Salary Employment and Seasonality Coefficients: Southcentral Alaska and State of Alaska 1965-1975

(Number of Persons)

Year	Southcentral Employment	Seasonality Coefficient[1]	Alaskan Employment	Seasonality Coefficient[1]
1965	37,779	1.233	70,527	1.312
66	39,915	1.230	73,193	1.276
67	42,536	1.215	76,785	1.266
68	44,008	1.217	79,802	1.284
69	47,440	1.205	86,563	1.281
70	51,409	1.189	92,465	1.213
71	55,452	1.199	97,585	1.249
72	58,850	1.182	104,244	1.246
73	62,590	1.168	109,852	1.210
74	71,983	1.258	128,177	1.349
75	87,787	1.274	161,308	1.312
Average Annual Rate of Growth 1965-1975	8.8%	--	8.6%	--

[1] Ratio of average employment in highest quarter (usually, the third quarter) to employment in lowest quarter (usually, the first quarter).

Table 3

State Agricultural Employment and Southcentral Fisheries Employment and Measures of Seasonality, 1965-1975

(Number of Persons)

	State Agricultural Employment[1]	Seasonality[2]	Southcentral Fishing Employment[3]	High Month/ Annual Average Ratio[4]
1965	900	2.333	NA	NA
66	925	2.333	NA	NA
67	900	2.333	NA	NA
68	800	2.200	NA	NA
69	750	2.000	NA	NA
70	800	1.660	2,193	3.340
71	900	1.833	2,052	3.540
72	1,000	2.333	1,853	3.460
73	700	2.000	2,235	3.270
74	750	1.666	1,998	3.080
75	750	1.500	2,031	3.100

[1] Includes farm operators and other members of household who work on the farm during the survey week for 15 hours or more without receiving cash wages, plus hired workers who received pay for one or more hours of work on the farm in the survey week. Source: U.S.D.A., Alaska Crop and Livestock Reporting Service, Alaska Agricultural Statistics. Separate figures for Southcentral were not available.

[2] High month survey week employment divided by low month survey week employment. Survey months are March, June, September, and December.

[3] Data from special employment estimates made from Alaska Department of Fish and Game fish ticket data by George W. Rogers and Richard F. Listowski, 1978. Includes Aleutian Islands.

[4] July average divided by annual average.

Table 3 reports the ratio of high quarter to low quarter state agricultural employment, and high month to annual average employment for fisheries in Southcentral Alaska. A declining ratio means reduced seasonality, while an increasing ratio means increased seasonality.

As can be seen from Table 2, nonagricultural wage and salary employment increased substantially during the ten-year period 1965 to 1975 in both the Southcentral region and in Alaska as a whole, while seasonality declined between 1965 and 1973. (Additional employment detail appears in Appendix Table A.2.) The decline in seasonality came from two sources. In the first place, as will be shown in the next section, much of the growth in employment occurred in the support sectors, such as government, trade, and services, which tend to be less seasonal than the traditional Alaska employment base in seafood processing, construction, and some mining. Second, there have been some technological innovations, such as year-round construction techniques, which have tended to reduce seasonality in traditionally seasonal industries. The sharp increase in seasonality in 1974 and 1975 was mainly due to the very large-scale seasonal pattern of employment on the Trans-Alaska Oil Pipeline project, for which statewide employment varied between five thousand in the low quarter to more than twenty thousand in the high quarter. Other evidence suggests that seasonality has continued to decline, apart from this project.

Table 3 shows a fairly constant or slightly declining employment base in agriculture, with very marked seasonality. Most of this seasonality is a result of the hiring and laying off of part-time or seasonal help, while family help remains employed the whole year. Fisheries employment has increased substantially, while seasonality remains high. Table 2 shows that, because of its larger base in the relatively nonseasonal support sectors, the Southcentral economy has grown faster and tended to remain less seasonal than the economy of the state as a whole.

Besides the employment opportunities afforded by economic growth, another significant impact on individuals is the incomes earned in production. Table 4 shows the U.S. Department of Commerce estimates of residence-adjusted constant dollar personal income (real income) for Southcentral Alaska, Alaska as a whole, and the United States, reported in 1967 dollars. Additional detail appears in Table A.3 in the appendix. The Alaska data is reported in 1967 Anchorage dollars and the United States data in 1967 U.S. dollars. This data is useful for estimating the aggregate increase in purchasing power of persons living in each location; however, because of differences in prices between Alaska and the Lower 48 contiguous states (about 42 percent in the fall of 1975), Alaska real per capita incomes are not strictly comparable to U.S. figures. Per capita income for the Alaska locations is obtained by dividing real personal income by the Alaska Department of Labor estimate of population, which varies from the U.S. Bureau of the Census estimate for Alaska, and which is probably more accurate for 1975 than the Census estimate.

The table indicates that real income and real per capita income have been growing more rapidly in Alaska than in the United States as a whole. This was particularly true during the 1974-75 U.S. recession, during which income in the United States fell slightly, while Alaska income rose substantially as a result of the pipeline project even when increases in prices are taken into account. The overall income increase masks a very uneven distribution in income gains among the various population groups; however, it does fairly reflect an increase in overall purchasing power in the Alaska economy and increasing demand for goods and services.

The rapid economic growth in Southcentral Alaska and in Alaska as a whole has resulted in substantial in-migration of people seeking jobs in the Alaska economy. Table 5 summarizes population growth in the region

Table 4

Real Personal Income and Per Capita Income:
Southcentral Alaska, Alaska, and the
United States 1965-1975[1]

(1967 Dollars)

	Southcentral Alaska		Rest of State		State of Alaska		United States	
	Real Income (10^3 $)	Per Capita Income	Real Income (10^3 $)	Per Capita Income	Real Income (10^3 $)	Per Capita Income	Real Income (10^6 $)	Per Capita Income
1965	$489,559	$3,693	$421,269	$3,177	$910,828	$3,435	$562,988	$2,947
66	496,716	3,638	429,284	3,181	926,000	3,411	595,845	3,087
67	572,572	4,083	444,428	3,228	1,017,000	3,660	620,023	3,188
68	608,281	4,163	473,597	3,413	1,081,878	3,798	650,469	3,318
69	686,241	4,520	488,452	3,422	1,174,693	3,988	672,348	3,400
70	730,364	4,459	556,132	4,014	1,286,496	4,255	682,279	3,410
71	783,927	4,516	600,483	4,367	1,384,410	4,450	702,351	3,406
72	829,733	4,566	635,323	4,526	1,465,056	4,548	746,579	3,586
73	894,842	4,742	765,754	5,405	1,660,596	5,027	785,198	3,742
74	1,022,756	5,257	791,284	5,053	1,814,040	5,166	778,329	3,682
75	1,246,726	5,433	1,013,944	5,789	2,260,670	5,587	773,264	3,630
Average Annual Rate of Growth: 1965-1975								
	9.8%	3.9%	9.2%	6.2%	9.5%	5.0%	3.2%	2.1%

[1]Income data used to compile this table are from computer printouts provided by the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economics Information System. Population data for Alaska are from Alaska Department of Labor, Current Population Estimates by Census Division.

Table 5

Population Growth: Southcentral Region and Alaska 1965-1975

(Number of Persons)

	Southcentral Region	State
1965	132,572	265,192
66	136,549	271,505
67	140,223	277,906
68	146,100	284,880
69	151,810	294,560
70	163,792	302,361
71	173,573	311,070
72	181,736	322,115
73	188,698	330,365
74	194,569	351,159
75	229,492	404,634
Average Annual Rate of Growth 1965-1975	5.6%	4.3%

and in the state as a whole. (Geographic detail appears in Appendix Table A.4.) Two major economic motivating factors explain the large population increase. One is that real per capita incomes have been rising in Alaska faster than in the United States as a whole, indicating that Alaska has been a region of improving wage scales compared to the rest of the United States. In addition, employment growth provides additional job opportunities for individuals. Some migrant job seekers also bring families. The Alaska Department of Labor estimates that net migration accounted for 73 thousand of the 103 thousand increase in resident population between 1970 and 1975, about 72 percent of the increase, while natural increase accounted for only 29 thousand, or about 28 percent of the total.

Growing economies often are characterized by growing demand and supply bottlenecks which add to pressures for rising prices. Offsetting this is the fact that growth provides opportunities for economies of scale in the distribution of goods and services and provides opportunities for import substitution, which may reduce consumer prices. Alaska's prices are closely linked to U.S. prices, largely because Alaska produces very few consumer goods, but rather imports most of them from the Lower 48. Table 6 indicates that the rate of growth of Alaska consumer prices, as measured by the Anchorage Consumer Price Index, was generally lower than that of the United States as a whole between 1965 and 1973, probably as a result of transportation savings, competition, and economies in distribution in growing Alaska markets. During the pipeline construction period, however, which was also a period of business recession in the Lower 48, Alaska prices grew at a rate faster than in the country as a whole. Table A.5 in the appendix shows the distribution of Alaska price increases among the major categories of goods and services purchased by consumers.

Table 6

Anchorage and U.S. Consumer Price Index, Percentage Change, and Difference in Percentage Change, 1965-1975

(1967 = 100.0)

	Index		Percent Change		
	Anchorage	U.S.	Anchorage	U.S.	Difference
1965	94.2	94.5	NA	NA	NA
66	100.0	97.2	6.2	2.9	+ 3.3
67	100.0	100.0	0.0	2.9	- 2.9
68	102.6	104.2	2.6	4.2	- 1.6
69	105.9	109.8	3.2	5.4	- 2.2
70	109.6	116.3	3.5	5.9	- 2.4
71	112.9	121.3	3.0	4.3	- 1.3
72	115.9	125.3	2.7	3.3	- 0.6
73	120.8	133.1	4.2	6.2	- 2.0
74	133.9	147.4	10.8	10.7	+ 0.1
75	152.3	161.2	13.7	9.4	+ 4.3

Distribution of Economic Growth Among Industries and Areas, Southcentral Region

The growth which took place in the Southcentral economy between 1965 and 1975 was not uniform across industries. Table 7 and Figure 2 demonstrate this fact in percentage growth terms for two subperiods: 1965 to 1973 (pre-pipeline) and 1974 and 1975 (pipeline construction). Both the figure and the table also show that the rate of growth in nearly all industries accelerated appreciably with the advent of pipeline construction in 1974. Industry-by-industry causes of growth are discussed below, divided into basic industries (solid lines in Figure 2) and support sector (dashed lines in Figure 2). For purposes of this discussion, basic industries are mining, manufacturing, construction, agriculture-forestry-fisheries, and federal government. Support sector industries are transportation-communications-public utilities, wholesale and retail trade, finance-insurance-real estate, services, and state and local government.

Basic Industries

Growth in these sectors was led by two industries: mining (including petroleum) and construction. The main cause of growth in the mining sector was the production of oil and gas from the Kenai Peninsula and Cook Inlet fields. Oil was discovered at Swanson River in 1957, but production never amounted to more than 1 million barrels per month until 1966, which inaugurated a steady five-year increase that peaked in 1970 at 7.5 million barrels per month. Prior to 1966, total cumulative value of oil and gas production from Alaska was about $156 million. The annual value in 1966 alone was $47 million, and the estimated annual gross sales accelerated from there to $407 million by 1975. Employment in production, specialized drilling and construction, field services, and headquarters grew at an annual rate of about 40 percent in the late sixties, causing nearly a tripling of mining employment from 694 to 1,913 in the Cook Inlet subregion between 1965 and 1969. As production in the

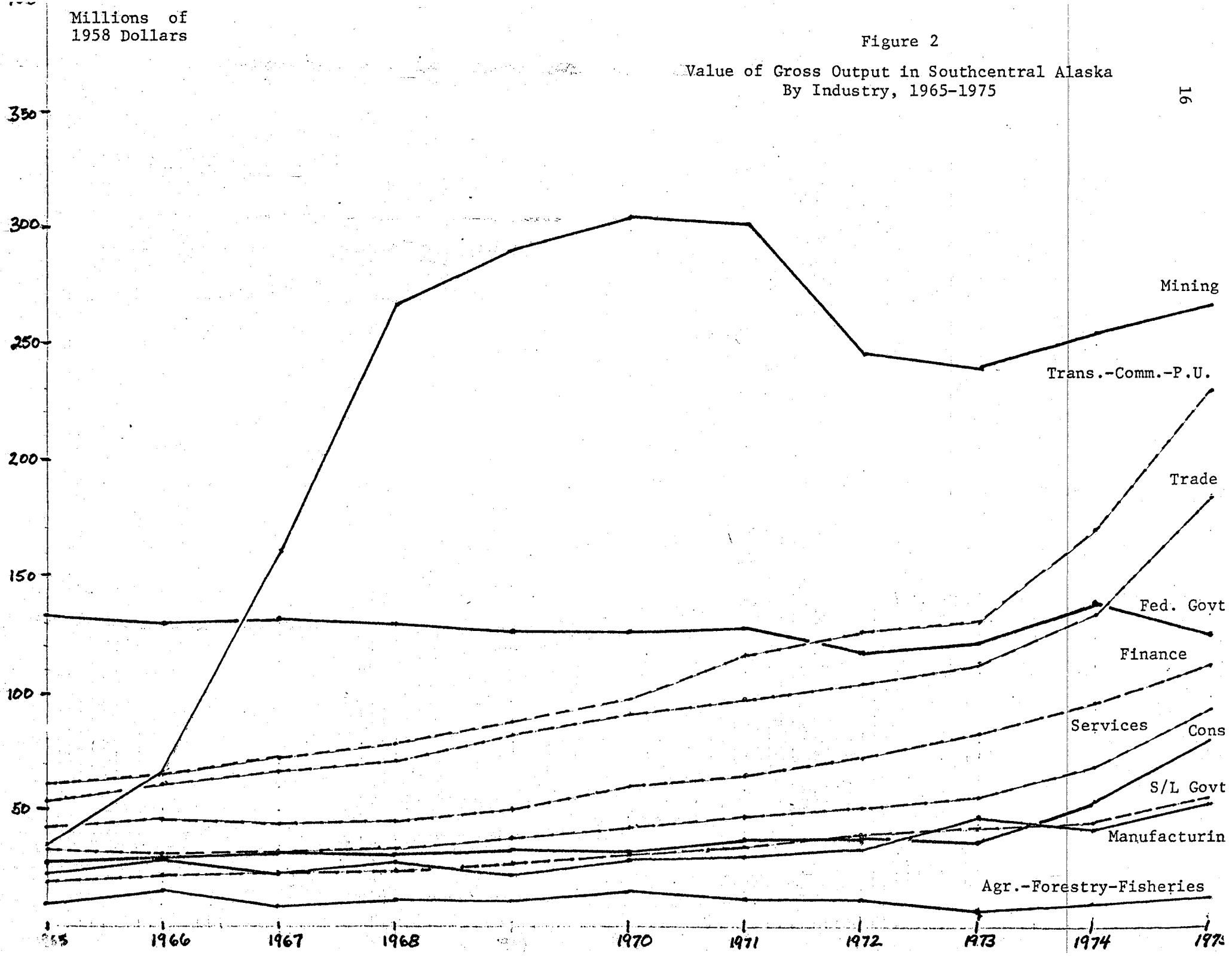
Table 7

Annual Percent Increase in Real Gross Output,
Southcentral Region and State, 1965 to 1975

Industry	Southcentral		Rest of State		State	
	1965-1973	1973-1975	1965-1973	1973-1975	1965-1973	1973-1975
Agr.-Forestry-Fisheries	- 4.9	32.5	- 13.5	70.5	- 9.9	51.5
Mining	27.2	5.5	13.1	70.2	24.0	17.2
Construction	1.6	48.4	1.7	125.7	1.6	81.6
Manufacturing	10.0	4.5	3.2	3.4	5.4	3.8
Food Mfg. Only	10.1	- 1.3	1.9	0.7	5.6	- 0.4
Trans.-Comm.-P.U.	10.1	32.1	4.7	36.8	7.4	34.2
Transportation	9.7	32.6	4.5	47.4	7.2	38.9
Communications	10.4	34.5	4.1	32.5	6.6	33.4
Public Utilities	10.7	27.4	7.5	20.8	9.6	25.3
Trade	9.9	27.4	6.7	49.0	8.8	34.5
Wholesale	11.3	38.3	7.3	48.0	10.2	40.6
Retail	8.9	18.6	6.4	49.3	7.9	30.5
Finance	9.0	15.8	6.2	31.7	8.1	20.4
Services	9.2	29.8	6.8	38.9	8.3	33.1
Government	2.4	3.6	1.2	0.8	1.0	1.8
Federal	- 1.1	2.0	- 1.1	- 5.2	- 1.1	- 1.1
State/Local	9.4	8.2	8.2	8.5	8.8	8.0

Figure 2

Value of Gross Output in Southcentral Alaska
By Industry, 1965-1975



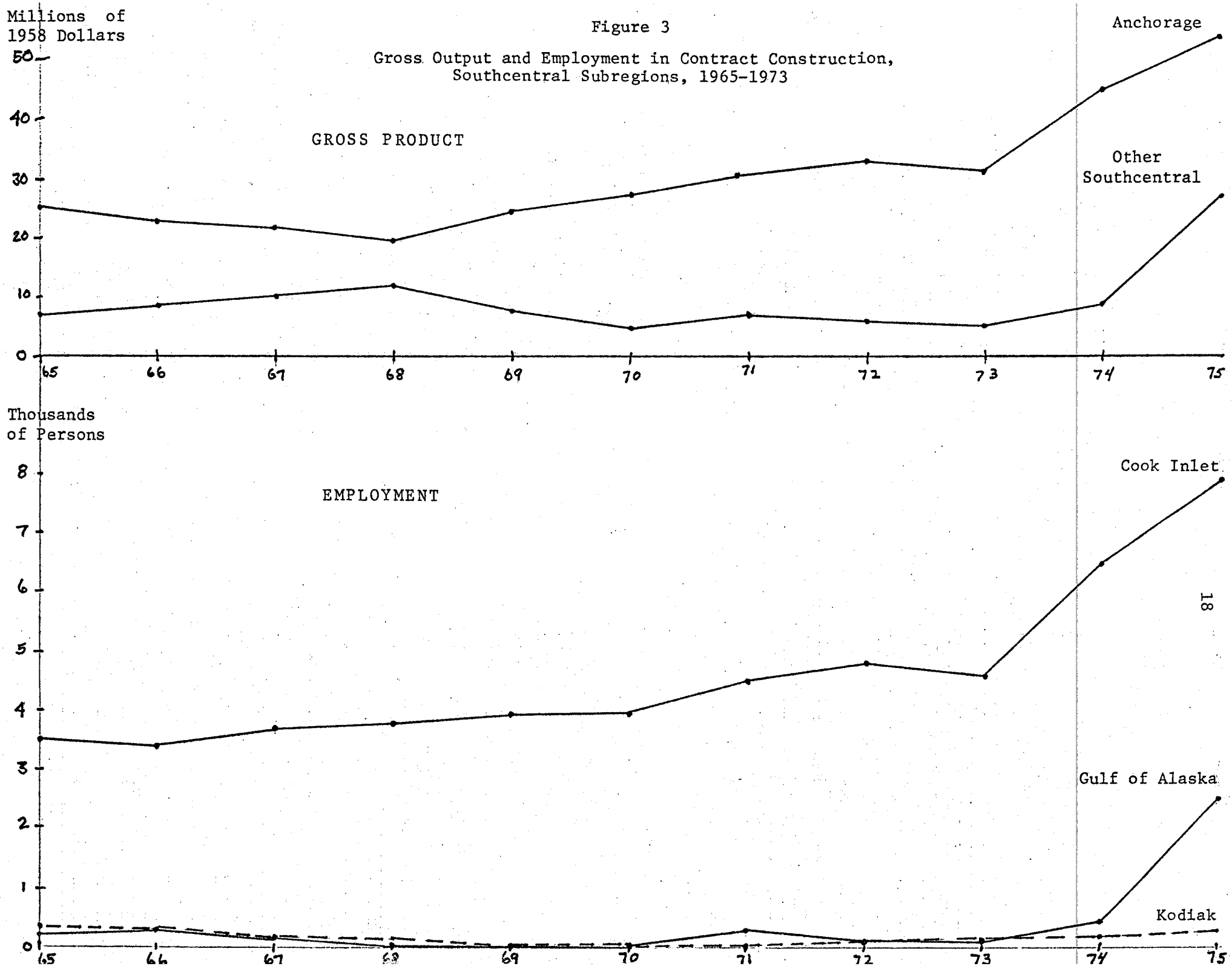
Upper Cook Inlet fields first stabilized and then began to fall off, and with the completion of most exploration and development drilling, employment shrank to 1,343 in 1972. The modest growth in this sector after 1973 seems to have come from three sources. In spite of steady or declining production of oil, the Arab oil embargo and OPEC price increases caused over a 50 percent rise in the nominal value of Upper Cook Inlet production (and some increase in real value) between 1973 and 1975. Second, largely in response to a burgeoning Anchorage market, natural gas production increased sharply in 1975. Finally, Anchorage headquarters and other mining industry employment increased by 69 percent between 1973 and 1975 to 1,300, about 36 percent more than the previous peak year of 1970. Slight increases in oil field employment occurred on the Kenai Peninsula as a result of Tesoro refinery and Collier Carbon and Chemical petrochemical expansion, although neither facility employs people in mining directly.

Recent development trends in the Cook Inlet area indicate a continuation of growth in mining, at least for the near future. North Slope development and increased exploration elsewhere in the state suggest that Anchorage mining sector employment and output will continue to grow, while exploratory activity in Lower Cook Inlet, the Northern Gulf of Alaska, and the Kodiak shelf will lead to greatly expanded employment and output elsewhere in the region, if exploration efforts are successful. In any case, there will be some short-term employment increases associated with exploration efforts.

Construction output remained fairly flat between 1965 and 1973, and then increased rapidly in response to demands arising both directly and indirectly from the Trans-Alaska Oil Pipeline and other oil and gas developments. As can be seen in the top half of Figure 3, constant dollar construction output declines in Anchorage in the late 1960s were about offset by increases elsewhere in the region (chiefly, the Kenai Peninsula). Both areas remained about flat between 1970 and 1973, then both grew rapidly

Figure 3

Gross Output and Employment in Contract Construction, Southcentral Subregions, 1965-1973



in response to Trans-Alaska Pipeline development. The bottom half of Figure 3 shows the pattern of employment in the three study subregions. The Cook Inlet subregion pattern was a result of the Kenai Peninsula boom in the late 1960s, followed by a smaller construction expansion in the 1973 to 1975 period. The underlying causes were expansions of oil and gas processing facilities and related construction, combined with uneven but continuous employment increases in Anchorage after 1970, culminating in a construction boom in 1975. Gulf of Alaska subregion employment was influenced primarily by the construction boom in Valdez, resulting from the building of the pipeline terminal and facilities. Kodiak-Shelikof experienced contraction of its construction sector in the late 1960s, apparently due to declining Kodiak Naval Station employment, stable population, and declining fisheries, but has experienced increases since about 1970, partly in response to increased fish processing and in anticipation of offshore oil development.

Overall, recent trends suggest that construction employment and output correspond with major construction decisions by outside agencies and firms (an example being the pipeline, or projects such as Pacific LNG's gas liquefaction facility), and responses of local community facilities to overall increase in population and demand for goods and services. There currently are several large projects pending or being discussed which will mean substantial direct construction employment, and which will probably lead to some overall increase in the size of Southcentral's economy, implying a secondary construction response. The likeliest subregion for the increase is the Cook Inlet subregion, since several major projects (Pacific LNG, capital move, Beluga coal, Susitna hydro) are proposed for this subregion, and because the subregion contains Anchorage which, as the major financial, trade, and government center, grows in response to business and government developments all over the state. The outlook for construction employment in the other two subregions is more likely to be tied to specific projects and be of a more cyclical nature.

The other basic sectors were less important to overall economic growth. Agriculture-forestry-fisheries sector, for example, showed its cyclical nature and did not show substantial increases in real value of output. Table 8 shows the nominal value of agricultural production (not necessarily sales), value of catch to fishermen, and inflation-adjusted output generated by this sector between 1965 and 1975. This sector accounted for about one percent of output in 1975, although it figures quite prominently in the local economies of Kodiak, Cordova, Homer, and Seward and provides raw materials for food manufacturing, which added another 2.8 percent of the value of 1975 Southcentral output. Forestry and lumber and wood products play only a very minor role in the Southcentral economy at present, contributing only about three-tenths of one percent of 1975 output and employing 426 people, about three-fourths of them in Anchorage. The prospects for growth in the agriculture-forestry-fisheries sector and related processing depend on the ability of American fishermen and processors to take advantage of rising prices for their output, the new 200-mile fisheries conservation zone established in 1976, and the ability of the State of Alaska to enhance the very low salmon runs of recent years. It should be pointed out that even a doubling of output in agriculture-forestry-fisheries would result in very modest increases in the overall output of the Southcentral economy, though it may be important for the employment base of several communities.

Other manufacturing, principally petroleum refining, petrochemicals, and printing and publishing, has been playing an increasingly important role within the manufacturing sector, historically dominated by fish processing. In 1965, other manufacturing accounted for 27.2 percent of manufacturing output in the Southcentral economy and 33.5 percent of manufacturing employment (about 53.6 percent of manufacturing employment in the Cook Inlet subregion). By 1974, output had increased to 33.9 percent of total manufacturing, with an increase of employment to 34.1 percent of the total (1974 is compared to 1965 in order to compare two "down" years in the salmon cycle). Prospects for growth in other manufacturing

Table 8

Agriculture, Forestry, and Fisheries Output Statistics, Southcentral Alaska, 1965-1975

	Value of Agricultural Output (Millions of Dollars)[1]	Value of Catch to Fishermen (Millions of Dollars)[2]	Real Gross Product (Millions of 1958 Dollars)
1965	$ 3.9	$ 22.3	$ 11.1
66	4.2	33.4	16.5
67	4.2	21.7	10.0
68	4.0	39.7	13.5
69	3.5	30.9	12.5
70	4.2	40.7	15.6
71	4.1	36.7	13.1
72	4.6	44.8	12.4
73	5.4	73.5	7.4
74	6.4	65.9	11.0
75	7.2	61.0	13.0

[1]Source: Alaska Agricultural Statistics, various issues.

[2]Source: Alaska Department of Fish and Game, Commercial Fisheries Division, Alaska Catch and Production, various issues.

depend mostly on the ability of the region to attract chemical facilities based on oil and gas. The proposed ALPETCO refinery, for example, would employ more than double the number of persons employed in other manufacturing in Southcentral in 1975.

Federal government output, evaluated as the wages and salaries paid to federal employees, stayed just about constant over the entire period, as did federal civilian employment. There has been an increase in federal civilian employment of about six percent since 1970, or about 600 persons. While there is some reason to believe the number of federal positions in Southcentral Alaska will increase over time, as this part of Alaska becomes more urbanized and requires more government services, and functions currently provided in Juneau and Seattle are provided locally, this is not expected to be a major growth industry in the future. Almost all future growth would probably occur in the Cook Inlet subregion, in Anchorage.

Support Sectors

The various support sector industries all followed very similar growth patterns between 1965 and 1975. Referring back to Table 7 and Figure 2, one can see that in Southcentral Alaska between 1965 and 1973, the real value of output in transportation, communications, public utilities, trade, finance (including insurance and real estate), services, and state and local government all grew at between 9 and 11 percent per annum. Figure 4 shows employment by industry. After 1973, the pipeline boom and its secondary effects caused these rates of increase to as much as triple the 1965-1973 rates. Some of the employment in transportation, communications, and public utilities and some of the employment in services was direct employment on the pipeline project and, therefore, should be included as part of the growth in basic sector employment. State and local government is also "basic" in one sense, since some of the increase in state and local employment and output can be attributed directly to increases in available revenues after the Prudhoe Bay lease sale in 1969. State and local government expansion provided part of the basic increase

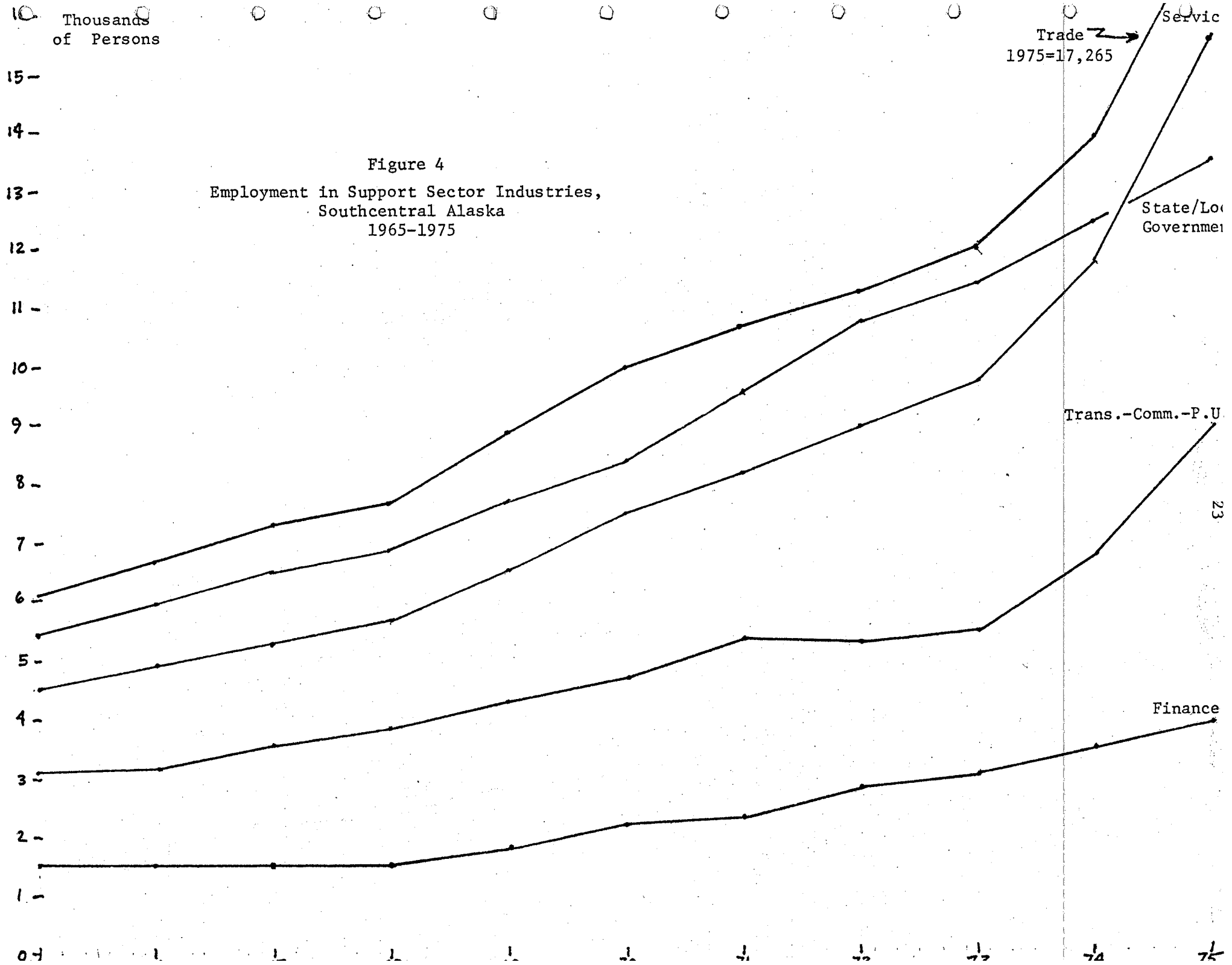


Figure 4

Employment in Support Sector Industries,
Southcentral Alaska
1965-1975

in economic activity that fueled growth in the rest of the support sector. However, since a large part of the growth in government can be attributed to the increases in staffing due to increased population and to increased per capita demand for government services, state and local government has been included in the support sector.

Of the available aggregate statistics, the one which best predicts growth in the support sector on a statewide level is personal income. Real personal income earned within a subregion is less in determining local support sector activity, the smaller and less isolated the subregion. In small subregions, a high proportion of goods and services are either provided by other localities or are provided to other localities. Even so, local real personal income (local demand) has a remarkably strong effect on the output of the support sectors. Figure 5 demonstrates that the real income-output relationship for Anchorage is fairly stable in services and also in trade, although there appears to have been some departure from the historical relationship in 1975. Transportation-communications-public utilities appears to have slowed in comparison with personal income growth in Anchorage in the early 1970s. A possible interpretation of this observation is that transportation in Anchorage experienced a pause between the Kenai construction boom and the North Slope construction boom as a result of slack statewide transportation demand (see Table A.6), while personal incomes of residents of Anchorage continued to grow from business generated locally and from the maturing Southcentral economy. Indeed, examination of the Anchorage census division employment data reveals that Anchorage transportation employment was essentially unchanged between 1970 and 1973. Communications employment was also essentially flat between 1970 and 1974, while public utilities employment, which reflects local demand, increased steadily. The break from the past pattern in trade in 1974-75 seems to have been caused by a rapid maturing of the Anchorage economy; e.g. Anchorage wholesale trade employment increased by 40 percent between 1974 and 1975.

Figure 5

Relationship of Real Personal Income to Real Output in Support Sector Industries, Anchorage, 1965-1975

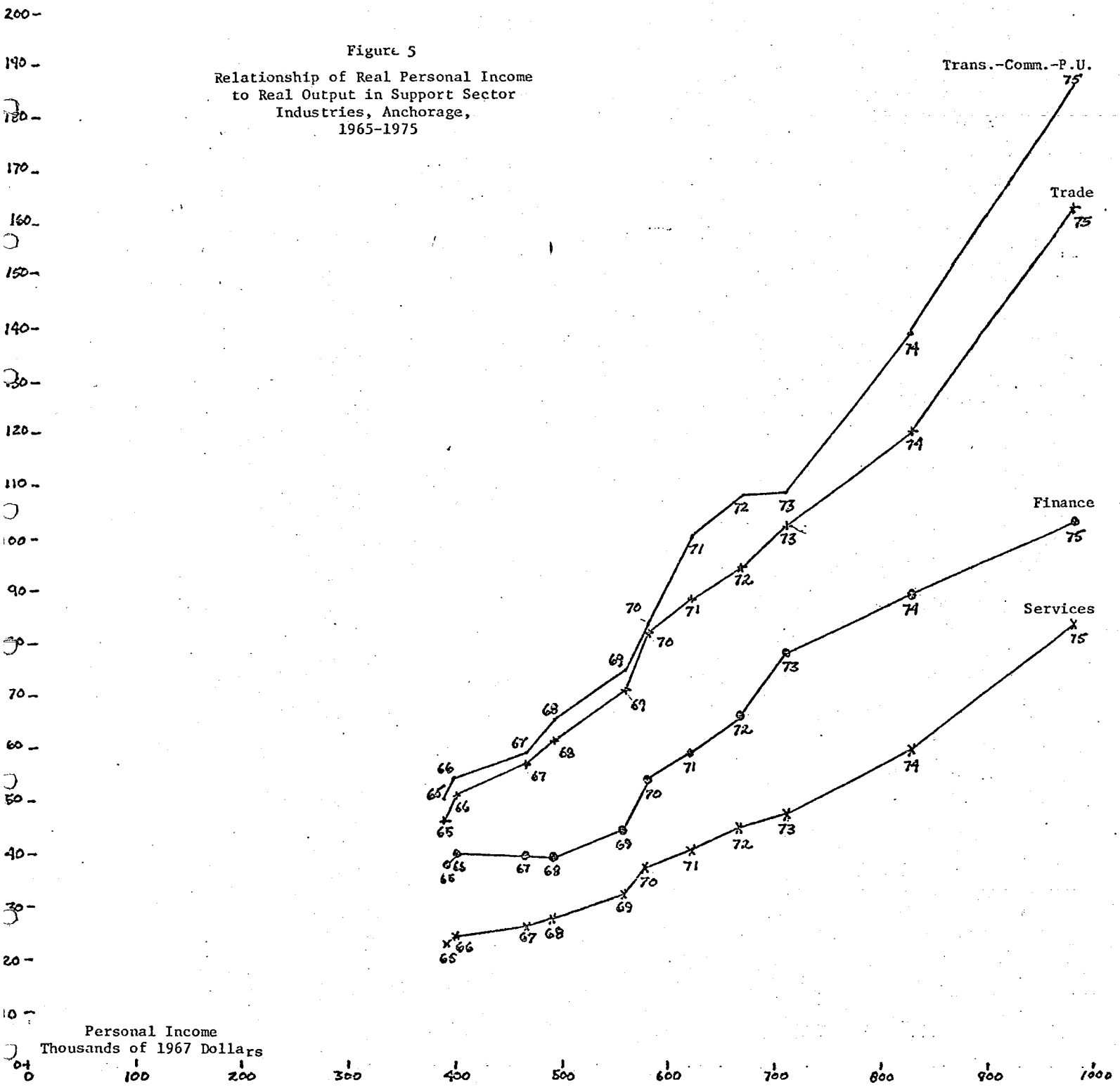


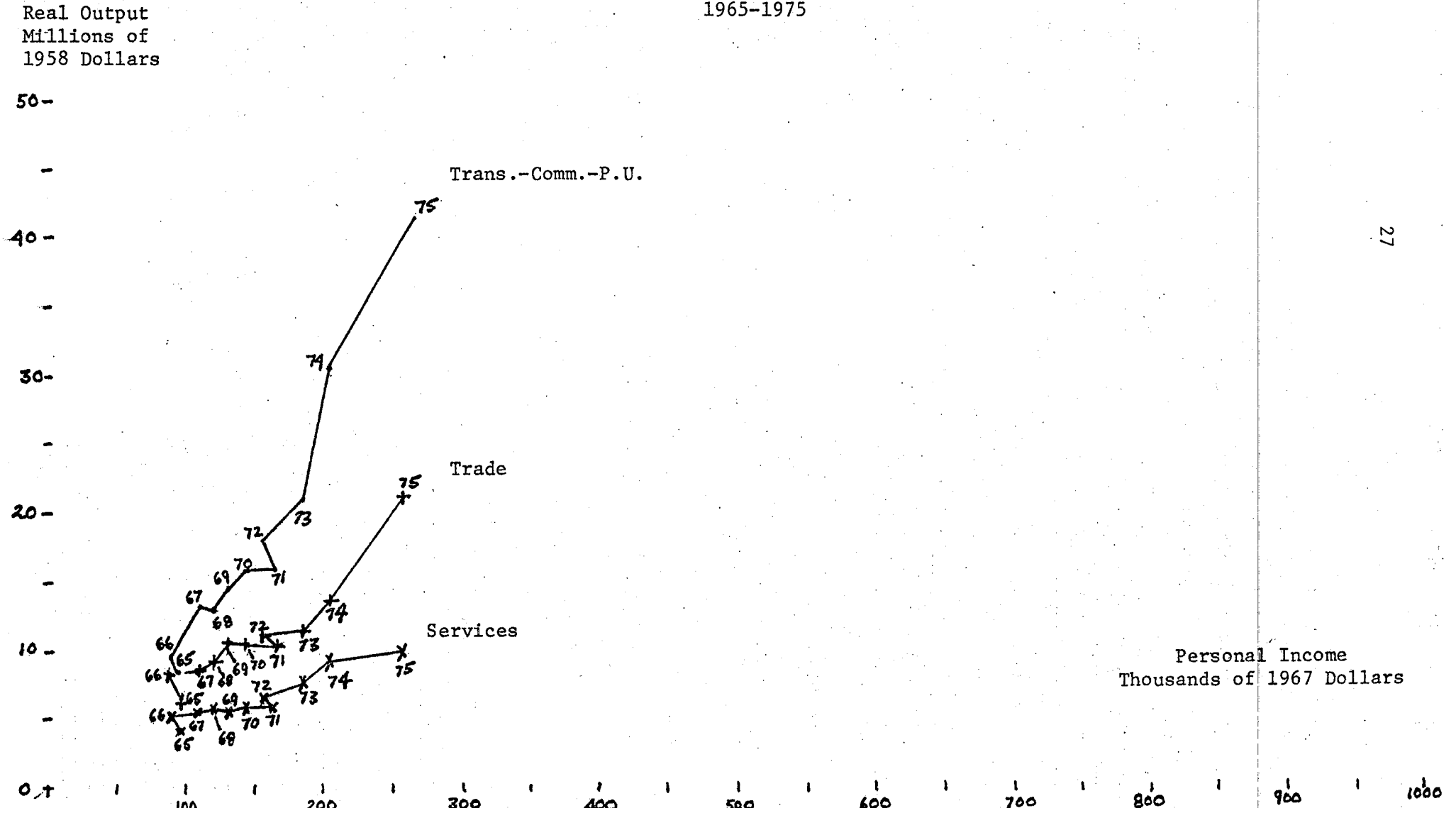
Figure 6 data on the support sector outside of Anchorage demonstrate that 1974 and 1975 again represent a departure from the 1965 to 1973 trend. Transportation-communications-public utilities shows the largest difference from historical trends, mostly as a result of an increase of 50 percent in "other transportation" employment in the Gulf of Alaska subregion in 1974, and another 183 percent increase in 1975. The output data are clearly affected by the pipeline project (see tonnage data in Table A.6), and projections of the transportation sector would need a separate component for local demand and resource development-related demand.

Trade output has also increased sharply in the Southcentral region, exclusive of Anchorage, with big percentage increases occurring at both the wholesale and retail level in 1974 and 1975. It should come as no surprise that the employment data from the individual census divisions indicate that large increases have occurred in employment in the Matanuska-Susitna Borough, the Kenai-Cook Inlet census division, and the Valdez-Chitina-Whittier census division, with little growth in Cordova-McCarthy and little or no growth at the wholesale level in Kodiak and Seward. In the case of the Matanuska-Susitna Borough, much of the growth is due to the development of Wasilla as a retailing center. In the case of Valdez-Chitina-Whittier, much of the growth is a direct consequence of services provided as a result of the pipeline project, and in the Kenai Peninsula, probably the growth is a result of a deepening and maturing economy which comes with larger populations.

Services did not keep pace with the increase in personal income outside of Anchorage between 1973 and 1975. This may be due to the fact that most services such as medical and business services are still obtained in Anchorage, while hotel, restaurant, and related services cannot yet be supported by internal business growth. The single exception was business services in the Valdez-Chitina-Whittier census

Figure 6

Relationship of Real Output in Support Sector Industries to Real Income, Other Southcentral, 1965-1975

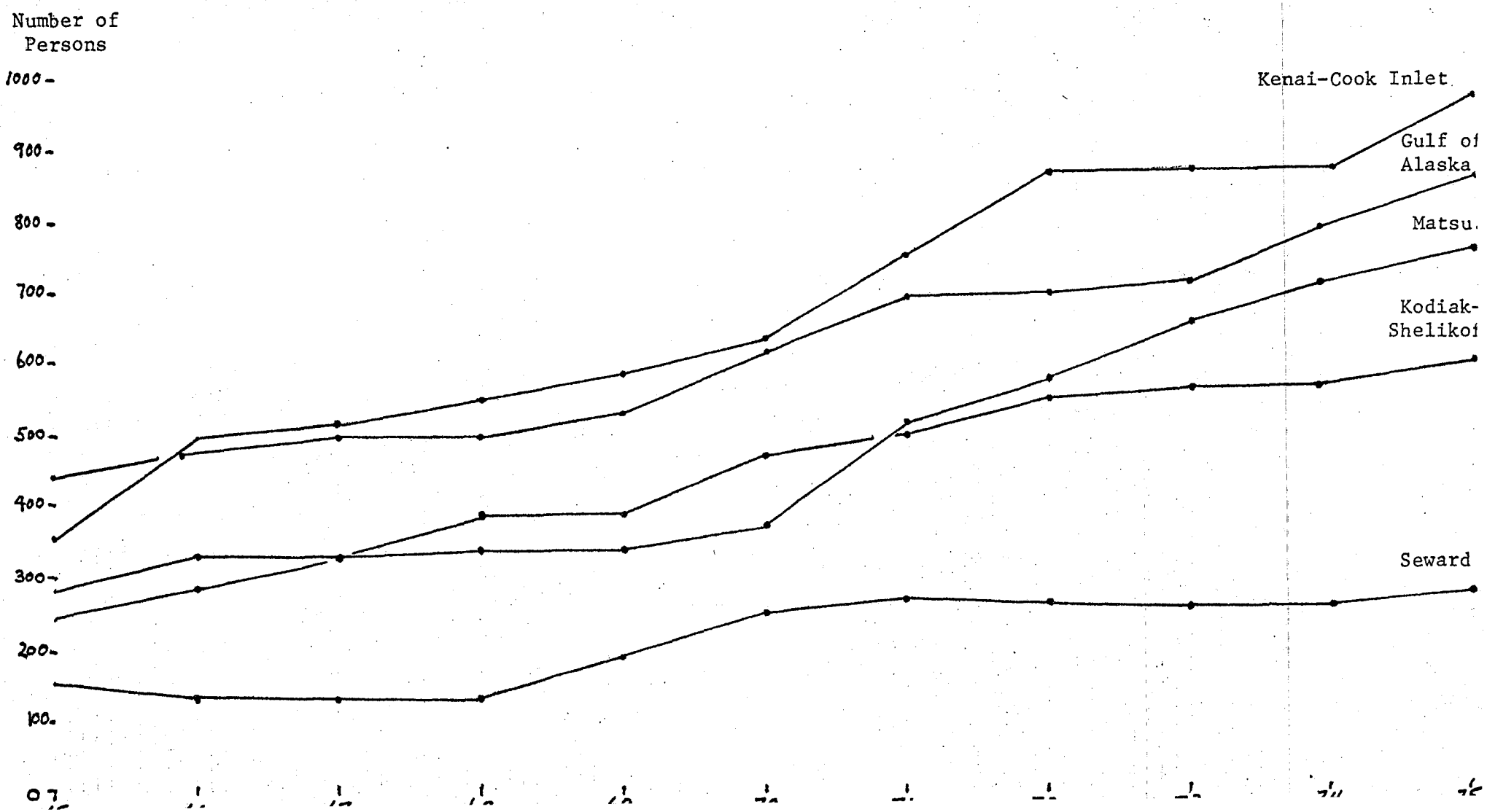


division, and this is because many pipeline project operations' employees are counted as employed in the business services sector by the Department of Labor. Again, the evidence suggests that, for projection purposes, the data be divided into local demand and direct demand caused by large-scale projects such as the pipeline.

State and local government output in non-Anchorage Southcentral, as measured by state and local government wages and salaries, grew at an annual average rate of 8.6 percent between 1965 and 1975. The rates of growth in the periods 1965 to 1973 and 1973 to 1975 were 9.4 percent and 5.6 percent, respectively, appearing to show that the pipeline had little influence on the growth of this sector outside of Anchorage. Indeed, the rate of growth in employment in state and local government was lower in Kodiak during the pipeline boom than it had been in the previous eight years: 3.5 percent, as opposed to 11.1 percent. The Gulf of Alaska subregion showed some influence from the pipeline, since the rate of employment growth in this sector increased from 6.2 percent to 9.5 percent--nearly all the increase in Valdez-Chitina-Whittier census division. Within Cook Inlet subregion, all the census divisions except Anchorage showed a decrease in the rate of growth of state and local government employment after 1973. Figure 7 demonstrates what happened over the entire period in each subdivision. Most areas show an acceleration in the rate of growth in employment either in 1969 or in 1970, probably reflecting both the expansion of state government after the Prudhoe Bay lease sale (beginning 1970) and the expansion of state revenue sharing to local governments, especially the School Foundation Program. The Kodiak-Shelikof subregion shows steady growth, probably a result of the roughly constant population and slow rate of real per capita spending. The Gulf of Alaska region shows its expected bulge in employment in 1973-1975 as the result of the pipeline. The Matanuska-Susitna Borough accelerated in 1970 and sustained the higher pace. This was probably a coincidence of expanded funding in 1970-1972 being followed by increasing population demands. Kenai-Cook Inlet initially

Figure 7

State and Local Government Employment,
Selected Southcentral Alaska Subregions,
1965-1975



shows the tail-end of oil expansion, an acceleration in 1970-1972 in probable response to increased funding, steady employment from 1972 to 1974 (estimated resident population shrank from 1971 to 1974), and a new round of expansion with population increases after 1974. Seward's resident population was growing until 1968, when it stabilized and began to fall. This probably accounts for the smaller revenue-induced acceleration in state and local government employment in 1969 and 1970, and the relatively flat spending pattern after 1970.

Comparison of Growth in the 3 Study Subregions

The three study subregions--Cook Inlet, Gulf of Alaska, and Kodiak-Shelikof--have economies which depend on different basic sectors and their 1965-1975 growth reflects these differences. The economic base of Cook Inlet is essentially threefold. It depends upon local resource development, as exemplified by the operation of the Upper Cook Inlet oil and gas fields; it depends upon Anchorage's role as a transportation and financial hub for all of Alaska (except Southeast Alaska for surface transportation); and it depends upon Anchorage as a regional and statewide governmental center. In contrast, both the other subregions currently depend upon resource development to sustain their economies. Gulf of Alaska is sustained by local resource development (fisheries and oil and gas exploration) and the petroleum transshipment facilities at Valdez. Kodiak depends upon the fisheries and upon federal government employment in support of fishing and navigation. Summary Tables 9, 10, and 11 show that the three major economic events in the 1965-1975 period--development of the Kenai oil and gas fields from 1965 to 1970, government expansion from 1970 to 1973, and pipeline-related development in 1974--had different effects in each of the three subregions.

Table 9 summarizes the changes in Cook Inlet. Anchorage dominates this subregion, and the maturing of the Anchorage economy plus its growth as a statewide service, trade, and financial center both in periods of rapid growth and in periods of slower growth made the support sector industries grow faster than the "basic" sector. As a result, the "basic" sector share of employment (about one-half of whom are federal government civilian employees) fell from 44 percent of the total in 1965 to 30 percent in 1975. The term "basic" is used in quotation marks, since several parts of the state government, transportation, communications, wholesale trade, and services industries are arguably part of the subregion's "export base." However, much more information and analysis

Table 9

Selected Measures of Growth
Cook Inlet Subregion, 1965-1975

	"Basic" Sector Employment (Number of Persons)[1]	Non-Agricultural Wage and Salary Employment (Number of Persons)	Real Personal Income (Million 1967 $)	Population (Number of Persons)
1965	15,144	34,134	442.5	119,121
66	15,278	35,761	448.7	123,665
67	16,169	38,317	522.6	126,376
68	16,447	40,073	555.9	132,180
69	16,552	43,578	631.2	137,400
70	17,193	47,407	667.3	149,428
71	17,666	51,091	716.8	159,046
72	17,963	54,329	769.4	167,765
73	18,147	57,156	820.8	174,280
74	20,812	65,918	943.3	179,544
75	23,505	78,389	1129.5	209,049
Average Annual Rate of Growth				
1965-1970	2.6%	6.8%	8.6%	4.6%
1970-1973	1.8%	6.4%	7.1%	5.3%
1973-1975	13.8%	17.1%	17.3%	9.5%
1965-1975	4.5%	8.7%	9.8%	5.4%

[1] Agriculture, Forestry, Fisheries, Mining, Contract Construction, Manufacturing, Federal Government.

would be required than is currently available to identify the "basic" parts of these industries, on the one hand, or the strictly local-serving parts of construction and manufacturing, on the other.

Examining Table 9, one can see that personal income gains in the Cook Inlet subregion were consistently larger than employment growth over the period, which means that many income benefits of increased employment opportunities were accrued to residents of the subregion. Employment grew more rapidly than population throughout the period, indicating the migration of primarily single and childless individuals to the subregion in search of employment and rising labor force participation of residents. Real per capita income rose throughout the period, because income rose more rapidly than population. The greatest jump occurred, not surprisingly, in 1973-1975, reflecting pipeline wages of residents. This is in spite of the fact that the reporting agency adjusted the data downward for those pipeline wages which did not remain in the communities (reportedly around 50 percent).

Table 10, referring to the Gulf of Alaska subregion, shows that the pattern of employment is closely tied to changes in "basic" sector employment, and that total employment changes in this region are in the same direction and about 1.2 - 1.6 times as large as employment changes in the "basic" sector in most years. The data are misleading to some degree since nonresident fishermen do not appear in the data; nor do self-employed and family workers in fishing; nor do fishing crew members before about 1972. However, it is clear that in this subregion the economy as a whole is much more dependent on the "basic" sector than in the Cook Inlet subregion. It is also clear that, although over the whole period per capita real resident personal income increased, many of the income benefits of the pipeline period went to people who worked in the region (and were counted as employed in the region), but who were not residents of the region (and therefore were not counted for income purposes). Thus, employment grew faster than either income or population.

Table 10

Selected Measures of Growth
Gulf of Alaska Subregion, 1965-1975

	"Basic" Sector Employment (Number of Persons)[1]	Non-Agricultural Wage and Salary Employment (Number of Persons)	Real Personal Income (Million 1967 $)	Population (Number of Persons)
1965	497	1,355	14.5	4,387
66	575	1,453	15.2	4,405
67	431	1,343	16.2	4,369
68	399	1,284	17.2	4,400
69	524	1,467	17.4	4,540
70	461	1,533	21.3	4,955
71	595	1,742	23.0	4,862
72	482	1,643	22.8	5,326
73	603	1,858	26.0	5,550
74	828	2,423	30.4	5,793
75	3,025	5,596	66.4	11,642
Average Annual Rate of Growth				
1965-1970	- 1.5%	2.5%	8.0%	2.5%
1970-1973	9.3%	6.6%	6.9%	3.9%
1973-1975	224.0%	73.5%	59.8%	44.8%
1965-1975	19.8%	15.2%	16.4%	10.3%

[1]Agriculture, Forestry, Fisheries, Mining, Contract Construction, Manufacturing, Federal Government.

The fact that employment growth was concentrated in the "basic" sector (mainly construction) can be seen by comparing the basic sector and total employment growth in the two left-hand columns of the table.

The Kodiak-Shelikof subregion's experience is summarized in Table 11. In comparison with the other two tables, one is struck by the relatively low rate of growth in personal income, declines in population, and the low (sometimes negative) rate of employment growth. Even the relatively strong showing in the "basic" sector between 1970 and 1973 is partly a statistical quirk. The extension of coverage to fishermen under unemployment insurance in 1972 caused the estimate of agriculture-forestry-fisheries employment to increase from 123 to 402 in one year. Much of the rest of basic employment is in manufacturing (mainly canning and fish processing), which accounts for the cyclical nature of both basic and total employment in this subregion. This economy is heavily dependent on the basic sector: in 1965, 64 percent of all wage and salary employees were in the basic sector, and in 1975, the percentage was still 55 percent. There are two somewhat offsetting trends in Kodiak basic employment. On the one hand, federal civilian employment has fallen by more than 50 percent since 1965--from 541 to 269, or from about 1 in 4 jobs in the Kodiak economy to 7 percent, or less than 1 in 10. On the other hand, the traditionally cyclical food manufacturing industry increased from 618 to 1,134, or from 1 in 4 jobs to 1 in 3. Kodiak has increasingly become a one-industry economy dependent upon fishing, while the other two subregions have diversified economically. Job creation in Kodiak is increasingly dependent on growth in the fishing industry. The relative lack of stable economic opportunity and the decline in federal (military-related) employment may account for the estimated population declines. Since the gain in total employment is larger than the gain in personal incomes and is associated with estimated net population decreases, then either real wage rates are falling, which reduces income gains, or much of the income earned in the region goes to people who are not residents of the subregion. The latter seems the more likely explanation.

Table 11

Selected Measures of Growth
Kodiak-Shelikof Subregion, 1965-1975

	"Basic" Sector Employment (Number of Persons)[1]	Non-Agricultural Wage and Salary Employment (Number of Persons)	Real Personal Income (Million 1967 $)	Population (Number of Persons)
1965	1,483	2,310	32.6	9,064
66	1,678	2,710	32.9	8,479
67	1,760	2,876	33.7	9,478
68	1,505	2,650	35.2	9,520
69	1,228	2,395	37.6	9,870
70	1,206	2,469	41.7	9,409
71	1,205	2,619	44.2	9,665
72	1,453	2,878	37.5	8,645
73	2,067	3,576	48.0	8,868
74	2,006	3,641	49.1	9,232
75	2,045	3,802	50.9	8,801
Average Annual Rate of Growth				
1965-1970	- 4.1%	1.3%	5.0%	0.7%
1970-1973	19.7%	13.1%	4.8%	- 2.0%
1973-1975	- 0.5%	3.1%	3.0%	- 0.4%
1965-1975	3.3%	5.1%	4.6%	- 0.3%

[1] Agriculture, Forestry, Fisheries, Mining, Contract Construction, Manufacturing, Federal Government.

Age-Sex Distribution of the Population

The distribution of the population among age and sex categories is important insofar as it provides planning guidance on the probable demands for public services (e.g. schools versus Pioneers' Homes) and recreation opportunities (family motorhome camping and boating versus long-range hiking and kayaking, for example). Furthermore, it provides a benchmark for estimating the future natural increase in the population. The data available suggest that the faster growing areas in the region have gotten an increased concentration of working-age civilian population, accompanied by a relative decline in school-age population compared to 1970. Slow-growing areas such as Seward show a steep decline in the proportion of school-age population, a decline in the percentage of young (age 20-29) working-age population, and an increase in the proportion of older persons. If the results can be extended to the whole region, this suggests that rapidly growing areas will gain young adults, slow-growing areas will lose them, but that increases in young adults will not necessarily mean a corresponding increase in children.

Only fragmentary data are available on the age-sex distribution of the population of Southcentral Alaska since the 1970 Census of Population. The data from the Census appear in Table 12. The features worth noting are the relatively large number of young, working age individuals of both sexes, and especially young men aged 20 to 24, reflecting the military presence in Cook Inlet and Kodiak-Shelikof subregions especially, but also construction and fishing employment. The Gulf of Alaska subregion had the oldest distribution, with 31.7 percent of the population over 40 years old. Cook Inlet had the youngest, with 14.5 percent; while Kodiak-Shelikof had the intermediate age distribution, with 19.8 percent.

Some fragmentary data are available on Anchorage population from a household survey conducted by the Anchorage Urban Observatory in the summer and fall of 1975. About 650 households were selected utilizing a cluster

Table 12

Age-Sex Distribution of the Resident Population,
Southcentral Alaska, 1970

	Cook Inlet Subregion				Gulf of Alaska Subregion				Kodiak-Shelikof Subregion			
Age	Male	% [1]	Female	%	Male	%	Female	%	Male	%	Female	%
0-1	1,743	1	1,680	1	58	1	51	1	124	1	132	1
1-4	6,163	4	5,889	4	200	4	167	3	432	5	385	4
5-9	9,082	6	8,778	6	285	6	161	3	609	6	544	6
10-14	8,813	6	8,436	6	285	6	278	6	478	5	455	5
15-19	6,488	4	6,286	4	220	4	201	4	468	5	333	4
20-24	9,129	6	6,800	5	165	3	156	3	925	10	455	5
25-29	6,754	5	6,680	5	182	4	181	4	482	5	418	4
30-34	5,896	4	5,717	4	212	4	140	3	412	4	323	3
35-39	5,931	4	5,178	4	187	4	152	3	317	3	253	3
40-44	5,142	3	4,278	3	203	3	145	3	305	3	197	2
45-49	4,287	3	3,806	3	184	4	146	3	239	3	165	2
50-54	3,298	2	2,724	2	170	3	140	3	209	2	147	2
55-59	2,175	1	1,696	1	142	3	88	2	143	2	100	1
60-64	1,226	1	1,055	1	107	2	58	1	91	1	60	1
65 +	1,375	1	1,132	1	124	3	65	1	133	1	77	1
	77,502	52%	70,135	48%	2,726	55%	2,229	45%	5,365	57%	4,044	43%

[1]Percent of total population in the subregion. May not add to total because of rounding errors.

Source: 1970 Census of Population: PC(1) - B3, Table 35.

housing area probability sample from the entire Anchorage census division except the military bases. Table 13 compares the age distribution in this sample with the non-military base population of the 1970 Census. While the age groupings in the sample and the Census are slightly different, and the area sample in 1975 may have undercounted multiple family housing residents, it does appear that, at a minimum, the young adult population has increased substantially in comparison with school-age population. The relative number of older persons may also have increased.

The Urban Observatory also did a series of age-sex distributions for the Kenai Borough in August and September 1976 in conjunction with the study Profile of Five Kenai Peninsula Towns, published in 1977. Pooling the sample populations, one is able to estimate the 1976 population-age distributions for the Seward and Kenai-Cook Inlet census divisions, which are reported in Table 14. Also shown in Table 14 are the closest comparable figures for the 1970 Census. Table 14 shows that, provided the sample populations are representative of the census division populations, Seward's population has gotten significantly older (compatible with observations of low employment growth in the census division). On the other hand, there has been an apparent increase in the number of young adults relative to the number of children in the Kenai-Cook Inlet subdivision, consistent with the findings for the Anchorage census division and the rapid growth in employment opportunities in both areas.

Finally, we consider the population of the Valdez-Chitina-Whittier census divisions. Dr. Michael Baring-Gould and Marsha Bennett of the Department of Sociology of the University of Alaska-Anchorage conducted a census in Valdez in July 1975. There are no equivalent data for the rest of the census division or for the pipeline camp population, but since similar changes likely occurred in the Glennallen area and the camp population was temporary, one may get some indication of the direction of the "permanent" population distribution shifts between 1970 and

Table 13

Anchorage Census Division
Age Distribution of Non-Military Base Population

Percent of 1975 Sample		Percent of 1970 Census Population	
Age	Percent	Age	Percent
0-4	9.5	0-4	10.4
5-14	19.8	5-14	23.5
15-30	34.1	15-29	28.1
30-40	15.3	31-39	15.5
40-50	11.9	40-49	12.4
50-64	7.3	50-64	8.6
65 +	2.1	65 +	1.5

Sources: Patricia L. Dolezal and Richard L. Ender, 1976 Population Profile, Municipality of Anchorage, September 1976.
1970 Census of Population PC(1) - B3, Table 35.

Table 14

Kenai-Cook Inlet and Seward Census Divisions:
Age Distribution of the Population, 1970 and 1976

Kenai-Cook Inlet:

1976		1970	
Age	Percent	Age	Percent
0-9	17.8	0-9	23.4
10-19	20.8	10-19	22.0
20-29	18.8	20-29	15.4
30-39	18.8	30-39	15.5
40-49	12.0	40-49	12.4
50-59	7.1	50-59	7.4
60 +	4.8	60 +	4.0

Seward:

1976		1970	
Age	Percent	Age	Percent
0-9	6.0	0-9	18.4
10-19	4.0	10-19	19.8
20-29	9.8	20-29	13.5
30-39	12.8	30-39	11.3
40-49	13.1	40-49	14.0
50-59	18.7	50-59	12.5
60 +	35.6	60 +	10.7

Sources: Hitchins, et al, A Profile of Five Kenai Peninsula Towns, 1977.
1970 Census of Population PC(1) - B3, Table 35.

1975. The 1975 and 1970 distributions are reported in Table 15. The table indicates that, even excluding the pipeline camp population, there has probably been an increase in the working-age population relative to the 1970 Census for Valdez-Chitina-Whittier. This seems to be confirmed when the 1975 Valdez Census is combined with employment and population growth data supplied by the Department of Labor.

In summary, in most of the census divisions and areas for which more recent data than the 1970 Census exists, it appears that the young, working age population has increased dramatically relative to older workers and children. The exception is Seward, whose population distribution may have gotten older since the 1970 Census. In general, it appears that, as elsewhere, places experiencing strong economic growth tend to draw a young, working-age population, while low-growth areas are populated by the older workers, retirees, and the very young.

Table 15

Valdez-Chitina-Whittier Census Division:
Age Distribution of the Population
1975 (Valdez Only) and 1970

1975		1970	
Non-Camp Population, Valdez		Valdez-Chitina-Whittier	
Age	Percent	Age	Percent
0-4	7.3	0-4	9.6
5-12	13.3	5-12	14.8
13-18	9.9	13-18	12.5
19-65	68.6	19-64	44.4
65 +	0.8	65 +	3.5

Sources: Valdez Census, July 1975: "Summary of Final Valdez Census, July, 1975."

1970 Census of Population, PC(1) - B3, Table 35.

Summary: 1965 to 1975

Three major economic events occurred during the years 1965 to 1975 which influenced the growth of the Southcentral Alaska economy. The first was the development of the Upper Cook Inlet oil and gas fields, which diversified the Cook Inlet subregional economy and caused strong economic growth in this subregion and Anchorage's growth as a trade and financial center. The second was the sale of Prudhoe Bay leases, which led to growth in state and local government in all areas and the increased development of Anchorage as a governmental center. The third was the Trans-Alaska Oil Pipeline project, which caused a boom in population and construction in Valdez and Anchorage, with population spillover effects into the Matanuska Valley and Kenai Peninsula, and important development effects in the Anchorage support sector.

It seems clear from recent history that further economic development in Alaska, regardless of whether it takes place in the region or not, will increasingly affect Anchorage. It also seems clear that as Anchorage grows, the demands of its population will increasingly cause secondary economic changes of the sort now being experienced in the Matanuska-Susitna Borough. Planning for the actual shape of Southcentral regional development in the future is uncertain, because much will depend upon the rate of development of natural resources not yet discovered and because much will also depend upon governmental (primarily state government) spending decisions not yet made. Therefore, the next chapter describes two hypothetical scenarios or sets of informed guesses concerning future development. Obviously, these <u>are</u> guesses; however, in combination they are intended to provide planning guidance as to the likely upper and lower bounds of economic development in Southcentral Alaska through the end of the century.

CHAPTER 2

METHODOLOGY AND DATA USED IN PROJECTING SOUTHCENTRAL ALASKA'S ECONOMY, 1975-2025

This chapter describes the methodology and data used to project high and low growth of Southcentral Alaska's economy and population on a subregional basis from the base year of 1975 to the year 2025. The methodology involved the use of a statewide and regional econometric model to provide regional control total projections between 1975 and 2000. Less formal techniques were used to estimate the subregional distribution of economic activity and population and to project the path of employment and population after the year 2000. The data required to run the model were provided by various members of the economics task force, the assumptions were reviewed by the task force, and the model outputs and tentative projections were reviewed for internal consistency and plausibility by ISER researchers and by the task force.

The chapter is organized as follows: The next section describes the econometric models used, together with their strengths and limitations in the task for which they were used. The second section discusses the data required to do an econometric forecast of the Southcentral economy and population, with the actual assumptions relegated to Appendix B. The third section describes the assumptions and justifications used to disaggregate the regional control totals into projections for the Cook Inlet, Gulf of Alaska, and Kodiak-Shelikof subregions. The fourth and final section discusses the techniques used to project the subregional results after the year 2000.

The Econometric Models

The State Model

The method used to project the path of the Southcentral regional economy employed two econometric models. The first was a modification of the ISER Alaska state econometric model. The second was a version of ISER's regional econometric model which used outputs of the state model, and which was modified to simulate only the economies of Anchorage and the remainder of the Southcentral part of the state. This modification was done to reduce the requirements for data in other regions of the state and to reduce the cost of simulation.

A diagram of the modified statewide model is shown in Figure 8. The basic structure of the model is as follows: The model is divided into exogenous or "basic" sectors and endogenous or "nonbasic" sectors. In the exogenous sectors, level of output is assumed to be determined by factors outside the state's economy. The endogenous, "nonbasic" sector's primary reason for existence is to serve local Alaska markets rather than export markets; therefore, the level of output is determined within the model primarily as a function of Alaska real disposable income. There are some industries whose output is determined by a mix of forces related to export-base markets and local Alaska markets. The most important of these is construction, part of which is involved in the building of pipelines, seafood processing plants, etc., which serve export markets, and part of which serves (or can be explained by) growth in Alaska's economy and population. Many versions of the state model contain a large block of equations determining state and local government revenues and, using simple expenditure rules, the level of state and local employment, payroll, and capital spending. This was not done in the version used for two reasons. First, the level of expenditures and the resulting model output ordinarily are quite sensitive to the expenditure rule adopted, and the task force did not feel that they could forecast future budgets. However, they did have some confidence

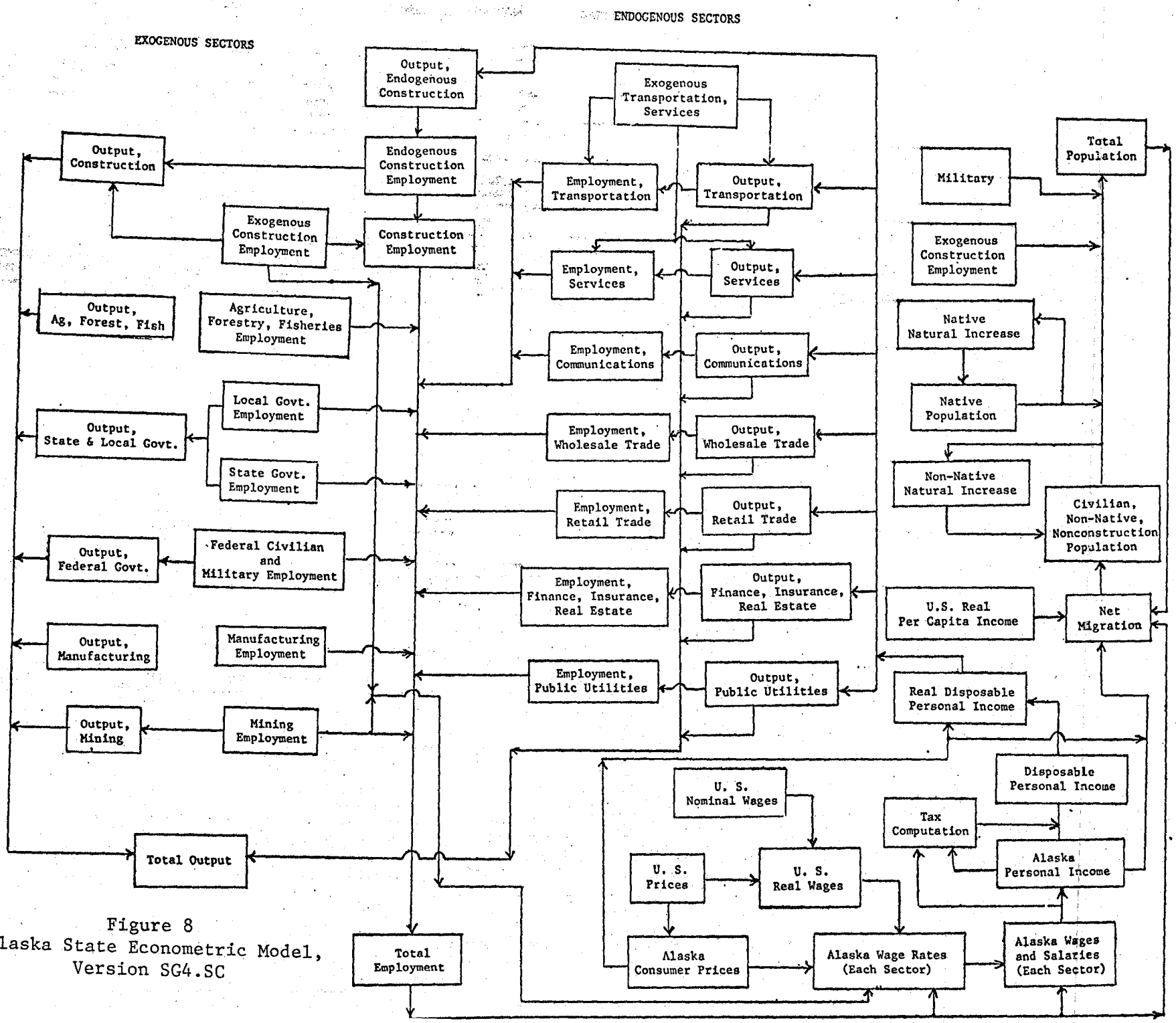


Figure 8
Alaska State Econometric Model,
Version SG4.SC

in projecting high and low overall government employment growth. Second, whatever model was used, it was necessary to estimate government employment growth at the subregional level anyway, there being no method within the model to estimate subregional employment in state and local government. Therefore, the unessential sections of the fiscal model were disabled, and exogenous estimates of government employment and capital expenditures were directly introduced into the model.

The basic (primarily export) industries in the model are mining (which includes oil and gas); agriculture, forestry (SIC code 8 only--most of what is usually thought of as "forestry" is actually included in lumber and wood products),[2] fisheries; food manufacturing (primarily seafood processing); lumber and wood products; pulp and paper manufacturing; "other" manufacturing (mostly petrochemicals and refining); the export-base component of construction; and government. For these industries, an estimate must be made outside the model of the dollar value of output and level of employment for each year of the projection period. The nonbasic industries are transportation, communications, public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. For these industries, the level of output is determined by an equation which has real disposable personal income as the principal explanatory variable. The level of employment in the industry is then determined as a function of output in the industry, which in effect summarizes the workings of the labor market in that sector. "Wage rates"--real annual wages per worker--are determined as a function of the U.S. private weekly real wage. This captures the effect of Alaska's having an open labor market whose wage rates will be

---

[2] Standard Industrial Classification Manual, Executive Office of the President, Office of Management and Budget, 1972. This reference document contains the standard U.S. methodology used to classify firms into industries, and is used by most state departments of labor, including Alaska. Alaska does keep track of government separately, as earlier versions of the manual direct.

influenced by the income alternatives available to workers elsewhere. In some industries the ratio of construction and mining employment to total wage and salary employment is added to capture the effect which large-scale resource development such as the trans-Alaska oil pipeline has on wages of workers in closely related industries such as transportation. Wages and salaries are then estimated for all industries from employment and wage rates, a series of equations computes an estimate of income taxes. These are deducted from income while nonwage income is added, to arrive at an estimate of disposable personal income. Income then feeds back into the output equations of the nonbasic sectors, so that total output and total income are arrived at simultaneously in each forecast year.

Population is then determined in the state model in a series of steps. The model uses age-sex-race specific survival rates and age-race specific fertility rates for the female non-Native civilian population to project births, deaths, and natural increase in the civilian population. To this is added an estimate of civilian net migration, which is determined by the change in civilian employment opportunities and the difference between real per capita income in Alaska and the United States as a whole. Migration is distributed by age and sex among the various population cohorts using 1970 census migration rates and age-sex proportions of migrating populations. The Native population is treated in a similar way, except that they are assumed not to migrate into or out of the state. Finally, an exogenous estimate of the military population is added to get total population.

The Regional Model

The regional model which works in a similar fashion, is portrayed in Figure 9. The regional model provides additional geographic detail by describing the Alaskan economy as a group of loosely integrated regional economies rather than as a single unit, but certain sectors of the Anchorage regional economy are influenced by statewide economic

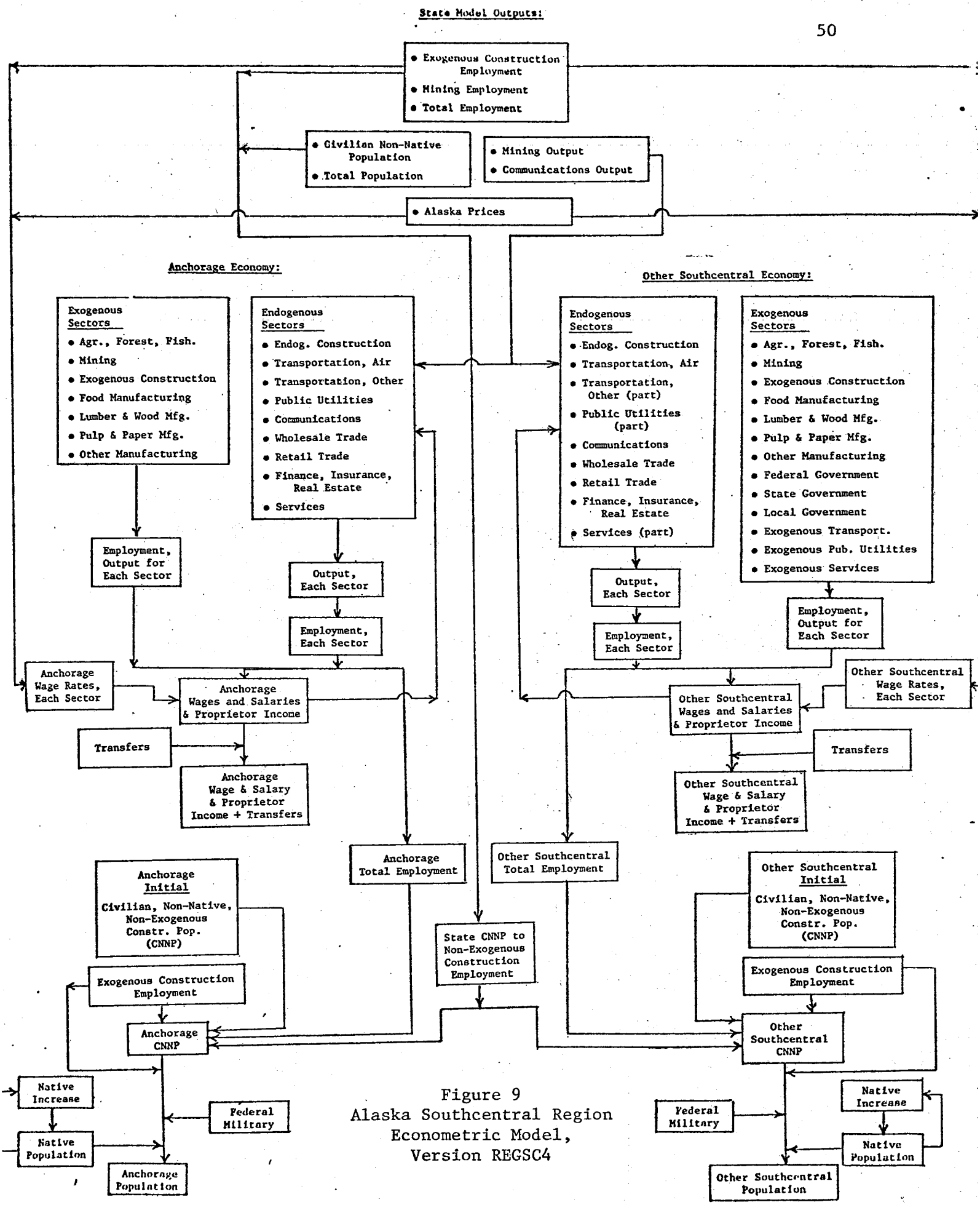


Figure 9
Alaska Southcentral Region
Econometric Model,
Version REGSC4

growth rather than just local growth. For each regional economy, as for the state model, there must be exogenous estimates of output and employment in each basic industry. The model then annually estimates output, employment, and wages and salaries in each nonbasic industry, with regional output in each nonbasic industry a function of the sum of real nonmining and nonconstruction wages and salaries paid in the region. Nonmining, nonconstruction wages serve as a proxy for local real income in estimating output in the support sector.

Certain nonbasic industries have been measurably influenced by factors other than local demand. For example, non-air transportation in "Other Southcentral" was strongly influenced by petroleum development on the Kenai Peninsula. This is captured in the specification of the model by making output in Other Southcentral's transportation (other than air transportation) industry a function of nonmining and mining wages and salaries. Communications industry output in each region seems to be not as well explained historically by local income changes as by expansion in the statewide communications network, itself a function of statewide incomes. Therefore, local communications output and employment were projected using the statewide total output as an explanatory variable. In Anchorage, statistically significant nonlocal influences were found in the output of air transportation, wholesale trade, and retail trade. In Anchorage air transportation and wholesale trade, the specification of the output equation used statewide personal income and mining sector output as explanatory variables. In retail trade, the more complex causative factor mix was estimated using a decaying function of time and local wages to depict the important but declining influence on the retail sector of the maturing of the Anchorage economy.

The regional model initially estimates total employment by industry in a fashion similar to that employed in the state model by summarizing the labor market for each industry in (usually) a single equation relating employment to real output. However, in both models, a series of

consistency conditions are imposed upon these first-round estimates. The period since statehood has been one characterized by the rapid maturing of the Alaskan economy--increasing availability of retail trade, wholesale trade, finance, insurance, and real estate, and business, medical, and personal services in Alaska--particularly Anchorage. Because the period during which the output equations were estimated is this period of rapid maturation of the economy, it appeared possible that the estimated equations might overestimate the growth of these sectors in the future when the economy was relatively mature (that is, offering the range of services offered in the United States as a whole). Consequently, in the state model, employment in trade, finance-insurance-real estate, and services was constrained to be no greater a proportion of total wage and salary employment than it is in the economy of the United States as a whole, and total output was adjusted accordingly. The constraints were not binding until nearly the end of the century. The situation varied somewhat in the regional model. Because the Anchorage economy is the most mature in the state, similar constraints, adjusted for Anchorage's share of these sectors in the state economy, were imposed in Anchorage. However, growth in the rest of Southcentral Alaska's non-basic employment was left unconstrained, since it is likely that the infilling and maturing which may occur in this economy should be well represented by the regional equations estimated for the historical period.

Population was more difficult to estimate in the regional model than in the state model. This is because there is no good estimate or understanding of the process of intrastate migration in Alaska. The procedure which was followed was to break the total population into its non-Native civilian, Native civilian, and military components. Beginning with the starting date, civilian non-Native population not employed on large construction projects was estimated using a weighted average population-to-employment ratio that had as arguments the previous year's

regional estimate of the ratio of this component of population-to-employment (excluding exogenous construction employment), and the equivalent statewide ratio. The method implicitly distributes interstate migration to Alaska across the state by allowing both the existing population/employment ratio and changes in the state ratio resulting from migration to determine the new population in each region. Native population was assumed to grow at its historic average--about 2 percent per year. Finally, military and exogenous construction employment were added to produce an estimate of total population.

Strengths and Limitations

The models described above have several strengths and limitations which must be kept in mind when examining the output results. Among the principal strengths are that these models capture the essence of the Alaska growth process--i.e., that export-base industries and government create jobs in the local economy both directly through hiring, and indirectly through construction, purchases, and the personal incomes of workers and profits of Alaska-owned firms. These incomes in turn form the base of a local economy, the demand for whose goods and services increases with increased incomes, which creates demand for still more jobs in support industries. Finally, since Alaska is a relatively small labor market with a mobile labor force, the models primarily relate Alaskan real wages to U.S. real wages while permitting labor productivity, local demand for labor, and consumer prices to influence salaries. Compared to an economic base model, the econometric specification of this type is preferred because it captures the dynamics of relative growth of industries. The economic base model is best at projecting the effects of marginal changes in existing industries and imposes the constraint that changes in support sector employment be proportional to changes in the basic sector employment, thus missing the feedback effect of growth in the support sector and the changing responsiveness over time among the support sector industries. Compared to static input-output models, the econometric approach enjoys the advantage that it

implicitly captures the evolutionary changes which occur over time in the input-output coefficients as the vector of final demands increases. While the input-output approach more precisely defines the interindustry flows of purchases of goods and services, it is a true representation of the economy only in the period in which the matrix was estimated. To the extent that the matrix coefficients are changing over time, a dynamic approach which permits change in the purchases and sales of one sector to another per dollar of final output has an advantage over the static approach. A truly dynamic I-O framework might do this if it could be built, but it would be unnecessarily expensive in an economy like Alaska's, with its few important interindustry purchases and rapidly changing structure. The econometric approach captures the historic evolutionary changes in industry importance and projects this evolution into the future.

As a practical matter, there are some limitations to the approach and actual models used. In the first place, no model captures very well revolutionary changes in industry structure which violate the initial assumptions upon which the model is built, unless the structural change can be foreseen and incorporated by some alteration imposed by the modeler. The development of major export-base manufacturing outside of lumbering, pulp and paper, and fish processing, together with secondary support services and goods-producing industries, is an example of such a change which would violate the assumptions that most service industry growth in Alaska can be attributed to (or explained by) local income. Nonevolutionary changes in the fundamental character of industries (e.g. sudden dominant development of different types of firms paying much higher or lower wages than traditional firms in a given sector) could also cause trouble. Accordingly, one must recognize that it was impossible to take into account <u>all</u> the possible changes in the Alaskan economy which could result from, for example, development of whole new industries such as large-scale trawl fisheries within fishing. Purchase of nontraditional services by a projected new industry in Alaska could bias the total employment projections produced by the model, but

combined with new industry employment structure and worker earnings, the overall effect is unclear. If industry requirements were well worked out, this might be one case in which dynamic I-O analysis would give some better answers than econometric models. Secondly, the further one extends the underlying model structure into the future, and the more precise one must be about the location of economic activity, the less likely one can expect to be "right." Consequently, results for 1985 are more likely to be correct than results for 1995, other things equal, while projections for the region are more likely to be correct than those for any subregion. This latter assertion is particularly true since the geographical allocation of basic economic activity and its timing are currently very uncertain and decisions of the economic task force to allocate this activity for projection purposes had to be arbitrary, at least to some extent. Thus, while one might be fairly certain of the level of employment in oil and gas, one cannot be as certain of the location of work, of the workers' salaries, or work rules related to time off, all of which would play a crucial role in their choice of residence and the geographic distribution of support services.

It must be noted that due to time constraints on this project, the state and regional models used were not estimated over the same time period. The state model had been updated using data from the historical period 1961 to 1976 at the time this project began. However, the historical period for the regional model was 1965 to 1973, updates not having been done for the period since 1973. The regional model was altered somewhat to account for this fact by changing the intercept coefficients of key output equations with shift coefficients so that these equations passed through the last real data point. This procedure is equivalent to assuming for the regional economies that the 1965-1973 income elasticity of demand for the output of the support sectors is unchanged and that the unusual alterations in output level caused by the 1974-76 pipeline boom were a once-only phenomenon now built into the economy, probably not an unreasonable position to take. Since

insufficient post-pipeline data is available to say whether or in what manner the underlying model relationships may have changed during 1974-1976, and since only a few variables from the statewide were used to calibrate the regional runs, we are unable to say exactly what effect a complete update might have had on the model results.

Finally, it should be noted that both the regional high and low projections presented for 1975 to 2000 in the following chapter are contingent projections. That is, they correctly project the path of the economy on the conditions that: 1) the model structure estimated for the historical period, together with incorporated changes designed to reflect anticipated structural changes in the economy and imposed consistency conditions, adequately reflects the path of future structural change in the economy; and 2) that the exogenously imposed assumptions reflecting conditions not determined within the Alaskan economy are all correct as to level, timing, and geographic distribution. The unlikelihood of the latter feature ever being wholly true is why this report emphasizes that the projections are primarily illustrative of general levels of development, given the assumptions. We turn now to those assumptions.

Assumptions Used to Produce Economic and Population Projections, 1975-2000

The use of the econometric model requires a set of assumptions related to the level and timing of development in the Alaskan economy and the Southcentral regional economy. The assumptions primarily consist of time series on employment and output in certain of the export-base industries and in government. The critical assumptions are organized into two scenarios which consist of all low-range assumptions taken together and, alternatively, all high-range assumptions taken together. The scenarios were intended to show a "reasonable" high and "reasonable" low development series of projects which together would offer about the broadest range of employment and population outcomes which could be foreseen. This does not mean that the task force predicts that all or any of the projects assumed will occur; on the contrary, there is a highly variable degree of uncertainty with respect to the level and timing of all developments in the scenarios. However, some projects were subjectively rated more likely than others, some unlikely, and some very unlikely. Task force consensus assigned most of the more likely projects to the low development scenario, some of the less likely to the high development scenario, and the remainder were assumed not to occur within the time horizon of the study.

The resulting low and high scenarios should not be considered synonyms for the terms "minimum" and "maximum" development, nor for the terms "environmental quality" and "net economic development." The task force did not feel competent to say what the theoretical minimum or maximum possible level of economic development in Southcentral Alaska might be, since this could be influenced by government policy at federal, state, and local levels and by market developments beyond the power of anyone to predict at this time; nor would that exercise have been of much use to planners. The terms "environmental quality" and "net economic development" refer to planning objectives in level B studies for which resource management strategies are devised. While such strategies, if

actually implemented, might result in outcomes which look very much like the high and low scenarios, the economic task force could not take the unformulated strategies into account; nor were they asked.

The assumptions are organized by industry and discussed in the text. The actual numbers for employment appear in Appendix B.

Agriculture

Agriculture is currently a marginal industry in Alaska, employing about a thousand people statewide (depending upon the definition of part-time, family help, and proprietors). In Southcentral Alaska, about 115 man-years per year are expended in agriculture. Under a set of very favorable public policy decisions and favorable markets, considerable further development might occur. Primary requirements include: public priority given to agricultural production in Alaska at the same level as petroleum, minerals, and marine products; active pursuit of statutes and programs to reserve and preserve agricultural lands; and public aid to innovative settlement and development techniques. In this case, the agricultural experts on the task force could foresee possible commercial agricultural employment of around 800 man-years in Southcentral Alaska per year, and about 4,600 statewide by the year 2000, rising to 6,900 by 2025. This reflects the current emphasis on development of the Tanana Valley, rather than Southcentral area. Total statewide sales of agricultural products in the high case rise to about $400 million (1975 dollars) per year in the year 2000, and to about $500 million in 2025. Value of output in constant 1972 dollars rises to $78 million by 2000, about $12.9 million from Southcentral. By the end of the study period in the high case, about 1.06 million acres would be cultivated for crops, and 5.2 million acres of range land utilized. (Currently, about 20,000 acres are used for crops and grass in the state, about 12-13 thousand in Southcentral.)

In the low case, public priority is given to "national" and "public" interest in aesthetic, recreational, subsistence, and wilderness values, tending to reduce the amount of land available for crops and reducing the access and usability of land for agriculture. In addition, public agricultural agencies and institutions which support agriculture are allowed to atrophy. In this case, with market conditions continuing to be unfavorable to Alaskan agriculture, the Southcentral industry output and commercial agricultural employment drops to zero, as the land is subdivided for homesites and recreational use. Value of commercial output drops to zero by 1991, with only "amenity" (part-time, partly subsistence) output remaining.

Forestry

Aggregated in state statistics under Agriculture-Forestry-Fisheries, this is a tiny component of the forest products industry which employs about 22 people statewide in tree farms, nurseries, timber cruising, reforestation, and pest control; and it is more fittingly placed with agriculture than with the rest of the forest products industry. Employment in logging, for example, occurs in Lumber and Wood Products Manufacturing. In the high case, the forestry sector grows in proportion to growth in the rest of the forest products group, lumber and wood products. In the low case, it stays at current levels.

Fisheries

The fisheries sector primarily consists of persons actually engaged in fishing. It is difficult to count fishermen since this is an industry in which proprietors do much of the work, often with unpaid family help, because the work is seasonal in nature, and because many out-of-state persons take part. This causes the state's employment statistics, based on employment covered by unemployment insurance, to be misleading. Likewise, multiple licenses and unfished licenses make fisherman licenses a misleading indicator. Area-of-catch statistics collected on fish landed in Alaska, together with independent data on crew size, by gear

type, give a pretty good picture of total persons actually engaged in fishing. For Southcentral Alaska (but including the Aleutian chain), annual average employment on this basis is about two thousand persons, while it was 4,359 statewide in 1975. In the high case, it is assumed that in existing fisheries, expansion of fishing productivity would be offset by limited entry and labor-saving improvements in the fleet, leaving constant employment at existing levels. However, given very favorable conditions, major development of the American trawl fishery off Alaska's coast could result in 100 percent replacement of the foreign fishing effort inside the 200-mile limit by the year 2000, employing about 17.5 thousand persons in fishing statewide and 8.7 thousand (or 50 percent) in Southcentral. This was considered to be a very speculative development; consequently, no bottomfishing development was added in the low case, and existing fisheries just maintained current employment.

Output level of existing fisheries in the high case expands considerably, since the state is assumed to undertake an aggressive hatchery and habitat improvement program, together with the 200-mile economic zone. The combined effect is assumed to be a quadrupling of salmon catch, while shellfish remain at about existing levels. The expansion of the trawl fishery was assumed to result in a Southcentral catch of 1.85 billion pounds per year, worth $361 million ex-vessel in the high case. In the low case, all fisheries maintain their approximate 1975 levels.

Mining, Including Oil and Gas

The mining sector is dominated by employment and output in oil and gas, with lesser amounts in coal, sand and gravel, and a few persons engaged in precious metal exploration and extraction. For the state as a whole, oil and gas developments are expected to dwarf all other considerations in this industry. Within Southcentral Alaska, an important local issue is the development of the Beluga coal field.

The developments in mining in the high case are assumed to be as follows: There is a small find of hydrocarbons in the Northern Gulf of Alaska, but no important production. If the mean expected reserves are found, peak production would be about 932 thousand barrels of oil per day in 1985, and peak gas production of 0.5 billion cubic feet per day in 1987. The Sadlerochit, Kuparuk River, and Lisburne formations at Prudhoe Bay all combine in the high case for a 1.785 million barrels/day flow of oil in 1985. In addition, the joint state/federal lease sale is assumed to contain oil and gas resources equivalent to total reserves of 1.9 billion barrels. The Lower Cook Inlet produces substantial oil and gas--about 930 thousand barrels per day of oil at peak production. There are also two lease sales--in the Northern Gulf of Alaska (Sale 55) and Western Gulf/Kodiak Area (Sale 46)--which result in moderate-sized oil finds. Peak oil production in the Northern Gulf is about .550 million barrels per day in 1986, and .515 million barrels per day in 1992 in the Western Gulf. Daily gas production peaks at 1.0 bcf/day in the Northern Gulf and .26 bcf/day in the Western Gulf. Coal production in the high case would begin in 1983, with full-scale mining of 730,000 tons of coal per year by 1984 to feed a mine-mouth power plant, twice that amount by 1986 to feed a second plant, and development of exports amounting to six million tons/year by 1990. In the high case, employment peaks at slightly over nine thousand in 1984, subsequently declining to 8,200 in 1995, while output rises to $4.8 billion (constant 1972 dollars), tailing off to $3.9 billion.

Low case development basically consists of development at or around Prudhoe Bay. There is exploration in all the areas noted in the previous case, but exploration turns up far fewer prospects worth developing. While the Kuparuk and Lisburne are developed in this case and there is a joint offshore sale, the Beaufort sale turns up only 0.8 billion barrels of reserves instead of 1.9 billion. The Lower Cook turns up only a small find, while the Northern Gulf and Western Gulf are dry

and result in "exploration only" employment. Beluga coal is not developed in the low case. As a result of all this, statewide peak employment in mining rises to about seven thousand in 1984, dropping to less than 4,800 by the end of the century.

Within the region, exploration plus development of oil and gas employ almost 4,800 persons by 1984 in the high case, declining thereafter. Beluga coal adds about 220 workers by 1990, the first year of coal export. In the low case, the peak employment is only 2,700 persons in 1984, the peak year, and declines sharply thereafter.

Food Manufacturing

The food manufacturing industry in Alaska is dominated by seafood processing, a situation which is not expected to change in the near future. In the high case, the projected fourfold increase in the output of the salmon fisheries implies about a doubling in employment required to process the salmon. Since it was assumed that shellfish are at or near maximum sustained yield, the overall processing plant employment for existing fisheries is projected to increase about 25 percent. Also in the high case, by the year 2000 the 100 percent replacement of foreign bottomfish effort off Alaska results in a catch of 3.7 million metric tons per year, requiring estimated total processing employment of about 12,000 full-time bottomfish and short-term (five-month) seasonal employment of 21,211--for an annual average of 21,000 by 2000. However, we assumed that only about one-third of total catch would be processed in Alaska shore-based facilities, resulting in total Southcentral Alaska shore-based employment of 3,759 and affecting the local economy. The remainder of the 21,000 work on processing vessels nearshore and offshore, but their incomes probably would affect the Anchorage economy and the statewide economy to some degree. Output for this industry was estimated by taking the expected ex-vessel value and using the historic ratio of ex-vessel to wholesale value, and the ratio of

value-added to wholesale value. In the high cases, the value of catch in existing fisheries was assumed to rise at the same rate as total catch, yielding $220 million in value added in 2000, while catch in the emergent trawl fishery was assumed to rise to $722 million (3.7 million metric tons), yielding about $253 million of value added in processing (all value added in constant 1972 dollars). In the low case, a growth rate of one percent per year was projected for total output, yielding $123.3 million per year value-added by 2000.

Lumber and Wood Products Manufacturing

The two critical assumptions for this industry are the annual cut of timber in the state, determined mostly by Forest Service allowable cut and Japanese market conditions, and whether any dimension sawmills are built in Alaska. In the high case, the annual cut by the year 2000 was assumed to be 1,260 million board feet (probably partly from Native lands), compared with 660 million in 1970. In the low case, the increase is to only 960 million. No new mills are built in either case. While not exactly proportional, the increase in employment is similar: in the high case, statewide employment rises to 3,834 from 2,176 in 1975; in the low case, the rise is from 2,176 to 3,280. The output of this industry was estimated by calculating the 1975 ratio of output per employee. This was assumed to escalate at its 1965-1975 rate of growth in the high case (about 1.66 percent), but stayed at 1975 levels in the low case.

Since almost all the prime timber likely to be exploited by an expanding industry is located outside the Southcentral region, we assumed that in Other Southcentral, the employment of firms in this sector would escalate by about 1 percent per year in the low case, by 2.3 percent per year in the high case, which is about the same or less than the statewide rates. Employment was assumed constant in Anchorage.

Pulp and Paper Manufacturing

The growth in this sector is determined by most of the same factors as lumber and wood products. In neither case is there a pulp mill built in Southcentral Alaska, so there is no employment or output in this sector within the region. In the state, the increase in total cut results in average employment increases of about 1.6 percent per year in the low case, 1.8 percent per year in the high, resulting in totals of 1,777 and 1,886, respectively. In the low case, productivity per worker remains at its 1975 value; in the high case, it increases at 2.76 percent annually, its 1965-1975 rate, resulting in 1972-dollar value added of $133.5 million and $141.7 million, respectively, in the year 2000.

Other Manufacturing

This sector is an odd mixture of a wide variety of cottage industries, printing and publishing, and consumer goods manufacture, together with a few major petrochemical plants and refineries. The major possible sources of new employment in this sector were assumed to be the Alpetco royalty oil refinery-petrochemical complex, Alaska Pacific LNG plant, and whatever other LNG or gas treatment facilities might be associated with gas output from Lower Cook Inlet and the Gulf of Alaska. In the high case, the total operating employment of these facilities was about two thousand persons (mostly working for Alpetco). In the low case, the only source was Pacific LNG, employing about 60 persons. Statewide output in this sector was more of a problem since it was unclear how much the output to be added by any of the LNG plants might be. It was decided to subsume LNG value-added under mining, and in the high case, value-added in other manufacturing was estimated as the existing level of output, plus total revenues of Alpetco, minus cost of feedstocks, from the Alpetco pro forma financial projections of March 10, 1978. All the growth was centered in Other Southcentral. In the low case, the existing level of output was used.

Construction

For modeling purposes, it was only necessary to estimate total employment working on major projects exogenous to the economy, since the rest of construction is projected with the support sector and output in endogenous construction is determined in the models. In the high case, the significant projects within the region were assumed to be oil treatment and shipment facilities in the Gulf of Alaska and Kodiak Subregions and the Kenai-Cook Inlet Census Division, small LNG facilities associated with the Northern Gulf and Lower Cook Inlet development, a Beluga coal transshipment facility, Pacific LNG and Alpetco plants, and a new state capital in Willow. Outside the region, there is augmentation of TAPS pipeline capacity, the Northwest Alaska gas pipeline is constructed, and field development facilities are projected for the Beaufort Sea and the Kuparuk and Lisburne formations. Statewide, total exogenous construction employment peaks at a total of about 14 thousand in 1981, declining rapidly thereafter. In the region, the peak employment is a bit less than seven thousand in 1981.

The level of construction employment was considerably less in the low case, both because of fewer developments in oil and gas, and because several projects needing state support do not occur, e.g. Alpetco and the state capital move. In this case, the Northwest Alaska pipeline is constructed, but the oil finds at Prudhoe Bay offshore areas are relatively small, as are those in Lower Cook Inlet. The Kuparuk and Lusburne formations are developed, and the Pacific LNG plant is built. However, there is no new substantial augmentation to fish processing in the form of new plants to process bottomfish. In the low case, statewide peak employment in exogenous construction is about 9,500, while in the region it is about 1,800.

Federal Government

Federal government employment has been growing very little over the last ten years, with civilian increases about offset by decreases in military employment. The rate of civilian increase has been about 0.5 percent per year, and in the low case, lacking the boost of any massive developments requiring federal support, and lacking a new state capital, the likely rate of increase in federal civilian employment is assumed to remain at 0.5 percent. This means employment increases from 18 thousand to 21 thousand statewide, and from 10,900 to 12,250 in the region by 2000. In the high case, general development results in a doubling of the average rate of increase to about 1 percent per year in federal government in most of the state, and 1.2 percent per year in Southcentral to reflect the state capital move. This increases statewide federal civilian employment from 18,000 to 22,000, and regional employment from 10,900 to 14,500. Federal military employment is assumed to remain constant at 1975 levels in both the state and region.

State Government

State government employment assumptions went through several revisions because of concern about state budgets. Historically, the rate of growth in this sector averaged 8.5 percent per year, a rate which most task force members believed was unlikely to continue. On the other hand, in the high case, bottomfish development, major oil development, and the moving of the state capital to Willow were likely to result in fairly substantial increases in state employment. In the high case, it was assumed that 2,750 positions were transferred from Juneau to Willow. Total state government employment would increase from 14,700 to about 39,000 in the year 2000, declining from around 7.6 percent of civilian wage and salary employment to about 7.2 percent. In the region, state employment bulks fairly large because of the state capital move, with the total from Anchorage and Other Southcentral combined moving from 5,400 to 14,900, or from 5.2 percent to 13.1 percent of total employment.

In the low case, it was assumed that government growth is restricted by lower development needs, by funding constraints or public opinion, and by the fact that the state capital does not move. Before 1985, state government employment growth is held to about 2 percent per year, with zero growth thereafter. As a result, state employment goes from 14,700 in 1975 to 19,159 in 2000, about 6.4 percent of civilian employment in the latter year. In the region, total state employment rises from 5,400 to 7,140 in 1985-2000, about 6.1 percent of civilian employment in 1975 and 3.1 percent in the year 2000.

Local Government

Local government was assumed to be influenced in the future by many of the same factors influencing the rate of growth in state employment. The historic rate from 1965 to 1975 was 10.5 percent (10.1 percent in Southcentral), partly a result of development of school systems and the transfer of state-operated rural schools in the Unorganized Borough to local control. Due to increasing numbers of functions being performed at the local level and rural development in the high case, statewide growth was expected to be faster than in Southcentral, where local governments are already well organized. Due to the moving of the state capital and due to local government response to fishing and oil, local government employment was projected to sustain about a 4 percent per year growth rate outside the region and about 3.4 percent within the Southcentral region. This meant a statewide increase in local employment from 14,200 in 1975 to 34,900 in 2000. In the low case, since the state capital does not move and state-local transfers are expected to be sharply curtailed after 1985, the assumed rates of growth are about 2 percent until 1985 and about 1 percent thereafter. Total employment in local government goes from 14,200 in 1975 to 20,100 in 2000. Within the region, local government in the high case grows from about 8,100 to about 18,600. In the low case, regional local government employment grows from 8,100 to 11,300.

Miscellaneous Assumptions

In the model, Alaskan wage rates are determined in most industries as a function of Alaskan prices and U.S. average weekly wages in the private economy, deflated by the U.S. Consumer Price Index for Urban Clerical Workers. (Both the latter series are published by the Bureau of Labor Statistics.) Alaskan prices are in turn determined as a function of U.S. prices and local demand conditions, reflected by changes in employment. Finally, migration to Alaska is calculated as a function of the change in employment opportunities and relative per capita income in Alaska, compared to the rest of the country. In order to project a "high" and "low" scenario, the economics task force reexamined the assumptions usually used to run the model for impact-assessment purposes in Alaska and concluded that "high" or "low" growth could occur because of movements of the economy outside the state as well as inside the state. In particular, the rates of growth of U.S. disposable personal income per capita (2.0 percent) and wages (1.2 percent) appeared a bit optimistic for the low case. Therefore, in the low case, "pessimistic" forecasts by Data Resources, Inc. were used: 1.0 percent per annum average increase in real wages and 1.77 percent average increase in real disposable personal income per capita. These two changes had little influence on the outcome of the projections.

Government expenditures other than wages and salaries directly influence output in the construction sector. To avoid having to make a series of complex assumptions of doubtful validity concerning government capital spending programs, the task force assumed other government spending increased proportionately to government employment.

Finally, the task force recognized that some of the service, public utilities, and transportation employment in the Southcentral area would not be local-serving employment at all. Particularly, employment in these sectors for Alyeska Pipeline Service Company and Beluga coal extraction would be essentially exogenous to the local economy. Consequently, an exogenous component was added for employment in these three sectors to adjust for the employment by Alyeska and by Beluga.

Methodology Used to Disaggregate Regional Control Totals for the 3 Subregions

The econometric models used by the task force give projections of employment and population at the regional level, the two "regions" projected by the model being Anchorage and the remainder of Southcentral Alaska. It was therefore necessary to devise a method consistent with the known facts about the Southcentral economy which would permit disaggregation of the regional results into subregional totals. The method used was a multistep process employing a simple series of desk calculator manipulations of the output data. The method required three types of major assumptions:

1. The location of "basic" industry activity within the respective subregions in "Other" Southcentral. (Anchorage is projected as a separate region by the model.)

2. The ratio of "nonbasic" to "basic" employment in at least two of the subregions over time (the third subregion could take all residual nonbasic employment).

3. The manner in which population change could be expected to follow employment changes.

The decisions concerning the location of most basic industry employment were relatively straightforward, since most activity was associated with a small series of specific developments, such as the Pacific LNG plant and support bases for Western Gulf of Alaska oil exploration, whose likely location could be pretty well established. The exceptions were agriculture, whose activity was allocated to the Matanuska-Susitna and Kenai-Cook Inlet Census Divisions on the strength of their superior transportation links; fishing, which was allocated in accordance with historical shares of activity; and government, where separate estimates had to be made for each census division by the task force's government employment expert. A separate ratio of nonbasic to basic employment was estimated for the Gulf of Alaska and Kodiak-Shelikof subregions, with the remainder of nonbasic employment allocated to Other Cook Inlet (Cook Inlet

subregion, excluding Anchorage). This was done since it was assumed most of the support sector growth would actually occur in Other Cook Inlet, and because the historical period showed that the expected basic employment increases in the other two subregions was to occur in industries which have not typically resulted in large support sector increases. Nevertheless, the assumptions were different in the high and low cases, to reflect different ideas about the rate of maturation of rapidly growing, subregional economies. Finally, population was allocated by first projecting changes in total employment in each subregion, estimating each subregion's share of the total, and then allocating the corresponding regional change in civilian non-Native population not employed in exogenous construction by these shares. Exogenous construction employment was allocated by assuming the construction workers lived at or near the construction site; Native population was allocated by the percentages of Natives living in villages in each of the subregions within Other Southcentral in 1974. Military population was allocated using the state's estimate of military population by census division for 1975.

High Case

Specifically, the following was done in the high case. Basic employment (mining, exogenous construction, manufacturing, government excluding federal military, agriculture-forestry-fisheries, plus approximately 500 service and transportation sector jobs at Valdez related to the pipeline terminal) was allocated by giving the Other Cook Inlet all its existing employment, plus all Beluga coal; Lower Cook Inlet oil exploration and development; one-fourth of Northern Gulf of Alaska mining, construction, and other manufacturing; Pacific LNG, new capital city employment; about 32 percent of fishing and fish processing; and all agriculture. Gulf of Alaska got its existing employment, plus three-fourths of Northern Gulf of Alaska activity, all Alyeska pipeline activity (including 500 support sector jobs allocated to basic employment), its existing proportion (about 3.4 percent) of fishing and fish processing,

plus all Alpetco employment. Kodiak-Shelikof got all its existing activity, all activity related to Western Gulf of Alaska oil, and about 65 percent of fisheries-related activity.

Nonbasic employment was projected specifically for the Gulf of Alaska and Kodiak-Shelikof subregions. For the Gulf, the ratios of nonbasic employment to basic employment for Valdez-Chitian-Whittier Census Division for 1973 and 1975 were estimated, 1973 showing pre-boom conditions and 1975 showing boom conditions. If the Alpetco petrochemical plant is built, and fish processing expands, this area can be expected to develop a larger support sector. The Kenai Peninsula, during the years 1965 to 1975, was used as a model, and the ratio of nonbasic-to-basic employment was assumed to approach current levels in the Kenai-Cook Inlet census division. Kodiak was expected to be a somewhat more stable and growing economy than the Gulf of Alaska area as a consequence of major fisheries developments in the high case. It was therefore assumed that the ratio of nonbasic-to-basic employment would approach the current regional average toward the end of the century. The date picked was ten years after startup of oil production from the Western Gulf of Alaska--1996. The remaining nonbasic employment was allocated to Other Cook Inlet.

Population was allocated by beginning with the state's estimate of 1975 population by census division and then allocating the regional population changes as outlined above in the general description of the methodology. An exception had to be made for the Gulf of Alaska in 1980. In the low case, about 2,124 net jobs were estimated to have been lost from the Gulf's economy between 1975 and 1980 as a result of pipeline completion. Total 1975-1980 growth of regional population in the low case was 1,331 persons, who were allocated to the three subregions according to share of employment growth. This meant that since the Gulf showed a decline amounting to -57.3 percent of total employment change, it got -57.3 percent ot total civilian non-Native, nonexogenous construction population change. In 1990-1995, the winding down of Northern Gulf

of Alaska oil activity resulted in the net loss of about eight hundred jobs. However, population loss was estimated at over two thousand, which seemed to imply too many dependents of oil workers. An adjustment was made instead by making the 1975 Valdez population/ employment ratio of 1.3 the population "multiplier," which was thought to produce population losses more in keeping with the type of jobs and population in the subregion.

Low Case

The same basic procedure was followed in the low case as in the high case, except that the amount of basic employment to be allocated was less and there were different assumptions to be made concerning the nonbasic/basic employment ratio for Gulf of Alaska and Kodiak-Shelikof. In the low case, the nonbasic/basic ratio for Gulf of Alaska in 1975 (slightly lower than the average of 1973 and 1975 ratios for the Valdez-Chitina-Whittier Census Division) was used throughout the forecast period to reflect no "filling in" or maturing of the subregional economy. In the Kodiak subregion, no impetus was expected to come from additional fisheries development. Consequently, no change in the nonbasic/basic ratio was projected for Kodiak-Shelikof. The remainder of regional nonbasic employment (except 500 Alyeska terminal jobs in Valdez designated "basic") was allocated to Other Cook Inlet. With respect to the allocation of population change, the declines in employment in Gulf of Alaska and Kodiak-Shelikof between 1985 and 1990 as a result of failed oil exploration programs in the Gulf of Alaska were larger than the net regional employment growth. This produced implausibly large declines in population. Therefore, an adjustment was made that used the 1975 population/employment ratios for these two areas as "multipliers" to estimate population decline. The Other Cook Inlet area was then adjusted to the control total of regional population change.

Assumptions Used to Estimate Employment and Population, 2000-2025

The task force was charged with estimating total employment and population after the year 2000, but the econometric models' results were doubtful that far in the future. The task force instead developed some educated guesses concerning the Alaskan economy in the post-2000 period, and these were used to extrapolate the year 2000 results to 2025.

Basically, the same methodology was used as above. The basic sector employment was projected by individual industry, a relationship between nonbasic and basic employment was assumed, and then a relationship between population and employment assumed and projected. This was done regionally both for Anchorage and Other Southcentral, and the results allocated proportionately within Other Southcentral using year 2000 proportions for employment and population.

Basic employment was projected as follows. Since there were no significant additional prospects for oil development in Southcentral Alaska after 2000, this sector was assumed to stabilize at its year 2000 level, replacing old fields with some additional development. This was true in both cases. Exogenous construction tends to follow oil development, so it, too, was left at its year 2000 level. Federal civilian employment continued to grow to serve the expanding post-2000 population: by 1.2 percent per year in the high case and 0.5-0.6 percent in the low case. State and local government continued to grow at the rates projected for their respective cases from 1975 to 2000, with fairly rapid expansion in the high case, and virtually no expansion in the low case. Agriculture continued to expand after 2000 in the high case, with some significant opening up of lands other than in Other Cook Inlet. There was no post-2000 development in the low case. Since manufacturing of fish products, lumber, wood, and pulp was assumed to fully utilize the available resources (as in the high case), or its growth was restricted

by external institutional market factors (as in the low case), the level of employment in these industries was held constant at the year 2000 level. Fishing itself was assumed to replace ten percent of the foreign bottomfishing effort after 2000 by the year 2025 in the low case, but there was assumed to be no change in the traditional fisheries beyond their year 2000 level. In Other Manufacturing, the year 2000 employment level was sustained, except that nonpetrochemical "other" manufacturing was projected to double after the year 2000 to serve local markets in the high case. The extrapolations were done separately for Anchorage and Other Southcentral, added together into basic sector employment, and disaggregated within Other Southcentral based on the year 2000 proportions of basic employment.

In projecting the nonbasic/basic ratio, somewhat different procedures were used for Anchorage and the rest of the region. In Other Southcentral, the year 2000 regional ratio of nonbasic-to-basic employment was multiplied times regional basic employment each year out to 2025 and disaggregated, using year 2000 proportions, which permitted proportional growth in the nonbasic sector in each subregion after the year 2000. In the high case, the nonbasic/basic ratio was assumed to converge to the existing 1975 U.S. ratio by 2025, but it was found to be already there by 2000. In Anchorage, it was recognized that much of the "support sector" employment in fact serves statewide needs in transportation, financial services, etc. Therefore, an estimate was made of local-serving nonbasic employment by multiplying the statewide nonbasic/basic ratio times local basic sector employment. The remainder was designated "statewide-serving" nonbasic employment, which was assumed to grow at the same rate as basic employment because Anchorage statewide services in both the basic sector and this part of the nonbasic sector can be assumed to grow in response to similar statewide demands for central offices and general support services. With the Anchorage economy relatively mature by that time, it is more difficult to argue that statewide-serving nonbasic firms would continue to grow faster than their counterparts in the basic industries after 2000 than before 2000.

Finally, civilian non-Native population not employed in exogenous construction was estimated using year 2000 population/employment ratios at the regional level and allocated to subregions using year 2000 proportions. Any assumption other than proportional population growth among subregions after 2000 was judged too difficult to defend, since so little is known about the character of Alaska's economy at that point. To this was added exogenous construction employment (no growth), Native population (2 percent growth per year), and military (no growth).

CHAPTER 3
PROJECTION RESULTS FOR SOUTHCENTRAL ALASKA, 1975-2025

Growth to 2000

The economy of Southcentral Alaska grows quite rapidly under both the high and low sets of assumptions until the year 2000, and somewhat less rapidly thereafter. In the high case, gross real output of the Southcentral economy more than quadruples before the end of the century, and it more than doubles in the low case. Correspondingly, employment in the high case grows to about 3.7 times its 1975 level by the year 2000, and more than doubles in the low case. Population grows to almost 700 thousand people (three times the 1975 level) by the year 2000 in the high case and to 445 thousand (or about double the 1975 level) in the low case. The rate of growth is lower in the first twenty-five years of the next century in these scenarios: year 2025 population, for example, is "only" 40 percent larger than its year 2000 level in the high case, and 17 percent higher than its year 2000 level in the low case. This chapter presents several of the relevant measures of economic activity on a regional basis to the year 2000; it also includes detailed estimates of employment and population, disaggregated to the subregional level and projected to the year 2025.

The first section of this chapter discusses the Southcentral Alaska economy as a single unit to the year 2000. The second section discusses growth in the individual sectors, focusing on employment; and the third section compares and contrasts economic and population growth in each of the three subregions identified in the first chapter: Cook Inlet, Gulf of Alaska, and Kodiak-Shelikof. Because Anchorage is atypical and so important to both the regional economy and the Cook Inlet subregion, Anchorage results are reported separately. The final section discusses the projection results for the period 2000 to 2025.

Output

Table 16 reports total output in 1972 dollars for the high and low cases for Anchorage, Other Southcentral, and the region. The pattern of industrial output in the region is strongly influenced by construction and oil production projects in the 1980s in both cases. Real output shows a huge bulge in the Other Southcentral subregion related to building of the Pacific LNG plant and oil exploration in both cases, the additional impact of state capital construction, Alpetco construction, and the beginnings of oil production in Lower Cook Inlet and fisheries development between 1980 and 1985. That this boom is primarily oil and exploration-related is shown by the rather sharp tailing off of output after 1985 (and particularly after 1990) in both cases. Fisheries development, government growth, and ongoing oil production keep output in the high case at relatively high levels in the 1990s, but they cannot match the exploration and development impact of the oil industry. For example, the nonoil and construction output of the Other Southcentral economy actually increases relatively little between 1975 and 1980 (from $230.7 million to $349.4 million in 1972 dollars). In contrast, the output of Anchorage's economy grows fairly vigorously in both cases, with the higher level in the later years of the century being sustained by overall state growth. Anchorage output is apparently below that of Other Southcentral in the years up through 1985 in the low case and 1990 in the high case. In terms of economic activity, this is misleading, however, since oil industry output accounts for well over 75 percent of the Other Southcentral total during the period. By 2000 in the high case, the Anchorage economy dominates the region with 65 percent of output, even when the oil industry is counted. When the oil industry is subtracted, then Anchorage accounts for 74 percent of the total. In the low case, the corresponding figures are 69 percent and 88 percent, showing that the Anchorage economy is relatively less dependent on development within the region.

Table 16

Growth of Constant Dollar (Real) Output:
Anchorage, Other Southcentral, and Southcentral Alaska, 1975-2000

(Millions of 1972 Dollars)

	High Development:			Low Development:		
Year	Anchorage	Other Southcentral	Southcentral	Anchorage	Other Southcentral	Southcentral
1975	$1,281.6	$556.7	$1,838.3	$1,281.6	$556.7	$1,838.3
80	1,743.7	2,953.8	4,697.5	1,722.4	2,664.8	4,387.2
85	2,261.6	6,444.7	8,706.3	1,892.4	2,711.2	4,603.6
90	3,017.9	5,179.8	8,197.7	2,173.3	1,416.7	3,590.0
95	3,907.2	2,567.7	6,474.9	2,674.2	1,456.7	4,130.9
2000	5,455.4	2,894.0	8,349.4	3,341.5	1,504.0	4,845.5

Employment

Next, consider the employment opportunities offered by the developments projected in the two cases. These are shown in Table 17. Southcentral civilian employment is projected to rise substantially in both cases, relative to its 1975 level. The oil industry is a high-output, low-employment industry, which is revealed by the fact that the total output bulge created by oil development is much larger in percentage terms than that in employment associated with exploration and development of Southcentral oil fields in both cases between 1980 and 1990. Of more importance to the employment totals in Other Southcentral is the construction of several large projects in the 1980s (compare the jump in employment between 1980 and 1985 in Other Southcentral in the high case with the almost flat employment pattern in the low case), and government growth and fisheries development which occur between 1985 and 2000 in the high case, but not in the low case. Anchorage again shows quite steady and sustained growth in both cases but much greater employment in the high case because of overall state growth, growth in government employment in Anchorage, and continued construction and expansion of the support sector.

Income

In addition to the employment impacts, an important impact on individuals is the effect of growth on income. Table 18 shows real per capita income gains averaging about 1.1 percent per year in the high case, and 0.8 percent in the low case. In the high case, this is a rate of increase about like that in the United States in the last ten years; in the low case, it is more like the rate of increase during a recession. While the model projection is silent on the question of distribution of income, Table 18 data do give some idea of the aggregate prosperity of the residents of Southcentral Alaska. One thing to consider while examining these figures is that they are not residence-adjusted income figures; therefore, they may be too high in Other Southcentral, for example, if people live in Anchorage or out-of-state and commute to jobs in the

Table 17

Civilian Employment in Anchorage,
Other Southcentral, and Southcentral Alaska, 1975-2000

(Number of Persons)

	High Development:			Low Development:		
Year	Anchorage	Other Southcentral	Southcentral	Anchorage	Other Southcentral	Southcentral
1975[1]	69,645	19,753	89,398	69,645	19,753	89,398
80	84,600	28,569	113,169	84,486	23,459	107,945
85	109,494	47,668	157,132	93,689	24,346	118,035
90	143,659	59,036	202,695	109,014	24,558	133,572
95	176,946	71,097	248,043	133,702	26,875	160,577
2000	232,846	98,682	331,528	168,493	29,731	198,224

[1]Corresponding nonagricultural wage and salary employment for 1975 appears in Table A.2.

Table 18

Real Wage and Salary and Proprietor Income Earned
Plus Transfers, and Per Capita Income:
Anchorage, Other Southcentral, and Southcentral Alaska, 1975-2000

(1967 Dollars)

HIGH CASE:

	Total Income ($10^6$$):			Per Capita Income:		
Year	Anchorage	Other Southcentral	Southcentral	Anchorage	Other Southcentral	Southcentral
1975	$ 962.4	$ 299.3	$1,261.7	$5,413	$5,789	$5,498
80	1,095.3	391.1	1,486.4	5,317	6,566	5,598
85	1,453.4	704.4	2,157.8	5,695	7,450	6,169
90	1,957.2	871.5	2,828.7	6,039	7,303	6,380
95	2,517.6	1,061.5	3,579.1	6,424	7,297	6,660
2000	3,458.1	1,563.2	5,021.3	6,908	7,847	7,175

LOW CASE:

	Total Income ($10^6$$):			Per Capita Income:		
Year	Anchorage	Other Southcentral	Southcentral	Anchorage	Other Southcentral	Southcentral
1975	$ 962.4	$ 299.3	$1,261.7	$5,413	$5,789	$5,498
80	1,112.5	315.3	1,427.4	5,427	6,112	5,563
85	1,265.0	334.7	1,599.7	5,580	6,077	5,679
90	1,473.6	349.5	1,823.1	5,644	6,064	5,720
95	1,923.2	410.0	2,333.2	6,210	6,467	6,254
2000	2,481.6	482.7	2,964.3	6,614	6,908	6,660

Other Southcentral census divisions. The table indicates in general that real per capita income grows throughout the period, except for a small drop in Anchorage between 1975 and 1980 caused by faster price inflation and faster initial population growth in the high case, and reductions in Other Southcentral in the 1980s caused by the winding down of development related to the oil industry.

Population

Population growth is one important response to the growth of the Southcentral economy in both the high and low cases. The amount and rate of population growth in Anchorage and the rest of Southcentral is shown in Table 19. The most obvious general observation one can make about population growth in the two cases is that the causes of growth in Anchorage and Other Southcentral differ. Other Southcentral is expected to be influenced strongly by local development; while Anchorage, which depends on statewide growth, is affected less by the choice of scenario. The spread between the cases is also large, ranging from 94 percent growth in the low case over the next 25 years, which is 2.7 percent per year or about 48 percent of the 1965 to 1975 rate, to 205 percent growth in the high case over 25 years, which is 4.6 percent per year or 82 percent of the 1965 to 1975 rate. In neither case is Southcentral Alaska projected to grow as fast as in the ten years preceding the forecast period. The high growth case is roughly equivalent to the rate of growth experienced between 1965 and 1973, prior to the pipeline boom, while the low growth case is less than the rate of growth during the years between the earthquake and the North Slope lease sale.

Distribution of Growth Among Industries

Table 20 shows the projected growth of the Southcentral economy in the high and low cases, divided into four groups of industries: "nonrenewable resource" basic industries (defined here as mining, exogenous construction, exogenous transport, public utilities, services,

Table 19

Population Growth: Southcentral Region, 1975-2000

(Thousands of Persons)

	High Development:			Low Development:		
Year	Anchorage	Other Southcentral	Southcentral	Anchorage	Other Southcentral	Southcentral
1975	177.8	51.7	229.5	177.8	51.7	229.5
80	206.0	59.5	265.5	205.0	51.6	256.6
85	255.2	94.6	349.8	226.7	55.0	281.7
90	324.1	119.3	443.4	261.1	57.6	318.7
95	391.9	145.5	537.4	309.7	63.4	373.1
2000	500.6	199.2	699.8	375.2	69.9	445.1
Average Annual Rate of Growth 1975-2000	4.2%	5.5%	4.6%	3.0%	1.2%	2.7%

Table 20

Projected Civilian Employment Growth by Industry Group, Southcentral Alaska, 1975-2000

(Thousands of Persons)

HIGH CASE:

Year	Nonrenewable Resources	Renewable Resources	Government	Support Sector	Total
1975	6.117	4.997	24.348	53.936	89.398
80	8.297	5.699	26.955	72.218	113.169
85	12.188	7.324	31.830	105.790	157.132
90	9.648	10.635	37.220	145.192	202.695
95	6.260	13.565	42.420	185.798	248.043
2000	6.260	17.763	48.070	259.435	331.528

LOW CASE:

Year	Nonrenewable Resources	Renewable Resources	Government	Support Sector	Total
1975	6.117	4.997	24.348	53.936	89.398
80	6.473	4.889	26.615	69.968	107.945
85	4.305	4.868	28.075	80.787	118.035
90	4.246	4.836	28.921	95.569	133.572
95	4.246	4.852	29.794	121.685	160.577
2000	4.246	4.852	30.692	158.434	198.224

and "other" manufacturing), "renewable resource" basic industries (agriculture-forestry-fisheries, food manufacturing, lumber and wood products, and pulp and paper), government, and the support sector. The table demonstrates that most of the growth in the high case occurs in the support sector, the largest of the four groups. Government grows steadily throughout the period, just about doubling during the 25 years. Nonrenewable resources enjoys a boom which peaks in the middle 1980s, then tails off until the end of the period when it is about its 1975 level. Renewable resources (especially fishing) take over in the middle and late 1980s and sustain the growth in the export-base industries (nonrenewable and renewable combined), which in turn impacts the support sector.

While the support sector still accounts for the bulk of the growth in the low case, this case shows a much smaller long-term expansion of nonrenewable resource industries and a decline relative to 1975 by the end of the period. Renewable resource industries decline slightly due to the disappearance of commercial agriculture in this case, and while government expands by about 15 percent in the first 10 years, little further expansion takes place. The support sector expansion is probably due to several causes, including: the short-term expansion of the economy between 1980 and 1985 and the twenty-plus percent rise in real per capita incomes; maturing of the Alaskan economy; and economic expansion elsewhere in Alaska. The difference in support sector employment in Anchorage by the year 2000 is 41 percent between the two cases; it is 247 percent in the rest of the region, because there is relatively little support sector development in the low case (9,700 new jobs), while support sector development in the high case is spectacular (52,400 new jobs).

Subregional Economic and Population Growth, 1975 to 2000

The 1975 to 2000 distribution of employment and population growth in the Southcentral Alaska's subregions can be summarized as follows: In the high case, the fastest growing subregion is Other Cook Inlet followed by Kodiak-Shelikof, Anchorage, and Gulf of Alaska, in that order. Although there is considerable year-to-year variation in the rate of growth, only the Gulf of Alaska shows a negative growth rate or even one which could be described as slow during any decade before the end of the century. This is largely because several important development projects are projected for the region in the high case. In the low case, the comparative lack of major developments means that only Anchorage, which depends upon developments outside the region as well as inside it, can post substantial and consistent rates of gain in employment and population. It is trailed by Other Cook Inlet, Kodiak-Shelikof, and Gulf of Alaska, which in the low case actually records a loss in population relative to the boom year 1975. Table 21 summarizes growth rates in population and civilian employment at the subregional level between 1975 and 2000 in the high and low cases, respectively. The results for the years 2000 to 2025 are discussed in the next section, where the projected totals are presented.

High Case

As can be seen in Table 21, high case population growth rates are quite variable over time, depending upon what specific developments are occurring. Other Cook Inlet shows the fastest overall growth rate, largely as a result of the assumption that support sector employment would be relatively slowly developed in Gulf of Alaska and Kodiak, combined with the fact that rising incomes and basic sector employment in the region outside of Anchorage were projected to generate some 50 thousand support sector jobs over the 25-year period. Given the assumed location of much of the basic sector development, the task force analysis concluded that most of the support sector development would probably occur

Table 21

Average Annual Growth in Population
and Civilian Employment,
by Subregion, 1975-2000

HIGH DEVELOPMENT:

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Population:					
1975-80	3.0%	4.7%	- 1.6%	2.0%	3.0%
1980-90	4.6%	7.3%	4.9%	8.9%	5.3%
1990-2000	4.4%	6.3%	1.2%	4.1%	4.7%
1975-2000	4.2%	6.4%	2.1%	5.6%	4.6%
Civilian Employment:					
1975-80	4.0%	12.8%	0.6%	4.0%	4.8%
1980-90	5.4%	8.2%	5.2%	7.9%	6.0%
1990-2000	5.0%	6.7%	0.7%	3.8%	5.0%
1975-2000	5.0%	8.5%	2.5%	5.5%	5.4%

LOW DEVELOPMENT:

Population:					
1975-80	2.9%	1.8%	- 6.0%	0.0%	2.3%
1980-90	2.4%	1.1%	- 0.2%	2.4%	2.2%
1990-2000	3.7%	2.6%	0.6%	0.6%	3.4%
1975-2000	3.0%	1.8%	- 1.1%	1.2%	2.7%
Civilian Employment:					
1975-80	3.9%	10.2%	- 8.4%	0.2%	3.8%
1980-90	2.6%	0.9%	- 1.2%	0.2%	2.2%
1990-2000	4.4%	2.7%	0.1%	0.2%	4.0%
1975-2000	3.6%	3.4%	- 2.2%	0.2%	3.2%

on the Kenai Peninsula and in the Matanuska-Susitna Borough. The Gulf of Alaska figures represent a sharp decline and recovery of the subregional economy from Northern Gulf development between 1975 and 1980--a recovery which shows up more strongly in the 1980 to 1990 figures. Since there is little additional post-1990 basic sector activity in this region, relatively little additional population growth is expected during the nineties, most of it a result of support sector growth. Kodiak-Shelikof figures in the high case show expansion related to fisheries which is strong after 1980, and which coincides with Western Gulf of Alaska development. The expansion is more concentrated in fisheries in the 1990s, with lower probable per capita income gains. This will tend to reduce the rate of migration somewhat during the late 1990s, reducing the overall growth rate below that in the 1980s.

Low Case

In the low case, all areas show considerably lower population growth during most of the subperiods. Anchorage is the least affected by assumptions concerning Southcentral regional development, but even in Anchorage, low case population and employment growth rates before 1990 are considerably less than those in the high case. Other Cook Inlet is the most profoundly affected subregion. Because much of the basic employment growth due to development is assumed to occur in this subregion, the failure of development to take place in the low case reduces the average rate of population growth from a rapid 6.4 percent to a relatively modest 1.8 percent over the period. The figures for the Gulf of Alaska are a bit misleading, since the Gulf enjoys some construction boom periods between the years used here as signposts; however, the overall long-term employment picture under the assumptions of the low case is one of lower long-term employment than the 1975 boom year, with approximately steady population between 1980 and 2000. (The percentage changes represent small changes of 200 to 300 people.) Kodiak-Shelikof enjoys much slower growth in the low case than in the high. The principal causal factors of the difference are the lack of bottomfish development in the low case

(reflected as little employment growth in the 1980s) and the failure of Western Gulf of Alaska oil exploration, which eliminates oil development (indicated by the flat 1980 to 1990 employment growth). Finally, all areas are impacted by the slower growth of government in the low case.

Post-2000 Results

As outlined in the previous chapter, the economics task force departed from formal modeling methodology for the period 2000 to 2025. The reasons for this were many, but the principal one is that the structure of the post-2000 economy is likely to be different from today's in ways that could not be estimated well enough to justify a formal modeling methodology with its inherent difficulty and expense. Therefore, the task force decided to make some relatively cruder forecasts concerning the path of development of the basic sector after 2000. The main features of the method used were the simplest possible link between basic employment and nonbasic employment, and estimates of population using simple population-to-employment ratios likely to be characteristic of the latter part of this century. It was hoped that the resultant projections would be robust enough to withstand a wide margin of error in assumptions concerning individual sectors. The results are shown in Tables 22 and 23, along with those for the pre-2000 period.

Post-2000 development is distributed proportionately across the non-Anchorage subregions by assumption, because the post-2000 results for these specific areas are not a result of analysis of the individual economies as are the pre-2000 results. Consequently, all three non-Anchorage areas show the same rate of population growth, about 1.9-2.0 percent, in the high case; while Anchorage, clearly the most mature economy, shows about 1.1-1.2 percent. Timing of development is obviously important. If the schedules for development in the high case were stretched out, the total population of each area might well be lower by 2025, but the rate of

Table 22

Southcentral Water Study
High Case Projections (HIGHSC3)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	206.0	39.0	10.8	9.7	265.5
85	255.2	61.1	15.8	17.6	349.8
90	324.1	79.2	17.4	22.7	443.4
95	391.9	103.1	16.5	25.8	537.4
2000	500.6	145.6	19.7	34.0	699.8
05	525.5	162.1	21.9	37.9	747.3
10	557.5	179.6	24.2	41.9	803.2
15	589.3	199.5	26.9	46.6	862.3
20	625.1	218.2	29.4	51.0	923.7
2025	659.5	236.1	31.9	55.1	982.6
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary					
1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian					
1975	23.239	4.901	4.134	3.188	35.462
80	25.179	7.875	4.097	3.800	40.951
85	26.569	12.781	5.732	6.261	51.343
90	28.834	14.917	5.991	7.761	57.503
95	30.999	17.491	5.381	8.373	62.244
2000	33.364	21.987	6.084	10.659	72.094
05	35.577	24.502	6.780	11.878	78.737
10	38.862	27.171	7.518	13.172	86.723
15	41.928	30.199	8.356	14.640	95.124
20	45.482	33.022	9.137	16.009	103.650
2025	48.581	35.706	9.880	17.310	111.477

High Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	59.421	8.920	2.048	1.828	72.218
85	82.925	15.901	3.726	3.237	105.789
90	114.826	21.858	4.194	4.315	145.193
95	145.947	30.809	4.036	5.007	185.799
2000	199.482	48.221	4.867	6.864	259.434
05	209.356	53.739	5.424	7.649	276.168
10	221.726	59.592	6.015	8.483	295.816
15	234.155	66.234	6.685	9.428	316.502
20	248.049	72.425	7.310	10.309	338.093
2025	261.648	78.310	7.904	11.147	359.008
Total Civilian Employment (Excludes Self-Employed, except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment:					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment:					
1975	69.645	9.186	5.953	4.614	89.398
80	84.600	16.795	6.146	5.628	113.169
85	109.494	28.682	9.458	9.498	157.132
90	143.659	36.775	10.185	12.076	202.695
95	176.946	48.300	9.417	13.380	248.043
2000	232.846	70.208	10.951	17.523	331.528
05	244.933	78.241	12.204	19.528	354.905
10	260.588	86.763	13.533	21.655	382.538
15	276.083	96.433	15.041	24.068	411.626
20	293.531	105.447	16.447	26.318	441.743
2025	310.229	114.016	17.784	28.457	470.485

Table 23

Southcentral Water Study
Low Case Projections (LOWSC6)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	205.0	34.2	8.6	8.8	256.6
85	226.7	34.2	8.8	12.0	281.7
90	261.1	38.1	8.4	11.1	318.7
95	309.7	43.3	8.6	11.5	373.1
2000	375.2	49.2	8.9	11.8	445.1
05	383.7	53.1	9.6	12.7	459.1
10	392.4	57.3	10.4	13.8	473.9
15	401.3	61.5	11.1	14.8	488.7
20	410.5	65.9	11.9	15.8	504.1
2025	420.7	70.4	12.7	16.9	520.7
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary					
1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian					
1975	23.239	4.901	4.134	3.188	35.462
80	24.964	7.133	2.659	3.221	37.977
85	25.238	6.640	2.679	3.791	38.348
90	25.900	6.456	2.361	3.286	38.003
95	26.631	6.573	2.377	3.310	38.891
2000	27.331	6.747	2.393	3.337	39.808
05	28.101	7.256	2.573	3.589	41.519
10	28.893	7.812	2.771	3.864	43.340
15	29.708	8.345	2.960	4.127	45.140
20	30.546	8.884	3.151	4.394	46.975
2025	31.459	9.426	3.343	4.662	48.890

Low Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	59.522	7.836	1.170	1.440	69.968
85	68.451	8.362	1.179	1.695	79.687
90	83.114	9.947	1.039	1.469	95.569
95	107.071	12.089	1.046	1.480	121.686
2000	141.162	14.709	1.053	1.492	158.416
05	144.131	15.820	1.133	1.605	162.689
10	147.131	17.033	1.219	1.728	167.111
15	150.164	18.194	1.302	1.846	171.506
20	153.229	19.369	1.387	1.965	175.950
2025	156.669	20.551	1.471	2.085	180.776
Total Civilian Employment (Excludes Self-Employed, except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment:					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment:					
1975	69.645	9.186	5.953	4.614	89.398
80	84.486	14.969	3.829	4.661	107.945
85	93.689	15.002	3.858	5.486	118.035
90	109.014	16.403	3.400	4.755	133.572
95	133.702	18.662	3.423	4.790	160.577
2000	168.493	21.456	3.446	4.829	198.224
05	172.232	23.076	3.706	5.194	204.208
10	176.024	24.845	3.990	5.592	210.451
15	179.872	26.539	4.262	5.973	216.646
20	183.775	28.253	4.538	6.359	222.925
2025	188.128	29.977	4.814	6.747	229.666

growth between 2000 and 2025 would be somewhat greater. Likewise, there is no guarantee that growth would necessarily be proportional among subregions after 2000, but one could argue that general regional growth may reduce the transportation and market size barriers which currently inhibit development in the Gulf and Kodiak areas. The regional post-2000 rate of growth is projected at about one-third of the pre-2000 rate.

In the low case, the three non-Anchorage populations grow at 1.4 percent in the post-2000 period, while Anchorage grows at about 0.5 percent. The chief causes of growth in this case are limited bottomfish development (which takes place much earlier in the high case) and government (especially local). Very little development was forecast for this case, so it is conceivable that additional development in forestry, local-serving manufacturing, fishing, or development of oil fields not currently projected for lease sales could significantly change the results of the low case by 2025. The rate of growth for the whole region after 2000 is forecast to be about 0.6 percent, about 20-25 percent of the pre-2000 rate.

Summary

The Southcentral economy and population show substantial future growth regardless of whether high or low development assumptions are used. However, the difference between the high and low cases is substantial, and growth might well have very different impacts on Southcentral water resources in the two cases.

The high case represents about the highest economic and population growth that could reasonably be expected to occur in Southcentral Alaska before the year 2025, given what is currently known about the prospects for the development of the region's resource base. In this case, the real output of the economy grows to 4.6 times its 1975 boom-year level by the

end of the century, accompanied by a 270 percent increase in employment, and a tripling of population. The fastest growth takes place in the Cook Inlet subregion on the strength of several major projects in oil and gas, fisheries development, movement of the state capital, and broadening of the support sector. Because fishing grows so much in this case and because of its initial small size, Kodiak follows in percentage employment and population gains, followed by Anchorage, largely influenced by statewide growth, and finally by the Gulf of Alaska, with the Alpetco project its main source of growth. After the turn of the century, the rate of growth falls to about one-third its 1975 to 2000 rate, largely because the economy is maturing and because no major projects are forecast for after the year 2000.

The low case represents about the lowest plausible growth rate for Southcentral Alaska, although some major projects included in this case such as the Northwest-Alaska gas pipeline may not in fact be built. Nevertheless, the task force felt that even if some of the developments identified explicitly in the assumptions did not occur, the assumptions were inimical enough to development that some other unforeseen project was reasonably likely to take its place. In this case, the real output of the Southcentral economy increases to about 2.6 times its 1975 level by the end of the century, while civilian employment more than doubles, and population nearly doubles. In the low case, the major center of growth is Anchorage, which grows largely because of statewide developments in oil and gas, not because of regional development (which is minimal). After the turn of the century, the growth rate falls in this case to about one-fourth its pre-2000 rate, again largely because no major development projects can be currently foreseen for the early twenty-first century.

There is obviously plenty of room to pick between these two alternatives. Consequently, a third intermediate scenario was constructed and evaluated to give water resources planners a better idea of the

sensitivity of the population and employment estimates produced in the main report. This does not mean that planners should automatically take the middle case as the "most likely" and plan only for that case while ignoring the range of possible outcomes presented in this report. On the contrary, successful water resource planning for Southcentral Alaska will have to be a dynamic process, incorporating not only contingency plans or planning processes for the entire range of possibilities presented here, but also being updated periodically as better information becomes available.

ADDENDUM:

INTERMEDIATE CASE PROJECTIONS

METHODOLOGY AND DATA USED IN INTERMEDIATE CASE

Intermediate Case Assumptions Used to Produce Economic and Population Projections, 1975-2000

The intermediate case scenario used in this study was constructed in a manner similar to the high and low scenarios. That is, the economic task force took into account certain of the critical factors likely to cause differing rates of economic growth in Southcentral Alaska and made assumptions concerning these factors for the time period 1975 to 2000. For the most part, the assumptions fell between the high and low cases, and closer to those in the low case. The assumptions in the intermediate case produced estimates nearer the low case than the high; thus, this third case is not in any sense simply an "average" of the high and low. However, since the task force also did not have a firm idea of the relative likelihood of the three cases, it is somewhat misleading to call the intermediate case assumptions "best guess" or "most likely." Quite frequently, the assumptions represented compromises of mutually exclusive and firmly held positions of different members of the task force. It is only in the sense of consensus, compromise, or collective ignorance that the intermediate case is "most likely."

The intermediate case does not constitute a prediction of the future path of the Southcentral economy any more than the high and low cases do. The intermediate case is a contingent projection, based upon the assumptions which follow. The assumptions are organized by industry and are discussed in the text. The actual numbers appear in an appendix to the report.

Agriculture

The growth of agriculture in the intermediate case is predicated upon a fairly pessimistic evaluation of the chances for a combination of favorable public policy decisions and favorable markets. It is assumed

that relatively low priority will be given to agricultural development relative to aesthetic, recreational, subsistence, and wilderness uses of Alaska's lands, or that market opportunities for Alaska's agricultural products will remain minimal due to such factors as strong competition from imported foodstuffs and high operating costs. In the intermediate case, Southcentral employment in commercial agriculture rises from its current level of about 115 man-years to about 200 man-years in the year 2000. Dollar value of agricultural sales in constant 1975 dollars rises to $16.5 million, for an addition to gross state product of $3.2 million in 1972 dollars. Statewide, the level of employment rises to 1,150 from its current level of about 750 by the year 2000, and the 1975 constant dollar agricultural sales rise to $100 million. Agriculture's total contribution to gross state product in the year 2000 is estimated at 19.3 million constant 1972 dollars, about one-fourth the level in the high case. In the intermediate case, year 2000 agricultural sales rise to about three times their 1975 level.

Forestry

Employment and output of this small component of the forest products industry is assumed to grow at the same rate as lumber and wood products, which constitutes the bulk of the forest products industry. This growth is described below.

Fisheries

The high case scenario for this industry assumed a very ambitious fisheries development program to replenish salmon stocks and replace foreign bottomfish harvesting efforts with U.S. domestic fishermen. The low case assumed no change from current levels. The intermediate case takes a moderate position halfway between these two extremes. That is, while limited entry in salmon fishing and possibly shellfish limit employment growth in existing fisheries, there is assumed to be a 50 percent replacement of the foreign bottomfish effort off Alaska by the year 2000, requiring about 8,750 additional persons in fishing. While employment in salmon fishing is assumed to be constant, the real value of output from

existing fisheries doubles by the year 2000 as salmon run enhancement projects begin to have large impacts. Bottomfish output is estimated at $316 million statewide, $158 million in Southcentral.

Mining, Including Oil and Gas

The mining sector intermediate case incorporates assumptions which are closer to the low case than to the high case. In the intermediate case, the Kaparuk River Sands formation at Prudhoe Bay are developed, as well as 0.8 billion barrels of new petroleum finds offshore of Prudhoe Bay. The maximum rate of throughput of the TAPS oil pipeline is increased to 1.6 million barrels per day. While exploration takes place in both the Northern Gulf of Alaska and the Western Gulf/Kodiak area as a result of federal lease sales, there is no oil found, and exploration activity soon ceases. In contrast, there is a significant find in Lower Cook Inlet amounting to about 2.6 billion barrels, which results in output of about 930 thousand barrels per day at peak production, same as the high case. The Beluga coal fields are developed in the intermediate case; however, in contrast to the high case, there is no export of coal. Instead, a single mine-mouth electrical generating plant utilizing 730,000 tons of coal per year is built and operated. In the intermediate case, statewide employment in mining rises to a peak of about 7,100 persons in 1984, dropping to 5,200 by 2000. Statewide value added in mining rises to almost $3.0 billion 1972 constant dollars in 1984, trailing off to $1.7 billion by the year 2000.

Within the region, mining exploration and development employ about 2,800 persons in 1984, declining thereafter to about 1,350 in the year 2000. This includes about 60 miners at Beluga, with most of the rest in oil and gas.

Food Manufacturing

As in the high and low case, food manufacturing is dominated by seafood processing, whose growth is mainly determined by the level of output in fishing. As the industry grows, however, there are opportunities for

labor-saving innovations which keep the rate of growth in employment less than the rate of growth in output. For instance, in order to handle the projected doubling of the output of the salmon fleet, it is expected that only a 50 percent increase in fish processing employment would be required. Overall, existing fisheries are projected to require a 15 percent increase in processing employment, while the 50 percent replacement of foreign bottomfish catching effort would require about 10 thousand persons statewide (on- and offshore) by the year 2000, about one-third of these onshore, and about one-half of the onshore processing employment in the region. The total value added by food manufacturing rises to $268 million (1972 dollars) by the year 2000, about $124 million of that in the region.

Lumber and Wood Products Manufacturing

Since lumber and wood products contain most of what is thought of as the "forestry industry," an increase in logging activity would result in growth of this sector. In the intermediate case, statewide lumber and wood products growth is the same as in the low case; however, additional information has become available in the last six months on federal withdrawals of timber land in the southeast part of Alaska, which indicates that a larger part of the timber harvesting effort in the state may take place in the Southcentral region in the future. Employment in the Other Southcentral lumber and wood products industry increases from the 1975 level of 278 to 925 by the year 2000. Employment in Anchorage holds constant.

Pulp and Paper Manufacturing

The growth of this sector is determined by the same factors as lumber and wood products, with the exception that all logging activity in Southcentral is assumed to be carried out by firms engaged in manufacture of lumber and wood products rather than pulp and paper. Total manufacture of statewide employment increases to 1,777 persons in the year 2000 (none in Southcentral), same as the low case. Value added is the same as in the low case statewide; it is zero in Southcentral.

Other Manufacturing

Growth of the miscellaneous manufacturing sector is directly dependent upon a series of large-scale petrochemical projects whose future can only be guessed at this time. In the intermediate case, the projects which are included are a large fuels refinery utilizing state royalty oil from the Alaska North Slope, an LNG facility of the type proposed in the Pacific LNG Alaska-California project, and a smaller LNG facility to utilize Lower Cook Inlet gas. The fuels refinery is substituted for the proposed Alpetco facility shown in the high case because of persistent doubt concerning the economic viability of a grass-roots petrochemical plant, combined with ongoing state preferences for in-state processing of royalty oil. The fuels refinery is more likely to be viable, requires fewer construction personnel, and employs about 400 persons during its operations phase (in contrast to over 1,800 required in the Alpetco basic proposal). Both the Pacific LNG and the other LNG plant employ about 60 people during operations. Statewide employment in Other Manufacturing rises from 1,941 in 1975 to 2,512 by the year 2000. Within the region, Other Manufacturing rises from 348 to 879 in Other Southcentral, compared to 408 in the low case and 2,333 in the high case. Anchorage employment remains at 1,100.

Construction

Major projects constructed statewide during the period 1975 to 2000 in the intermediate case include oil treatment and shipment facilities for the Lower Cook Inlet oil fields, two LNG plants and a major oil refinery, the Beluga coal mine-mouth power plant, facilities for operation of the Kaparuk formation at Prudhoe Bay, development of the Prudhoe Bay offshore oil field with pipeline capacity expansion, the Northwest Alaska gas pipeline, and a small state capital campus somewhere in Southcentral Alaska which conforms to the concept of a limited capital move. Statewide, the level of construction employment on these major projects reaches a peak of 11,800 in 1981, declining rapidly thereafter. In the Southcentral region, exogenous construction employment reaches 2,800 in 1981.

Federal Government

Federal government employment in Alaska has been growing very little during the last ten years, the increases in civilian employment being offset by declining military employment. The decline in military employment has slowed or halted, however, and civilian employment is expected to continue to grow slowly. In the intermediate case, federal civilian employment rises at the same rate as in the low case--about 0.5 percent per year. This results in federal civilian employment of about 21 thousand statewide, and 12,250 in the region by the year 2000. Military employment is assumed constant at 1975 levels.

State Government

The rate of growth of state government may be one of the key driving forces in the Alaska economy, after construction. A fairly persuasive story can be told about nearly any projected rate, but an annual rate of two percent was assumed through 1990, and about 1.5 percent thereafter. This is similar to the low case, but government growth continues after 1985.

In the intermediate case, it was assumed some sort of limited state capital move would take place which would transfer major central government functions to a capital campus somewhere in Southcentral Alaska--possibly Willow. The number of positions involved in an immediate move of just the legislature, commissioners, and the governor and their immediate staffs was calculated at roughly 750 persons. Since some growth in these staffs will probably occur by the time the move is likely to be conducted, and other government operations may also move, the task force assumed a move between 1982 and 1990 involving about one thousand employees in two groups of 500. State government employment reaches 4,100 in Other Southcentral and 6,200 in Anchorage by the year 2000, for a total of 10,300.

Local Government

Local government growth is partly conditional upon local sources of revenue, but also depends upon revenues available from federal sources and the growth of demand for government services. In the intermediate case, the projected rate of growth was fixed at three percent, halfway between the rates in the high and low cases. This results in statewide local government employment of about 29,000 in the year 2000, and regional employment of 14,900.

Miscellaneous Assumptions

The Alaska economy is influenced by growth in U.S. per capita disposable (after tax) income, wages, and prices, since these set bounds on the ability of Alaska to encourage or discourage migration and increase the real incomes of Alaskans. In the high case, real wages rise at 1.2 percent per annum and real per capita disposable incomes at 2 percent. In the low and intermediate cases, U.S. real per capita disposable income and wages track the Data Resources, Inc., "pessimistic" long-term forecasts of 1.77 percent for real income and 1.0 percent for wages.

Government spending is again assumed proportional to expenditures for government wages and salaries, just as in the high and low cases.

Finally, the exogenous components of transportation, public utilities, and services represented by major basic projects such as the oil pipeline was estimated. In the intermediate scenario, Beluga coal development does not require a large support facility, although 90 persons are employed by the coal-fired power plant. Most of the employment added by these large projects in transportation, public utilities, and services is attributable to the oil pipeline project and its continued operations. Long-term employment in the intermediate case is estimated at 250 in transportation, about 1,000 in services, and 90 in public utilities.

Intermediate Case Methodology Used to Disaggregate Regional Control Totals for the Three Subregions

The disaggregation methodology used in the intermediate case was similar to that used in the high and low case. That is, specific projections of basic employment were made for the Anchorage, Other Cook Inlet, Gulf of Alaska, and Kodiak-Shelikof subregions. The econometric model produced an estimate of nonbasic, civilian employment in the Anchorage subregion, while the model's estimate of Other Southcentral nonbasic employment, computed by the model, was allocated to the three remaining subregions by projecting specific ratios of nonbasic-to-basic employment for Kodiak-Shelikof and Gulf of Alaska subregions. The remainder was allocated to Other Cook Inlet. The resulting changes in total civilian employment were used to estimate changes in population. Each subregion's share of the change in total civilian employment in each five-year period was used to allocate the corresponding five-year regional change computed by the model of the non-Native, civilian population not directly engaged in large construction projects. Finally, exogenous construction employment, military population, and Native population estimates were added for each subregion to give total subregional population.

Specifically, the task force made the following assumptions. Basic employment in Other Cook Inlet (Cook Inlet, less Anchorage) included existing mining employment, all employment related to Lower Cook Inlet oil and gas, one-fourth of Northern Gulf of Alaska oil employment, all Beluga coal employment, 36 percent of lumber and wood products employment by the year 2000, historic proportions of fishing, food manufacture, pulp and paper, employment related to the compact capital move, low growth in government employment, Pacific LNG and Lower Cook petrochemicals employment, and all agricultural employment in the region. Gulf of Alaska employment included existing mining, three-fourths of all direct employment related to Northern Gulf lease sales 39 and 55, direct employment related to the Alpetco fuels refinery, 40 percent of lumber

and wood products employment by the year 2000, historical proportions of fishing and food processing employment, low growth in government employment with an addition of fifty local government workers during Alpetco plant construction, and 500 transportation and service workers employed in the operation of the oil pipeline. The Kodiak-Shelikof area employment featured all existing activity, all the oil exploratory activity related to federal OCS lease sale 46, 24 percent of lumber and wood products employment in the region outside of Anchorage by the year 2000, historical proportions of fisheries and food processing manufacturing, and slow government growth.

Nonbasic employment was specifically projected for the Gulf of Alaska and Kodiak-Shelikof subregions. The major driving factors leading to development of a support sector in these two subregions are the same as in the high case, but more modest in impact. Since the Valdez area can be expected to develop a support sector comparable to that of the Kenai Peninsula as a result of major refining and oil transshipment operations employment in the area, the Gulf subregion ratio of nonbasic/basic employment is assumed to change at the same rate as did the nonbasic/basic ratio in the Kenai-Cook Inlet census division between 1960 and 1975, the period during which the Kenai oil shipment and manufacturing facilities were constructed and began operations. In Kodiak-Shelikof, many of the same factors are at work as in the high case broadening the support sector, although basic employment is expected to be less. The same rate of change in the nonbasic/ basic ratio was used in the intermediate case as in the high case for the Kodiak-Shelikof subregion, giving approximately the current Other Southcentral average for this ratio by 1996. The remainder of Other Southcentral nonbasic employment was allocated to the Other Cook Inlet subregion.

Civilian, non-Native, nonconstruction population was allocated within Other Southcentral by beginning with the state's estimate of 1975 population by census division and then allocating region-wide population changes as described in the text above. An exception was made for the Gulf of Alaska region between 1975 and 1980. In the intermediate case, 505 jobs were lost from the subregional economy, about -7.9 percent of the total gain in jobs in the region. This would have translated into a net civilian population loss of 269 between 1975 and 1980. This seemed a little high when compared to the low case, where .36 people were lost per lost job. Consequently, the .36 ratio was imposed, resulting in a population loss of 181 people. The rest of 1975-1980 Other Southcentral population growth was allocated proportionately between Kodiak-Shelikof and Other Cook Inlet.

Assumptions Used to Estimate Employment and Population in the Intermediate Case, 2000-2025

The same basic methodology was followed in the intermediate case as in the high and low cases for the period after the year 2000. Since the econometric model was considered unreliable that far in the future, the task force made some simple assumptions concerning growth of basic sector employment by industry for Anchorage and the rest of Southcentral. The task force then assumed a moving ratio of nonbasic employment to basic employment. Finally, population was derived by estimating a population/employment ratio for civilian, non-Native, nonconstruction population and then adding Natives, military, and construction employees working on large-scale projects to the resultant total.

The basic sector assumptions were as follows: Since, as in the low and high cases, the task force could foresee no significant additional prospects for the oil and gas industry in Southcentral after the year 2000, the task force simply assumed that the industry stabilized at its level in that year, with new, smaller finds replacing older fields. Since

exogenous construction is dependent upon large-scale projects, and none of these is foreseen in the intermediate case after the year 2000, exogenous construction employment was specified at its year 2000 level. Federal civilian employment continued to increase after the year 2000 at the same rate as in the low case, and state government employment grew at about the rate it grew between 1985 and 2000. The rate of growth of local government employment was assumed to be half the rate of increase for this sector in the high case. Agriculture was beset with unfavorable conditions for further growth in the intermediate case, so the year 2000 level of employment was chosen for the period 2000 to 2025. Fisheries were being influenced by active replacement of foreign bottomfishing effort in the year 2000. This process was assumed to continue with a further ten percent replacement between 2000 and 2025. Food manufacturing employment due to this part of the fishing industry also was assumed to increase by ten percent. Lumber and wood products may be using most of their available timber lands by 2000. Consequently, employment in this sector was assumed to stabilize by the year 2000. In contrast, it is likely that the larger population base may begin to give rise to import substitution and some miscellaneous manufacturing other than petrochemicals. This portion of Other Manufacturing was projected to increase by 50 percent after the turn of the century. Total basic sector employment in Anchorage increases 8,400-plus jobs after the turn of the century in the intermediate case, about 27.5 percent. In Other Southcentral, it grows 7,900 jobs, or about 33.7 percent. This compares with increases for Anchorage of 4,100 jobs and Other Southcentral of 5,000 jobs in the low case and 15,200 and 24,200 jobs, respectively, in the high case for the period 2000 to 2025.

The nonbasic/basic employment ratio was projected separately for Anchorage and the rest of Southcentral. In Other Southcentral, the nonbasic/basic ratio was assumed to continue to trend in the direction of the "current" (1975) United States value of about 1.55, which it

reaches in 2025. In the high case, this value for the ratio is reached much sooner--the year 2000--while in the low case, it only reaches about 1.38 (about twice its current level) in the year 2000, where it remains. This puts the intermediate case about halfway between the high and low case for support sector growth after the turn of the century. In Anchorage, the support sector was divided into "statewide" and "local-serving" components. The former was assumed to grow at the same rate as the Anchorage basic sector, except local government. The local-serving component was set equal to the statewide nonbasic/basic ratio times the basic sector employment in Anchorage. The reason for the division was that part of the employment in the Anchorage support sector, especially in finance and transportation, provides many of the same headquarters functions as the basic sector employment in Anchorage. Consequently, one would expect it to grow at about the rate of the basic sector in Anchorage, except for local government, which has an obviously local function in spite of being basic.

Civilian, non-Native population not engaged in major construction projects was estimated using year 2000 population to employment ratios, allocated proportionately to subregions using year 2000 proportions. Any other assumption than proportionality was judged too difficult to defend. To this was added construction employment on major projects, Native population, and military.

INTERMEDIATE CASE PROJECTION RESULTS FOR SOUTHCENTRAL ALASKA 1975-2025

Growth to 2000

In the intermediate case, the economy of Southcentral Alaska more than doubles in size before the year 2000. The rapid rate of growth in this case puts total employment at 252.1 thousand by the year 2000, compared with 198.2 thousand in the low case and 331.5 thousand in the high case. This is about 25 thousand closer to low case than to the high. The principal reason is, of course, that many of the "best guess" or "most likely" assumptions were shaded toward the conservative end of the range of possibilities outlined in the main body of the report. When it came to what the task force actually thought was the likeliest outcome of a large group of possible scenarios of varying probabilities, the task force was inclined to be conservative and to discount heavily the more optimistic of their opinions.

Output

The Southcentral Alaska economy's gross output increased to 3.4 times its 1975 level between 1975 and 2000 in the intermediate case. This was about 29 percent more than the low case and about 25 percent less than the high case. Table AD.1 reports the 1972 constant dollar industrial output for Anchorage and the rest of Southcentral. Real output is dominated in the 1980s, as it is in the other two cases, by the impact of several major construction projects. The importance of oil and gas is shown by the relatively low gross output in Other Southcentral in the 1990s. Fisheries development, government growth, and ongoing oil and timber production keep output from falling as far as in the low case, but they are unable to match the relatively lucrative oil and gas industry. Non-oil and construction output of the Other Southcentral economy grows at an average rate of 4.9 percent during the period 1975 to 2000, reaching $961 million (1972 dollars) in 2000. Anchorage non-oil output grows at a slower rate of 3.9 percent per year, reaching $3.7 billion in the year 2000.

Table AD.1

Growth of Constant Dollar (Real) Output:
Anchorage, Other Southcentral, and
Southcentral Alaska, 1975-2000

(Millions of 1972 Dollars)

Intermediate Development:

Year	Anchorage	Other Southcentral	Southcentral
1975	$1,281.6	$ 556.7	$1,838.3
80	1,722.4	2,664.8	4,387.2
85	1,979.9	3,062.5	5,042.4
90	2,382.4	1,885.4	4,267.8
95	3,034.4	2,006.3	5,040.7
2000	4,052.9	2,219.3	6,272.2

Employment

Civilian employment is projected to rise quite rapidly overall, though not nearly as fast as in the high case. Table AD.2 shows total employment for the intermediate case. As can be seen from the table, total employment increases some 182 percent, which is considerably more than the 121 percent increase in the low case, but which falls far short of the 271 percent increase in the high case. There are several causal factors which contribute to the difference. Since a less elaborate Alpetco project was assumed for this case than the high case, and since oil exploration in the Western and Northern Gulf of Alaska proves unsuccessful, the amount of oil-related development is much lower. This tends to depress the rate of increase. In addition, the smaller capital move and the slower rate of increase in fisheries also tend to keep total employment increases below those in the high case. On the other hand, there is an oil refinery built, the capital does move, and there is some replacement of the foreign bottomfish effort; and these combine to make the increase about 50 percent larger than in the low case.

Income

As in the other two cases, an important impact of economic growth on individuals is the effect on their incomes. Table AD.3 shows how per capita income earned in Anchorage and the rest of Southcentral is affected by the intermediate case. As in the other cases, the model does not give a projection of residence-adjusted income; therefore, the total earned income shown in the table may not capture the effects on income of the resident population caused by the fact that some workers may be commuters or out-of-state workers. The table indicates that real incomes plus transfers received increase some 195 percent over the 25-year period, which compares to 298 percent in the high case and 135 percent in the low case. The increase in real per capita income in the intermediate case averages 0.9 percent per year, close to the low end of the range established by the high and low cases (1.1 percent and 0.8 percent,

Table AD.2

Civilian Employment in Anchorage, Other Southcentral, And Southcentral Alaska, 1975-2000

(Number of Persons)

Intermediate Development:

Year	Anchorage	Other Southcentral	Southcentral
1975	69,645	19,753	89,398
80	86,689	24,819	111,508
85	97,516	30,605	128,121
90	118,535	34,803	153,338
95	148,430	42,025	190,455
2000	197,178	54,944	252,122

Table AD.3

Real Wage and Salary and Proprietor Income Earned Plus Transfers, and Per Capita Income: Anchorage, Other Southcentral, and Southcentral Alaska, 1975-2000

(1967 Dollars)

Intermediate Development:

TOTAL INCOME (10^6 $)

Year	Anchorage	Other Southcentral	Southcentral
1975	$ 962.4	$ 299.3	$1,261.7
80	1,112.3	315.3	1,427.4
85	1,313.8	430.6	1,744.4
90	1,641.2	495.4	2,136.6
95	2,116.3	625.6	2,741.9
2000	2,871.1	851.8	3,722.9

PER CAPITA INCOME

Year	Anchorage	Other Southcentral	Southcentral
1975	$5,413	$5,789	$5,498
80	5,427	6,112	5,563
85	5,664	6,614	5,872
90	5,946	6,576	6,081
95	6,333	6,914	6,457
2000	6,755	7,380	6,888

respectively). In the intermediate case, the only period in which real per capita income does not increase is the period 1985 to 1990 (in Other Southcentral). This is because of a decline in the number of high-paying oil and gas and construction jobs related to oil field development between those years.

Population

The growth in the Southcentral regional economy causes net in-migration to Southcentral Alaska, which in turn results in population increases. Table AD.4 shows the growth of the population of Anchorage and the balance of Southcentral in the intermediate development case. As can be seen in the table, Anchorage shows a relatively rapid rate of growth--3.6 percent, compared to 4.1 percent in the high case and 2.8 percent in the low case. Other Southcentral, which benefits from the Alpetco project, limited capital move, some bottomfish development, and forest products industry development in the intermediate case, grows quite a bit faster than in the low case: 3.3 percent, compared with 1.2 percent. However, the limited nature of this development and the lack of success in Gulf of Alaska oil exploration keep the rate of increase well below the 5.5 percent in the high case. Overall, the rate of increase of Southcentral population shown in the intermediate case is 3.5 percent--halfway between the high and low rates.

Distribution of Growth Among Industries

Table AD.5 shows the distribution of growth among four groups of industries for the intermediate case. The "nonrenewable resource" basic industries (mining, exogenous construction, exogenous transportation, public utilities, services, and "other" manufacturing) grow rapidly until the middle 1980s, then tail off until the end of the period. The pattern is similar to the high case, but not so pronounced. The "renewable resource" basic industries (agriculture-forestry-fisheries, food manufacturing, lumber and wood products, and pulp and paper) do not grow as

Table AD.4

Population Growth: Southcentral Region, 1975-2000

(Thousands of Persons)

Intermediate Development:

Year	Anchorage	Other Southcentral	Southcentral
1975	177.8	51.7	229.5
80	205.2	54.9	260.1
85	232.0	64.5	296.5
90	276.0	75.2	351.2
95	334.2	90.4	424.6
2000	425.0	115.4	540.4
Average Annual Rate of Growth 1975-2000	3.6%	3.3%	3.5%

Table AD.5

Projected Civilian Employment Growth by Industry Group, Southcentral Alaska, 1975-2000

(Thousands of Persons)

Intermediate Development:

Year	Nonrenewable Resources	Renewable Resources	Government	Support Sector	Total
1975	6.117	4.997	24.348	53.936	89.398
80	7.208	5.327	26.615	61.948	101.098
85	6.865	5.912	29.102	86.360	128.239
90	5.324	6.894	32.095	109.150	153.463
95	4.997	8.561	34.659	142.358	190.575
2000	4.997	11.725	37.490	198.030	252.242

fast as in the high case; but, in contrast to the low case, which shows almost no employment growth in this sector, intermediate case renewable resource industry employment grows by 123 percent by the year 2000.

Government growth also lies in-between the two previous cases. Since state and local government grows somewhat faster than in the low case because of the state capital move and lack of a ceiling on government employment, total government grows 80 percent more than the low case. The growth is not as great as in the high case because the state capital does not move, fewer local government personnel are hired (partly due to lower population), and federal government civilian employment growth is assumed to be very conservative.

Reflecting the growth in the basic sector industries, the support sector grows at a rate which lies about midway between the rates in the high case and the low case. In Anchorage, the underlying development of the Alaska economy keeps support sector growth at about the level one would expect: between 1975 and 2000, the support sector grows 323 percent, compared to 407 percent in the high case and 259 percent in the low. Although Other Southcentral is more dependent upon local developments than Anchorage, the total growth in the support sector in this part of the region grows 318 percent, compared to 129 percent in the low case and 696 percent in the high.

Subregional Economic and Population Growth, 1975 to 2000, Intermediate Case

Table AD.6 summarizes the population and civilian employment growth at the subregional level for the period 1975 to 2000. The rates of growth during the five-year subperiods were quite variable, highly dependent upon which economic developments were occurring at the time. For example, Other Cook Inlet is currently undergoing very rapid growth

Table AD.6

Average Annual Growth in Population and Civilian Employment, by Subregion, 1975-2000

Intermediate Development:

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Population:					
1975-1980	2.9%	2.7%	-3.1%	1.1%	2.5%
1980-1990	3.0%	3.4%	-0.2%	5.5%	3.0%
1990-2000	4.4%	4.3%	4.1%	4.8%	4.4%
1975-2000	3.6%	3.6%	0.8%	4.3%	3.5%
Civilian Employment:					
1975-1980	2.6%	11.1%	-1.8%	2.1%	3.3%
1980-1990	4.1%	3.8%	0.3%	2.6%	3.8%
1990-2000	5.2%	4.7%	3.5%	5.4%	5.1%
1975-2000	4.2%	5.6%	1.1%	3.6%	4.2%

as the support sector employment in the Matanuska-Susitna Boroughs and the Kenai Peninsula deepens, drawing many residents into the year-round labor force. The Gulf of Alaska region shows a drop in both employment and population between 1975 and 1980 because the building of the Alpetco project is not expected to employ as many people as the pipeline did at its peak. Subsequently, however, the deepening of the support sector and the provision of many new basic sector jobs in petrochemicals (the Alpecto refinery), lumber and wood products, and fishing cause this area's population to grow modestly over the period as a whole. The Kodiak-Shelikof region grows at a relatively fast clip during the 1980s, due to oil exploration, expansion of the bottomfishery, and the increasing relative size of the support sector. Anchorage grows at a steadily increasing rate over the period in response to the growth in the state as a whole, import substitution, and the municipality's continuing role as a transportation, governmental, trade, and financial center. Overall, the intermediate case shows population and employment growth somewhat nearer the rates in the low case than in the high case.

Post-2000 Results, Intermediate Case

The methodology used in the high case and low case was also extended to the intermediate case. That is, basic employment was estimated for each applicable industry for the years 2000 to 2025, the nonbasic/basic ratio was assumed to change in a specified manner, and the year 2000 population/employment ratio was applied to the estimate of total employment. The post-2000 development was distributed proportionately across the subregions because, as before in the high and low case, results for the post-2000 economy are not the result of analysis of individual subregions. The results for 1975 to 2025 are shown in Table AD.7.

Table AD.7

Southcentral Water Study
Intermediate Case Projections (INTSC10)

(Thousands)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Resident Population:					
1975	177.8	31.2	11.7	8.8	229.5
80	205.2	35.6	10.0	9.3	260.1
85	232.0	42.6	9.5	12.4	296.5
90	276.0	49.5	9.8	15.9	351.2
95	334.2	59.3	11.8	19.3	424.6
2000	425.0	75.5	14.6	25.3	540.4
05	444.5	84.2	15.7	27.2	571.6
10	465.1	90.8	16.9	29.3	602.1
15	486.5	98.0	18.2	31.6	634.3
20	509.4	106.1	19.8	34.2	669.5
2025	534.2	115.1	21.4	37.2	707.9
Basic Sector Civilian Employment (1975 Wage and Salary Employment in Parentheses):					
Non-Ag. Wage & Salary					
1975	(23.239)	(4.460)	(3.779)	(2.376)	(33.854)
Civilian					
1975	23.239	4.901	4.134	3.188	35.462
80	24.611	7.401	3.635	3.458	39.105
85	25.683	8.427	3.369	4.282	41.761
90	27.203	9.438	3.296	4.251	44.188
95	28.879	10.379	3.707	5.132	48.097
2000	30.634	12.242	4.374	6.842	54.092
05	32.124	12.890	4.606	7.204	56.824
10	33.701	13.635	4.872	7.620	59.828
15	35.365	14.441	5.160	8.071	63.037
20	37.143	15.348	5.484	8.578	66.553
2025	39.069	16.372	5.850	9.150	70.441

Intermediate Case Projections (continued)

	Anchorage	Other Cook Inlet	Gulf of Alaska	Kodiak-Shelikof	Total
Non-Basic Sector Civilian Employment:					
1975	46.406	4.285	1.819	1.426	53.936
80	54.418	8.153	1.812	1.663	66.046
85	71.833	10.124	2.189	2.214	86.360
90	91.332	13.147	2.307	2.364	109.150
95	119.551	16.958	2.780	3.069	142.358
2000	166.544	23.581	3.499	4.406	198.030
05	174.586	25.584	3.796	4.780	208.746
10	182.996	27.864	4.134	5.206	220.200
15	191.774	30.381	4.508	5.677	232.340
20	200.989	33.194	4.925	6.202	245.310
2025	211.000	36.370	5.397	6.796	259.563
Total Civilian Employment (Excludes Self-Employed, Except Fishing and Agriculture, and Military):					
Non-Ag. Wage & Salary Employment					
1975	(69.645)	(8.745)	(5.598)	(3.802)	(87.790)
Total Civilian Employment					
1975	69.645	9.186	5.953	4.614	89.398
80	79.029	15.554	5.447	5.121	105.151
85	97.516	18.551	5.558	6.496	128.121
90	118.535	22.585	5.603	6.615	153.338
95	148.430	27.337	6.487	8.201	190.455
2000	197.178	35.823	7.873	11.248	252.122
05	206.710	38.474	8.402	11.984	265.570
10	216.697	41.499	9.006	12.826	280.028
15	227.139	44.822	9.668	13.748	295.377
20	238.132	48.542	10.409	14.780	311.863
2025	250.069	52.742	11.247	15.946	330.004

Sensitivity Test: Northwest Gas Pipeline

As the work of the economics task force progressed, the members became aware that the initial assessments they had made concerning the characteristics of certain large-scale development may have been incorrect. One example of this was the Alpetco project, which the task force initially assigned to the Kenai area. Subsequently, it was announced that Alpetco had chosen Valdez as its site, and the report had to be corrected for this fact.

Another example of a large-scale project for which the outcome is highly questionable is the Northwest Alaska natural gas pipeline project. The task force originally included this project in all three scenarios, but it appears at this writing that the project may be significantly delayed or never built. Consequently, the task force felt it was important to estimate the difference the lack of such a project might make to the Southcentral regional economy. A true sensitivity test is difficult to do in this case for two reasons: (1) the construction and operations activity directly involved with the project occurs outside the region, which causes the regional effects to be dependent on a few tenuous links between the state and regional models; and (2) it is impossible to estimate what psychological impacts on other development the failure of such a large project would have. Here, it has been assumed that model structure correctly portrays the regional impacts and that there is no deterrence to other major projects because the Northwest pipeline is not built.

Table AD.8 summarizes the results of the sensitivity test. While the impact is certainly noticeable, the Northwest pipeline is apparently not crucial to the Southcentral regional economy. For example, by the year 2000 it makes a difference of 1,100 jobs out of a total of 252 thousand, about 0.4 percent in the intermediate case. Population is about

Table AD.8

Sensitivity of the Intermediate Case Southcentral Economy to the Elimination of the Northwest Alaska Natural Gas Pipeline

	Real Output (Millions of 1972 Dollars)	Civilian Employment (Thousands)	Real Income (Millions of 1967 Dollars)	Population (Thousands)
1980	0	0	0	0
1985	-13.8	-.514	-9.9	-4.5
1990	-19.4	-.747	-14.2	-6.3
1995	-22.1	-.740	-15.6	-6.6
2000	-31.2	-1.079	-22.6	-7.3

7,300 lower than it otherwise would have been (probably including families of workers who commute to the line), which is a difference of 1.4 percent, taking the intermediate case as a base. While the difference would be somewhat larger or smaller with a larger or smaller economy, the sensitivity test reveals that the outcome is not critically dependent upon the natural gas pipeline project.

APPENDIX A

HISTORICAL DATA ON SOUTHCENTRAL ALASKA'S ECONOMY

Table A.1.

Gross Product, in Millions of 1958 Dollars
Anchorage, Other Southcentral, Southcentral, and State of Alaska

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975[p]
Anchorage:											
Agr.-Forestry-Fisheries	.2	.1	.1	.1	.1	.1	.2	.2	.1	.1	.1
Mining	16.8	23.7	37.2	53.4	63.6	80.3	77.3	65.6	57.6	47.7	79.9
Construction	25.5	23.0	22.1	19.8	25.2	27.9	31.1	33.3	31.9	45.3	54.0
Manufacturing	8.6	9.9	8.3	9.7	9.5	11.1	12.3	13.2	14.7	15.0	18.8
Food	2.9	4.5	2.7	3.8	2.5	3.1	3.2	3.4	4.4	3.7	5.9
Lumber and Wood	.1	.1	.2	.1	.1	.4	.5	.4	.5	.7	1.3
Pulp and Paper	.1	.1	.1	.1	.1	.1	.1	.2	.1	.2	.3
Other	5.5	5.2	5.3	5.7	6.8	7.5	8.5	9.2	9.7	10.4	11.3
Trans.-Comm.-P.U.	52.1	55.0	59.0	66.0	75.5	84.3	101.8	108.9	109.5	140.0	187.0
Transport	24.1	27.2	29.1	32.4	38.4	43.6	41.6	45.4	52.0	67.6	85.0
Air	14.3	17.9	20.1	22.4	26.9	29.2	28.8	32.5	38.4	38.7	51.7
Other	9.8	9.3	9.0	10.0	11.5	14.4	12.8	12.9	13.6	28.9	33.3
Communications	19.2	18.8	19.5	22.4	24.5	26.9	43.6	44.6	35.6	44.5	67.3
Public Utilities	8.8	9.0	10.4	11.2	12.6	13.8	16.6	18.9	21.9	27.9	34.7
Trade	47.5	52.5	57.9	61.8	72.1	82.0	89.2	94.6	103.0	121.7	163.9
Wholesale	19.3	22.8	25.2	27.4	33.3	37.9	39.7	42.3	46.5	56.3	86.3
Retail	28.2	29.7	32.7	34.4	38.8	44.1	49.5	52.3	56.5	65.4	77.6
Finance	38.0	40.4	39.9	40.9	45.0	55.3	59.5	67.7	78.5	89.3	103.5
Services	23.3	25.1	26.3	28.0	33.1	38.0	41.1	44.7	48.1	60.4	84.0
Hotel	2.3	2.6	2.7	2.6	3.4	3.7	3.4	3.8	3.7	5.1	
Personal	2.5	2.7	2.8	3.1	3.1	3.4	3.5	3.6	3.7	3.3	detail
Business	6.0	6.2	6.3	6.4	7.9	8.4	8.5	8.1	8.6	13.5	not
Medical	4.7	5.1	5.3	5.8	6.9	7.7	8.7	10.3	11.4	12.5	available
Other	7.8	8.5	9.2	10.1	11.8	14.8	17.0	18.9	20.7	26.0	
Government	131.3	132.6	134.4	135.9	133.7	134.7	141.9	141.9	146.0	166.3	155.3
Federal	116.3	116.5	117.0	117.2	112.4	112.3	116.5	112.9	115.2	132.2	118.6
State/Local	15.0	16.1	17.4	18.7	21.3	22.4	25.4	29.0	30.8	34.1	36.7
Total	343.3	362.3	385.2	415.6	457.8	513.7	554.4	570.1	589.4	685.9	846.5

p = preliminary
Source: Institute of Social and Economic Research, University of Alaska.

Table A.1. (continued)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975[p]
Other Southcentral:											
Agr.-Forestry-Fisheries	10.9	16.4	9.9	13.4	12.4	15.5	12.9	12.2	7.3	10.9	12.9
Mining	18.3	43.1	123.6	213.8	228.2	224.2	226.0	179.7	182.7	207.2	187.8
Construction	7.1	8.5	10.4	12.1	7.8	4.6	6.9	5.9	5.1	9.4	27.5
Manufacturing	14.2	18.8	15.6	18.7	13.5	18.4	18.6	19.9	34.2	26.0	34.6
Food	13.3	17.8	14.4	16.9	10.4	14.8	14.8	16.4	30.5	20.9	28.1
Lumber and Wood	.2	.2	.2	.3	.5	.6	.9	.5	.6	1.6	2.7
Pulp and Paper	0	0	0	0	0	0	0	0	0	0	0
Other	.7	.8	1.0	1.5	2.6	3.0	2.9	3.0	3.1	3.5	3.8
Trans.-Comm.-P.U.	8.6	9.5	13.2	13.1	13.6	14.3	15.9	19.0	22.0	30.5	42.3
Transport	3.5	4.1	7.2	6.4	6.9	5.9	5.0	5.1	5.8	11.6	16.6
Air	1.5	1.6	1.8	2.4	2.6	2.2	1.7	1.9	2.0	2.0	2.8
Other	2.0	2.5	5.4	4.0	4.3	3.7	3.3	3.2	3.8	9.6	13.8
Communications	.5	.6	.6	.7	.7	2.3	3.9	5.9	7.8	8.9	11.2
Public Utilities	4.6	4.8	5.4	6.0	6.0	6.1	7.0	8.0	8.4	10.0	14.5
Trade	6.3	8.4	8.6	9.3	10.8	10.6	10.3	11.0	11.2	13.8	21.5
Wholesale	1.5	2.4	2.1	3.0	3.6	3.1	2.5	2.9	2.4	3.8	7.2
Retail	4.8	6.0	6.5	6.3	7.2	7.5	7.8	8.1	8.8	10.0	14.3
Finance	4.7	5.2	4.7	5.0	5.4	5.6	5.6	5.8	6.3	8.5	10.2
Services	4.3	5.2	5.6	5.9	5.7	5.7	5.9	6.3	7.7	9.2	10.0
Hotel	.7	.8	.8	.7	.6	.7	1.1	1.4	1.4	2.0	
Personal	.1	.2	.2	.2	.2	.2	.2	.3	.3	.2	detail
Business	.9	1.3	1.5	1.6	1.2	.9	.7	.5	1.0	1.4	not
Medical	.9	1.1	1.3	1.3	1.4	1.7	1.7	1.8	1.9	2.0	available
Other	1.7	1.8	1.8	2.1	2.3	2.2	2.2	2.3	3.1	3.6	
Government	22.6	20.4	21.7	20.5	22.4	22.5	22.2	17.8	18.1	19.8	20.9
Federal	17.1	14.0	15.0	13.5	14.8	13.8	12.1	6.9	6.8	8.1	8.3
State/Local	5.5	6.4	6.7	7.0	7.6	8.7	10.1	10.9	11.3	11.7	12.6
Total	97.0	135.5	213.3	311.8	319.8	321.4	324.3	277.6	294.6	335.5	367.7

p = preliminary
Source: Institute of Social and Economic Research, University of Alaska.

Table A.1. (continued)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975[p]
Southcentral Total:											
Agr.-Forestry-Fisheries	11.1	16.5	10.0	13.5	12.5	15.6	13.1	12.4	7.4	11.0	13.0
Mining	35.1	66.8	160.8	267.2	291.8	304.5	303.3	245.3	240.3	254.9	267.7
Construction	32.6	31.5	32.5	31.9	33.0	32.5	38.0	39.2	37.0	54.7	81.5
Manufacturing	22.8	28.7	23.9	28.4	23.0	29.5	30.9	33.1	48.9	41.0	53.4
Food	16.2	22.3	17.1	20.7	12.9	17.9	18.0	19.8	34.9	24.6	34.0
Lumber and Wood	.3	.3	.4	.4	.6	1.0	1.4	.9	1.1	2.3	4.0
Pulp and Paper	.1	.1	.1	.1	.1	.1	.1	.2	.1	.2	.3
Other	6.2	6.0	6.3	7.2	9.4	10.5	11.4	12.2	12.8	13.9	15.1
Trans.-Comm.-P.U.	60.7	64.5	72.2	79.1	89.1	98.6	117.7	127.9	131.5	170.5	229.3
Transport	27.6	31.3	36.3	38.8	45.3	49.5	46.6	50.5	57.8	79.2	101.6
Air	15.8	19.5	21.9	24.8	29.5	31.4	30.5	34.4	40.4	40.7	54.5
Other	11.8	11.8	14.4	14.0	15.8	18.1	16.1	16.1	17.4	38.5	47.1
Communications	19.7	19.4	20.1	23.1	25.2	29.2	47.5	50.5	43.4	53.4	78.5
Public Utilities	13.4	13.8	15.8	17.2	18.6	19.9	23.6	26.9	30.3	37.9	49.2
Trade	53.8	60.9	66.5	71.1	82.9	92.6	99.5	105.6	114.2	135.5	185.4
Wholesale	20.8	25.2	27.3	30.4	36.9	41.0	42.2	45.2	48.9	60.1	93.5
Retail	33.0	35.7	39.2	40.7	46.0	51.6	57.3	60.4	65.3	75.4	91.9
Finance	42.7	45.6	44.6	45.9	50.4	60.9	65.1	73.5	84.8	97.8	113.7
Services	27.6	30.3	31.9	33.9	38.8	43.7	47.0	51.0	55.8	69.6	94.0
Hotel	3.0	3.4	3.5	3.3	4.0	4.4	4.5	5.2	5.1	7.1	
Personal	2.6	2.8	3.0	3.3	3.3	3.6	3.7	3.9	4.0	3.5	detail
Business	6.9	7.5	7.8	8.0	9.1	9.3	9.2	8.6	9.6	14.9	not
Medical	5.6	6.2	6.6	7.1	8.3	9.4	10.4	12.1	13.3	14.5	available
Other	9.5	10.3	11.0	12.2	14.1	17.0	19.2	21.2	23.8	29.6	
Government	153.9	153.0	156.1	156.4	156.1	157.2	164.1	159.7	164.1	186.1	176.2
Federal	133.4	130.5	132.0	130.7	127.2	126.1	128.6	119.8	122.0	140.3	126.9
State/Local	20.5	22.5	24.1	25.7	28.9	31.1	35.5	39.9	42.1	45.8	49.3
Total	440.3	497.8	598.5	727.4	777.6	835.1	878.7	847.7	884.0	1021.4	1214.2

p = preliminary
Source: Institute of Social and Economic Research, University of Alaska.

Table A.1. (continued)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975[p]
State of Alaska:											
Agr.-Forestry-Fisheries	31.9	38.0	20.9	30.4	24.2	35.9	29.1	24.7	13.9	23.6	31.9
Mining	50.4	82.8	180.8	298.0	410.5	403.9	378.8	295.6	281.4	301.9	386.7
Construction	52.4	47.2	48.4	48.5	53.4	54.4	58.6	61.3	59.6	107.6	196.6
Manufacturing	82.4	92.0	79.5	94.3	78.3	98.9	100.4	100.9	125.5	118.8	135.3
Food	41.3	51.8	37.4	50.5	30.7	46.5	46.7	44.8	64.1	46.1	63.6
Lumber and Wood	8.8	10.6	13.9	13.8	14.0	16.0	16.2	16.7	20.4	23.1	20.9
Pulp and Paper	23.5	21.1	19.5	19.9	21.5	23.3	23.7	24.7	25.5	32.2	30.2
Other	8.8	8.5	8.7	10.1	12.1	13.1	13.8	14.7	15.5	17.4	20.6
Trans.-Comm.-P.U.	135.3	145.3	152.1	161.7	180.6	184.9	209.2	225.3	239.1	309.9	430.7
Transport	56.3	61.1	68.3	72.8	89.5	89.3	82.8	90.4	98.5	141.3	190.0
Air	32.1	37.0	41.8	46.4	58.9	55.8	52.3	57.5	64.1	68.3	92.1
Other	24.2	24.1	26.5	26.4	30.6	33.5	30.5	32.9	34.4	73.0	97.9
Communications	57.1	61.4	58.5	61.0	61.7	63.8	88.9	94.0	95.1	113.7	169.3
Public Utilities	21.9	22.8	25.3	27.9	29.4	31.8	37.5	40.9	45.5	55.0	71.4
Trade	84.6	93.5	102.0	110.5	125.2	137.4	145.6	153.1	165.8	197.8	299.9
Wholesale	29.2	34.2	37.8	41.4	49.4	54.6	55.6	58.3	63.7	80.1	125.9
Retail	55.4	59.3	64.2	69.1	75.8	82.8	90.0	94.8	102.1	117.8	174.0
Finance	62.9	67.0	66.4	68.6	73.0	85.0	91.1	102.6	117.5	137.7	170.4
Services	45.7	48.0	52.2	55.9	62.6	67.3	72.6	79.8	86.5	108.1	153.2
Hotel	5.3	6.0	6.3	6.3	6.6	7.0	7.9	8.5	8.7	11.5	
Personal	4.1	4.5	4.6	5.0	5.1	5.4	5.4	5.7	5.6	5.0	detail
Business	10.5	10.6	11.6	13.1	16.0	14.7	15.1	14.6	15.0	23.4	not
Medical	10.0	10.4	10.8	11.3	12.6	13.8	15.0	17.5	19.2	21.7	available
Other	15.8	16.5	18.9	20.2	22.3	26.4	29.2	33.5	38.0	46.5	
Government	284.2	290.6	297.5	293.9	297.5	303.2	306.0	299.2	307.7	351.3	318.7
Federal	238.2	240.1	243.6	236.8	234.4	234.5	229.3	213.0	217.6	256.2	212.9
State/Local	46.0	50.5	53.9	57.1	63.1	68.7	76.7	86.2	90.1	95.1	105.8
Total	829.8	904.4	999.8	1161.8	1305.1	1370.9	1391.4	1342.5	1397.0	1656.7	2123.4

p = preliminary
Source: Institute of Social and Economic Research, University of Alaska.

Table A.2.

Non-Agricultural Wage and Salary Employment by Industry
Study Subregion, Southcentral Alaska, and State

(Number of Persons)

Cook Inlet Subregion:

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agr.-Forestry-Fisheries	39	30	38	57	85	87	103	180	233	235	250
Mining	694	1,007	1,591	1,913	1,843	1,626	1,453	1,343	1,346	1,556	2,115
Contract Construction	3,509	3,393	3,687	3,738	3,963	3,994	4,477	4,803	4,631	6,479	7,876
Manufacturing	1,211	1,183	1,079	1,218	1,499	1,710	1,841	1,965	2,159	2,384	2,774
Food	521	528	381	445	470	583	560	639	789	863	983
Lumber and Wood	*	*	*	*	*	*	*	*	*	*	*
Pulp and Paper	*	*	*	*	*	*	*	*	*	*	*
Other	649	624	651	728	944	1,021	1,119	1,212	1,242	1,282	1,392
Trans.-Comm.-P.U.	2,877	2,923	3,257	3,489	3,928	4,350	5,019	4,960	5,120	6,213	8,208
Transport	1,844	1,928	2,234	2,355	2,689	3,065	3,039	3,050	3,351	4,293	5,973
Air	799	887	1,018	1,172	1,388	1,537	1,495	1,670	1,873	2,173	2,685
Other	1,045	1,041	1,216	1,183	1,292	1,528	1,544	1,380	1,478	2,120	3,287
Communications	692	654	654	743	824	836	1,494	1,380	1,192	1,304	1,575
Public Utilities	341	341	369	391	415	449	486	530	571	616	660
Trade	5,746	6,259	6,868	7,216	8,335	9,410	10,126	10,805	11,539	13,299	16,286
Wholesale	1,303	1,547	1,671	1,761	2,121	2,349	2,398	2,555	2,579	3,008	4,326
Retail	4,443	4,712	5,197	5,455	6,214	7,061	7,728	8,250	8,960	10,291	11,959
Finance	1,402	1,477	1,468	1,571	1,736	2,109	2,201	2,544	2,936	3,302	3,821
Services	4,180	4,580	4,921	5,331	6,205	7,049	7,677	8,516	9,287	11,215	14,533
Hotel	519	570	601	599	766	836	812	1,005	979	1,323	1,531
Personal	417	450	464	506	517	554	576	582	602	600	652
Business	868	975	1,041	1,090	1,244	1,301	1,285	1,204	1,328	1,852	3,938
Medical	776	844	901	1,019	1,186	1,376	1,682	1,986	2,267	2,553	2,550
Other	1,600	1,741	1,914	2,117	2,493	2,982	3,322	3,739	4,109	4,887	5,862
Federal Government	9,691	9,665	9,774	9,521	9,162	9,776	9,792	9,672	9,778	10,158	10,490
State Government	1,989	2,177	2,242	2,367	2,546	2,872	3,619	4,119	4,306	4,646	4,796
Local Government	2,796	3,067	3,388	3,652	4,276	4,424	4,783	5,422	5,821	6,431	7,239
Total	34,134	35,761	38,317	40,073	43,578	47,407	51,091	54,329	57,156	65,918	78,389

*Information suppressed to avoid disclosure of individual firm data.
Source: Estimated from Alaska Department of Labor Research and Analysis Section Worksheets.

Table A.2. (continued)

Gulf of Alaska Subregion:

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agr.-Forestry-Fisheries	13	24	0	1	0	0	2	24	50	37	58
Mining	*	*	*	*	*	*	*	*	*	*	*
Contract Construction	186	238	150	53	74	57	278	108	91	427	2,555
Manufacturing	138	158	144	165	220	212	130	193	315	224	227
Food	130	152	139	159	213	208	125	183	303	214	217
Lumber and Wood	*	*	*	*	*	*	*	*	*	*	*
Pulp and Paper	*	*	*	*	*	*	*	*	*	*	*
Other	*	*	*	*	*	*	*	*	*	*	*
Trans.-Comm.-P.U.	138	110	109	94	90	97	98	121	167	221	473
Transport	114	83	80	67	67	74	70	92	106	155	392
Air	39	24	19	23	23	29	16	19	23	29	35
Other	75	59	61	44	44	45	54	73	83	126	357
Communications	*	*	*	*	*	*	*	*	*	*	*
Public Utilities	*	*	*	*	*	*	*	*	*	*	*
Trade	136	147	149	139	158	165	149	138	159	230	495
Wholesale	16	24	25	27	48	52	35	19	20	44	62
Retail	120	123	124	122	120	113	114	119	139	186	433
Finance	16	18	20	18	18	23	26	30	39	75	76
Services	129	135	139	139	151	171	183	182	178	286	673
Hotel	40	31	37	27	30	43	72	76	80	155	198
Personal	*	*	*	*	*	*	*	*	*	*	*
Business	*	*	*	*	*	*	*	*	*	*	*
Medical	*	*	*	*	*	*	*	*	*	*	*
Other	59	69	67	77	86	89	89	90	58	88	124
Federal Government	138	126	103	110	114	103	97	84	84	80	99
State Government	327	350	382	410	419	482	520	500	508	531	854
Local Government	112	118	113	85	107	134	171	190	204	252	
Total	1,355	1,453	1,343	1,284	1,467	1,533	1,742	1,643	1,858	2,423	5,596

*Information suppressed to avoid disclosure of individual firm data.

Table A.2. (continued)

Kodiak-Shelikof Subregion:

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agr.-Forestry-Fisheries	0	13	13	16	22	26	18	189	252	282	307
Mining	*	*	*	*	*	*	*	*	*	*	*
Contract Construction	312	291	191	166	84	46	61	125	131	206	269
Manufacturing	630	831	1,014	811	664	743	768	866	1,421	1,274	1,200
Food	618	801	977	779	637	701	738	842	1,383	1,220	1,134
Lumber and Wood	*	*	*	*	*	*	*	*	*	*	*
Pulp and Paper	*	*	*	*	*	*	*	*	*	*	*
Other	*	*	*	*	*	*	*	*	*	*	*
Trans.-Comm.-P.U.	142	161	226	227	236	216	267	228	223	264	219
Transport	117	126	192	196	209	181	197	121	168	200	160
Air	37	43	51	57	62	53	47	51	59	75	87
Other	80	83	141	139	147	128	150	70	109	125	73
Communications	*	*	*	*	*	*	*	*	*	*	*
Public Utilities	*	*	*	*	*	*	*	*	*	*	*
Trade	211	324	331	319	326	346	343	355	394	429	484
Wholesale	10	10	13	11	12	12	12	11	9	10	33
Retail	201	314	318	308	314	334	331	344	385	420	451
Finance	36	40	43	47	51	59	64	60	64	78	91
Services	196	215	193	166	168	191	241	232	268	302	367
Hotel	39	50	46	29	28	30	55	50	52	63	83
Personal	*	*	*	*	*	*	*	*	*	*	*
Business	*	*	*	*	*	*	*	*	*	*	*
Medical	19	27	35	36	44	63	66	76	140	95	85
Other	96	107	99	94	92	91	112	95	63	134	189
Federal Government	541	541	539	504	449	387	351	272	263	244	269
State Government	77	94	111	140	143	167	160	190	178	168	199
Local Government	165	188	212	249	243	284	339	360	382	394	401
Total	2,310	2,710	2,876	2,650	2,395	2,469	2,619	2,878	3,576	3,641	3,802

*Information suppressed to avoid disclosure of individual firm data.

Table A.2. (continued)

Southcentral Alaska:

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agr.-Forestry-Fisheries	52	67	52	74	107	113	123	394	535	554	615
Mining	716	1,038	1,629	1,988	1,968	1,720	1,549	1,417	1,409	1,616	2,201
Contract Construction	4,007	3,922	4,029	3,957	4,121	4,097	4,816	5,036	4,853	7,113	10,700
Manufacturing	1,979	2,173	2,237	2,195	2,383	2,665	2,739	3,024	3,895	3,878	4,201
Food	1,268	1,482	1,497	1,383	1,320	1,492	1,422	1,664	2,475	2,297	2,334
Lumber and Wood	*	*	*	*	*	*	*	*	*	*	*
Pulp and Paper	*	*	*	*	*	*	*	*	*	*	*
Other	664	655	690	761	975	1,055	1,150	1,242	1,290	1,326	1,427
Trans.-Comm.-P.U.	3,157	3,194	3,592	3,810	4,254	4,664	5,384	5,308	5,510	6,698	8,900
Transport	2,076	2,137	2,506	2,618	2,965	3,320	3,306	3,263	3,625	4,646	6,525
Air	875	954	1,088	1,252	1,473	1,619	1,558	1,740	1,955	2,277	2,807
Other	1,201	1,183	1,419	1,367	1,483	1,701	1,748	1,523	1,670	2,371	3,717
Communications	700	666	662	749	828	848	1,542	1,462	1,253	1,376	1,645
Public Utilities	382	391	423	443	462	496	536	584	633	674	730
Trade	6,093	6,730	7,349	7,674	8,819	9,920	10,618	11,298	12,092	13,958	17,265
Wholesale	1,328	1,581	1,709	1,799	2,181	2,413	2,445	3,674	2,608	3,062	4,421
Retail	4,765	5,149	5,639	5,885	6,648	7,508	8,173	8,713	9,484	10,897	12,843
Finance	1,454	1,535	1,531	1,636	1,805	2,191	2,291	2,634	3,039	3,456	3,988
Services	4,505	4,930	5,254	5,636	6,524	7,410	8,101	8,930	9,733	11,803	15,573
Hotel	598	651	684	655	824	909	939	1,131	1,111	1,541	1,812
Personal	427	464	475	515	523	563	585	595	617	612	673
Business	906	999	1,048	1,092	1,245	1,302	1,288	1,207	1,329	1,858	4,236
Medical	820	900	967	970	1,263	1,475	1,766	2,074	2,444	2,683	2,677
Other	1,755	1,917	2,080	2,288	2,671	3,162	3,523	3,924	4,230	5,109	6,175
Federal Government	10,370	10,332	10,416	10,136	9,725	10,266	10,240	10,028	10,125	10,482	10,858
State Government	2,393	2,621	2,736	2,917	3,109	3,521	4,299	4,809	4,993	5,345	13,490
Local Government	3,073	3,373	3,713	3,986	4,626	4,842	5,293	5,972	6,407	7,077	
Total	37,799	39,915	42,536	44,008	47,440	51,409	55,452	58,850	62,590	71,983	87,789

*Information suppressed to avoid disclosure of individual firm data.
Individual entries may not add to total because of rounding errors.

Table A.2. (continued)

State of Alaska:

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agr.-Forestry-Fisheries	145	166	154	146	174	193	226	835	1,040	1,031	1,013
Mining	1,088	1,372	1,967	2,455	3,494	2,995	2,431	2,113	1,966	2,977	3,790
Contract Construction	6,455	5,864	5,991	5,998	6,653	6,894	7,445	7,893	7,837	14,068	25,876
Manufacturing	6,274	6,634	6,621	6,924	7,025	7,839	7,780	8,060	9,349	9,612	9,639
Food	3,007	3,373	3,090	3,313	3,191	3,741	3,612	3,745	4,576	4,293	4,320
Lumber and Wood	1,080	1,266	1,616	1,570	1,581	1,743	1,754	1,799	2,177	2,395	2,176
Pulp and Paper	1,228	1,060	957	947	967	1,016	1,010	1,013	1,022	1,244	1,202
Other	959	933	958	1,093	1,283	1,339	1,408	1,505	1,574	1,681	1,941
Trans.-Comm.-P.U.	7,267	7,279	7,483	7,811	8,807	9,100	9,808	9,993	10,403	12,380	16,473
Transport	4,711	4,709	5,062	5,309	6,272	6,428	6,116	6,365	6,768	8,534	11,943
Air	1,923	1,986	2,230	2,492	3,132	3,071	2,761	3,012	3,266	3,975	4,782
Other	2,789	2,724	2,832	2,817	3,142	3,356	3,354	3,354	3,501	4,557	7,161
Communications	1,897	1,905	1,725	1,764	1,771	1,857	2,779	2,693	2,631	2,809	3,409
Public Utilities	659	665	696	740	763	819	913	935	1,004	1,039	1,121
Trade	9,950	10,806	11,754	12,519	13,946	15,365	16,148	17,107	18,337	21,135	26,209
Wholesale	1,853	2,140	2,380	2,554	2,923	3,245	3,224	3,347	3,405	4,049	5,909
Retail	8,096	8,666	9,374	9,965	11,024	12,121	12,924	13,760	14,932	17,086	20,300
Finance	2,171	2,285	2,315	2,483	2,652	3,098	3,245	3,713	4,243	4,894	6,029
Services	7,513	7,890	8,692	9,289	10,486	11,435	12,559	14,034	15,182	18,313	25,136
Hotel	1,030	1,131	1,222	1,216	1,366	1,448	1,639	1,849	1,884	2,513	3,158
Personal	679	712	739	800	825	852	878	905	869	868	922
Business	1,397	1,415	1,564	1,756	2,128	1,999	2,070	2,061	2,070	2,887	7,318
Medical	1,453	1,517	1,603	1,717	1,925	2,173	2,572	3,005	3,368	3,828	4,330
Other	2,954	3,116	3,564	3,801	4,245	4,963	5,402	6,218	6,991	8,218	9,408
Federal Government	17,429	17,509	17,422	16,860	16,453	17,112	17,269	17,234	17,166	18,016	18,288
State Government	6,994	7,677	8,105	8,684	9,329	10,363	11,730	13,277	13,757	14,164	14,678
Local Government	5,240	5,719	6,284	6,640	7,548	8,078	8,956	9,987	10,575	11,591	14,176
Total	70,527	73,193	76,785	79,802	86,563	92,465	97,585	104,244	109,852	128,177	161,308

Table A.3.

Wages and Salaries by Place of Work
and Personal Income by Place of Residence, 1965-1975

(Thousands of Dollars)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Cook Inlet Subregion											
Wages and Salaries	372,045	399,733	462,881	511,502	597,538	642,069	709,675	777,076	828,956	1,055,883	1,447,492
Personal Income	416,818	448,679	522,634	570,397	668,400	731,366	809,234	891,765	991,585	1,263,057	1,720,196
Real Income (1967 $)	442,482	448,679	522,634	555,943	631,161	667,304	716,771	769,426	820,849	943,284	1,129,479
Gulf of Alaska Subregion											
Wages and Salaries	9,341	10,398	11,930	13,343	11,051	16,336	18,889	19,520	21,433	40,656	185,903
Personal Income	13,658	15,169	16,214	17,646	18,459	23,382	25,915	26,444	31,448	40,696	101,065
Real Income (1967 $)	14,499	15,169	16,214	17,199	17,431	21,334	22,954	22,816	26,033	30,393	66,359
Kodiak-Shelikof Subregion											
Wages and Salaries	25,239	26,663	27,533	29,877	32,675	36,427	39,938	33,094	42,210	49,549	59,971
Personal Income	30,689	32,868	33,724	36,053	39,870	45,731	49,905	43,452	57,936	65,717	77,503
Real Income (1967 $)	32,579	32,868	33,724	35,193	37,649	41,725	44,203	37,491	47,960	49,079	50,888
Southcentral Region											
Wages and Salaries	406,625	436,794	502,344	554,722	641,264	694,832	768,502	829,690	892,599	1,146,088	1,693,366
Personal Income	461,165	496,716	572,572	624,096	726,729	800,479	885,054	961,661	1,080,969	1,369,470	1,898,764
Real Income (1967 $)	489,559	496,716	572,572	608,281	686,241	730,364	783,927	829,733	894,842	1,022,756	1,246,726
State											
Wages and Salaries	759,000	811,000	891,000	978,000	1,110,000	1,243,000	1,360,000	1,477,000	1,621,000	2,167,000	3,449,000
Personal Income	858,000	926,000	1,017,000	1,110,000	1,244,000	1,410,000	1,563,000	1,698,000	2,006,000	2,429,000	3,443,000
Real Income (1967 $)	910,828	926,000	1,017,000	1,081,871	1,174,693	1,286,496	1,384,410	1,465,056	1,660,596	1,814,040	2,260,670

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. August 1977 printouts.

Table A.4.

Estimated July 1 Resident Population, Study Subregions
Southcentral Alaska and State, 1965-1975

	1965	1966	1967	1968	1969	1970[1]	1971	1972	1973	1974	1975
Cook Inlet Subregion											
Anchorage	102,337	105,925	107,817	111,600[2]	114,150	126,333	134,971	143,255	149,440	153,112	177,817
Kenai-Cook Inlet	8,446	9,020	9,400	11,300	13,550	14,250	14,204	13,830	13,808	13,962	15,621
Matanuska-Susitna	6,125	6,481	6,379	6,420	7,000	6,509	7,293	8,310	8,586	9,787	12,462
Seward	2,213	2,239	2,780	2,860	2,700	2,336	2,578	2,370	2,446	2,683	3,149
Total	119,121	123,665	126,376	132,180	137,400	149,428	159,046	167,765	174,280	179,544	209,049
Gulf of Alaska Subregion											
Cordova-McCarthy	1,991	1,956	2,088	2,200	2,240	1,857	1,930	1,862	1,982	1,960	2,003
Valdez-Chitina-Whittier	2,396	2,449	2,281	2,200	2,300	3,098	2,932	3,464	3,568	3,833	9,639
Total	4,387	4,405	4,369	4,400	4,540	4,955	4,862	5,326	5,550	5,793	11,642
Kodiak-Shelikof Subregion											
Kodiak	9,064	8,479	9,478	9,520	9,870	9,409	9,665	8,645	8,868	9,232	8,801
Southcentral Alaska Total	132,572	136,549	140,223	146,100	151,810	163,792	173,573	181,736	188,698	194,569	229,492
State Total	265,192	271,505	277,906	284,880	294,560	302,361	311,070	322,115	330,365	351,159	404,634

[1] April 1970 Census of Population. Data may be lower than July 1 partially due to seasonality of employment, especially in fishing.

[2] Special Census taken in October 1968 tabulated 113,522.

Source: State of Alaska Department of Labor Research and Analysis Section, Population Estimates by Census Division.

Table A.5.

Consumer Price Index for Urban Wage and Clerical Worker Families of Two or More Persons

Anchorage, Alaska - All Items, Groups, and Subgroups

(October 1967 = 100)

	All Items	Food	Housing	Apparel and Upkeep	Transportation	Health and Recreation
1965	94.2	96.8	92.2	95.0	96.1	94.5
1966	100.0	100.0	96.8	100.7	97.2	97.2
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	102.6	101.3	103.2	103.4	100.5	103.5
1969	105.9	104.7	107.1	104.3	102.7	106.6
1970	109.6	107.2	110.5	108.8	106.9	112.2
1971	112.9	109.2	113.8	112.2	111.4	116.0
1972	115.9	113.1	117.3	115.7	111.8	118.5
1973	120.8	124.4	120.4	120.6	113.1	122.8
1974	133.9	145.7	131.5	128.5	122.6	136.1
1975	152.3	167.6	152.7	138.6	134.6	152.5

1965, 1966, 1967, 1968 - October Index cited

1969--1975 - Average Annual Index cited

Source: U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.

Table A.6.

Traffic in Southcentral Alaskan Ports, 1965-1975

(Short Tons, Number of Persons)

Port	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Cook Inlet Subregion											
Anchorage											
Tonnage	1,080,094	1,008,999	1,406,128	1,310,981	1,807,405	1,936,976	1,782,064	2,058,199	2,624,763	2,340,181	2,936,159
Passengers	19	11	4	NA	1,754	1,954	2,840	2,342	2,900	--	--
Homer											
Tonnage	10,871	13,811	22,957	17,424	19,488	189,748	52,564	170,382	146,349	11,939	39,279
Passengers	1,353	2,328	836	3,123	3,911	5,074	5,850	7,052	8,666	10,511	11,215
Ninilchik											
Tonnage	NA	NA	NA	NA	NA	NA	NA	--	50	--	763
Passengers	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--
Seward											
Tonnage	37,462	49,326	90,857	117,329	60,084	29,309	126,664	61,726	51,913	71,844	382,051
Passengers	3,185	2,954	2,757	2,987	1,443	1,712	2,041	2,612	2,926	7,628	8,859
Seldovia											
Tonnage	20,566	12,232	51,589	15,321	92,713	98,145	18,944	9,447	10,663	9,171	9,462
Passengers	180	2,026	1,477	881	1,331	1,952	1,896	2,279	2,662	4,317	4,523
South Side Alaska Peninsula											
Tonnage	NA	NA	NA	9,783,924	11,340,000	13,284,699	12,587,185	12,399,786	11,864,646	11,778,847	11,764,374
Passengers	NA	NA	NA	408	435	227	370	632	859	1,165	891
Total											
Tonnage	1,148,993	1,084,368	1,571,531	11,244,979	13,319,690	15,538,877	14,567,421	14,699,540	14,698,384	14,211,982	15,132,088
Passengers	4,737	7,319	5,074	7,399	8,874	10,919	12,997	14,917	18,013	23,621	25,488

Source: Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Part 4.

Table A.6. (continued)

Port	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Gulf of Alaska Subregion											
Valdez											
Tonnage	51,336	188,093	215,022	181,945	354,935	477,677	288,728	253,505	301,076	356,967	654,514
Passengers	NA	3,789	NA	NA	NA	16,162	20,004	12,277	25,297	25,577	25,039
Cordova											
Tonnage	43,169	56,830	51,114	43,666	46,405	34,455	68,553	42,114	46,750	35,218	43,132
Passengers	3,882	4,197	941	3,594	3,187	4,247	5,637	5,616	5,851	8,291	8,256
Whittier											
Tonnage	177,249	NA	NA	311,997	485,380	348,954	713,290	646,609	392,491	666,315	667,112
Passengers	--	NA	NA	4,339	8,045	13,449	16,535	18,833	19,186	20,173	18,942
Total											
Tonnage	271,754	244,923	266,136	537,608	886,720	861,086	1,070,571	942,228	740,317	1,058,500	1,364,758
Passengers	3,882	7,986	941	7,933	11,232	33,858	42,176	36,726	50,334	54,041	52,237
Kodiak-Shelikof Subregion											
Kodiak											
Tonnage	127,584	212,675	133,247	109,645	115,863	124,479	148,444	192,963	236,612	217,024	329,639
Passengers	3,219	3,790	6,407	3,755	4,959	5,839	7,985	9,717	10,875	11,846	12,350
Old Harbor											
Tonnage	NA	NA	NA	NA	NA	NA	NA	NA	3,166	1,416	732
Passengers	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--
Total											
Tonnage	127,584	212,675	133,247	109,645	115,863	124,479	148,444	192,963	239,778	218,440	330,371
Passengers	3,219	3,790	6,407	3,755	4,959	5,839	7,985	9,717	10,875	11,846	12,350
SOUTHCENTRAL REGION											
Tonnage	1,548,331	1,541,966	1,970,914	11,892,232	14,322,273	16,524,442	15,786,436	15,834,731	15,678,479	15,488,922	16,827,217
Passengers	11,838	19,095	12,422	19,087	25,065	50,616	63,158	61,360	79,222	89,508	90,075

APPENDIX B

SELECTED REGIONAL MODEL INPUTS AND OUTPUTS

Appendix B

Selected Regional Model Inputs and Outputs

Employment (Note: Suffix R5 denotes Anchorage, R4 denotes Other Southcentral)

Exogenous Industries (Basic Employment)

EMA9A	Employment in agriculture (10^3 persons)
EMA9B	Employment in forestry (10^3 persons)
EMA9C	Employment in fisheries (10^3 persons)
EMMF	Employment in food manufacturing (10^3 persons)
EMML	Employment in lumber and wood products (10^3 persons)
EMMP	Employment in pulp and paper (10^3 persons)
EMMO	Employment in other manufacturing (10^3 persons)
EMP9	Employment in mining (10^3 persons)
ECONX	Exogenous construction employment (10^3 persons)
EMPUX	Exogenous public utilities employment (10^3 persons)
EMS9X	Exogenous services employment (10^3 persons)
EMTOX	Exogenous transportation employment (10^3 persons)
EMGF	Employment by the federal government (10^3 persons)
EMGS	Employment by the state government (10^3 persons)
EMGL	Employment by local government (10^3 persons)
EM99	Total employment (10^3 persons)

Endogenous Industries (Nonbasic Employment)

EMCN1	Employment in endogenous (nonbasic) construction (10^3 persons)
EMCM	Employment in communications (10^3 persons)
EMTA	Employment in air transportation (10^3 persons)
EMTO	Employment in other transportation (10^3 persons)
EMPU	Employment in public utilities (10^3 persons)
EMFI	Employment in finance, insurance, and real estate (10^3 persons)
EMDW	Employment in wholesale trade (10^3 persons)
EMDR	Employment in retail trade (10^3 persons)
EMS9	Employment in services (10^3 persons)

Population (Note: Anchorage total and non-Native civilian population not engaged in major construction projects has been adjusted upward in the text by 20 thousand persons from the number shown in this appendix to hit the 1978 population estimated by the Municipality of Anchorage.)

Population (continued)

CNNP2	Non-Native civilian population not engaged in major construction projects (10^3 persons)
POPNE	Native population (10^3 persons)
POPM	Military population (includes only active duty military) (10^3 persons)

High Case Employment (10^3 persons)

	EMA9AR4	EMA9AR5	EMA9BR4	EMA9BR5	EMA9CR4	EMA9CR5
1980	0.089	0.	0.	0.	2.467	0.
1981	0.089	0.	0.	0.	2.592	0.
1982	0.083	0.	0.	0.	2.753	0.
1983	0.091	0.	0.	0.	2.961	0.
1984	0.1	0.	0.	0.	3.228	0.
1985	0.107	0.	0.	0.	3.573	0.
1986	0.112	0.	0.	0.	3.879	0.
1987	0.118	0.	0.	0.	4.247	0.
1988	0.133	0.	0.	0.	4.689	0.
1989	0.154	0.	0.	0.	5.219	0.
1990	0.186	0.	0.	0.	5.853	0.
1991	0.224	0.	0.	0.	6.182	0.
1992	0.274	0.	0.	0.	6.539	0.
1993	0.341	0.	0.	0.	6.927	0.
1994	0.409	0.	0.	0.	7.349	0.
1995	0.456	0.	0.	0.	7.807	0.
1996	0.506	0.	0.	0.	8.305	0.
1997	0.573	0.	0.	0.	8.845	0.
1998	0.643	0.	0.	0.	9.431	0.
1999	0.725	0.	0.	0.	10.068	0.
2000	0.823	0.	0.	0.	10.76	0.

	EMMFR4	EMMFR5	EMMLR4	EMMLR5	EMMPR4	EMMPR5
1980	2.188	0.496	0.311	0.148	0.	0.
1981	2.231	0.529	0.319	0.148	0.	0.
1982	2.28	0.562	0.326	0.148	0.	0.
1983	2.337	0.595	0.333	0.148	0.	0.
1984	2.406	0.628	0.341	0.148	0.	0.
1985	2.485	0.662	0.349	0.148	0.	0.
1986	2.582	0.695	0.357	0.148	0.	0.
1987	2.698	0.728	0.365	0.148	0.	0.
1988	2.838	0.761	0.374	0.148	0.	0.
1989	3.008	0.794	0.382	0.148	0.	0.
1990	3.23	0.827	0.391	0.148	0.	0.
1991	3.319	0.86	0.4	0.148	0.	0.
1992	3.41	0.893	0.409	0.149	0.	0.
1993	3.51	0.926	0.419	0.148	0.	0.
1994	3.613	0.959	0.428	0.148	0.	0.
1995	3.724	0.992	0.438	0.148	0.	0.
1996	3.841	1.025	0.448	0.148	0.	0.
1997	3.964	1.058	0.458	0.148	0.	0.
1998	4.097	1.091	0.469	0.148	0.	0.
1999	4.236	1.124	0.48	0.148	0.	0.
2000	4.384	1.157	0.491	0.148	0.	0.

High Case Employment (10^3 persons)

	EMMOR4	EMMOR5	EMP9R4	EMP9R5	ECONXR4	ECONXR5
1980	0.398	1.1	2.532	1.009	2.132	0.626
1981	0.458	1.1	3.03	1.009	6.417	0.524
1982	0.458	1.1	3.762	1.009	5.952	0.027
1983	0.458	1.1	4.59	1.009	6.11	0.
1984	2.383	1.1	4.779	1.009	2.676	0.
1985	2.443	1.1	4.649	1.009	2.487	0.
1986	2.443	1.1	4.167	1.009	2.26	0.
1987	2.383	1.1	3.892	1.009	2.844	0.
1988	2.333	1.1	4.448	1.009	3.154	0.
1989	2.333	1.1	3.547	1.009	1.995	0.
1990	2.333	1.1	3.551	1.009	1.155	0.
1991	2.333	1.1	3.249	1.009	0.775	0.
1992	2.333	1.1	2.395	1.009	0.725	0.
1993	2.333	1.1	1.243	1.009	0.725	0.
1994	2.333	1.1	1.243	1.009	0.725	0.
1995	2.333	1.1	1.243	1.009	0.075	0.
1996	2.333	1.1	1.243	1.009	0.075	0.
1997	2.333	1.1	1.243	1.009	0.075	0.
1998	2.333	1.1	1.243	1.009	0.075	0.
1999	2.333	1.1	1.243	1.009	0.075	0.
2000	2.333	1.1	1.243	1.009	0.075	0.

	EMPUXR4	EMTOXR4	EMS9XR4	EMGFR4	EMGFR5	EMGSR4
1980	0.	0.5	0.05	1.486	22.332	2.035
1981	0.	0.5	0.09	1.536	22.478	2.245
1982	0.	0.5	0.12	1.592	22.626	2.475
1983	0.	0.5	0.12	1.652	22.776	2.73
1984	0.09	0.5	0.1	1.717	22.928	3.01
1985	0.09	0.5	0.08	1.786	23.082	3.32
1986	0.12	0.5	0.06	1.855	23.238	3.554
1987	0.12	0.5	0.06	1.929	23.395	3.805
1988	0.12	0.5	0.06	2.009	23.555	4.074
1989	0.12	0.5	0.12	2.094	23.717	4.362
1990	0.12	0.53	0.06	2.186	23.882	4.67
1991	0.12	0.53	0.	2.195	24.	4.969
1992	0.12	0.53	0.	2.206	24.118	5.287
1993	0.12	0.53	0.	2.144	24.238	5.626
1994	0.12	0.53	0.	2.226	24.36	5.987
1995	0.12	0.53	0.	2.236	24.482	6.37
1996	0.12	0.53	0.	2.255	24.6	6.664
1997	0.12	0.53	0.	2.275	24.719	6.971
1998	0.12	0.53	0.	2.295	24.839	7.292
1999	0.12	0.53	0.	2.315	24.96	7.628
2000	0.12	0.53	0.	2.336	25.082	7.98

High Case Employment (10^3 persons)

	EMGSR5	EMGLR4	EMGLR5
1980	4.75	2.47	6.8
1981	4.827	2.708	6.935
1982	4.906	2.969	7.072
1983	4.986	3.254	7.212
1984	5.067	3.567	7.354
1985	5.15	3.91	7.5
1986	5.256	4.179	7.644
1987	5.363	4.465	7.791
1988	5.473	4.772	7.941
1989	5.585	5.1	8.094
1990	5.7	5.45	8.25
1991	5.806	5.713	8.413
1992	5.914	5.989	8.58
1993	6.024	6.279	8.749
1994	6.136	6.582	8.923
1995	6.25	6.9	9.1
1996	6.384	7.218	9.273
1997	6.521	7.549	9.45
1998	6.661	7.897	9.63
1999	6.804	8.26	9.813
2000	6.95	8.64	10.

High Case Employment (10^3 persons)

	EMCN1R4	EMCN1R5	EMCMR4	EMCMR5	EMTAR4	EMTAR5
1980	2.12729	5.74844	0.379877	1.97612	0.160764	5.393
1981	3.40604	6.21602	0.403392	2.10671	0.170727	6.44835
1982	3.59145	6.30023	0.406319	2.12304	0.180632	6.31059
1983	3.9267	6.66957	0.422798	2.21535	0.192117	6.96902
1984	3.48293	6.88516	0.434184	2.27944	0.194357	7.19775
1985	3.69281	7.24026	0.450854	2.37374	0.194041	7.72055
1986	3.88646	7.67276	0.469483	2.47973	0.189786	8.36552
1987	4.30468	8.00797	0.486631	2.57785	0.187179	8.83742
1988	4.7417	8.47143	0.503654	2.67578	0.19534	9.58682
1989	4.68479	8.89282	0.52189	2.78122	0.184446	10.2402
1990	4.76982	9.20498	0.539367	2.88279	0.185239	10.8707
1991	4.93924	9.56134	0.55519	2.97516	0.181514	11.3801
1992	5.23411	9.94046	0.57257	3.07707	0.167849	12.0002
1993	5.57595	10.3761	0.592684	3.19558	0.141051	12.8455
1994	6.00298	10.7435	0.612179	3.31102	0.141873	13.6649
1995	6.18758	11.2459	0.632693	3.43306	0.142481	14.5543
1996	6.65221	11.8398	0.654535	3.56366	0.143348	15.5892
1997	7.16677	12.4682	0.67966	3.71465	0.144224	16.8276
1998	7.73151	13.1574	0.703884	3.86101	0.145097	18.0704
1999	8.35651	13.8695	0.729329	4.01554	0.145984	19.4277
2000	9.05158	14.4448	0.756004	4.17837	0.146875	20.9082

	EMTOR4	EMTOR5	EMPUR4	EMPUR5	EMFIR4	EMFIR5
1980	0.760286	1.63451	0.352789	0.919091	0.419775	4.96199
1981	0.908737	1.7567	0.397509	1.0136	0.482526	5.6398
1982	0.98185	1.77862	0.412339	1.03081	0.503606	5.76545
1983	1.07628	1.87454	0.432801	1.107	0.532897	6.32913
1984	1.06093	1.93032	0.456926	1.15196	0.567731	6.66754
1985	1.07337	2.02192	0.476104	1.2268	0.595643	7.23981
1986	1.05868	2.13301	0.492864	1.3192	0.620192	7.96131
1987	1.06685	2.21878	0.514566	1.39173	0.652184	8.15078
1988	1.1461	2.3369	0.538815	1.49327	0.688202	8.79478
1989	1.06963	2.44386	0.552371	1.5868	0.708456	9.25919
1990	1.07942	2.52284	0.570976	1.65683	0.736389	9.56125
1991	1.06295	2.61274	0.586922	1.73749	0.76045	10.241
1992	0.984218	2.70811	0.606037	1.82415	0.789438	10.6311
1993	0.817004	2.81735	0.625621	1.92476	0.819298	11.0827
1994	0.836669	2.90918	0.650483	2.01044	0.857429	11.5958
1995	0.846726	3.03436	0.67012	2.12878	0.887719	12.3518
1996	0.867083	3.18181	0.695463	2.27042	0.927031	13.4312
1997	0.888394	3.33717	0.722578	2.42223	0.96936	14.3863
1998	0.910449	3.50688	0.751286	2.59097	1.01446	15.6765
1999	0.933521	3.68149	0.781866	2.76765	1.06283	16.8063
2000	0.957644	3.82203	0.814661	2.91206	1.11505	17.7068

High Case Employment (10^3 persons)

	EMDWR4	EMDWR5	EMDRR4	EMDRR5	EMS9R4	EMS9R5
1980	0.609311	7.94194	3.17775	14.4841	5.30948	16.3622
1981	0.940547	9.24628	3.92908	16.1241	9.49216	18.7464
1982	1.00698	9.04652	4.19354	16.4479	10.1805	19.1882
1983	1.11723	9.84324	4.57071	17.7883	11.306	21.164
1984	1.01548	10.1188	5.03358	18.5944	9.72151	22.3625
1985	1.06563	10.7659	5.41538	19.9245	10.4003	24.4118
1986	1.10125	11.5601	5.75903	21.5709	11.0324	27.0107
1987	1.19626	12.15	6.21765	22.8762	12.5124	29.1016
1988	1.32401	13.0255	6.74824	24.7038	14.0972	32.1016
1989	1.28192	13.8023	7.05311	26.3993	14.0083	34.9373
1990	1.30449	14.5466	7.4811	27.6809	14.1999	35.899
1991	1.33684	15.1591	7.85664	29.1594	14.7049	37.3925
1992	1.38012	15.8977	8.3174	30.7525	15.8055	39.1542
1993	1.42297	16.8796	8.80138	32.6066	17.1006	40.9928
1994	1.52776	17.3043	9.43294	33.4271	18.7461	42.5827
1995	1.57333	18.149	9.94526	35.0588	19.4664	45.9911
1996	1.6872	19.1458	10.6239	36.9844	21.303	49.9201
1997	1.81309	20.2057	11.3717	39.0318	23.374	54.1641
1998	1.95103	21.3887	12.1875	41.3171	25.6894	58.9026
1999	2.10346	22.61	13.0835	43.6765	28.3008	63.9229
2000	2.2727	23.4878	14.0753	45.372	31.2618	66.6502

High Case Population (10^3 persons)

	CNNP2R4	CNNP2R5	POPMR4	POPMR5	POPNE4	POPNE5
1980	49.2459	166.29	0.836244	12.0817	7.35156	7.02763
1981	63.2747	180.685	0.836244	12.0817	7.49859	7.16818
1982	68.4019	183.638	0.836244	12.0817	7.64855	7.31154
1983	75.3488	195.706	0.836244	12.0817	7.80152	7.45777
1984	78.3599	203.381	0.836244	12.0817	7.95755	7.60692
1985	83.1146	215.359	0.836244	12.0817	8.11669	7.75905
1986	86.6514	230.046	0.836244	12.0817	8.27902	7.91423
1987	93.0389	241.613	0.836244	12.0817	8.4446	8.07251
1988	101.824	257.979	0.836244	12.0817	8.61349	8.23395
1989	103.463	273.142	0.836244	12.0817	8.78575	8.39863
1990	108.379	283.469	0.836244	12.0817	8.96146	8.5666
1991	112.175	295.218	0.836244	12.0817	9.14068	8.73792
1992	116.521	307.761	0.836244	12.0817	9.32349	8.91268
1993	120.68	322.12	0.836244	12.0817	9.50996	9.09093
1994	128.93	332.985	0.836244	12.0817	9.70015	9.27274
1995	134.659	350.388	0.836244	12.0817	9.89415	9.45819
1996	143.36	370.648	0.836244	12.0817	10.092	9.64735
1997	152.917	392.098	0.836244	12.0817	10.2939	9.84029
1998	163.31	415.827	0.836244	12.0817	10.4997	10.0371
1999	174.724	440.262	0.836244	12.0817	10.7097	10.2378
2000	187.375	458.071	0.836244	12.0817	10.9239	10.4426

	POPR4	POPR5
1980	59.5656	186.026
1981	78.0265	200.459
1982	82.8387	203.059
1983	90.0965	215.245
1984	89.8297	223.069
1985	94.5545	235.2
1986	98.0267	250.042
1987	105.164	261.768
1988	114.428	278.294
1989	115.08	293.622
1990	119.332	304.117
1991	122.927	316.038
1992	127.406	328.755
1993	131.751	343.293
1994	140.192	354.339
1995	145.464	371.928
1996	154.363	392.377
1997	164.122	414.019
1998	174.721	437.946
1999	186.345	462.582
2000	199.21	480.595

Low Case Employment (10^3 persons)

	EMA9AR4	EMA9AR5	EMA9BR4	EMA9BR5	EMA9CR4	EMA9CR5
1980	0.084	0.	0.	0.	2.031	0.
1981	0.078	0.	0.	0.	2.031	0.
1982	0.078	0.	0.	0.	2.031	0.
1983	0.064	0.	0.	0.	2.031	0.
1984	0.063	0.	0.	0.	2.031	0.
1985	0.048	0.	0.	0.	2.031	0.
1986	0.038	0.	0.	0.	2.031	0.
1987	0.029	0.	0.	0.	2.031	0.
1988	0.023	0.	0.	0.	2.031	0.
1989	0.016	0.	0.	0.	2.031	0.
1990	0.	0.	0.	0.	2.031	0.
1991	0.	0.	0.	0.	2.031	0.
1992	0.	0.	0.	0.	2.031	0.
1993	0.	0.	0.	0.	2.031	0.
1994	0.	0.	0.	0.	2.031	0.
1995	0.	0.	0.	0.	2.031	0.
1996	0.	0.	0.	0.	2.031	0.
1997	0.	0.	0.	0.	2.031	0.
1998	0.	0.	0.	0.	2.031	0.
1999	0.	0.	0.	0.	2.031	0.
2000	0.	0.	0.	0.	2.031	0.

	EMMFR4	EMMFR5	EMMLR4	EMMLR5	EMMPR4	EMMPR5
1980	2.003	0.331	0.292	0.148	0.	0.
1981	2.003	0.331	0.295	0.148	0.	0.
1982	2.003	0.331	0.298	0.148	0.	0.
1983	2.003	0.331	0.301	0.148	0.	0.
1984	2.003	0.331	0.304	0.148	0.	0.
1985	2.003	0.331	0.307	0.148	0.	0.
1986	2.003	0.331	0.31	0.148	0.	0.
1987	2.003	0.331	0.313	0.148	0.	0.
1988	2.003	0.331	0.316	0.148	0.	0.
1989	2.003	0.331	0.32	0.148	0.	0.
1990	2.003	0.331	0.323	0.148	0.	0.
1991	2.003	0.331	0.326	0.148	0.	0.
1992	2.003	0.331	0.329	0.148	0.	0.
1993	2.003	0.331	0.333	0.148	0.	0.
1994	2.003	0.331	0.336	0.148	0.	0.
1995	2.003	0.331	0.339	0.148	0.	0.
1996	2.003	0.331	0.343	0.148	0.	0.
1997	2.003	0.331	0.346	0.148	0.	0.
1998	2.003	0.331	0.349	0.148	0.	0.
1999	2.003	0.331	0.352	0.148	0.	0.
2000	2.003	0.331	0.357	0.148	0.	0.

Low Case Employment (10^3 persons)

	EMMOR4	EMMOR5	EMP9R4	EMP9R5	ECONXR4	ECONXR5
1980	0.348	1.1	2.363	1.009	0.527	0.626
1981	0.408	1.1	2.664	1.009	1.294	0.524
1982	0.408	1.1	2.59	1.009	1.065	0.027
1983	0.408	1.1	2.67	1.009	0.284	0.
1984	0.408	1.1	2.731	1.009	0.099	0.
1985	0.408	1.1	2.388	1.009	0.	0.
1986	0.408	1.1	1.931	1.009	0.	0.
1987	0.408	1.1	1.297	1.009	0.	0.
1988	0.408	1.1	1.229	1.009	0.	0.
1989	0.408	1.1	1.229	1.009	0.	0.
1990	0.408	1.1	1.229	1.009	0.	0.
1991	0.408	1.1	1.229	1.009	0.	0.
1992	0.408	1.1	1.229	1.009	0.	0.
1993	0.408	1.1	1.229	1.009	0.	0.
1994	0.408	1.1	1.229	1.009	0.	0.
1995	0.408	1.1	1.229	1.009	0.	0.
1996	0.408	1.1	1.229	1.009	0.	0.
1997	0.408	1.1	1.229	1.009	0.	0.
1998	0.408	1.1	1.229	1.009	0.	0.
1999	0.408	1.1	1.229	1.009	0.	0.
2000	0.408	1.1	1.229	1.009	0.	0.

	EMPUXR4	EMTOXR4	EMS9XR4	EMGFR4	EMGFR5	EMGSR4
1980	0.	0.5	0.	1.486	22.332	1.89
1981	0.	0.5	0.	1.486	22.391	1.938
1982	0.	0.5	0.	1.486	22.451	1.986
1983	0.	0.5	0.	1.486	22.511	2.036
1984	0.	0.5	0.	1.486	22.571	2.087
1985	0.	0.5	0.	1.486	22.632	2.14
1986	0.	0.5	0.	1.486	22.691	2.14
1987	0.	0.5	0.	1.49	22.751	2.14
1988	0.	0.5	0.	1.492	22.811	2.14
1989	0.	0.5	0.	1.494	22.871	2.14
1990	0.	0.5	0.	1.536	22.932	2.14
1991	0.	0.5	0.	1.536	23.001	2.14
1992	0.	0.5	0.	1.536	23.071	2.14
1993	0.	0.5	0.	1.536	23.141	2.14
1994	0.	0.5	0.	1.536	23.211	2.14
1995	0.	0.5	0.	1.536	23.282	2.14
1996	0.	0.5	0.	1.546	23.341	2.14
1997	0.	0.5	0.	1.556	23.401	2.14
1998	0.	0.5	0.	1.566	23.461	2.14
1999	0.	0.5	0.	1.576	23.521	2.14
2000	0.	0.5	0.	1.586	23.582	2.14

Low Case Employment (10^3 persons)

	EMGSR5	EMGLR4	EMGLR5
1980	4.75	2.325	6.75
1981	4.799	2.384	6.819
1982	4.848	2.444	6.888
1983	4.898	2.506	6.958
1984	4.948	2.57	7.029
1985	5.	2.635	7.1
1986	5.	2.661	7.171
1987	5.	2.688	7.243
1988	5.	2.715	7.315
1989	5.	2.742	7.388
1990	5.	2.769	7.462
1991	5.	2.797	7.537
1992	5.	2.825	7.612
1993	5.	2.853	7.688
1994	5.	2.882	7.765
1995	5.	2.911	7.843
1996	5.	2.94	7.921
1997	5.	2.969	8.
1998	5.	2.999	8.08
1999	5.	3.029	8.161
2000	5.	3.059	8.243

Low Case Employment (10^3 persons)

	EMCN1R4	EMCN1R5	EMCMR4	EMCMR5	EMTAR4	EMTAR5
1980	1.68314	5.81442	0.374244	1.94501	0.158596	5.12368
1981	1.94813	6.07018	0.386739	2.0141	0.164757	5.64693
1982	1.93969	5.99211	0.380768	1.98105	0.162038	5.15774
1983	1.78646	6.14256	0.386033	2.01019	0.16375	5.24823
1984	1.78469	6.31482	0.394799	2.05885	0.165292	5.50231
1985	1.79313	6.46244	0.402438	2.10139	0.159704	5.63799
1986	1.84182	6.71447	0.411859	2.15401	0.1517	5.83048
1987	1.84172	6.77087	0.414524	2.16894	0.135939	5.70024
1988	1.88931	6.93871	0.419274	2.19556	0.134334	5.60128
1989	1.95708	7.26853	0.432454	2.26969	0.135292	5.98102
1990	2.01829	7.51431	0.442287	2.32522	0.136025	6.24913
1991	2.08497	7.83704	0.454581	2.39489	0.136758	6.59582
1992	2.14771	8.10533	0.463033	2.44296	0.137503	6.84066
1993	2.22098	8.42028	0.473825	2.50453	0.138252	7.16031
1994	2.29273	8.70495	0.483954	2.5625	0.13906	7.50115
1995	2.3654	9.06222	0.4957	2.62996	0.139809	7.86509
1996	2.44047	9.42504	0.505122	2.68425	0.14052	8.13893
1997	2.51995	9.80824	0.516614	2.75066	0.141242	8.48401
1998	2.60418	10.2269	0.526931	2.81047	0.141998	8.82428
1999	2.68908	10.6426	0.538493	2.8777	0.142683	9.15606
2000	2.78312	11.102	0.550146	2.94567	0.143453	9.55592

	EMTOR4	EMTOR5	EMPUR4	EMPUR5	EMFIR4	EMFIR5
1980	0.708977	1.6518	0.334269	0.932313	0.394166	5.05557
1981	0.766368	1.71867	0.34629	0.983922	0.410762	5.42478
1982	0.75103	1.69828	0.348081	0.968109	0.413243	5.311
1983	0.745861	1.73755	0.347185	0.998626	0.412002	5.53107
1984	0.753805	1.78242	0.350256	1.0338	0.416259	5.78731
1985	0.725248	1.8208	0.353252	1.06414	0.420418	6.01049
1986	0.687694	1.88616	0.357634	1.11633	0.426512	6.39904
1987	0.605868	1.90077	0.358282	1.12808	0.427415	6.48729
1988	0.601157	1.94416	0.362961	1.16319	0.433937	6.75266
1989	0.611073	2.0292	0.369078	1.2328	0.442486	7.28613
1990	0.619292	2.09238	0.374653	1.28519	0.450299	7.44789
1991	0.627851	2.17508	0.380238	1.35465	0.458144	8.02488
1992	0.636153	2.24364	0.385689	1.41294	0.46582	8.28651
1993	0.645146	2.32389	0.391577	1.48199	0.474131	8.60166
1994	0.654301	2.39622	0.397519	1.54496	0.482541	9.01179
1995	0.663144	2.48675	0.403555	1.62473	0.491104	9.54098
1996	0.671877	2.57839	0.409755	1.70655	0.499922	10.2422
1997	0.680893	2.67488	0.416224	1.79383	0.509148	10.8349
1998	0.690339	2.77998	0.422888	1.89018	0.518677	11.6559
1999	0.699356	2.88398	0.429659	1.98682	0.528384	12.3278
2000	0.709339	2.99855	0.436874	2.09473	0.538756	13.0734

Low Case Employment (10^3 persons)

	EMDWR4	EMDWR5	EMDRR4	EMDRR5	EMS9R4	EMS9R5
1980	0.496608	7.59987	2.88718	14.7084	3.90864	16.691
1981	0.572565	8.23944	3.0744	15.6167	4.67668	17.989
1982	0.56555	7.60835	3.10274	15.3738	4.64928	17.5863
1983	0.531062	7.72523	3.08855	15.9215	4.16488	18.3362
1984	0.533494	8.04817	3.13729	16.5502	4.14702	19.233
1985	0.525507	8.23326	3.18517	17.0966	4.17115	20.0236
1986	0.524591	8.49343	3.25578	18.0232	4.31203	21.4048
1987	0.503966	8.35607	3.26628	18.2485	4.31159	21.7191
1988	0.513909	8.26473	3.3425	18.8807	4.45023	22.6664
1989	0.531648	8.75019	3.44334	20.1195	4.64919	24.578
1990	0.547526	9.09418	3.53638	21.0608	4.83032	26.0453
1991	0.564757	9.536	3.63067	22.3077	5.02921	28.027
1992	0.581037	9.84625	3.72374	23.3615	5.21782	29.7212
1993	0.599917	10.2493	3.82543	24.6112	5.43984	31.764
1994	0.618496	10.6713	3.92927	25.7571	5.659	33.0953
1995	0.637235	11.1253	4.03598	27.2095	5.88268	35.5268
1996	0.656523	11.4691	4.14691	28.7054	6.11557	38.0693
1997	0.676908	11.8998	4.26405	30.3069	6.36408	40.795
1998	0.698506	12.3185	4.38621	32.0807	6.62954	43.7977
1999	0.720181	12.7338	4.51187	33.8677	6.89929	46.885
2000	0.744206	13.2215	4.64748	35.8699	7.20052	50.3008

Low Case Population (10^3 persons)

	CNNP2R4	CNNP2R5	POPMR4	POPMR5	POPNE4	POPNE5
1980	42.8752	165.272	0.836244	12.0817	7.35156	7.02763
1981	46.1244	173.088	0.836244	12.0817	7.49859	7.16818
1982	46.2818	170.885	0.836244	12.0817	7.64855	7.31154
1983	45.552	175.55	0.836244	12.0817	7.80152	7.45777
1984	46.1947	181.625	0.836244	12.0817	7.95755	7.60692
1985	46.1254	186.9	0.836244	12.0817	8.11669	7.75905
1986	46.0301	194.651	0.836244	12.0817	8.27902	7.91423
1987	45.0263	196.983	0.836244	12.0817	8.4446	8.07251
1988	45.7408	201.991	0.836244	12.0817	8.61349	8.23395
1989	46.8339	212.691	0.836244	12.0817	8.78575	8.39863
1990	47.8376	220.409	0.836244	12.0817	8.96146	8.5666
1991	48.8149	230.78	0.836244	12.0817	9.14068	8.73792
1992	49.7096	238.921	0.836244	12.0817	9.32349	8.91268
1993	50.7133	248.606	0.836244	12.0817	9.50996	9.09093
1994	51.6914	256.883	0.836244	12.0817	9.70015	9.27274
1995	52.672	268.18	0.836244	12.0817	9.89415	9.45819
1996	53.6777	279.578	0.836244	12.0817	10.092	9.64735
1997	54.7334	291.662	0.836244	12.0817	10.2939	9.84029
1998	55.826	304.958	0.836244	12.0817	10.4997	10.0371
1999	56.9271	318.102	0.836244	12.0817	10.7097	10.2378
2000	58.119	332.675	0.836244	12.0817	10.9239	10.4426

	POPR4	POPR5
1980	51.59	185.007
1981	55.7533	192.862
1982	55.8316	190.305
1983	54.4737	195.089
1984	55.0875	201.314
1985	55.0784	206.74
1986	55.1453	214.647
1987	54.3072	217.137
1988	55.1905	222.307
1989	56.4559	233.171
1990	57.6353	241.057
1991	58.7918	251.599
1992	59.8693	259.916
1993	61.0595	269.778
1994	62.2278	278.237
1995	63.4024	289.719
1996	64.606	301.307
1997	65.8635	313.583
1998	67.162	327.077
1999	68.4731	340.422
2000	69.8791	355.198

Intermediate Case Employment (10^3 persons)

	EMA9AR4	EMA9AR5	EMA9BR4	EMA9BR5	EMA9CR4	EMA9CR5
1980	0.089	0.	0.	0.	2.231	0.
1981	0.091	0.	0.	0.	2.263	0.
1982	0.093	0.	0.	0.	2.3	0.
1983	0.096	0.	0.	0.	2.342	0.
1984	0.098	0.	0.	0.	2.392	0.
1985	0.1	0.	0.	0.	2.449	0.
1986	0.11	0.	0.	0.	2.516	0.
1987	0.12	0.	0.	0.	2.593	0.
1988	0.13	0.	0.	0.	2.682	0.
1989	0.14	0.	0.	0.	2.785	0.
1990	0.15	0.	0.	0.	2.905	0.
1991	0.155	0.	0.	0.	3.044	0.
1992	0.16	0.	0.	0.	3.205	0.
1993	0.165	0.	0.	0.	3.392	0.
1994	0.17	0.	0.	0.	3.608	0.
1995	0.175	0.	0.	0.	3.859	0.
1996	0.18	0.	0.	0.	4.149	0.
1997	0.185	0.	0.	0.	4.486	0.
1998	0.19	0.	0.	0.	4.877	0.
1999	0.195	0.	0.	0.	5.329	0.
2000	0.2	0.	0.	0.	5.853	0.

	EMMFR4	EMMFR5	EMMLR4	EMMLR5	EMMPR4	EMMPR5
1980	2.154	0.375	0.33	0.148	0.	0.
1981	2.18	0.384	0.36	0.148	0.	0.
1982	2.208	0.394	0.39	0.148	0.	0.
1983	2.24	0.403	0.42	0.148	0.	0.
1984	2.273	0.413	0.45	0.148	0.	0.
1985	2.311	0.424	0.48	0.148	0.	0.
1986	2.353	0.434	0.51	0.148	0.	0.
1987	2.4	0.445	0.54	0.148	0.	0.
1988	2.452	0.456	0.57	0.148	0.	0.
1989	2.51	0.468	0.6	0.148	0.	0.
1990	2.577	0.479	0.63	0.148	0.	0.
1991	2.65	0.491	0.66	0.148	0.	0.
1992	2.733	0.504	0.69	0.148	0.	0.
1993	2.828	0.516	0.72	0.148	0.	0.
1994	2.936	0.529	0.75	0.148	0.	0.
1995	3.057	0.542	0.78	0.148	0.	0.
1996	3.197	0.556	0.81	0.148	0.	0.
1997	3.357	0.57	0.84	0.148	0.	0.
1998	3.538	0.584	0.87	0.148	0.	0.
1999	3.746	0.599	0.9	0.148	0.	0.
2000	3.985	0.614	0.925	0.148	0.	0.

Intermediate Case Employment (10^3 persons)

	EMMOR4	EMMOR5	EMP9R4	EMP9R5	ECONXR4	ECONXR5
1980	0.348	1.1	2.363	1.009	1.609	0.229
1981	0.408	1.1	2.664	1.009	2.809	0.626
1982	0.819	1.1	2.59	1.009	1.714	0.524
1983	0.819	1.1	2.7	1.009	1.053	0.027
1984	0.819	1.1	2.761	1.009	0.701	0.
1985	0.879	1.1	2.448	1.009	0.809	0.
1986	0.879	1.1	1.991	1.009	0.675	0.
1987	0.879	1.1	1.357	1.009	0.415	0.
1988	0.879	1.1	1.357	1.009	0.552	0.
1989	0.879	1.1	1.357	1.009	0.442	0.
1990	0.879	1.1	1.357	1.009	0.359	0.
1991	0.879	1.1	1.357	1.009	0.265	0.
1992	0.879	1.1	1.357	1.009	0.249	0.
1993	0.879	1.1	1.357	1.009	0.249	0.
1994	0.879	1.1	1.357	1.009	0.032	0.
1995	0.879	1.1	1.357	1.009	0.032	0.
1996	0.879	1.1	1.357	1.009	0.032	0.
1997	0.879	1.1	1.357	1.009	0.032	0.
1998	0.879	1.1	1.357	1.009	0.032	0.
1999	0.879	1.1	1.357	1.009	0.032	0.
2000	0.879	1.1	1.357	1.009	0.032	0.

	EMPUXR4	EMTOXR4	EMS9XR4	EMGFR4	EMGFR5	EMGSR4
1980	0.	0.5	0.05	1.486	22.332	1.89
1981	0.	0.5	0.09	1.486	22.391	1.982
1982	0.	0.5	0.12	1.486	22.451	2.131
1983	0.	0.5	0.12	1.486	22.511	2.292
1984	0.09	0.5	0.06	1.486	22.571	2.464
1985	0.09	0.5	0.03	1.486	22.632	2.65
1986	0.09	0.5	0.03	1.496	22.691	2.811
1987	0.09	0.5	0.03	1.506	22.751	2.982
1988	0.09	0.5	0.03	1.516	22.811	3.164
1989	0.09	0.5	0.03	1.526	22.871	3.357
1990	0.09	0.5	0.03	1.536	22.932	3.561
1991	0.09	0.5	0.03	1.536	23.001	3.613
1992	0.09	0.5	0.03	1.536	23.071	3.666
1993	0.09	0.5	0.03	1.536	23.141	3.72
1994	0.09	0.5	0.03	1.536	23.211	3.775
1995	0.09	0.5	0.03	1.536	23.282	3.83
1996	0.09	0.5	0.03	1.546	23.341	3.886
1997	0.09	0.5	0.03	1.556	23.401	3.943
1998	0.09	0.5	0.03	1.566	23.461	4.
1999	0.09	0.5	0.03	1.576	23.521	4.059
2000	0.09	0.5	0.03	1.576	23.582	4.118

Intermediate Case Employment (10^3 persons)

	EMGSR5	EMGLR4	EMGLR5
1980	4.75	2.328	6.75
1981	4.799	2.416	6.885
1982	4.848	2.506	7.023
1983	4.898	2.601	7.163
1984	4.949	2.698	7.306
1985	5.	2.8	7.452
1986	5.076	2.905	7.602
1987	5.152	3.014	7.754
1988	5.23	3.127	7.909
1989	5.309	3.245	8.067
1990	5.389	3.367	8.228
1991	5.468	3.493	8.393
1992	5.548	3.625	8.561
1993	5.629	3.761	8.732
1994	5.711	3.902	8.906
1995	5.795	4.049	9.085
1996	5.88	4.201	9.267
1997	5.966	4.359	9.452
1998	6.053	4.523	9.641
1999	6.142	4.693	9.834
2000	6.232	4.869	10.031

Intermediate Case Employment (10^3 persons)

	EMCN1R4	EMCN1R5	EMCMR4	EMCMR5	EMTAR4	EMTAR5
1980	1.91157	5.50613	0.363055	1.88344	0.156805	4.41059
1981	2.40723	6.13407	0.392702	2.04719	0.165111	5.68765
1982	2.39662	6.44251	0.403691	2.10837	0.164369	6.00606
1983	2.22752	6.29625	0.396568	2.06869	0.164824	5.59507
1984	2.2255	6.45473	0.404874	2.11498	0.166173	5.82367
1985	2.3598	6.66	0.415334	2.17347	0.161516	6.04445
1986	2.42385	6.87569	0.423271	2.21801	0.153171	6.1039
1987	2.41928	6.98415	0.429057	2.25055	0.13784	6.0703
1988	2.60371	7.28379	0.440241	2.31365	0.138552	6.28608
1989	2.74022	7.6693	0.457111	2.40927	0.139525	6.83102
1990	2.87488	7.97869	0.470087	2.48318	0.140199	7.21004
1991	2.99838	8.3559	0.483354	2.55907	0.140929	7.6165
1992	3.14506	8.70008	0.495626	2.62953	0.141636	8.00064
1993	3.32433	8.99581	0.510458	2.71505	0.142404	8.48446
1994	3.43224	9.33436	0.524001	2.79346	0.143093	8.96621
1995	3.62871	9.78094	0.540627	2.89013	0.14386	9.54183
1996	3.84389	10.2418	0.55509	2.97458	0.14459	10.0299
1997	4.08018	10.7411	0.572499	3.07666	0.145332	10.6392
1998	4.34059	11.288	0.58927	3.17543	0.146105	11.2741
1999	4.62323	11.8482	0.608117	3.28692	0.146811	11.9419
2000	4.93856	12.4639	0.627053	3.39945	0.147599	12.7043

	EMTOR4	EMTOR5	EMPUR4	EMPUR5	EMFIR4	EMFIR5
1980	0.720653	1.57088	0.342474	0.870861	0.405483	4.62412
1981	0.806827	1.73533	0.364262	0.996899	0.435755	5.51856
1982	0.801824	1.81562	0.375988	1.06003	0.452171	5.98018
1983	0.790881	1.77759	0.376082	1.03	0.452303	5.75948
1984	0.798191	1.81879	0.382343	1.06255	0.461107	5.99072
1985	0.782964	1.87205	0.392568	1.10501	0.475532	6.31426
1986	0.741024	1.92788	0.401282	1.14998	0.487876	6.65255
1987	0.655776	1.95589	0.406657	1.17273	0.495514	6.82522
1988	0.671002	2.03312	0.420073	1.23604	0.514649	7.3112
1989	0.684492	2.13213	0.433176	1.31846	0.533436	7.71322
1990	0.695996	2.2113	0.445788	1.38536	0.55161	8.02577
1991	0.70703	2.3075	0.456602	1.46782	0.567261	8.69618
1992	0.719033	2.39499	0.468314	1.54388	0.584282	9.06161
1993	0.732876	2.46994	0.481282	1.60984	0.603213	9.33127
1994	0.742441	2.55551	0.492877	1.68603	0.62021	9.83
1995	0.756722	2.66802	0.507094	1.78758	0.641143	10.4945
1996	0.771376	2.78369	0.522291	1.89362	0.663629	11.3642
1997	0.786732	2.90858	0.538573	2.00987	0.68784	12.1433
1998	0.802982	3.04483	0.555921	2.13875	0.713773	13.1972
1999	0.819342	3.18388	0.574429	2.27242	0.741589	14.1141
2000	0.837101	3.33611	0.594239	2.42118	0.771527	15.1326

Intermediate Case Employment (10^3 persons)

	EMDWR4	EMDWR5	EMDRR4	EMDRR5	EMS9R4	EMS9R5
1980	0.549721	6.70129	3.01441	13.6678	4.67037	15.1828
1981	0.685687	8.33388	3.36386	15.8384	6.24736	18.3195
1982	0.681726	8.7193	3.55881	16.9502	6.27061	19.9496
1983	0.641153	8.16996	3.56039	16.4604	5.71433	19.1431
1984	0.643181	8.4586	3.66648	17.0459	5.57551	19.9821
1985	0.667603	8.7567	3.84266	17.8042	5.92742	21.103
1986	0.669673	8.8558	3.99564	18.6085	6.12582	22.3089
1987	0.648155	8.84006	4.09132	19.0269	6.11139	22.9259
1988	0.694249	9.13082	4.33443	20.1562	6.68997	24.6681
1989	0.728874	9.81195	4.57776	21.6278	7.12469	26.9894
1990	0.762688	10.2891	4.81745	22.8324	7.55883	28.9162
1991	0.793823	10.797	5.02722	24.3194	7.96138	31.3418
1992	0.830602	11.2741	5.2588	25.6992	8.44488	33.6275
1993	0.87542	11.871	5.52057	26.9033	9.04343	34.516
1994	0.902674	12.4556	5.75929	28.2964	9.4075	36.0994
1995	0.951671	13.1561	6.058	30.1554	10.0778	39.0765
1996	1.00517	13.7504	6.38462	32.1052	10.8222	42.2388
1997	1.06381	14.4869	6.74285	34.252	11.6515	45.7205
1998	1.12835	15.2444	7.1339	36.6425	12.5794	49.5879
1999	1.19818	16.0461	7.56171	39.1341	13.602	53.6776
2000	1.27604	16.9434	8.03165	41.9196	14.7612	58.2225

Intermediate Case Population (10^3 persons)

	CNNP2R4	CNNP2R5	POPMR4	POPMR5	POPNE4	POPNE5
1980	44.9433	165.229	0.836244	12.0817	7.35156	7.02763
1981	50.5342	174.839	0.836244	12.0817	7.49859	7.16818
1982	52.2336	183.126	0.836244	12.0817	7.64855	7.31154
1983	51.9948	179.703	0.836244	12.0817	7.80152	7.45777
1984	53.0592	185.256	0.836244	12.0817	7.95755	7.60692
1985	54.914	192.11	0.836244	12.0817	8.11669	7.75905
1986	55.9495	198.893	0.836244	12.0817	8.27902	7.91423
1987	55.9876	203.127	0.836244	12.0817	8.4446	8.07251
1988	59.2189	212.717	0.836244	12.0817	8.61349	8.23395
1989	62.133	225.28	0.836244	12.0817	8.78575	8.39863
1990	65.0197	235.371	0.836244	12.0817	8.96146	8.5666
1991	67.489	247.718	0.836244	12.0817	9.14068	8.73792
1992	70.2628	258.894	0.836244	12.0817	9.32349	8.91268
1993	73.4581	267.365	0.836244	12.0817	9.50996	9.09093
1994	76.0728	277.841	0.836244	12.0817	9.70015	9.27274
1995	79.6597	292.623	0.836244	12.0817	9.89415	9.45819
1996	83.5803	307.834	0.836244	12.0817	10.092	9.64735
1997	87.9052	324.44	0.836244	12.0817	10.2939	9.84029
1998	92.6512	342.815	0.836244	12.0817	10.4997	10.0371
1999	97.8537	361.686	0.836244	12.0817	10.7097	10.2378
2000	103.608	382.511	0.836244	12.0817	10.9239	10.4426

	POPR4	POPR5
1980	54.7401	184.965
1981	61.678	194.715
1982	62.4324	203.044
1983	61.6856	199.27
1984	62.554	204.944
1985	64.6759	211.951
1986	65.7397	218.889
1987	65.6835	223.281
1988	69.2206	233.033
1989	72.1969	245.76
1990	75.1764	256.019
1991	77.7309	268.537
1992	80.6715	279.888
1993	84.0533	288.537
1994	86.6412	299.195
1995	90.4221	314.163
1996	94.5405	329.563
1997	99.0673	346.362
1998	104.019	364.934
1999	109.432	384.005
2000	115.4	405.035

References

1. Kresge, David, and Thomas, Monica. "Estimated Gross State Product for Alaska," Alaska Review of Business and Economic Conditions, 11(1), April 1974.

2. Thomas, Monica and Goodwin, Earlene. "Estimates of Alaska Gross Product, 1965-1973," Alaska Review of Business and Economic Conditions, 12(1), March 1975.

3. Dolezal, Patricia L. and Ender, Richard L. 1976 Population Profile, Municipality of Anchorage, Anchorage, Alaska: Anchorage Urban Observatory Program, University of Alaska-Anchorage, September 1976.

4. Hitchins, Diddy R. et al. A Profile of Five Kenai Peninsula Towns: An Analysis of the Demographic Characteristics and Attitudes Toward Services and Community Development in Kenai, Soldotna, Seward, Seldovia, and Homer, Anchorage, Alaska: Bureau of Management and Urban Affairs and Anchorage Urban Observatory, University of Alaska-Anchorage, 1977.

Government Documents

State of Alaska, Department of Fish and Game, Division of Commercial Fisheries. "Alaska Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet Nos. 11, 13, 15, 17, 19, 21, 23, 25, 26, 27, 28. Juneau, Alaska: Alaska Department of Fish and Game, Various Issues.

State of Alaska, Department of Labor, Employment Security Division, Research and Analysis Section. Alaska Labor Force Estimates by Industry and Area. Various Issues.

_____. State of Alaska Current Population Estimates by Census Division. Various Issues.

_____. State of Alaska Current Population Estimates by Labor Market Area, July 1, 1971. Juneau, Alaska: Alaska Department of Labor, n.d.

State of Alaska, Department of Natural Resources, Division of Oil and Gas. Statistical Report for the Year 1975.

U.S. Department of Agriculture, Alaska Crop and Livestock Reporting Service. Alaska Agricultural Statistics. Palmer, Alaska: Alaska Crop and Livestock Reporting Service. Various Issues.

U.S. Department of Commerce, Bureau of the Census. 1970 Census of Population: PC(1)-B3, General Population Characteristics, Alaska.

U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business, 56(1), parts 1 and 2, January 1976.

_____. Survey of Current Business, 57(7), July 1977.