

APPENDIX C

ISER MAP ALASKA ECONOMIC MODEL: POPULATION MODULE

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Institute of Social
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MAP Documentation
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C.1 General Model Description

The population module of the Alaska economic model provides annual forecasts of total population and detailed population characteristics for the State of Alaska. Population in each year is estimated as an average annual value which is determined by the sum of natural increase of the previous year's population and net immigration. The former is based upon age-sex-race-specific fertility and mortality rates. The latter is based upon a stochastically determined equation relating net immigration to the change in employment opportunities in Alaska, Alaskan unemployment, and real wage levels relative to the U.S. average. This specification is based upon the theory that migration flows clear regional labor markets, with people moving into regions where employment opportunities are increasing faster than local supplies can satisfy them and out of economically declining regions.

The three main components of population--Native, military, and civilian non-Native--each receive separate treatment because of different characteristics. The Native population can only migrate out of Alaska and has different fertility and mortality rates than do civilian non-Natives. The military population consists of armed forces personnel and military dependents. Births, deaths, and net migration are not calculated for this component of the population. Its age-sex structure essentially remains constant in simulation, as each year those leaving are replaced by individuals with identical characteristics.

Total Population. Total population is the sum of the three components of the population which are individually treated because of different characteristics. These components are civilian/non-Native population, Native population, and military population which is armed forces personnel plus military dependents. Each of the components of the population is divided into 30 age-sex cohorts. The population under 1 year is the first cohort for each sex, and the 65-and-over population is cohort 15. Cohort 2 is the population aged 1 through 4 years; all others span five years.

The military population is static in the sense that the age-sex structure of both the armed forces personnel and the military dependents does not change over time, nor does the ratio of military dependents to armed forces personnel. The total military population is calculated as a percentage of the 1980 military population and its age-sex structure scaled accordingly.

Civilian/Non-Native Natural Increase. Each year, a percentage of individuals within each cohort die, and another percentage move into the next cohort as people age. The aging process applies to all individuals within a cohort, and the result of this process is an "intermediate cohort" to which migrants must be added to arrive at the final cohort value for the new year.

The population of the 0-1-aged cohort is determined by the number of births, which is the sum of cohort-specific fertility rates applied to the female population surviving from the previous year. While mortality rates change very slowly, fertility rates are affected by a number of socioeconomic variables. Since precise relationships cannot be determined for Alaskan fertility rates, these are held constant in the model for the projection period. A percentage of infants do not survive, and a specific sex division of births is applied to total births.

From these calculations, both infant deaths and total deaths can be calculated as sums. Finally, natural increase is the excess of births over deaths.

Civilian/Non-Native Migration. Net immigration is a function of the year-to-year change in the level of total Alaskan civilian employment, the percentage change in the lagged value of the Alaskan-U.S. ratio of real weekly earnings, and the lagged ratio of U.S.-to-Alaska unemployment rates. Migrants, according to this formulation, will be drawn to Alaska in response to a tightening of the Alaskan labor market indicated by low unemployment rates and rising real wages. Higher relative unemployment rates and declining real wages would cause net immigration to be negative.

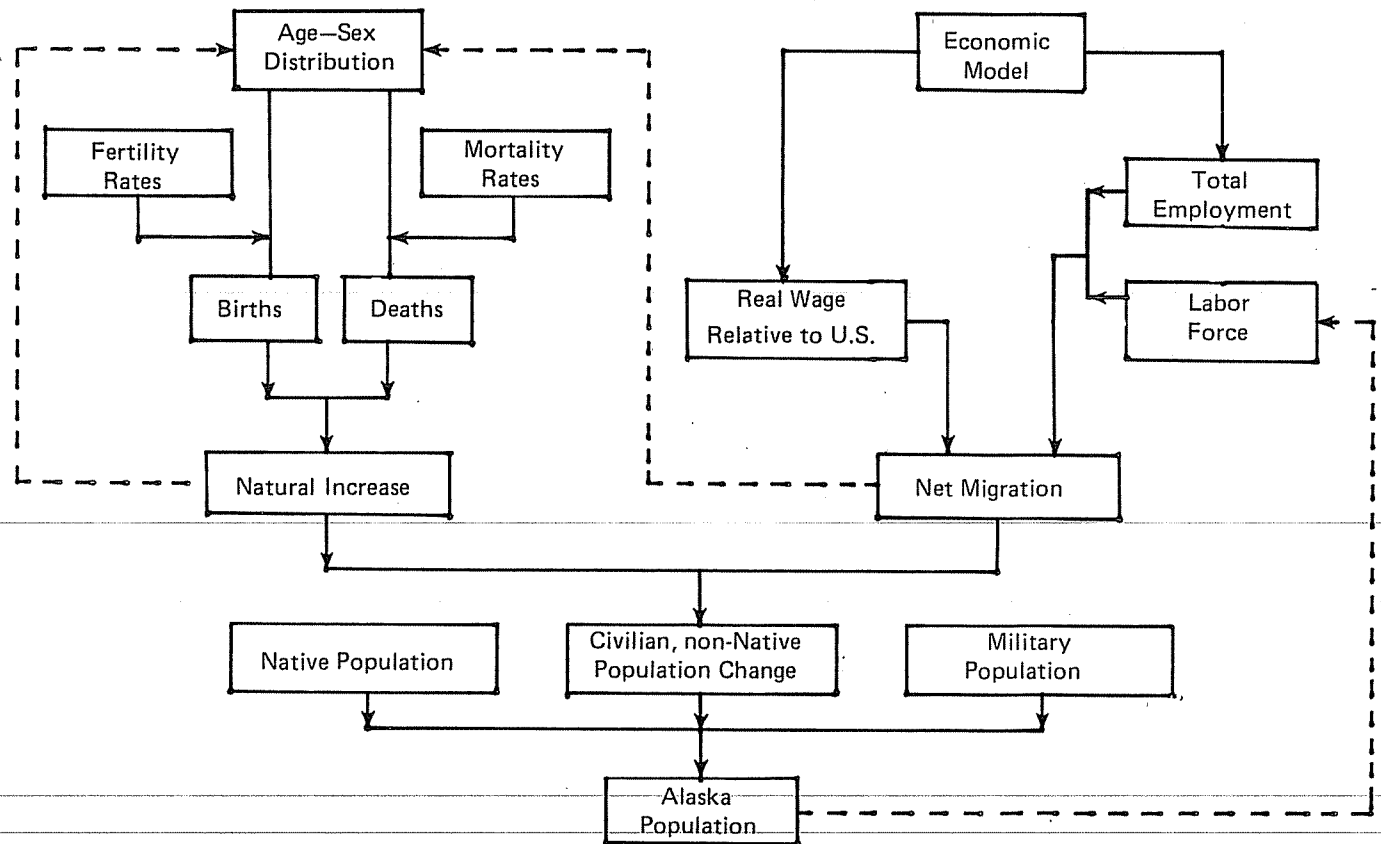
Net immigration is distributed among the age-sex cohorts by a two-step process. First, a percentage of each cohort of the population leaves the state independent of the overall amount of net migration. The remainder of net migration is allocated among all the cohorts on the basis of a percentage of total net migration. (This remainder can be a negative number.) Net migration to Alaska is biased toward young males relative to the U.S. average.

Total civilian/non-Native population is finally calculated by summing the population in each cohort including the results of the migration process during the year.

Net Native Population. As with the civilian/non-Native population, a percentage of individuals die each year within each cohort, and a percentage age into the next cohort. Native births are the sum of cohorts of the female population of child-bearing age times the fertility rate for Natives within each cohort. Total Native births are allocated between the sexes and reduced by the percentage of Native infant deaths by sex. Native infant deaths are the difference between total births and infant deaths, and total Native deaths include those of all cohorts. Native natural increase is the excess of births over deaths. The Native population migrates out of Alaska at a rate independent of the level of economic activity.

Two distinct definitions of the total Native population are calculated. The first is based upon Native self-enumeration data from the 1980 Census. This forms the basis for the age-sex distribution of the Native population. A second larger number is calculated from the number of enrollees for the twelve Native corporations residing in the state. This latter concept of Native population is assumed to grow at the same rate as the census-based Native population.

C.2 MAP Economic Population Module



C.3 Output Variables of the Population Module

Total Population

POP	Total Alaska population
CNNTOT	Total Alaska civilian non-Native population
NATTOT	Total Alaska Native population (civilian)
POPi _j	Total Alaska population in cohort i _j
CNNPi _j	Alaska civilian non-Native population in cohort i _j
NATPi _j	Alaska Native population in cohort i _j
POPC	Alaska Population not in military service
BTOT	Total Alaska civilian births
DTOT	Total Alaska civilian deaths
POPNI9	Total Alaska civilian natural increase

Military Population

POPM	Alaska active duty military personnel
MILPCT	Alaska military population as a fraction of 1980 level

Civilian Non-Native Natural Increase

Cij	Alaska Civilian non-Native population in cohort i _j before migration
BTHTOT	Total Alaska civilian non-Native births to civilian population
DTHINF	Alaska infant civilian non-Native deaths
DTHTOT	Total Alaska civilian non-Native deaths
NATINC	Alaska civilian non-Native natural increase

(Civilian) Native Natural Increase

NCij	Alaska Native population in cohort i _j before migration
NBTHTOT	Total Alaska Native births
NDTHINF	Alaska Native infant deaths
NDTHTOT	Total Alaska Native deaths
NNATINC	Alaska Native natural increase
POPNE	Alaska Native enrollment population

Civilian Migration and Total Civilian Population

POPMIG	Total net civilian migration to Alaska
MIGOUT	Exogenous civilian migration to Alaska
MIGIN	Endogenous civilian migration to Alaska

Labor Force and Unemployment

PLFDMC	Alaska potential civilian non-Native labor force (population age 15 to 64)
PLFDMN	Alaska potential civilian Native labor force
PLFDDMM	Alaska potential military labor force (military dependents age 15 to 64, active-duty military are excluded)
PLFD9	Total Alaska potential civilian labor force
LF	Total Alaska civilian labor force
UNEMP	Alaska unemployed
WR.AK.US	Relative real wage rate, Alaska to U.S.
U.AK.US	Relative unemployment rate, Alaska to U.S.

Households

HH	Total Alaska households
HHC	Total Alaska civilian non-Native households
HHN	Total Alaska civilian Native households
HHM	Total Alaska military households
CHHi	Alaska households headed by civilian non-Native persons in cohort ij
NHHij	Alaska households headed by civilian Native persons in cohort ij
HHij	Total Alaska households headed by persons in cohort ij

Non-Household Population and Average Household Size

POPCGQ	Alaska civilian non-Native population in group quarters
POPNGQ	Alaska Native population in group quarters
POPGQ	Total Alaska population in group quarters
HHSIZEN	Average Alaska Native household size
HHSIZEC	Average Alaska civilian non-Native household size
HHSIZE	Average Alaska household size, all households

Special Population Characteristics

POPSKL	Total Alaska population age 5-19
POPKID	Total Alaska population under 15
POPGER	Total Alaska population 65 and over
POPADS	Total Alaska population age 15-64
POP.AD	Ratio of Alaska population 15-64 to total population
POP.KID	Ratio of Alaska population under 15 to total population
POP.GER	Ratio of Alaska population 65 and over to total population
POP.MIL	Ratio of Alaska military and military dependents to total population

POP.NAT	Ratio of Alaska Native population to total population
POP.CIV	Ratio of Alaska civilian non-Native population to total population
NCBR	Alaska crude Native birth rate (per thousand)
NCDR	Alaska crude Native death rate
CBR	Alaska crude civilian non-Native birth rate
CDR	Alaska crude civilian non-Native death rate
BCRUDE	Alaska crude civilian birth rate
DCRUDE	Alaska crude civilian death rate

C.4 Cohort Designation

Sex (i)

F Female
M Male

Age (j)

1	Under 1 year
2	1 - 4 years
3	5 - 9 years
4	10 - 14 years
5	15 - 19 years
6	20 - 24 years
7	25 - 29 years
8	30 - 34 years
9	35 - 39 years
10	40 - 44 years
11	45 - 49 years
12	50 - 54 years
13	55 - 59 years
14	60 - 64 years
15	65 years and older

C.5 Parameter Definitions

Military Population

AFTOT Total armed forces personnel in 1980
MDTOT Total military dependents in 1980
MILij Armed forces personnel and military dependents
in cohort ij in 1980

Civilian Non-Native Natural Increase

Gj Shift factor for aging of cohorts
Sij Non-Native survival rate for cohort ij
FERTj Non-Native fertility rate for female cohort j
SEXDIV Non-Native sex division at birth
SURINFi Non-Native infant survival rates
BADD Birth adjustment factor to account for birth of
Native children to non-Native women

(Civilian) Native Natural Increase

NSij Native survival rate for cohort ij
NFERTij Native fertility in female cohort j
NSEXDIV Native sex division at birth
NSURINFi Native infant survival rates

Civilian Migration

NMij Migration rate (positive for in, negative for out)
for Native population in cohort ij
OEMij Exogenous civilian non-Native migration rate (positive
for in, negative for out) for population in cohort ij
Mij Fraction of total endogenous civilian (non-Native)
migration assigned to cohort ij

Household Formation

HHRij Household formation rate for civilian non-Native
population in cohort ij
NHRij Household formation rate for civilian Native
population in cohort ij
RCij Rate of change in HHRij
NRCij Rate of change in NHRij
CPGQij Fraction of civilian non-Native population in
cohort ij in group quarters

NPGQij Fraction of civilian Native population in cohort ij
in group quarters
POPMGQ Military population in group quarters in 1980
MHHAGE Average age of head of military household

Labor Force

LFPART Labor force participation rate as a fraction of
potential labor force
PLFRATE Fraction of migrant population in potential labor force

C.6 Coefficients

Regression coefficients for net migration equation:

CMIGa	Net migration to Alaska	a = 1,2,3,4

C.7 Input Variables for Population Module

The following variables require a forecast for each year:

EMGM	Alaska military employment (thousands)
EM96	Total Alaska employment (thousands)
R.WR97	Average Alaska real wage rate
WEUS	U.S. weekly earnings
PDUSCPI	U.S. consumer price index
U.US	U.S. unemployment rate
YR	Year

All other population variables may be updated as new population estimates become available.

C.8 Input Data Sets

Input data required to run the population module are contained in the following data sets:

AKHIST	Historical time series data
POPST2	Estimated 1980 Alaska population by age, sex, and race.*

*Alaska population by age, sex, and race cohorts estimated from the 1980 U.S. Census are shown in Table C-6. These figures represent Alaska population as of April 1, 1980, the date of the census. Population estimates for the MAP population module, however, represent average annual values. The census-derived figures for population cohorts were adjusted to average annual figures using the following procedure:

- (1) The population module was simulated for one full year starting from the April 1, 1980, population, but with average annual 1980 employment and wage data.
- (2) The average annual 1980 population estimates, contained in the Data Set POPST2, were computed using the formula:

$$\text{POPST2\_POPijk} = 0.25 * [\text{POPijk}(1981) - \text{POPijk}(1980)]$$

where POPST2_POPijk is the average 1980 population of sex i in age cohort j and race k; POPijk(1981) is the simulated 1981 population cohort, and POPijk(1980) is the census April 1, 1980, cohort.

C.9 Structural Description

Refer to the variable list and symbol dictionary for names and symbols.

Total Population

$$POP = CNNTOT + NATTOT + MILPCT * (AFTOT + MDTOT)$$

$$POPi_j == CNNPi_j + NATPi_j + MILPCT * (AFPi_j + MDPi_j)$$

$$i = M, F$$

$$j = 1 \text{ to } 15$$

$$POPM == EMGM$$

Civilian/Non-Native Natural Increase

$$Cij == Gj * Sij * CNNPi_j (-1) + (1 - Gj - 1) * Si_{j-1} * CNNPi_{j-1} (-1)$$

$$i = M, F$$

$$j = 2 \text{ to } 15$$

$$BHTTOT == \left(\sum_{j=4}^{11} (CF_j * FERT_j) \right) - BADD$$

$$CM1 == SEXDIV * BHTTOT * SURINFM$$

$$CF1 == (1 - SEXDIV) * BHTTOT * SURINFF$$

$$DTHINF == BHTTOT - CM1 - CF1$$

$$DHTTOT == DTHINF + \sum_{i=M,F} \sum_{j=1}^{15} (Cij(-1) * (1 - Sij))$$

$$NATINC == BHTTOT - DHTTOT$$

(Civilian) Native Natural Increase

$$NC_{ij} == G_j * NS_{ij} * NAT_{Pi,j-1} + (1-G_j-1) * NS_{i,j-1} * NAT_{Pi,j-1} (-1)$$

$$\begin{aligned} i &= M, F \\ j &= 1 \text{ to } 15 \end{aligned}$$

$$NBTHTOT == \left(\sum_{j=4}^{11} (NCF_j * NFERT_j) \right) + BADD$$

$$NCPM1 == NSEXDIV * NBTHTOT * NSURINFM$$

$$NCPF1 == (1-NSEXDIV) * NBTHTOT * NSURINFF$$

$$NDTHINF == NBTHTOT - NCM1 - NCF1$$

$$NDTHTOT == NDTHINF + \sum_{i=M,F} \sum_{j=1}^{15} (NC_{ij}(-1) * (1-NS_{ij}))$$

$$NNATINC == NBTHTOT - NDTHTOT$$

Civilian Migration and Total Civilian Population

$$NAT_{Pij} = NC_{ij} * (1 + NM_{ij}) \quad i=M,F \quad j=1 \text{ to } 15$$

$$\begin{aligned} POPMIG &= CMIG1 + CMIG2 * 1/U.AK.US(-1) + CMIG3 * WR.AK.US(-1) \\ &\quad + CMIG4 * DELEMP \end{aligned}$$

$$MIGOUT = \sum_{i=M,F} \sum_{j=1}^{15} ((OEM_{ij} * C_{ij}) + (NM_{ij} * NC_{ij}))$$

$$MIGIN = POPMIG - MIGOUT$$

$$NATTOT = \sum_{i=M,F} \sum_{j=1}^{15} NAT_{Pij}$$

$$CNNP_{ij} = MIGIN * M_{ij} + C_{ij} * (1 + OEM_{ij}) \quad (M_{ij} \geq 0) \quad i=M,F \quad j=1 \text{ to } 15$$

$$\text{CNNTOT} = \sum_{i=M,F} \sum_{j=1}^{15} \text{CNNPi}_{ij}$$

Labor Force and Unemployment

$$\text{PLFD9} == \sum_{i=M,F} \sum_{j=5}^{14} \text{POPi}_{ij}$$

$$\text{LF} == \text{LFPART} * \text{PLFD9}$$

$$\text{UNEMP} == \text{LF} - \text{EM96}$$

$$\text{U.AK.US} == \text{UNEMP} / \text{LF} / \text{U.US}$$

$$\text{WR.AK.US} == \text{LOG}(\text{R.WR97}) - \text{LOG}(\text{WEUS} * 100 / \text{PDUSCPI}) - \\ (\text{LOG}(\text{R.WR97}(-1)) - \text{LOG}(\text{WEUS}(-1) * 100 / \text{PDUSCPI}(-1)))$$

$$\text{DELEMP} == \text{EM96} - \text{EM96}(-1)$$

C.10 Regression Coefficients

Net Migration to Alaska

$$\text{POPMIG} = \text{CMIG1} + \text{CMIG2} * 1/\text{U.AK.US}(-1) + \text{CMIG3} * \text{WR.AK.US}(-1) \\ + \text{CMIG4} * \text{DELEMP}$$

<u>Coefficient</u>	<u>Value</u>	<u>Standard Error</u>	<u>t Statistic</u>
CMIG1	-16.0216	5.5354	-2.8944
CMIG2	14.1206	5.4030	2.6135
CMIG3	49.2216	13.7389	3.5827
CMIG4	0.9567	0.0969	9.8699

Range: 1971 to 1980 $F(3,6) = 53.57$

$R^2 = 0.964$ standard error of regression = 2.816

Estimation method: generalized least squares (correction
for autocorrelation), $\hat{\rho} = 0.75$

Notes: Historical series for POPMIG taken from the series
AKHIST POPMIGNW. Historical series for U.AK.US
taken from ANANHIST_U.AK.USU. Other series archived
in ANANHIST.

C.11 Parameter Values

Military Population (Table C-6)

AFTOT	From Alaska Air Command and J. Kruse, <u>Design and Implementation of Alaska 1980 Reapportionment Data Collection Effort</u> , ISER, August 1980.
MDTOT, MILij	Military age-sex-race distribution outside Anchorage assumed equal to Anchorage on-base distribution. Anchorage figures from 1980 U.S. Census, Anchorage Census Tracts 3 and 4.

Civilian Natural Increase

Gj	1/Tj where Tj is the number of years spanned by age cohort j; except G15 (65 and over) = 0
All Others	See Tables C-4 (birth rates) and C-5 (survival rates).

Civilian Migration

NMij	Parameters assumed = 0. Insufficient information available on migration of Native population
OEMij	See Table C-3.
Mij	Estimated from columns 1 and 2, Table C-1, and columns 1 and 2, Table C-2.

Household Formation

Military Households	Estimated using data from Alaska Air Command and 1980 U.S. Census
Civilian Households	See Appendix D.

Labor Force

LFPART	Ratio of sum of total civilian employment and unemployment to civilian potential labor force
PLFRATE	Fraction of population 15-64 from Table C-6

TABLE C-1: CIVILIAN MIGRATION TO ANCHORAGE,
ALASKA PUBLIC SURVEY SAMPLE
(N = 1,867 Individuals)

Age Group	Interstate Migrants		Alaska Natives		Non-Native Intrastate		Total	
	F	M	F	M	F	M	F	M
Under 5	19	15	3	5	11	8	33	28
5-9	18	19	4	6	5	9	27	34
10-14	8	7	3	1	7	5	18	13
15-19	9	13	0	3	8	6	17	22
20-24	33	27	1	3	11	10	45	40
25-29	26	34	4	2	15	16	45	52
30-34	22	27	3	3	15	17	40	47
35-39	10	14	2	2	5	6	17	22
40-44	9	12	1	1	4	3	14	16
45-49	5	6	1	0	4	5	10	11
50-54	1	1	0	0	2	3	3	4
55-59	2	3	0	0	2	2	4	5
60-64	1	1	0	0	0	2	1	3
65 and over	1	0	0	0	1	0	2	0
Total	164	179	22	26	90	92	276	297

NOTE: Figures include all members of the household of survey respondents resident in community (in Alaska for interstate migrants) thirty-six months or less.

TABLE C-2. ESTIMATED CIVILIAN MIGRATION RATES TO ANCHORAGE
(percent of migrants in each category)

Age Group	<u>Interstate Migrants</u>		<u>Alaska Natives</u>		<u>All Non-Native Migrants</u>	
	F	M	F	M	F	M
Under 5	5.0	5.0	8.3	8.3	5.0	5.0
5-9	5.4	5.4	10.4	10.4	4.9	4.9
10-14	2.2	2.2	4.2	4.2	2.6	2.6
15-19	2.6	3.8	3.1	3.1	3.2	3.6
20-24	9.6	7.9	4.2	4.2	8.3	7.0
25-29	7.6	9.9	6.3	6.3	7.8	9.4
30-34	6.4	7.9	6.3	6.3	7.0	8.4
35-39	2.9	4.1	4.2	4.2	2.9	3.8
40-44	2.6	3.5	2.0	2.0	2.5	2.9
45-49	1.5	1.7	1.0	1.0	1.7	2.1
50-54	0.3	0.3	-	-	0.6	0.8
55-59	0.6	0.8	-	-	0.8	1.0
60-64	0.3	0.3	-	-	0.4	0.4
65 and over	0.1	0.1	-	-	0.2	0.2
Total	47.1	52.9	50.0	50.0	47.9	52.1

SOURCE: Data from Alaska Public Survey.

TABLE C-3. ESTIMATED EXOGENOUS OUT-MIGRATION RATES

Age Group	Percent of Migrants		Percent of Age-Sex Cohort	
	F	M	F	M
Under 5	5.8	5.8	10.77	10.17
5-9	5.8	5.8	10.76	10.37
10-14	2.9	2.9	5.17	4.79
15-19	3.3	3.3	5.10	4.98
20-24	3.2	3.6	4.52	5.33
25-29	7.0	8.2	8.79	9.98
30-34	5.8	8.1	7.42	9.77
35-39	4.0	5.2	6.56	9.35
40-44	3.2	3.5	7.26	6.38
45-49	1.8	1.4	4.49	3.26
50-54	1.9	1.9	7.09	5.61
55-59	1.1	1.3	4.41	5.07
60-64	1.3	1.3	9.60	8.55
65 and over	0.3	0.3	1.41	1.78
Total	47.4	52.6	6.63	

SOURCE: Richard Ender, Anchorage Urban Observatory and U.S. Census, 1980.

TABLE C-4. 1980 BIRTHS: NUMBER OF BIRTHS AND BIRTH RATES
PER THOUSAND WOMEN IN FIVE-YEAR AGE COHORTS,
ALASKA RESIDENTS

Age of Mother	Native		Non-Native	
	No. of Births	Rate	No. of Births	Rate
10-14 years	1	0.3	5	0.4
15-19 years	438	138.5	686	48.4
20-24 years	821	297.9 ^a	2,632	145.1 ^a
25-29 years	528	173.3	2,548	127.2 ^a
30-34 years	260	101.1	1,212	71.7
35-39 years	84	46.5	283	22.7
40-44 years	18	12.7	38	4.3
Not Stated	1	--	2	--
Total	2,151		7,406	

(9,557 total births in Alaska in 1980)

^aRate includes one case where age was not stated.

SOURCE: Number of births from Alaska Department of Health and Social Services, Office of Information Systems; and Alaska Native Medical Center, Anchorage.

TABLE C-5. 1980 DEATHS: NUMBER OF DEATHS AND DEATH RATES
PER THOUSAND, ALASKA RESIDENTS

Age	NATIVE				NON-NATIVE			
	Female		Male		Female		Male	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
<28 Days	8	7.63	14	12.69	16	4.48	24	6.26
28 days - 1 year	10	12.36	13	15.53	11	3.15	21	5.81
1-4 yrs.	3	1.09	4	1.36	8	0.67	11	0.87
5-9	2	0.55	3	0.78	1	0.07	2	0.14
10-14	1	0.28	5	1.32	1	0.08	6	0.43
15-19	10	3.16	24	6.70	6	0.42	22	1.36
20-24	8	2.90	32	10.00	9	0.50	50	2.38
25-29	11	3.61	29	8.60	13	0.65	56	2.52
30-34	10	3.89	13	4.34	13	0.77	50	2.54
35-39	8	4.42	22	10.10	13	1.04	28	1.88
40-44	9	6.34	17	9.82	15	1.71	43	4.00
45-49	3	2.67	8	5.87	20	2.74	43	4.99
50-54	12	12.90	12	10.80	22	3.54	59	7.76
55-59	10	13.00	19	21.20	40	7.89	76	12.92
60-64	8	16.00	19	33.50	34	10.30	77	20.62
65 +	45	31.10	91	63.20	148	34.10	268	62.05
Totals	158		325		370		836	

SOURCE: Number of deaths from Alaska Department of Health and
Social Services, Office of Information Systems.

C.12 Model Validation

The population module of the economic model uses as the basis of its forecasts the demographic characteristics of the population enumerated by the 1980 U.S. Census. No detailed enumeration of the state population has been undertaken since the 1980 Census. The most recent past detailed population count that could be used to test the ability of the full module to predict demographic shifts up to 1980 is the 1970 U.S. Census. Conceptually, one could use the population module to "predict" the 1980 population given the 1970 population characteristics and estimated migration between 1970 and 1980.

Such a test is impractical, however, since Alaskan cohort-specific birth, death, and household formation rates changed significantly between the 1970 and 1980 Census benchmarks. Consequently, one would not expect a module to forecast population changes accurately during this period using the 1980 parameters.

Although it is not practical to test predictions of the full population module against historical events, it is possible to examine closely one important component of the module--net migration. The equation forecasting net civilian migration was estimated using recent historical data. To the extent that future economic conditions resemble those that have occurred in the past decade, the ability of the module equation to estimate historical migration flows provides a reliable indicator of the type and magnitude of likely future forecasting errors. Table C-7 displays a comparison of actual estimated net civilian migration to the migration equation predictions in the years for which it is possible to compute a forecast from available data.

TABLE C-7. COMPARISON OF ACTUAL AND PREDICTED
NET MIGRATION TO ALASKA

Year	Implied Net Civilian Migration ¹	Regression Prediction ²	Difference
1980	- 7,900	- 4,566	-3,334
1979	-10,490	-12,694	2,204
1978	-14,270	-12,963	-1,307
1977	- 4,460	- 3,008	-1,452
1976	22,530	23,324	- 794
1975	33,760	33,140	620
1974	10,380	14,443	-4,063
1973	4,290	3,660	630
1972	6,050	3,539	2,511
1971	4,000	2,116	1,884

¹Net migration in year t is defined as the difference between the (mid-year) population estimate for year t and for year t-1, less the excess of births over deaths (computed as a two-year moving average), adjusted to exclude estimated military population changes.

²Using the equation presented in Section C-10, including the estimate of serial correlation in the error term.

APPENDIX D

ISER MAP ALASKA ECONOMIC MODEL:
HOUSEHOLD FORMATION MODULE

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D.1 Model Description

A household is a living unit of one of two types: a family or an individual or group of individuals, not related, who are living as a unit.

The population projections determine the number of households in the state. The number of households is a function of both the level of population and its age-sex distribution. The age-sex distribution of the population is important because the rate at which people form households differs across age-sex cohorts. This household formation module accounts for both of these influences of population on household formation.

The household formation module is an accounting model which depends on a set of assumptions about the age-sex cohort-specific rates of household formation, known as headship rates, and changes in those rates. The module is based on the assumption that the social, economic, and life-cycle factors which determine the formation of households can be described by a set of headship rates. Headship rates describe the probability that a person in a particular cohort is a household head.

The module requires input from the population module in the form of the projected size and age-sex distribution of the population. The total number of households in the state (HH) is equal to the number of households summed across age and sex cohorts.

$$(1) \quad HH = \sum_{ij} HH_{ij}$$

The total number of households in sex cohort i and age cohort j (HH_{ij}) describes the number of households with household head or primary individual in the i th sex and j th age cohort. This total is, in turn, composed of three components: the number of civilian/non-Native households in cohort ij (CHH_{ij}), the number of Native households in cohort ij (NHH_{ij}), and the number of military households in cohort ij (MHH_{ij}).

$$(2) \quad HH_{ij} = CHH_{ij} + NHH_{ij} + MHH_{ij}$$

The number of civilian and Native households in each cohort is a function of the population and headship rate for the cohort. The number of households in any cohort equals the cohort-specific headship rate (HHR_{ij} for civilian/non-Natives and $NHHR_{ij}$ for Natives) multiplied by the cohort population (CNP_{ij} for civilian/non-Natives and $NATP_{ij}$ for Natives) net of the proportion of the population in group quarters ($CPGQ_{ij}$ for civilian/non-Natives and $NPGQ_{ij}$ for Natives).

$$(3) \quad CHH_{ij} = CNNP_{ij} * (1 - CPGQ_{ij}) * HHR_{ij}$$

$$(4) \quad NHH_{ij} = NATP_{ij} * (1 - NPGQ_{ij}) * NHHR_{ij}$$

The cohort distribution of military households (MHH_{ij}) is assumed to remain constant throughout the projection period. The number of military households (MHH_{ij}) equals the number in 1980.

The headship rates have changed historically and are expected to continue to vary. The headship rates are assumed to approach a specified target over a specified time period. Thus, the headship rate in any year equals:

$$(5) \quad HHR_{ij} = HHR_{ij}(80) + RC_{ij} * \frac{\log(T-80)}{\log TP}$$

$$(6) \quad NHHR_{ij} = NHHR_{ij}(80) + NRC_{ij} * \frac{\log(T-80)}{\log NTP}$$

where RC_{ij} (NRC_{ij}) is the specified target change for non-Natives (Natives) $_{ij}$ and TP_{ij} (NTP) is the time period in which the change is assumed to take place.

The model also calculates Native, civilian/non-Native, and total population in group quarters, as well as average household size for Natives, civilian/non-Natives, military, and total population.

$$(7) \quad NPGQ = = \sum_{ij} (NPGQ_{ij} * NATP_{ij})$$

$$(8) \quad CPGQ = = \sum_{ij} (CNNP_{ij} * CPGQ_{ij})$$

$$(9) \quad POPGQ = = NPGQ + CPGQ + MILPCT * MPGQ$$

$$(10) \quad HHSIZEN = = (NATTOT - NPGQ) / \sum_{ij} NHH_{ij}$$

$$(11) \quad HHSIZEC = = (CNNTOT - CPGQ) / \sum_{ij} CHH_{ij}$$

$$(12) \quad HHSIZEM = = (MILPCT * [AFTOT + MDTOT - MPGQ]) / \sum_{ij} MHH_{ij}$$

$$(13) \quad HHSIZE = = (POP - POPGQ) / HH$$

D.2 Model Parameter Assumptions

The model was calibrated using the 1980 Census as a benchmark. The civilian/non-Native and Native headship rates were calculated from the statewide census data. These parameter values are shown in Table D-1.

The civilian/non-Native and Native population proportions in group quarters, also derived from the census, are assumed to remain a constant proportion of each cohort over the projection period. These are shown in Table D-2.

Military households are taken directly from the 1980 Census and are shown in Table D-3. The age-sex distribution of military households is assumed to remain constant over time and to increase or decrease proportionately as total military population changes. The proportion in group quarters also remains the same constant proportion of total military as it was in 1980.

The parameters determining the rates of change of headship rates are discussed in the next section.

TABLE D-1. 1980 ALASKA CIVILIAN HEADSHIP RATES

Age	Civilian/Non-Native		Native	
	Male	Female	Male	Female
15-19	.063	.036	.025	.026
20-24	.553	.201	.257	.127
25-29	.742	.234	.539	.188
30-34	.836	.237	.691	.219
35-39	.905	.215	.807	.227
40-44	.914	.216	.807	.227
45-49	.943	.224	.864	.267
50-54	.931	.223	.864	.267
55-59	.923	.262	.893	.297
60-64	.922	.320	.925	.330
65+	.884	.466	.888	.503

NOTES: Assumes 1970 distribution for age 15-54 in group quarters after military in group quarters of 8,078 males and 1,365 females was subtracted from total age 15-54 in group quarters. Other group quarters by cohort is from U.S. Census.

Assumes no Natives in military.

SOURCE: U.S. Department of Commerce, Bureau of Census, 1980, Census of Population, Census Tape STF2, Table 11.

TABLE D-2. ALASKA CIVILIAN POPULATION IN GROUP QUARTERS, 1980

Age	Non-Native				Native			
	Male		Female		Male		Female	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
< 1	0	0	0	0	0	0	0	0
1-4	71	.0071	41	.0045	12	.0041	7	.0026
5-9	53	.0046	35	.0032	20	.0058	20	.0059
10-14	53	.0044	35	.0031	20	.0053	20	.0055
15-19	569	.0435	48	.0040	160	.0376	98	.0240
20-24	986	.0729	401	.0283	239	.0692	98	.0284
25-29	439	.0238	69	.0040	115	.0405	33	.0118
30-34	291	.0166	33	.0022	69	.0314	20	.0092
35-39	374	.0278	13	.0011	40	.0224	10	.0057
40-44	379	.0369	29	.0036	41	.0288	4	.0029
45-49	331	.0392	64	.0092	35	.0258	12	.0092
50-54	198	.0265	30	.0051	20	.0181	12	.0112
55-59	154	.0266	46	.0093	22	.0233	11	.0128
60-64	98	.0268	10	.0032	22	.0350	7	.0103
65+	281	.0648	320	.0751	61	.0417	72	.0510
	4,277		1,174		876		424	

SOURCE: U.S. Census Tape STF2B

TABLE D-3. ALASKA MILITARY HOUSEHOLDS
(percent of total)

<u>Age</u>	<u>Male</u>	<u>Female</u>
15-19	.6	.1
20-24	18.3	.6
25-29	29.1	.9
30-34	23.7	.3
35-39	15.8	.2
40-44	6.7	.1
45-49	1.7	.1
50-54	1.0	.1
55-59	.3	-
60-64	.1	-
65+	.1	.1

SOURCE: 1980 Census, Census Tapes.

D.3 Projecting Alaskan Households in the Future

National Trends

The relationship between population and the number of households has not remained constant over time. Table D-4 shows historical trends in the size and composition of households in the United States since 1940. Average household size has declined steadily since World War II, primarily as a result of the increase in the proportion of "primary individual" households. The average size of families actually increased after the war until the mid-1960s because of the "baby boom," but this was more than compensated for by the fact that the average household size of "primary individual" households has fallen dramatically from 1.94 to 1.19 in 1980.

Somewhat more detail on recent historical trends is provided by Table D-5 which focuses on the composition of households in the last ten years. Total households increased by 27 percent over that period in contrast to an increase in population of 7.6 percent. Family households increased by 15.7 percent while nonfamily households grew 78 percent.

Part of the decline in average household size for families can be attributed to the relative growth of one-parent households and families with no children less than 18 years of age. All categories of nonfamily households grew rapidly, but those with more than one member grew most rapidly at 157 percent. This category includes both couples living together and groups of unrelated individuals sharing households.

The dominant factors which underlie these trends are the increased life expectancy of people, which has increased the proportion of older-couple family households, and more importantly the aging of the post-war baby boom population which is now entering the primary headship years both in and out of families.

These trends have been projected forward nationally by the Department of Commerce (Table D-6) to predict the number of households in the future under different sets of assumptions of population (I, II, III) and headship rates (A, B, C, D).

These projections all assume a continued reduction of average household size during the next fifteen years. A control projection, K, is presented which assumes no change in headship rates to isolate the effect of population growth alone on the number of households.

TABLE D-4. HISTORICAL ANALYSIS OF HOUSEHOLDS
IN THE UNITED STATES
(thousands)

	Households	Average Household Size	Primary Families			Primary Individuals		
			Number	Average Family Size	Percent of Households	Number	Average Family Size	Percent of Households
1940		3.67		3.76				
1950	43,554	3.37	38,838	3.54	89.2	4,716	1.94	10.8
1955	47,874	3.33	41,732	3.59	87.2	6,142	1.61	12.8
1960	52,799	3.33	44,905	3.67	85.0	7,895	1.40	15.0
1965	57,436	3.29	47,838	3.70	83.3	9,598	1.28	16.7
1970	63,401	3.14	51,456	3.58	81.2	11,945	1.25	18.8
1975	71,120	2.94	55,563	3.42	78.1	15,557	1.23	21.9
1979	77,330	2.78	57,498	3.34	74.4	19,831	1.19	25.6
1980	80,776	2.76	59,550	3.31	73.7	21,226	1.19	26.3

SOURCES: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract, 1979.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports,
Population Estimates and Projections, Series P-25, No. 805, May 1979.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports,
Household and Family Characteristics: March 1979, Series P-20, No. 352, July 1980.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports,
Households, Families, Marital Status and Living Arrangements, Series P-20, No. 376,
October 1982.

TABLE D-5. U.S. HOUSEHOLD COMPOSITION
IN THE MOST RECENT DECADE

	1980		1970		Percent Growth 1970 to 1980
	Millions	Percent	Millions	Percent	
Total	80.776		63.401		27.4
Family Households	59.550	73.7	51.456	81.2	15.7
Married Couples	49.112	60.8	44.728	70.5	9.8
Other Family Households	10.438	12.9	6.728	10.6	55.1
Nonfamily Households	21.226	26.3	11.945	18.8	77.7
Persons Living Alone	18.419	22.8	10.851	17.1	69.7
Other Nonfamily Households	2.807	3.5	1.094	1.7	156.6

SOURCES: U.S. Department of Commerce, Bureau of the Census, Current Population Reports,
Household and Family Characteristics: March 1979, Series P-20, No. 352, July 1980.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports,
Households, Families, Marital Status, and Living Arrangements, Series P-20, No. 376.

TABLE D-6. PROJECTIONS OF HOUSEHOLDS AND
HOUSEHOLD COMPOSITION IN 1995

Dept. of Commerce Projection Series	Households	Average Household Size	Family Households	Percent	Nonfamily Households	Percent
1979 (BASE)	77,330	2.78	57,498	74.4	19,831	25.6
A I	107,528	2.46	72,709	67.6	34,819	32.4
II		2.31				
III		2.21				
B I	103,856	2.55	72,234	69.4	31,622	30.6
II		2.39				
III		2.28				
C I	104,194	2.54	70,715	67.8	33,479	32.2
II		2.38				
III		2.28				
D I	97,180	2.72	71,590	73.5	25,590	26.5
II		2.55				
III		2.44				
K	94,192		71,424	75.8	22,768	

^aFor definition of terms, see text.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current
Population Reports, Projection of the Number of Households
and Families, 1979 to 1995, Series P-25, No. 805, May 1979.

For high rates of population growth (primarily due to natural increase), the average household size in 1995 would vary between 2.46 and 2.72. For low rates of population increase (fewer births and more deaths), average household size is projected to decline to between 2.21 and 2.44. Conversion of these trends in household size into annual rates of change yields a range of from -01.5 percent annually for the high population growth case to -.1 percent for the low population growth case.

Alaskan Trends

Turning to Alaska, the data is not so complete, but some trends can be identified. Table D-7 shows the growth in the number of households since 1950 and their composition. Several similarities and contrasts with the national trends are in evidence. Briefly, they are as follows:

Similarities

- o Average household size has fallen since 1970.
- o Average family size has fallen.
- o The importance of female family heads has increased dramatically.
- o The proportion of family households has declined at about the rate of the United States.

Contrasts

- o The average household size for nonfamily households has not declined.
- o In 1950 the average household size was below the national average, but since 1960 it has exceeded the national average by a substantial amount.

Average household size estimates from surveys conducted in Anchorage and Fairbanks in the mid-1970s confirm the declining trend in average household size. Estimates of 3.27 to 3.32 for Anchorage for 1975 and 3.18 for 1977 have been published by the Anchorage Urban Observatory. An estimate of 2.9 for 1976 for Fairbanks has been published by the Institute of Social and Economic Research (ISER).

Further comparison of Alaska with other states reveals that in 1980, the average household size in Alaska of 2.93 was fourth highest in the nation, after Hawaii (3.15), Utah (3.20), and Mississippi (2.97). Alaska experienced the greatest change between 1970 and 1980. Household size fell 16.8 percent, compared to the U.S. average which fell 11.6 percent.¹

¹U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States 1981, December 1981.

TABLE D-7. ALASKA HISTORICAL HOUSEHOLD STATISTICS

	All Households ^a			Primary Family Households ^a							Primary Individual Households ^a					
	Households	Persons in HH	Average HH Size* (2) / (1)	Households No.	(%)	Husband/ Wife	Male Head	Female Head	All Persons	Average HH Size* (9) / (5)	Households No.	%	Male Head	Female Head	All Persons	Average HH Size* (15)/(12)
1950 ^b	31,047	100,779	3.25	NA		21,788	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1960 ^b	57,250	199,982	3.49	46,261	(80.8)	42,750	NA	NA	184,385	3.99	10,989	(19.2)	NA	NA	15,597	1.42
1960 ^c	57,250	200,418	3.50	46,613	(81.4)	43,172	1,235	2,706	185,655	3.98	10,637	(18.6)	7,804	2,833	14,763	1.39
1970 ^d	79,054	278,039	3.52	66,034	(83.5)	61,697		4,067	258,469	3.91	13,025	(16.5)	8,674	4,351	19,570	1.5
1970 ^c	79,739	278,145	3.49	66,670	(83.6)	60,380	2,233	4,057	258,640	3.88	13,069	(16.4)	8,654	4,415	19,505	1.49
1976 ^e	104,000	339,000	3.26	82,000	(78.8)	70,000	2,000	8,000	298,000	3.71	22,000	(21.2)	14,000	9,000	41,000	--
1980 ^f	132,369	385,608	2.91	96,840	(73.2)	82,102	4,683	10,055	332,161	3.43	35,529	(26.8)	22,606	12,923	53,447	1.5

*Person per household

^aBy definition, Primary Families and Primary Individuals sum to total households.

^bU.S. Census of Population, 1960, General Population Characteristics PC(1) 3B, Table 19, pp. 3-26, May 1961.

^cU.S. Census of Population, Detailed Characteristics PC(1) D3, Alaska, Table 153, pp. 3-246, June 1972.

^dU.S. Census of Population, General Characteristics PC(1) B3, Table 22, pp. 3-43, September 1971.

^eCurrent Population Reports, Population Characteristics, Series P-20, No. 334, Table 4, p. 24, January 1979.

^fU.S. Department of Commerce, Bureau of the Census, Supplementary Report, Advance Estimates of Social, Economic, and Housing Characteristics, Table P-1, 1980.

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APPENDIX E
ISER MAP ECONOMIC MODELING SYSTEM:
REGIONALIZATION MODEL

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E.1. Model Description

Introduction

This appendix presents in general outline form the structure of the revised regionalization model which allocates population, households, and employment to the census division level from a simulation of the state economic model. Southeast census divisions and Bristol Bay Borough census divisions are aggregated due to a prior constraint imposed by limited computer capabilities. The model essentially takes cross-sectional information on employment and population and projects the panel forward through time. The regional allocations are affected by variation over time in the location of basic sector and government activity. The total support employment and dependent population proportions vary over time to maintain consistency with the results of the state model.

In developing this model, several major objectives have been addressed as follows:

- o that the structure be simple and generalizable
- o that the parameters be specified in terms with clear, intuitive meaning
- o that the regions be disaggregated to census division levels
- o that the model be sufficiently flexible to be tied easily to the MAP statewide model

As such, the main strength of the model is in providing interregional consistency for any simulation analysis. On the other hand, because it treats each region in quite aggregate form, it cannot substitute for a detailed economic analysis for a particular labor market area, and in general the chance of projection error increases as the size of the census division analyzed declines.

The model consists of two components. First, given an exogenous estimate of statewide employment by sector (provided from a corresponding state model run) and vectors of basic and government employment in each of the twenty regions (1970 census division aggregates and Alaska Department of Labor, Labor Market Areas), the employment component of the model allocates support and total employment to each of the twenty regions. The population component then uses these estimates along with estimates of statewide population and households (from the statewide model) to generate regional population and household allocations.

The Employment Component

For each of the twenty regions, the model projects three types of employment: basic, government, and support. The basic sector consists of (1) all sectors or portions of sectors treated as exogenous in the state model: agriculture, fisheries, exogenous manufacturing, mining, exogenous construction, and a portion of transportation, as well as (2) some sectors which are endogenous in the state model: endogenous construction, forestry, miscellaneous, endogenous manufacturing, proprietors, and tourism employment. Government consists of federal civilian and military employees as well as state and local employees. State and local government are endogenous in the state model, but exogenous in the regionalization model. The support sector is defined as all other employment.

Total employment (M.aa) in each region aa is the sum of basic (B.aa), government (G.aa), and support (S.aa) employment.

$$M.aa = B.aa + G.aa + S.aa$$

Support employment in any region aa is a function of total employment in every region of the state as follows:

$$S.aa = S M.bb * A.aa.bb * BETA$$

where A.aa.bb is the proportion of support sector employment stimulated by an increase in total employment in region bb which is observed in region aa.. The preliminary estimate is adjusted by the parameter BETA to yield a final figure which, when aggregated, is consistent with the state model simulation. According to this model formulation, an increase in basic or government employment in a single region can, in theory, give rise directly and indirectly to support employment in every other region of the state.

The support employment is calculated for each region aa based upon demand in region bb as follows:

$$S.aa.bb = A.aa.bb * M.bb * BETA$$

The Population Component

Population (P.aa) in each region is a function of residence-adjusted employment. Specifically,

$$PRE.aa = PM.aa * S M.bb * IM.aa.bb$$

where PRE.aa is a preliminary population estimate for region aa, IM.aa.bb is the proportion of workers employed in region bb (M.bb)

who live in region aa, and PM.aa is the ratio of population to residence-adjusted employment in region aa. This preliminary estimate is forced to conform in the aggregate to total state population by multiplying through by an adjustment factor (ADJ). This yields final population (P.aa).

$$P.aa = PRE.aa * ADJ$$

Since the 1970 census division boundaries were changed in 1980 and were renamed census areas, the population by 1980 census areas (PCEN.cc) is calculated from the estimates of population by 1970 census divisions (P.aa) as follows:

$$PCEN.cc = \sum_{aa} P.aa * PC.cc.aa$$

where PC.cc.aa is the proportion of population in region aa (1970 census division) allocated to region cc (1980 census area).

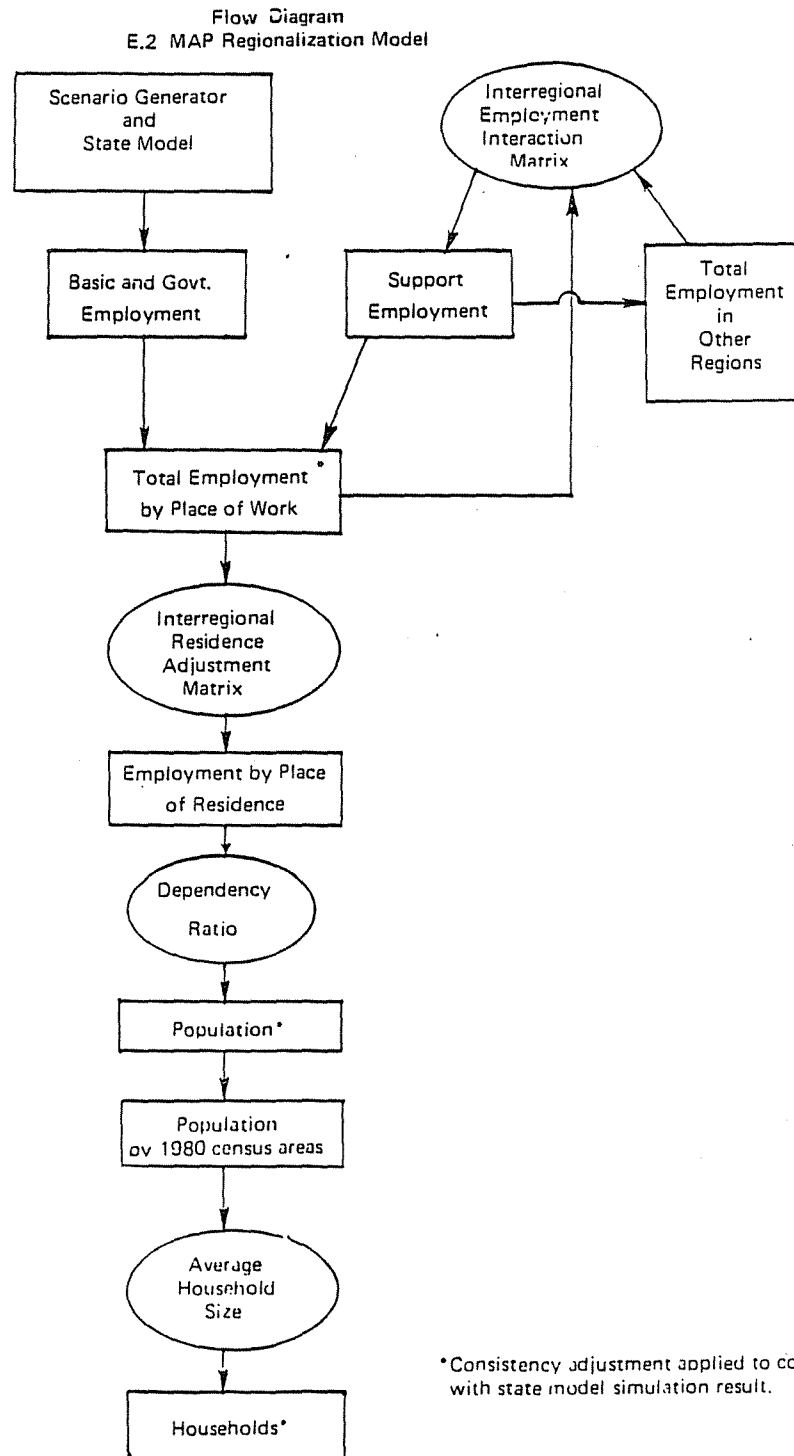
From these regional population figures, a preliminary value for the number of households (HPRE.cc) can be calculated as follows:

$$HPRE.cc = (PCEN.cc - PGQ.cc) / HHSZ.cc$$

where PGQ.cc is population in group quarters and HHSZ.cc is average household size in region cc. The preliminary figure is adjusted using the ratio ADJHH for consistency with the state simulation result (HHCEN.cc). A final product of the model is a set of household figures based upon the 1970 census divisions using the same allocation factors as employed in allocating population (HH.aa).

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E.2 Flow Diagram



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E.3. Model Inputs

Provided by the Scenario Generator

- Baa Portion of basic employment in region aa (mining [EMP9], exogenous construction [EMCNX], exogenous manufacturing [EMMX], exogenous transportation [EMT9X], agriculture [EMAGRI], fishing [EMFISH])
- Gaa Portion of government employment in region aa (federal civilian and military [EMGC and EMGM])

Provided by MAP State Economic Model

- HH Households
- POP Population

Provided by the Program for Running the Model*

- B.aa Total basic employment in region aa (EMP9, EMM9, EMCN, EMA9, EMT9X, EMPRO, EMTOUR)
- BETA Support employment/total employment $((EM99-EMA9-EMM9-EMCN-EMP9-EMT9X-EMPRO-EMGA-EMGF-EMTOUR)/EM99)$
- G.aa Government employment in region aa (EMGC, EMGM, EMGS, EMGL)

*The program used to run the regionalization model converts the basic sector employment from the scenario generator, utilizing output from the MAP state economic model, into the basic sector employment definition used in the regionalization model.

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E.4. Variable and Parameter Names

Variables

M.aa Total employment, region aa (EM99)
G.aa Government employment, region aa (EMGC, EMGM, EMGS, EMGL)
B.aa Basic employment, region aa (EMP9, EMCN, EMM9, EMA9, EMTOUR,
 EMT9X, EMPRO)

S.aa Support employment, region aa (M.aa - G.aa - B.aa)
S.aa.bb Support employment in region aa caused by economic activity
 in region bb

P.aa Population^a, region aa
PCEN.cc Population, region cc

HH.aa Households, region aa
HHCEN.cc Households^b, region cc

Parameters

A.aa.bb Proportion of support sector employment stimulated by
 increase in total employment in region bb which occurs in
 region aa

IM.aa.bb Percent of workers employed in region bb who live in
 region aa

PM.aa Ratio of population to residence-adjusted employment in
 region aa

HHSZ.cc Average household size in 1980 in Census Division cc

PGQ.cc Population in group quarters in 1980 in Census Division cc

PC.cc.aa Proportion of population in region aa (1970 Census division
 definition) allocated to region cc (1980 Census area
 definition)

^aA preliminary population, PRE.aa, is calculated for internal use.

^bA preliminary household, HPRE.cc, is calculated for internal use.

Suffixes

aa Labor Market Areas--1970 Census Divisions		Use in Model	
		Yes	*
01	Aleutian Islands	x	
02	Anchorage	x	
03	Angoon		11
04	Barrow-North Slope	x	
05	Bethel	x	
06	Bristol Bay	x (includes 7)	
07	Bristol Bay Borough		6
08	Cordova-McCarthy	x	
09	Fairbanks	x	
10	Haines		11
11	Juneau	x (includes 3, 10, 13, 19, 20, 22, 23, 28)	
12	Kenai-Cook Inlet	x	
13	Ketchikan		11
14	Kobuk	x	
15	Kodiak	x	
16	Kuskokwim	x	
17	Matanuska/Susitna	x	
18	Nome	x	
19	Outer Ketchikan		11
20	Prince of Wales		11
21	Seward	x	
22	Sitka		11
23	Skagway/Yakutat		11
24	Southeast Fairbanks	x	
25	Upper Yukon	x	
26	Valdez/Chitina/Whittier	x	
27	Wade Hampton	x	
28	Wrangell/Petersburg		11
29	Yukon/Koyukuk	x	
ST	State		
RB	Railbelt = 2 + 9 + 12 + 17 + 21 + 24 + 26		
AG	Greater Anchorage = 2 + 12 + 17 + 21		
AM	Anchorage + MatSu = 2 + 17		
NR	Non-Railbelt = ST - RB		
FG	Greater Fairbanks = 9 + 24		
IR	Intertied Railbelt = RB - 26		

*Aggregated into area indicated.

cc	--1980 Census Areas	Used in Model	
		Yes	*
01	North Slope	x	
02	Kobuk	x	
03	Nome	x	
04	Yukon/Koyukuk	x	
05	Fairbanks	x	
06	Southeast Fairbanks	x	
07	Wade Hampton	x	
08	Bethel	x	
09	Dillingham		10
10	Bristol Bay Borough	x (includes 09)	
11	Aleutian Islands	x	
12	Matanuska/Susitna	x	
13	Anchorage	x	
14	Kenai Peninsula	x	
15	Kodiak	x	
16	Valdez/Cordova	x	
17	Skagway/Yakutat/Angoon		19
18	Haines		19
19	Juneau	x (includes 17, 18, 20, 21, 22, 23)	
20	Sitka		19
21	Wrangell/Petersburg		19
22	Prince of Wales/Outer Ketchikan		19
23	Ketchikan Borough		19

*Aggregated into area indicated.

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E.5. Parameter Values

HHSZ.cc Average Household Size

PGQ.cc Population in Group Quarters

These parameters are calculated from the 1980 census as shown in Table E.1.

TABLE E.1.

1980 Census Area (Aggregated as Required by Model)	Average Household Size (HHSZ.cc)	Population in Group Quarters (PGQ.cc) (thousands)
1 North Slope	3.91	.365
2 Kobuk	4.2	.048
3 Nome	3.7	.088
4 Yukon/Koyukuk	3.18	.614
5 Fairbanks	2.78	3.339
6 Southeast Fairbanks	3.16	.399
7 Wade Hampton	4.87	.055
8 Bethel	4.05	.118
9 Dillingham ^a	0	0
10 Bristol Bay Borough	3.68	.339
11 Aleutian Islands	3.27	2.548
12 Matanuska/Susitna	3.06	.324
13 Anchorage	2.80	4.848
14 Kenai Peninsula	2.92	.32
15 Kodiak	3.06	.681
16 Valdez/Cordova	2.84	.702
17 Skagway/Yakutat/Angoon ^b	0	0
18 Haines ^b	0	0
19 Juneau	2.89	1.418
20 Sitka ^b	0	0
21 Wrangell/Petersburg ^b	0	0
22 Prince of Wales/ Outer Ketchikan ^b	0	0
23 Ketchikan ^b	0	0

^aAggregated with Bristol Bay Borough

^bAggregated with Juneau

SOURCE: 1980 Census of Population

PM.aa Ratio of Population to Residence-Adjusted Employment

This parameter is calculated using the most recent population and employment estimates of the Department of Labor (see Table E.2). The 1981 population estimate is adjusted to a labor-market basis using PC.cc.aa to be consistent with employment data by labor markets. Employment by place of residence is estimated using the interregional residence adjustment matrix, IM.aa.bb, applied to an estimated 1981 regional distribution of employment. This estimate is determined by running the regionalization model to allocate regionally the estimated 1981 statewide employment. The simplest way to accomplish this is to run the model once and then calibrate PM.aa to hit the correct population figure.

TABLE E.2. CALCULATION OF POPULATION/RESIDENT
EMPLOYMENT RATIO (PM.aa)

Labor Market Area	Estimated Residence- Adjusted Average Annual Employment 1981	Census Population 1981	Census Population per Avg. Annual Employed Resident (PM.aa)
1 Aleutian Islands	2.556	8.624	3.374
2 Anchorage	87.458	180.740	2.066
4 Barrow/North Slope ¹	.591	7.098	7.1
5 Bethel	2.983	9.579	3.211
6 Bristol Bay*	1.920	5.716	2.977
8 Cordova/McCarthy	.903	2.374	2.629
9 Fairbanks	26.047	58.313	2.239
11 Juneau**	27.495	55.985	2.036
12 Kodiak/Cook Inlet	8.984	23.574	2.624
14 Kobuk	1.586	4.960	3.127
15 Kodiak	5.461	9.728	1.782
16 Kuskokwim	.468	2.577	5.506
17 Matanuska-Susitna	6.183	19.123	3.093
18 Nome	1.910	7.565	3.961
21 Seward	.757	2.947	3.893
24 Southeast Fairbanks	1.472	5.734	3.895
25 Upper Yukon	.485	1.229	3.534
26 Valdez/Chitina/ Whittier	3.023	6.471	2.141
27 Wade Hampton	1.077	4.726	4.388
29 Yukon/Koyukuk	<u>1.665</u>	<u>5.122</u>	<u>3.076</u>
ST Statewide	183.024	422.185	2.307

¹The 1980 population of 4.199 was used for Barrow due to a change in the definition of residence in 1982.

*Includes 7

**Includes 3, 10, 13, 19, 20, 22, 23, 28

A.aa.bb Interregional Employment Interaction Matrix

Regional employment for 1979 was available from the Alaska Department of Labor publications, specifically Statistical Quarterly and Alaska Economic Trends. The breakdown of such employment by basic, government, and support sectors is shown in Table E.3 for 1979.

Since the major concern of the regional model is to capture the effect of support sector demands which are supplied in regions other than the one giving rise to such demands, rather than to examine the effects of differential support demands across regions, it seems plausible, or at least not overly restrictive, to impose the condition that the ratio of support employment generated by a unit of basic employment is the same wherever the basic employment occurs. The difference between regions, then, is solely the difference in the locations from which these demands will be supplied.

This assumption has the obvious disadvantage that it neglects real interregional differences in demand for support sector services. However, it also has several advantages which may more than compensate for this shortcoming. Most obviously, it reduces our estimation problem by $n-1$ parameters. More importantly, it is extremely valuable as a tool for maintaining consistency with the statewide MAP model, in both a static and a dynamic sense. Currently, a unit of basic sector employment in the state model has the same static employment impact regardless of its location in the state. Regionally varying support/basic ratios would produce differing total statewide static impacts by location, thus being inconsistent with the state model. Furthermore, the introduction of BETA (the ratio of support to total employment from the state model) exogenously provides a valuable tool for maintaining dynamic consistency between the models. By letting BETA vary with time so as to reflect the corresponding state model simulation, we both force the matrix (A.aa.bb) to vary over time to reflect the same degree of structural change represented by the state model and force the employment totals to replicate the statewide results.

The major reason that not all support sector requirements are supplied internally within the region is that it would be more costly to do so than to secure those services from a different region. It is only natural, then, that the cost of supply should be the major determining factor in deciding to which other regions to allocate the supply. Such costs as transportation, communication, etc. are generally expected to increase with distance and to decrease with the size of the support sector source for the region. We hypothesize that the location of support services is chosen in such a way as to minimize the costs of providing the required services observed in region bb from each of the sources of such supply aa. Cost between locations is an increasing function of distance and an inverse function of employment in the supplying region.

TABLE E.3. EMPLOYMENT COMPOSITION, 1979

Region	Support (S _i)	Basic ¹ (B _i)	Government ² (G _i)	Total (M _i)
1 Aleutian Islands	377	2,463	3,264	6,104
2 Anchorage	45,404	13,828	34,009	93,241
4 Barrow/North Slope	594	3,467	1,514	5,575
5 Bethel	1,917	420	1,360	3,697
6 Bristol Bay*	839	1,778	1,197	3,814
8 Cordova/McCarthy	403	1,005	344	1,752
9 Fairbanks	11,191	3,584	12,801	27,576
11 Southeast Alaska**	9,475	9,284	11,081	29,840
12 Kenai/Cook Inlet	2,819	3,564	1,481	7,864
14 Kobuk	402	114	935	1,451
15 Kodiak	1,644	3,631	2,051	7,326
16 Kuskokwim	123	13	435	571
17 Matanuska-Susitna	1,505	560	1,345	3,410
18 Nome	1,083	298	980	2,361
21 Seward	433	709	390	1,532
24 Southeast Fairbanks	240	149	1,636	2,025
25 Upper Yukon	99	25	302	426
26 Valdez/Chitina/ Whittier	715	678	927	2,320
27 Wade Hampton	208	236	595	1,039
29 Yukon/Koyukuk	506	807	1,208	2,521
ST Statewide	79,977	46,613	77,855	204,445

¹Mining, manufacturing, construction, agriculture-forestry-fisheries, and miscellaneous.

²Federal, state, and local government

*Includes Bristol Bay and Bristol Bay Borough Census Divisions

**Includes the following Census Divisions: Angoon, Haines, Juneau, Ketchikan, Outer Ketchikan, Prince of Wales, Sitka, Skagway-Yakutat, and Wrangell-Petersburg.

SOURCE: Alaska Economic Projections for Electricity Requirements for the Railbelt, ISER, 1981.

The A.aa.bb matrix was estimated by a linear programming routine for the problem of minimizing the cost of service delivery using 1979 data. It is presented in Table E.4. The solution, A.aa.bb, comprises a matrix which we call the interregional employment interaction matrix. Each entry represents the share of support requirements for region bb supplied from region aa. Each of the columns, therefore, must sum to unity. Thus, a quick glance down each column provides a subjective test of the plausibility of the matrix. A priori, one would expect nonzero entries in all of the diagonal elements and along the rows of the regional support centers (Bethel, Fairbanks, Nome) and probably along the entire row corresponding to Anchorage, which is a statewide support center. The pattern is as would have been expected. All diagonal terms are nonzero, with the larger support centers being self-sufficient vis-a-vis the rest of the state (having diagonal entries of 1). Anchorage and Fairbanks appear to be the only significant support centers, with Anchorage supplying most regions and Fairbanks supplying Kuskokwim, Upper Yukon, and Yukon/Koyukuk. Two local support centers emerge, with Bethel supporting Wade Hampton and Nome supporting Kobuk.

A complete description of the methodology used to derive this matrix appears in Alaska Economic Projections for Estimating Electricity Requirements for the Railbelt, ISER.

TABLE E.4. INTERREGIONAL EMPLOYMENT INTERACTION MATRIX (A.aa.bb)

Supply Region	Demand Region																			
	01	02	04	05	06	08	09	11	12	14	15	16	17	18	21	24	25	26	27	29
01 Aleutian Islands	.16																			
02 Anchorage	.84	1.	.73		.44	.41		.19	.08	.01	.43				.28	.7			.21	.25
04 Barrow			.27																	
05 Bethel				1.															.49	
06 Bristol Bay					.56															
08 Cordova/McCarthy						.59														
09 Fairbanks							1.				.45					.41				.24
11 Southeast Alaska								.81												
12 Kenai/Cook Inlet									.92											
14 Kobuk										.71										
15 Kodiak											.57									
16 Kuskokwim												.55								
17 Matanuska/Susitna													1.							
18 Nome									.28					1.						
21 Seward															.72					
24 S.E. Fairbanks																.3				
25 Upper Yukon																	.59			
26 Valdez/Chitina/Whittier																		.79		
27 Wade Hampton																			.51	
29 Yukon/Koyukuk																				.51

IM.aa.bb Interregional Residence Adjustment Matrix

The interregional residence adjustment matrix calculates the place of residence of workers employed in Alaska. It is an expanded and refined version of the Interregional Wage and Employee Flow Matrix constructed for the econometric model of Anchorage (see Municipality of Anchorage: Economic Modeling Project, ISER, 1982, p. II-24).

Four sources of information are used to construct the matrix. The first is the U.S. Census data on commuting which provides information on the proportion of residents in a region who are employed outside the region. The second is an analysis of tax returns by Alaskan places which, when compared to wages and salaries earned by place of work, provides a comparison of wages earned by workers in a region and workers living in a region. The third is the residency adjustment figures of the Bureau of Economic Analysis which provides another estimate of the ratio of wage and salary income earned in a region to resident wage and salary income. The fourth is the preliminary results of a special census for oil-related work sites on Alaska's North Slope conducted by the Alaska Department of Labor which reports usual place of residence of oil field employees. This census provided the basis for the column vector of the matrix for Barrow, after adjustment for non-oil-related employment on the North Slope.

Filling in the other cells of the matrix involved a judgmental approach because the available data left too many degrees of freedom to specify values for the 360 remaining cells.

The first step was calculation of the diagonal elements--the proportion of employment in each region done by residents of the region. This involved the following equation:

$$IM.aa.aa = \frac{(1-\%) * WR}{WP}$$

where % is the proportion of workers reporting employment outside their census area of residence in 1980 (1980 Census Table 36, STF3); WR is wages reported by residents on their 1978 income tax returns (Federal Income Taxpayer Profile 1978, Alaska Department of Revenue, 1981); and WP is wages and salaries paid in 1978 by labor market area (Statistical Quarterly, Alaska Department of Labor). The resulting parameter is net of both outflows of wages by nonresidents and inflows of wages by commuting residents. Table E.5 shows the ratio of wages reported to wages paid in 1978 and demonstrates a considerable amount of job commuting, particularly in certain census divisions.

TABLE E.5. WAGES PAID BY LOCATION AND WAGES EARNED
BY RESIDENTS IN 1978
(million \$)

Census Division	(1) Wages ^a Paid	(2) Wages ^b Reported by Residents	(2)-(1) Net Inflo (Outflo)	(3)/(1) Wages Reported as Percent of Wages Paid
Matanuska-Susitna	52.5	110.4	58.2	211
Kobuk	15.5	21.5	6.0	139
Skagway/Yakutat	12.5	14.6	2.1	117
Haines	6.8	7.4	0.6	110
Kenai/Cook Inlet	147.3	160.4	13.1	109
Upper Yukon	5.5	6.0	0.5	109
Valdez/Chitina/ Whittier	40.7	44.3	3.6	109
Wade Hampton	8.7	9.0	0.3	103
Seward	20.2	19.1	(1.1)	95
Bethel	36.0	31.7	(4.3)	88
Juneau	191.9	169.0	(22.9)	88
Anchorage	1,737.3	1,513.2	(224.1)	87
Fairbanks	532.6	459.0	(73.6)	86
Ketchikan	102.6	86.6	(16.0)	84
Nome	32.6	27.3	(5.3)	84
Angoon	2.4	2.0	(0.4)	83
Wrangell/Petersburg	41.0	33.6	(7.4)	82
Kuskokwim	8.8	6.9	(1.9)	79
Sitka	73.1	56.7	(16.4)	78
Southeast Fairbanks	26.1	19.4	(6.7)	74
Bristol Bay	17.8	13.0	(4.8)	73
Outer Ketchikan	8.4	5.9	(2.5)	70
Kodiak	86.7	60.6	(26.1)	70
Yukon/Koyukuk	54.4	32.8	(21.6)	60
Cordova/McCarthy	21.8	12.6	(9.2)	58
Prince of Wales	14.7	7.5	(7.2)	51
Bristol Bay Br.	13.9	5.7	(8.2)	41
Aleutian Islands	85.3	14.5	(70.8)	17
Barrow/North Slope	237.3	27.0	(210.3)	11
Alaska	3,634.1	2,977.9	(656.2)	82
United States	1,102,062.0	1,092,000.0	(10,062.0)	99

^aU.S. Department of Commerce, Bureau of Economic Analysis.

^bAlaska Department of Revenue, Federal Income Taxpayers Profile 1978, December 1981.

Off-diagonal elements are best understood by thinking of the columns where the elements in a particular column represent the percentage of employees working in the location represented by that column who live in each census area. To determine these elements, three assumptions are made. First, Alaskan residents earn no wage income outside of Alaska. Second, non-Alaskan residents can earn wage income in Alaska. Third, based upon a general knowledge of the state, certain elements can be assumed to be zero, thus reducing the number of degrees of freedom for the problem considerably. The matrix was then regionally aggregated into seven regions, and the wage income earned by nonresidents in each region was allocated to the other six and out of the state so that each column summed to one and each row completely allocated all earned income. The resulting parameters were then split into the twenty regions proportionately, except in a few instances where judgment about local conditions resulted in an adjustment. The full matrix is shown as Table E.6.

TABLE E.6. INTERREGIONAL RESIDENCE ADJUSTMENT MATRIX (IM.aa.bb)

Place of Work																					
Place of Residence	01	02	04	05	06	08	09	11	12	14	15	16	17	18	21	24	25	26	27	29	
01 Aleutian Islands	.41																				
02 Anchorage	.09	.86	.38	.09	.09	.02			.02		.02	.09			.02						
04 Barrow			.08																		
05 Bethel			0	.86							.02										
06 Bristol Bay					.5																
08 Cordova/McCarthy						.55															
09 Fairbanks			.16				.86									.05					
11 Southeast Alaska			.01					.84													
12 Kenai/ Cook Inlet	.02		.06	.02	.02				.97		.02										
14 Kobuk			.01							1											
15 Kodiak	.02				.02						.69	.02									
16 Kuskokwim												.78									
17 Matanuska/ Susitna	.02	.02	.06	.02	.02	.01			.01		.01	.02	1		.01						
18 Nome			.0											.79							
21 Seward															.80						
24 S.E. Fairbanks			.01													.69					
25 Upper Yukon																.005	1				
26 Valdez/Chitina/ Whittier			.01															1			
27 Wade Hampton																			1		
29 Yukon/Koyukuk			.01																	.61	
Total Residential*	.56	.88	.78	.99	.65	.58	.86	.84	1	1	.74	.93	1	.79	.83	.75	1	1	1	.61	
Out of Alaska	.44	.12	.22	.01	.35	.43	.14	.16	0	0	.26	.07	0	.21	.17	.25	0	0	0	.39	

*Components may not sum to total due to rounding.

PC.cc.aa 1970 to 1980 Census Boundary Allocations

These allocations are based upon population by place from the 1980 Census.

PC.04.16 .5079

PC.04.25 .9475

PC.06.25 .0525

PC.08.16 .4921

SOURCE: 1980 Census, Population data by place

E.6. Model Validation

The regionalization model has been initialized on 1981 population. The year 1981 is considered to be less affected by the temporary effects of the business cycle and the permanent fund dividend distribution program than 1982.

Because accurate historical data on interregional commuter patterns and a complete historical data set on basic employment by region are not available, it is not possible to do a historical simulation using the regionalization model. It is possible to compare the historical trends in the regional distribution of employment and population with the projections.

Historically, the proportion of state employment occurring in the railbelt has remained remarkably constant (Table E.7). Aside from the years of peak construction of the oil pipeline, the proportion has ranged between 67.1 and 68.6 percent since 1965. On the other hand, there has been an increasing concentration of population in the railbelt, growing from 62.1 percent of the total in 1960 to 68.9 percent in 1980 (Table E.8).

The differentially more rapid population growth in the railbelt (and conversely the differentially slower population growth outside of the railbelt) is an interesting phenomenon explained partially by the nature of the labor market. The demand for labor has been increasing at a rapid pace historically throughout the state, as reflected by the employment data. The growth in population through in-migration augments the supply of labor to clear the labor market. Outside of the railbelt, rates of unemployment have historically been higher, indicating that employment can increase without requiring population increase through in-migration. In March 1982, for example, the unemployment rates for the railbelt and nonrailbelt were 10.8 and 13.7 percent, respectively.

The uncertainty surrounding projections of the regional distribution of population is not so much where the employment opportunities are located but where those workers who have the skills necessary to do those jobs choose to live. The assumption reflected in the structure of the regionalization model is that there will be a continuation of the trend in concentration of population in the railbelt but that the moderation of the growth rate in population through in-migration will slow this trend.

TABLE E.7. EMPLOYMENT
(thousand)

	Anchorage M.02	Matanuska- Susitna M.17	Cook Inlet (Includes Seward) M.12 + M.21	Fairbanks M.09	Southeast Fairbanks M.24	Railbelt M.IR	% of Total	State M.ST
<u>Historical</u>								
1965	47.8	1.2	3.3		21.8	74.1	67.7	109.5
1966	48.2	1.2	4.1		21.8	75.3	67.7	111.3
1967	49.3	1.2	5.3		21.6	77.4	67.3	115.0
1968	50.0	1.1	6.1		22.1	79.3	67.7	117.2
1969	54.6	1.1	5.6		24.0	85.3	68.1	125.3
1970	58.0	1.2	5.0		24.3	88.5	68.5	129.2
1971	60.6	1.5	5.0		23.7	90.8	68.4	132.7
1972	63.3	1.6	5.1		23.4	93.4	68.6	136.1
1973	65.5	1.7	5.4		22.6	95.2	67.7	140.7
1974	73.3	1.9	5.8		26.5	107.5	68.0	158.2
1975	83.8	2.1	7.5		37.0	130.4	67.1	194.3
1976	86.7	2.4	7.9		37.0	134.0	66.6	201.2
1977	91.7	2.7	8.6		31.9	134.9	70.0	192.6
1978	90.6	3.1	7.8		29.4	130.9	68.4	191.5
1979	91.3	3.3	8.1		29.3	132.0	68.2	193.7
<u>Projection</u>								
1981	99.3	3.4	9.3		31.2	143.2	65.5	218.5
1990	125.1	4.2	12.5		36.8	178.6	64.3	277.6
2000	140.3	4.4	12.6		40.2	197.5	65.8	300.1
2010	168.6	5.1	14.6		47.0	235.4	67.9	346.7

HISTORICAL DATA SOURCE: ISER data base; employment includes active-duty military and reservists
but not proprietors.

PROJECTION DATA SOURCE: Projection HER.9; employment includes proprietors.

TABLE E.8. POPULATION
(thousand)

	Anchorage P.02	Matanuska- Susitna P.17	Cook Inlet (Includes Seward) P.12 + P.21	Fairbanks P.09	Southeast Fairbanks P.24	Railbelt P.1R	State P.ST
<u>Historical</u>							
1960							
Number	82,833	5,188	9,053	41,089	2,323	140,486	226,167
% of State	36.6	2.3	4	18.2	1	62.1	
1970							
Number	126,385	6,509	16,586	45,864	4,326	199,670	302,583
% of State	41.8	2.2	5.5	15.2	1.4	66.0	
1980							
Number	173,017	17,766	25,282	53,983	5,770	275,818	400,481
% of State	43.2	4.4	6.3	13.5	1.4	68.9	
<u>Projection</u>							
1990							
Number	233,675	24,768	35,636	71,219	6,242	371,539	533,184
% of State	43.8	4.7	6.7	13.4	1.2	69.7	
2000							
Number	267,251	26,969	36,863	79,156	6,384	416,622	593,611
% of State	45.0	4.5	6.2	13.3	1.1	70.2	
2010							
Number	318,393	31,014	42,155	92,530	6,530	490,620	684,180
% of State	46.5	4.5	6.2	13.5	1.0	71.7	

HISTORICAL DATA SOURCE: U.S. Census.

PROJECTION DATA SOURCE: Simulation HER.9.

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E.7. Programs for Model Use

A83RUNCD This MACRO takes output from a simulation using the state economic model and inputs provided by the scenario generator on basic and government sector employment by census division and runs the regionalization model.

The definition of basic sector plus government employment in the regionalization model includes the following categories of employment:

EMP9	Mining
EMM9	Total Manufacturing
EMCN	Total Construction
EMA9	Agriculture/Forestry/Fisheries
EMT9X	Exogenous Transportation
EMPRO	Proprietor Employment
EMTOUR	Tourism Employment
EMGA	State and Local
EMGF	Federal

In the state model, however, EMTOUR, EMGA, and portions of EMA9, EMM9, EMCN, and EMPRO are endogenous and thus not provided on a regional basis from the scenario generator. This program includes a procedure for converting the endogenous portions of these industries to exogenous and regionalizing them.

Specifically, the following variables are regionalized and added to Baa to derive B.aa:

EMCN1	Endogenous Construction
EMA9-EMAGRI-EMAFISH	Forestry and Nonclassifiable
EMPRO1	Endogenous Proprietor Employment
EMTOUR	Tourism Employment
EMMO	Endogenous Manufacturing

In addition, the following variable is regionalized and added to Gaa to derive G.aa:

EMGA	State and Local Government Employment

The parameters used in the regional allocation of these variables are calculated using the 1979 regional distribution of employment. The values used are shown in the accompanying table (Table E.9).

TABLE E.9. PARAMETER VALUES USED IN REGIONAL ALLOCATION
OF CERTAIN EXOGENOUS VARIABLES*

Region Number aa	Endogenous Construction	Forestry	Proprietors	Tourism	State and Local Government
1	.01	0	.02	0	.01
2	.57	.45	.46	.33	.34
4	.03	0	0	0	.03
5	.01	0	.01	0	.03
6	.01	0	.01	0	.02
8	0	0	.01	.01	.01
9	.16	.27	.11	.13	.13
11	.10	.04	.23	.30	.22
12	.04	.17	.05	.07	.04
14	0	0	0	0	.02
15	.01	.02	.04	.04	.02
16	0	0	0	0	.01
17	.02	.02	.02	.1	.03
18	0	.02	.01	0	.02
21	0	0	.01	0	.01
24	0	0	.01	0	.01
25	0	0	0	0	.01
26	.01	0	.01	.11	.02
27	0	0	0	0	.01
29	.01	.01	0	0	.01

*May not sum to 1 due to rounding error.

APPENDIX F
ISER MAP ALASKA ECONOMIC MODEL:
VARIABLE AND PARAMETER DICTIONARY

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
ADMDIS	average daily membership in district schools; thousand	ADE, <u>Annual Report</u>
ADMREA	average daily membership in REAA schools; thousand	ADE, <u>Annual Report</u>
ADMSD	average daily membership in district and REAA schools; thousand	ADE, <u>Annual Report</u>
AEX	Alaskan personal income tax exemptions; million \$	Constructed from IRS, <u>Statistics of Income</u> , ADL, <u>Statistical Quarterly</u> and unpublished data, and 1970 U.S. Census
AFTOT	total armed forces personnel in 1980	Alaska Air Command and Kruse, <u>Design and Implementation of Alaska, 1980 Reapportionment Data Collection Effort</u>
AGI	gross income reported on Alaskan state personal income tax returns; million \$	Constructed from IRS, <u>Statistics of Income</u> , ADL, <u>Statistical Quarterly</u> and unpublished data, and 1970 U.S. Census
AHG	Alaskan highway gasoline consumption per vehicle; gallons	-
ANCSA	payment to Alaska Natives by federal and state government under Alaska Native Claims Settlement Act; million \$	Constructed from Alaska <u>Native Land Claims</u> , Arnold and BEA personal income data

^a No entry indicates either a constructed variable or no historical data available.

Data Source Abbreviations:

ADA - Alaska Department of Administration
ADC - Alaska Department of Commerce and Economic Development
ADCR - Alaska Department of Community and Regional Affairs
ADE - Alaska Department of Education
ADL - Alaska Department of Labor
ADPW - Alaska Department of Transportation and Public Facilities
ADR - Alaska Department of Revenue
BEA - U.S. Department of Commerce, Bureau of Economic Analysis
BOC - U.S. Department of Commerce, Bureau of Census
IRS - U.S. Department of Treasury, Internal Revenue Service

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
ATD	Alaska personal income tax deductions; million \$	Constructed from IRS, <u>Statistics of Income</u> , ADL <u>Statistical Quarterly</u> and unpublished data, and 1970 U.S. Census
ATI	Alaska state personal income tax taxable income; million \$	Constructed from IRS, <u>Statistics of Income</u> , ADL <u>Statistical Quarterly</u> and unpublished data, and 1970 U.S. Census
ATI.TT	Alaska state taxable personal income per taxpayer; thousand \$	-
ATT	Alaska state personal income tax returns - individual plus joint returns; thousand	constructed from IRS <u>Statistics of Income</u> and ADL <u>Statistical Quarterly</u>
BADD	birth adjustment factor to account for birth of Native children to non-Native women	-
BAL99	combined state fund balances; million \$	ADA, <u>Annual Financial Report</u>
BAL991	initial combined state fund balances; million \$	-
BALCAB	state general fund revenues minus general fund expenditures; million \$	-
BALCABBM	unrestricted general fund revenues minus unrestricted general fund expenditures	-
BALCAP84	net additions to the state capital stock put in place after 1983, inflated to current dollar value; million \$	-
BALDF	development fund balance; million \$	-
BALDF1	initial state development fund (hypothetical) balance; million \$	-
BALGF	state general fund balance (available for appropriations); million \$	ADA, <u>Annual Financial Report</u>
BALGF1	initial state general fund balance; million \$	-
BALGFCP	positive change in general fund balance from year to year (if change negative, this takes zero value); million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
BALGFP	state general fund balance if positive; if state general fund balance negative, then zero; million \$	-
BALLANDS	state plus local government current account balance; million \$	-
BALOCAL	local government revenues minus nondebt financed expenditures; million \$	-
BALPF	permanent fund balance; million \$	ADA, <u>Annual Financial Report</u>
BALPF1	initial state permanent fund balance; million \$	-
BASEMCNX	a base case vector of EMCNX values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	-
BASEPOP	a base case vector of POP values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	-
BASEXCAP	a base case vector of EXCAP values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	-
BASEXGF	base case expenditure value to be placed in impact run to calculate difference in state expenditures in real per capita terms	-
BASEXOPS	a base case vector of EXOPS values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	-
BASPDROI	base case value of RPI to be input into impact run to calculate difference in state expenditures in real per capita terms	-
BCRUDE	Alaska crude civilian birth rate	-
BIU	the Basic Instructional Unit for School Foundation distribution program; thousand \$	ADE, <u>Annual Report</u>
BIU1	initial value of Basic Instructional Unit for School Foundation distribution program; thousand \$	-
BL	Alaska business licenses issued; thousand	ADR, unpublished data

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
BTHTOT	total Alaska civilian non-Native births to civilian population	-
BTOT	total Alaska civilian births; thousand	-
C***	stochastic coefficient	-
CBR	Alaska crude civilian non-Native birth rate	-
CDR	Alaska crude civilian non-Native death rate	-
CEabN	proportion of Native employment in sector ab	1970 U.S. Census, Alaska public use samples
CHHij	Alaska households headed by civilian non-Native persons in cohort ij	-
CNNPij	Alaska civilian non-Native population in cohort ij	-
CNNTOT	total Alaska civilian non-Native population	-
COLA	federal cost of living adjustment for Alaska state personal income tax purposes; million \$	Constructed from ADL <u>Statistical Quarterly</u> and PCOLART
CPGQij	fraction of civilian non-Native population in cohort ij in group quarters	BOC, 1980 Census Tape STF2B
Cij	Alaska civilian non-Native population in cohort ij before migration	-
D****	dummy variable with value of 1 for year or period of years indicated; units	-
D.80DEC6	dummy variable with value of one in 1980 tapering off to zero in 6 years, reflecting the fact that Alaskan wage rates are "sticky downward"	-
DCRUDE	Alaska crude civilian death rate	-
DEBTP82	sum of general obligation bonded debt incurred by the state after 1982; million \$	-
DELEMP	annual change in civilian employment (EM96); thousand	-
DF.***	variable deflated to 1982 dollars (PDRPIBAS is base year index);	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
DF.RSVP	cumulative discounted value of petroleum revenues received from 1982; million 1982 \$	-
DPI	Alaska disposable personal income; million \$	BEA disposable personal income data & ADA, <u>Annual Financial Report</u>
DPI8	Alaska disposable personal income plus residency adjustment; million \$	BEA disposable personal income data & ADA, <u>Annual Financial Report</u>
DPIRES	total nonfederal, nonstate personal income tax payments paid out of Alaskan personal income for purposes of calculating disposable personal income; million \$	BEA, disposable personal income data
DTHINF	Alaska infant civilian non-Native deaths	-
DHTOT	total Alaska civilian non-Native deaths	-
DTOT	total Alaska civilian deaths	-
EL99	total local government expenditures; million \$	-
ELBD	local government debt service; million \$	BOC, <u>Governmental Finances</u>
ELED	local government education expenditures; million \$	BOC, <u>Governmental Finances</u>
ELED1	local government education expenditures from own sources; million \$	Constructed from ADA, <u>Executive Budget</u> and BOC, <u>State Government Finances</u>
ELEDCP	local government education expenditures for capital outlays; million \$	BOC, <u>Governmental Finances</u>
ELNED1	local government non-education expenditures net of debt service; million \$	BOC, <u>Governmental Finances</u>
ELPERS	local government personal services expenditures; million \$	BOC, <u>Governmental Finances</u>
EM.EMCN	ratio of construction to total employment	-
EM.EMG9	ratio of total government to total employment	-
EM.EMGA	ratio of state and local government to total employment	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EM.EMGF	ratio of federal government to total employment	-
EM.EMNR	ratio of total minus support type (SP), government, construction, and petroleum employment to total employment	-
EM.EMNS	ratio of total minus support type (SP) and government to total employment	-
EM.EMP9	ratio of mining to total employment	-
EM.EMSP	ratio of service type (T9, CM, PU, D9, FI, S9) to total employment	-
EM.EMSUP	ratio of trade, finance, and service to total employment	-
EM.EMTCU	ratio of transport, communication, and public utilities to total employment	-
EM96	total wage and salary plus proprietor employment; thousand	-
EM97	nonagricultural wage & salary employment; thousand	ADL, <u>Alaska Labor Force Estimates and Statistical Quarterly</u>
EM98	wage and salary and military employment; thousand	-
EM99	total wage and salary, nonwage and salary (proprietor), and military employment; thousand	-
EMAFISH	wage and salary component of fish harvesting employment; thousand	-
EMAGRI	wage and salary component of agriculture employment; thousand	ADL, <u>Statistical Quarterly</u>
EMCN1	construction employment net of exogenous construction employment; thousand	-
EMCNRT	ratio of premium wage construction employment to EM98 net of premium wage construction employment. Employed as a measure of labor market "tightness"; percent	-
EMCNX	exogenous construction employment; thousand	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EMCNX1	"enclave" high (premium) wage exogenous construction employment; thousand	constructed from ADL, unpublished worksheets
EMCNX2	non- "enclave" low (normal) wage exogenous construction employment; thousand	-
EMCU	communications plus public utilities employment; thousand	-
EMDR	employment in retail trade; thousand	ADL, <u>Statistical Quarterly</u>
EMDW	employment in wholesale trade; thousand	ADL, <u>Statistical Quarterly</u>
EMDRNT	employment in retail trade net of tourism; thousand	-
EMD TOUR	tourism employment in trade sector; thousand	<u>Improvements to Specification of the MAP Model</u>
EMFISH	fish harvesting employment; thousand	<u>G. Rogers, Measuring the Socio-economic Impact of Alaska's Fisheries</u>
EMG9	federal, state, and local government employment; thousand	-
EMGA	state and local government employment; thousand	-
EMGC	federal civilian employment; thousand	ADL, <u>Statistical Quarterly</u>
EMGF	federal civilian and military employment; thousand	-
EMGL	local government employment; thousand	ADL, <u>Statistical Quarterly</u>
EMGM	military employment; thousand	ADL
EMGS	state government employment; thousand	ADL, <u>Statistical Quarterly</u>
EMM91	manufacturing employment net of new large project employment (EMMX1); thousand	ADL, <u>Statistical Quarterly</u>
EMMO	employment in endogenous manufacturing; thousand	ADL, <u>Statistical Quarterly</u>
EMMX	exogenous manufacturing employment; thousand	-
EMMX1	high (premium) wage exogenous manufacturing employment; thousand	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EMMX2	low wage exogenous manufacturing employment; thousand	ADL, <u>Statistical Quarterly</u>
EMNA	Native employment; thousand	-
EMNAT	Native employment obtained from the income distribution model; thousand	-
EMNATX	Native employment obtained from the income distribution model; thousand	-
EMNC	Native Corporation direct employment; thousand	-
EMNNC	total civilian non-Native employment; thousand	-
EMNR	total employment minus support type (SP), government, construction, and mining; thousand	-
EMNS	total employment minus support type (SP) and government	-
EMOCSX	sum of mining, exogenous construction, exogenous transportation, and high wage exogenous manufacturing employment; thousand	-
EMP9	mining employment; thousand	ADL, <u>Statistical Quarterly</u>
EMPRO	total proprietor employment; thousand	BEA employment data
EMPROFIS	fish harvesting proprietor employment; thousand	DOL, <u>Statistical Quarterly</u> ; BEA employment data; and G. Rogers, <u>Measuring the Socioeconomic Impact of Alaska's Fisheries</u>
EMPRO1	proprietor employment net of fish harvesting; thousand	-
EMRATE	ratio of wage and salary plus proprietor employment to civilian population	-
EMRATN	Native employment rate based on Native enrollments; percent	-
EMRATN1	interim calculation of Native employment rate; percent	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EMS8NT	employment in support services (net of business, tourism, and Native claims); thousand	-
EMS91	service sector employment net of direct Native Corporation employment; thousand	-
EMSB	business service employment; thousand	ADL, <u>Statistical Quarterly</u>
EMSP	transport, communication, public utility, trade, finance, and service employment; thousand	-
EMSTOUR	tourism employment in service sector; thousand	<u>Improvements to Specification of the MAP Model</u>
EMSUP	trade, finance, and service employment; thousand	-
EMT91	transportation employment net of exogenous employment; thousand	-
EMT9X	exogenous (large pipeline project-related) transportation employment; thousand	-
EMTCU	transport, communication, and public utility employment; thousand	-
EMTNT	employment in transportation net of tourism and exogenous components; thousand	-
EMTOUR	total tourism employment; thousand	<u>Improvements to Specification of the MAP Model</u>
EMTTOUR	transportation-related tourism employment; thousand	<u>Improvements to Specification of the MAP Model</u>
EMX	extractive industries-related employment consisting of mining and exogenous construction; thousand	-
EMab	employment by industry; ab=CM CN D9 FI PU GS GL M9 S9 T9 A9 GM GC P9; thousand	ADL, <u>Statistical Quarterly</u>
EX.DSS	ratio of debt service expenditures to total state general fund expenditures	-
EX.NPET	ratio of state "non-endowment" revenues to total state general fund expenditures	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EX.NRP9	ratio of state nonpetroleum revenues to total state general fund expenditures	-
EX.PET	ratio of "endowment" type revenues to total state general fund expenditures	-
EX.R99S	ratio of general fund plus Permanent Fund revenues to total state general fund expenditures	-
EX.RP9S	ratio of petroleum revenues to total state general fund expenditures	-
EX.RSEN	ratio of endogenous revenues to total state general fund expenditures	-
EX.RSIN	ratio of total fund earnings to total state general fund expenditures	-
EX.RVNT	ratio of general fund revenues net of permanent fund contributions to total state general fund expenditures	-
EX99S	total state government expenditures from all funds—capital and operating; million \$	-
EXANNU	if EXRLOP8 is in effect in the state operating expenditure equation, the base amount of the annuity which adds to state operating expenditures; \$	-
EXANSAV	amount of state government saving when using fiscal rule option EXRLOP8; million \$	-
EXBM.CAB	ratio of general fund current account balance (BALCABBM) to unrestricted general fund expenditures	-
EXBM.END	ratio of development fund withdrawals (EXDFWITH) to unrestricted general fund expenditures	-
EXBM.FD	ratio of total fund balance (BAL99) to unrestricted general fund expenditures	-
EXBM.GR1	ratio of revenues net of petroleum (RSGFBM+EXPFCO-EXPFBK*RSIP-RP9S) to unrestricted general fund expenditures	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXBM.RV	ratio of general fund unrestricted revenues to unrestricted general fund expenditures	-
EXBOND	proportion of capital expenditures financed by general obligation bonds and federal grants; percent	constructed from ADA, Annual Financial Report
EXBUD	state operating expenditures as defined in the budget; million \$	ADA, <u>Executive Budget</u>
EXCAP	total state capital expenditures; million \$	-
EXCAP1	initial state capital expenditures; million \$	-
EXCAPFR	capital expenditures for ferries—assumed to be purchases out of state; million \$	ADPW unpublished data
EXCAPIMP	per capita impact state capital expenditures used with fiscal rule EXRL4	Goldsmith and Mogford, <u>The Relationship Between the Alaska Natural Gas Pipeline and State and Local Govern- ment Expenditures</u>
EXCAPNEW	new additions to state capital stock in a given year; million \$	-
EXCAPOLD	state spending to replace capital stock put in place prior to 1984	-
EXCAPREP	capital expenditures necessary to replace state capital stock which depreciates each year; million \$	-
EXCDS	state development operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXCDS4	initial model estimate of state development operating expenditures net of debt service before application of RATI01; million \$	-
EXCDSNT	development component of the state operating budget net of transfers to local government; million \$	-
EXCPS	construction expenditures from state capital project funds; million \$	ADA, <u>Annual Financial Report</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXCPSFED	portion of capital project fund revenues from federal capital grants; million \$	ADA, <u>Annual Financial Report</u>
EXCPSGOB	portion of capital project fund revenues from bond sales; million \$	ADA, <u>Annual Financial Report</u>
EXCPSHY	highway construction expenditures out of state capital project construction funds; million \$	ADA, <u>Annual Financial Report</u>
EXCPSHY1	initial highway construction expenditures out of state capital project construction funds; million \$	-
EXCPSM	portion of capital project fund revenues from bond sales (used to calculate bond maturation); million \$	ADA, <u>Annual Financial Report</u>
EXCPSNH	nonhighway construction expenditure out of state capital project construction funds; million \$	ADA, <u>Annual Financial Report</u>
EXCPSNH1	initial nonhighway construction expenditures out of state capital project construction funds; million \$	-
EXDF1	percent of state current account balance placed into development fund (hypothetical); percent	-
EXDFCON	development fund contribution; million \$	-
EXDFPCNT	percent of development fund earnings withdrawn; percent	-
EXDFWITH	development fund withdrawals; million \$	-
EXDSS	annual debt service payment to service general obligation bonded debt of the state; million \$	ADA, <u>Annual Financial Report</u>
EXDSSX	annual debt service payment to service general obligation bonds outstanding at beginning of simulation period; million \$	ADA, <u>Annual Financial Report</u>
EXEDS	state education operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXEDS4	state education operating expenditure net of debt service before application of RATIO1; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXEDSNT	state education operating expenditures net of transfers to local government; million \$	-
EXEL1	elasticity of state expenditures with respect to population	-
EXEL2	elasticity of state expenditures with respect to prices	-
EXEL3	elasticity of state expenditures with respect to real per capita personal income	-
EXEL4	elasticity of state expenditures with respect to personal income	-
EXEL5	elasticity of state expenditures to personal income net of "enclave" employment-related income (PI3)	-
EXEL6	elasticity of state expenditures to population net of "enclave" construction employment	-
EXGF	state general fund expenditures; million \$	ADA, <u>Annual Financial Report</u>
EXGFBM	state general fund expenditures net of expenditures from restricted revenues; million \$	-
EXGFCAP	state general fund capital outlays—actual disbursements; million \$	ADA, <u>Annual Financial Report</u>
EXGFCHY	state general fund capital expenditures for highways; million \$	ADA, <u>Annual Financial Report</u>
EXGFCHY1	initial state general fund capital expenditures for highways; million \$	-
EXGFCNH	state general fund capital expenditures nonhighways; million \$	ADA, <u>Annual Financial Report</u>
EXGFCNH1	initial state general fund capital expenditures nonhighways; million \$	-
EXGFOPER	state general fund operating expenditures; million \$	-
EXGGS	state general government operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXGGS4	initial model estimate of state general government operating expenditures net of debt service before application of RATI01; million \$	-
EXHES	state health operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXHES4	state health operating expenditures net of debt service before application of RATI01; million \$	-
EXHYCAP	state capital expenditures for highways; million \$	-
EXINREC	state government interagency receipts; million \$	ADA, <u>Annual Financial Report</u>
EXJUS	state administration of justice operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXJUS4	state administration of justice operating expenditures net of debt service before application of RATI01; million \$	-
EXLIM	state expenditures allowed by constitutionally mandated spending limit; million \$	-
EXLIM82	constitutionally mandated 1982 state spending limit; million \$	-
EXLIMOK	actual state expenditures which can be supported by revenues and general fund balance under constitutionally mandated spending limit; million \$	-
EXNHYCP	state capital expenditures for nonhighway projects; million \$	-
EXNOPS	state expenditures—total net of the operating budget; million \$	-
EXNRS	state natural resource operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXNRS4	state natural resource operating expenditures net of debt service before application of RATI01; million \$	-
EXOM84	annual operations and maintenance cost associated with incremental state capital stock put in place in 1984 and succeeding years; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXOMCOST	annual operations and maintenance cost of incremental state capital stock (EXOM84) as a percentage of original cost; percent	-
EXONTR	state operating expenditures net of local government transfers; million \$	-
EXOPS	total state operating expenditures net of debt service and University of Alaska nongeneral fund assistance. It is the sum of the nine functional categories; million \$	ADA, <u>Executive Budget</u>
EXOPS1	initial total state operating expenditures net of debt service and University of Alaska nongeneral fund assistance. It is the sum of the nine functional categories; million \$	ADA, <u>Executive Budget</u>
EXOPSIMP	per capita impact state operation expenditure used with fiscal rule EXRL4	Goldsmith and Mogford, <u>The Relationship Between the Alaska Natural Gas Pipeline and State and Local Government Expenditures</u>
EXPF1	percent contribution from available funds to Permanent Fund; percent	-
EXPFBK	percent of Permanent Fund earnings plowed back into the Permanent Fund; percentage	-
EXPFCO	total contributions to Permanent Fund, including special appropriations and reinvested earnings; million \$	-
EXPFCO1	contributions to the Permanent Fund, not including special appropriations; million \$	-
EXPFCOX	special Permanent Fund contributions appropriated from the general fund; million \$	-
EXPFDIST	percent of Permanent Fund earnings transferred to general fund which are distributed to individuals; percent	-
EXPFNEW	constitutionally mandated Permanent Fund contributions from petroleum revenues; million \$	ADR, <u>Revenue Sources</u>
EXPFREIN	reinvested Permanent Fund earnings; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXPPS	state public protection operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXPPS4	state public protection operating expenditures net of debt service before application of RATIO1; million \$	-
EXPR99	total state personnel expenditures; million \$	ADA, <u>Executive Budget</u>
EXPRCDS	state personnel expenditures for development; million \$	ADA, <u>Executive Budget</u>
EXPRED51	state personnel expenditures for education net of University of Alaska; million \$	ADA, <u>Executive Budget</u>
EXPRGGS	state personnel expenditures for general government; million \$	ADA, <u>Executive Budget</u>
EXPRHES	state personnel expenditures for health; million \$	ADA, <u>Executive Budget</u>
EXPRJUS	state personnel expenditures for administration of justice; million \$	ADA, <u>Executive Budget</u>
EXPRNRS	state personnel expenditures for natural resources; million \$	ADA, <u>Executive Budget</u>
EXPRPER	adjustment to state personnel expenditures data for consistency with state government employment data; percent	-
EXPRPPS	state personnel expenditures for public protection; million \$	ADA, <u>Executive Budget</u>
EXPRSSS	state personnel expenditures for social services; million \$	ADA, <u>Executive Budget</u>
EXPRTRS	state personnel expenditures for transportation; million \$	ADA, <u>Executive Budget</u>
EXPRUA	wages and salaries of University of Alaska; million \$	constructed from University of Alaska records and ADL data
EXRL1	policy switch which, if set at 1, determines state operating expenditure growth based primarily upon aggregate demand;	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXRL2	policy switch which, if set at 1, determines state operating expenditure growth based upon exogenous growth rate	-
EXRL3	policy switch which, if set at 1, determines state expenditure growth based upon real per capita operating expenditure levels and real per capita capital stock levels	-
EXRL4	policy switch which, if set at 1, determines state expenditure growth based upon a specified expenditure level per impact individual (for use in impact analysis)	-
EXRL40P	policy switch used with EXRL4 with value of one if enclave construction employment not counted in impact population	-
EXRL5	policy switch which, if set at 1, determines state expenditure growth based upon constitutionally imposed spending limit	-
EXRLOP6	policy switch which, if set at 1, determines state operating expenditure growth based upon annual change in level of general fund balance	-
EXRLOP7	policy switch which, if set at 1, determines state operating expenditures growth based upon saving a specified amount of revenues	-
EXRLOP8	policy switch which, if set at 1, determines state operating expenditure growth based upon spending an annuity (EXANSAV)	-
EXRP84	annual cost for replacement of capital stock put in place after 1983; million \$	-
EXSAVS	if EXRLOP7 is invoked in determination of state operating expenditures, this is the amount of revenues not spent; million \$	-
EXSAVX	if EXRLOP7 is invoked in determination of state operating expenditures, this is the exogenous amount of revenues not spent; million \$	-
EXSPCAP	special state capital appropriations; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
EXSPLIT	the allocation to operations when state spending falls below the authorized spending limit; percent	-
EXSPLITX	the target allocation to operations when state spending falls below the authorized spending limit; percent	-
EXSSS	state social services operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXSSS4	state social services operating expenditures net of debt service before application of RATIO1; million \$	ADA, <u>Executive Budget</u>
EXSUBS	state subsidy programs initiated after 1980; million \$	-
EXSUBS1	initial values for state subsidy programs initiated after 1980; million \$	-
EXTRNS	state Permanent Fund dividend distribution; million \$	-
EXTRS	state transportation operating expenditures net of debt service; million \$	ADA, <u>Executive Budget</u>
EXTRS4	state transportation operating expenditures net of debt service before application of RATIO1; million \$	-
EXUA	University of Alaska operating budget; million \$	ADA, <u>Executive Budget</u>
FAGI	federal adjusted gross income earned in Alaska; million \$	Constructed from IRS, <u>Statistics of Income</u> and ADL <u>Statistical Quarterly</u>
FAGII	federal adjusted gross income reported on federal tax returns filed from Alaska; million \$	IRS <u>Statistics of Income</u>
FERTj	non-Native fertility rate for female cohort j	Alaska Department of Health and Social Services and Alaska Native Medical Center
G.BAL99	annual growth in total state fund balance	-
G.BAL9PC	annual growth in per capita value of combined state funds	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
G.EL99	annual growth in local government expenditures	-
G.EM99	annual growth in total employment	-
G.EX99S	annual growth in state government expenditures	-
G.PDRPI	annual growth in Alaskan relative price index	-
G.POP	annual growth in population	-
G.PR.DPI	annual growth in real disposable personal income per capita	-
G.PR.PI	annual growth in real per capita personal income	-
G.R.WR98	annual growth in the average annual real wage	-
G.RNSPC	annual growth in endogenous state revenues per capita	-
G.RSEN	annual growth in endogenous state revenues	-
G.SRPC	annual growth in real state expenditures per capita	-
G.XONRPC	annual growth in real per capita state expenditures net of local transfers (EXONTR)	-
GOBONDL	general obligation bonded indebtedness of local government; million \$	ADCR, <u>Alaska Taxable</u>
GODT	general obligation bonded indebtedness of state; million \$	ADA, <u>Annual Financial Report</u>
GODTX	general obligation bonded indebtedness of the state from debt incurred before 1983; million \$	ADA, <u>Annual Financial Report</u>
GR	gross business receipts; million \$	ADA, <u>Annual Financial Report</u>
GRDIRPU	annual growth rate of U.S. real disposable personal income per capita; percent	-
GREXCAP	nominal growth rate of state capital expenditures using EXRL2	-
GREXOPS	nominal growth rate of state operating expenditures using EXRL2	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
GRRPCEX	growth rate of real per capita state expenditures using EXRL3	-
GRRWEUS	annual real growth rate of U.S. average weekly earnings; percent	-
GRSSCP	growth rate of state real per capita state capital stock using EXRL3	-
GRUSCPI	annual growth rate of U.S. consumer price index; percent	-
GTR	gross taxable receipts; million \$	Constructed from ADA, <u>Annual Financial Report</u> and ADR unpublished data
Gj	shift factor for aging of cohorts	-
HH	total Alaska households; thousand	BOC, Census of Population
HH24	households: head under age_of 25; thousand	BOC, Census of Population
HH25.29	households: head between ages of 25 and 29; thousand	BOC, Census of Population
HH30.54	households: head between ages of 30 and 54; thousand	BOC, Census of Population
HH55	households: head over 54; thousand	BOC, Census of Population
HHC	total Alaska civilian non-Native households; thousand	BOC, Census of Population
HHM	total Alaska military households; thousand	BOC, Census of Population
HHN	total Alaska civilian Native households; thousand	BOC, Census of Population
HHRij	household formation rate for civilian non-Native population in cohort ij	BOC, 1980 Census of Population, Census Tape STF2
HHSIZE	average Alaska household size, all households	-
HHSIZEC	average Alaska civilian non-Native household size	-
HHSIZEN	average Alaska Native household size	-
HHij	total Alaska households headed by persons in cohort ij; thousand	BOC, Census of Population

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
IM.BAL	the summation over time of the annual increments to IM.REV; million \$	-
IM.BAL99	the sum of the general fund, Permanent Fund, and IMBAL; million \$	-
IM.BALPC	"impact balance" per capita; \$	-
IM.BALR	real "impact balance"; million 1967 U.S. \$	-
IM.BALRV	annual revenues contributed to IMBAL, including interest; million \$	-
IM.BLRPC	real per capita "impact balance"; 1967 U.S. \$	-
IM.REV	the difference between actual state expenditures in an impact analysis case and what they would have been if expenditures in real per capita terms had been kept equivalent to the base case; million \$	-
INDEX.DI	ratio of Alaskan to U.S. per capita real disposable personal income	-
INDEX.S1	ratio of trade/service/finance employment to Alaska real disposable personal income	-
INDEX.S2	ratio of transportation/communications/utilities employment to Alaska real disposable personal income	-
INDEX.WG	ratio of Alaskan to U.S. real average wage	-
LF	labor force; thousand	-
LFPART	labor force participation rate as a percent of potential labor force (civilian population 15 through 64); percent	-
LPTB	total value of real property falling within local government jurisdiction; million \$	-
LPTBFV	total assessed value of real, personal, and petroleum property falling within local government jurisdiction; million \$	-
LPTBP9	taxable petroleum property falling within local government jurisdiction; million \$	ADCR, <u>Alaska Taxable</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
LPTB1	assessed value of real and personal property (A.S. 29.53) (not full value); million \$	ADCR, <u>Alaska Taxable</u>
LPTB1FV	assessed value of real and personal property assessed at full value; million \$	ADCR, <u>Alaska Taxable</u>
LPTRAT	percentage of pipeline property within local jurisdictions actually subject to local tax because of limitations imposed by state statutes; percent	Constructed from ADCR, <u>Alaska Taxable</u>
MDPi _j	military dependents in cohort i _j ; thousand	BOC, 1980 Census of Population
MDTOT	total military dependents in 1980; thousand	BOC, 1980 Census of Population
MHHi _j	military households headed by individual in cohort i _j ; thousand	BOC, 1980 Census of Population
MIGIN	endogenous civilian migration to Alaska; thousand	-
MIGOUT	exogenous civilian migration to Alaska; thousand	-
MILPCT	Alaska military population as a fraction of 1980 level	-
MILRAT	the ratio of military employment (EMGM) to military population (POPM)	-
MILi _j	armed forces personnel and military dependents in cohort i _j in 1980; thousand	BOC, 1980 Census of Population
Mi _j	fraction of total endogenous civilian (non-Native) migration assigned to cohort i _j	<u>Alaska Public Survey</u>
NAPi _k	Native population in aggregated cohorts k (for use with income distribution model); thousand	-
NATINC	Alaska civilian non-Native (SIC) natural increase	-
NATPi _j	Alaska Native population in cohort i _j ; thousand	BOC, 1980 Census of Population
NATTOT	total Alaska Native population (civilian); thousand	BOC, 1980 Census of Population
NBHTOT	total Alaska Native births; thousand	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
NBCP	bonus income to Natives from lease sales on Native lands; million \$	-
NGBR	Alaska crude Native birth rate (per thousand)	-
NCCAP	accumulated capital of Native Corporations; million \$	-
NCCI	Native Corporation income from ANCSA-related activities; million \$	-
NCDR	Alaska crude Native death rate	-
NCEXP	current expenditures of Native Corporations; million \$	-
NCPI	Native personal income from ANCSA-related activities; million \$	-
NCRP	Native recurrent income from petroleum development on Native lands; million \$	-
NCWS	wages and salaries paid by Native Corporations; million \$	-
NCij	Alaska Native population in cohort ij before migration; thousand	BOC, Census of Population
NDTHINF	Alaska Native infant deaths; thousand	-
NDTHTOT	total Alaska Native deaths; thousand	-
NEMabN	Native employment in sector ab; thousand	-
NFERTj	Native fertility in female cohort j	Alaska Department of Health and Social Services and Alaska Native Medical Center
NHHRij	household formation rate for civilian Native population in cohort ij; percent	BOC, Census of Population, Census Tape STF2
NHHij	Alaska households headed by civilian Native persons in cohort ij; thousand	BOC, Census of Population, Census Tape STF2
NMij	migration rate (positive for in; negative for out) for Native population in cohort ij; percent	-
NNATINC	Alaska Native natural increase; thousand	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
NNPik	non-Native population in aggregated cohorts k for use with income distribution model; thousand	-
NONPET	general fund plus Permanent Fund revenues net of petroleum revenues and fund earnings - "non-endowment" revenues; million \$	-
NONRP9S	general fund plus Permanent Fund revenues net of petroleum revenues; million \$	-
NPGQij	fraction of civilian Native population in cohort ij in group quarters	BOC, 1980 Census of Population
NRCij	targeted total change in Native household formation rate for cohort ij	-
NSEXDIV	Native sex division at birth	Alaska Department of Health and Social Services
NSURINFi	Native infant survival rates	Alaska Department of Health and Social Services
NSij	Native survival rate for cohort ij	Alaska Department of Health and Social Services
NTP	period over which Native household formation rates trend; years	-
NWSabN	Native wages and salaries in sector ab; million \$	-
OEMij	exogenous civilian non-Native migration rate (positive for in; negative for out) for population in cohort ij	Anchorage Urban Observatory and BOC, 1980 Census of Population
P.BAL99	combined fund balance per capita; \$	-
P.BALGF	general fund balance per capita; \$	-
P.BALPF	Permanent Fund balance per capita; \$	-
P.DPINN	non-Native disposable personal income per capita; \$	-
P.DPINN1	Native disposable personal income (SIC) per capita net of nontaxable ANCSA payment; \$	-
P.EL99	per capita EL99; \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
P.ELED	per capita ELED; \$	-
P.ELNED1	per capita ELNED1; \$	-
P.EX99S	per capita EX99S; \$	-
P.EXBM	per capita unrestricted general fund expenditures (EXGFBM); \$	-
P.EXCAP	per capita state capital expenditures; \$	-
P.EXONTR	per capita state operating expenditures net of local government transfers; \$	-
P.EXOPS	per capita state operating expenditures; \$	-
P.GEXP	per capita state plus local government expenditures; \$	-
P.GODT	per capita state government bonded indebtedness; \$	-
P.NPET	per capita state "non-endowment" revenues; \$	-
P.NRP9S	per capita state nonpetroleum revenues; \$	-
P.PI	per capita personal income; \$	-
P.PIN	per capita Native personal income; \$	-
P.PINCL	per capita Native claims personal income; \$	-
P.PINN	per capita non-Native personal income; \$	-
P.R99S	per capita state general plus Permanent Fund revenues; \$	-
P.RLT99	per capita state-local revenue transfers; \$	-
P.RSEN	per capita state endogenous revenues; \$	-
P.RSIN	per capita general and Permanent Fund earnings; \$	-
P.RSIP	per capita interest on the Permanent Fund; \$	-
P.RT99	per capita total state taxes; \$	-
P.RTIS	per capita state personal income tax revenues; \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
P1-P6	variables to facilitate printing population distribution model results;	-
P9PTPER	percentage of petroleum property which is taxable by state which falls within local taxing jurisdiction; percentage	ADCR, <u>Alaska Taxable</u>
PAD1	proportion of population aged 5 to 19 attending district schools; percent	-
PAD2	proportion of population aged 5 to 19 attending REAA schools; percent	-
PADJ	ratio of premium (WRM9P) to average wage (WRM91) in manufacturing sector	-
PARLVFV	ratio of local estimate to full value of local property according to state appraiser; percent	-
PARNONGF	proportion of University of Alaska revenues not from the general fund; percent	-
PBLTBL	proportion of gross business receipts taxable after 1978 tax law change; percent	-
PBTRATE	state business license tax rate per business; million dollars per business	ADR, <u>Revenues Sources</u>
PC12N	proportion of ANCSA payments made to 12 regional Native corporations in Alaska; percent	Robert Nathan Associates, <u>2(c) Report: Federal Programs and Alaska Natives</u>
PC12RN	proportion of members of 12 regional Native corporations residing in Alaska; percent	Robert Nathan Associates, <u>2(c) Report: Federal Programs and Alaska Natives</u>
PC13C	exogenous adjustment to force consistency between local government personnel expenditures and wages and salaries	DOL, <u>Statistical Quarterly, Alaska Economic Trends, and BOC, Governmental Finances</u>
PC39A	miscellaneous employment within agriculture-forestry-fisheries industrial category; thousand	DOL, <u>Statistical Quarterly</u>
PC39B	forestry employment within agriculture-forestry-fisheries as proportion of manufacturing employment	DOL, <u>Statistical Quarterly</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PCINDA	proportion of gap between average industry employment share and Native industry employment share that is closed within one time period	-
PCIVPY	ratio of military to federal civilian wage rate; percent	-
PCNC1	proportion of ANCSA payments paid directly to individuals; percent	-
PCNC2	proportion of recurring income from petroleum development on Native lands paid directly to individuals; percent	-
PCNC3	proportion of earnings on Native Corporation accumulated capital paid directly to individuals; percent	-
PCNC4	proportion of bonus income from lease sales on Native lands paid directly to individuals; percent	-
PCNC5V	proportion of Native Corporation income used for investment; percent	-
PCNC5V1	proportion of bonus income from lease sales on Native lands and retained by Native Corporations which is used for investment; percent	-
PCNCWS	proportion of current expenditures of Native Corporations paid in wages and salaries; percent	-
PCOLART	the cost of living differential for federal employees; percentage	-
PCWS1	ratio of state government wage and salary payments to personnel expenditures; percent	ADL, <u>Statistical Quarterly</u> and ADA, <u>Executive Budget</u>
PCYNA1	proportion by which the ratio of personal income to wages and salaries for Native exceeds that of the total population; percent	-
PDCON	state government construction price deflator; index	for construction methodology, see Kresge and Thomas "Estimating Alaska Gross Product by Industry," <u>Alaska Review of Business and Economic Conditions</u> , Vol. XI, No. 1

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PDEXOPS	state government operating expenditures price deflator; index	constructed from ADL, <u>Statistical Quarterly</u> , BEA personal income and employment data
PDRATIO	ratio of Alaskan relative price index to U.S. consumer price index	-
PDRPI	Alaskan relative price index—1967 value is 1.425 times U.S. CPI which in 1967 was 100; index	constructed from U.S. Department of Labor, Bureau of Labor Statistics and University of Alaska, Agriculture Extension Service, Quarterly Food Price Survey of 13 Alaskan cities
PDRPIBAS	1982 Alaskan price level using 1967 US as base; index	-
PDUSCPI	U.S. consumer price index (1967=100); index	U.S. Department of Labor, Bureau of Labor Statistics
PDUSCPI1	initial value for US consumer price index; index	-
PECIG	proportion of cigarette tax receipts paid to special fund	-
PERNA1	proportion of change in state employment rate reflected in change in Native employment rate; percent	-
PERNA2	proportion of gap between Native and state employment rates that is closed in one year; percent	-
PERNA3	percentage of Native Corporation jobs held by Natives	-
PESLT	proportion of "other" state taxes shared with local government; percent	-
PESLTC	proportion of state corporate income tax shared with local government; percent	-
PF	non-Native females 14 and under; thousand	-
PFISH1	percentage of fish harvesting employment reported as proprietors	DOL, <u>Statistical Quarterly</u> ; BEA employment data; and G. Rogers, <u>Measuring the Socioeconomic Impact of Alaska's Fisheries</u>
PFN	Native females 14 and under; thousand	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PI	personal income; million \$	BEA personal income data
PI.DPI	ratio of disposable personal income to total personal income	-
PI.EL99	ratio of local government expenditures to personal income	-
PI.EX99S	ratio of total state government expenditures to personal income	-
PI.EXL	ratio of local government expenditures net of debt service to personal income	-
PI.EXS	ratio of state government general fund expenditures (EXGF) to personal income	-
PI.EXT	ratio of state and local government expenditures to personal income	-
PI.GODT	ratio of state general obligation bonded debt to personal income	-
PI.RL99	ratio of local government revenues to personal income	-
PI.RLPT	ratio of local property taxes to personal income	-
PI.RSEN	ratio of endogenous state revenues to personal income	-
PI.TXL	ratio of locally generated local government taxes to personal income	-
PI.TXS	ratio of state taxes net of petroleum-related taxes to personal income	-
PI.WS98	ratio of wage and salary plus military salary income to personal income	-
PI3	personal income net of "enclave" construction employee personal income; million \$	-
PI8	personal income plus residence adjustment; million \$	-
PIDIR	dividends, interest, and rent component of income; million \$	BEA personal income

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PIDIST	model switch which results in retrieval of Native employment and wages and salaries from income distribution model if a value of one is chosen; units	-
PIL	the value of personal income lagged one year for use in income distribution model	-
PIN	Native personal income, including Native claims income to individuals; million \$	-
PIN1	Native personal income net of Native claims income to individuals, million \$	-
PINN	non-Native personal income; million \$	-
PIOL1	other labor income component of personal income; million \$	BEA, personal income data
PIPADJ	ratio of "enclave" to regular construction wage rate; percent	ADL <u>Statistical Quarterly</u>
PIPE	a proxy variable which takes a value of one in years of very substantial exogenous construction activity	-
PIPRO	proprietors income component of personal income; million \$	BEA, personal income data
PIPRO1	nonfishery proprietor income component of personal income; million \$	BEA, personal income data
PIPROF	fishery proprietor income component of personal income; million \$	BEA, personal income data
PIRADJ	residence adjustment component of personal income; million \$	BEA, personal income data
PISSC	personal contributions to Social Security component of personal income; million \$	BEA, personal income data
PITRAN	transfers component of personal income; million \$	BEA, personal income data
PITRAN1	transfers (excluding Permanent Fund dividend payments) component of personal income; million \$	-
PIU.PIA	ratio of non-Native disposable personal income per capita in Alaska to disposable personal income per capita in the U.S.	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PLFD9	total Alaska potential civilian labor force aged 15 to 64; thousand	-
PLFDMC	Alaska potential civilian non-Native, non-military dependent labor force (population aged 15 to 64); thousand	-
PLFDOMM	Alaska potential military labor force (military dependents aged 15 to 64; active-duty military are excluded); thousand	-
PLFDMN	Alaska potential civilian Native labor force aged 15 to 64; thousand	-
PM	non-Native males 14 and under used with income distribution model; thousand	-
PMN	Native males 14 and under used with income distribution model; thousand	-
PNTGR	amount of gross receipts exempt from state gross receipts tax; million \$	-
POP	total population; thousand	BOC and ADL
POP.AD	ratio of Alaska population aged 15 to 64 to total population	-
POP.CIV	ratio of Alaska civilian non-Native population to total population	-
POP.GER	ratio of Alaska population aged 65 and over to total population	-
POP.KID	ratio of Alaska population under 15 to total population	-
POP.MIL	ratio of Alaska military and military dependents to total population	-
POP.NAT	ratio of Alaska Native population to total population	-
POPADS	total Alaska population aged 15 to 64; thousand	-
POPC	total population net of armed forces personnel (includes military dependents); thousand	BOC and ADL

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
POPCGQ	Alaska civilian non-Native population in group quarters; thousand	BOC, Census of Population
POPPER	total Alaska population aged 65 and over; thousand	BOC, Census of Population
POPGQ	total Alaska population in group quarters; thousand	BOC, Census of Population
POPKIDS	total Alaska population under 15; thousand	BOC, Census of Population
POPM	armed forces personnel; thousand	BOC, Census of Population
POPMGQ	military population in group quarters; thousand	BOC, Census of Population
POPMIG	total net civilian migration to Alaska; thousand	-
POPNE	Native population based upon Native Corporation enrollment records; thousand	<u>2(c) Report-Federal Program & Alaska Natives</u> by Robert Nathan Associates, for U.S. Department of Interior
POPNGQ	Alaska Native population in group quarters; thousand	BOC, Census of Population
POPNI9	total Alaska civilian natural increase; thousand	-
POPSKUL	total Alaska population aged 5 to 19; thousand	BOC, Census of Population
POPIj	total Alaska population in cohort ij; thousand	-
PPVAL	total full assessed value of real, personal, and petroleum-related property in the state; million \$	-
PR.BAL99	general plus Permanent Fund balance real per capita; 1967 \$	-
PR.BALCP	value of state capital stock real per capita; 1967 U.S. \$	-
PR.BALG1	general fund balance real per capita; 1967 U.S. \$	-
PR.BALG2	general fund balance real per capita deflated by state operating budget deflator; 1967 U.S. \$	-
PR.BALP2	Permanent Fund balance real per capita deflated by operating budget deflator; 1967 U.S. \$	-
PR.BALPF	Permanent Fund balance real per capita; 1967 U.S. \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PR.DPI	disposable personal income real per capita; 1967 U.S. \$	-
PR.DPIN	Native disposable personal income real per capita; 1967 U.S. \$	-
PR.DPINN	non-Native disposable income real per capita; 1967 U.S. \$	-
PR.DPIU1	initial value for US real per capita disposable personal income; \$	-
PR.DPIUS	U.S. disposable personal income real per capita; 1967 U.S. \$	U.S. Department of Commerce
PR.ECP	state capital expenditures for highways from bond funds real per capita (EXCPSHY); 1967 U.S. \$	-
PR.ECPN	state capital expenditures nonhighway from bond funds real per capita (EXCPSNH); 1967 U.S. \$	-
PR.EL99	total local expenditures (EL99) real per capita; 1967 U.S. \$	-
PR.ELED	local expenditures for education (ELED) real per capita; 1967 U.S. \$	-
PR.ELEDC	local government capital expenditures for education (ELEDCP) real per capita; 1967 U.S. \$	-
PR.ELNED	local non-education expenditures (ELNED1) real per capita; 1967 U.S. \$	-
PR.EX99S	total state expenditures (EX99S) real per capita; 1967 U.S. \$	-
PR.EXBM	state general fund expenditures (EXBM) real per capita; 1967 U.S. \$	-
PR.EXCAP	state capital expenditures real per capita; 1967 U.S. \$	-
PR.EXONT	state operating expenditures net of local government transfers real per capita; 1967 U.S. \$	-
PR.EXOPS	state operating expenditures real per capita; 1967 U.S. \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PR.EXccc	state expenditures in program category ccc real per capita; 1967 \$	-
PR.GEXP	state and local government expenditures real per capita; 1967 U.S. \$	-
PR.GFC	state general fund highway capital expenditures (EXGFCHY) real per capita; 1967 U.S. \$	-
PR.GFCN	state general fund nonhighway capital expenditures (EXGFCNH) real per capita; 1967 U.S. \$	-
PR.GODT	state government bonded indebtedness real per capita; 1967 U.S. \$	-
PR.NCEXP	real current expenditures of Native Corporations per Native; 1967 U.S. \$	-
PR.NPET	state "non-endowment" revenues real per capita; 1967 U.S. \$	-
PR.NRP9	state nonpetroleum revenues real per capita; 1967 U.S. \$	-
PR.PI	personal income real per capita; 1967 U.S. \$	-
PR.PI3	personal income net of "enclave" construction employee personal income (PI3) real per capita; 1967 U.S. \$	-
PR.PIN	Native personal income real per capita; 1967 U.S. \$	-
PR.PINCL	Native personal income real per capita plus real current expenditures of Native Corporations per capita; 1967 U.S. \$	-
PR.PINN	non-Native personal income real per capita; 1967 U.S. \$	-
PR.R99S	total state revenues (R99S) real per capita; 1967 U.S. \$	-
PR.RLT99	state-local revenue transfers real per capita; 1967 U.S. \$	-
PR.RSEN	state endogenous revenues (RSEN) real per capita; 1967 U.S. \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
PR.RSIN	general and Permanent Fund earnings real per capita; 1967 U.S. \$	-
PR.RSIP	Permanent Fund earnings real per capita; 1967 U.S. \$	-
PR.RT99	state tax revenues (RT99) real per capita; 1967 U.S. \$	-
PR.RTIS	state personal income tax receipts real per capita; 1967 U.S. \$	-
PRINT	variable from income distribution model which allows results to be printed if value of one is chosen	-
PRINT2	variable from income distribution model which allows results to be printed if value of one is chosen	-
PTBP9	total value of taxable petroleum property; million \$	ADCR, <u>Alaska Taxable</u>
PTOURB	intercept term on tourist industry employment equation	<u>Improvements to Specification of the MAP Model</u>
PTOURD	proportion of tourist industry employment in trade	<u>Improvements to Specification of the MAP Model</u>
PTOURE	elasticity of tourism employment to growth in number of tourists	<u>Improvements to Specification of the MAP Model</u>
PTOURS	proportion of tourist industry employment in services	<u>Improvements to Specification of the MAP Model</u>
PTOURT	proportion of tourist industry employment in transportation	<u>Improvements to Specification of the MAP Model</u>
PTRTS	tax rate on state petroleum-related property; percent	-
PWRBASE	average U.S. wages paid in government in 1967; \$	-
R.BALCAP	real value of state capital stock; million 1967 U.S. \$	constructed using ADA, <u>Annual Financial Report</u>
R.DPI	real disposable personal income; million 1967 U.S. \$	-
R.DPI8N	real disposable personal income plus residence adjustment; million 1967 U.S. \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
R.DPI8X	real disposable personal income plus residence adjustment of "enclave" construction employees; million 1967 U.S. \$	constructed using ADL, <u>Statistical Quarterly</u>
R.PI	real personal income; million 1967 U.S. \$	-
R.PIN	Native real personal income; million 1967 U.S. \$	-
R.PINN	non-Native real personal income; million 1967 U.S. \$	-
R.WR97	average annual real wage rate for civilian employment; 1967 U.S. \$	-
R.WR98	average annual real wage rate including military; 1967 U.S. \$	-
R99S	total general fund and Permanent Fund revenues; million \$	ADA, <u>Annual Financial Report</u>
R99SNT	total state revenues net of Permanent Fund contributions (EXPFCON); million \$	-
R99SON	total state revenues net of federal grants-in-aid; million \$	-
RAT1	ratio of non-Native income to total taxable income; percent	-
RATIO1	variable used to make individual state budget items consistent with total operating budget constraint; percent	-
RCij	targeted total change in civilian household formation rate for cohort ij	-
RL99	total local government revenues; million \$	constructed from BOC <u>Governmental Finances</u> and BOC <u>State Government Finances</u>
RL99.PT	ratio of local property taxes to total local government revenues	-
RL99.RT	ratio of state-local transfers to state-local government revenues	-
RL991	total local government revenues net of miscellaneous revenues; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RLMC	local charges and miscellaneous revenue; million \$	BOC, <u>Governmental Finances</u>
RL0T	local government taxes net of property tax; million \$	BOC, <u>Governmental Finances</u>
RLPT	local property taxes; million \$	BOC, <u>Governmental Finances</u>
RLPT1	local property tax revenues net of exogenous component; million \$	BOC, <u>Governmental Finances</u>
RLPTX	exogenous local property tax; million \$	-
RLT99	total revenue transfers from state to local government; million \$	-
RLTCS	state-local shared corporate income tax after 1978 tax law change; million \$	-
RLTCS4	initial estimate of state-local shared corporate income tax before application of RATI01; million \$	-
RLTE99	total state-local government transfers for education purposes; million \$	-
RLTE994	initial estimate of transfers from state to local government for education purposes before application of RATI01; million \$	-
RLTEA	total transfers from state to local government for primary and secondary education; million \$	ADA, <u>Annual Financial Report</u>
RLTEA4	initial estimate of transfers from state to local government for primary and secondary education before application of RATI01; million \$	-
RLTEB	state aid to local education net of aid to district schools and since their inception, the REAA schools; million \$	constructed from BOC, <u>State Governmental Finances</u> and ADA <u>Annual Financial Report</u>
RLTEB4	initial estimate of state aid to local government for education net of district and REAA aid before application of RATI01	-
RLTEC	cigarette tax education transfers from state to local government; million \$	ADA, <u>Annual Financial Report</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RLTEC4	initial estimate of cigarette tax education transfers from state to local government before application of RATI01; million \$	-
RLTEF	school foundation program transfers from state to local government; million \$	ADA, <u>Annual Financial Report</u>
RLTEF4	initial estimate of school foundation program transfers from state to local government before application of RATI01; million \$	-
RLTE0	miscellaneous state aids to district schools; million \$	ADA, <u>Annual Financial Report</u>
RLTE04	initial estimate of miscellaneous state aids to district schools before application of RATI01; million \$	-
RLTET	state aid to local district schools for transportation; million \$	ADA, <u>Annual Financial Report</u>
RLTET4	initial estimate of state aid to district schools for transportation before application of RATI01; million \$	-
RLTF	federal-local government transfers; million \$	BOC, <u>Governmental Finances</u>
RLTFPX	petroleum-related federal-local government transfers; million \$	-
RLTMA	state local transfers under municipal assistance program; million \$	ADA, <u>Executive Budget</u>
RLTMA4	initial estimate of state-local transfers under municipal assistance program; million \$	-
RLTMS	state-local revenue transfers net of education, revenue sharing, and tax sharing; million \$	constructed from BOC <u>State Government Finances & ADA Executive Budget</u>
RLTOT	state-local tax sharing of other taxes (amusement licenses, aviation fuel tax, liquor licenses, fisheries tax); million \$	-
RLTOT4	initial estimate of state-local sharing of other taxes before application of RATI01; million \$	-
RLTRS	state-local revenue sharing; million \$	ADA, <u>Executive Budget</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RLTRS4	initial estimate of state-local revenue sharing before application of RATIO1; million \$.	-
RLTT9	total state-local tax transfers; million \$	-
RLTT94	initial estimate of total state-local tax transfers; million \$	-
RLTVS	state-local shared electric and telephone co-op taxes; million \$	ADA, <u>Executive Budget</u>
RLTVS4	initial estimate of state-local shared electric and telephone co-op taxes before application of RATIO1; million \$	-
RLTX	exogenous state-local transfers; million \$	-
RMIS	miscellaneous unrestricted general fund revenues; million \$	ADR, <u>Revenue Sources</u>
RMISRES	miscellaneous restricted general fund revenues; million \$	-
RN.FED	ratio of federal transfers to general fund plus Permanent Fund revenues net of Permanent Fund contributions (EXPFCON)	-
RN.OIL	ratio of state petroleum revenues to general fund plus Permanent Fund revenues net of Permanent Fund contributions (EXPFCON)	-
RN.RSEN	ratio of endogenous revenues to general fund plus Permanent Fund revenues net of Permanent Fund contributions (EXPFCON)	-
RN.RSIN	ratio of general and Permanent Fund earnings to state general fund plus Permanent Fund revenues net of Permanent Fund contributions (EXPFCON)	-
RNAT	Native personal income as percentage of total personal income calculated using the income distribution model	-
RNATX	Native personal income as percentage of total personal income calculated using the income distribution model	-
ROFAS	state auto licenses and fees; million \$	ADA, <u>Annual Financial Report</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
ROFERS	general fund ferry receipts; million \$	ADA, <u>Annual Financial Report</u>
ROFOS	nonauto-related business and nonbusiness licenses and fees to general fund; million \$	constructed from ADA, <u>Annual Financial Report</u>
ROFTS	total general fund fees and licenses; million \$	ADA, <u>Annual Financial Report</u>
ROR	real rate of return on general fund balance; percent	-
RORANGRO	under EXRLOP8, rate at which state operating expenditure annuity grows; percent	-
RORCPDEP	real rate of depreciation of state-owned capital; percent	-
RORCRF	capital recovery factor for calculating annual servicing of bonded debt; percent	-
RORDISK	discount rate applied to future petroleum revenues to calculate present value in 1982 dollars (DF.RSVP)	-
RORNC	nominal rate of return on accumulated capital of Native Corporations; percent	-
RORPDF	real rate of return premium applied to development fund over general fund; percent	-
RORPPF	real rate of return premium applied to Permanent Fund in excess of general fund; percent	-
RP7S	total petroleum royalties and bonuses; million \$	ADR <u>Revenue Sources</u>
RP9S	total petroleum revenues before Permanent Fund deductions; million \$	ADR, <u>Revenue Sources</u>
RP9SGF	total petroleum revenues paid to general fund; million \$	ADR, <u>Revenue Sources</u>
RP9X	miscellaneous exogenous petroleum revenues; million \$	-
RPBS	state petroleum bonuses before Permanent Fund deduction; million \$	ADR, <u>Revenue Sources</u>
RPBSGF	state petroleum bonuses paid to general fund; million \$	ADR, <u>Revenue Sources</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RPPS	state petroleum property tax; million \$	ADR, <u>Revenue Sources</u>
RPRY	state petroleum royalties before Permanent Fund deduction; million \$	ADA, <u>Revenue Sources</u>
RPRYGF	state petroleum royalties paid to general fund; million \$	ADR, <u>Revenue Sources</u>
RPTS	state petroleum production taxes; million \$	ADR, <u>Revenue Sources</u>
RS.FED	ratio of federal transfers to total state revenues	-
RS.OWN	ratio of revenues net of federal transfers to total state revenues	-
RS.PET	ratio of "endowment" type revenues to total state revenues	-
RS.REC	ratio of endogenous and interest revenues to total state revenues	-
RS.RN	ratio of state general fund revenues net of permanent fund contributions (EXPFCN) to total state revenues	-
RS.RP9S	ratio of petroleum revenues to total state revenues	-
RS.RSEN	ratio of endogenous revenues to total state revenues	-
RS.RSIN	ratio of general and Permanent Fund earnings to total state revenues	-
RSBM.B99	ratio of fund earnings (RSIG+RSID+RSIPGF) to unrestricted general fund revenues	-
RSBM.EXD	ratio of debt service expenditures (EXDSS) to unrestricted general fund revenues	-
RSBM.GF	ratio of general fund earnings (RSIG) to unrestricted general fund revenues	-
RSBM.PET	ratio of endowment revenues (RP9SGF+RSIG+RSID+RSIPGF) to unrestricted general fund revenues	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RSBM.PF	ratio of Permanent Fund earnings transferred to general fund (RSIPGF) to unrestricted general fund revenues	-
RSBM.REN	ratio of endogenous general fund revenues (RSENGF) to unrestricted general fund revenues	-
RSBM.RP9	ratio of petroleum revenues (RP9SGF) to unrestricted general fund revenues	-
RSEN	state endogenous revenues; million \$	-
RSENGF	endogenous state unrestricted general fund revenues; million \$	-
RSFDN	total federal grants-in-aid to state general fund; million \$	ADA, <u>Annual Financial Report</u>
RSFDNPX	federal-state shared petroleum royalties; million \$	ADR, <u>Revenue Sources</u>
RSFDNPXG	general fund portion of federal-state shared petroleum royalties; million \$	ADR, <u>Revenue Sources</u>
RSFDNX	exogenous federal-state transfer payments; million \$	-
RSFFS	fees and licenses receipts paid into the fish and game special revenue fund; million \$	ADA, <u>Annual Financial Report</u>
RSFS	total revenues of the special funds except the Permanent Fund; million \$	ADA, <u>Annual Financial Report</u>
RSFS1	miscellaneous receipts of state special revenue funds; million \$	ADA, <u>Annual Financial Report</u>
RSGF	total state general fund revenues (unrestricted and restricted); million \$	ADA, <u>Annual Financial Report</u>
RSGFBM	total general fund unrestricted revenues; million \$	ADR, <u>Revenue Sources</u>
RSGFGAP	the difference between the statutory spending limit and available funds; million \$	-
RSGFRS	restricted state general fund revenues; million \$	-
RSIAS	international airport receipts (enterprise fund); million \$	ADA, <u>Annual Financial Report</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RSID	state development fund earnings; million \$	-
RSIDNET	state development fund earnings net of inflation; million \$	-
RSIG	state general fund interest; million \$	-
RSIGNET	state general fund interest net of inflation; million \$	-
RSIN	state general fund interest plus Permanent Fund interest; million \$	ADR, <u>Revenue Sources</u>
RSINNET	state general fund interest plus Permanent Fund interest net of inflation; million \$	-
RSIP	state Permanent Fund interest; million \$	ADR, <u>Revenue Sources</u>
RSIPGF	state Permanent Fund interest transferred into general fund; million \$	-
RSIPNET	state Permanent Fund interest net of inflation; million \$	-
RT99	total state tax revenues; million \$	-
RTAS	alcoholic beverage tax; million \$	ADA, <u>Annual Financial Report</u> and ADR, <u>Revenue Sources</u>
RTBS	gross receipts tax and business license tax; million \$	ADA, <u>Annual Financial Report</u>
RTBS1	portion of gross receipts tax revenues derived from business licenses; million \$	constructed from ADR unpublished data
RTBS2	portion of gross receipts tax revenues derived from gross receipts in excess of exempted amount per business; million \$	constructed from ADA, <u>Annual Financial Report</u> and ADL, unpublished data
RTCIS	cigarette tax receipts (sum of general fund and tobacco fund receipts); million \$	ADA, <u>Annual Financial Report</u> and ADR, <u>Revenue Sources</u>
RTCS	state corporate tax receipts; million \$	ADA, <u>Annual Financial Report</u> and ADR, <u>Revenue Sources</u>
RTCS1	corporate income tax net of petroleum sector; million \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
RTCSPX	state corporate tax receipts from petroleum sector; million \$	ADR, <u>Revenue Sources</u>
RTCSX	exogenous corporate income tax; million \$	-
RTIS	personal income tax; million \$	ADA, <u>Annual Financial Report</u>
RTISC	personal income tax on a calendar year basis; million \$	ADR, <u>Cumulative Summary of Revenue</u> , a monthly report
RTISCA	personal income tax liability per taxpayer on a calendar year basis; thousand \$	-
RTISCA1	initial estimate of personal income tax liability per taxpayer on a calendar year basis; thousand \$	-
RTISCA2	initial estimate of personal income tax liability per taxpayer on a calendar year basis without tax structure changes introduced by modeler; thousand \$	-
RTISCP	calendar-year state income taxes paid out of Alaskan resident personal income; million \$	ADR, unpublished data
RTISLOS	difference per taxpayer between personal income tax liability before and after structural changes introduced by modeler; million \$	-
RTISXX	adjustment of disposable income to cover lag in refund in state personal income taxes after repeal; million \$	-
RTMF	highway, aviation, and marine fuel taxes; million \$	ADA, <u>Annual Financial Report</u> and ADR, <u>Revenue Sources</u>
RTOTS	other state taxes—consists of fiduciary, inheritance, estate, mining, conservation, prepaid, and fish taxes; million \$	ADR, <u>Revenue Sources</u>
RTPIF	federal income taxes paid out of Alaskan resident personal income; million \$	BEA - disposable personal income data
RTSS	school tax; million \$	ADA, <u>Annual Financial Report</u>
RTVS	ad valorem taxes consisting of insurance premium tax and electric telephone company revenue tax; million \$	ADA, <u>Annual Financial Report</u> and ADR, <u>Revenue Sources</u>

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
SANCSA	payments to Alaska Natives by state government under ANCSA; million \$	-
SEXDIV	non-Native sex division at birth; percent	Alaska Department of Health and Social Services
SLGEXP	total combined state and local government expenditures; million \$	-
SURINF _i	non-Native infant survival rates; percent	Alaska Department of Health and Social Services
S _{ij}	non-Native survival rate for cohort ij	Alaska Department of Health and Social Services
TCRED	individual tax credit beginning after 12/31/77; \$	-
THG	total gallons of highway gasoline sold in the state (does not include off-highway gallon sales); million gallons	ADR, monthly motor vehicle tax forms
TOURIST	number of tourist visitors to Alaska; thousands	Alaska Department of Health and Social Services
TP	period over which civilian household formation rates trend; years	-
TPTV	total highway motor vehicles operating in the state (passenger and truck); thousand	Department of Public Safety, Motor Vehicle Division
TXBASE	change in the floor of personal income tax rate schedule; units	-
TXCRPC	state personal income tax credit adjustment (percentage of tax liability);	-
TXPTXX	adjustment to withhold from state expenditures a portion of any personal income tax reduction; percent	-
TXRT	percentage change in state personal income tax rate; percentage	-
U.AK.US	ratio of unemployment rates in Alaska and the U.S. average	-
UNEMP	average annual Alaska unemployment; thousand	ADL

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
UUS	US unemployment rate; percent	U.S. Department of Labor, Bureau of Labor Statistics
VAEX	value of a personal exemption on personal income tax; \$	IRS, <u>Statistics of Income</u>
VAEX1	initial value for personal exemption; \$	-
WEALTH	four-year average of real per capita income; 1967 U.S. \$	-
WEUS	average weekly wage & salary earnings in U.S.; \$	U.S. Department of Labor, Bureau of Labor Statistics
WEUS1	initial value for average weekly wage and salary earnings in United States; \$	-
WR.AK.US	ratio of Alaska to U.S. civilian wage rate	-
WR97	average annual wage rate for nonagricultural wage and salary employment; \$	-
WR98	average annual wage rate for nonagricultural wage and salary employment plus military; \$	-
WRCNNP	average annual wage rate for non- "enclave" construction wage rate; \$	ADL, <u>Statistical Quarterly</u>
WRCNP	average annual wage rate for premium wage (pipeline or "enclave") construction; \$	ADL, <u>Statistical Quarterly</u>
WRCU	average annual wage rate for communications and public utilities; \$	ADL, <u>Statistical Quarterly</u>
WRGC	average annual wage rate for federal civilian; \$	ADL, <u>Statistical Quarterly</u>
WRGMS	annual growth in income per proprietor (input to income distribution model)	-
WRGab	annual growth in real annual wage rate in industry ab (input to income distribution model)	-
WRM91	average annual wage rate for existing (low wage) manufacturing employment; \$	ADL, <u>Statistical Quarterly</u>
WRM9P	average annual wage rate for large-project (high wage) manufacturing employment; \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
WRSB	average annual wage rate for business services; \$	ADL, <u>Statistical Quarterly</u>
WRSNB	average annual wage rate for nonbusiness services; \$	ADL, <u>Statistical Quarterly</u>
WRab	average annual wage rate for industry sector ab; \$	ADL, <u>Statistical Quarterly</u>
WS97	total wage and salary payments in nonagricultural wage and salary industries; million \$	-
WS98	total wage and salary payments in nonagricultural wage and salary industries plus military; million \$	-
WS98L	wages and salaries lagged one year (input to income distribution model); million \$	-
WSCNP	wages and salary payments in high wage ("enclave") construction; million \$	-
WSGC	federal civilian wages and salaries; million \$	ADL, <u>Statistical Quarterly</u>
WSGL	local government wages and salaries; million \$	ADL, <u>Statistical Quarterly</u>
WSGM	military personnel wages and salaries; million \$	BEA, personal income data
WSGS	state government wages and salaries; million \$	ADL, <u>Statistical Quarterly</u>
WSGSFY	state government wages and salaries on fiscal year basis; million \$	ADL, <u>Statistical Quarterly</u>
WSM9P	wages and salaries paid in high wage exogenous large-project manufacturing; million \$	-
WSNA	wages and salaries paid to Natives; million \$	-
WSS91	wages and salaries in services net of Native Corporation-related wages; million \$	-
WSab	wages and salaries paid in industry ab; ab=CN GA A9 CM DR DW D9 FI GF M9 PU P9 S9 T9; million \$	ADL, <u>Statistical Quarterly</u>
X1-X6	variables used to facilitate printing of output of the income distribution model	-
XX98	total real gross state product in wage and salary industries and military; million 1972 U.S. \$	-

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
XXA9	agriculture-forestry-fisheries real gross state product; million 1972 U.S. \$	for construction methodology, see Kresge and Thomas, "Estimating Alaska Gross Product by Industry," <u>Alaska Review of Business and Economic Conditions</u> , Vol. XI, No. 1
XXCN1	endogenous (residential plus state government) component of construction real gross state product; million 1972 U.S. \$	-
XXCN8	residential construction real gross state product; million 1972 U.S. \$	-
XXDRNT	state retail trade net of tourism real gross state product; million 1972 \$	-
XXM9	manufacturing real gross state product; million 1972 U.S. \$	-
XXM91	manufacturing net of large projects real gross state product net of large projects; million 1972 U.S. \$	for construction methodologies, see Kresge and Thomas, "Estimating Alaska Gross Product by Industry," <u>Alaska Review of Business and Economic Conditions</u> , Vol. XI, No. 1
XXMX2	exogenous large-project manufacturing real gross state product; million 1972 U.S. \$	-
XXSBNT	support services (net of business, tourism, and Native claims) real gross state product; million 1972 U.S. \$	-
XXSB	business services real gross state product; million 1972 U.S. \$	-
XXTNT	transportation (net of tourism and exogenous components) real gross state product; million 1972 U.S. \$	-
XXVACAP	value added in contract construction accounted for by government (state) purchases from the private contracting industry; million 1972 U.S. \$	-
XXVHY	value added in construction industry from private contracts for highway construction let by state government; million \$	constructed from ADPW worksheets

<u>Variable</u>	<u>Definition; Units</u>	<u>Historical Data Source^a</u>
XXVNHY	value added in construction industry from private contracts for nonhighway construction let by state government; million \$	constructed from ADPW worksheets
.XXab	real gross state product in industry ab; ab=A9 CM CN DR DW D9 FI GA GF PU P9 S9 T9; million 1972 U.S. \$	for construction methodologies, see Kresge and Thomas, "Estimating Alaska Gross Product by Industry," <u>Alaska Review of Business and Economic Conditions</u> , Vol. XI, No. 1
YR	year	-

APPENDIX G
MAP ECONOMIC MODEL LISTING

Including

1. Fiscal Module
2. Economic Module
3. Population Module
4. Household Module
5. Native Economic Activity
6. Definitional Equations
7. Links to Income Distribution Model
8. Parameter List

MODEL: A83.2

PURPOSE: This model calculates annual statewide economic, fiscal, and demographic output based on user-specified input assumptions.

DATE: May 1983

SYMBOLS

ENDOGENOUS:

ADMSD AEX AGI AHG ATD ATI ATI.TT ATT BALCAP84 BALDF BALGF
BALGFCP BALGFP BALPF BAL99 BIU BL CEA9N CECMN CECNN CED9N
CEFIN CEGAN CEGFN CEM9N CEPUN CEP9N CES9N CET9N CNNPF1
CNNPF10 CNNPF11 CNNPF12 CNNPF13 CNNPF14 CNNPF15 CNNPF2 CNNPF3
CNNPF4 CNNPF5 CNNPF6 CNNPF7 CNNPF8 CNNPF9 CNNPM1 CNNPM10
CNNPM11 CNNPM12 CNNPM13 CNNPM14 CNNPM15 CNNPM2 CNNPM3 CNNPM4
CNNPM5 CNNPM6 CNNPM7 CNNPM8 CNNPM9 COLA DEBTP82 DF.RSVP DPI
DPIRES DPI8 ELBD ELED ELEDCEP ELED1 ELNED1 ELPERS EL99
EMAFISH EMA9 EMCM EMCN EMCNRT EMCNX EMCN1 EMDR EMDRNT
EMDTOUR EMDW EMD9 EMFI EMGA EMGF EMGL EMGS EMMO EMM9 EMM91
EMPRO EMPROFIS EMPRO1 EMPU EMRATE EMRATN1 EMSB EMSP EMSTOUR
EMSUP EMS8NT EMS9 EMS91 EMTCU EMTNT EMTOUR EMTTOUR EMT9
EMT91 EMX EM96 EM97 EM98 EM99 EXANSAV EXCAP EXCAPFR EXCDS
EXCDSNT EXCDS4 EXCPS EXCPSFED EXCPSHY EXCPSM EXCPSNH EXDFCON
EXDFWITH EXDSS EXEDS EXEDS4 EXGF EXGFBM EXGFCHY EXGFCNH
EXGGS EXGGS4 EXHES EXHES4 EXINREC EXJUS EXJUS4 EXLIM EXLIMOK
EXNOPS EXNRS EXNRS4 EXOPS EXPFCON EXPPS EXPPS4 EXPRCDS
EXPREDs1 EXPRGGS EXPRHES EXPRJUS EXPRNRS EXPRPPS EXPRSSS
EXPRTRS EXPRUA EXPR99 EXSAVS EXSSS EXSSS4 EXSUBS EXTRNS
EXTRS EXTRS4 EXUA EX99S FAGI FAGII GOBONDL GODT GR GTR
IM.BAL IM.BALRV LPTB LPTB1 MIGIN MIGOUT MILPCT NATPF1
NATPF10 NATPF11 NATPF12 NATPF13 NATPF14 NATPF15 NATPF2 NATPF3
NATPF4 NATPF5 NATPF6 NATPF7 NATPF8 NATPF9 NATPM1 NATPM10
NATPM11 NATPM12 NATPM13 NATPM14 NATPM15 NATPM2 NATPM3 NATPM4
NATPM5 NATPM6 NATPM7 NATPM8 NATPM9 NCCAP NCCI NCPI P.DPINN

PDCON PDEXOPS PDRATIO PDRPI PDUSCPI PI PIDIR PIOLI PIPROF
PIPRO1 PIRADJ PISSC PITRAN PITRAN1 PI3 PI8 POP POPC POPGER
POPM POPMIG POPNE POPSKUL PR.BALCP PR.DPINN PR.DPIUS PR.PI
PR.PI3 R.BALCAP R.DPI R.DPI8N R.DPI8X R.WR97 RLMC RLOT RLPT1
RLTCS RLTC4 RLTEB RLTEB4 RLTEF4 RLTEO RLTEO4 RLTET RLTET4
RLTE99 RLTE994 RLTF RLTM RLTM4 RLTM5 RLTRS RLTRS4 RLTT9
RLTT94 RLTVS4 RLTV9 RMIS RMISRES ROFAS ROFERS ROFOS RSFDN
RSFFS RSFS1 RSGF RSGFBM RSIAS RTAS RTBS2 RTCIS RTCS1 RTIS
RTISC RTISCA1 RTISCA2 RTISCP RTISLOS RTMF RTOTS RTPIF RTSS
RTVS R99S TPTV VAEX WEALTH WEUS WRA9 WRCM WRCN WRCNNP
WRCNP WRDR WRDW WRD9 WRFI WRGA WRGC WRGF WRGL WRGM WRGS
WRM91 WRPW WRP9 WRSB WRSNB WRS9 WRT9 WR98 WSCN WSCNP WSGA
WSGC WSGL WSGM WSGS WSGSFY WS97 WS98 XXA9 XXCM XXCN XXCN1
XXCN8 XXDR XXDRNT XXDW XXD9 XXFI XXGA XXGF XXM91 XXPU XXP9
XXSB XXS8NT XXS9 XXTNT XXT9 XXVHY XXVNHY XX98

CONSTRUCT:

DF.BALDF DF.BALGF DF.BALPF DF.BAL9P DF.BAL99 DF.CABBM DF.EXGF
DF.EXGFB DF.EXGFP DF.GOXBM DF.NPET DF.NRP9S DF.PI DF.PIP
DF.RGFNT DF.RP9S DF.RSEN DF.RSFD DF.RSGF DF.RSGFB DF.RSIDN
DF.RSIGN DF.RSIN DF.RSINN DF.RSIP DF.RSIPN DF.R99S DF.WRG9
DF.WRNS DF.WRSP DF.WSG9 DF.WSNS DF.WSSP DF.WS98 EM.EMCN
EM.EMGA EM.EMGF EM.EMG9 EM.EMNR EM.EMNS EM.EMP9 EM.EMSP
EM.EMSUP EM.EMTCU EX.DSS EX.NPET EX.NRP9 EX.PET EX.RP9S
EX.RSEN EX.RSIN EX.RVNT EX.R99S EXBM.CAB EXBM.END EXBM.FD
EXBM.GR1 EXBM.RV G.BAL9PC G.BAL99 G.EL99 G.EM99 G.EX99S
G.PDRPI G.POP G.PR.DPI G.PR.PI G.R.WR98 G.RNSPC G.RSEN G.SRPC
G.XONRPC IM.BALPC IM.BALR IM.BAL99 IM.BLRPC IM.REV INDEX.DI
INDEX.S1 INDEX.S2 INDEX.WG P.BALGF P.BALPF P.BAL99 P.DPINN1
P.ELED P.ELNED1 P.EL99 P.EXBM P.EXCAP P.EXONTR P.EXOPS
P.EX99S P.GEXP P.GODT P.NPET P.NRP9S P.PI P.PIN P.PINCL
P.PINN P.RLT99 P.RSEN P.RSIN P.RSIP P.RTIS P.RT99 P.R99S
PI.DPI PI.EL99 PI.EXL PI.EXS PI.EXT PI.EX99S PI.GODT PI.RLPT
PI.RL99 PI.RSEN PI.TXL PI.TXS PI.WS98 PIU.PIA POP.AD POP.CIV
POP.GER POP.KID POP.MIL POP.NAT PR.BALG1 PR.BALG2 PR.BALPF
PR.BALP2 PR.BAL99 PR.DPI PR.DPIN PR.ECP PR.ECPN PR.ELED
PR.ELEDC PR.ELNED PR.EL99 PR.EXBM PR.EXCAP PR.EXCDS PR.EXEDS
PR.EXGGS PR.EXHES PR.EXJUS PR.EXNRS PR.EXONT PR.EXOPS PR.EXPPS
PR.EXSSS PR.EXTRS PR.EX99S PR.GEXP PR.GFC PR.GFCN PR.GODT
PR.NCEXP PR.NPET PR.NRP9 PR.PIN PR.PINCL PR.PINN PR.RLT99
PR.RSEN PR.RSIN PR.RSIP PR.RTIS PR.RT99 PR.R99S R.PI R.PIN
R.PINN R.WR98 RL99.PT RL99.RT RN.FED RN.OIL RN.RSEN RN.RSIN
RS.FED RS.OWN RS.PET RS.REC RS.RN RS.RP9S RS.RSEN RS.RSIN
RSBM.B99 RSBM.GF RSBM.PET RSBM.PF RSBM.REN RSBM.RP9 U.AK.US
WR.AK.US

DEFINITION:

ADMDIS ADMREA BALCAB BALCABBM BALLANDS BALOCAL BCRUDE BTHTOT
BTOT CBR CDR CF1 CF10 CF11 CF12 CF13 CF14 CF15 CF2 CF3
CF4 CF5 CF6 CF7 CF8 CF9 CHHF10 CHHF11 CHHF12 CHHF13 CHHF14
CHHF15 CHHF4 CHHF5 CHHF6 CHHF7 CHHF8 CHHF9 CHHM10 CHHM11
CHHM12 CHHM13 CHHM14 CHHM15 CHHM4 CHHM5 CHHM6 CHHM7 CHHM8
CHHM9 CM1 CM10 CM11 CM12 CM13 CM14 CM15 CM2 CM3 CM4 CM5
CM6 CM7 CM8 CM9 CNNTOT DCRUDE DELEMP DTHINF DTHTOT DTOT
EMCU EMG9 EMMX EMNA EMNAT EMNC EMNNC EMNR EMNS EMOCSX
EMRATN EXBUD EXCAPNEW EXCAPREP EXCPGSOB EXEDSNT EXGFCAP
EXGFOPER EXHYCAP EXNHYP EXOM84 EXONTR EXPFCON1 EXPFNEW
EXPFREIN EXRP84 EXSPLIT HH HHC HHF10 HHF11 HHF12 HHF13
HHF14 HHF15 HHF4 HHF5 HHF6 HHF7 HHF8 HHF9 HHM HHM10 HHM11
HHM12 HHM13 HHM14 HHM15 HHM4 HHM5 HHM6 HHM7 HHM8 HHM9 HHN
HHSIZE HHSIZEC HHSIZEN HH24 HH25.29 HH30.54 HH55 LF LPTBFV
LPTBP9 LPTB1FV NAPF1 NAPF2 NAPF3 NAPF4 NAPF5 NAPF6 NAPF7
NAPM1 NAPM2 NAPM3 NAPM4 NAPM5 NAPM6 NAPM7 NATINC NATTOT
NBTHTOT NCBR NCDR NCEXP NCF1 NCF10 NCF11 NCF12 NCF13 NCF14
NCF15 NCF2 NCF3 NCF4 NCF5 NCF6 NCF7 NCF8 NCF9 NCM1 NCM10
NCM11 NCM12 NCM13 NCM14 NCM15 NCM2 NCM3 NCM4 NCM5 NCM6
NCM7 NCM8 NCM9 NCWS NDTHINF NDTHTOT NEMA9N NEMCMN NEMCNN
NEMD9N NEMFIN NEMGAN NEMGFN NEMM9N NEMPUN NEMP9N NEMS9N
NEMT9N NHHF10 NHHF11 NHHF12 NHHF13 NHHF14 NHHF15 NHHF4 NHHF5
NHHF6 NHHF7 NHHF8 NHHF9 NHHM10 NHHM11 NHHM12 NHHM13 NHHM14
NHHM15 NHHM4 NHHM5 NHHM6 NHHM7 NHHM8 NHHM9 NNATINC NNPF1
NNPF2 NNPF3 NNPF4 NNPF5 NNPF6 NNPF7 NNPM1 NNPM2 NNPM3 NNPM4
NNPM5 NNPM6 NNPM7 NONPET NONRP9S NWSA9N NWSCMN NWSCNN NWSD9N
NWSFIN NWSGAN NWSGFN NWSM9N NWSPUN NWSP9N NWSS9N NWST9N PF
PFN PIL PIN PINN PIN1 PIPE PIPRO PLFDMC PLFDOMM PLFDOMN
PLFD9 PM PMN POPADS POPCGQ POPF1 POPF10 POPF11 POPF12
POPF13 POPF14 POPF15 POPF2 POPF3 POPF4 POPF5 POPF6 POPF7
POPF8 POPF9 POPGQ POPKIDS POPM1 POPM10 POPM11 POPM12 POPM13
POPM14 POPM15 POPM2 POPM3 POPM4 POPM5 POPM6 POPM7 POPM8
POPM9 POPNGQ POPNI9 PPVAL PRINT PTBP9 RATIO1 RAT1 RLPT
RLTEA RLTEA4 RLTEC RLTEC4 RLTEF RLTOT RLTOT4 RLTVS RL99
RL991 RNAT ROFTS RPBGSF RPRYGF RP7S RP9S RP9SGF RSBM.EXD
RSEN RSENGF RSFDNPXG RSFS RSGFGAP RSGFRS RSID RSIDNET RSIG
RSIGNET RSIN RSINNET RSIP RSIPGF RSIPNET RTBS RTBS1 RTCS
RTISCA RT99 R99SNT R99SON SLGEXP THG UNEMP WRCU WRGCN WRGCU
WRGD9 WRGFI WRGGA WRGGC WRGMS WRGM9 WRGP9 WRGS9 WRGT9 WRM9
WRM9P WR97 WSA9 WSCM WSD9 WSFI WSGF WSM9 WSM9P WSNA WSPU
WSP9 WSS9 WSS91 WST9 WS98L XXM9 XXVACAP X1 X2 X3 X4 X5 X6

EXOGENOUS:

ANCSA BADD BALDF1 BALGF1 BALPF1 BAL991 BASEMCNX BASEPOP
BASEXCAP BASEXGF BASEXOPS BASPDRPI BIU1 D.80DEC6 D61.66
D61.68 D61.69 D61.70 D61.72 D61.73 D61.74 D61.75 D61.76
D61.77 D64.65 D69 D71.00 D71.73 D72 D75 D77.00 D79 D81.00
EMNATX EXCAP1 EXCPSHY1 EXCPSNH1 EXDSSX EXGFCHY1 EXGFCNH1
EXOPS1 GODTX LPTRAT NCBP NCRP PCNC1 PCNC2 PCNC3 PCOLART
PDUSCPI1 PIPADJ PR.DPIU1 P9PTPER RNATX RTISXX SANCSA TCRED
TXBASE TXCRPC TXPTXX TXRT VAEX1 WEUS1 YR

POLICY:

EMAGRI EMCNX1 EMCNX2 EMFISH EMGC EMGM EMMX1 EMMX2 EMP9
EMT9X EXBOND EXDFPCNT EXDF1 EXPFBAK EXPFCONX EXPFDIST EXPF1
EXPRPER EXSAVX EXSPCAP EXSPLITX EXSUBS1 GRDIRPU GREXCAP
GREXOPS GRRPCEX GRRWEUS GRSSCP GRUSCPI RLPTX RLTFPX RLTX
RPBS RPPS RPRY RPTS RP9X RSFDNPX RSFDNX RTCSPX RTC SX
TOURIST UUS XXMX2

COEFFICIENT:

CMIG1 CMIG2 CMIG3 CMIG4 C1A C1B C1C C10A C10B C10C C100A
C100B C100C C101A C101B C102A C102B C102C C102D C102F C103A
C103B C103C C104A C104B C105A C105B C105C C106A C106B C107A
C107B C11A C11B C12A C12B C13A C13B C14A C14B C14C C15A
C15B C16A C16B C16C C16D C16E C17A C17B C18A C18B C19A
C19B C2A C2B C20A C20B C21A C21B C21C C22A C22B C23A C23B
C23C C23D C24A C24B C25A C25B C26A C26B C26C C27A C27B
C27C C28A C28B C28C C29A C29B C3A C3B C30A C30B C31A C31B
C32A C32B C33A C33B C34A C34B C34C C35A C35B C36A C36B
C36C C36D C36F C37A C37B C38A C38B C39A C39B C4A C4B C40A
C40B C41A C41B C42A C42B C43A C43B C43C C44A C44B C44C
C44D C45A C45B C45C C45D C46A C46B C47A C47B C48A C48B
C49A C49B C5A C5B C50A C50B C51A C51B C52A C52B C53A C53B
C53C C53D C53F C54A C54B C54C C54D C54E C55A C55B C55C
C56A C56B C57A C57B C57C C58A C58B C59A C59B C59C C59D
C59E C59F C6A C6B C60A C60B C60C C61A C61B C62A C62B C62C
C62D C62F C63A C63B C64A C64B C64C C64D C64E C65A C65B
C66A C66B C66C C66D C66E C66F C67A C67B C67C C68A C68B
C68C C68D C69A C69B C7A C7B C70A C70B C70C C70D C70F C71A
C71B C71C C71D C71E C72A C72B C72C C72D C73A C73B C73C
C74A C74B C74C C74D C74F C75A C75B C76A C76B C76C C76D
C76E C77A C77B C78A C78B C78C C78D C78E C78F C79A C79B
C79D C79E C79F C8A C8B C80A C80B C80C C81A C81B C82A C82B
C82C C82D C82F C83A C83C C83D C83E C84A C84B C84C C84D
C85A C85B C86A C86B C86C C86D C86E C86F C87A C87B C88A
C88B C88C C88D C88E C88F C88G C89A C9A C9B C90A C90B C91A
C91B C92A C92B C92C C92F C93A C93B C94A C94B C95A C95B
C95C C95D C95F C96A C96B C97A C97B C98A C98B C99A C99B

PARAMETER:

AFTOT CPGQF1 CPGQF10 CPGQF11 CPGQF12 CPGQF13 CPGQF14 CPGQF15
CPGQF2 CPGQF3 CPGQF4 CPGQF5 CPGQF6 CPGQF7 CPGQF8 CPGQF9
CPGQM1 CPGQM10 CPGQM11 CPGQM12 CPGQM13 CPGQM14 CPGQM15 CPGQM2
CPGQM3 CPGQM4 CPGQM5 CPGQM6 CPGQM7 CPGQM8 CPGQM9 EXANNU
EXCAPIMP EXCAPOLD EXEL1 EXEL2 EXEL3 EXEL4 EXEL5 EXEL6
EXLIM82 EXOMCOST EXOPSIMP EXRLOP6 EXRLOP7 EXRLOP8 EXRL1 EXRL2
EXRL3 EXRL4 EXRL4OP EXRL5 FERT10 FERT11 FERT4 FERT5 FERT6
FERT7 FERT8 FERT9 G1 G10 G11 G12 G13 G14 G15 G2 G3 G4
G5 G6 G7 G8 G9 HHRF10 HHRF11 HHRF12 HHRF13 HHRF14 HHRF15
HHRF4 HHRF5 HHRF6 HHRF7 HHRF8 HHRF9 HHRM10 HHRM11 HHRM12
HHRM13 HHRM14 HHRM15 HHRM4 HHRM5 HHRM6 HHRM7 HHRM8 HHRM9
LFPART MDPF1 MDPF10 MDPF11 MDPF12 MDPF13 MDPF14 MDPF15 MDPF2

MDPF3 MDPF4 MDPF5 MDPF6 MDPF7 MDPF8 MDPF9 MDPM1 MDPM10
MDPM11 MDPM12 MDPM13 MDPM14 MDPM15 MDPM2 MDPM3 MDPM4 MDPM5
MDPM6 MDPM7 MDPM8 MDPM9 MDTOT MF1 MF10 MF11 MF12 MF13 MF14
MF15 MF2 MF3 MF4 MF5 MF6 MF7 MF8 MF9 MHHF10 MHHF11 MHHF12
MHHF13 MHHF14 MHHF15 MHHF5 MHHF6 MHHF7 MHHF8 MHHF9 MHHM10
MHHM11 MHHM12 MHHM13 MHHM14 MHHM15 MHHM5 MHHM6 MHHM7 MHHM8
MHHM9 MILF1 MILF10 MILF11 MILF12 MILF13 MILF14 MILF15 MILF2
MILF3 MILF4 MILF5 MILF6 MILF7 MILF8 MILF9 MILM1 MILM10
MILM11 MILM12 MILM13 MILM14 MILM15 MILM2 MILM3 MILM4 MILM5
MILM6 MILM7 MILM8 MILM9 MILRAT MM1 MM10 MM11 MM12 MM13
MM14 MM15 MM2 MM3 MM4 MM5 MM6 MM7 MM8 MM9 NFERT10 NFERT11
NFERT4 NFERT5 NFERT6 NFERT7 NFERT8 NFERT9 NHHRF10 NHHRF11
NHHRF12 NHHRF13 NHHRF14 NHHRF15 NHHRF4 NHHRF5 NHHRF6 NHHRF7
NHHRF8 NHHRF9 NHHRM10 NHHRM11 NHHRM12 NHHRM13 NHHRM14 NHHRM15
NHHRM4 NHHRM5 NHHRM6 NHHRM7 NHHRM8 NHHRM9 NMF1 NMF10 NMF11
NMF12 NMF13 NMF14 NMF15 NMF2 NMF3 NMF4 NMF5 NMF6 NMF7 NMF8
NMF9 NMM1 NMM10 NMM11 NMM12 NMM13 NMM14 NMM15 NMM2 NMM3
NMM4 NMM5 NMM6 NMM7 NMM8 NMM9 NPGQF1 NPGQF10 NPGQF11
NPGQF12 NPGQF13 NPGQF14 NPGQF15 NPGQF2 NPGQF3 NPGQF4 NPGQF5
NPGQF6 NPGQF7 NPGQF8 NPGQF9 NPGQM1 NPGQM10 NPGQM11 NPGQM12
NPGQM13 NPGQM14 NPGQM15 NPGQM2 NPGQM3 NPGQM4 NPGQM5 NPGQM6
NPGQM7 NPGQM8 NPGQM9 NRCF10 NRCF11 NRCF12 NRCF13 NRCF14
NRCF15 NRCF4 NRCF5 NRCF6 NRCF7 NRCF8 NRCF9 NRCM10 NRCM11
NRCM12 NRCM13 NRCM14 NRCM15 NRCM4 NRCM5 NRCM6 NRCM7 NRCM8
NRCM9 NSEXDIV NSF1 NSF10 NSF11 NSF12 NSF13 NSF14 NSF15 NSF2
NSF3 NSF4 NSF5 NSF6 NSF7 NSF8 NSF9 NSM1 NSM10 NSM11 NSM12
NSM13 NSM14 NSM15 NSM2 NSM3 NSM4 NSM5 NSM6 NSM7 NSM8 NSM9
NSURINFF NSURINFM NTP OEMF1 OEMF10 OEMF11 OEMF12 OEMF13
OEMF14 OEMF15 OEMF2 OEMF3 OEMF4 OEMF5 OEMF6 OEMF7 OEMF8
OEMF9 OEMM1 OEMM10 OEMM11 OEMM12 OEMM13 OEMM14 OEMM15 OEMM2
OEMM3 OEMM4 OEMM5 OEMM6 OEMM7 OEMM8 OEMM9 PADJ PAD1 PAD2
PARLVFV PARNONGF PBLTBL PBTRATE PCINDA PCIVPY PCNCVS PCNCV1
PCNCWS PCNC4 PCWS1 PCYNA1 PC12N PC12RN PC13C PC39A PC39B
PDRPIBAS PECIG PERNA1 PERNA2 PERNA3 PESLT PESLTC PFISH1
PIDIST PNTGR POPMGQ PRINT2 PTOURB PTOURD PTOURE PTOURS
PTOURT PTRTS PWRBASE P1 P2 P3 P4 P5 P6 RCF10 RCF11 RCF12
RCF13 RCF14 RCF15 RCF4 RCF5 RCF6 RCF7 RCF8 RCF9 RCM10
RCM11 RCM12 RCM13 RCM14 RCM15 RCM4 RCM5 RCM6 RCM7 RCM8
RCM9 ROR RORANGRO RORCPDEP RORCRF RORDISK RORNC RORPDF
RORPPF SEXDIV SF1 SF10 SF11 SF12 SF13 SF14 SF15 SF2 SF3
SF4 SF5 SF6 SF7 SF8 SF9 SM1 SM10 SM11 SM12 SM13 SM14
SM15 SM2 SM3 SM4 SM5 SM6 SM7 SM8 SM9 SURINFF SURINFM TP

EQUATIONS

National Variables

- 1: $PR.DPIUS = IF\ YR\ LT\ 1982\ THEN\ PR.DPIU1\ ELSE\ PR.DPIUS(-1) * (1+GRDIRPU)$
- 2: $PDUSCPI = IF\ YR\ LT\ 1982\ THEN\ PDUSCPI1\ ELSE\ PDUSCPI(-1) * (1+GRUSCPI)$
- 3: $WEUS = IF\ YR\ LT\ 1982\ THEN\ WEUS1\ ELSE\ WEUS(-1) * (1+GRUSCPI+GRRWEUS)$
- 4: $PDRATIO = IF\ YR\ EQ\ 1980\ THEN\ 1.296\ ELSE\ (IF\ YR\ EQ\ 1981\ THEN\ 1.266\ ELSE\ (IF\ YR\ EQ\ 1982\ THEN\ 1.262\ ELSE\ (IF\ RTIS(-2)-RTIS(-1)\ NE\ 0\ AND\ RTIS(-2)\ EQ\ 0\ THEN\ PDRATIO(-1)+C67A*(EMSP-EMSP(-1))/EMSP(-1)+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))-C67C\ ELSE\ PDRATIO(-1)+C67A*(EMSP-EMSP(-1))/EMSP(-1)+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1))))))$

Price Deflators

- 5: $PDRPI = PDRATIO * PDUSCPI$
- 6: $PDEXOPS = WSGSFY(-1)/EXOPS(-1) * (WRGA * 100 / PWRBASE) + (EXOPS(-1) - WSGSFY(-1)) / EXOPS(-1) * PDRPI$
- 7: $PDCON = C107A + C107B * WRCNNP$

Fiscal Module

State Revenues

- 8: $RP7S == RPBS + RPRY + RSFDNPX$
- 9: $RP9S == RP7S + RPPS + RPTS + RTCSPX + RP9X$
- 10: $RP9SGF == RP9S - EXPF1 * RP7S$
- 11: $RPBSGF == (1 - EXPF1) * RPBS$
- 12: $RPRYGF == (1 - EXPF1) * RPRY$
- 13: $RSFDNPXG == (1 - EXPF1) * RSFDNPX$
- 14: $DF.RSVP = IF\ YR\ LT\ 1982\ THEN\ 0\ ELSE\ DF.RSVP(-1) + RP9S * (PDRPIBAS / PDRPI) * (1 / (1 + RORDISK)) * (YR - 1981)$
- 15: $LOG(FAGI) = C21A + C21B * LOG(PI8) + C21C * LOG(EMCNX1 + EMP9)$

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16: LOG(FAGII) = C22A+C22B*LOG(PI)
17: COLA = (1-1/(1+PCOLART))*WSGC
18: AGI = FAGI+COLA-WSGM-PC12N*PC12RN*ANCSA*PCNC1
19: AEX*1000 = C10A+C10B*POPC+C10C*(EMCNX1+EMP9)
20: ATT = C28A+C28B*(EM99-EMGM)+C28C*EMCNX1
21: LOG(ATD/ATT) = C23A+C23B*LOG(AGI/ATT)+C23C*D69+C23D*D72
22: VAEX = IF YR LT 1980 THEN VAEX1 ELSE VAEX(-1)*(1+GRUSCPI)
23: ATI = AGI-AEX*VAEX-ATD
24: ATI.TT = ATI/ATT
25: LOG(RTISCA1) = C24A-TXBASE+C24B*(1-TXRT)*LOG(ATI.TT)
26: LOG(RTISCA2) = C24A+C24B*LOG(ATI.TT)
27: RTISCA == IF YR GT 1984 THEN (IF EXTRNS+EXTRNS(-1) EQ 0 THEN
EXRL5*(RTISCA1-TXCRPC*RTISCA1-TCRED/1000)ELSE 0) ELSE (IF YR LT
1979 THEN RTISCA1-TXCRPC*RTISCA1-TCRED/1000 ELSE 0)
28: RTISLOS == (RTISCA2-RTISCA)*ATT
29: RTISC = RTISCA*ATT
30: RTIS = IF YR EQ 1980 THEN 0 ELSE C25A*RTISC(-1)+C25B*RTISC
31: RTISCP = C105A+C105B*PI8+C105C*RTISC
32: LOG(RTPIF/ATT) = C26A+C26B*LOG(FAGII/ATT+TCRED/1000/ATT+
RTISLOS/ATT)+C26C*D61.68*LOG(FAGII/ATT+TCRED/1000/ATT+RTISLOS/ATT)
33: DPIRES = C27A+C27B*PI3+C27C*WSCNP
34: LOG(BL) = C39A+C39B*LOG(XX98-XXP9)
35: LOG(GR) = C40A+C40B*LOG(XX98)
36: RTBS1 == (BL+BL(-1))*1000/2*PBTRATE
37: GTR = GR-BL(-1)*PNTGR*1000
38: LOG(RTBS2*10**3/BL(-1)) = C29A+C29B*LOG(GTR(-1)*10**3/BL(-1))
39: RTBS == IF YR GE 1979 THEN RTBS1+RTBS2*PBLTBL ELSE RTBS1+RTBS2

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40: $\text{LOG}(\text{RTCS1} \times 100 / \text{PDRPI}) = \text{C43A} + \text{C43C} \times \text{D64.65} + \text{C43B} \times \text{LOG}(\text{EMP9}(-1) + \text{EMCN}(-1) + \text{EMM9}(-1) + \text{EMT9}(-1) + \text{EMCM}(-1) + \text{EMPU}(-1))$

41: $\text{RTCS} == \text{RTCS1} + \text{RTCSPX} + \text{RTCSX}$

42: $\text{TPTV} = \text{C38A} + \text{C38B} \times \text{POP}$

43: $\text{LOG}(\text{AHG}) = \text{C37A} + \text{C37B} \times \text{LOG}(\text{PR.PI})$

44: $\text{THG} == \text{AHG} \times \text{TPTV}$

45: $\text{LOG}(\text{RTMF}) = \text{C46A} + \text{C46B} \times \text{LOG}(\text{THG})$

46: $\text{LOG}(\text{RTVS}) = \text{C47A} + \text{C47B} \times \text{LOG}(\text{R.DPI8N}(-1))$

47: $\text{LOG}(\text{RTAS}) = \text{C48A} + \text{C48B} \times \text{LOG}(\text{R.DPI}(-1))$

48: $\text{LOG}(\text{RTCIS}) = \text{C49A} + \text{C49B} \times \text{LOG}(\text{R.DPI}(-1))$

49: $\text{RTSS} = \text{IF YR GT 1980 THEN 0 ELSE } \text{C50A} + \text{C50B} \times (\text{EM99} - \text{EMGM})$

50: $\text{RTOTS} = \text{RTOTS}(-1) \times (1 + \text{GRUSCPI} + \text{GRDIRPU})$

51: $\text{RT99} == \text{RTIS} + \text{RTCS} + \text{RPPS} + \text{RPTS} + \text{RP9X} + \text{RTBS} + \text{RTMF} + \text{RTAS} + (1 - \text{PECIG}) \times \text{RTCIS} + \text{RTVS} + \text{RTSS} + \text{RTOTS}$

52: $\text{LOG}(\text{ROFAS}) = \text{C30A} + \text{C30B} \times \text{LOG}(\text{TPTV}(-1))$

53: $\text{LOG}(\text{ROFOS}) = \text{C33A} + \text{C33B} \times \text{LOG}(\text{PI3}(-1))$

54: $\text{ROFTS} == \text{ROFAS} + \text{ROFOS}$

55: $\text{ROFERS} = \text{ROFERS}(-1) \times (1 + \text{GRUSCPI} + \text{GRDIRPU})$

56: $\text{LOG}(\text{RMIS}) = \text{C35A} + \text{C35B} \times \text{LOG}(\text{PI3}(-1))$

57: $\text{RSIP} == (\text{ROR} + \text{GRUSCPI} + \text{RORPPF}) \times \text{BALPF}(-1)$

58: $\text{RSIPGF} == (1 - \text{EXPFBK}) \times \text{RSIP}$

59: $\text{RSID} == (\text{ROR} + \text{GRUSCPI} - \text{RORPDF}) \times \text{BALDF}(-1)$

60: $\text{RSIG} == (\text{ROR} + \text{GRUSCPI}) \times \text{BALGF}(-1)$

61: $\text{RSIN} == (\text{ROR} + \text{GRUSCPI}) \times \text{BAL99}(-1) + \text{RORPPF} \times \text{BALPF}(-1) - \text{RORPDF} \times \text{BALDF}(-1)$

62: $\text{RSIPNET} == (\text{ROR} + \text{GRUSCPI} - (\text{PDRPI} / \text{PDRPI}(-1) - 1) + \text{RORPPF}) \times \text{BALPF}(-1)$

63: $\text{RSIDNET} == (\text{ROR} + \text{GRUSCPI} - (\text{PDRPI} / \text{PDRPI}(-1) - 1) - \text{RORPDF}) \times \text{BALDF}(-1)$

64: $\text{RSIGNET} == (\text{ROR} + \text{GRUSCPI} - (\text{PDRPI} / \text{PDRPI}(-1) - 1)) \times \text{BALGF}(-1)$

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65: RSINNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1))*BAL99+RORPPF*
    BALPF(-1)-RORPDF*BALDF(-1)

66: RSGFBM = RT99+(1-EXPF1)*RP7S+ROFTS+ROFERS+RSIG+(1-EXPFBK)*
    RSIP+RMIS+EXDFWITH

67: RSFDN = IF YR EQ 1982 THEN 187.968 ELSE RSFDNX+RSFDN(-1)*
    (1+GRUSCPI+GRDIRPU)

68: RMISRES = IF YR EQ 1982 THEN 16.739 ELSE RMISRES(-1)*
    (1+GRUSCPI+GRDIRPU)

69: RSGFRS == RSFDN+RMISRES

70: RSGF = RSGFBM+RSGFRS

71: R99S = RSGF+EXPF1*RP7S+EXPFBK*RSIP+(RSID-EXDFWITH)-SANCSA

72: LOG(RSFFS) = C58A+C58B*LOG(POP(-1))

73: RSFS1 = RSFS1(-1)*(1+GRUSCPI+GRDIRPU)

74: RSFS == PECIG*RTCIS+RSFFS+RSFS1

75: RSIAS = IF YR EQ 1982 THEN 31.12 ELSE RSIAS(-1)*(1+GRUSCPI+
    GRDIRPU)

76: R99SNT == R99S-EXPFCO

77: R99SON == R99S-RSFDN

78: NONPET == R99S-RP9S-RSIN

79: NONRP9S == R99S-RP9S

80: RSEN == R99S-(RP9S-SANCSA)-RSIN-RSFDN

81: RSENGF == RSGFBM-RP9SGF-RSIPGF-RSIG

82: EXPFCO = EXPFBK*RSIP+EXPF1*RP7S+EXPFCO

83: EXPFNEW == EXPF1*RP7S

84: EXPFREIN == EXPFBK*RSIP

85: EXPFCO1 == EXPFCO-EXPFCO

86: EXDFCO = IF RSGFBM GT EXGFBM THEN EXDF1*(RSGFBM-EXGFBM)+
    (RSID-EXDFWITH) ELSE RSID-EXDFWITH

87: EXDFWITH = EXDFPCNT*RSIDNET

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State Expenditures

- 88: EXLIM = IF YR EQ 1982 THEN EXLIM82 ELSE EXLIM82*
(PDRPI/PDRPIBAS)*(POP/430)
- 89: EXLIMOK = IF YR LT 1985 THEN EXLIM ELSE (IF RSGFBM-EXDSS-EXTRNS+
BALGF(-1) GT EXLIM THEN EXLIM ELSE RSGFBM-EXDSS-EXTRNS)
- 90: RSGFGAP == EXLIM-EXLIMOK
- 91: EXSPLIT == IF YR LT 1985 THEN 0.67 ELSE (IF RSGFGAP GT 0 AND
RSGFGAP(-1) GT 0 THEN EXSPLITX ELSE (IF RSGFGAP GT 0 THEN
0.67+(EXSPLITX-0.67)/2 ELSE 0.67))
- 92: EXOPS = IF YR LE 1983 THEN EXOPS1 ELSE EXRL5*(EXLIMOK*EXSPLIT+
EXINREC+RSFDN+RMISRES+RSFS+RSIAS)+EXRL1*(EXOPS(-1)*(1+(EXEL1*(POP
(-1)/POP(-2)-1)+EXEL2*(PDEXOPS(-1)/PDEXOPS(-2)-1)+EXEL3*(PR.PI3
(-1)/PR.PI3(-2)-1)+EXEL4*(PI(-1)/PI(-2)-1)+EXEL5*(PI3(-1)/PI3(-2)-
1)+EXEL6*((POP(-1)-EMCNX1(-1))/(POP(-2)-EMCNX1(-2)-1)))+EXRLOP6*
BALGFCP(-1)*(BALGFP(-1)/EXGF(-1))+EXRLOP7*(R99S(-1)-EXNOPS(-1)-
EXSAVS)+EXRLOP8*(R99S(-1)-EXNOPS(-1)-EXANSAV)+EXRL3*(1+GRRPCEX)*
(EXOPS(-1)/POP(-1)/PDEXOPS(-1)*POP*PDEXOPS)+EXRL2*EXOPS(-1)*
(1+GREXOPS)+EXRL4*(BASEXOPS+EXOPSIMP*(PDEXOPS*(POP-BASEPOP-
EXRL4OP*(EMCNX1-BASEMCNX))))
- 93: EXANSAV = RP9S+RSIN-EXANNU*(1+RORANGRO)**(YR-1980)
-
- 94: EXSAVS = EXSAVX+EXPFCN+TXPTXX*RTISLOS
- 95: LOG(EXJUS4) = C20A+C20B*LOG(EXOPS)
- 96: LOG(EXPPS4) = C91A+C91B*LOG(EXOPS)
- 97: LOG(EXNRS4) = C93A+C93B*LOG(EXOPS)
-
- 98: LOG(EXHES4) = C94A+C94B*LOG(EXOPS)
-
- 99: LOG(EXSSS4) = C96A+C96B*LOG(EXOPS)
- 100: LOG(EXEDS4) = C19A+C19B*LOG(EXOPS)
- 101: LOG(EXCDS4) = C97A+C97B*LOG(EXOPS)
- 102: LOG(EXTRS4) = C98A+C98B*LOG(EXOPS)
- 103: LOG(EXGGS4) = C99A+C99B*LOG(EXOPS)
- 104: RATIO1 == EXOPS/(EXEDS4+EXSSS4+EXHES4+EXNRS4+EXPPS4+EXJUS4+
EXCDS4+RLTX+EXTRS4+EXGGS4)
- 105: EXUA = IF YR EQ 1982 THEN 197.7 ELSE EXUA(-1)*(EXOPS/EXOPS(-1))

106: EXEDS = RATIO1*EXEDS4
107: EXSSS = RATIO1*EXSSS4
108: EXHES = RATIO1*EXHES4
109: EXNRS = RATIO1*EXNRS4
110: EXPPS = RATIO1*EXPPS4
111: EXJUS = RATIO1*EXJUS4
112: EXTRS = RATIO1*EXTRS4
113: EXGGS = RATIO1*EXGGS4
114: EXCDS = RATIO1*(EXCDS4+RLTX)
115: RLTE99 = RLTE994*RATIO1
116: EXEDSNT == EXEDS-RLTE99
117: RLTT9 = RLTT94*RATIO1
118: RLTRS = RLTRS4*RATIO1
119: EXCDSNT = EXCDS-RLTT9-RLTRS-RLTX
120: EXPRCDS = C7A+C7B*EXCDSNT
121: EXPREDS1 = C1A+C1B*EXEDSNT+C1C*D61.75*EXEDSNT
122: EXPRSSS = C2A+C2B*EXSSS
123: EXPRUA = C32A+C32B*EXUA
124: EXPRHES = C3A+C3B*EXHES
125: EXPRNRS = C4A+C4B*EXNRS
126: EXPRPPS = C5A+C5B*EXPPS
127: EXPRGGS = C8A+C8B*EXGGS
128: EXPRJUS = C6A+C6B*EXJUS
129: EXPRTS = C9A+C9B*EXTRS
130: EXPR99 = EXPRPER*(EXPREDS1+EXPRSSS+EXPRHES+EXPRNRS+EXPRPPS+
EXPRJUS+(+EXPRCDS)+EXPRGGS+EXPRTS+EXPRUA)

131: WSGSFY = PCWS1*EXPR99

132: LOG(WSGS) = C55A+C55B*LOG(WSGSFY)+C55C*D75

133: EXTRNS = IF YR LT 1981 THEN 0 ELSE (IF YR EQ 1982 THEN 425 ELSE
RSIP*(1-EXPFBK)*EXPFDIST)

134: EXINREC = C17A+C17B*(EXOPS-RLT99)

135: EXSUBS = IF YR LT 1988 THEN EXSUBS1 ELSE (IF EXRL5 EQ 1 THEN (IF
RSGFBM(-1)+RSGFBM(-2)-1 LT EXGFBM(-1)+EXGFBM(-2) OR EXSUBS(-1)
EQ 0 THEN 0 ELSE EXLIMOK*(0.5*(1-EXSPLIT))) ELSE
EXSUBS(-1)*(1+GRUSCPI))

136: EXCAP = IF YR LT 1984 THEN EXCAP1 ELSE EXRL5*(EXLIMOK*
(1-EXSPLIT)-EXSUBS)/(1-EXBOND)+EXRL3*((1+GRSSCP)*PR.BALCP(-1)*POP/
1000-R.BALCAP(-1)*(1/(1+RORCPDEP)))/(100/PDCON)+EXRL2*(EXCAP(-1)*
(1+GREXCAP))+EXRL4*(BASEXCAP+EXCAPIMP*(PDCON*(POP-BASEPOP-EXRL4OP*
(EMCNX1-BASEMCNX))))+EXRL1*(EXCAP(-1)*(1+EXEL1*(POP(-1)/POP(-2)-
1)+EXEL2*(PDCON(-1)/PDCON(-2)-1)+EXEL3*(PR.PI3(-1)/PR.PI3(-2)-1)+
EXEL4*(PI(-1)/PI(-2)-1)+EXEL5*(PI3(-1)/PI3(-2)-1)+EXEL6*((POP(-1)-
EMCNX1(-1))/(POP(-2)-EMCNX1(-2))-1)))

137: EXGFCHY = IF YR LT 1984 THEN EXGFCHY1 ELSE 0.6*EXCAP*(1-EXBOND)

138: EXGFCNH = IF YR LT 1984 THEN EXGFCNH1 ELSE 0.4*EXCAP*(1-EXBOND)

139: EXCPSHY = IF YR LT 1984 THEN EXCPSHY1 ELSE 0.25*EXCAP*EXBOND

140: EXCPSNH = IF YR LT 1984 THEN EXCPSNH1 ELSE 0.75*EXCAP*EXBOND

141: EXHYCAP == EXGFCHY+EXCPSHY

142: EXNHYCP == EXGFCNH+EXCPSNH

143: EXGFCAP == EXGFCHY+EXGFCNH

144: EXCAPFR = EXCAPFR(-1)*(EXCAP/EXCAP(-1))

145: EXCPS = EXCPSHY+EXCPSNH

146: XXVHY = C41A+C41B*(EXHYCAP+EXHYCAP(-1))

147: XXVNHY = C42A+C42B*(EXNHYCP(-1)+EXSPCAP(-1)-EXCAPFR(-2)+
EXNHYCP+EXSPCAP-EXCAPFR(-1))

148: XXVACAP == (XXVHY+XXVNHY)/(PDCON/100)

149: EXDSS = IF YR LT 1983 THEN EXDSSX ELSE EXDSSX+RORCRF*DEBTP82(-1)

150: EXCPSFED = IF YR EQ 1982 THEN 105.021 ELSE EXCPSFED(-1)*
(1+GRUSCPI)

151: EXCPSGOB == EXCPS-EXCPSFED

152: EXCPSM = IF YR LT 1983 THEN 0 ELSE EXCPSGOB

153: DEBTP82 = IF YR LT 1983 THEN 0 ELSE
DEBTP82(-1)+EXCPSGOB-EXCPSM(-20)

154: GODT = IF YR LT 1983 THEN GODTX ELSE GODTX+EXCPSM(-19)*0.05+
EXCPSM(-18)*0.1+EXCPSM(-17)*0.15+EXCPSM(-16)*0.2+EXCPSM(-15)*0.25+
EXCPSM(-14)*0.3+EXCPSM(-13)*0.35+EXCPSM(-12)*0.4+EXCPSM(-11)*0.45+
EXCPSM(-10)*0.5+EXCPSM(-9)*0.55+EXCPSM(-8)*0.6+EXCPSM(-7)*0.65+
EXCPSM(-6)*0.7+EXCPSM(-5)*0.75+EXCPSM(-4)*0.8+EXCPSM(-3)*0.85+
EXCPSM(-2)*0.9+EXCPSM(-1)*0.95+EXCPSGOB

155: EXGF = EXOPS+EXTRNS+EXSUBS+EXSPCAP+EXDSS-EXINREC+EXGFCAP-
RSFS-RSIAS

156: EX99S = EXOPS+EXTRNS+EXSUBS+EXSPCAP+EXDSS+EXCAP+PARNONGF*EXUA

157: EXGFBM = EXGF+EXPFCNX-RSFDN-RMISRES

158: EXNOPS = EX99S-EXOPS

159: EXBUD == EXOPS+EXDSS+PARNONGF*EXUA

160: EXGFOPER == EXGFBM-EXTRNS-EXGFCAP-EXSUBS-EXSPCAP-EXPFCNX

161: EXONTR == EXOPS+EXDSS-RLTE99-RLTT9-RLTRS-RLTMS-RLTX

162: BALCAB == R99S-EXGF

163: BALCABBM == RSGFBM-EXGFBM

164: BAL99 = IF YR LT 1982 THEN BAL991 ELSE (IF YR EQ 1982 THEN 3612
ELSE BAL99(-1)+R99S-EXGF)

165: BALGF = IF YR LT 1982 THEN BALGF1 ELSE BAL99-BALPF-BALDF

166: BALDF = IF YR LT 1983 THEN BALDF1 ELSE BALDF(-1)+EXDFCON

167: BALPF = IF YR LT 1983 THEN BALPF1 ELSE BALPF(-1)+EXPFCNX

168: BALGFP = IF BALGF LT 0 THEN 0 ELSE BALGF

169: BALGFCP = IF BALGF-BALGF(-1) GT 0 THEN BALGF-BALGF(-1) ELSE 0

170: R.BALCAP = R.BALCAP(-1)*(1/(1+RORCPDEP))+EXCAP*100/PDCON

171: PR.BALCP = R.BALCAP*1000/POP
172: EXCAPREP == IF YR LT 1984 THEN 0 ELSE RORCPDEP*BALCAP84(-1)+
EXCAPOLD*(PDRPI/PDRPIBAS)
173: EXCAPNEW == IF YR LT 1984 THEN 0 ELSE EXCAP-EXCAPREP
174: BALCAP84 = IF YR LT 1984 THEN 0 ELSE BALCAP84(-1)*PDRPI/
PDRPI(-1)+EXCAPNEW
175: EXOM84 == BALCAP84(-1)*EXOMCOST
176: EXRP84 == RORCPDEP*BALCAP84(-1)

Local Revenues

177: LOG(LPTB1) = C57A+C57B*LOG(PI3(-1))+C57C*D71.00
178: LPTB1FV == LPTB1*1/PARLVFV
179: PTBP9 == RPPS*(1/PTRTS)
180: LPTBP9 == P9PTPER*PTBP9
181: LPTB = LPTB1+LPTBP9*LPTRAT
182: LPTBFV == LPTB1FV+LPTBP9
183: PPVAL == LPTB1FV+PTBP9
184: RLPT1 = C18A+C18B*LPTB
185: RLPT == RLPT1+RLPTX
186: LOG(RLOT*1000/POP(-1)) = C31A+C31B*LOG(PI(-1)*1000/POP(-1))
187: RLTC4 = IF YR GT 1981 THEN 0 ELSE PESLTC*RTCS1
188: RLTVS4 = C63A+C63B*RTVS
189: RLTOT4 == PESLT*RTOTS
190: RLMA4 = IF YR LT 1982 THEN 0 ELSE
RLMA(-1)/PDRPI(-1)/POP(-1)*POP*PDRPI
191: RLTT94 = RLTVS4+RLTOT4+RLTC4+RLMA4
192: RLTRS4 = RLTRS(-1)*(1+GRUSCPI+GRDIRPU)

193: RLIMS = IF YR EQ 1981 THEN 50.887 ELSE (IF EXSUBS EQ 0 THEN 0
ELSE RLIMS(-1)*(1+GRUSCPI+GRDIRPU))

194: RLTEC4 == PECIG*RTCIS

195: ADMDIS == PAD1*POPSKUL(-1)

196: ADMREA == PAD2*POPSKUL(-1)

197: ADMSD = ADMDIS+ADMREA

198: BIU = IF YR LT 1980 THEN BIU1 ELSE BIU(-1)*(1+GRUSCPI)

199: RLTEF4 = C36A+C36F*D81.00+D71.00*C36B+BIU*C36C+C36D*ADMSD

200: RLTE4 = (POP/POP(-1)+PDRPI/PDRPI(-1)-1)*RLTE(-1)

201: RLTEO4 = RLTEO(-1)*(1+GRUSCPI+GRDIRPU)

202: RLTEA4 == RLTEC4+RLTEF4+RLTE4+RLTEO4

203: RLTEB4 = IF YR EQ 1980 THEN 7.5 ELSE
RLTEB(-1)*(1+GRUSCPI+GRDIRPU)

204: RLTE994 = RLTEA4+RLTEB4

205: RLTC4 = RLTC4*RATIO1

206: RLTVS == RLTVS4*RATIO1

207: RLTOT == RLTOT4*RATIO1

208: RLTEA = RLTEA4*RATIO1

209: RLTEC == RLTEC4*RATIO1

210: RLTEF == RLTEF4*RATIO1

211: RLTE4 = RLTE4*RATIO1

212: RLTEO = RLTEO4*RATIO1

213: RLTEA == RLTEA4*RATIO1

214: RLTEB = RLTEB4*RATIO1

215: RLTE99 = RLTE9+RLTRS+RLTE99+RLTE4+RLTE

Local Expenditures

216: $ELED1 = C11A + C11B * PI3(-1)$

217: $ELED = RLTE99 + ELED1$

218: $ELBD = C14A + C14C * D61.77 * GOBOND(-1) + C14B * GOBOND(-1)$

219: $ELNED1/PDRPI = C16A + C16E * D81.00 + C16D * R.DPI8N(-1) +$
 $C16B * D71.00 * R.DPI8N(-1) + C16C * WEALTH(-1) * POP(-1)$

220: $EL99 = ELED + ELNED1 + ELBD + RLTX + RLTFPX + RLMS$

221: $RLTF = RLTF(-1) * (1 + GRUSCPI + GRDIRPU)$

222: $RL991 == RLPT + RLOT + RL99 + RLTF + RLTFPX$

223: $RLMC = EL99 - RL991 - (GOBOND - GOBOND(-1))$

224: $RL99 == RL991 + RLMC$

225: $ELEDCP = C15A + C15B * ELED$

226: $ELPERS = C12A + C12B * (EL99 - ELEDCP - ELBD)$

227: $WSGL = C13A + PC13C * D81.00 + C13B * (ELPERS + ELPERS(-1))$

228: $GOBOND = GOBOND(-1) * (1 + GRUSCPI + GRDIRPU)$

229: $SLGEXP == EX99S + EL99 - RL99$

230: $BALOCAL == RL99 - (EL99 - ELBD)$

231: $BALLANDS == BALOCAL + BALCAB$

Economic Module

Personal Income

232: $PIDIR = C51A + C51B * (DPI + DPI(-1) + DPI(-2) + DPI(-3) + DPI(-4))$

233: $PITRAN1 = IF YR EQ 1981 THEN 500.245 ELSE PITRAN1(-1) /$
 $POPPER(-1) * (1 + GRUSCPI) * POPGER$

234: $PITRAN/PDRPI = IF YR GT 1980 THEN PITRAN1/PDRPI + EXTRNS/PDRPI$
 $ELSE C34A + C34B * POP + C34C * D61.72 + EXTRNS/PDRPI$

235: $PIOLI = C44A + C44D * D61.75 + C44B * (WS98 - WSCNP) + C44C * WSCNP(-1)$

236: $PISSC = C106A + C106B * (WS98 - WSCNP)$

237: $PIPRO1*100/PDRPI = C45A+C45B*EMPRO1+C45C*D61.66+C45D*D79$

238: $PIPROF = EMPROFIS*(4.523*(PDRPI/340))$

239: $PIPRO == PIPRO1+PIPROF$

240: $PI8 = WS98+PIOLI+PIPRO-PISSC+PIDIR+PITRAN$

241: $NCCI = PC12N*(1-PCNC1)*ANCSA+(1-PCNC2)*NCRP+(1-PCNC3)*RORNC*NCCAP(-1)$

242: $NCCAP = PCNCSV*NCCI+NCCAP(-1)+PCNCSV1*(1-PCNC4)*NCBP$

243: $NCEXP == (1-PCNCSV)*NCCI+(1-PCNCSV1)*(1-PCNC4)*NCBP$

244: $NCWS == PCNCWS*NCEXP$

245: $NCPI = PC12N*PC12RN*PCNC1*ANCSA+PC12RN*PCNC2*NCRP+PC12RN*PCNC3*RORNC*NCCAP(-1)+PC12RN*PCNC4*NCBP$

246: $PIRADJ*100/PDRPI = C103A+C103B*EMCNX1+C103C*EM97$

247: $PI = PI8-PIRADJ$

248: $PI3 = PI-PI/WS98*WRCNP*EMCNX1/1000$

249: $R.PI == PI*100./PDRPI$

250: $P.PI == PI*1000./POP$

251: $PR.PI3 = PI3*100/PDRPI*1000/(POP-EMCNX1)$

252: $PR.PI = R.PI*1000./POP$

253: $WEALTH = (PR.PI+PR.PI(-1)+PR.PI(-2)+PR.PI(-3))/4$

254: $DPI = PI-RTPIF-RTISCP-DPIRES+RTISXX$

255: $DPI8 = DPI+PIRADJ$

256: $R.DPI = 100.*DPI/PDRPI$

257: $PR.DPI == R.DPI*1000/POP$

258: $R.DPI8N = DPI8*100/PDRPI-R.DPI8X$

259: $R.DPI8X = DPI8/PI8*WRCNP*EMCNX1/10/PDRPI$

Sectoral Activity

260: $EMCNRT = IF EMCNX1/4 LT EMCNX1(-1) THEN 0 ELSE EMCNX1/(EM98-EMCNX1)$

261: $PIPE == IF EMCNX1-EMCNX1(-1) GT 5 THEN 1 ELSE 0$

262: $XXCN8 = C54A+C54B*R.DPI8N+C54C*R.DPI8X+C54D*R.DPI8X(-1)+C54E*D64.65$

263: $XXCN1 = XXCN8+XXVACAP$

264: $LOG(EMCN1) = C56A+C56B*LOG(XXCN1)$

265: $EMCNX = EMCNX1+EMCNX2$

266: $EMCN = EMCN1+EMCNX$

267: $XXCN = EMCN/EMCN1*XXCN1$

268: $LOG(WRCNNP/PDRPI) = C59A+C59F*D.80DEC6+C59B*LOG(WEUS/PDUSCPI)+C59C*LOG(1+EMCNRT)+C59D*LOG(1+EMCNRT(-1))+C59E*LOG(1+EMCNRT(-2))$

269: $WRCNP = WRCNNP*PIPADJ$

270: $WSCN = (EMCN1+EMCNX2)*WRCNNP/1000+EMCNX1*WRCNP/1000$

271: $WRCN = WSCN/EMCN*1000$

272: $WSCNP = EMCNX1*WRCNP/1000$

273: $LOG(XXP9) = C52A+C52B*LOG(EMP9)$

274: $LOG(WRP9/PDRPI) = C53A+C53F*D.80DEC6+C53D*D61.76+C53B*LOG(WEUS/PDUSCPI)+C53C*LOG(1+EMCNRT)$

275: $WSP9 == EMP9*WRP9/1000$

276: $EMMO = C60A+C60B*R.DPI8N+C60C*D61.77$

277: $EMM91 = EMMO+EMMX2$

278: $LOG(XXM91) = C61A+C61B*LOG(EMM91)$

279: $XXM9 == XXM91+XXMX2$

280: $EMMX == EMMX1+EMMX2$

281: $EMM9 = EMMO+EMMX$

282: $\text{LOG}(\text{WRM91}/\text{PDRPI}) = \text{C62A} + \text{C62F} * \text{D.80DEC6} + \text{C62B} * \text{LOG}(\text{WEUS}/\text{PDUS CPI}) + \text{C62C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C62D} * \text{LOG}(1 + \text{EMCNRT}(-1))$

283: $\text{WRM9P} == \text{WRM91} * \text{PADJ}$

284: $\text{WSM9} == (\text{EMMO} + \text{EMMX2}) * \text{WRM91}/1000 + \text{EMMX1} * \text{WRM9P}/1000$

285: $\text{WSM9P} == \text{EMMX1} * \text{WRM9P}/1000$

286: $\text{WRM9} == \text{WSM9}/\text{EMM9} * 1000$

287: $\text{XXTNT} = \text{C64A} + \text{C64B} * \text{R.DPI8X} + \text{C64D} * \text{R.DPI8X} * \text{R.DPI8X}(-1) + \text{C64C} * \text{R.DPI8N} + \text{C64E} * \text{D71.73}$

288: $\text{LOG}(\text{EMTNT}) = \text{C65A} + \text{C65B} * \text{LOG}(\text{XXTNT})$

289: $\text{EMTTour} = \text{PTOURT} * \text{EMTOUR}$

290: $\text{EMT91} = \text{EMTNT} + \text{EMTTour}$

291: $\text{EMT9} = \text{EMT91} + \text{EMT9X}$

292: $\text{XXT9} = \text{XXTNT} * (\text{EMT9}/\text{EMTNT})$

293: $\text{LOG}(\text{WRT9}/\text{PDRPI}) = \text{C66A} + \text{C66F} * \text{D.80DEC6} + \text{C66D} * \text{D61.76} + \text{C66B} * \text{LOG}(\text{WEUS}/\text{PDUS CPI}) + \text{C66C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C66E} * \text{LOG}(1 + \text{EMCNRT}(-1))$

294: $\text{WST9} == \text{EMT9} * \text{WRT9}/1000.$

295: $\text{XXCM} = \text{C68A} + \text{C68B} * \text{R.DPI8N}(-1) + \text{C68C} * \text{D61.74} + \text{C68D} * \text{WEALTH}(-1) * \text{POP}(-1)$

296: $\text{LOG}(\text{EMCM}) = \text{C69A} + \text{C69B} * \text{LOG}(\text{XXCM})$

297: $\text{LOG}(\text{WRCM}/\text{PDRPI}) = \text{C70A} + \text{C70F} * \text{D.80DEC6} + \text{C70B} * \text{LOG}(\text{WEUS}/\text{PDUS CPI}) + \text{C70C} * \text{LOG}(1 + \text{EMCNRT}(-2)) + \text{C70D} * \text{LOG}(1 + \text{EMCNRT}(-1))$

298: $\text{WSCM} == \text{EMCM} * \text{WRCM}/1000.$

299: $\text{XXPU} = \text{C72A} + \text{C72B} * \text{R.DPI8N}(-1) + \text{C72C} * \text{R.DPI8X} + \text{C72D} * \text{R.DPI8N}(-2)$

300: $\text{LOG}(\text{EMPU}) = \text{C73A} + \text{C73C} * \text{PIPE}(-1) + \text{C73B} * \text{LOG}(\text{XXPU})$

301: $\text{LOG}(\text{WRPU}/\text{PDRPI}) = \text{C74A} + \text{C74F} * \text{D.80DEC6} + \text{C74B} * \text{LOG}(\text{WEUS}/\text{PDUS CPI}) + \text{C74C} * \text{LOG}(1 + \text{EMCNRT}(-2)) + \text{C74D} * \text{LOG}(1 + \text{EMCNRT}(-1))$

302: $\text{WSPU} == \text{EMPU} * \text{WRPU}/1000.$

303: $\text{XXDW} = \text{C71A} + \text{C71B} * \text{R.DPI8N} + \text{C71C} * \text{R.DPI8X} + \text{C71D} * \text{R.DPI8X}(-1) * \text{R.DPI8X} + \text{C71E} * \text{WEALTH}(-1) * \text{POP}(-1)$

304: $\text{XXDRNT} = \text{C76A} + \text{C76B} * \text{R.DPI8N} + \text{C76C} * \text{R.DPI8X} + \text{C76D} * \text{R.DPI8N}(-1) + \text{C76E} * \text{R.DPI8X}(-1)$

305: $\text{LOG}(\text{EMDW}) = \text{C77A} + \text{C77B} * \text{LOG}(\text{XXDW})$

306: $\text{LOG}(\text{EMDRNT}) = \text{C75A} + \text{C75B} * \text{LOG}(\text{XXDRNT})$

307: $\text{EMDR} = \text{EMDRNT} + \text{EMDTOUR}$

308: $\text{LOG}(\text{WRDW}/\text{PDRPI}) = \text{C78A} + \text{C78F} * \text{D.80DEC6} + \text{C78B} * \text{LOG}(\text{WEUS}/\text{PDUSCPI}) +$
 $\text{C78C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C78D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C78E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

309: $\text{LOG}(\text{WRDR}/\text{PDRPI}) = \text{C79A} + \text{C79F} * \text{D.80DEC6} + \text{C79B} * \text{LOG}(\text{WEUS}/\text{PDUSCPI}) +$
 $(+\text{C79D}) * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C79E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

310: $\text{EMDTOUR} = \text{PTOURD} * \text{EMTOUR}$

311: $\text{EMD9} = \text{EMDRNT} + \text{EMDW} + \text{EMDTOUR}$

312: $\text{WSD9} == (\text{EMDRNT} + \text{EMDTOUR}) * \text{WRDR}/1000 + \text{EMDW} * \text{WRDW}/1000$

313: $\text{WRD9} = \text{WSD9}/\text{EMD9} * 1000$

314: $\text{XXD9} = (\text{XXDW} + \text{XXDRNT}) / (\text{EMDW} + \text{EMDRNT}) * \text{EMD9}$

315: $\text{XXDR} = \text{XXD9} - \text{XXDW}$

316: $\text{XXFI} = \text{C80A} + \text{C80C} * \text{D71.73} + \text{C80B} * \text{WEALTH}(-1) * \text{POP}(-1)$

317: $\text{LOG}(\text{EMFI}) = \text{C81A} + \text{C81B} * \text{LOG}(\text{XXFI})$

318: $\text{LOG}(\text{WRFI}/\text{PDRPI}) = \text{C82A} + \text{C82F} * \text{D.80DEC6} + \text{C82B} * \text{LOG}(\text{WEUS}/\text{PDUSCPI}) +$
 $\text{C82D} * \text{LOG}(1 + \text{EMCNRT}) + \text{C82C} * \text{LOG}(1 + \text{EMCNRT}(-1))$

319: $\text{WSFI} == \text{EMFI} * \text{WRFI}/1000.$

320: $\text{XXS8NT} = \text{C84A} + \text{C84B} * \text{R.DPI8N} + \text{C84C} * \text{R.DPI8X}(-1) + \text{C84D} * \text{WEALTH}(-1) * \text{POP}(-1)$

321: $\text{XXSB} = \text{C83A} + (+\text{C83C}) * \text{R.DPI8X} + \text{C83D} * \text{R.DPI8X}(-1) + \text{C83E} * \text{WEALTH}(-1) * \text{POP}(-1)$

322: $\text{LOG}(\text{EMS8NT}) = \text{C85A} + \text{C85B} * \text{LOG}(\text{XXS8NT})$

323: $\text{LOG}(\text{EMS8B}) = \text{C87A} + \text{C87B} * \text{LOG}(\text{XXSB})$

324: $\text{LOG}(\text{WRSNB}/\text{PDRPI}) = \text{C86A} + \text{C86F} * \text{D.80DEC6} + \text{C86B} * \text{LOG}(\text{WEUS}/\text{PDUSCPI}) +$
 $\text{C86C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C86D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C86E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

325: $\text{LOG}(\text{WRSB}/\text{PDRPI}) = \text{C88A} + \text{C88F} * \text{D.80DEC6} + \text{C88E} * \text{D61.70} + \text{C88B} * \text{LOG}(\text{WEUS}/\text{PDUSCPI}) +$
 $\text{C88C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C88D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C88G} * \text{LOG}(1 + \text{EMCNRT}(-2))$

326: $EMSTOUR = PTOURS * EMTOUR$

327: $EMS91 = EMSB + EMS8NT + EMSTOUR$

328: $WSS91 == (EMS8NT + EMSTOUR) * WRSNB / 1000 + EMSB * WRSB / 1000$

329: $WSS9 == WSS91 + NCWS$

330: $EMS9 = EMS91 + NCWS / (WRS9 * 1000)$

331: $WRS9 = WSS91 / EMS91 * 1000$

332: $XXS9 = (XXS8NT + XXSB) / (EMS8NT + EMSB) * EMS9$

333: $EMGF = EMGM + EMGC$

334: $LOG(XXGF) = C101A + C101B * LOG(EMGF)$

335: $LOG(WRGC / PDRPI) = C89A + LOG(WEUS / PDUSCPI)$

336: $WRGM = WRGC * PCIVPY$

337: $WSGC = WRGC * EMGC / 1000$

338: $WSGM = WRGM * EMGM / 1000$

339: $WSGF == WSGC + WSGM$

340: $WRGF = WSGF / EMGF * 1000$

341: $LOG(WRGS / PDRPI) = IF C92A + C92F * D.80DEC6 + C92B * LOG(WEUS / PDUSCPI) +$
 $C92C * D61.73 \text{ LT } LOG(WRGS(-1) / PDRPI(-1)) \text{ THEN}$
 $LOG(WRGS(-1) / PDRPI(-1)) \text{ ELSE } C92A + C92F * D.80DEC6 + C92B *$
 $LOG(WEUS / PDUSCPI) + C92C * D61.73$

342: $EMGS = WSGS / WRGS * 1000$

343: $LOG(WRGL / PDRPI) = IF C102A + C102F * D.80DEC6 + C102D * D61.69 + C102C *$
 $LOG(1 + EMCNRT) + C102B * LOG(WEUS / PDUSCPI) \text{ LT } LOG(WRGL(-1) / PDRPI(-1))$
 $\text{ THEN } LOG(WRGL(-1) / PDRPI(-1)) \text{ ELSE } C102A + C102F * D.80DEC6 + C102D *$
 $D61.69 + C102C * LOG(1 + EMCNRT) + C102B * LOG(WEUS / PDUSCPI)$

344: $EMGL = WSGL / WRGL * 1000$

345: $EMGA = EMGS + EMGL$

346: $WSGA = WSGS + WSGL$

347: $WRGA = WSGA / EMGA * 1000$

348: $LOG(XXGA) = C104A + C104B * LOG(EMGA)$

349: $EMA9 = EMAFISH + EMAGRI + PC39A * D77.00 + PC39B * EMMX2$

350: $XXA9 = C90A + C90B * (EMA9 + EMPROFIS)$

351: $LOG(WRA9/PDRPI) = C95A + C95F * D.80DEC6 + C95B * LOG(WEUS/PDUSCPI) + C95C * LOG(1 + EMCNRT) + C95D * LOG(1 + EMCNRT(-1))$

352: $WSA9 == EMA9 * WRA9 / 1000.$

353: $EM98 = EMP9 + EMCN + EMM9 + EMT9 + EMCM + EMPU + EMD9 + EMFI + EMS9 + EMGF + EMGA + EMA9$

354: $EM97 = EM98 - EMGM$

355: $WS98 = (WRP9 * EMP9 + WRCN * EMCN + WRM9 * EMM9 + WRT9 * EMT9 + WRCM * EMCM + WRP9 * EMPU + WRD9 * EMD9 + WRFI * EMFI + WRS9 * EMS9 + WRGF * EMGF + WRGA * EMGA + WRA9 * EMA9) / 1000.$

356: $WS97 = WS98 - WSGM$

357: $WR98 = WS98 * 1000 / EM98$

358: $WR97 == WS97 * 1000 / EM97$

359: $LOG(EMPRO1) = C100A + C100C * D61.66 + C100B * LOG(EM98)$

360: $EMPROFIS = PFISH1 * EMFISH$

361: $EMAFISH = (1 - PFISH1) * EMFISH$

362: $EMPRO = EMPRO1 + EMPROFIS$

363: $EM99 == EM98 + EMPRO$

364: $EM96 = EM99 - EMGM$

365: $EMX = EMCNX + EMP9$

366: $EMOCSX == EMP9 + EMT9X + EMCNX1 + EMCNX2 + EMMX1$

367: $EMCU == EMCM + EMPU$

368: $WRCU == (WSCM + WSPU) / EMCU * 1000$

369: $EMNC == EMS9 - EMS91$

370: $EMTCU = EMT9 + EMCM + EMPU$

371: $EMSUP = EMD9 + EMFI + EMS9$

372: $EMSP = EMTCU + EMSUP$

373: $EMG9 == EMGF + EMGA$

374: $EMNR == EM99 - EMSP - EMG9 - EMCN - EMP9$

375: $EMNS == EM99 - EMSP - EMG9$

376: $LOG(EMTOUR) = PTOURB + PTOURE * LOG(TOURIST)$

377: $XX98 = XXP9 + XXCN + XXM9 + XXT9 + XXCM + XXPU + XXD9 + XXFI + XXS9 +$
 $XXGF + XXGA + XXA9$

Population Module

Civilian Non-Native Population

378: $CM2 == G2 * SM2 * CNNPM2(-1) + (1 - G1) * CNNPM1(-1) * SM1$

379: $CF2 == G2 * SF2 * CNNPF2(-1) + (1 - G1) * CNNPF1(-1) * SF1$

380: $CM3 == G3 * SM3 * CNNPM3(-1) + (1 - G2) * CNNPM2(-1) * SM2$

381: $CF3 == G3 * SF3 * CNNPF3(-1) + (1 - G2) * CNNPF2(-1) * SF2$

382: $CM4 == G4 * SM4 * CNNPM4(-1) + (1 - G3) * CNNPM3(-1) * SM3$

383: $CF4 == G4 * SF4 * CNNPF4(-1) + (1 - G3) * CNNPF3(-1) * SF3$

384: $CM5 == G5 * SM5 * CNNPM5(-1) + (1 - G4) * CNNPM4(-1) * SM4$

385: $CF5 == G5 * SF5 * CNNPF5(-1) + (1 - G4) * CNNPF4(-1) * SF4$

386: $CM6 == G6 * SM6 * CNNPM6(-1) + (1 - G5) * CNNPM5(-1) * SM5$

387: $CF6 == G6 * SF6 * CNNPF6(-1) + (1 - G5) * CNNPF5(-1) * SF5$

388: $CM7 == G7 * SM7 * CNNPM7(-1) + (1 - G6) * CNNPM6(-1) * SM6$

389: $CF7 == G7 * SF7 * CNNPF7(-1) + (1 - G6) * CNNPF6(-1) * SF6$

390: $CM8 == G8 * SM8 * CNNPM8(-1) + (1 - G7) * CNNPM7(-1) * SM7$

391: $CF8 == G8 * SF8 * CNNPF8(-1) + (1 - G7) * CNNPF7(-1) * SF7$

392: $CM9 == G9 * SM9 * CNNPM9(-1) + (1 - G8) * CNNPM8(-1) * SM8$

393: $CF9 == G9 * SF9 * CNNPF9(-1) + (1 - G8) * CNNPF8(-1) * SF8$

394: $CM10 == G10 * SM10 * CNNPM10(-1) + (1 - G9) * CNNPM9(-1) * SM9$

395: $CF10 == G10 * SF10 * CNNPF10(-1) + (1 - G9) * CNNPF9(-1) * SF9$

396: $CM11 == G11*SM11*CNNPM11(-1)+(1-G10)*CNNPM10(-1)*SM10$

397: $CF11 == G11*SF11*CNNPF11(-1)+(1-G10)*CNNPF10(-1)*SF10$

398: $CM12 == G12*SM12*CNNPM12(-1)+(1-G11)*CNNPM11(-1)*SM11$

399: $CF12 == G12*SF12*CNNPF12(-1)+(1-G11)*CNNPF11(-1)*SF11$

400: $CM13 == G13*SM13*CNNPM13(-1)+(1-G12)*CNNPM12(-1)*SM12$

401: $CF13 == G13*SF13*CNNPF13(-1)+(1-G12)*CNNPF12(-1)*SF12$

402: $CM14 == G14*SM14*CNNPM14(-1)+(1-G13)*CNNPM13(-1)*SM13$

403: $CF14 == G14*SF14*CNNPF14(-1)+(1-G13)*CNNPF13(-1)*SF13$

404: $CM15 == G15*SM15*CNNPM15(-1)+(1-G14)*CNNPM14(-1)*SM14$

405: $CF15 == G15*SF15*CNNPF15(-1)+(1-G14)*CNNPF14(-1)*SF14$

406: $BTHTOT == CF4*FERT4+CF5*FERT5+CF6*FERT6+CF7*FERT7+CF8*FERT8+CF9*FERT9+CF10*FERT10+CF11*FERT11-BADD$

407: $CM1 == SEXDIV*BTHTOT*SURINFM$

408: $CF1 == (1-SEXDIV)*BTHTOT*SURINFF$

409: $DTHINF == BTHTOT-CM1-CF1$

410: $DTHTOT == DTHINF+CM15(-1)*(1-SM15)+CF15(-1)*(1-SF15)+CM14(-1)*(1-SM14)+CF14(-1)*(1-SF14)+CM13(-1)*(1-SM13)+CF13(-1)*(1-SF13)+CM12(-1)*(1-SM12)+CF12(-1)*(1-SF12)+CM11(-1)*(1-SM11)+CF11(-1)*(1-SF11)+CM10(-1)*(1-SM10)+CF10(-1)*(1-SF10)+CM9(-1)*(1-SM9)+CF9(-1)*(1-SF9)+CM8(-1)*(1-SM8)+CF8(-1)*(1-SF8)+CM7(-1)*(1-SM7)+CF7(-1)*(1-SF7)+CM6(-1)*(1-SM6)+CF6(-1)*(1-SF6)+CM5(-1)*(1-SM5)+CF5(-1)*(1-SF5)+CM4(-1)*(1-SM4)+CF4(-1)*(1-SF4)+CM3(-1)*(1-SM3)+CF3(-1)*(1-SF3)+CM2(-1)*(1-SM2)+CF2(-1)*(1-SF2)+CM1(-1)*(1-SM1)+CF1(-1)*(1-SF1)$

411: $NATINC == BTHTOT-DTHTOT$

412: $CNNPM10 = CM10*(1+OEMM10)+MIGIN*MM10$

413: $CNNPF10 = CF10*(1+OEMF10)+MIGIN*MF10$

414: $CNNPM11 = CM11*(1+OEMM11)+MIGIN*MM11$

415: $CNNPF11 = CF11*(1+OEMF11)+MIGIN*MF11$

416: $CNNPM12 = CM12*(1+OEMM12)+MIGIN*MM12$

417: $CNNPF12 = CF12 * (1 + OEMF12) + MIGIN * MF12$
418: $CNNPM13 = CM13 * (1 + OEMM13) + MIGIN * MM13$
419: $CNNPF13 = CF13 * (1 + OEMF13) + MIGIN * MF13$
420: $CNNPM14 = CM14 * (1 + OEMM14) + MIGIN * MM14$
421: $CNNPF14 = CF14 * (1 + OEMF14) + MIGIN * MF14$
422: $CNNPM15 = CM15 * (1 + OEMM15) + MIGIN * MM15$
423: $CNNPF15 = CF15 * (1 + OEMF15) + MIGIN * MF15$
424: $CNNPM1 = CM1 * (1 + OEMM1) + MIGIN * MM1$
425: $CNNPF1 = CF1 * (1 + OEMF1) + MIGIN * MF1$
426: $CNNPM2 = CM2 * (1 + OEMM2) + MIGIN * MM2$
427: $CNNPF2 = CF2 * (1 + OEMF2) + MIGIN * MF2$
428: $CNNPM3 = CM3 * (1 + OEMM3) + MIGIN * MM3$
429: $CNNPF3 = CF3 * (1 + OEMF3) + MIGIN * MF3$
430: $CNNPM4 = CM4 * (1 + OEMM4) + MIGIN * MM4$
431: $CNNPF4 = CF4 * (1 + OEMF4) + MIGIN * MF4$
432: $CNNPM5 = CM5 * (1 + OEMM5) + MIGIN * MM5$
433: $CNNPF5 = CF5 * (1 + OEMF5) + MIGIN * MF5$
434: $CNNPM6 = CM6 * (1 + OEMM6) + MIGIN * MM6$
435: $CNNPF6 = CF6 * (1 + OEMF6) + MIGIN * MF6$
436: $CNNPM7 = CM7 * (1 + OEMM7) + MIGIN * MM7$
437: $CNNPF7 = CF7 * (1 + OEMF7) + MIGIN * MF7$
438: $CNNPM8 = CM8 * (1 + OEMM8) + MIGIN * MM8$
439: $CNNPF8 = CF8 * (1 + OEMF8) + MIGIN * MF8$
440: $CNNPM9 = CM9 * (1 + OEMM9) + MIGIN * MM9$
441: $CNNPF9 = CF9 * (1 + OEMF9) + MIGIN * MF9$

442: $CNNTOT == CNNPM15 + CNNPF15 + CNNPM14 + CNNPF14 + CNNPM13 + CNNPF13 +$
 $CNNPM12 + CNNPF12 + CNNPM11 + CNNPF11 + CNNPM10 + CNNPF10 + CNNPM9 + CNNPF9 +$
 $CNNPM8 + CNNPF8 + CNNPM7 + CNNPF7 + CNNPM6 + CNNPF6 + CNNPM5 + CNNPF5 + CNNPM4 +$
 $CNNPF4 + CNNPM3 + CNNPF3 + CNNPM2 + CNNPF2 + CNNPM1 + CNNPF1$

Native Population

443: $NCM2 == G2 * NSM2 * NATPM2(-1) + (1 - G1) * NATPM1(-1) * NSM1$

444: $NCF2 == G2 * NSF2 * NATPF2(-1) + (1 - G1) * NATPF1(-1) * NSF1$

445: $NCM3 == G3 * NSM3 * NATPM3(-1) + (1 - G2) * NATPM2(-1) * NSM2$

446: $NCF3 == G3 * NSF3 * NATPF3(-1) + (1 - G2) * NATPF2(-1) * NSF2$

447: $NCM4 == G4 * NSM4 * NATPM4(-1) + (1 - G3) * NATPM3(-1) * NSM3$

448: $NCF4 == G4 * NSF4 * NATPF4(-1) + (1 - G3) * NATPF3(-1) * NSF3$

449: $NCM5 == G5 * NSM5 * NATPM5(-1) + (1 - G4) * NATPM4(-1) * NSM4$

450: $NCF5 == G5 * NSF5 * NATPF5(-1) + (1 - G4) * NATPF4(-1) * NSF4$

451: $NCM6 == G6 * NSM6 * NATPM6(-1) + (1 - G5) * NATPM5(-1) * NSM5$

452: $NCF6 == G6 * NSF6 * NATPF6(-1) + (1 - G5) * NATPF5(-1) * NSF5$

453: $NCM7 == G7 * NSM7 * NATPM7(-1) + (1 - G6) * NATPM6(-1) * NSM6$

454: $NCF7 == G7 * NSF7 * NATPF7(-1) + (1 - G6) * NATPF6(-1) * NSF6$

455: $NCM8 == G8 * NSM8 * NATPM8(-1) + (1 - G7) * NATPM7(-1) * NSM7$

456: $NCF8 == G8 * NSF8 * NATPF8(-1) + (1 - G7) * NATPF7(-1) * NSF7$

457: $NCM9 == G9 * NSM9 * NATPM9(-1) + (1 - G8) * NATPM8(-1) * NSM8$

458: $NCF9 == G9 * NSF9 * NATPF9(-1) + (1 - G8) * NATPF8(-1) * NSF8$

459: $NCM10 == G10 * NSM10 * NATPM10(-1) + (1 - G9) * NATPM9(-1) * NSM9$

460: $NCF10 == G10 * NSF10 * NATPF10(-1) + (1 - G9) * NATPF9(-1) * NSF9$

461: $NCM11 == G11 * NSM11 * NATPM11(-1) + (1 - G10) * NATPM10(-1) * NSM10$

462: $NCF11 == G11 * NSF11 * NATPF11(-1) + (1 - G10) * NATPF10(-1) * NSF10$

463: $NCM12 == G12 * NSM12 * NATPM12(-1) + (1 - G11) * NATPM11(-1) * NSM11$

464: $NCF12 == G12 * NSF12 * NATPF12(-1) + (1 - G11) * NATPF11(-1) * NSF11$

465: $NCM13 == G13 * NSM13 * NATPM13(-1) + (1 - G12) * NATPM12(-1) * NSM12$

466: $NCF13 == G13 * NSF13 * NATPF13(-1) + (1 - G12) * NATPF12(-1) * NSF12$

467: $NCM14 == G14 * NSM14 * NATPM14(-1) + (1 - G13) * NATPM13(-1) * NSM13$

468: $NCF14 == G14 * NSF14 * NATPF14(-1) + (1 - G13) * NATPF13(-1) * NSF13$

469: $NCM15 == G15 * NSM15 * NATPM15(-1) + (1 - G14) * NATPM14(-1) * NSM14$

470: $NCF15 == G15 * NSF15 * NATPF15(-1) + (1 - G14) * NATPF14(-1) * NSF14$

471: $NBHTOT == NCF4 * NFERT4 + NCF5 * NFERT5 + NCF6 * NFERT6 + NCF7 * NFERT7 +$
 $NCF8 * NFERT8 + NCF9 * NFERT9 + NCF10 * NFERT10 + NCF11 * NFERT11 + BADD$

472: $NCM1 == NSEXDIV * NBHTOT * NSURINF$

473: $NCF1 == (1 - NSEXDIV) * NBHTOT * NSURINF$

474: $NATPM1 = NCM1 * (1 + NMM1)$

475: $NATPF1 = NCF1 * (1 + NMF1)$

476: $NATPM2 = NCM2 * (1 + NMM2)$

477: $NATPF2 = NCF2 * (1 + NMF2)$

478: $NATPM3 = NCM3 * (1 + NMM3)$

479: $NATPF3 = NCF3 * (1 + NMF3)$

480: $NATPM4 = NCM4 * (1 + NMM4)$

481: $NATPF4 = NCF4 * (1 + NMF4)$

482: $NATPM5 = NCM5 * (1 + NMM5)$

483: $NATPF5 = NCF5 * (1 + NMF5)$

484: $NATPM6 = NCM6 * (1 + NMM6)$

485: $NATPF6 = NCF6 * (1 + NMF6)$

486: $NATPM7 = NCM7 * (1 + NMM7)$

487: $NATPF7 = NCF7 * (1 + NMF7)$

488: $NATPM8 = NCM8 * (1 + NMM8)$

489: $NATPF8 = NCF8 * (1 + NMF8)$

490: $\text{NATPM9} = \text{NCM9} * (1 + \text{NMM9})$

491: $\text{NATPF9} = \text{NCF9} * (1 + \text{NMF9})$

492: $\text{NATPM10} = \text{NCM10} * (1 + \text{NMM10})$

493: $\text{NATPF10} = \text{NCF10} * (1 + \text{NMF10})$

494: $\text{NATPM11} = \text{NCM11} * (1 + \text{NMM11})$

495: $\text{NATPF11} = \text{NCF11} * (1 + \text{NMF11})$

496: $\text{NATPM12} = \text{NCM12} * (1 + \text{NMM12})$

497: $\text{NATPF12} = \text{NCF12} * (1 + \text{NMF12})$

498: $\text{NATPM13} = \text{NCM13} * (1 + \text{NMM13})$

499: $\text{NATPF13} = \text{NCF13} * (1 + \text{NMF13})$

500: $\text{NATPM14} = \text{NCM14} * (1 + \text{NMM14})$

501: $\text{NATPF14} = \text{NCF14} * (1 + \text{NMF14})$

502: $\text{NATPM15} = \text{NCM15} * (1 + \text{NMM15})$

503: $\text{NATPF15} = \text{NCF15} * (1 + \text{NMF15})$

504: $\text{NDTHINF} == \text{NBTHTOT} - \text{NCM1} - \text{NCF1}$

505: $\text{NDTHTOT} == \text{NDTHINF} + \text{NCM15}(-1) * (1 - \text{NSM15}) + \text{NCF15}(-1) * (1 - \text{NSF15}) +$
 $\text{NCM14}(-1) * (1 - \text{NSM14}) + \text{NCF14}(-1) * (1 - \text{NSF14}) + \text{NCM13}(-1) * (1 - \text{NSM13}) +$
 $\text{NCF13}(-1) * (1 - \text{NSF13}) + \text{NCM12}(-1) * (1 - \text{NSM12}) + \text{NCF12}(-1) * (1 - \text{NSF12}) +$
 $\text{NCM11}(-1) * (1 - \text{NSM11}) + \text{NCF11}(-1) * (1 - \text{NSF11}) + \text{NCM10}(-1) * (1 - \text{NSM10}) +$
 $\text{NCF10}(-1) * (1 - \text{NSF10}) + \text{NCM9}(-1) * (1 - \text{NSM9}) + \text{NCF9}(-1) * (1 - \text{NSF9}) +$
 $\text{NCM8}(-1) * (1 - \text{NSM8}) + \text{NCF8}(-1) * (1 - \text{NSF8}) + \text{NCM7}(-1) * (1 - \text{NSM7}) + \text{NCF7}(-1) * (1 - \text{NSF7}) +$
 $\text{NCM6}(-1) * (1 - \text{NSM6}) + \text{NCF6}(-1) * (1 - \text{NSF6}) + \text{NCM5}(-1) * (1 - \text{NSM5}) +$
 $\text{NCF5}(-1) * (1 - \text{NSF5}) + \text{NCM4}(-1) * (1 - \text{NSM4}) + \text{NCF4}(-1) * (1 - \text{NSF4}) + \text{NCM3}(-1) * (1 - \text{NSM3}) +$
 $\text{NCF3}(-1) * (1 - \text{NSF3}) + \text{NCM2}(-1) * (1 - \text{NSM2}) + \text{NCF2}(-1) * (1 - \text{NSF2}) +$
 $\text{NCM1}(-1) * (1 - \text{NSM1}) + \text{NCF1}(-1) * (1 - \text{NSF1})$

506: $\text{NATTOT} == \text{NATPM15} + \text{NATPF15} + \text{NATPM14} + \text{NATPF14} + \text{NATPM13} + \text{NATPF13} +$
 $\text{NATPM12} + \text{NATPF12} + \text{NATPM11} + \text{NATPF11} + \text{NATPM10} + \text{NATPF10} + \text{NATPM9} + \text{NATPF9} +$
 $\text{NATPM8} + \text{NATPF8} + \text{NATPM7} + \text{NATPF7} + \text{NATPM6} + \text{NATPF6} + \text{NATPM5} + \text{NATPF5} + \text{NATPM4} +$
 $\text{NATPF4} + \text{NATPM3} + \text{NATPF3} + \text{NATPM2} + \text{NATPF2} + \text{NATPM1} + \text{NATPF1}$

507: $\text{POPNE} = \text{POPNE}(-1) * \text{NATTOT} / \text{NATTOT}(-1)$

508: $\text{NNATINC} == \text{NBTHTOT} - \text{NDTHTOT}$

509: $\text{MIGOUT} = \text{OEMM1} * \text{CM1} + \text{OEMM2} * \text{CM2} + \text{OEMM3} * \text{CM3} + \text{OEMM4} * \text{CM4} + \text{OEMM5} * \text{CM5} +$
 $\text{OEMM6} * \text{CM6} + \text{OEMM7} * \text{CM7} + \text{OEMM8} * \text{CM8} + \text{OEMM9} * \text{CM9} + \text{OEMM10} * \text{CM10} + \text{OEMM11} * \text{CM11} +$
 $\text{OEMM12} * \text{CM12} + \text{OEMM13} * \text{CM13} + \text{OEMM14} * \text{CM14} + \text{OEMM15} * \text{CM15} + \text{OEMF1} * \text{CF1} +$
 $\text{OEMF2} * \text{CF2} + \text{OEMF3} * \text{CF3} + \text{OEMF4} * \text{CF4} + \text{OEMF5} * \text{CF5} + \text{OEMF6} * \text{CF6} + \text{OEMF7} * \text{CF7} +$
 $\text{OEMF8} * \text{CF8} + \text{OEMF9} * \text{CF9} + \text{OEMF10} * \text{CF10} + \text{OEMF11} * \text{CF11} + \text{OEMF12} * \text{CF12} +$
 $\text{OEMF13} * \text{CF13} + \text{OEMF14} * \text{CF14} + \text{OEMF15} * \text{CF15} + \text{NMM1} * \text{NCM1} + \text{NMM2} * \text{NCM2} + \text{NMM3} * \text{NCM3} +$
 $\text{NMM4} * \text{NCM4} + \text{NMM5} * \text{NCM5} + \text{NMM6} * \text{NCM6} + \text{NMM7} * \text{NCM7} + \text{NMM8} * \text{NCM8} + \text{NMM9} * \text{NCM9} +$
 $\text{NMM10} * \text{NCM10} + \text{NMM11} * \text{NCM11} + \text{NMM12} * \text{NCM12} + \text{NMM13} * \text{NCM13} + \text{NMM14} * \text{NCM14} +$
 $\text{NMM15} * \text{NCM15} + \text{NMF1} * \text{NCF1} + \text{NMF2} * \text{NCF2} + \text{NMF3} * \text{NCF3} + \text{NMF4} * \text{NCF4} +$
 $\text{NMF5} * \text{NCF5} + \text{NMF6} * \text{NCF6} + \text{NMF7} * \text{NCF7} + \text{NMF8} * \text{NCF8} + \text{NMF9} * \text{NCF9} + \text{NMF10} * \text{NCF10} +$
 $\text{NMF11} * \text{NCF11} + \text{NMF12} * \text{NCF12} + \text{NMF13} * \text{NCF13} + \text{NMF14} * \text{NCF14} + \text{NMF15} * \text{NCF15}$

510: $\text{MIGIN} = \text{POPMIG} - \text{MIGOUT}$

511: $\text{POPM} = \text{EMGM} / \text{MILRAT}$

512: $\text{MILPCT} = \text{POPM} / \text{AFTOT}$

513: $\text{POP} = \text{CNNTOT} + \text{NATTOT} + \text{MILPCT} * (\text{AFTOT} + \text{MDTOT})$

514: $\text{POPC} = \text{POP} - \text{POPM}$

Military Population

515: $\text{POPM1} == \text{CNNPM1} + \text{MILPCT} * \text{MILM1} + \text{NATPM1}$

516: $\text{POPM2} == \text{CNNPM2} + \text{MILPCT} * \text{MILM2} + \text{NATPM2}$

517: $\text{POPM3} == \text{CNNPM3} + \text{MILPCT} * \text{MILM3} + \text{NATPM3}$

518: $\text{POPM4} == \text{CNNPM4} + \text{MILPCT} * \text{MILM4} + \text{NATPM4}$

519: $\text{POPM5} == \text{CNNPM5} + \text{MILPCT} * \text{MILM5} + \text{NATPM5}$

520: $\text{POPM6} == \text{CNNPM6} + \text{MILPCT} * \text{MILM6} + \text{NATPM6}$

521: $\text{POPM7} == \text{CNNPM7} + \text{MILPCT} * \text{MILM7} + \text{NATPM7}$

522: $\text{POPM8} == \text{CNNPM8} + \text{MILPCT} * \text{MILM8} + \text{NATPM8}$

523: $\text{POPM9} == \text{CNNPM9} + \text{MILPCT} * \text{MILM9} + \text{NATPM9}$

524: $\text{POPM10} == \text{CNNPM10} + \text{MILPCT} * \text{MILM10} + \text{NATPM10}$

525: $\text{POPM11} == \text{CNNPM11} + \text{MILPCT} * \text{MILM11} + \text{NATPM11}$

526: $\text{POPM12} == \text{CNNPM12} + \text{MILPCT} * \text{MILM12} + \text{NATPM12}$

527: $\text{POPM13} == \text{CNNPM13} + \text{MILPCT} * \text{MILM13} + \text{NATPM13}$

528: POPM14 == CNNPM14+MILPCT*MILM14+NATPM14
529: POPM15 == CNNPM15+MILPCT*MILM15+NATPM15
530: POPF1 == CNNPF1+MILPCT*MILF1+NATPF1
531: POPF2 == CNNPF2+MILPCT*MILF2+NATPF2
532: POPF3 == CNNPF3+MILPCT*MILF3+NATPF3
533: POPF4 == CNNPF4+MILPCT*MILF4+NATPF4
534: POPF5 == CNNPF5+MILPCT*MILF5+NATPF5
535: POPF6 == CNNPF6+MILPCT*MILF6+NATPF6
536: POPF7 == CNNPF7+MILPCT*MILF7+NATPF7
537: POPF8 == CNNPF8+MILPCT*MILF8+NATPF8
538: POPF9 == CNNPF9+MILPCT*MILF9+NATPF9
539: POPF10 == CNNPF10+MILPCT*MILF10+NATPF10
540: POPF11 == CNNPF11+MILPCT*MILF11+NATPF11
541: POPF12 == CNNPF12+MILPCT*MILF12+NATPF12
542: POPF13 == CNNPF13+MILPCT*MILF13+NATPF13
543: POPF14 == CNNPF14+MILPCT*MILF14+NATPF14
544: POPF15 == CNNPF15+MILPCT*MILF15+NATPF15
545: BTOT == BHTTOT+NBHTTOT
546: DTOT == DHTTOT+NDHTTOT
547: POPNI9 == BTOT-DTOT
548: NCBR == NBHTTOT/NATTOT*1000
549: NCDR == NDHTTOT/NATTOT*1000
550: CBR == BHTTOT/CNNTOT*1000
551: CDR == DHTTOT/CNNTOT*1000
552: BCRUDE == BTOT/(CNNTOT+NATTOT)*1000
553: DCRUDE == DTOT/(CNNTOT+NATTOT)*1000

554: $\text{POPSKUL} == \text{POPM3} + \text{POPM4} + \text{POPM5} + \text{POPF3} + \text{POPF4} + \text{POPF5}$

555: $\text{POPKIDS} == \text{POPSKUL} + \text{POPM1} + \text{POPM2} + \text{POPF1} + \text{POPF2} - \text{POPM5} - \text{POPF5}$

556: $\text{POPPER} = \text{POPM15} + \text{POPF15}$

557: $\text{POPADS} == \text{POP} - \text{POPKIDS} - \text{POPPER}$

558: $\text{POP.AD} == \text{POPADS} / \text{POP}$

559: $\text{POP.KID} == \text{POPKIDS} / \text{POP}$

560: $\text{POP.GER} == \text{POPPER} / \text{POP}$

561: $\text{POP.MIL} == \text{MILPCT} * (\text{AFTOT} + \text{MDTOT}) / \text{POP}$

562: $\text{POP.NAT} == \text{NATTOT} / \text{POP}$

563: $\text{POP.CIV} == \text{CNNTOT} / \text{POP}$

564: $\text{PLFDMC} == \text{CNNPM5} + \text{CNNPM6} + \text{CNNPM7} + \text{CNNPM8} + \text{CNNPM9} + \text{CNNPM10} +$
 $\text{CNNPM11} + \text{CNNPM12} + \text{CNNPM13} + \text{CNNPM14} + \text{CNNPF5} + \text{CNNPF6} + \text{CNNPF7} +$
 $\text{CNNPF8} + \text{CNNPF9} + \text{CNNPF10} + \text{CNNPF11} + \text{CNNPF12} + \text{CNNPF13} + \text{CNNPF14}$

565: $\text{PLFDMN} == \text{NATPM5} + \text{NATPM6} + \text{NATPM7} + \text{NATPM8} + \text{NATPM9} + \text{NATPM10} +$
 $\text{NATPM11} + \text{NATPM12} + \text{NATPM13} + \text{NATPM14} + \text{NATPF5} + \text{NATPF6} + \text{NATPF7}$
 $+ \text{NATPF8} + \text{NATPF9} + \text{NATPF10} + \text{NATPF11} + \text{NATPF12} + \text{NATPF13} + \text{NATPF14}$

566: $\text{PLFDOMM} == \text{MILPCT} * (\text{MILM5} + \text{MILM6} + \text{MILM7} + \text{MILM8} + \text{MILM9} + \text{MILM10} +$
 $\text{MILM11} + \text{MILM12} + \text{MILM13} + \text{MILM14} + \text{MILF5} + \text{MILF6} + \text{MILF7} + \text{MILF8} + \text{MILF9} +$
 $\text{MILF10} + \text{MILF11} + \text{MILF12} + \text{MILF13} + \text{MILF14} - \text{AFTOT})$

567: $\text{PLFD9} == \text{PLFDMC} + \text{PLFDMN} + \text{PLFDOMM}$

568: $\text{LF} == \text{LFPART} * \text{PLFD9}$

569: $\text{UNEMP} == \text{LF} - \text{EM96}$

570: $\text{U.AK.US} == \text{UNEMP} / \text{LF} / \text{UUS}$

571: $\text{DELEMP} == \text{EM96} - \text{EM96}(-1)$

572: $\text{WR.AK.US} == \text{LOG}(\text{R.WR97}) - \text{LOG}(\text{WEUS} * 100 / \text{PDUSCPI}) - (\text{LOG}(\text{R.WR97}(-1)) -$
 $\text{LOG}(\text{WEUS}(-1) * 100 / \text{PDUSCPI}(-1)))$

573: $\text{POPMIG} = \text{CMIG1} + \text{CMIG2} * 1 / \text{U.AK.US}(-1) + \text{CMIG3} * \text{WR.AK.US}(-1) +$
 $\text{CMIG4} * \text{DELEMP}$

Household Module

574: CHHM4 == IF YR LT 1980 THEN 1 ELSE CNNPM4*(1-CPGQM4)*
(HHRM4+RCM4/TP*(YR-1980))

575: NHHM4 == IF YR LT 1980 THEN 1 ELSE NATPM4*(1-NPGQM4)*
(NHHRM4+NRCM4/NTP*(YR-1980))

576: HHM4 == CHHM4+NHHM4

577: CHHM5 == IF YR LT 1980 THEN 1 ELSE CNNPM5*(1-CPGQM5)*
(HHRM5+RCM5/TP*(YR-1980))

578: NHHM5 == IF YR LT 1980 THEN 1 ELSE NATPM5*(1-NPGQM5)*
(NHHRM5+NRCM5/NTP*(YR-1980))

579: HHM5 == CHHM5+NHHM5+MHHM5*MILPCT

580: CHHM6 == IF YR LT 1980 THEN 1 ELSE CNNPM6*(1-CPGQM6)*
(HHRM6+RCM6/TP*(YR-1980))

581: NHHM6 == IF YR LT 1980 THEN 1 ELSE NATPM6*(1-NPGQM6)*
(NHHRM6+NRCM6/NTP*(YR-1980))

582: HHM6 == CHHM6+NHHM6+MHHM6*MILPCT

583: CHHM7 == IF YR LT 1980 THEN 1 ELSE CNNPM7*(1-CPGQM7)*
(HHRM7+RCM7/TP*(YR-1980))

584: NHHM7 == IF YR LT 1980 THEN 1 ELSE NATPM7*(1-NPGQM7)*
(NHHRM7+NRCM7/NTP*(YR-1980))

585: HHM7 == CHHM7+NHHM7+MHHM7*MILPCT

586: CHHM8 == IF YR LT 1980 THEN 1 ELSE CNNPM8*(1-CPGQM8)*
(HHRM8+RCM8/TP*(YR-1980))

587: NHHM8 == IF YR LT 1980 THEN 1 ELSE NATPM8*(1-NPGQM8)*
(NHHRM8+NRCM8/NTP*(YR-1980))

588: HHM8 == CHHM8+NHHM8+MHHM8*MILPCT

589: CHHM9 == IF YR LT 1980 THEN 1 ELSE CNNPM9*(1-CPGQM9)*
(HHRM9+RCM9/TP*(YR-1980))

590: NHHM9 == IF YR LT 1980 THEN 1 ELSE NATPM9*(1-NPGQM9)*
(NHHRM9+NRCM9/NTP*(YR-1980))

591: HHM9 == CHHM9+NHHM9+MHHM9*MILPCT

592: CHHM10 == IF YR LT 1980 THEN 1 ELSE CNNPM10*(1-CPGQM10)*
(HHRM10+RCM10/TP*(YR-1980))

593: NHHM10 == IF YR LT 1980 THEN 1 ELSE NATPM10*(1-NPGQM10)*
(NHHRM10+NRCM10/NTP*(YR-1980))

594: HHM10 == CHHM10+NHHM10+MHHM10*MILPCT

595: CHHM11 == IF YR LT 1980 THEN 1 ELSE CNNPM11*(1-CPGQM11)*
(HHRM11+RCM11/TP*(YR-1980))

596: NHHM11 == IF YR LT 1980 THEN 1 ELSE NATPM11*(1-NPGQM11)*
(NHHRM11+NRCM11/NTP*(YR-1980))

597: HHM11 == CHHM11+NHHM11+MHHM11*MILPCT

598: CHHM12 == IF YR LT 1980 THEN 1 ELSE CNNPM12*(1-CPGQM12)*
(HHRM12+RCM12/TP*(YR-1980))

599: NHHM12 == IF YR LT 1980 THEN 1 ELSE NATPM12*(1-NPGQM12)*
(NHHRM12+NRCM12/NTP*(YR-1980))

600: HHM12 == CHHM12+NHHM12+MHHM12*MILPCT

601: CHHM13 == IF YR LT 1980 THEN 1 ELSE CNNPM13*(1-CPGQM13)*
(HHRM13+RCM13/TP*(YR-1980))

602: NHHM13 == IF YR LT 1980 THEN 1 ELSE NATPM13*(1-NPGQM13)*
(NHHRM13+NRCM13/NTP*(YR-1980))

603: HHM13 == CHHM13+NHHM13+MHHM13*MILPCT

604: CHHM14 == IF YR LT 1980 THEN 1 ELSE CNNPM14*(1-CPGQM14)*
(HHRM14+RCM14/TP*(YR-1980))

605: NHHM14 == IF YR LT 1980 THEN 1 ELSE NATPM14*(1-NPGQM14)*
(NHHRM14+NRCM14/NTP*(YR-1980))

606: HHM14 == CHHM14+NHHM14+MHHM14*MILPCT

607: CHHM15 == IF YR LT 1980 THEN 1 ELSE CNNPM15*(1-CPGQM15)*
(HHRM15+RCM15/TP*(YR-1980))

608: NHHM15 == IF YR LT 1980 THEN 1 ELSE NATPM15*(1-NPGQM15)*
(NHHRM15+NRCM15/NTP*(YR-1980))

609: HHM15 == CHHM15+NHHM15+MHHM15*MILPCT

610: CHHF4 == IF YR LT 1980 THEN 1 ELSE CNNPF4*(1-CPGQF4)*
(HHRF4+RCF4/TP*(YR-1980))

611: NHHF4 == IF YR LT 1980 THEN 1 ELSE NATPF4*(1-NPGQF4)*
(NHHRF4+NRCF4/NTP*(YR-1980))

612: HHF4 == CHHF4+NHHF4

613: CHHF5 == IF YR LT 1980 THEN 1 ELSE CNNPF5*(1-CPGQF5)*
(HHRF5+RCF5/TP*(YR-1980))

614: NHHF5 == IF YR LT 1980 THEN 1 ELSE NATPF5*(1-NPGQF5)*
(NHHRF5+NRCF5/NTP*(YR-1980))

615: HHF5 == CHHF5+NHHF5+MHHF5*MILPCT

616: CHHF6 == IF YR LT 1980 THEN 1 ELSE CNNPF6*(1-CPGQF6)*
(HHRF6+RCF6/TP*(YR-1980))

617: NHHF6 == IF YR LT 1980 THEN 1 ELSE NATPF6*(1-NPGQF6)*
(NHHRF6+NRCF6/NTP*(YR-1980))

618: HHF6 == CHHF6+NHHF6+MHHF6*MILPCT

619: CHHF7 == IF YR LT 1980 THEN 1 ELSE CNNPF7*(1-CPGQF7)*
(HHRF7+RCF7/TP*(YR-1980))

620: NHHF7 == IF YR LT 1980 THEN 1 ELSE
NATPF7*(1-NPGQF7)*(NHHRF7+NRCF7/NTP*(YR-1980))

621: HHF7 == CHHF7+NHHF7+MHHF7*MILPCT

622: CHHF8 == IF YR LT 1980 THEN 1 ELSE CNNPF8*(1-CPGQF8)*
(HHRF8+RCF8/TP*(YR-1980))

623: NHHF8 == IF YR LT 1980 THEN 1 ELSE NATPF8*(1-NPGQF8)*
(NHHRF8+NRCF8/NTP*(YR-1980))

624: HHF8 == CHHF8+NHHF8+MHHF8*MILPCT

625: CHHF9 == IF YR LT 1980 THEN 1 ELSE CNNPF9*(1-CPGQF9)*
(HHRF9+RCF9/TP*(YR-1980))

626: NHHF9 == IF YR LT 1980 THEN 1 ELSE NATPF9*(1-NPGQF9)*
(NHHRF9+NRCF9/NTP*(YR-1980))

627: HHF9 == CHHF9+NHHF9+MHHF9*MILPCT

628: CHHF10 == IF YR LT 1980 THEN 1 ELSE CNNPF10*(1-CPGQF10)*
(HHRF10+RCF10/TP*(YR-1980))

629: NHHF10 == IF YR LT 1980 THEN 1 ELSE NATPF10*(1-NPGQF10)*
(NHHRF10+NRCF10/NTP*(YR-1980))

630: HHF10 == CHHF10+NHHF10+MHHF10*MILPCT

631: CHHF11 == IF YR LT 1980 THEN 1 ELSE CNNPF11*(1-CPGQF11)*
(HHRF11+RCF11/TP*(YR-1980))

632: NHHF11 == IF YR LT 1980 THEN 1 ELSE NATPF11*(1-NPGQF11)*
(NHHRF11+NRCF11/NTP*(YR-1980))

633: HHF11 == CHHF11+NHHF11+MHHF11*MILPCT

634: CHHF12 == IF YR LT 1980 THEN 1 ELSE CNNPF12*(1-CPGQF12)*
(HHRF12+RCF12/TP*(YR-1980))

635: NHHF12 == IF YR LT 1980 THEN 1 ELSE NATPF12*(1-NPGQF12)*
(NHHRF12+NRCF12/NTP*(YR-1980))

636: HHF12 == CHHF12+NHHF12+MHHF12*MILPCT

637: CHHF13 == IF YR LT 1980 THEN 1 ELSE CNNPF13*(1-CPGQF13)*
(HHRF13+RCF13/TP*(YR-1980))

638: NHHF13 == IF YR LT 1980 THEN 1 ELSE NATPF13*(1-NPGQF13)*
(NHHRF13+NRCF13/NTP*(YR-1980))

639: HHF13 == CHHF13+NHHF13+MHHF13*MILPCT

640: CHHF14 == IF YR LT 1980 THEN 1 ELSE CNNPF14*(1-CPGQF14)*
(HHRF14+RCF14/TP*(YR-1980))

641: NHHF14 == IF YR LT 1980 THEN 1 ELSE NATPF14*(1-NPGQF14)*
(NHHRF14+NRCF14/NTP*(YR-1980))

642: HHF14 == CHHF14+NHHF14+MHHF14*MILPCT

643: CHHF15 == IF YR LT 1980 THEN 1 ELSE CNNPF15*(1-CPGQF15)*
(HHRF15+RCF15/TP*(YR-1980))

644: NHHF15 == IF YR LT 1980 THEN 1 ELSE NATPF15*(1-NPGQF15)*
(NHHRF15+NRCF15/NTP*(YR-1980))

645: HHF15 == CHHF15+NHHF15+MHHF15*MILPCT

646: HH == HHM4+HHM5+HHM6+HHM7+HHM8+HHM9+HHM10+HHM11+HHM12+HHM13+
HHM14+HHM15+HHF4+HHF5+HHF6+HHF7+HHF8+HHF9+HHF10+HHF11+HHF12+
HHF13+HHF14+HHF15

- 647: $POPCGQ == CNNPM1 * CPGQM1 + CNNPM2 * CPGQM2 + CNNPM3 * CPGQM3 + CNNPM4 * CPGQM4 + CNNPM5 * CPGQM5 + CNNPM6 * CPGQM6 + CNNPM7 * CPGQM7 + CNNPM8 * CPGQM8 + CNNPM9 * CPGQM9 + CNNPM10 * CPGQM10 + CNNPM11 * CPGQM11 + CNNPM12 * CPGQM12 + CNNPM13 * CPGQM13 + CNNPM14 * CPGQM14 + CNNPM15 * CPGQM15 + CNNPF1 * CPGQF1 + CNNPF2 * CPGQF2 + CNNPF3 * CPGQF3 + CNNPF4 * CPGQF4 + CNNPF5 * CPGQF5 + CNNPF6 * CPGQF6 + CNNPF7 * CPGQF7 + CNNPF8 * CPGQF8 + CNNPF9 * CPGQF9 + CNNPF10 * CPGQF10 + CNNPF11 * CPGQF11 + CNNPF12 * CPGQF12 + CNNPF13 * CPGQF13 + CNNPF14 * CPGQF14 + CNNPF15 * CPGQF15$
- 648: $POPNGQ == NATPM1 * NPGQM1 + NATPM2 * NPGQM2 + NATPM3 * NPGQM3 + NATPM4 * NPGQM4 + NATPM5 * NPGQM5 + NATPM6 * NPGQM6 + NATPM7 * NPGQM7 + NATPM8 * NPGQM8 + NATPM9 * NPGQM9 + NATPM10 * NPGQM10 + NATPM11 * NPGQM11 + NATPM12 * NPGQM12 + NATPM13 * NPGQM13 + NATPM14 * NPGQM14 + NATPM15 * NPGQM15 + NATPF1 * NPGQF1 + NATPF2 * NPGQF2 + NATPF3 * NPGQF3 + NATPF4 * NPGQF4 + NATPF5 * NPGQF5 + NATPF6 * NPGQF6 + NATPF7 * NPGQF7 + NATPF8 * NPGQF8 + NATPF9 * NPGQF9 + NATPF10 * NPGQF10 + NATPF11 * NPGQF11 + NATPF12 * NPGQF12 + NATPF13 * NPGQF13 + NATPF14 * NPGQF14 + NATPF15 * NPGQF15$
- 649: $HHC == CHHM4 + CHHM5 + CHHM6 + CHHM7 + CHHM8 + CHHM9 + CHHM10 + CHHM11 + CHHM12 + CHHM13 + CHHM14 + CHHM15 + CHHF4 + CHHF5 + CHHF6 + CHHF7 + CHHF8 + CHHF9 + CHHF10 + CHHF11 + CHHF12 + CHHF13 + CHHF14 + CHHF15$
- 650: $HHN == NHHM4 + NHHM5 + NHHM6 + NHHM7 + NHHM8 + NHHM9 + NHHM10 + NHHM11 + NHHM12 + NHHM13 + NHHM14 + NHHM15 + NHHF4 + NHHF5 + NHHF6 + NHHF7 + NHHF8 + NHHF9 + NHHF10 + NHHF11 + NHHF12 + NHHF13 + NHHF14 + NHHF15$
- 651: $HHM == MILPCT * (MHHM5 + MHHM6 + MHHM7 + MHHM8 + MHHM9 + MHHM10 + MHHM11 + MHHM12 + MHHM13 + MHHM14 + MHHM15 + MHHF5 + MHHF6 + MHHF7 + MHHF8 + MHHF9 + MHHF10 + MHHF11 + MHHF12 + MHHF13 + MHHF14 + MHHF15)$
- 652: $HHSIZE_N == (NATTOT - POPNGQ) / HHN$
- 653: $HHSIZE_C == (CNNTOT - POPCGQ) / HHC$
- 654: $HHSIZE == (POP - POPNGQ - POPCGQ - MILPCT * POPMGQ) / HH$
- 655: $POPGQ == POPNGQ + POPCGQ + POPMGQ$
- 656: $HH24 == HHF4 + HHF5 + HHF6 + HHM4 + HHM5 + HHM6$
- 657: $HH25.29 == HHF7 + HHM7$
- 658: $HH30.54 == HHF8 + HHF9 + HHF10 + HHF11 + HHF12 + HHM8 + HHM9 + HHM10 + HHM11 + HHM12$
- 659: $HH55 == HHF13 + HHF14 + HHF15 + HHM13 + HHM14 + HHM15$

Native Economic Activity

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660: EMNAT == EMNATX

661: RNAT == RNATX

662: EMRATE = EM96/POPC

663: EMRATN1 = (1+PERNA1*(EMRATE-EMRATE(-1))/EMRATE(-1))*EMRATN1(-1)+
PERNA2*(EMRATE-EMRATN1(-1))

664: EMNA == IF PIDIST EQ 1 THEN EMNAT(-1)*POPNE ELSE EMRATN1*
POPNE+PERNA3*EMNC

665: EMNNC == EM99-EMGM-EMNA

666: EMRATN == EMNA/POPNE

667: CEA9N = (1-PCINDA)*CEA9N(-1)+PCINDA*(EMA9/
(EM96-EMPRO-PERNA3*EMNC))

668: CEP9N = (1-PCINDA)*CEP9N(-1)+PCINDA*(EMP9/
(EM96-EMPRO-PERNA3*EMNC))

669: CECNN = (1-PCINDA)*CECNN(-1)+PCINDA*(EMCN/
(EM96-EMPRO-PERNA3*EMNC))

670: CEM9N = (1-PCINDA)*CEM9N(-1)+PCINDA*(EMM9/
(EM96-EMPRO-PERNA3*EMNC))

671: CET9N = (1-PCINDA)*CET9N(-1)+PCINDA*(EMT9/
(EM96-EMPRO-PERNA3*EMNC))

672: CECMN = (1-PCINDA)*CECMN(-1)+PCINDA*(EMCM/
(EM96-EMPRO-PERNA3*EMNC))

673: CEPUN = (1-PCINDA)*CEPUN(-1)+PCINDA*(EMPU/
(EM96-EMPRO-PERNA3*EMNC))

674: CED9N = (1-PCINDA)*CED9N(-1)+PCINDA*(EMD9/
(EM96-EMPRO-PERNA3*EMNC))

675: CEFIN = (1-PCINDA)*CEFIN(-1)+PCINDA*(EMFI/
(EM96-EMPRO-PERNA3*EMNC))

676: CES9N = (1-PCINDA)*CES9N(-1)+PCINDA*((EMS9-PERNA3*EMNC)/
(EM96-EMPRO-PERNA3*EMNC))

677: CEGFN = (1-PCINDA)*CEGFN(-1)+PCINDA*((EMGF-EMGM)/
(EM96-EMPRO-PERNA3*EMNC))

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678: CEGAN = (1-PCINDA)*CEGAN(-1)+PCINDA*(EMGA/
(EM96-EMPRO-PERNA3*EMNC))

679: NEMA9N == CEA9N*(EMNA-PERNA3*EMNC)

680: NWSA9N == WRA9*NEMA9N/1000

681: NEMP9N == CEP9N*(EMNA-PERNA3*EMNC)

682: NWSP9N == WRP9*NEMP9N/1000

683: NEMCNN == CECNN*(EMNA-PERNA3*EMNC)

684: NWSCNN == WRCN*NEMCNN/1000

685: NEMM9N == CEM9N*(EMNA-PERNA3*EMNC)

686: NWSM9N == WRM9*NEMM9N/1000

687: NEMT9N == CET9N*(EMNA-PERNA3*EMNC)

688: NWST9N == WRT9*NEMT9N/1000

689: NEMCMN == CECMN*(EMNA-PERNA3*EMNC)

690: NWSCMN == WRCM*NEMCMN/1000

691: NEMPUN == CEPUN*(EMNA-PERNA3*EMNC)

692: NWSPUN == WRPUN*NEMPUN/1000

693: NEMD9N == CED9N*(EMNA-PERNA3*EMNC)

694: NWSD9N == WRD9*NEMD9N/1000

695: NEMFIN == CEFIN*(EMNA-PERNA3*EMNC)

696: NWSFIN == WRFI*NEMFIN/1000

697: NEMS9N == CES9N*(EMNA-PERNA3*EMNC)+PERNA3*EMNC

698: NWSS9N == WRS9*NEMS9N/1000

699: NEMGFN == CEGFN*(EMNA-PERNA3*EMNC)

700: NWSGFN == WRGF*NEMGFN/1000

701: NEMGAN == CEGAN*(EMNA-PERNA3*EMNC)

702: NWSGAN == WRGA*NEMGAN/1000

703: WSNA == NWSA9N+NWS9N+NWSCNN+NWSM9N+NWST9N+NWSCMN+NWS9N+
NWS9N+NWSFIN+NWS9N+NWSGFN+NWS9N

704: PIN1 == PCYNA1*((PI-NCPI)/WS98)*WSNA

705: PIN == IF PIDIST EQ 1 THEN RNAT(-1)*PI ELSE PIN1+NCPI

706: PINN == PI-PIN

707: R.PIN == PIN*100/PDRPI

708: R.PINN == PINN*100/PDRPI

709: P.PIN == PIN*1000/POPNE

710: P.PINCL == NCPI*1000/POPNE

711: P.PINN == PINN*1000/(POP-POPNE)

712: PR.PIN == R.PIN*1000/POPNE

713: PR.NCEXP == NCEXP/POPNE/PDRPI*100000

714: PR.PINCL == PR.PIN+PR.NCEXP

715: PR.PINN == R.PINN*1000/(POP-POPNE)

716: RAT1 == PINN/(PI-PC12N*PC12RN*PCNC1*ANCSA)

717: P.DPINN = 1000*(PINN-RAT1*(DPIRES+RTPIF+RTISCP))/(POP-POPNE)

718: P.DPINN1 == 1000*(PIN-PC12N*PC12RN*PCNC1*ANCSA-(1-RAT1)*
(DPIRES+RTPIF+RTISCP))/POPNE

719: PR.DPINN = P.DPINN*100/PDRPI

720: PR.DPIN == P.DPINN1*100/PDRPI+PC12N*PC12RN*PCNC1*ANCSA/
POPNE*100000/PDRPI

Definitional Equations

721: R.WR98 == WR98*100/PDRPI

722: R.WR97 = WR97*100/PDRPI

723: P.EX99S == EX99S*1000./POP

724: P.EXCAP == EXCAP*1000/POP

725: P.EXOPS == EXOPS*1000/POP

726: P.EXONTR == EXONTR*1000./POP
727: P.EXBM == EXGFBM*1000/POP
728: P.R99S == R99S*1000./POP
729: P.RTIS == RTIS*1000./POP
730: P.RT99 == RT99*1000./POP
731: P.EL99 == EL99*1000./POP
732: P.ELED == ELED*1000./POP
733: P.ELNED1 == ELNED1*1000/POP
734: P.RLT99 == RLT99*1000./POP
735: P.GEXP == SLGEXP*1000/POP
736: P.BAL99 == BAL99*1000/POP
737: P.BALPF == BALPF*1000/POP
738: P.BALGF == BALGF*1000/POP

739: P.RSIN == RSIN*1000/POP
740: P.RSIP == RSIP*1000/POP
741: P.NRP9S == NONRP9S*1000/POP
742: P.RSEN == RSEN*1000/POP

743: P.NPET == NONPET*1000/POP

744: P.GODT == GODT*1000/POP
745: PR.EX99S == P.EX99S*100/PDRPI
746: PR.EXONT == P.EXONTR*100/PDEXOPS
747: PR.EXBM == EXGFBM*10**5/PDEXOPS/POP
748: PR.EXCAP == P.EXCAP*100/PDCON
749: PR.EXOPS == P.EXOPS*100/PDEXOPS
750: PR.R99S == P.R99S*100/PDRPI
751: PR.RTIS == P.RTIS*100/PDRPI

752: PR.RT99 == P.RT99*100/PDRPI
753: PR.EL99 == P.EL99*100/PDRPI
754: PR.ELED == P.ELED*100/PDRPI
755: PR.ELNED == P.ELNED1*100/PDRPI
756: PR.GEXP == P.GEXP*100/PDRPI
757: PR.GFC == EXGFCHY*10**5/PDRPI/POP
758: PR.ECP == EXCPSHY*10**5/PDRPI/POP
759: PR.GFCN == EXGFCNH*10**5/PDRPI/POP
760: PR.ECPN == EXCPSNH*10**5/PDRPI/POP
761: PR.EXEDS == EXEDS*10**5/PDEXOPS/POP
762: PR.EXSSS == EXSSS*10**5/PDEXOPS/POP
763: PR.EXHES == EXHES*10**5/PDEXOPS/POP
764: PR.EXNRS == EXNRS*10**5/PDEXOPS/POP
765: PR.EXPPS == EXPPS*10**5/PDEXOPS/POP
766: PR.EXJUS == EXJUS*10**5/PDEXOPS/POP
767: PR.EXCDS == EXCDS*10**5/PDEXOPS/POP
768: PR.EXTRS == EXTRS*10**5/PDEXOPS/POP
769: PR.EXGGS == EXGGS*10**5/PDEXOPS/POP
770: PR.RLT99 == RLT99*10**5/PDRPI/POP
771: PR.ELEDC == ELEDCP*10**5/PDRPI/POP
772: PR.BAL99 == P.BAL99*(100/PDRPI)
773: PR.BALPF == P.BALPF*(100/PDRPI)
774: PR.BALG1 == P.BALGF*(100/PDRPI)
775: PR.BALP2 == P.BALPF*(100/PDEXOPS)
776: PR.BALG2 == P.BALGF*(100/PDEXOPS)
777: PR.RSIN == P.RSIN*(100/PDRPI)

778: $PR.RSIP == P.RSIP * (100 / PDRPI)$
779: $PR.NRP9 == P.NRP9S * (100 / PDRPI)$
780: $PR.NPET == P.NPET * (100 / PDRPI)$
781: $PR.RSEN == P.RSEN * (100 / PDRPI)$
782: $PR.GODT == P.GODT * (100 / PDRPI)$
783: $PI.TXS == RT99 / PI$
784: $PI.EXS == EXGF / PI$
785: $PI.TXL == (RL99 - RLT99 - RLTF) / PI$
786: $PI.EXL == (EL99 - (GOBOND - GOBOND(-1))) / PI$
787: $PI.EXT == (EXGF + (EL99 - (GOBOND - GOBOND(-1))) - RLT99) / PI$
788: $PI.RSEN == RSEN / PI$
789: $PI.GODT == GODT / PI$
790: $PI.EX99S == EX99S / PI$

791: $PI.EL99 == EL99 / PI$
792: $PI.RL99 == RL99 / PI$
793: $PI.RLPT == RLPT / PI$
794: $PI.WS98 == WS98 / PI$

795: $PI.DPI == DPI / PI$

796: $RL99.PT == RLPT / RL99$
797: $RL99.RT == RLT99 / RL99$
798: $RS.FED == RSFDN / R99S$
799: $RS.RP9S == RP9S / R99S$
800: $RS.RSIN == RSIN / R99S$
801: $RS.RSEN == RSEN / R99S$
802: $RS.PET == (RP9S + RSIN) / R99S$
803: $RS.OWN == R99SON / R99S$

804: $RS.REC == (RSIN+RSEN)/R99S$
805: $RS.RN == R99SNT/R99S$
806: $RSBM.RP9 == RP9SGF/RSGFBM$
807: $RSBM.PET == (RP9SGF+RSIG+RSID+(1-EXPFBK)*RSIP)/RSGFBM$
808: $RSBM.EXD == EXDSS/RSGFBM$
809: $RSBM.GF == RSIG/RSGFBM$
810: $RSBM.B99 == (RSIG+RSID+RSIPGF)/RSGFBM$
811: $RSBM.PF == RSIPGF/RSGFBM$
812: $RSBM.REN == RSENGF/RSGFBM$
813: $RN.FED == RSFDN/R99SNT$
814: $RN.OIL == (RP9S-EXPFCN)/R99SNT$
815: $RN.RSIN == RSIN/R99SNT$
816: $RN.RSEN == RSEN/R99SNT$
817: $EX.R99S == R99S/EXGF$
818: $EX.NRP9 == (RSEN+RSIN+RSFDN)/EXGF$
819: $EX.RSIN == RSIN/EXGF$
820: $EX.RP9S == 1-EX.NRP9$
821: $EX.NPET == NONPET/EXGF$
822: $EX.PET == 1-EX.NPET$
823: $EX.RSEN == RSEN/EXGF$
824: $EX.RVNT == R99SNT/EXGF$
825: $EX.DSS == EXDSS/EXGF$
826: $EXBM.RV == RSGFBM/EXGFBM$
827: $EXBM.CAB == BALCABBM/EXGFBM$
828: $EXBM.FD == BAL99/EXGFBM$
829: $EXBM.GR1 == (RSGFBM+EXPFCN-EXPFBK*RSIP-RP9S)/EXGFBM$

830: EXBM.END == EXDFWITH/EXGFBM

831: DF.RSFD == RSFDN*PDRPIBAS/PDRPI

832: DF.RP9S == RP9S*PDRPIBAS/PDRPI

833: DF.RSGF == RSGF*PDRPIBAS/PDRPI

834: DF.RSGFB == RSGFBM*PDRPIBAS/PDRPI

835: DF.R99S == R99S*PDRPIBAS/PDRPI

836: DF.RSEN == RSEN*PDRPIBAS/PDRPI

837: DF.RSIN == RSIN*PDRPIBAS/PDRPI

838: DF.EXGF == EXGF*PDRPIBAS/PDRPI

839: DF.EXGFB == EXGFBM*PDRPIBAS/PDRPI

840: DF.CABBM == BALCABBM*PDRPIBAS/PDRPI

841: DF.GOXB M == (EXGFBM-EXGFCAP)*376.536/PDEXOPS

842: DF.NRP9S == NONRP9S*PDRPIBAS/PDRPI

843: DF.BAL99 == BAL99*PDRPIBAS/PDRPI

844: DF.BALDF == BALDF*PDRPIBAS/PDRPI

845: DF.BALGF == BALGF*PDRPIBAS/PDRPI

846: DF.NPET == NONPET*PDRPIBAS/PDRPI

847: DF.RSIP == RSIP*PDRPIBAS/PDRPI

848: DF.BALPF == BALPF*PDRPIBAS/PDRPI

849: DF.RGFNT == R99SNT*PDRPIBAS/PDRPI

850: DF.RSIPN == RSIPNET*PDRPIBAS/PDRPI

851: DF.RSIDN == RSIDNET*PDRPIBAS/PDRPI

852: DF.RSIGN == RSIGNET*PDRPIBAS/PDRPI

853: DF.RSINN == RSINNET*PDRPIBAS/PDRPI

854: DF.PI == PI*PDRPIBAS/PDRPI

855: DF.WS98 == WS98*PDRPIBAS/PDRPI

856: DF.WSG9 == (WSGS+WSGL+WSGC+WSGM)*PDRPIBAS/PDRPI
857: DF.WSSP == (WST9+WSCM+WSPU+WSD9+WSFI+WSS9)*PDRPIBAS/PDRPI
858: DF.WSNS == (WSA9+WSM9+WSCN+WSP9)*PDRPIBAS/PDRPI
859: DF.WRG9 == DF.WSG9*1000/EMG9
860: DF.WRSP == DF.WSSP*1000/EMSP
861: DF.WRNS == DF.WSNS*1000/(EMA9+EMM9+EMCN+EMP9)
862: DF.BAL9P == DF.BAL99*1000/POP
863: DF.EXGFP == DF.EXGF*1000/POP
864: DF.PIP == DF.PI*1000/POP
865: IM.REV == (EXGF/PDRPI/POP-BASEXGF/BASPDRPI/BASEPOP)*PDRPI*POP
866: IM.BALRV = IM.BAL(-1)*(ROR+RORPPF)+IM.REV
867: IM.BAL = IF YR EQ 1977 THEN 0 ELSE IM.BAL(-1)+IM.BALRV
868: IM.BAL99 == BAL99+IM.BAL
869: IM.BALPC == IM.BAL*1000/POP
870: IM.BALR == IM.BAL*100/PDRPI
871: IM.BLRPC == IM.BALR*1000/POP
872: EM.EMTCU == EMTCU/EM99
873: EM.EMSUP == EMSUP/EM99
874: EM.EMSP == EMSP/EM99
875: EM.EMG9 == EMG9/EM99
876: EM.EMGA == EMGA/EM99
877: EM.EMGF == EMGF/EM99
878: EM.EMCN == EMCN/EM99
879: EM.EMP9 == EMP9/EM99
880: EM.EMNR == EMNR/EM99
881: EM.EMNS == EMNS/EM99

882: $G.PR.PI == PR.PI/PR.PI(-1)$
883: $G.PR.DPI == PR.DPI/PR.DPI(-1)$
884: $G.RSEN == RSEN/RSEN(-1)$
885: $G.EX99S == EX99S/EX99S(-1)$
886: $G.EL99 == EL99/EL99(-1)$
887: $G.PDRPI == PDRPI/PDRPI(-1)$
888: $G.XONRPC == PR.EXONT/PR.EXONT(-1)$
889: $G.POP == POP/POP(-1)$
890: $G.EM99 == EM99/EM99(-1)$
891: $G.SRPC == PR.EX99S/PR.EX99S(-1)$
892: $G.RNSPC == P.RSEN/P.RSEN(-1)$
893: $G.BAL99 == BAL99/BAL99(-1)$
894: $G.BAL9PC == P.BAL99/P.BAL99(-1)$
895: $G.R.WR98 == R.WR98/R.WR98(-1)$
896: $PIU.PIA == PR.DPINN/PR.DPIUS$
897: $INDEX.DI == PR.DPI/PR.DPIUS$
898: $INDEX.WG == R.WR97/(WEUS*52*100/PDUSCPI)$
899: $INDEX.S1 == EMSUP/R.DPI$
900: $INDEX.S2 == EMTCU/R.DPI$

Income Distribution Model Links

901: $NNPM1 == CNNPM5 + MILPCT * MDPM5$
902: $NNPM2 == CNNPM6 + MILPCT * MDPM6$
903: $NNPM3 == CNNPM7 + CNNPM8 + MILPCT * (MDPM7 + MDPM8)$
904: $NNPM4 == CNNPM9 + CNNPM10 + MILPCT * (MDPM9 + MDPM10)$
905: $NNPM5 == CNNPM11 + CNNPM12 + MILPCT * (MDPM11 + MDPM12)$

906: $NNPM6 == CNNPM13 + CNNPM14 + MILPCT * (MDPM13 + MDPM14)$

907: $NNPM7 == CNNPM15 + MILPCT * MDPM15$

908: $NNPF1 == CNNPF5 + MILPCT * MDPF5$

909: $NNPF2 == CNNPF6 + MILPCT * MDPF6$

910: $NNPF3 == CNNPF7 + CNNPF8 + MILPCT * (MDPF7 + MDPF8)$

911: $NNPF4 == CNNPF9 + CNNPF10 + MILPCT * (MDPF9 + MDPF10)$

912: $NNPF5 == CNNPF11 + CNNPF12 + MILPCT * (MDPF11 + MDPF12)$

913: $NNPF6 == CNNPF13 + CNNPF14 + MILPCT * (MDPF13 + MDPF14)$

914: $NNPF7 == CNNPF15 + MILPCT * MDPF15$

915: $NAPM1 == NATPM5$

916: $NAPM2 == NATPM6$

917: $NAPM3 == NATPM7 + NATPM8$

918: $NAPM4 == NATPM9 + NATPM10$

919: $NAPM5 == NATPM11 + NATPM12$

920: $NAPM6 == NATPM13 + NATPM14$

921: $NAPM7 == NATPM15$

922: $NAPF1 == NATPF5$

923: $NAPF2 == NATPF6$

924: $NAPF3 == NATPF7 + NATPF8$

925: $NAPF4 == NATPF9 + NATPF10$

926: $NAPF5 == NATPF11 + NATPF12$

927: $NAPF6 == NATPF13 + NATPF14$

928: $NAPF7 == NATPF15$

929: $PF == CNNPF1 + CNNPF2 + CNNPF3 + CNNPF4 + MILPCT * (MDPF1 + MDPF2 + MDPF3 + MDPF4)$

930: $PM == CNNPM1 + CNNPM2 + CNNPM3 + CNNPM4 + MILPCT * (MDPM1 + MDPM2 + MDPM3 + MDPM4)$

931: PFN == NATPF1+NATPF2+NATPF3+NATPF4

932: PMN == NATPM1+NATPM2+NATPM3+NATPM4

933: WRGMS == (PI8-WS98)/(EMPRO*PDRPI)/((PI8(-1)-WS98(-1))/
(EMPRO(-1)*PDRPI(-1)))

934: WRGP9 == WRP9/PDRPI/(WRP9(-1)/PDRPI(-1))

935: WRGCN == WRCN/PDRPI/(WRCN(-1)/PDRPI(-1))

936: WRGM9 == WRM9/PDRPI/(WRM9(-1)/PDRPI(-1))

937: WRGT9 == WRT9/PDRPI/(WRT9(-1)/PDRPI(-1))

938: WRGCU == WRCU/PDRPI/(WRCU(-1)/PDRPI(-1))

939: WRGD9 == WRD9/PDRPI/(WRD9(-1)/PDRPI(-1))

940: WRGFI == WRFI/PDRPI/(WRFI(-1)/PDRPI(-1))

941: WRGS9 == WRS9/PDRPI/(WRS9(-1)/PDRPI(-1))

942: WRGGC == WRGC/PDRPI/(WRGC(-1)/PDRPI(-1))

943: WRGGA == WRGA/PDRPI/(WRGA(-1)/PDRPI(-1))

944: PRINT == PRINT2

945: X1 == P1

946: X2 == P2

947: X3 == P3

948: X4 == P4

949: X5 == P5

950: X6 == P6

951: WS98L == WS98(-1)

952: PIL == PI(-1)

PARAMETER LIST:

A83.2 CONSTANT FILE FOR MODEL A83.2 OF THE ALASKAN ECONOMY. CREATED BY THE INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH OF THE UNIVERSITY OF ALASKA UNDER THE MAN IN THE ARCTIC PROGRAM FUNDED BY THE NATIONAL SCIENCE FOUNDATION. REGRESSION COEFFICIENTS HAVE THE PREFIX C FOLLOWED BY A NUMBER. THIS FILE WAS CREATED MAY 1983.

CMIG1	-12.6876	CMIG2	14.1206	CMIG3	49.2216
CMIG4	0.95671	CPGQF1	0.	CPGQF10	0.0036
CPGQF11	0.0092	CPGQF12	0.0051	CPGQF13	0.0093
CPGQF14	0.0032	CPGQF15	0.0751	CPGQF2	0.0045
CPGQF3	0.0032	CPGQF4	0.0031	CPGQF5	0.004
CPGQF6	0.0238	CPGQF7	0.004	CPGQF8	0.0022
CPGQF9	0.0011	CPGQM1	0.	CPGQM10	0.0369
CPGQM11	0.0392	CPGQM12	0.0265	CPGQM13	0.0266
CPGQM14	0.0268	CPGQM15	0.0648	CPGQM2	0.0071
CPGQM3	0.0046	CPGQM4	0.0044	CPGQM5	0.0435
CPGQM6	0.0729	CPGQM7	0.0238	CPGQM8	0.0166
CPGQM9	0.0278	C1A	0.42666	C1B	0.050183
C1C	0.371052	C10A	16.9371	C10B	0.895141
C10C	6.97821	C100A	-4.35555	C100B	1.25095
C100C	-0.993033	C101A	5.58779	C101B	0.162732
C102A	4.0938	C102B	1.95194	C102C	1.68094
C102D	-0.089862	C102F	0.243258	C103A	-20.3494
C103B	15.8847	C103C	0.712195	C104A	2.28334
C104B	0.967574	C105A	1.01698	C105B	0.013219
C105C	0.73757	C106A	-19.3534	C106B	0.069511
C107A	-46.6199	C107B	0.014517	C11A	-4.74734
C11B	0.024928	C12A	7.83103	C12B	0.520103
C13A	-8.45346	C13B	0.683069	C13C	-80.
C14A	-0.885606	C14B	0.173656	C14C	-0.11048
C15A	-8.30542	C15B	0.293671	C16A	0.074055
C16B	0.000307	C16C	1.567790E-06	C16D	-0.001325
C16E	0.433666	C17A	-10.9796	C17B	0.119691
C18A	-3.66471	C18B	0.015655	C19A	-1.18305
C19B	1.03791	C2A	1.50943	C2B	0.274289
C20A	-2.68296	C20B	1.01735	C21A	0.363308
C21B	0.930152	C21C	0.042017	C22A	-0.918589
C22B	1.08552	C23A	-2.75748	C23B	1.34193
C23C	0.930092	C23D	0.430625	C24A	-3.45059
C24B	1.19903	C25A	0.468259	C25B	0.527066
C26A	-1.76919	C26B	1.00396	C26C	-0.118769
C27A	-6.66783	C27B	0.011282	C27C	-0.00875
C28A	80.1874	C28B	1.09189	C28C	3.14996
C29A	-3.76782	C29B	0.802622	C3A	2.7822
C3B	0.246103	C30A	-4.09671	C30B	1.19138
C31A	-6.94273	C31B	1.25147	C32A	-1.8791

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C32B	0.663336	C33A	-5.44841	C33B	0.896499
C34A	0.197424	C34B	0.002957	C34C	-0.629312
C35A	-1.791	C35B	0.570399	C36A	-41.7079
C36B	-117.753	C36C	7.69046	C36D	0.982345
C36E	-10.3654	C36F	81.4021	C37A	-5.65507
C37B	0.66256	C38A	-189.355	C38B	1.07998
C39A	-5.90571	C39B	1.17929	C4A	-1.6632
C4B	0.672086	C40A	-10.2398	C40B	2.44783
C41A	-4.96533	C41B	0.261135	C42A	0.925213
C42B	0.171959	C43A	-4.35327	C43B	1.71165
C43C	-0.357641	C44A	16.699	C44B	0.063707
C44C	0.032434	C44D	-40.2662	C45A	9.0322
C45B	7.29399	C45C	18.7679	C45D	-21.7906
C46A	-1.82278	C46B	0.907323	C47A	-10.7859
C47B	1.80202	C48A	-4.54331	C48B	0.917921
C49A	-3.70367	C49B	0.726188	C5A	0.106732
C5B	-0.596163	C50A	-0.379274	C50B	0.010411
C51A	-48.4838	C51B	0.030347	C52A	3.21093
C52B	1.28862	C53A	4.7921	C53B	3.05381
C53C	3.83615	C53D	-0.272543	C53F	0.320275
C54A	20.3019	C54B	0.058467	C54C	0.201308
C54D	0.098856	C54E	11.6116	C55A	0.169745
C55B	0.978561	C55C	0.043843	C56A	-2.32004
C56B	0.949211	C57A	-1.3362	C57B	1.26857
C57C	0.042129	C58A	-18.3431	C58B	3.27405
C59A	4.64174	C59B	2.00986	C59C	2.67656
C59D	0.949676	C59E	1.43667	C59F	0.28503
C6A	-0.757478	C6B	0.648296	C60A	0.917411
C60B	0.001215	C60C	-0.630477	C61A	2.3273
C61B	1.18434	C62A	4.1444	C62B	1.5729
C62C	0.901649	C62D	0.706814	C62F	0.15724
C63A	-0.088472	C63B	0.144498	C64A	3.83502
C64B	0.204201	C64C	0.125501	C64D	-0.000633
C64E	-12.3188	C65A	-1.78308	C65B	0.771752
C66A	4.37672	C66B	1.79364	C66C	5.75206
C66D	-0.253902	C66E	-0.897404	C66F	0.148826
C67A	-0.3	C67B	0.616529	C67C	-0.060264
C68A	41.1756	C68B	-0.123466	C68C	-30.7457
C68D	0.000198	C69A	-1.99105	C69B	0.653562
C7A	0.908821	C7B	0.209675	C70A	4.5201
C70B	0.723184	C70C	1.22075	C70D	1.43879
C70F	0.177801	C71A	-4.27825	C71B	0.016818
C71C	0.148471	C71D	-0.000295	C71E	5.268135E-05
C72A	3.76867	C72B	0.011235	C72C	0.013736
C72D	0.025526	C73A	-3.01609	C73B	0.830038
C73C	-0.04871	C74A	4.5073	C74B	0.723184
C74C	1.22075	C74D	1.43879	C74F	0.177801
C75A	-2.37192	C75B	1.00465	C76A	-12.5389

HHRM13	0.923	HHRM14	0.922	HHRM15	0.884
HHRM4	0.001	HHRM5	0.063	HHRM6	0.56
HHRM7	0.742	HHRM8	0.836	HHRM9	0.905
LFPART	0.78045	MDPF1	1.013	MDPF10	1.121
MDPF11	0.253	MDPF12	0.253	MDPF13	0.109
MDPF14	0.036	MDPF15	0.036	MDPF2	2.424
MDPF3	3.834	MDPF4	2.749	MDPF5	1.881
MDPF6	4.088	MDPF7	2.713	MDPF8	2.605
MDPF9	1.338	MDPM1	0.796	MDPM10	0.
MDPM11	0.	MDPM12	0.	MDPM13	0.
MDPM14	0.	MDPM15	0.	MDPM2	2.894
MDPM3	3.871	MDPM4	2.894	MDPM5	1.302
MDPM6	0.	MDPM7	0.036	MDPM8	0.
MDPM9	0.	MDTOT	25.131	MF1	0.01
MF10	0.026	MF11	0.015	MF12	0.003
MF13	0.006	MF14	0.003	MF15	0.001
MF2	0.04	MF3	0.054	MF4	0.022
MF5	0.026	MF6	0.096	MF7	0.076
MF8	0.064	MF9	0.029	MHHF10	0.015
MHHF11	0.006	MHHF12	0.008	MHHF13	0.002
MHHF14	0.002	MHHF15	0.012	MHHF5	0.006
MHHF6	0.068	MHHF7	0.102	MHHF8	0.039
MHHF9	0.028	MHHM10	0.794	MHHM11	0.206
MHHM12	0.119	MHHM13	0.038	MHHM14	0.014
MHHM15	0.006	MHHM5	0.074	MHHM6	2.165
MHHM7	3.44	MHHM8	2.802	MHHM9	1.863
MILF1	0.732	MILF10	0.816	MILF11	0.12
MILF12	0.125	MILF13	0.043	MILF14	0.019
MILF15	0.057	MILF2	2.854	MILF3	2.727
MILF4	1.718	MILF5	1.279	MILF6	3.291
MILF7	3.254	MILF8	2.379	MILF9	1.001
MILM1	0.727	MILM10	0.777	MILM11	0.178
MILM12	0.125	MILM13	0.038	MILM14	0.019
MILM15	0.015	MILM2	2.607	MILM3	2.947
MILM4	1.867	MILM5	2.481	MILM6	7.219
MILM7	4.262	MILM8	2.931	MILM9	1.846
MILRAT	1.	MM1	0.01	MM10	0.035
MM11	0.017	MM12	0.003	MM13	0.008
MM14	0.003	MM15	0.001	MM2	0.04
MM3	0.054	MM4	0.022	MM5	0.038
MM6	0.079	MM7	0.099	MM8	0.079
MM9	0.041	NCHHRF10	1.037	NCHHRF11	1.022
NFERT4	0.0003	NFERT5	0.1083	NFERT6	0.2381
NFERT7	0.1857	NFERT8	0.1188	NFERT9	0.0484
NHHRF10	0.227	NHHRF11	0.267	NHHRF12	0.267
NHHRF13	0.297	NHHRF14	0.33	NHHRF15	0.503
NHHRF4	0.	NHHRF5	0.026	NHHRF6	0.127

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NHHRF7	0.188	NHHRF8	0.219	NHHRF9	0.227
NHHRM10	0.807	NHHRM11	0.864	NHHRM12	0.864
NHHRM13	0.893	NHHRM14	0.925	NHHRM15	0.888
NHHRM4	0.003	NHHRM5	0.025	NHHRM6	0.257
NHHRM7	0.539	NHHRM8	0.691	NHHRM9	0.807
NMF1	0.	NMF10	0.	NMF11	0.
NMF12	0.	NMF13	0.	NMF14	0.
NMF15	0.	NMF2	0.	NMF3	0.
NMF4	0.	NMF5	0.	NMF6	0.
NMF7	0.	NMF8	0.	NMF9	0.
NMM1	0.	NMM10	0.	NMM11	0.
NMM12	0.	NMM13	0.	NMM14	0.
NMM15	0.	NMM2	0.	NMM3	0.
NMM4	0.	NMM5	0.	NMM6	0.
NMM7	0.	NMM8	0.	NMM9	0.
NPGQF1	0.	NPGQF10	0.0029	NPGQF11	0.0092
NPGQF12	0.0112	NPGQF13	0.0128	NPGQF14	0.0103
NPGQF15	0.051	NPGQF2	0.0026	NPGQF3	0.0059
NPGQF4	0.0055	NPGQF5	0.024	NPGQF6	0.0284
NPGQF7	0.0118	NPGQF8	0.0092	NPGQF9	0.0057
NPGQM1	0.	NPGQM10	0.0288	NPGQM11	0.0258
NPGQM12	0.0181	NPGQM13	0.0233	NPGQM14	0.035
NPGQM15	0.0417	NPGQM2	0.0041	NPGQM3	0.0058
NPGQM4	0.0053	NPGQM5	0.0376	NPGQM6	0.0692
NPGQM7	0.0405	NPGQM8	0.0314	NPGQM9	0.0224
NRCF10	-0.002	NRCF11	-0.035	NRCF12	-0.035
NRCF13	-0.028	NRCF14	-0.061	NRCF15	0.033
NRCF4	0.	NRCF5	0.	NRCF6	0.064
NRCF7	0.072	NRCF8	0.028	NRCF9	-0.002
NRCM10	0.12	NRCM11	0.076	NRCM12	0.076
NRCM13	0.016	NRCM14	-0.016	NRCM15	0.05
NRCM4	0.	NRCM5	0.	NRCM6	0.108
NRCM7	0.187	NRCM8	0.186	NRCM9	0.12
NSEXDIV	0.513	NSF1	0.99891	NSF10	0.99366
NSF11	0.99733	NSF12	0.9871	NSF13	0.987
NSF14	0.984	NSF15	0.9689	NSF2	0.99891
NSF3	0.99945	NSF4	0.99972	NSF5	0.99684
NSF6	0.9971	NSF7	0.99639	NSF8	0.99611
NSF9	0.99558	NSM1	0.99864	NSM10	0.99018
NSM11	0.99413	NSM12	0.9892	NSM13	0.9788
NSM14	0.9665	NSM15	0.9368	NSM2	0.99864
NSM3	0.99922	NSM4	0.99868	NSM5	0.9933
NSM6	0.99	NSM7	0.9914	NSM8	0.99566
NSM9	0.9899	NSURINFF	1.	NSURINFM	1.
NTP	40.	OEMF1	-0.1077	OEMF10	-0.0726
OEMF11	-0.0449	OEMF12	-0.0709	OEMF13	-0.0441
OEMF14	-0.096	OEMF15	-0.0141	OEMF2	-0.1077
OEMF3	-0.1076	OEMF4	-0.0517	OEMF5	-0.051

OEMF6	-0.0452	OEMF7	-0.0879	OEMF8	-0.0742
OEMF9	-0.0656	OEMM1	-0.1017	OEMM10	-0.0638
OEMM11	-0.0326	OEMM12	-0.0561	OEMM13	-0.0507
OEMM14	-0.0178	OEMM15	-0.0178	OEMM2	-0.1017
OEMM3	-0.1037	OEMM4	-0.0479	OEMM5	-0.0498
OEMM6	-0.0533	OEMM7	-0.0998	OEMM8	-0.0977
OEMM9	-0.0935	PADJ	1.5	PAD1	0.7
PAD2	0.082	PARLVFV	0.919	PARNONGF	0.2
PBLTBL	0.13	PCINDA	0.1	PCIVPY	0.65
PCNCSV	0.5	PCNCSV1	1.	PCNCWS	0.25
PCNC4	0.	PCWS1	0.9	PCYNA1	1.01545
PC12N	0.922	PC12RN	0.833	PC13C	-55.
PC39A	0.5	PC39B	0.003	PDRPIBAS	364.23
PEGIG	0.625	PERNA1	0.	PERNA2	0.005
PERNA3	1.	PESLT	0.4	PESLTC	0.1
PFISH1	0.97	PIDIST	0.	PNTGR	0.02
POPMGQ	9.443	PRINT2	0.	PTOURB	-4.75
PTOURD	0.4	PTOURE	1.	PTOURS	0.4
PTOURT	0.2	PTRTS	0.02	PWRBASE	5473.
P1	0.	P2	0.	P3	0.
P4	1.	P5	1.	P6	1.
RCF10	0.009	RCF11	0.008	RCF12	0.009
RCF13	0.007	RCF14	-0.051	RCF15	0.097
RCF4	0.	RCF5	0.	RCF6	-0.008
RCF7	0.026	RCF8	0.01	RCF9	0.01
RCM10	0.013	RCM11	-0.003	RCM12	0.009
RCM13	-0.014	RCM14	-0.013	RCM15	0.054
RCM4	0.	RCM5	0.	RCM6	-0.195
RCM7	-0.016	RCM8	0.041	RCM9	0.022
ROR	0.02	RORANGRO	0.08	RORCPDEP	0.03
RORCRF	0.08	RORDISK	0.02	RORNC	0.07
RORPDF	0.	RORPPF	0.01	SEXDIV	0.518
SF1	0.99933	SF10	0.99829	SF11	0.99726
SF12	0.99646	SF13	0.99211	SF14	0.9897
SF15	0.9659	SF2	0.99933	SF3	0.99993
SF4	0.99992	SF5	0.99958	SF6	0.9995
SF7	0.99935	SF8	0.99923	SF9	0.99896
SM1	0.99913	SM10	0.996	SM11	0.99501
SM12	0.99224	SM13	0.98708	SM14	0.97938
SM15	0.93795	SM2	0.99913	SM3	0.99986
SM4	0.99957	SM5	0.99864	SM6	0.99762
SM7	0.99748	SM8	0.99746	SM9	0.99812
SURINFF	1.	SURINFM	1.	TP	30.

APPENDIX H

ISER MAP ALASKA ECONOMIC MODEL

STOCHASTIC EQUATIONS FOR
ECONOMIC AND FISCAL MODULES

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APPENDIX H
ISER MAP ALASKA ECONOMIC MODEL

This appendix shows the coefficients and regression statistics for each stochastic equation in the economic and fiscal modules of the ISER MAP Alaska Economic Model (version A83.2).

Each equation is first printed, followed by the summary statistics and, finally, the coefficient values. Abbreviations have the following notations:

NOB	Number of observations
NOVAR	Number of variables
RANGE	Range of observations
RSQ	R squared
CRSQ	Corrected R squared
F(i/j)	F test
SER	Standard error of regression
DW(i)	Durbin Watsin test
COND(x)	Condition number of x matrix (for monitoring least squares solution algorithm)
SSR	Sum of squared residuals
COEF	Coefficient value
ST ER	Standard error of coefficient
T-STAT	T Statistic

4: $PDRATIO = PDRATIO(-1) + C67A * (EMSP - EMSP(-1)) / EMSP(-1) + C67B * (EMCNX1 / EM98(-1)) + C67C * D80$

NOB = 19 NOVAR = 3

RANGE = 1962 TO 1980

RSQ = 0.92621 CRSQ = 0.91699

F(2/16) = 100.420

SER = 0.0153 SSR = 3.738E-03

DW(0) = 1.64

COND(X) =

2.21

COEF	VALUE	ST ER	T-STAT
C67A	-0.10202	0.04678	-2.18088
C67B	0.61653	0.15164	4.06577
C67C	-0.06026	0.01532	-3.93418

7: $PDCON = C107A + C107B * WRCNNP$

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.99987 CRSQ = 0.99987

F(1/18) = 1.43E+05

SER = 1.5924 SSR = 45.646

DW(0) = 0.97

COND(X) =

4.95

COEF	VALUE	ST ER	T-STAT
C107A	-46.61990	0.91687	-50.84700
C107B	0.01452	3.84526E-05	377.53600

15: $LOG(FAGI) = C21A + C21B * LOG(PI8) + C21C * LOG(EMCNX1 + EMP9)$

NOB = 16 NOVAR = 3

RANGE = 1961 TO 1976

RSQ = 0.99827 CRSQ = 0.998

F(2/13) = 3741.180

SER = 0.0275 SSR = 9.815E-03

DW(0) = 1.55

COND(X) =

72.63

COEF	VALUE	ST ER	T-STAT
C21A	0.36331	0.20550	1.76795
C21B	0.93015	0.03099	30.01790
C21C	0.04202	0.02088	2.01253

16: LOG(FAGII) = C22A+C22B*LOG(PI)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.998

CRSQ = 0.99789

F(1/18) = 8969.980

SER = 0.0368

SSR = 2.443E-02

DW(0) = 2.43

COND(X) =

20.65

COEF	VALUE	ST ER	T-STAT
C22A	-0.91859	0.08523	-10.77750
C22B	1.08552	0.01146	94.70880

19: AEX*1000 = C10A+C10B*POPC+C10C*(EMCNX1+EMP9)

NOB = 16 NOVAR = 3

RANGE = 1961 TO 1976

RSQ = 0.97065

CRSQ = 0.96614

F(2/13) = 214.994

SER = 16.2836

SSR = 3447.010

DW(0) = 2.19

COND(X) =

20.95

COEF	VALUE	ST ER	T-STAT
C10A	16.93710	34.72310	0.48777
C10B	0.89514	0.14540	6.15625
C10C	6.97821	1.33067	5.24415

20: ATT = C28A+C28B*(EM99-EMGM)+C28C*EMCNX1

NOB = 19 NOVAR = 3

RANGE = 1961 TO 1979

RSQ = 0.99476

CRSQ = 0.9941

F(2/16) = 1518.330

SER = 4.5696

SSR = 334.103

DW(0) = 2.81

COND(X) =

7.27

COEF	VALUE	ST ER	T-STAT
C28A	80.18740	3.35025	23.93470
C28B	1.09189	0.03070	35.56360
C28C	3.14996	0.27770	11.34320

21: LOG(ATD/ATT) = C23A+C23B*LOG(AGI/ATT)+C23C*D69+C23D*D72

NOB = 16 NOVAR = 4

RANGE = 1961 TO 1976

RSQ = 0.94457 CRSQ = 0.93072

F(3/12) = 68.169

SER = 0.1680 SSR = 0.339

DW(0) = 1.50 COND(X) =

9.20

COEF	VALUE	ST ER	T-STAT
C23A	-2.75748	0.18568	-14.85040
C23B	1.34193	0.10579	12.68440
C23C	0.93009	0.17391	5.34818
C23D	0.43063	0.17515	2.45858

26: LOG(RTISCA2) = C24A+C24B*LOG(ATI.TT)

NOB = 16 NOVAR = 2

RANGE = 1961 TO 1976

RSQ = 0.97107 CRSQ = 0.969

F(1/14) = 469.867

SER = 0.0985 SSR = 0.136

DW(0) = 1.57 COND(X) =

6.20

COEF	VALUE	ST ER	T-STAT
C24A	-3.45059	0.07834	-44.04770
C24B	1.19903	0.05532	21.67630

30: RTIS = IF YR EQ 1980 THEN 0 ELSE C25A*RTISC(-1)+C25B*RTISC

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.97803 CRSQ = 0.97674

F(1/17) = 756.726

SER = 8.8000 SSR = 1316.490

DW(0) = 2.34 COND(X) =

7.19

COEF	VALUE	ST ER	T-STAT
C25A	0.46826	0.09575	4.89051
C25B	0.52707	0.08996	5.85858

31: RTISCP = C105A+C105B*PI8+C105C*RTISC

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.99238 CRSQ = 0.99148

F(2/17) = 1106.550

SER = 5.7689 SSR = 565.767

DW(0) = 2.45

COND(X) =

5.40

COEF	VALUE	ST ER	T-STAT
C105A	1.01698	2.18267	0.46593
C105B	0.01322	0.00119	11.07110
C105C	0.73757	0.03581	20.59760

32: LOG(RTPIF/ATT) = C26A+C26B*LOG(FAGII/ATT+TCRED/1000/ATT+RTISLOS/ATT)+C26C*D61.68*LOG(FAGII/ATT+TCRED/1000/ATT+RTISLOS/ATT)

NOB = 19 NOVAR = 3

RANGE = 1961 TO 1979

RSQ = 0.99351 CRSQ = 0.9927

F(2/16) = 1225.390

SER = 0.0499 SSR = 3.986E-02

DW(0) = 1.57

COND(X) =

14.47

COEF	VALUE	ST ER	T-STAT
C26A	-1.76919	0.08018	-22.06600
C26B	1.00396	0.03795	26.45370
C26C	-0.11877	0.03094	-3.83920

33: DPIRES = C27A+C27B*PI3+C27C*WSCNP

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.97549 CRSQ = 0.97261

F(2/17) = 338.350

SER = 2.5946 SSR = 114.447

DW(0) = 1.26

COND(X) =

3.5

COEF	VALUE	ST ER	T-STAT
C27A	-6.05350	1.01043	-5.99103
C27B	0.01107	4.32765E-04	25.58420
C27C	-0.00870	0.00239	-3.63518

34 : LOG(BL) = C39A+C39B*LOG(XX98-XXF9)

NOB = 17 NOVAR = 2

RANGE = 1961 TO 1977

RSQ = 0.97163 CRSQ = 0.96974

SER = 0.0722 SSR = 7.817E-02

F(1/15) = 513.808

DW(0) = 0.85 COND(X) = 4'

COEF	VALUE	ST ER	T-STAT
C39A	-6.96721	0.42986	-16.20800
C39B	1.32915	0.05864	22.66700

35 : LOG(GR) = C40A+C40B*LOG(XX98)

NOB = 17 NOVAR = 2

RANGE = 1961 TO 1977

RSQ = 0.9871 CRSQ = 0.98624

SER = 0.1018 SSR = 0.155

F(1/15) = 1147.740

DW(0) = 1.33 COND(X) = 48

COEF	VALUE	ST ER	T-STAT
C40A	-12.50600	0.60181	-20.78070
C40B	2.76494	0.08161	33.87790

38 : LOG(RTBS2*10**3/BL(-1)) = C29A+C29B*LOG(GTR(-1)*10**3/BL(-1))

NOB = 16 NOVAR = 2

RANGE = 1962 TO 1977

RSQ = 0.88051 CRSQ = 0.87198

SER = 0.1492 SSR = 0.311

F(1/14) = 103.166

DW(0) = 1.50 COND(X) =

50.09

COEF	VALUE	ST ER	T-STAT
C29A	-3.76782	0.93422	-4.03314
C29B	0.80262	0.07902	10.15700

40: $\text{LOG}(\text{RTCS1} \times 100 / \text{PDRPI}) = \text{C43A} + \text{C43C} \times \text{D64.65} + \text{C43B} \times \text{LOG}(\text{EMP9}(-1) + \text{EMCN}(-1) + \text{EMM9}(-1) + \text{EMT9}(-1) + \text{EMCM}(-1) + \text{EMPU}(-1))$

NOB = 20 NOVAR = 3

RANGE = 1962 TO 1981

RSQ = 0.96592

CRSQ = 0.96191

F(2/17) = 240.894

SER = 0.1507

SSR = 0.386

DW(0) = 1.65

COND(X) =

18.94

COEF	VALUE	ST ER	T-STAT
C43A	-4.35327	0.31079	-14.00690
C43C	-0.35764	0.12116	-2.95191
C43B	1.71165	0.08980	19.06040

42: $\text{TPTV} = \text{C38A} + \text{C38B} \times \text{POP}$

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.97676

CRSQ = 0.97539

F(1/17) = 714.451

SER = 10.4952

SSR = 1872.550

DW(0) = 1.12

COND(X) =

10.73

COEF	VALUE	ST ER	T-STAT
C38A	-189.35500	13.03360	-14.52820
C38B	1.07998	0.04040	26.72920

43: $\text{LOG}(\text{AHG}) = \text{C37A} + \text{C37B} \times \text{LOG}(\text{PR.PI})$

NOB = 11 NOVAR = 2

RANGE = 1966 TO 1976

RSQ = 0.7315

CRSQ = 0.70166

F(1/9) = 24.519

SER = 0.0829

SSR = 6.186E-02

DW(0) = 1.51

COND(X) =

86.02

COEF	VALUE	ST ER	T-STAT
C37A	-5.65507	1.07530	-5.25904
C37B	0.66256	0.13381	4.95165

45: LOG(RTMF) = C46A+C46B*LOG(THG)

NOB = 11 NOVAR = 2

RANGE = 1966 TO 1976

RSQ = 0.98679 CRSQ = 0.98532

F(1/9) = 672.222

SER = 0.0479 SSR = 2.061E-02

DW(0) = 0.86 COND(X) =

22.67

COEF	VALUE	ST ER	T-STAT
C46A	-1.82278	0.16384	-11.12510
C46B	0.90732	0.03500	25.92720

46: LOG(RTVS) = C47A+C47B*LOG(R.DPI8N(-1))

NOB = 19 NOVAR = 2

RANGE = 1962 TO 1980

RSQ = 0.97077 CRSQ = 0.96905

F(1/17) = 564.507

SER = 0.1373 SSR = 0.320

DW(0) = 0.55 COND(X) =

32.26

COEF	VALUE	ST ER	T-STAT
C47A	-10.78590	0.50842	-21.21440
C47B	1.80202	0.07584	23.75930

47: LOG(RTAS) = C48A+C48B*LOG(R.DFI(-1))

NOB = 19 NOVAR = 2

RANGE = 1962 TO 1980

RSQ = 0.98924 CRSQ = 0.98861

F(1/17) = 1563.080

SER = 0.0422 SSR = 3.024E-02

DW(0) = 1.35 COND(X) =

31.86

COEF	VALUE	ST ER	T-STAT
C48A	-4.54331	0.15432	-29.44060
C48B	0.91792	0.02322	39.53530

48: LOG(RTCIS) = C49A+C49B*LOG(R.DFI(-1))

NOB = 19 NOVAR = 2

RANGE = 1962 TO 1980

RSQ = 0.98 CRSQ = 0.97882

SER = 0.0457 SSR = 3.552E-02 F(1/17) = 832.910
31.86 DW(0) = 2.39 COND(X) =

COEF	VALUE	ST ER	T-STAT
C49A	-3.70367	0.16725	-22.14490
C49B	0.72619	0.02516	28.85990

49: RTSS = IF YR GT 1980 THEN 0 ELSE C50A+C50B*(EM99-EMGM)

NOB = 19 NOVAR = 2

RANGE = 1962 TO 1980

RSQ = 0.97716 CRSQ = 0.97582

SER = 0.1108 SSR = 0.209 F(1/17) = 727.364
5.62 DW(0) = 1.29 COND(X) =

COEF	VALUE	ST ER	T-STAT
C50A	-0.31682	0.07375	-4.29562
C50B	0.01545	5.72778E-04	26.96970

52: LOG(ROFAS) = C30A+C30B*LOG(TPTV(-1))

NOB = 19 NOVAR = 2

RANGE = 1962 TO 1980

RSQ = 0.96111 CRSQ = 0.95882

SER = 0.1060 SSR = 0.191 F(1/17) = 420.083
23.67 DW(0) = 1.10 COND(X) =

COEF	VALUE	ST ER	T-STAT
C30A	-4.09671	0.28830	-14.20960
C30B	1.19138	0.05813	20.49580

53: LOG(ROFOS) = C33A+C33B*LOG(PI3(-1))

NOB = 19 NOVAR = 2
 RANGE = 1962 TO 1980
 RSQ = 0.98893 CRSQ = 0.98828 F(1/17) = 1519.150
 SER = 0.0651 SSR = 7.199E-02 DW(0) = 1.73 COND(X) =
 22.57

COEF	VALUE	ST ER	T-STAT
C33A	-5.44841	0.16877	-32.28220
C33B	0.89650	0.02300	38.97610

56: LOG(RMIS) = C35A+C35B*LOG(PI3(-1))

NOB = 17 NOVAR = 2
 RANGE = 1962 TO 1964, 1968 TO 1981
 RSQ = 0.59386 CRSQ = 0.56678 F(1/15) = 21.933
 SER = 0.3427 SSR = 1.761 DW(1) = 0.93 COND(X) = 21

COEF	VALUE	ST ER	T-STAT
C35A	-1.79100	0.91547	-1.95638
C35B	0.57040	0.12180	4.68325

72: LOG(RSFFS) = C58A+C58B*LOG(POP(-1))

NOB = 18 NOVAR = 2
 RANGE = 1963 TO 1980
 RSQ = 0.9391 CRSQ = 0.93529 F(1/16) = 246.718
 SER = 0.1580 SSR = 0.399 DW(0) = 0.98 COND(X) =
 64.47

COEF	VALUE	ST ER	T-STAT
C58A	-18.34310	1.20056	-15.27880
C58B	3.27405	0.20844	15.70730

95: LOG(EXJUS4) = C20A+C20B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99519 CRSQ = 0.99493

SER = 0.0713 SSR = 9.162E-02

12.06

F(1/18) = 3726.980

DW(0) = 1.14

COND(X) =

COEF	VALUE	ST ER	T-STAT
C20A	-2.68296	0.09689	-27.69200
C20B	1.01735	0.01666	61.04880

96: LOG(EXFPS4) = C91A+C91B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.98271 CRSQ = 0.98175

SER = 0.1662 SSR = 0.497

12.06

F(1/18) = 1023.320

DW(0) = 1.05

COND(X) =

COEF	VALUE	ST ER	T-STAT
C91A	-5.36404	0.22575	-23.76100
C91B	1.24213	0.03883	31.98930

97: LOG(EXNRS4) = C93A+C93B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99079 CRSQ = 0.99028

SER = 0.0940 SSR = 0.159

12.06

F(1/18) = 1936.610

DW(0) = 0.81

COND(X) =

COEF	VALUE	ST ER	T-STAT
C93A	-2.52615	0.12761	-19.79540
C93B	0.96594	0.02195	44.00690

98: LOG(EXHES4) = C94A+C94B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.97559 CRSQ = 0.97423

SER = 0.1617 SSR = 0.471

12.06

F(1/18) = 719.325

DW(0) = 0.45 COND(X) =

COEF	VALUE	ST ER	T-STAT
C94A	-2.81492	0.21962	-12.81710
C94B	1.01315	0.03778	26.82020

99: LOG(EXSSS4) = C96A+C96B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.98987 CRSQ = 0.9893

SER = 0.1137 SSR = 0.233

12.06

F(1/18) = 1758.210

DW(0) = 1.07 COND(X) =

COEF	VALUE	ST ER	T-STAT
C96A	-2.89633	0.15440	-18.75900
C96B	1.11355	0.02656	41.93110

100: LOG(EXEDS4) = C19A+C19B*LOG(EXOPS)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99519 CRSQ = 0.99492

SER = 0.0728 SSR = 9.551E-02

12.06

F(1/18) = 3721.010

DW(0) = 1.12 COND(X) =

COEF	VALUE	ST ER	T-STAT
C19A	-1.18305	0.09892	-11.95930
C19B	1.03791	0.01701	60.99980

101: LOG(EXCDS4) = C97A+C97B*LOG(EXOPS)

NOB = 20 NOVAR = 2
 RANGE = 1962 TO 1981
 RSQ = 0.98103 CRSQ = 0.97997 F(1/18) = 930.686
 SER = 0.1777 SSR = 0.569 DW(0) = 1.50 COND(X) =
 12.06

COEF	VALUE	ST ER	T-STAT
C97A	-4.63823	0.24137	-19.21660
C97B	1.26652	0.04152	30.50710

102: LOG(EXTRS4) = C98A+C98B*LOG(EXOPS)

NOB = 20 NOVAR = 2
 RANGE = 1962 TO 1981
 RSQ = 0.99756 CRSQ = 0.99743 F(1/18) = 7372.610
 SER = 0.0415 SSR = 3.098E-02 DW(0) = 1.37 COND(X) =
 12.06

COEF	VALUE	ST ER	T-STAT
C98A	-1.02656	0.05634	-18.22140
C98B	0.83204	0.00969	85.86340

103: LOG(EXGGS4) = C99A+C99B*LOG(EXOPS)

NOB = 20 NOVAR = 2
 RANGE = 1962 TO 1981
 RSQ = 0.91646 CRSQ = 0.91182 F(1/18) = 197.461
 SER = 0.2492 SSR = 1.117 DW(0) = 1.73 COND(X) =
 12.06

COEF	VALUE	ST ER	T-STAT
C99A	-1.31799	0.33836	-3.89527
C99B	0.81780	0.05820	14.05200

120: EXPRCDS = C7A+C7B*EXCDSNT

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.84914 CRSQ = 0.84076

SER = 1.0883 SSR = 21.320

F(1/18) = 101.318

DW(0) = 1.05 COND(X) =

1.96

COEF	VALUE	ST ER	T-STAT
C7A	0.90882	0.30060	3.02337
C7B	0.20968	0.02083	10.06570

121: EXPREDS1 = C1A+C1B*EXEDSNT+C1C*D61.75*EXEDSNT

NOB = 17 NOVAR = 3

RANGE = 1965 TO 1981

RSQ = 0.98143 CRSQ = 0.97878

SER = 1.5340 SSR = 32.945

F(2/14) = 369.990

DW(0) = 1.80 COND(X) =

4.64

COEF	VALUE	ST ER	T-STAT
C1A	0.42666	0.89349	0.47752
C1B	0.05018	0.00503	9.97479
C1C	0.37105	0.01375	26.98410

122: EXPRSSS = C2A+C2B*EXSSS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.97794 CRSQ = 0.97671

SER = 2.0905 SSR = 78.666

F(1/18) = 797.781

DW(0) = 0.74 COND(X) =

2.62

COEF	VALUE	ST ER	T-STAT
C2A	1.50943	0.70182	2.15075
C2B	0.27429	0.00971	28.24500

123: EXPRUA = C32A+C32B*EXUA

NOB = 11 NOVAR = 2

RANGE = 1971 TO 1981

RSQ = 0.96844 CRSQ = 0.96493

SER = 6.8793 SSR = 425.920

3.61

F(1/9) = 276.161

DW(0) = 1.40 COND(X) =

COEF	VALUE	ST ER	T-STAT
C32A	-1.87910	4.03380	-0.46584
C32B	0.66334	0.03992	16.61810

124: EXPRHES = C3A+C3B*EXHES

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.96456 CRSQ = 0.96259

SER = 1.6653 SSR = 49.918

2.37

F(1/18) = 489.935

DW(0) = 1.05 COND(X) =

COEF	VALUE	ST ER	T-STAT
C3A	2.78220	0.51996	5.35074
C3B	0.24610	0.01112	22.13450

125: EXPRNRS = C4A+C4B*EXNRS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99589 CRSQ = 0.99567

SER = 1.2941 SSR = 30.143

2.57

F(1/18) = 4366.430

DW(0) = 0.75 COND(X) =

COEF	VALUE	ST ER	T-STAT
C4A	-1.66320	0.42822	-3.88402
C4B	0.67209	0.01017	66.07890

126: EXPRFFS = C5A+C5B*EXFFS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99484 CRSQ = 0.99455

SER = 0.4924 SSR = 4.363

2.41

F(1/18) = 3471.220

DW(0) = 1.51 COND(X) =

COEF	VALUE	ST ER	T-STAT
C5A	0.10673	0.15566	0.68568
C5B	0.59616	0.01012	58.91700

127: EXPRGGS = C8A+C8B*EXGGS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.95541 CRSQ = 0.95293

SER = 3.5722 SSR = 229.688

2.73

F(1/18) = 385.656

DW(0) = 0.87 COND(X) =

COEF	VALUE	ST ER	T-STAT
C8A	1.14384	1.23748	0.92433
C8B	0.45566	0.02320	19.63810

128: EXPRJUS = C6A+C6B*EXJUS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99766 CRSQ = 0.99753

SER = 1.0478 SSR = 19.763

2.66

F(1/18) = 7683.690

DW(0) = 0.62 COND(X) =

COEF	VALUE	ST ER	T-STAT
C6A	-0.75748	0.35603	-2.12758
C6B	0.64830	0.00740	87.65660

129: EXPRTS = C9A+C9B*EXTRS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.99855 CRSQ = 0.99847

F(1/18) = 1.24E+04

SER = 0.9717 SSR = 16.995
2.97

DW(0) = 0.85 COND(X) =

COEF	VALUE	ST ER	T-STAT
C9A	-0.62981	0.35909	-1.75393
C9B	0.55615	0.00499	111.37100

132: LOG(WSGS) = C55A+C55B*LOG(WSGSFY)+C55C*D75

NOB = 16 NOVAR = 3

RANGE = 1965 TO 1980

RSQ = 0.99791 CRSQ = 0.99759

F(2/13) = 3104.200

SER = 0.0335 SSR = 1.456E-02
15.49

DW(0) = 2.17 COND(X) =

COEF	VALUE	ST ER	T-STAT
C55A	0.16975	0.06303	2.69326
C55B	0.97856	0.01264	77.39190
C55C	0.04384	0.03509	1.24937

134: EXINREC = C17A+C17B*(EXOPS-RLT99)

NOB = 11 NOVAR = 2

RANGE = 1971 TO 1981

RSQ = 0.87016 CRSQ = 0.85573

F(1/9) = 60.316

SER = 14.4962 SSR = 1891.270
4.21

DW(0) = 1.88 COND(X) =

COEF	VALUE	ST ER	T-STAT
C17A	-10.97960	9.71360	-1.13033
C17B	0.11969	0.01541	7.76636

146: XXVHY = C41A+C41B*(EXHYCAP+EXHYCAP(-1))

NOB = 12 NOVAR = 2

RANGE = 1964 TO 1975

RSQ = 0.78763 CRSQ = 0.7664 F(1/10) = 37.088
 SER = 5.8369 SSR = 340.691 DW(0) = 1.47 COND(X) =
 6.91

COEF	VALUE	ST ER	T-STAT
C41A	-4.96533	5.94174	-0.83567
C41B	0.26113	0.04288	6.08998

147: XXVNHY = C42A+C42B*(EXNHYCP(-1)+EXSPCAP(-1)-EXCAPFR(-2)+EXNHYCP+EXSPCAP-EXCAPFR(-1))

NOB = 11 NOVAR = 2

RANGE = 1965 TO 1975

RSQ = 0.86994 CRSQ = 0.85549 F(1/9) = 60.201
 SER = 3.5535 SSR = 113.646 DW(0) = 1.94 COND(X) =
 3.69

COEF	VALUE	ST ER	T-STAT
C42A	0.92521	2.11974	0.43648
C42B	0.17196	0.02216	7.75893

177: LOG(LPTR1) = C57A+C57B*LOG(PI3(-1))+C57C*D71.00

NOB = 19 NOVAR = 3

RANGE = 1963 TO 1981

RSQ = 0.9973 CRSQ = 0.99696 F(2/16) = 2954.450
 SER = 0.0490 SSR = 3.844E-02 DW(0) = 2.40 COND(X) =
 45.64

COEF	VALUE	ST ER	T-STAT
C57A	-1.33620	0.20928	-6.38484
C57B	1.26857	0.03084	41.13980
C57C	0.04213	0.04169	1.01042

184: RLPT1 = C18A+C18B*LPTE

NOB = 19 NOVAR = 2

RANGE = 1963 TO 1981

RSQ = 0.99145 CRSQ = 0.99095

F(1/17) = 1971.900

SER = 6.1860 SSR = 650.535

DW(0) = 1.50

COND(X) =

2.73

COEF	VALUE	ST ER	T-STAT
C18A	-3.66471	2.19556	-1.66914
C18B	0.01566	3.52547E-04	44.40600

186: LOG(RLOT*1000/POP(-1)) = C31A+C31B*LOG(PI(-1)*1000/POP(-1))

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.98831 CRSQ = 0.98767

F(1/18) = 1522.330

SER = 0.0752 SSR = 0.102

DW(0) = 1.74

COND(X) =

32.26

COEF	VALUE	ST ER	T-STAT
C31A	-6.82373	0.27159	-25.12500
C31B	1.23627	0.03169	39.01640

188: RLTVS4 = C63A+C63B*RTVS

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.85998 CRSQ = 0.85221

F(1/18) = 110.557

SER = 0.2441 SSR = 1.073

DW(0) = 2.39

COND(X) =

2.92

COEF	VALUE	ST ER	T-STAT
C63A	-0.08847	0.08911	-0.99289
C63B	0.14450	0.01374	10.51460

199: RLTEF4 = C36A+C36F*D81.00+D71.00*C36B+BIU*C36C+C36D*ADMSD

NOB = 19 NOVAR = 5

RANGE = 1963 TO 1981

RSQ = 0.9957 CRSQ = 0.99448

F(4/14) = 811.379

SER = 5.1635 SSR = 373.270

DW(0) = 2.37 COND(X) =

33.96

COEF	VALUE	ST ER	T-STAT
C36A	-41.70790	13.12910	-3.17675
C36F	81.40210	7.04958	11.54710
C36B	-117.75300	9.80848	-12.00520
C36C	7.69046	0.40097	19.17960
C36D	0.98234	0.20856	4.71003

216: ELED1 = C11A+C11B*PI3(-1)

NOB = 17 NOVAR = 2

RANGE = 1965 TO 1981

RSQ = 0.8627 CRSQ = 0.85354

F(1/15) = 94.246

SER = 14.7509 SSR = 3263.850

DW(0) = 2.34 COND(X) =

3.52

COEF	VALUE	ST ER	T-STAT
C11A	-4.74734	6.80070	-0.69807
C11B	0.02493	0.00257	9.70803

218: ELBD = C14A+C14C*D61.77*GOBOND(-1)+C14B*GOBOND(-1)

NOB = 12 NOVAR = 3

RANGE = 1970 TO 1981

RSQ = 0.96021 CRSQ = 0.95137

SER = 11.4753 SSR = 1185.150

6.68

F(2/9) = 108.607

DW(0) = 2.52 COND(X) =

COEF	VALUE	ST ER	T-STAT
C14A	-0.88561	11.03360	-0.08026
C14C	-0.11048	0.02727	-4.05157
C14B	0.17366	0.01804	9.62580

219: ELNED1/PDRPI = C16A+C16E*D81.00+C16D*R.DPI8N(-1)+C16B*D71.00*R.DPI8N(-1)+C16C*WEALTH(-1)*POP(-1)

NOB = 17 NOVAR = 5

RANGE = 1965 TO 1981

RSQ = 0.98777 CRSQ = 0.98369

SER = 0.0559 SSR = 3.748E-02

69.85

F(4/12) = 242.263

DW(0) = 2.37 COND(X) =

COEF	VALUE	ST ER	T-STAT
C16A	0.07405	0.08404	0.88121
C16E	0.43367	0.06199	6.99545
C16D	-0.00132	3.58569E-04	-3.69483
C16B	3.07177E-04	7.31536E-05	4.19908
C16C	1.56779E-06	2.67099E-07	5.86969

225: ELEDGP = C15A+C15B*ELED

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.82638 CRSQ = 0.81674

SER = 16.3857 SSR = 4832.850

2.79

F(1/18) = 85.675

DW(0) = 1.13 COND(X) =

COEF	VALUE	ST ER	T-STAT
C15A	-8.30542	5.77502	-1.43816
C15B	0.29367	0.03173	9.25607

226: ELPERS = C12A+C12B*(EL99-ELEDGP-ELBD)

NOB = 20 NOVAR = 2

RANGE = 1962 TO 1981

RSQ = 0.98926 CRSQ = 0.98866

SER = 13.2365 SSR = 3153.680

2.61

F(1/18) = 1657.480

DW(0) = 2.91 COND(X) =

COEF	VALUE	ST ER	T-STAT
C12A	7.83103	4.42589	1.76937
C12B	0.52010	0.01278	40.71210

227: WSGL = C13A+C13C*DB1.00+C13B*(ELPERS+ELPERS(-1))

NOB = 18 NOVAR = 3

RANGE = 1963 TO 1980

RSQ = 0.99238 CRSQ = 0.99136

SER = 13.0148 SSR = 2540.770

1.0E+75

F(2/15) = 976.625

DW(0) = 1.82 COND(X) =

COEF	VALUE	ST ER	T-STAT
C13A	-8.31784	4.89396	-1.69961
C13C	0.00000	0.00000	0.00000
C13B	0.68222	0.01544	44.19560

232: FIDIR = C51A+C51B*(DPI+DPI(-1)+DPI(-2)+DPI(-3)+DPI(-4))

NOB = 16 NOVAR = 2

RANGE = 1965 TO 1980

RSQ = 0.9903 CRSQ = 0.98961

F(1/14) = 1429.870

SER = 15.8473 SSR = 3515.920

DW(0) = 1.03 COND(X) =

3.59

COEF	VALUE	ST ER	T-STAT
C51A	-48.48380	7.66457	-6.32570
C51B	0.03035	8.02538E-04	37.81360

234: FITRAN/PDRPI = C34A+C34B*POP+C34C*D61.72+EXTRNS/PDRPI

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.93435 CRSQ = 0.92663

F(2/17) = 120.979

SER = 0.1370 SSR = 0.319

DW(0) = 0.74 COND(X) =

30.57

COEF	VALUE	ST ER	T-STAT
C34A	0.19742	0.43778	0.45096
C34B	0.00296	0.00112	2.63731
C34C	-0.62931	0.13954	-4.50993

235: FIOLI = C44A+C44D*D61.75+C44B*(WS98-WSCNF)+C44C*WSCNF(-1)

NOB = 20 NOVAR = 4

RANGE = 1961 TO 1980

RSQ = 0.99191 CRSQ = 0.99039

F(3/16) = 653.632

SER = 9.9931 SSR = 1597.790

DW(0) = 2.14 COND(X) =

16.29

COEF	VALUE	ST ER	T-STAT
C44A	16.69900	17.34240	0.96290
C44D	-40.26620	13.24440	-3.04023
C44B	0.06371	0.00422	15.10940
C44C	0.03243	0.01169	2.77496

236: FISSC = C106A+C106B*(WS98-WSCNF)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.99259 CRSQ = 0.99218

F(1/18) = 2411.940

SER = 7.7477 SSR = 1080.480

DW(0) = 1.07

COND(X) =

3.20

COEF	VALUE	ST ER	T-STAT
C106A	-19.35340	3.03884	-6.36868
C106B	0.06951	0.00142	49.11140

237: PIPRO1*100/PDRPI = C45A+C45B*EMPRO1+C45C*D61.66+C45D*D79

NOB = 19 NOVAR = 4

RANGE = 1961 TO 1979

RSQ = 0.88532 CRSQ = 0.86239

F(3/15) = 38.601

SER = 5.0034 SSR = 375.508

DW(0) = 1.23

COND(X) =

11.40

COEF	VALUE	ST ER	T-STAT
C45A	9.03220	6.29946	1.43380
C45B	7.29399	0.92964	7.84607
C45C	18.76790	5.32460	3.52474
C45D	-21.79060	5.95788	-3.65745

246: PIRADJ*100/PDRPI = C103A+C103B*EMCNX1+C103C*EM97

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.98502 CRSQ = 0.98326

F(2/17) = 559.021

SER = 12.6270 SSR = 2710.510

DW(0) = 2.15

COND(X) =

6.78

COEF	VALUE	ST ER	T-STAT
C103A	-20.34940	8.55305	-2.37919
C103B	15.88470	0.72688	21.85320
C103C	0.71219	0.08147	8.74166

262: $XXCN8 = C54A + C54B * R.DPI8N + C54C * R.DPI8X + C54D * R.DPI8X(-1) + C54E * D64.65$

NOB = 19 NOVAR = 5

RANGE = 1962 TO 1980

RSQ = 0.96235 CRSQ = 0.95159

SER = 9.5354 SSR = 1272.930

8.72

F(4/14) = 89.453

DW(0) = 2.08 COND(X) =

COEF	VALUE	ST ER	T-STAT
C54A	20.30190	7.65963	2.65051
C54B	0.05847	0.00843	6.93728
C54C	0.20131	0.03229	6.23466
C54D	0.09886	0.03467	2.85108
C54E	11.61160	7.67436	1.51304

264: $LOG(EMCN1) = C56A + C56B * LOG(XXCN1)$

NOB = 21 NOVAR = 2

RANGE = 1961 TO 1981

RSQ = 0.95001 CRSQ = 0.94738

SER = 0.0903 SSR = 0.155

23.35

F(1/19) = 361.072

DW(0) = 0.47 COND(X) =

COEF	VALUE	ST ER	T-STAT
C56A	-2.32004	0.23045	-10.06740
C56B	0.94921	0.04995	19.00170

268: $\text{LOG}(\text{WRCNNF}/\text{PIRPI}) = \text{C59A} + \text{C59F} * \text{D.80DEC6} + \text{C59B} * \text{LOG}(\text{WEUS}/\text{PIUSCPI}) + \text{C59C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C59D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C59E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

NOB = 20 NOVAR = 6

RANGE = 1961 TO 1980

RSQ = 0.93976 CRSQ = 0.91825

SER = 0.0431 SSR = 2.602E-02

6.00

F(5/14) = 43.680

DW(0) = 1.38 COND(X) =

COEF	VALUE	ST ER	T-STAT
C59A	4.64174	0.01229	377.54500
C59F	0.28503	0.04745	6.00643
C59B	2.00986	0.24339	8.25779
C59C	2.67656	0.68143	3.92787
C59D	0.94968	0.93281	1.01808
C59E	1.43667	0.69160	2.07730

273: $\text{LOG}(\text{XXF9}) = \text{C52A} + \text{C52B} * \text{LOG}(\text{EMP9})$

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.89638 CRSQ = 0.89028

SER = 0.2534 SSR = 1.092

3.41

F(1/17) = 147.058

DW(0) = 0.80 COND(X) =

COEF	VALUE	ST ER	T-STAT
C52A	3.21093	0.10769	29.81700
C52B	1.28862	0.10626	12.12650

274: $\text{LOG}(\text{WRP9}/\text{PDRPI}) = \text{C53A} + \text{C53F} * \text{D.80DEC6} + \text{C53D} * \text{D61.76} + \text{C53B} * \text{LOG}(\text{WEUS}/\text{PDUSCFI}) + \text{C53C} * \text{LOG}(1 + \text{EMCNRT})$

NOB = 20 NOVAR = 5
 RANGE = 1961 TO 1980
 RSQ = 0.95288 CRSQ = 0.94032 F(4/15) = 75.835
 SER = 0.0546 SSR = 4.480E-02 DW(0) = 1.53 COND(X) = 5.92

COEF	VALUE	ST ER	T-STAT
C53A	4.79210	0.03468	138.17800
C53F	0.32028	0.06966	4.59761
C53D	-0.27254	0.03549	-7.67849
C53B	3.05381	0.31010	9.84789
C53C	3.83615	0.48142	7.96847

276: $\text{EMMO} = \text{C60A} + \text{C60B} * \text{R.DFI8N} + \text{C60C} * \text{D61.77}$

NOB = 20 NOVAR = 3
 RANGE = 1961 TO 1980
 RSQ = 0.98062 CRSQ = 0.97834 F(2/17) = 430.081
 SER = 0.0926 SSR = 0.146 DW(0) = 0.70 COND(X) = 10.73

COEF	VALUE	ST ER	T-STAT
C60A	0.91741	0.10770	8.51843
C60B	0.00122	6.69159E-05	18.16440
C60C	-0.63048	0.06982	-9.03053

278: $\text{LOG}(\text{XXM91}) = \text{C61A} + \text{C61B} * \text{LOG}(\text{EMM91})$

NOB = 19 NOVAR = 2
 RANGE = 1961 TO 1979
 RSQ = 0.88816 CRSQ = 0.88158 F(1/17) = 135.004
 SER = 0.1177 SSR = 0.235 DW(0) = 0.92 COND(X) = 15.57

COEF	VALUE	ST ER	T-STAT
C61A	2.32730	0.21101	11.02960
C61B	1.18434	0.10193	11.61860

282: $\text{LOG}(\text{WRM9A9}/\text{PDRFI}) = \text{C62A} + \text{C62F} * \text{D.80DEC6} + \text{C62B} * \text{LOG}(\text{WEUS}/\text{PDUSCFI}) + \text{C62C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C62D} * \text{LOG}(1 + \text{EMCNRT}(-1))$

NDB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.81971 CRSQ = 0.77163

F(4/15) = 17.050

SER = 0.0421 SSR = 2.663E-02

DW(0) = 1.50

COND(X) =

2.97

COEF	VALUE	ST ER	T-STAT
C62A	4.13658	0.01161	356.33400
C62F	0.15724	0.04638	3.39060
C62B	1.57290	0.23340	6.73918
C62C	0.90165	0.51283	1.75817
C62D	0.70681	0.51625	1.36914

287: $\text{XXTNT} = \text{C64A} + \text{C64B} * \text{R.DFI8X} + \text{C64D} * \text{R.DFI8X} * \text{R.DFI8X}(-1) + \text{C64C} * \text{R.DFI8N} + \text{C64E} * \text{D71.73}$

NDB = 19 NOVAR = 5

RANGE = 1962 TO 1980

RSQ = 0.99452 CRSQ = 0.99295

F(4/14) = 634.976

SER = 4.4006 SSR = 271.116

DW(0) = 2.39

COND(X) =

7.46

COEF	VALUE	ST ER	T-STAT
C64A	3.83502	3.02693	1.26696
C64B	0.20420	0.02259	9.03747
C64D	-6.32537E-04	9.93881E-05	-6.36431
C64C	0.12550	0.00335	37.48510
C64E	-12.31880	2.83003	-4.35288

288: LOG(EMTNT) = C65A+C65B*LOG(XXTNT)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.98902 CRSQ = 0.98841

SER = 0.0368 SSR = 2.438E-02

21.86

F(1/18) = 1621.080

DW(0) = 0.93 COND(X) =

COEF	VALUE	ST ER	T-STAT
C65A	-1.78308	0.09015	-19.77980
C65B	0.77175	0.01917	40.26220

293: LOG(WRT9/PDRPI) = C66A+C66F*D.80DEC6+C66D*D61.76+C66B*LOG(WEUS/
PIUSCPI)+C66C*LOG(1+EMCNRT)+C66E*LOG(1+EMCNRT(-1))

NOB = 20 NOVAR = 6

RANGE = 1961 TO 1980

RSQ = 0.96202 CRSQ = 0.94846

SER = 0.0438 SSR = 2.680E-02

8.85

F(5/14) = 70.923

DW(0) = 1.99 COND(X) =

COEF	VALUE	ST ER	T-STAT
C66A	4.37672	0.03632	120.51600
C66F	0.14883	0.06076	2.44942
C66D	-0.25390	0.03755	-6.76150
C66B	1.79364	0.24866	7.21334
C66C	5.75206	0.63002	9.12999
C66E	-0.89740	0.70836	-1.26688

295: $XXCM = C68A + C68B * R.DPI8N(-1) + C68C * D61.74 + C68D * WEALTH(-1) * POP(-1)$

NOB = 16 NOVAR = 4

RANGE = 1965 TO 1980

RSQ = 0.98863 CRSQ = 0.98579

F(3/12) = 347.875

SER = 6.5512 SSR = 515.018

DW(0) = 1.68 COND(X) =

57.55

COEF	VALUE	ST ER	T-STAT
C68A	41.17560	15.84540	2.59858
C68B	-0.12347	0.03746	-3.29566
C68C	-30.74570	8.13001	-3.78175
C68D	1.98004E-04	3.12176E-05	6.34269

296: $LOG(EMCM) = C69A + C69B * LOG(XXCM)$

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.95761 CRSQ = 0.95525

F(1/18) = 406.583

SER = 0.0696 SSR = 8.708E-02

DW(0) = 0.66 COND(X) =

18.67

COEF	VALUE	ST ER	T-STAT
C69A	-1.99105	0.14562	-13.67290
C69B	0.65356	0.03241	20.16380

297: $LOG(WRCMPU/PDRPI) = C70A + C70F * D.80DEC6 + C70B * LOG(WEUS/PDUSCPI) + C70C * LOG(1+EMCNRT(-2)) + C70D * LOG(1+EMCNRT(-1))$

NOB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.77282 CRSQ = 0.71224

F(4/15) = 12.757

SER = 0.0479 SSR = 3.444E-02

DW(0) = 1.65 COND(X) =

3.02

COEF	VALUE	ST ER	T-STAT
C70A	4.53206	0.01306	347.01400
C70F	0.17780	0.05268	3.37538
C70B	0.72318	0.26940	2.68445
C70C	1.22075	0.59194	2.06229
C70D	1.43879	0.58295	2.46813

299: $XXFU = C72A + C72B * R.DPI8N(-1) + C72C * R.DPI8X + C72D * R.DPI8N(-2)$

NOB = 18 NOVAR = 4

RANGE = 1963 TO 1980

RSQ = 0.99072 CRSQ = 0.98873

F(3/14) = 497.984

SER = 1.4839 SSR = 30.828

DW(0) = 2.67 COND(X) =

49.68

COEF	VALUE	ST ER	T-STAT
C72A	3.76867	1.07636	3.50130
C72B	0.01123	0.00744	1.50922
C72C	0.01374	0.00599	2.29492
C72D	0.02553	0.00705	3.61830

300: $\text{LOG}(EMPV) = C73A + C73C * \text{PIPE}(-1) + C73B * \text{LOG}(XXFU)$

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.9914 CRSQ = 0.99039

F(2/17) = 979.867

SER = 0.0366 SSR = 2.274E-02

DW(0) = 1.62 COND(X) =

16.58

COEF	VALUE	ST ER	T-STAT
C73A	-3.01609	0.06610	-45.62580
C73C	-0.04871	0.03876	-1.25677
C73B	0.83004	0.01923	43.15370

301: $\text{LOG}(WRMPV/FDRPI) = C74A + C74F * D.80DEC6 + C74B * \text{LOG}(WEUS/FDUSCPI) + C74C * \text{LOG}(1 + EMCNRT(-2)) + C74D * \text{LOG}(1 + EMCNRT(-1))$

NOB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.77282 CRSQ = 0.71224

F(4/15) = 12.757

SER = 0.0479 SSR = 3.444E-02

DW(0) = 1.65 COND(X) =

3.02

COEF	VALUE	ST ER	T-STAT
C74A	4.53206	0.01306	347.01400
C74F	0.17780	0.05268	3.37538
C74B	0.72318	0.26940	2.68445
C74C	1.22075	0.59194	2.06229
C74D	1.43879	0.58295	2.46813

303: $XXIDW = C71A + C71B * R.DPI8N + C71C * R.DPI8X + C71D * R.DPI8X(-1) * R.DPI8X + C71E * WEALTH(-1) * POP(-1)$

NOB = 16 NOVAR = 5

RANGE = 1965 TO 1980

RSQ = 0.99494 CRSQ = 0.9931

F(4/11) = 540.533

SER = 2.6783 SSR = 78.907

DW(0) = 1.40 COND(X) =

63.22

COEF	VALUE	ST ER	T-STAT
C71A	-4.27825	3.93849	-1.08627
C71B	0.01682	0.01623	1.03628
C71C	0.14847	0.02288	6.48977
C71D	-2.95076E-04	6.45149E-05	-4.57376
C71E	5.26814E-05	1.19548E-05	4.40671

304: $XXDRNT = C76A + C76B * R.DPI8N + C76C * R.DPI8X + C76D * R.DPI8N(-1) + C76E * R.DPI8X(-1)$

NOB = 19 NOVAR = 5

RANGE = 1962 TO 1980

RSQ = 0.99701 CRSQ = 0.99616

F(4/14) = 1167.510

SER = 3.7780 SSR = 199.828

DW(0) = 2.91 COND(X) =

62.81

COEF	VALUE	ST ER	T-STAT
C76A	-8.12942	2.98554	-2.72293
C76B	0.06973	0.02099	3.32245
C76C	0.07878	0.02108	3.73662
C76D	0.09790	0.02020	4.84584
C76E	-0.09266	0.01603	-5.78080

305: LOG(EMDW) = C77A+C77B*LOG(XXIW)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.99722 CRSQ = 0.99707

SER = 0.0266 SSR = 1.278E-02

14.68

F(1/18) = 6467.990

DW(0) = 0.46 COND(X) =

COEF	VALUE	ST ER	T-STAT
C77A	-2.35546	0.04393	-53.61710
C77B	0.87700	0.01090	80.42340

306: LOG(EMDRNT) = C75A+C75B*LOG(XXDRNT)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.99744 CRSQ = 0.9973

SER = 0.0239 SSR = 1.032E-02

21.68

F(1/18) = 7017.800

DW(0) = 1.28 COND(X) =

COEF	VALUE	ST ER	T-STAT
C75A	-2.37192	0.05817	-40.77430
C75B	1.00465	0.01199	83.77210

308: $\text{LOG}(\text{WRDW}/\text{PDRPI}) = \text{C78A} + \text{C78F} * \text{D.80DEC6} + \text{C78B} * \text{LOG}(\text{WEUS}/\text{PDUSCFI}) + \text{C78C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C78D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C78E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

NOB = 20 NOVAR = 6

RANGE = 1961 TO 1980

RSQ = 0.87863 CRSQ = 0.83528

F(5/14) = 20.269

SER = 0.0275 SSR = 1.058E-02

DW(0) = 1.68 COND(X) =

6.00

COEF	VALUE	ST ER	T-STAT
C78A	4.34562	0.00784	554.30800
C78F	0.07522	0.03026	2.48574
C78B	0.72197	0.15520	4.65192
C78C	1.69244	0.43452	3.89499
C78D	0.14758	0.59482	0.24812
C78E	0.58088	0.44101	1.31715

309: $\text{LOG}(\text{WRDR}/\text{PDRPI}) = \text{C79A} + \text{C79F} * \text{D.80DEC6} + \text{C79B} * \text{LOG}(\text{WEUS}/\text{PDUSCFI}) + (\text{C79D}) * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C79E} * \text{LOG}(1 + \text{EMCNRT}(-2))$

NOB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.6895 CRSQ = 0.6067

F(4/15) = 8.327

SER = 0.0273 SSR = 1.122E-02

DW(0) = 2.28 COND(X) =

3.02

COEF	VALUE	ST ER	T-STAT
C79A	3.83950	0.00745	515.09800
C79F	-0.04314	0.03006	-1.43510
C79B	0.61019	0.15376	3.96855
C79D	0.96035	0.33271	2.88643
C79E	-0.91468	0.33784	-2.70742

316: $XXFI = C80A + C80C * D71.73 + C80B * WEALTH(-1) * POP(-1)$

NOB = 16 NOVAR = 3

RANGE = 1965 TO 1980

RSQ = 0.9941 CRSQ = 0.9932

SER = 8.4999 SSR = 939.228

5.85

F(2/13) = 1096.090

DW(0) = 1.24 COND(X) =

COEF	VALUE	ST ER	T-STAT
C80A	-50.15230	6.16004	-8.14155
C80C	-15.88940	5.53236	-2.87209
C80B	2.41737E-04	5.31543E-06	45.47830

317: $LOG(EMFI) = C81A + C81B * LOG(XXFI)$

NOB = 21 NOVAR = 2

RANGE = 1961 TO 1981

RSQ = 0.99604 CRSQ = 0.99583

SER = 0.0386 SSR = 2.826E-02

17.03

F(1/19) = 4773.880

DW(0) = 0.60 COND(X) =

COEF	VALUE	ST ER	T-STAT
C81A	-3.62853	0.07190	-50.46620
C81B	0.98204	0.01421	69.09300

318: $LOG(WRFI/PDRFI) = C82A + C82F * D.80DEC6 + C82B * LOG(WEUS/PIUSCFI) + C82C * LOG(1+EMCNR) + C82C * LOG(1+EMCNR(-1))$

NOB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.94077 CRSQ = 0.92498

SER = 0.0253 SSR = 9.630E-03

2.97

F(4/15) = 59.567

DW(0) = 1.57 COND(X) =

COEF	VALUE	ST ER	T-STAT
C82A	3.97093	0.00698	568.82900
C82F	0.19859	0.02789	7.12106
C82B	1.89818	0.14035	13.52440
C82D	0.60491	0.30839	1.96150
C82C	0.75790	0.31045	2.44133

320: XXSBNT = C84A+C84B*R.DPI8N+C84C*R.DPI8X(-1)+C84D*WEALTH(-1)*POP(-1)

NOB = 16 NOVAR = 4

RANGE = 1965 TO 1980

RSQ = 0.99276 CRSQ = 0.99095

SER = 5.0981 SSR = 311.890

30.09

F(3/12) = 548.673

DW(0) = 2.13 COND(X) =

COEF	VALUE	ST ER	T-STAT
C84A	-26.91120	5.30315	-5.07457
C84B	0.04680	0.01557	3.00657
C84C	-0.05933	0.01786	-3.32122
C84D	9.73265E-05	1.17353E-05	8.29346

321: XXSB = C83A+(+C83C)*R.DPI8X+C83D*R.DPI8X(-1)+C83E*WEALTH(-1)*POP(-1)

NOB = 16 NOVAR = 4

RANGE = 1965 TO 1980

RSQ = 0.97912 CRSQ = 0.97391

SER = 4.2878 SSR = 220.627

7.28

F(3/12) = 187.610

DW(0) = 2.19 COND(X) =

COEF	VALUE	ST ER	T-STAT
C83A	-4.91663	3.15771	-1.55702
C83C	0.13914	0.01415	9.83411
C83D	0.03976	0.01584	2.51112
C83E	3.43157E-05	3.11547E-06	11.01460

322: LOG(EMSBNT) = C85A+C85B*LOG(XXSBNT)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.99834 CRSQ = 0.99825

SER = 0.0228 SSR = 9.376E-03

17.17

F(1/18) = 1.08E+04

DW(0) = 0.98 COND(X) =

COEF	VALUE	ST ER	T-STAT
C85A	-2.27710	0.04397	-51.78730
C85B	1.00835	0.00969	104.04200

323: LOG(EMSB) = C87A+C87B*LOG(XXSB)

NOB = 20 NOVAR = 2

RANGE = 1961 TO 1980

RSQ = 0.9989 CRSQ = 0.99884

SER = 0.0250 SSR = 1.128E-02

9.24

F(1/18) = 1.64E+04

DW(0) = 0.76 COND(X) =

COEF	VALUE	ST ER	T-STAT
C87A	-2.41837	0.02617	-92.42570
C87B	1.00842	0.00788	128.03700

324: LOG(WRSNB/PDRPI) = C86A+C86F*D.80DEC6+C86B*LOG(WEUS/PDUSCPI)+
C86C*LOG(1+EMCNRT)+C86D*LOG(1+EMCNRT(-1))+C86E*LOG(1+EMCNRT(-2))

NOB = 20 NOVAR = 6

RANGE = 1961 TO 1980

RSQ = 0.83956 CRSQ = 0.78226

SER = 0.0600 SSR = 5.033E-02

6.00

F(5/14) = 14.652

DW(0) = 0.86 COND(X) =

COEF	VALUE	ST ER	T-STAT
C86A	3.77964	0.01710	221.02400
C86F	0.22935	0.06600	3.47475
C86B	1.36430	0.33853	4.03004
C86C	2.78304	0.94780	2.93630
C86D	-0.23809	1.29746	-0.18350
C86E	2.13938	0.96196	2.22398

325: $\text{LOG}(\text{WRSB}/\text{FDRFI}) = \text{C88A} + \text{C88F} * \text{D.80DEC6} + \text{C88E} * \text{D61.70} + \text{C88B} * \text{LOG}(\text{WEUS}/\text{PDUSCFI}) + \text{C88C} * \text{LOG}(1 + \text{EMCNRT}) + \text{C88D} * \text{LOG}(1 + \text{EMCNRT}(-1)) + \text{C88G} * \text{LOG}(1 + \text{EMCNRT}(-2))$

NOB = 20 NOVAR = 7

RANGE = 1961 TO 1980

RSQ = 0.95023 CRSQ = 0.92727

SER = 0.0632 SSR = 5.193E-02

8.95

F(6/13) = 41.371

DW(0) = 1.92 COND(X) =

COEF	VALUE	ST ER	T-STAT
C88A	3.89635	0.04859	80.18010
C88F	0.21638	0.09348	2.31476
C88E	0.24418	0.05403	4.51911
C88B	0.67850	0.49601	1.36792
C88C	9.34441	1.21868	7.66762
C88D	-0.24398	1.44964	-0.16830
C88G	4.52672	1.17680	3.84664

334: $\text{LOG}(\text{XXGF}) = \text{C101A} + \text{C101B} * \text{LOG}(\text{EMGF})$

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.16241 CRSQ = 0.11314

SER = 0.0312 SSR = 1.656E-02

103.99

F(1/17) = 3.296

DW(0) = 0.49 COND(X)

COEF	VALUE	ST ER	T-STAT
C101A	5.58779	0.37237	15.00610
C101B	0.16273	0.09690	1.67945

335: LOG(WRGC/PDRPI) = C89A+LOG(WEUS/PDUSCFI)

NOB = 20 NOVAR = 1
 RANGE = 1961 TO 1980
 RSQ = 0.44462 CRSQ = 0.44462 F(0/19) = 15.211
 SER = 0.0853 SSR = 0.138 DW(0) = 0.22 COND(X) =
 1.00

COEF	VALUE	ST ER	T-STAT
C89A	4.14408	0.01907	217.32900

341: LOG(WRGS/PDRPI) = C92A+C92F*D.80DEC6+C92B*LOG(WEUS/PDUSCFI)+C92C
 *D61.73

NOB = 20 NOVAR = 4
 RANGE = 1961 TO 1980
 RSQ = 0.94424 CRSQ = 0.93378 F(3/16) = 90.312
 SER = 0.0473 SSR = 3.582E-02 DW(0) = 1.06 COND(X) =
 3.90

COEF	VALUE	ST ER	T-STAT
C92A	4.28374	0.02172	197.22500
C92F	0.29925	0.05622	5.32240
C92B	2.40477	0.26893	8.94205
C92C	-0.23483	0.02418	-9.70994

343: LOG(WRGL/PDRPI) = C102A+C102F*D.80DEC6+C102D*D61.69+C102C*LOG(1+
 EMCNRT)+C102B*LOG(WEUS/PDUSCFI)

NOB = 20 NOVAR = 5
 RANGE = 1961 TO 1980
 RSQ = 0.94901 CRSQ = 0.93542 F(4/15) = 69.798
 SER = 0.0353 SSR = 1.867E-02 DW(0) = 1.87 COND(X) =
 5.02

COEF	VALUE	ST ER	T-STAT
C102A	4.09380	0.02027	201.93100
C102F	0.24326	0.04742	5.12951
C102D	-0.08986	0.02486	-3.61516
C102C	1.68094	0.36066	4.66074
C102B	1.95194	0.26951	7.24264

348: LOG(XXGA) = C104A+C104B*LOG(EMGA)

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.99634 CRSQ = 0.99613

SER = 0.0281 SSR = 1.339E-02

12.91

F(1/17) = 4631.660

DW(0) = 1.95 COND(X) =

COEF	VALUE	ST ER	T-STAT
C104A	2.28334	0.04182	54.59890
C104B	0.96757	0.01422	68.05550

350: XXA9 = C90A+C90B*(EMA9+EMPROFIS)

NOB = 19 NOVAR = 2

RANGE = 1961 TO 1979

RSQ = 0.88599 CRSQ = 0.87929

SER = 5.1414 SSR = 449.375

10.16

F(1/17) = 132.115

DW(0) = 2.13 COND(X) =

COEF	VALUE	ST ER	T-STAT
C90A	-43.64550	6.05120	-7.21269
C90B	13.92170	1.21120	11.49410

351: LOG(WRM9A9/PDRPI) = C95A+C95F*D.80DEC6+C95B*LOG(WEUS/PIDUSCFI)+
C95C*LOG(1+EMCNRT)+C95D*LOG(1+EMCNRT(-1))

NOB = 20 NOVAR = 5

RANGE = 1961 TO 1980

RSQ = 0.81971 CRSQ = 0.77163

SER = 0.0421 SSR = 2.663E-02

2.97

F(4/15) = 17.050

DW(0) = 1.50 COND(X) =

COEF	VALUE	ST ER	T-STAT
C95A	4.13658	0.01161	356.33400
C95F	0.15724	0.04638	3.39060
C95B	1.57290	0.23340	6.73918
C95C	0.90165	0.51283	1.75817
C95D	0.70681	0.51625	1.36914

359: LOG(EMPRD1) = C100A+C100C*D61.66+C100B*LOG(EM98)

NOB = 20 NOVAR = 3

RANGE = 1961 TO 1980

RSQ = 0.94547 CRSQ = 0.93906

SER = 0.1937 SSR = 0.638

F(2/17) = 147.382

DW(0) = 0.81 COND(X) =

59.08

COEF	VALUE	ST ER	T-STAT
C100A	-4.35555	1.18255	-3.68318
C100C	-0.99303	0.14017	-7.08426
C100B	1.25095	0.23555	5.31071

APPENDIX I
MAP REGIONALIZATION MODEL LISTING

(Including Parameters)

MODEL: A83.CD

PURPOSE: This model allocates statewide projections of population, employment, and households from the MAP economic model to the census division level.

DATE: May 2, 1983

SYMBOLS:

ENDOGENOUS:

M.01 M.02 M.03 M.04 M.05 M.06 M.07 M.08 M.09 M.10 M.11
M.12 M.13 M.14 M.15 M.16 M.17 M.18 M.19 M.20 M.21 M.22
M.23 M.24 M.25 M.26 M.27 M.28 M.29 PCEN.06

CONSTRUCT:

ADJ B.AG B.AM B.FG B.NR B.RB B.ST BAG BAM BFG BNR BRB
BST G.AG G.AM G.FG G.NR G.RB G.ST GAG GAM GFG GNR GRB
GST M.AG M.AM M.FG M.NR M.RB M.ST P.AG P.AM P.FG P.NR
P.RB P.ST P.01 P.02 P.03 P.04 P.05 P.06 P.07 P.08 P.09
P.10 P.11 P.12 P.13 P.14 P.15 P.16 P.17 P.18 P.19 P.20
P.21 P.22 P.23 P.24 P.25 P.26 P.27 P.28 P.29 PCEN.01
PCEN.02 PCEN.03 PCEN.04 PCEN.05 PCEN.07 PCEN.08 PCEN.09
PCEN.10 PCEN.11 PCEN.12 PCEN.13 PCEN.14 PCEN.15 PCEN.16
PCEN.17 PCEN.18 PCEN.19 PCEN.20 PCEN.21 PCEN.22 PCEN.23
PRE.ST PRE.01 PRE.02 PRE.03 PRE.04 PRE.05 PRE.06 PRE.07
PRE.08 PRE.09 PRE.10 PRE.11 PRE.12 PRE.13 PRE.14 PRE.15
PRE.16 PRE.17 PRE.18 PRE.19 PRE.20 PRE.21 PRE.22 PRE.23
PRE.24 PRE.25 PRE.26 PRE.27 PRE.28 PRE.29 S.AG S.AM S.FG
S.NR S.RB S.ST

DEFINITION:

ADJHH B.IR G.IR HH.AG HH.AM HH.FG HH.IR HHCEN.ST HHCEN.01
HHCEN.02 HHCEN.03 HHCEN.04 HHCEN.05 HHCEN.06 HHCEN.07
HHCEN.08 HHCEN.09 HHCEN.10 HHCEN.11 HHCEN.12 HHCEN.13
HHCEN.14 HHCEN.15 HHCEN.16 HHCEN.17 HHCEN.18 HHCEN.19
HHCEN.20 HHCEN.21 HHCEN.22 HHCEN.23 HPRE.ST HPRE.01 HPRE.02
HPRE.03 HPRE.04 HPRE.05 HPRE.06 HPRE.07 HPRE.08 HPRE.09
HPRE.10 HPRE.11 HPRE.12 HPRE.13 HPRE.14 HPRE.15 HPRE.16
HPRE.17 HPRE.18 HPRE.19 HPRE.20 HPRE.21 HPRE.22 HPRE.23 M.IR

P.IR S.IR S.01 S.01.01 S.01.02 S.01.03 S.01.04 S.01.05
S.01.06 S.01.07 S.01.08 S.01.09 S.01.10 S.01.11 S.01.12
S.01.13 S.01.14 S.01.15 S.01.16 S.01.17 S.01.18 S.01.19
S.01.20 S.01.21 S.01.22 S.01.23 S.01.24 S.01.25 S.01.26
S.01.27 S.01.28 S.01.29 S.02 S.02.01 S.02.02

S.28.28 S.28.29 S.29 S.29.01 S.29.02 S.29.03 S.29.04 S.29.05
S.29.06 S.29.07 S.29.08 S.29.09 S.29.10 S.29.11 S.29.12
S.29.13 S.29.14 S.29.15 S.29.16 S.29.17 S.29.18 S.29.19
S.29.20 S.29.21 S.29.22 S.29.23 S.29.24 S.29.25 S.29.26
S.29.27 S.29.28 S.29.29

EXOGENOUS:

B.01 B.02 B.04 B.05 B.06 B.08 B.09 B.11 B.12 B.14 B.15
B.16 B.17 B.18 B.21 B.24 B.25 B.26 B.27 B.29 BETA B01
B02 B04 B05 B06 B08 B09 B11 B12 B14 B15 B16 B17 B18
B21 B24 B25 B26 B27 B29 G.01 G.02 G.04 G.05 G.06 G.08
G.09 G.11 G.12 G.14 G.15 G.16 G.17 G.18 G.21 G.24 G.25
G.26 G.27 G.29 G01 G02 G04 G05 G06 G08 G09 G11 G12 G14
G15 G16 G17 G18 G21 G24 G25 G26 G27 G29 HH POP

PARAMETER:

A.01.01 A.01.02 A.01.03 A.01.04 A.01.05 A.01.06 A.01.07
A.01.08 A.01.09 A.01.10 A.01.11 A.01.12 A.01.13 A.01.14
A.01.15 A.01.16 A.01.17 A.01.18 A.01.19 A.01.20 A.01.21
A.01.22 A.01.23 A.01.24 A.01.25 A.01.26 A.01.27 A.01.28
A.01.29 A.02.01 A.02.02

A.28.29 A.29.01 A.29.02 A.29.03 A.29.04 A.29.05 A.29.06
A.29.07 A.29.08 A.29.09 A.29.10 A.29.11 A.29.12 A.29.13
A.29.14 A.29.15 A.29.16 A.29.17 A.29.18 A.29.19 A.29.20
A.29.21 A.29.22 A.29.23 A.29.24 A.29.25 A.29.26 A.29.27
A.29.28 A.29.29 B.03 B.07 B.10 B.13 B.19 B.20 B.22 B.23
B.28 B03 B07 B10 B13 B19 B20 B22 B23 B28 G.03 G.07 G.10
G.13 G.19 G.20 G.22 G.23 G.28 G03 G07 G10 G13 G19 G20
G22 G23 G28 HHSZ.01 HHSZ.02 HHSZ.03 HHSZ.04 HHSZ.05 HHSZ.06
HHSZ.07 HHSZ.08 HHSZ.09 HHSZ.10 HHSZ.11 HHSZ.12 HHSZ.13
HHSZ.14 HHSZ.15 HHSZ.16 HHSZ.17 HHSZ.18 HHSZ.19 HHSZ.20
HHSZ.21 HHSZ.22 HHSZ.23 IM.01.01 IM.01.02 IM.01.03 IM.01.04
IM.01.05 IM.01.06 IM.01.07 IM.01.08 IM.01.09 IM.01.10
IM.01.11 IM.01.12 IM.01.13 IM.01.14 IM.01.15 IM.01.16

IM.01.17 IM.01.18 IM.01.19 IM.01.20 IM.01.21 IM.01.22
IM.01.23 IM.01.24 IM.01.25 IM.01.26 IM.01.27 IM.01.28
IM.01.29 IM.02.01 IM.02.02

IM.28.28 IM.28.29 IM.29.01 IM.29.02 IM.29.03 IM.29.04
IM.29.05 IM.29.06 IM.29.07 IM.29.08 IM.29.09 IM.29.10
IM.29.11 IM.29.12 IM.29.13 IM.29.14 IM.29.15 IM.29.16
IM.29.17 IM.29.18 IM.29.19 IM.29.20 IM.29.21 IM.29.22
IM.29.23 IM.29.24 IM.29.25 IM.29.26 IM.29.27 IM.29.28
IM.29.29 PC.04.16 PC.04.25 PC.06.25 PC.08.16
PGQ.01 PGQ.02 PGQ.03 PGQ.04 PGQ.05 PGQ.06 PGQ.07
PGQ.08 PGQ.09 PGQ.10 PGQ.11 PGQ.12 PGQ.13 PGQ.14 PGQ.15
PGQ.16 PGQ.17 PGQ.18 PGQ.19 PGQ.20 PGQ.21 PGQ.22 PGQ.23
PM.01 PM.02 PM.03 PM.04 PM.05 PM.06 PM.07 PM.08 PM.09
PM.10 PM.11 PM.12 PM.13 PM.14 PM.15 PM.16 PM.17 PM.18
PM.19 PM.20 PM.21 PM.22 PM.23 PM.24 PM.25 PM.26 PM.27
PM.28 PM.29

EQUATIONS:

Total Employment (M.aa) in region aa

1:
$$\begin{aligned} M.01 = & (A.01.01*M.01+A.01.02*M.02+A.01.03*M.03+A.01.04* \\ & M.04+A.01.05*M.05+A.01.06*M.06+A.01.07*M.07+A.01.08*M.08 \\ & +A.01.09*M.09+A.01.10*M.10+A.01.11*M.11+A.01.12*M.12+ \\ & A.01.13*M.13+A.01.14*M.14+A.01.15*M.15+A.01.16*M.16+ \\ & A.01.17*M.17+A.01.18*M.18+A.01.19*M.19+A.01.20*M.20+ \\ & A.01.21*M.21+A.01.22*M.22+A.01.23*M.23+A.01.24*M.24+ \\ & A.01.25*M.25+A.01.26*M.26+A.01.27*M.27+A.01.28*M.28+ \\ & A.01.29*M.29)*BETA+B.01+G.01 \end{aligned}$$

2:
$$\begin{aligned} M.02 = & (A.02.01*M.01+A.02.02*M.02+A.02.03*M.03+A.02.04* \\ & M.04+A.02.05*M.05+A.02.06*M.06+A.02.07*M.07+A.02.08*M.08 \\ & +A.02.09*M.09+A.02.10*M.10+A.02.11*M.11+A.02.12*M.12+ \\ & A.02.13*M.13+A.02.14*M.14+A.02.15*M.15+A.02.16*M.16+ \\ & A.02.17*M.17+A.02.18*M.18+A.02.19*M.19+A.02.20*M.20+ \\ & A.02.21*M.21+A.02.22*M.22+A.02.23*M.23+A.02.24*M.24+ \\ & A.02.25*M.25+A.02.26*M.26+A.02.27*M.27+A.02.28*M.28+ \\ & A.02.29*M.29)*BETA+B.02+G.02 \end{aligned}$$

- 3:
$$\begin{aligned} M.03 = & (A.03.01*M.01+A.03.02*M.02+A.03.03*M.03+A.03.04* \\ & M.04+A.03.05*M.05+A.03.06*M.06+A.03.07*M.07+A.03.08*M.08 \\ & +A.03.09*M.09+A.03.10*M.10+A.03.11*M.11+A.03.12*M.12+ \\ & A.03.13*M.13+A.03.14*M.14+A.03.15*M.15+A.03.16*M.16+ \\ & A.03.17*M.17+A.03.18*M.18+A.03.19*M.19+A.03.20*M.20+ \\ & A.03.21*M.21+A.03.22*M.22+A.03.23*M.23+A.03.24*M.24+ \\ & A.03.25*M.25+A.03.26*M.26+A.03.27*M.27+A.03.28*M.28+ \\ & A.03.29*M.29)*BETA+B.03+G.03 \end{aligned}$$
- 4:
$$\begin{aligned} M.04 = & (A.04.01*M.01+A.04.02*M.02+A.04.03*M.03+A.04.04* \\ & M.04+A.04.05*M.05+A.04.06*M.06+A.04.07*M.07+A.04.08*M.08 \\ & +A.04.09*M.09+A.04.10*M.10+A.04.11*M.11+A.04.12*M.12+ \\ & A.04.13*M.13+A.04.14*M.14+A.04.15*M.15+A.04.16*M.16+ \\ & A.04.17*M.17+A.04.18*M.18+A.04.19*M.19+A.04.20*M.20+ \\ & A.04.21*M.21+A.04.22*M.22+A.04.23*M.23+A.04.24*M.24+ \\ & A.04.25*M.25+A.04.26*M.26+A.04.27*M.27+A.04.28*M.28+ \\ & A.04.29*M.29)*BETA+B.04+G.04 \end{aligned}$$
- 5:
$$\begin{aligned} M.05 = & (A.05.01*M.01+A.05.02*M.02+A.05.03*M.03+A.05.04* \\ & M.04+A.05.05*M.05+A.05.06*M.06+A.05.07*M.07+A.05.08*M.08 \\ & +A.05.09*M.09+A.05.10*M.10+A.05.11*M.11+A.05.12*M.12+ \\ & A.05.13*M.13+A.05.14*M.14+A.05.15*M.15+A.05.16*M.16+ \\ & A.05.17*M.17+A.05.18*M.18+A.05.19*M.19+A.05.20*M.20+ \\ & A.05.21*M.21+A.05.22*M.22+A.05.23*M.23+A.05.24*M.24+ \\ & A.05.25*M.25+A.05.26*M.26+A.05.27*M.27+A.05.28*M.28+ \\ & A.05.29*M.29)*BETA+B.05+G.05 \end{aligned}$$
- 6:
$$\begin{aligned} M.06 = & (A.06.01*M.01+A.06.02*M.02+A.06.03*M.03+A.06.04* \\ & M.04+A.06.05*M.05+A.06.06*M.06+A.06.07*M.07+A.06.08*M.08 \\ & +A.06.09*M.09+A.06.10*M.10+A.06.11*M.11+A.06.12*M.12+ \\ & A.06.13*M.13+A.06.14*M.14+A.06.15*M.15+A.06.16*M.16+ \\ & A.06.17*M.17+A.06.18*M.18+A.06.19*M.19+A.06.20*M.20+ \\ & A.06.21*M.21+A.06.22*M.22+A.06.23*M.23+A.06.24*M.24+ \\ & A.06.25*M.25+A.06.26*M.26+A.06.27*M.27+A.06.28*M.28+ \\ & A.06.29*M.29)*BETA+B.06+G.06 \end{aligned}$$
- 7:
$$\begin{aligned} M.07 = & (A.07.01*M.01+A.07.02*M.02+A.07.03*M.03+A.07.04* \\ & M.04+A.07.05*M.05+A.07.06*M.06+A.07.07*M.07+A.07.08*M.08 \\ & +A.07.09*M.09+A.07.10*M.10+A.07.11*M.11+A.07.12*M.12+ \\ & A.07.13*M.13+A.07.14*M.14+A.07.15*M.15+A.07.16*M.16+ \\ & A.07.17*M.17+A.07.18*M.18+A.07.19*M.19+A.07.20*M.20+ \\ & A.07.21*M.21+A.07.22*M.22+A.07.23*M.23+A.07.24*M.24+ \\ & A.07.25*M.25+A.07.26*M.26+A.07.27*M.27+A.07.28*M.28+ \\ & A.07.29*M.29)*BETA+B.07+G.07 \end{aligned}$$

- 8: $M.08 = (A.08.01 * M.01 + A.08.02 * M.02 + A.08.03 * M.03 + A.08.04 * M.04 + A.08.05 * M.05 + A.08.06 * M.06 + A.08.07 * M.07 + A.08.08 * M.08 + A.08.09 * M.09 + A.08.10 * M.10 + A.08.11 * M.11 + A.08.12 * M.12 + A.08.13 * M.13 + A.08.14 * M.14 + A.08.15 * M.15 + A.08.16 * M.16 + A.08.17 * M.17 + A.08.18 * M.18 + A.08.19 * M.19 + A.08.20 * M.20 + A.08.21 * M.21 + A.08.22 * M.22 + A.08.23 * M.23 + A.08.24 * M.24 + A.08.25 * M.25 + A.08.26 * M.26 + A.08.27 * M.27 + A.08.28 * M.28 + A.08.29 * M.29) * BETA + B.08 + G.08$
- 9: $M.09 = (A.09.01 * M.01 + A.09.02 * M.02 + A.09.03 * M.03 + A.09.04 * M.04 + A.09.05 * M.05 + A.09.06 * M.06 + A.09.07 * M.07 + A.09.08 * M.08 + A.09.09 * M.09 + A.09.10 * M.10 + A.09.11 * M.11 + A.09.12 * M.12 + A.09.13 * M.13 + A.09.14 * M.14 + A.09.15 * M.15 + A.09.16 * M.16 + A.09.17 * M.17 + A.09.18 * M.18 + A.09.19 * M.19 + A.09.20 * M.20 + A.09.21 * M.21 + A.09.22 * M.22 + A.09.23 * M.23 + A.09.24 * M.24 + A.09.25 * M.25 + A.09.26 * M.26 + A.09.27 * M.27 + A.09.28 * M.28 + A.09.29 * M.29) * BETA + B.09 + G.09$
- 10: $M.10 = (A.10.01 * M.01 + A.10.02 * M.02 + A.10.03 * M.03 + A.10.04 * M.04 + A.10.05 * M.05 + A.10.06 * M.06 + A.10.07 * M.07 + A.10.08 * M.08 + A.10.09 * M.09 + A.10.10 * M.10 + A.10.11 * M.11 + A.10.12 * M.12 + A.10.13 * M.13 + A.10.14 * M.14 + A.10.15 * M.15 + A.10.16 * M.16 + A.10.17 * M.17 + A.10.18 * M.18 + A.10.19 * M.19 + A.10.20 * M.20 + A.10.21 * M.21 + A.10.22 * M.22 + A.10.23 * M.23 + A.10.24 * M.24 + A.10.25 * M.25 + A.10.26 * M.26 + A.10.27 * M.27 + A.10.28 * M.28 + A.10.29 * M.29) * BETA + B.10 + G.10$
- 11: $M.11 = (A.11.01 * M.01 + A.11.02 * M.02 + A.11.03 * M.03 + A.11.04 * M.04 + A.11.05 * M.05 + A.11.06 * M.06 + A.11.07 * M.07 + A.11.08 * M.08 + A.11.09 * M.09 + A.11.10 * M.10 + A.11.11 * M.11 + A.11.12 * M.12 + A.11.13 * M.13 + A.11.14 * M.14 + A.11.15 * M.15 + A.11.16 * M.16 + A.11.17 * M.17 + A.11.18 * M.18 + A.11.19 * M.19 + A.11.20 * M.20 + A.11.21 * M.21 + A.11.22 * M.22 + A.11.23 * M.23 + A.11.24 * M.24 + A.11.25 * M.25 + A.11.26 * M.26 + A.11.27 * M.27 + A.11.28 * M.28 + A.11.29 * M.29) * BETA + B.11 + G.11$
- 12: $M.12 = (A.12.01 * M.01 + A.12.02 * M.02 + A.12.03 * M.03 + A.12.04 * M.04 + A.12.05 * M.05 + A.12.06 * M.06 + A.12.07 * M.07 + A.12.08 * M.08 + A.12.09 * M.09 + A.12.10 * M.10 + A.12.11 * M.11 + A.12.12 * M.12 + A.12.13 * M.13 + A.12.14 * M.14 + A.12.15 * M.15 + A.12.16 * M.16 + A.12.17 * M.17 + A.12.18 * M.18 + A.12.19 * M.19 + A.12.20 * M.20 + A.12.21 * M.21 + A.12.22 * M.22 + A.12.23 * M.23 + A.12.24 * M.24 + A.12.25 * M.25 + A.12.26 * M.26 + A.12.27 * M.27 + A.12.28 * M.28 + A.12.29 * M.29) * BETA + B.12 + G.12$

13: $M.13 = (A.13.01 * M.01 + A.13.02 * M.02 + A.13.03 * M.03 + A.13.04 * M.04 + A.13.05 * M.05 + A.13.06 * M.06 + A.13.07 * M.07 + A.13.08 * M.08 + A.13.09 * M.09 + A.13.10 * M.10 + A.13.11 * M.11 + A.13.12 * M.12 + A.13.13 * M.13 + A.13.14 * M.14 + A.13.15 * M.15 + A.13.16 * M.16 + A.13.17 * M.17 + A.13.18 * M.18 + A.13.19 * M.19 + A.13.20 * M.20 + A.13.21 * M.21 + A.13.22 * M.22 + A.13.23 * M.23 + A.13.24 * M.24 + A.13.25 * M.25 + A.13.26 * M.26 + A.13.27 * M.27 + A.13.28 * M.28 + A.13.29 * M.29) * BETA + B.13 + G.13$

14: $M.14 = (A.14.01 * M.01 + A.14.02 * M.02 + A.14.03 * M.03 + A.14.04 * M.04 + A.14.05 * M.05 + A.14.06 * M.06 + A.14.07 * M.07 + A.14.08 * M.08 + A.14.09 * M.09 + A.14.10 * M.10 + A.14.11 * M.11 + A.14.12 * M.12 + A.14.13 * M.13 + A.14.14 * M.14 + A.14.15 * M.15 + A.14.16 * M.16 + A.14.17 * M.17 + A.14.18 * M.18 + A.14.19 * M.19 + A.14.20 * M.20 + A.14.21 * M.21 + A.14.22 * M.22 + A.14.23 * M.23 + A.14.24 * M.24 + A.14.25 * M.25 + A.14.26 * M.26 + A.14.27 * M.27 + A.14.28 * M.28 + A.14.29 * M.29) * BETA + B.14 + G.14$

15: $M.15 = (A.15.01 * M.01 + A.15.02 * M.02 + A.15.03 * M.03 + A.15.04 * M.04 + A.15.05 * M.05 + A.15.06 * M.06 + A.15.07 * M.07 + A.15.08 * M.08 + A.15.09 * M.09 + A.15.10 * M.10 + A.15.11 * M.11 + A.15.12 * M.12 + A.15.13 * M.13 + A.15.14 * M.14 + A.15.15 * M.15 + A.15.16 * M.16 + A.15.17 * M.17 + A.15.18 * M.18 + A.15.19 * M.19 + A.15.20 * M.20 + A.15.21 * M.21 + A.15.22 * M.22 + A.15.23 * M.23 + A.15.24 * M.24 + A.15.25 * M.25 + A.15.26 * M.26 + A.15.27 * M.27 + A.15.28 * M.28 + A.15.29 * M.29) * BETA + B.15 + G.15$

16: $M.16 = (A.16.01 * M.01 + A.16.02 * M.02 + A.16.03 * M.03 + A.16.04 * M.04 + A.16.05 * M.05 + A.16.06 * M.06 + A.16.07 * M.07 + A.16.08 * M.08 + A.16.09 * M.09 + A.16.10 * M.10 + A.16.11 * M.11 + A.16.12 * M.12 + A.16.13 * M.13 + A.16.14 * M.14 + A.16.15 * M.15 + A.16.16 * M.16 + A.16.17 * M.17 + A.16.18 * M.18 + A.16.19 * M.19 + A.16.20 * M.20 + A.16.21 * M.21 + A.16.22 * M.22 + A.16.23 * M.23 + A.16.24 * M.24 + A.16.25 * M.25 + A.16.26 * M.26 + A.16.27 * M.27 + A.16.28 * M.28 + A.16.29 * M.29) * BETA + B.16 + G.16$

17: $M.17 = (A.17.01 * M.01 + A.17.02 * M.02 + A.17.03 * M.03 + A.17.04 * M.04 + A.17.05 * M.05 + A.17.06 * M.06 + A.17.07 * M.07 + A.17.08 * M.08 + A.17.09 * M.09 + A.17.10 * M.10 + A.17.11 * M.11 + A.17.12 * M.12 + A.17.13 * M.13 + A.17.14 * M.14 + A.17.15 * M.15 + A.17.16 * M.16 + A.17.17 * M.17 + A.17.18 * M.18 + A.17.19 * M.19 + A.17.20 * M.20 + A.17.21 * M.21 + A.17.22 * M.22 + A.17.23 * M.23 + A.17.24 * M.24 + A.17.25 * M.25 + A.17.26 * M.26 + A.17.27 * M.27 + A.17.28 * M.28 + A.17.29 * M.29) * BETA + B.17 + G.17$

- 18: $M.18 = (A.18.01 * M.01 + A.18.02 * M.02 + A.18.03 * M.03 + A.18.04 * M.04 + A.18.05 * M.05 + A.18.06 * M.06 + A.18.07 * M.07 + A.18.08 * M.08 + A.18.09 * M.09 + A.18.10 * M.10 + A.18.11 * M.11 + A.18.12 * M.12 + A.18.13 * M.13 + A.18.14 * M.14 + A.18.15 * M.15 + A.18.16 * M.16 + A.18.17 * M.17 + A.18.18 * M.18 + A.18.19 * M.19 + A.18.20 * M.20 + A.18.21 * M.21 + A.18.22 * M.22 + A.18.23 * M.23 + A.18.24 * M.24 + A.18.25 * M.25 + A.18.26 * M.26 + A.18.27 * M.27 + A.18.28 * M.28 + A.18.29 * M.29) * BETA + B.18 + G.18$
- 19: $M.19 = (A.19.01 * M.01 + A.19.02 * M.02 + A.19.03 * M.03 + A.19.04 * M.04 + A.19.05 * M.05 + A.19.06 * M.06 + A.19.07 * M.07 + A.19.08 * M.08 + A.19.09 * M.09 + A.19.10 * M.10 + A.19.11 * M.11 + A.19.12 * M.12 + A.19.13 * M.13 + A.19.14 * M.14 + A.19.15 * M.15 + A.19.16 * M.16 + A.19.17 * M.17 + A.19.18 * M.18 + A.19.19 * M.19 + A.19.20 * M.20 + A.19.21 * M.21 + A.19.22 * M.22 + A.19.23 * M.23 + A.19.24 * M.24 + A.19.25 * M.25 + A.19.26 * M.26 + A.19.27 * M.27 + A.19.28 * M.28 + A.19.29 * M.29) * BETA + B.19 + G.19$
- 20: $M.20 = (A.20.01 * M.01 + A.20.02 * M.02 + A.20.03 * M.03 + A.20.04 * M.04 + A.20.05 * M.05 + A.20.06 * M.06 + A.20.07 * M.07 + A.20.08 * M.08 + A.20.09 * M.09 + A.20.10 * M.10 + A.20.11 * M.11 + A.20.12 * M.12 + A.20.13 * M.13 + A.20.14 * M.14 + A.20.15 * M.15 + A.20.16 * M.16 + A.20.17 * M.17 + A.20.18 * M.18 + A.20.19 * M.19 + A.20.20 * M.20 + A.20.21 * M.21 + A.20.22 * M.22 + A.20.23 * M.23 + A.20.24 * M.24 + A.20.25 * M.25 + A.20.26 * M.26 + A.20.27 * M.27 + A.20.28 * M.28 + A.20.29 * M.29) * BETA + B.20 + G.20$
- 21: $M.21 = (A.21.01 * M.01 + A.21.02 * M.02 + A.21.03 * M.03 + A.21.04 * M.04 + A.21.05 * M.05 + A.21.06 * M.06 + A.21.07 * M.07 + A.21.08 * M.08 + A.21.09 * M.09 + A.21.10 * M.10 + A.21.11 * M.11 + A.21.12 * M.12 + A.21.13 * M.13 + A.21.14 * M.14 + A.21.15 * M.15 + A.21.16 * M.16 + A.21.17 * M.17 + A.21.18 * M.18 + A.21.19 * M.19 + A.21.20 * M.20 + A.21.21 * M.21 + A.21.22 * M.22 + A.21.23 * M.23 + A.21.24 * M.24 + A.21.25 * M.25 + A.21.26 * M.26 + A.21.27 * M.27 + A.21.28 * M.28 + A.21.29 * M.29) * BETA + B.21 + G.21$
- 22: $M.22 = (A.22.01 * M.01 + A.22.02 * M.02 + A.22.03 * M.03 + A.22.04 * M.04 + A.22.05 * M.05 + A.22.06 * M.06 + A.22.07 * M.07 + A.22.08 * M.08 + A.22.09 * M.09 + A.22.10 * M.10 + A.22.11 * M.11 + A.22.12 * M.12 + A.22.13 * M.13 + A.22.14 * M.14 + A.22.15 * M.15 + A.22.16 * M.16 + A.22.17 * M.17 + A.22.18 * M.18 + A.22.19 * M.19 + A.22.20 * M.20 + A.22.21 * M.21 + A.22.22 * M.22 + A.22.23 * M.23 + A.22.24 * M.24 + A.22.25 * M.25 + A.22.26 * M.26 + A.22.27 * M.27 + A.22.28 * M.28 + A.22.29 * M.29) * BETA + B.22 + G.22$

23: $M.23 = (A.23.01 * M.01 + A.23.02 * M.02 + A.23.03 * M.03 + A.23.04 * M.04 + A.23.05 * M.05 + A.23.06 * M.06 + A.23.07 * M.07 + A.23.08 * M.08 + A.23.09 * M.09 + A.23.10 * M.10 + A.23.11 * M.11 + A.23.12 * M.12 + A.23.13 * M.13 + A.23.14 * M.14 + A.23.15 * M.15 + A.23.16 * M.16 + A.23.17 * M.17 + A.23.18 * M.18 + A.23.19 * M.19 + A.23.20 * M.20 + A.23.21 * M.21 + A.23.22 * M.22 + A.23.23 * M.23 + A.23.24 * M.24 + A.23.25 * M.25 + A.23.26 * M.26 + A.23.27 * M.27 + A.23.28 * M.28 + A.23.29 * M.29) * BETA + B.23 + G.23$

24: $M.24 = (A.24.01 * M.01 + A.24.02 * M.02 + A.24.03 * M.03 + A.24.04 * M.04 + A.24.05 * M.05 + A.24.06 * M.06 + A.24.07 * M.07 + A.24.08 * M.08 + A.24.09 * M.09 + A.24.10 * M.10 + A.24.11 * M.11 + A.24.12 * M.12 + A.24.13 * M.13 + A.24.14 * M.14 + A.24.15 * M.15 + A.24.16 * M.16 + A.24.17 * M.17 + A.24.18 * M.18 + A.24.19 * M.19 + A.24.20 * M.20 + A.24.21 * M.21 + A.24.22 * M.22 + A.24.23 * M.23 + A.24.24 * M.24 + A.24.25 * M.25 + A.24.26 * M.26 + A.24.27 * M.27 + A.24.28 * M.28 + A.24.29 * M.29) * BETA + B.24 + G.24$

25: $M.25 = (A.25.01 * M.01 + A.25.02 * M.02 + A.25.03 * M.03 + A.25.04 * M.04 + A.25.05 * M.05 + A.25.06 * M.06 + A.25.07 * M.07 + A.25.08 * M.08 + A.25.09 * M.09 + A.25.10 * M.10 + A.25.11 * M.11 + A.25.12 * M.12 + A.25.13 * M.13 + A.25.14 * M.14 + A.25.15 * M.15 + A.25.16 * M.16 + A.25.17 * M.17 + A.25.18 * M.18 + A.25.19 * M.19 + A.25.20 * M.20 + A.25.21 * M.21 + A.25.22 * M.22 + A.25.23 * M.23 + A.25.24 * M.24 + A.25.25 * M.25 + A.25.26 * M.26 + A.25.27 * M.27 + A.25.28 * M.28 + A.25.29 * M.29) * BETA + B.25 + G.25$

26: $M.26 = (A.26.01 * M.01 + A.26.02 * M.02 + A.26.03 * M.03 + A.26.04 * M.04 + A.26.05 * M.05 + A.26.06 * M.06 + A.26.07 * M.07 + A.26.08 * M.08 + A.26.09 * M.09 + A.26.10 * M.10 + A.26.11 * M.11 + A.26.12 * M.12 + A.26.13 * M.13 + A.26.14 * M.14 + A.26.15 * M.15 + A.26.16 * M.16 + A.26.17 * M.17 + A.26.18 * M.18 + A.26.19 * M.19 + A.26.20 * M.20 + A.26.21 * M.21 + A.26.22 * M.22 + A.26.23 * M.23 + A.26.24 * M.24 + A.26.25 * M.25 + A.26.26 * M.26 + A.26.27 * M.27 + A.26.28 * M.28 + A.26.29 * M.29) * BETA + B.26 + G.26$

27: $M.27 = (A.27.01 * M.01 + A.27.02 * M.02 + A.27.03 * M.03 + A.27.04 * M.04 + A.27.05 * M.05 + A.27.06 * M.06 + A.27.07 * M.07 + A.27.08 * M.08 + A.27.09 * M.09 + A.27.10 * M.10 + A.27.11 * M.11 + A.27.12 * M.12 + A.27.13 * M.13 + A.27.14 * M.14 + A.27.15 * M.15 + A.27.16 * M.16 + A.27.17 * M.17 + A.27.18 * M.18 + A.27.19 * M.19 + A.27.20 * M.20 + A.27.21 * M.21 + A.27.22 * M.22 + A.27.23 * M.23 + A.27.24 * M.24 + A.27.25 * M.25 + A.27.26 * M.26 + A.27.27 * M.27 + A.27.28 * M.28 + A.27.29 * M.29) * BETA + B.27 + G.27$

28: $M.28 = (A.28.01*M.01+A.28.02*M.02+A.28.03*M.03+A.28.04*M.04+A.28.05*M.05+A.28.06*M.06+A.28.07*M.07+A.28.08*M.08+A.28.09*M.09+A.28.10*M.10+A.28.11*M.11+A.28.12*M.12+A.28.13*M.13+A.28.14*M.14+A.28.15*M.15+A.28.16*M.16+A.28.17*M.17+A.28.18*M.18+A.28.19*M.19+A.28.20*M.20+A.28.21*M.21+A.28.22*M.22+A.28.23*M.23+A.28.24*M.24+A.28.25*M.25+A.28.26*M.26+A.28.27*M.27+A.28.28*M.28+A.28.29*M.29)*BETA+B.28+G.28$

29: $M.29 = (A.29.01*M.01+A.29.02*M.02+A.29.03*M.03+A.29.04*M.04+A.29.05*M.05+A.29.06*M.06+A.29.07*M.07+A.29.08*M.08+A.29.09*M.09+A.29.10*M.10+A.29.11*M.11+A.29.12*M.12+A.29.13*M.13+A.29.14*M.14+A.29.15*M.15+A.29.16*M.16+A.29.17*M.17+A.29.18*M.18+A.29.19*M.19+A.29.20*M.20+A.29.21*M.21+A.29.22*M.22+A.29.23*M.23+A.29.24*M.24+A.29.25*M.25+A.29.26*M.26+A.29.27*M.27+A.29.28*M.28+A.29.29*M.29)*BETA+B.29+G.29$

Support Employment (S.aa.bb) in region aa due to economic activity in region bb

30: $S.01.01 == A.01.01*M.01*BETA$

31: $S.01.02 == A.01.02*M.02*BETA$

32: $S.01.03 == A.01.03*M.03*BETA$

33: $S.01.04 == A.01.04*M.04*BETA$

34: $S.01.05 == A.01.05*M.05*BETA$

35: $S.01.06 == A.01.06*M.06*BETA$

36: $S.01.07 == A.01.07*M.07*BETA$

37: $S.01.08 == A.01.08*M.08*BETA$

38: $S.01.09 == A.01.09*M.09*BETA$

39: $S.01.10 == A.01.10*M.10*BETA$

40: $S.01.11 == A.01.11*M.11*BETA$

41: $S.01.12 == A.01.12*M.12*BETA$

42: $S.01.13 == A.01.13*M.13*BETA$

43: S.01.14 == A.01.14*M.14*BETA
44: S.01.15 == A.01.15*M.15*BETA
45: S.01.16 == A.01.16*M.16*BETA
46: S.01.17 == A.01.17*M.17*BETA
47: S.01.18 == A.01.18*M.18*BETA
48: S.01.19 == A.01.19*M.19*BETA
49: S.01.20 == A.01.20*M.20*BETA
50: S.01.21 == A.01.21*M.21*BETA
51: S.01.22 == A.01.22*M.22*BETA
52: S.01.23 == A.01.23*M.23*BETA
53: S.01.24 == A.01.24*M.24*BETA
54: S.01.25 == A.01.25*M.25*BETA
55: S.01.26 == A.01.26*M.26*BETA

56: S.01.27 == A.01.27*M.27*BETA
57: S.01.28 == A.01.28*M.28*BETA
58: S.01.29 == A.01.29*M.29*BETA
59: S.02.01 == A.02.01*M.01*BETA

60: S.02.02 == A.02.02*M.02*BETA

840: S.28.28 == A.28.28*M.28*BETA
841: S.28.29 == A.28.29*M.29*BETA
842: S.29.01 == A.29.01*M.01*BETA
843: S.29.02 == A.29.02*M.02*BETA
844: S.29.03 == A.29.03*M.03*BETA

845: S.29.04 == A.29.04*M.04*BETA
846: S.29.05 == A.29.05*M.05*BETA
847: S.29.06 == A.29.06*M.06*BETA
848: S.29.07 == A.29.07*M.07*BETA
849: S.29.08 == A.29.08*M.08*BETA
850: S.29.09 == A.29.09*M.09*BETA
851: S.29.10 == A.29.10*M.10*BETA
852: S.29.11 == A.29.11*M.11*BETA
853: S.29.12 == A.29.12*M.12*BETA
854: S.29.13 == A.29.13*M.13*BETA
855: S.29.14 == A.29.14*M.14*BETA
856: S.29.15 == A.29.15*M.15*BETA
857: S.29.16 == A.29.16*M.16*BETA
858: S.29.17 == A.29.17*M.17*BETA
859: S.29.18 == A.29.18*M.18*BETA
860: S.29.19 == A.29.19*M.19*BETA
861: S.29.20 == A.29.20*M.20*BETA
862: S.29.21 == A.29.21*M.21*BETA
863: S.29.22 == A.29.22*M.22*BETA
864: S.29.23 == A.29.23*M.23*BETA
865: S.29.24 == A.29.24*M.24*BETA
866: S.29.25 == A.29.25*M.25*BETA
867: S.29.26 == A.29.26*M.26*BETA
868: S.29.27 == A.29.27*M.27*BETA
869: S.29.28 == A.29.28*M.28*BETA
870: S.29.29 == A.29.29*M.29*BETA

Support Employment (S.aa) in region aa

871: S.01 == S.01.01+S.01.02+S.01.03+S.01.04+S.01.05+S.01.06+
S.01.07+S.01.08+S.01.09+S.01.10+S.01.11+S.01.12+S.01.13+
S.01.14+S.01.15+S.01.16+S.01.17+S.01.18+S.01.19+S.01.20+
S.01.21+S.01.22+S.01.23+S.01.24+S.01.25+S.01.26+S.01.27+
S.01.28+S.01.29

872: S.02 == S.02.01+S.02.02+S.02.03+S.02.04+S.02.05+S.02.06+
S.02.07+S.02.08+S.02.09+S.02.10+S.02.11+S.02.12+S.02.13+
S.02.14+S.02.15+S.02.16+S.02.17+S.02.18+S.02.19+S.02.20+
S.02.21+S.02.22+S.02.23+S.02.24+S.02.25+S.02.26+S.02.27+
S.02.28+S.02.29

873: S.03 == S.03.01+S.03.02+S.03.03+S.03.04+S.03.05+S.03.06+
S.03.07+S.03.08+S.03.09+S.03.10+S.03.11+S.03.12+S.03.13+
S.03.14+S.03.15+S.03.16+S.03.17+S.03.18+S.03.19+S.03.20+
S.03.21+S.03.22+S.03.23+S.03.24+S.03.25+S.03.26+S.03.27+
S.03.28+S.03.29

874: S.04 == S.04.01+S.04.02+S.04.03+S.04.04+S.04.05+S.04.06+
S.04.07+S.04.08+S.04.09+S.04.10+S.04.11+S.04.12+S.04.13+
S.04.14+S.04.15+S.04.16+S.04.17+S.04.18+S.04.19+S.04.20+
S.04.21+S.04.22+S.04.23+S.04.24+S.04.25+S.04.26+S.04.27+
S.04.28+S.04.29

875: S.05 == S.05.01+S.05.02+S.05.03+S.05.04+S.05.05+S.05.06+
S.05.07+S.05.08+S.05.09+S.05.10+S.05.11+S.05.12+S.05.13+
S.05.14+S.05.15+S.05.16+S.05.17+S.05.18+S.05.19+S.05.20+
S.05.21+S.05.22+S.05.23+S.05.24+S.05.25+S.05.26+S.05.27+
S.05.28+S.05.29

876: S.06 == S.06.01+S.06.02+S.06.03+S.06.04+S.06.05+S.06.06+
S.06.07+S.06.08+S.06.09+S.06.10+S.06.11+S.06.12+S.06.13+
S.06.14+S.06.15+S.06.16+S.06.17+S.06.18+S.06.19+S.06.20+
S.06.21+S.06.22+S.06.23+S.06.24+S.06.25+S.06.26+S.06.27+
S.06.28+S.06.29

877: S.07 == S.07.01+S.07.02+S.07.03+S.07.04+S.07.05+S.07.06+
S.07.07+S.07.08+S.07.09+S.07.10+S.07.11+S.07.12+S.07.13+
S.07.14+S.07.15+S.07.16+S.07.17+S.07.18+S.07.19+S.07.20+
S.07.21+S.07.22+S.07.23+S.07.24+S.07.25+S.07.26+S.07.27+
S.07.28+S.07.29

878: S.08 == S.08.01+S.08.02+S.08.03+S.08.04+S.08.05+S.08.06+
S.08.07+S.08.08+S.08.09+S.08.10+S.08.11+S.08.12+S.08.13+
S.08.14+S.08.15+S.08.16+S.08.17+S.08.18+S.08.19+S.08.20+
S.08.21+S.08.22+S.08.23+S.08.24+S.08.25+S.08.26+S.08.27+
S.08.28+S.08.29

- 879: S.09 == S.09.01+S.09.02+S.09.03+S.09.04+S.09.05+S.09.06+
S.09.07+S.09.08+S.09.09+S.09.10+S.09.11+S.09.12+S.09.13+
S.09.14+S.09.15+S.09.16+S.09.17+S.09.18+S.09.19+S.09.20+
S.09.21+S.09.22+S.09.23+S.09.24+S.09.25+S.09.26+S.09.27+
S.09.28+S.09.29
- 880: S.10 == S.10.01+S.10.02+S.10.03+S.10.04+S.10.05+S.10.06+
S.10.07+S.10.08+S.10.09+S.10.10+S.10.11+S.10.12+S.10.13+
S.10.14+S.10.15+S.10.16+S.10.17+S.10.18+S.10.19+S.10.20+
S.10.21+S.10.22+S.10.23+S.10.24+S.10.25+S.10.26+S.10.27+
S.10.28+S.10.29
- 881: S.11 == S.11.01+S.11.02+S.11.03+S.11.04+S.11.05+S.11.06+
S.11.07+S.11.08+S.11.09+S.11.10+S.11.11+S.11.12+S.11.13+
S.11.14+S.11.15+S.11.16+S.11.17+S.11.18+S.11.19+S.11.20+
S.11.21+S.11.22+S.11.23+S.11.24+S.11.25+S.11.26+S.11.27+
S.11.28+S.11.29
- 882: S.12 == S.12.01+S.12.02+S.12.03+S.12.04+S.12.05+S.12.06+
S.12.07+S.12.08+S.12.09+S.12.10+S.12.11+S.12.12+S.12.13+
S.12.14+S.12.15+S.12.16+S.12.17+S.12.18+S.12.19+S.12.20+
S.12.21+S.12.22+S.12.23+S.12.24+S.12.25+S.12.26+S.12.27+
S.12.28+S.12.29
- 883: S.13 == S.13.01+S.13.02+S.13.03+S.13.04+S.13.05+S.13.06+
S.13.07+S.13.08+S.13.09+S.13.10+S.13.11+S.13.12+S.13.13+
S.13.14+S.13.15+S.13.16+S.13.17+S.13.18+S.13.19+S.13.20+
S.13.21+S.13.22+S.13.23+S.13.24+S.13.25+S.13.26+S.13.27+
S.13.28+S.13.29
- 884: S.14 == S.14.01+S.14.02+S.14.03+S.14.04+S.14.05+S.14.06+
S.14.07+S.14.08+S.14.09+S.14.10+S.14.11+S.14.12+S.14.13+
S.14.14+S.14.15+S.14.16+S.14.17+S.14.18+S.14.19+S.14.20+
S.14.21+S.14.22+S.14.23+S.14.24+S.14.25+S.14.26+S.14.27+
S.14.28+S.14.29
- 885: S.15 == S.15.01+S.15.02+S.15.03+S.15.04+S.15.05+S.15.06+
S.15.07+S.15.08+S.15.09+S.15.10+S.15.11+S.15.12+S.15.13+
S.15.14+S.15.15+S.15.16+S.15.17+S.15.18+S.15.19+S.15.20+
S.15.21+S.15.22+S.15.23+S.15.24+S.15.25+S.15.26+S.15.27+
S.15.28+S.15.29
- 886: S.16 == S.16.01+S.16.02+S.16.03+S.16.04+S.16.05+S.16.06+
S.16.07+S.16.08+S.16.09+S.16.10+S.16.11+S.16.12+S.16.13+
S.16.14+S.16.15+S.16.16+S.16.17+S.16.18+S.16.19+S.16.20+
S.16.21+S.16.22+S.16.23+S.16.24+S.16.25+S.16.26+S.16.27+
S.16.28+S.16.29

- 887: S.17 == S.17.01+S.17.02+S.17.03+S.17.04+S.17.05+S.17.06+
S.17.07+S.17.08+S.17.09+S.17.10+S.17.11+S.17.12+S.17.13+
S.17.14+S.17.15+S.17.16+S.17.17+S.17.18+S.17.19+S.17.20+
S.17.21+S.17.22+S.17.23+S.17.24+S.17.25+S.17.26+S.17.27+
S.17.28+S.17.29
- 888: S.18 == S.18.01+S.18.02+S.18.03+S.18.04+S.18.05+S.18.06+
S.18.07+S.18.08+S.18.09+S.18.10+S.18.11+S.18.12+S.18.13+
S.18.14+S.18.15+S.18.16+S.18.17+S.18.18+S.18.19+S.18.20+
S.18.21+S.18.22+S.18.23+S.18.24+S.18.25+S.18.26+S.18.27+
S.18.28+S.18.29
- 889: S.19 == S.19.01+S.19.02+S.19.03+S.19.04+S.19.05+S.19.06+
S.19.07+S.19.08+S.19.09+S.19.10+S.19.11+S.19.12+S.19.13+
S.19.14+S.19.15+S.19.16+S.19.17+S.19.18+S.19.19+S.19.20+
S.19.21+S.19.22+S.19.23+S.19.24+S.19.25+S.19.26+S.19.27+
S.19.28+S.19.29
- 890: S.20 == S.20.01+S.20.02+S.20.03+S.20.04+S.20.05+S.20.06+
S.20.07+S.20.08+S.20.09+S.20.10+S.20.11+S.20.12+S.20.13+
S.20.14+S.20.15+S.20.16+S.20.17+S.20.18+S.20.19+S.20.20+
S.20.21+S.20.22+S.20.23+S.20.24+S.20.25+S.20.26+S.20.27+
S.20.28+S.20.29
- 891: S.21 == S.21.01+S.21.02+S.21.03+S.21.04+S.21.05+S.21.06+
S.21.07+S.21.08+S.21.09+S.21.10+S.21.11+S.21.12+S.21.13+
S.21.14+S.21.15+S.21.16+S.21.17+S.21.18+S.21.19+S.21.20+
S.21.21+S.21.22+S.21.23+S.21.24+S.21.25+S.21.26+S.21.27+
S.21.28+S.21.29
- 892: S.22 == S.22.01+S.22.02+S.22.03+S.22.04+S.22.05+S.22.06+
S.22.07+S.22.08+S.22.09+S.22.10+S.22.11+S.22.12+S.22.13+
S.22.14+S.22.15+S.22.16+S.22.17+S.22.18+S.22.19+S.22.20+
S.22.21+S.22.22+S.22.23+S.22.24+S.22.25+S.22.26+S.22.27+
S.22.28+S.22.29
- 893: S.23 == S.23.01+S.23.02+S.23.03+S.23.04+S.23.05+S.23.06+
S.23.07+S.23.08+S.23.09+S.23.10+S.23.11+S.23.12+S.23.13+
S.23.14+S.23.15+S.23.16+S.23.17+S.23.18+S.23.19+S.23.20+
S.23.21+S.23.22+S.23.23+S.23.24+S.23.25+S.23.26+S.23.27+
S.23.28+S.23.29
- 894: S.24 == S.24.01+S.24.02+S.24.03+S.24.04+S.24.05+S.24.06+
S.24.07+S.24.08+S.24.09+S.24.10+S.24.11+S.24.12+S.24.13+
S.24.14+S.24.15+S.24.16+S.24.17+S.24.18+S.24.19+S.24.20+
S.24.21+S.24.22+S.24.23+S.24.24+S.24.25+S.24.26+S.24.27+
S.24.28+S.24.29

895: S.25 == S.25.01+S.25.02+S.25.03+S.25.04+S.25.05+S.25.06+
S.25.07+S.25.08+S.25.09+S.25.10+S.25.11+S.25.12+S.25.13+
S.25.14+S.25.15+S.25.16+S.25.17+S.25.18+S.25.19+S.25.20+
S.25.21+S.25.22+S.25.23+S.25.24+S.25.25+S.25.26+S.25.27+
S.25.28+S.25.29

896: S.26 == S.26.01+S.26.02+S.26.03+S.26.04+S.26.05+S.26.06+
S.26.07+S.26.08+S.26.09+S.26.10+S.26.11+S.26.12+S.26.13+
S.26.14+S.26.15+S.26.16+S.26.17+S.26.18+S.26.19+S.26.20+
S.26.21+S.26.22+S.26.23+S.26.24+S.26.25+S.26.26+S.26.27+
S.26.28+S.26.29

897: S.27 == S.27.01+S.27.02+S.27.03+S.27.04+S.27.05+S.27.06+
S.27.07+S.27.08+S.27.09+S.27.10+S.27.11+S.27.12+S.27.13+
S.27.14+S.27.15+S.27.16+S.27.17+S.27.18+S.27.19+S.27.20+
S.27.21+S.27.22+S.27.23+S.27.24+S.27.25+S.27.26+S.27.27+
S.27.28+S.27.29

898: S.28 == S.28.01+S.28.02+S.28.03+S.28.04+S.28.05+S.28.06+
S.28.07+S.28.08+S.28.09+S.28.10+S.28.11+S.28.12+S.28.13+
S.28.14+S.28.15+S.28.16+S.28.17+S.28.18+S.28.19+S.28.20+
S.28.21+S.28.22+S.28.23+S.28.24+S.28.25+S.28.26+S.28.27+
S.28.28+S.28.29

899: S.29 == S.29.01+S.29.02+S.29.03+S.29.04+S.29.05+S.29.06+
S.29.07+S.29.08+S.29.09+S.29.10+S.29.11+S.29.12+S.29.13+
S.29.14+S.29.15+S.29.16+S.29.17+S.29.18+S.29.19+S.29.20+
S.29.21+S.29.22+S.29.23+S.29.24+S.29.25+S.29.26+S.29.27+
S.29.28+S.29.29

Aggregate Employment by Type

900: S.ST == S.01+S.02+S.03+S.04+S.05+S.06+S.07+S.08+S.09+
S.10+S.11+S.12+S.13+S.14+S.15+S.16+S.17+S.18+S.19+S.20+
S.21+S.22+S.23+S.24+S.25+S.26+S.27+S.28+S.29

901: B.ST == B.01+B.02+B.03+B.04+B.05+B.06+B.07+B.08+B.09+
B.10+B.11+B.12+B.13+B.14+B.15+B.16+B.17+B.18+B.19+B.20+
B.21+B.22+B.23+B.24+B.25+B.26+B.27+B.28+B.29

902: G.ST == G.01+G.02+G.03+G.04+G.05+G.06+G.07+G.08+G.09+
G.10+G.11+G.12+G.13+G.14+G.15+G.16+G.17+G.18+G.19+G.20+
G.21+G.22+G.23+G.24+G.25+G.26+G.27+G.28+G.29

903: M.ST == M.01+M.02+M.03+M.04+M.05+M.06+M.07+M.08+M.09+
M.10+M.11+M.12+M.13+M.14+M.15+M.16+M.17+M.18+M.19+M.20+
M.21+M.22+M.23+M.24+M.25+M.26+M.27+M.28+M.29

904: B.RB == B.02+B.09+B.12+B.17+B.21+B.24+B.26

905: G.RB == G.02+G.09+G.12+G.17+G.21+G.24+G.26

906: S.RB == S.02+S.09+S.12+S.17+S.21+S.24+S.26

907: M.RB == M.02+M.09+M.12+M.17+M.21+M.24+M.26

908: B.NR == B.ST-B.RB

909: G.NR == G.ST-G.RB

910: S.NR == S.ST-S.RB

911: M.NR == M.ST-M.RB

912: B.AM == B.02+B.17

913: G.AM == G.02+G.17

914: S.AM == S.02+S.17

915: M.AM == M.02+M.17

916: BAM == B02+B17

917: GAM == G02+G17

918: BST == B01+B02+B03+B04+B05+B06+B07+B08+B09+B10+B11+B12+
B13+B14+B15+B16+B17+B18+B19+B20+B21+B22+B23+B24+B25+B26+
B27+B28+B29

919: GST == G01+G02+G03+G04+G05+G06+G07+G08+G09+G10+G11+G12+
G13+G14+G15+G16+G17+G18+G19+G20+G21+G22+G23+G24+G25+G26+
G27+G28+G29

920: BRB == B02+B09+B12+B17+B21+B24+B26

921: BNR == BST-BRB

922: GRB == G02+G09+G12+G17+G21+G24+G26

923: GNR == GST-GRB

924: G.AG == G.AM+G.21+G.12

925: B.AG == B.AM+B.21+B.12

926: S.AG == S.AM+S.21+S.12

927: M.AG == M.AM+M.21+M.12
928: G.FG == G.09+G.24
929: B.FG == B.09+B.24
930: S.FG == S.09+S.24
931: M.FG == M.09+M.24
932: GAG == GAM+G21+G12
933: BAG == BAM+B21+B12
934: GFG == G09+G24
935: BFG == B09+B24

Preliminary Population Estimate (PRE.aa) for region aa

936: PRE.29 == PM.29*(M.01*IM.29.01+M.02*IM.29.02+M.03*
IM.29.03+M.04*IM.29.04+M.05*IM.29.05+M.06*IM.29.06+M.07*
IM.29.07+M.08*IM.29.08+M.09*IM.29.09+M.10*IM.29.10+M.11*
IM.29.11+M.12*IM.29.12+M.13*IM.29.13+M.14*IM.29.14+M.15*
IM.29.15+M.16*IM.29.16+M.17*IM.29.17+M.18*IM.29.18+M.19*
IM.29.19+M.20*IM.29.20+M.21*IM.29.21+M.22*IM.29.22+M.23*
IM.29.23+M.24*IM.29.24+M.25*IM.29.25+M.26*IM.29.26+M.27*
IM.29.27+M.28*IM.29.28+M.29*IM.29.29)
937: PRE.28 == PM.28*(M.01*IM.28.01+M.02*IM.28.02+M.03*
IM.28.03+M.04*IM.28.04+M.05*IM.28.05+M.06*IM.28.06+M.07*
IM.28.07+M.08*IM.28.08+M.09*IM.28.09+M.10*IM.28.10+M.11*
IM.28.11+M.12*IM.28.12+M.13*IM.28.13+M.14*IM.28.14+M.15*
IM.28.15+M.16*IM.28.16+M.17*IM.28.17+M.18*IM.28.18+M.19*
IM.28.19+M.20*IM.28.20+M.21*IM.28.21+M.22*IM.28.22+M.23*
IM.28.23+M.24*IM.28.24+M.25*IM.28.25+M.26*IM.28.26+M.27*
IM.28.27+M.28*IM.28.28+M.29*IM.28.29)
938: PRE.27 == PM.27*(M.01*IM.27.01+M.02*IM.27.02+M.03*
IM.27.03+M.04*IM.27.04+M.05*IM.27.05+M.06*IM.27.06+M.07*
IM.27.07+M.08*IM.27.08+M.09*IM.27.09+M.10*IM.27.10+M.11*
IM.27.11+M.12*IM.27.12+M.13*IM.27.13+M.14*IM.27.14+M.15*
IM.27.15+M.16*IM.27.16+M.17*IM.27.17+M.18*IM.27.18+M.19*
IM.27.19+M.20*IM.27.20+M.21*IM.27.21+M.22*IM.27.22+M.23*
IM.27.23+M.24*IM.27.24+M.25*IM.27.25+M.26*IM.27.26+M.27*
IM.27.27+M.28*IM.27.28+M.29*IM.27.29)

939: PRE.26 == PM.26*(M.01*IM.26.01+M.02*IM.26.02+M.03*
IM.26.03+M.04*IM.26.04+M.05*IM.26.05+M.06*IM.26.06+M.07*
IM.26.07+M.08*IM.26.08+M.09*IM.26.09+M.10*IM.26.10+M.11*
IM.26.11+M.12*IM.26.12+M.13*IM.26.13+M.14*IM.26.14+M.15*
IM.26.15+M.16*IM.26.16+M.17*IM.26.17+M.18*IM.26.18+M.19*
IM.26.19+M.20*IM.26.20+M.21*IM.26.21+M.22*IM.26.22+M.23*
IM.26.23+M.24*IM.26.24+M.25*IM.26.25+M.26*IM.26.26+M.27*
IM.26.27+M.28*IM.26.28+M.29*IM.26.29)

940: PRE.25 == PM.25*(M.01*IM.25.01+M.02*IM.25.02+M.03*
IM.25.03+M.04*IM.25.04+M.05*IM.25.05+M.06*IM.25.06+M.07*
IM.25.07+M.08*IM.25.08+M.09*IM.25.09+M.10*IM.25.10+M.11*
IM.25.11+M.12*IM.25.12+M.13*IM.25.13+M.14*IM.25.14+M.15*
IM.25.15+M.16*IM.25.16+M.17*IM.25.17+M.18*IM.25.18+M.19*
IM.25.19+M.20*IM.25.20+M.21*IM.25.21+M.22*IM.25.22+M.23*
IM.25.23+M.24*IM.25.24+M.25*IM.25.25+M.26*IM.25.26+M.27*
IM.25.27+M.28*IM.25.28+M.29*IM.25.29)

941: PRE.24 == PM.24*(M.01*IM.24.01+M.02*IM.24.02+M.03*
IM.24.03+M.04*IM.24.04+M.05*IM.24.05+M.06*IM.24.06+M.07*
IM.24.07+M.08*IM.24.08+M.09*IM.24.09+M.10*IM.24.10+M.11*
IM.24.11+M.12*IM.24.12+M.13*IM.24.13+M.14*IM.24.14+M.15*
IM.24.15+M.16*IM.24.16+M.17*IM.24.17+M.18*IM.24.18+M.19*
IM.24.19+M.20*IM.24.20+M.21*IM.24.21+M.22*IM.24.22+M.23*
IM.24.23+M.24*IM.24.24+M.25*IM.24.25+M.26*IM.24.26+M.27*
IM.24.27+M.28*IM.24.28+M.29*IM.24.29)

942: PRE.23 == PM.23*(M.01*IM.23.01+M.02*IM.23.02+M.03*
IM.23.03+M.04*IM.23.04+M.05*IM.23.05+M.06*IM.23.06+M.07*
IM.23.07+M.08*IM.23.08+M.09*IM.23.09+M.10*IM.23.10+M.11*
IM.23.11+M.12*IM.23.12+M.13*IM.23.13+M.14*IM.23.14+M.15*
IM.23.15+M.16*IM.23.16+M.17*IM.23.17+M.18*IM.23.18+M.19*
IM.23.19+M.20*IM.23.20+M.21*IM.23.21+M.22*IM.23.22+M.23*
IM.23.23+M.24*IM.23.24+M.25*IM.23.25+M.26*IM.23.26+M.27*
IM.23.27+M.28*IM.23.28+M.29*IM.23.29)

943: PRE.22 == PM.22*(M.01*IM.22.01+M.02*IM.22.02+M.03*
IM.22.03+M.04*IM.22.04+M.05*IM.22.05+M.06*IM.22.06+M.07*
IM.22.07+M.08*IM.22.08+M.09*IM.22.09+M.10*IM.22.10+M.11*
IM.22.11+M.12*IM.22.12+M.13*IM.22.13+M.14*IM.22.14+M.15*
IM.22.15+M.16*IM.22.16+M.17*IM.22.17+M.18*IM.22.18+M.19*
IM.22.19+M.20*IM.22.20+M.21*IM.22.21+M.22*IM.22.22+M.23*
IM.22.23+M.24*IM.22.24+M.25*IM.22.25+M.26*IM.22.26+M.27*
IM.22.27+M.28*IM.22.28+M.29*IM.22.29)

944: PRE.21 == PM.21*(M.01*IM.21.01+M.02*IM.21.02+M.03*
IM.21.03+M.04*IM.21.04+M.05*IM.21.05+M.06*IM.21.06+M.07*
IM.21.07+M.08*IM.21.08+M.09*IM.21.09+M.10*IM.21.10+M.11*
IM.21.11+M.12*IM.21.12+M.13*IM.21.13+M.14*IM.21.14+M.15*
IM.21.15+M.16*IM.21.16+M.17*IM.21.17+M.18*IM.21.18+M.19*
IM.21.19+M.20*IM.21.20+M.21*IM.21.21+M.22*IM.21.22+M.23*
IM.21.23+M.24*IM.21.24+M.25*IM.21.25+M.26*IM.21.26+M.27*
IM.21.27+M.28*IM.21.28+M.29*IM.21.29)

945: PRE.20 == PM.20*(M.01*IM.20.01+M.02*IM.20.02+M.03*
IM.20.03+M.04*IM.20.04+M.05*IM.20.05+M.06*IM.20.06+M.07*
IM.20.07+M.08*IM.20.08+M.09*IM.20.09+M.10*IM.20.10+M.11*
IM.20.11+M.12*IM.20.12+M.13*IM.20.13+M.14*IM.20.14+M.15*
IM.20.15+M.16*IM.20.16+M.17*IM.20.17+M.18*IM.20.18+M.19*
IM.20.19+M.20*IM.20.20+M.21*IM.20.21+M.22*IM.20.22+M.23*
IM.20.23+M.24*IM.20.24+M.25*IM.20.25+M.26*IM.20.26+M.27*
IM.20.27+M.28*IM.20.28+M.29*IM.20.29)

946: PRE.19 == PM.19*(M.01*IM.19.01+M.02*IM.19.02+M.03*
IM.19.03+M.04*IM.19.04+M.05*IM.19.05+M.06*IM.19.06+M.07*
IM.19.07+M.08*IM.19.08+M.09*IM.19.09+M.10*IM.19.10+M.11*
IM.19.11+M.12*IM.19.12+M.13*IM.19.13+M.14*IM.19.14+M.15*
IM.19.15+M.16*IM.19.16+M.17*IM.19.17+M.18*IM.19.18+M.19*
IM.19.19+M.20*IM.19.20+M.21*IM.19.21+M.22*IM.19.22+M.23*
IM.19.23+M.24*IM.19.24+M.25*IM.19.25+M.26*IM.19.26+M.27*
IM.19.27+M.28*IM.19.28+M.29*IM.19.29)

947: PRE.18 == PM.18*(M.01*IM.18.01+M.02*IM.18.02+M.03*
IM.18.03+M.04*IM.18.04+M.05*IM.18.05+M.06*IM.18.06+M.07*
IM.18.07+M.08*IM.18.08+M.09*IM.18.09+M.10*IM.18.10+M.11*
IM.18.11+M.12*IM.18.12+M.13*IM.18.13+M.14*IM.18.14+M.15*
IM.18.15+M.16*IM.18.16+M.17*IM.18.17+M.18*IM.18.18+M.19*
IM.18.19+M.20*IM.18.20+M.21*IM.18.21+M.22*IM.18.22+M.23*
IM.18.23+M.24*IM.18.24+M.25*IM.18.25+M.26*IM.18.26+M.27*
IM.18.27+M.28*IM.18.28+M.29*IM.18.29)

948: PRE.17 == PM.17*(M.01*IM.17.01+M.02*IM.17.02+M.03*
IM.17.03+M.04*IM.17.04+M.05*IM.17.05+M.06*IM.17.06+M.07*
IM.17.07+M.08*IM.17.08+M.09*IM.17.09+M.10*IM.17.10+M.11*
IM.17.11+M.12*IM.17.12+M.13*IM.17.13+M.14*IM.17.14+M.15*
IM.17.15+M.16*IM.17.16+M.17*IM.17.17+M.18*IM.17.18+M.19*
IM.17.19+M.20*IM.17.20+M.21*IM.17.21+M.22*IM.17.22+M.23*
IM.17.23+M.24*IM.17.24+M.25*IM.17.25+M.26*IM.17.26+M.27*
IM.17.27+M.28*IM.17.28+M.29*IM.17.29)

949: PRE.16 == PM.16*(M.01*IM.16.01+M.02*IM.16.02+M.03*
IM.16.03+M.04*IM.16.04+M.05*IM.16.05+M.06*IM.16.06+M.07*
IM.16.07+M.08*IM.16.08+M.09*IM.16.09+M.10*IM.16.10+M.11*
IM.16.11+M.12*IM.16.12+M.13*IM.16.13+M.14*IM.16.14+M.15*
IM.16.15+M.16*IM.16.16+M.17*IM.16.17+M.18*IM.16.18+M.19*
IM.16.19+M.20*IM.16.20+M.21*IM.16.21+M.22*IM.16.22+M.23*
IM.16.23+M.24*IM.16.24+M.25*IM.16.25+M.26*IM.16.26+M.27*
IM.16.27+M.28*IM.16.28+M.29*IM.16.29)

950: PRE.15 == PM.15*(M.01*IM.15.01+M.02*IM.15.02+M.03*
IM.15.03+M.04*IM.15.04+M.05*IM.15.05+M.06*IM.15.06+M.07*
IM.15.07+M.08*IM.15.08+M.09*IM.15.09+M.10*IM.15.10+M.11*
IM.15.11+M.12*IM.15.12+M.13*IM.15.13+M.14*IM.15.14+M.15*
IM.15.15+M.16*IM.15.16+M.17*IM.15.17+M.18*IM.15.18+M.19*
IM.15.19+M.20*IM.15.20+M.21*IM.15.21+M.22*IM.15.22+M.23*
IM.15.23+M.24*IM.15.24+M.25*IM.15.25+M.26*IM.15.26+M.27*
IM.15.27+M.28*IM.15.28+M.29*IM.15.29)

951: PRE.14 == PM.14*(M.01*IM.14.01+M.02*IM.14.02+M.03*
IM.14.03+M.04*IM.14.04+M.05*IM.14.05+M.06*IM.14.06+M.07*
IM.14.07+M.08*IM.14.08+M.09*IM.14.09+M.10*IM.14.10+M.11*
IM.14.11+M.12*IM.14.12+M.13*IM.14.13+M.14*IM.14.14+M.15*
IM.14.15+M.16*IM.14.16+M.17*IM.14.17+M.18*IM.14.18+M.19*
IM.14.19+M.20*IM.14.20+M.21*IM.14.21+M.22*IM.14.22+M.23*
IM.14.23+M.24*IM.14.24+M.25*IM.14.25+M.26*IM.14.26+M.27*
IM.14.27+M.28*IM.14.28+M.29*IM.14.29)

952: PRE.13 == PM.13*(M.01*IM.13.01+M.02*IM.13.02+M.03*
IM.13.03+M.04*IM.13.04+M.05*IM.13.05+M.06*IM.13.06+M.07*
IM.13.07+M.08*IM.13.08+M.09*IM.13.09+M.10*IM.13.10+M.11*
IM.13.11+M.12*IM.13.12+M.13*IM.13.13+M.14*IM.13.14+M.15*
IM.13.15+M.16*IM.13.16+M.17*IM.13.17+M.18*IM.13.18+M.19*
IM.13.19+M.20*IM.13.20+M.21*IM.13.21+M.22*IM.13.22+M.23*
IM.13.23+M.24*IM.13.24+M.25*IM.13.25+M.26*IM.13.26+M.27*
IM.13.27+M.28*IM.13.28+M.29*IM.13.29)

953: PRE.12 == PM.12*(M.01*IM.12.01+M.02*IM.12.02+M.03*
IM.12.03+M.04*IM.12.04+M.05*IM.12.05+M.06*IM.12.06+M.07*
IM.12.07+M.08*IM.12.08+M.09*IM.12.09+M.10*IM.12.10+M.11*
IM.12.11+M.12*IM.12.12+M.13*IM.12.13+M.14*IM.12.14+M.15*
IM.12.15+M.16*IM.12.16+M.17*IM.12.17+M.18*IM.12.18+M.19*
IM.12.19+M.20*IM.12.20+M.21*IM.12.21+M.22*IM.12.22+M.23*
IM.12.23+M.24*IM.12.24+M.25*IM.12.25+M.26*IM.12.26+M.27*
IM.12.27+M.28*IM.12.28+M.29*IM.12.29)

- 954: PRE.11 == PM.11*(M.01*IM.11.01+M.02*IM.11.02+M.03*
IM.11.03+M.04*IM.11.04+M.05*IM.11.05+M.06*IM.11.06+M.07*
IM.11.07+M.08*IM.11.08+M.09*IM.11.09+M.10*IM.11.10+M.11*
IM.11.11+M.12*IM.11.12+M.13*IM.11.13+M.14*IM.11.14+M.15*
IM.11.15+M.16*IM.11.16+M.17*IM.11.17+M.18*IM.11.18+M.19*
IM.11.19+M.20*IM.11.20+M.21*IM.11.21+M.22*IM.11.22+M.23*
IM.11.23+M.24*IM.11.24+M.25*IM.11.25+M.26*IM.11.26+M.27*
IM.11.27+M.28*IM.11.28+M.29*IM.11.29)
- 955: PRE.10 == PM.10*(M.01*IM.10.01+M.02*IM.10.02+M.03*
IM.10.03+M.04*IM.10.04+M.05*IM.10.05+M.06*IM.10.06+M.07*
IM.10.07+M.08*IM.10.08+M.09*IM.10.09+M.10*IM.10.10+M.11*
IM.10.11+M.12*IM.10.12+M.13*IM.10.13+M.14*IM.10.14+M.15*
IM.10.15+M.16*IM.10.16+M.17*IM.10.17+M.18*IM.10.18+M.19*
IM.10.19+M.20*IM.10.20+M.21*IM.10.21+M.22*IM.10.22+M.23*
IM.10.23+M.24*IM.10.24+M.25*IM.10.25+M.26*IM.10.26+M.27*
IM.10.27+M.28*IM.10.28+M.29*IM.10.29)
- 956: PRE.09 == PM.09*(M.01*IM.09.01+M.02*IM.09.02+M.03*
IM.09.03+M.04*IM.09.04+M.05*IM.09.05+M.06*IM.09.06+M.07*
IM.09.07+M.08*IM.09.08+M.09*IM.09.09+M.10*IM.09.10+M.11*
IM.09.11+M.12*IM.09.12+M.13*IM.09.13+M.14*IM.09.14+M.15*
IM.09.15+M.16*IM.09.16+M.17*IM.09.17+M.18*IM.09.18+M.19*
IM.09.19+M.20*IM.09.20+M.21*IM.09.21+M.22*IM.09.22+M.23*
IM.09.23+M.24*IM.09.24+M.25*IM.09.25+M.26*IM.09.26+M.27*
IM.09.27+M.28*IM.09.28+M.29*IM.09.29)
- 957: PRE.08 == PM.08*(M.01*IM.08.01+M.02*IM.08.02+M.03*
IM.08.03+M.04*IM.08.04+M.05*IM.08.05+M.06*IM.08.06+M.07*
IM.08.07+M.08*IM.08.08+M.09*IM.08.09+M.10*IM.08.10+M.11*
IM.08.11+M.12*IM.08.12+M.13*IM.08.13+M.14*IM.08.14+M.15*
IM.08.15+M.16*IM.08.16+M.17*IM.08.17+M.18*IM.08.18+M.19*
IM.08.19+M.20*IM.08.20+M.21*IM.08.21+M.22*IM.08.22+M.23*
IM.08.23+M.24*IM.08.24+M.25*IM.08.25+M.26*IM.08.26+M.27*
IM.08.27+M.28*IM.08.28+M.29*IM.08.29)
- 958: PRE.07 == PM.07*(M.01*IM.07.01+M.02*IM.07.02+M.03*
IM.07.03+M.04*IM.07.04+M.05*IM.07.05+M.06*IM.07.06+M.07*
IM.07.07+M.08*IM.07.08+M.09*IM.07.09+M.10*IM.07.10+M.11*
IM.07.11+M.12*IM.07.12+M.13*IM.07.13+M.14*IM.07.14+M.15*
IM.07.15+M.16*IM.07.16+M.17*IM.07.17+M.18*IM.07.18+M.19*
IM.07.19+M.20*IM.07.20+M.21*IM.07.21+M.22*IM.07.22+M.23*
IM.07.23+M.24*IM.07.24+M.25*IM.07.25+M.26*IM.07.26+M.27*
IM.07.27+M.28*IM.07.28+M.29*IM.07.29)

959: PRE.06 == PM.06*(M.01*IM.06.01+M.02*IM.06.02+M.03*
IM.06.03+M.04*IM.06.04+M.05*IM.06.05+M.06*IM.06.06+M.07*
IM.06.07+M.08*IM.06.08+M.09*IM.06.09+M.10*IM.06.10+M.11*
IM.06.11+M.12*IM.06.12+M.13*IM.06.13+M.14*IM.06.14+M.15*
IM.06.15+M.16*IM.06.16+M.17*IM.06.17+M.18*IM.06.18+M.19*
IM.06.19+M.20*IM.06.20+M.21*IM.06.21+M.22*IM.06.22+M.23*
IM.06.23+M.24*IM.06.24+M.25*IM.06.25+M.26*IM.06.26+M.27*
IM.06.27+M.28*IM.06.28+M.29*IM.06.29)

960: PRE.05 == PM.05*(M.01*IM.05.01+M.02*IM.05.02+M.03*
IM.05.03+M.04*IM.05.04+M.05*IM.05.05+M.06*IM.05.06+M.07*
IM.05.07+M.08*IM.05.08+M.09*IM.05.09+M.10*IM.05.10+M.11*
IM.05.11+M.12*IM.05.12+M.13*IM.05.13+M.14*IM.05.14+M.15*
IM.05.15+M.16*IM.05.16+M.17*IM.05.17+M.18*IM.05.18+M.19*
IM.05.19+M.20*IM.05.20+M.21*IM.05.21+M.22*IM.05.22+M.23*
IM.05.23+M.24*IM.05.24+M.25*IM.05.25+M.26*IM.05.26+M.27*
IM.05.27+M.28*IM.05.28+M.29*IM.05.29)

961: PRE.04 == PM.04*(M.01*IM.04.01+M.02*IM.04.02+M.03*
IM.04.03+M.04*IM.04.04+M.05*IM.04.05+M.06*IM.04.06+M.07*
IM.04.07+M.08*IM.04.08+M.09*IM.04.09+M.10*IM.04.10+M.11*
IM.04.11+M.12*IM.04.12+M.13*IM.04.13+M.14*IM.04.14+M.15*
IM.04.15+M.16*IM.04.16+M.17*IM.04.17+M.18*IM.04.18+M.19*
IM.04.19+M.20*IM.04.20+M.21*IM.04.21+M.22*IM.04.22+M.23*
IM.04.23+M.24*IM.04.24+M.25*IM.04.25+M.26*IM.04.26+M.27*
IM.04.27+M.28*IM.04.28+M.29*IM.04.29)

962: PRE.03 == PM.03*(M.01*IM.03.01+M.02*IM.03.02+M.03*
IM.03.03+M.04*IM.03.04+M.05*IM.03.05+M.06*IM.03.06+M.07*
IM.03.07+M.08*IM.03.08+M.09*IM.03.09+M.10*IM.03.10+M.11*
IM.03.11+M.12*IM.03.12+M.13*IM.03.13+M.14*IM.03.14+M.15*
IM.03.15+M.16*IM.03.16+M.17*IM.03.17+M.18*IM.03.18+M.19*
IM.03.19+M.20*IM.03.20+M.21*IM.03.21+M.22*IM.03.22+M.23*
IM.03.23+M.24*IM.03.24+M.25*IM.03.25+M.26*IM.03.26+M.27*
IM.03.27+M.28*IM.03.28+M.29*IM.03.29)

963: PRE.02 == PM.02*(M.01*IM.02.01+M.02*IM.02.02+M.03*
IM.02.03+M.04*IM.02.04+M.05*IM.02.05+M.06*IM.02.06+M.07*
IM.02.07+M.08*IM.02.08+M.09*IM.02.09+M.10*IM.02.10+M.11*
IM.02.11+M.12*IM.02.12+M.13*IM.02.13+M.14*IM.02.14+M.15*
IM.02.15+M.16*IM.02.16+M.17*IM.02.17+M.18*IM.02.18+M.19*
IM.02.19+M.20*IM.02.20+M.21*IM.02.21+M.22*IM.02.22+M.23*
IM.02.23+M.24*IM.02.24+M.25*IM.02.25+M.26*IM.02.26+M.27*
IM.02.27+M.28*IM.02.28+M.29*IM.02.29)

964: PRE.01 == PM.01*(M.01*IM.01.01+M.02*IM.01.02+M.03*
IM.01.03+M.04*IM.01.04+M.05*IM.01.05+M.06*IM.01.06+M.07*
IM.01.07+M.08*IM.01.08+M.09*IM.01.09+M.10*IM.01.10+M.11*
IM.01.11+M.12*IM.01.12+M.13*IM.01.13+M.14*IM.01.14+M.15*
IM.01.15+M.16*IM.01.16+M.17*IM.01.17+M.18*IM.01.18+M.19*
IM.01.19+M.20*IM.01.20+M.21*IM.01.21+M.22*IM.01.22+M.23*
IM.01.23+M.24*IM.01.24+M.25*IM.01.25+M.26*IM.01.26+M.27*
IM.01.27+M.28*IM.01.28+M.29*IM.01.29)

965: PRE.ST == PRE.01+PRE.02+PRE.03+PRE.04+PRE.05+PRE.06+
PRE.07+PRE.08+PRE.09+PRE.10+PRE.11+PRE.12+PRE.13+PRE.14+
PRE.15+PRE.16+PRE.17+PRE.18+PRE.19+PRE.20+PRE.21+PRE.22+
PRE.23+PRE.24+PRE.25+PRE.26+PRE.27+PRE.28+PRE.29

966: ADJ == POP/PRE.ST

Population (P.aa) in region aa (1970 Census Divisions)

967: P.29 == PRE.29*ADJ

968: P.28 == PRE.28*ADJ

969: P.27 == PRE.27*ADJ

970: P.26 == PRE.26*ADJ

971: P.25 == PRE.25*ADJ

972: P.24 == PRE.24*ADJ

973: P.23 == PRE.23*ADJ

974: P.22 == PRE.22*ADJ

975: P.21 == PRE.21*ADJ

976: P.20 == PRE.20*ADJ

977: P.19 == PRE.19*ADJ

978: P.18 == PRE.18*ADJ

979: P.17 == PRE.17*ADJ

980: P.16 == PRE.16*ADJ

981: P.15 == PRE.15*ADJ
982: P.14 == PRE.14*ADJ
983: P.13 == PRE.13*ADJ
984: P.12 == PRE.12*ADJ
985: P.11 == PRE.11*ADJ
986: P.10 == PRE.10*ADJ
987: P.09 == PRE.09*ADJ
988: P.08 == PRE.08*ADJ
989: P.07 == PRE.07*ADJ
990: P.06 == PRE.06*ADJ
991: P.05 == PRE.05*ADJ
992: P.04 == PRE.04*ADJ
993: P.03 == PRE.03*ADJ
994: P.02 == PRE.02*ADJ
995: P.01 == PRE.01*ADJ
996: P.ST == P.01+P.02+P.03+P.04+P.05+P.06+P.07+P.08+P.09+
P.10+P.11+P.12+P.13+P.14+P.15+P.16+P.17+P.18+P.19+P.20+
P.21+P.22+P.23+P.24+P.25+P.26+P.27+P.28+P.29
997: P.RB == P.02+P.09+P.12+P.17+P.21+P.24+P.26
998: P.NR == P.ST-P.RB
999: P.AM == P.02+P.17
1000: P.AG == P.AM+P.21+P.12
1001: P.FG == P.09+P.24

Population (PCEN.cc) in region cc (1980 Census Divisions)

1002: PCEN.01 == P.04
1003: PCEN.02 == P.14
1004: PCEN.03 == P.18
1005: PCEN.04 == P.29+P.16*PC.04.16+P.25*PC.04.25
1006: PCEN.05 == P.09
1007: PCEN.06 = P.24+P.25*PC.06.25
1008: PCEN.07 == P.27
1009: PCEN.08 == P.05+P.16*PC.08.16
1010: PCEN.09 == P.07
1011: PCEN.10 == P.06
1012: PCEN.11 == P.01
1013: PCEN.12 == P.17
1014: PCEN.13 == P.02
1015: PCEN.14 == P.12+P.21
1016: PCEN.15 == P.15
1017: PCEN.16 == P.08+P.26
1018: PCEN.17 == P.23+P.03
1019: PCEN.18 == P.10
1020: PCEN.19 == P.11
1021: PCEN.20 == P.22
1022: PCEN.21 == P.28
1023: PCEN.22 == P.20+P.19
1024: PCEN.23 == P.13

Preliminary Household Estimate (HPRE.cc) for region cc

1025: HPRE.01 == (PCEN.01-PGQ.01)/HHSZ.01
1026: HPRE.02 == (PCEN.02-PGQ.02)/HHSZ.02
1027: HPRE.03 == (PCEN.03-PGQ.03)/HHSZ.03
1028: HPRE.04 == (PCEN.04-PGQ.04)/HHSZ.04
1029: HPRE.05 == (PCEN.05-PGQ.05)/HHSZ.05
1030: HPRE.06 == (PCEN.06-PGQ.06)/HHSZ.06
1031: HPRE.07 == (PCEN.07-PGQ.07)/HHSZ.07
1032: HPRE.08 == (PCEN.08-PGQ.08)/HHSZ.08
1033: HPRE.09 == 0
1034: HPRE.10 == (PCEN.10-PGQ.10)/HHSZ.10
1035: HPRE.11 == (PCEN.11-PGQ.11)/HHSZ.11
1036: HPRE.12 == (PCEN.12-PGQ.12)/HHSZ.12
1037: HPRE.13 == (PCEN.13-PGQ.13)/HHSZ.13
1038: HPRE.14 == (PCEN.14-PGQ.14)/HHSZ.14
1039: HPRE.15 == (PCEN.15-PGQ.15)/HHSZ.15
1040: HPRE.16 == (PCEN.16-PGQ.16)/HHSZ.16
1041: HPRE.17 == 0
1042: HPRE.18 == 0
1043: HPRE.19 == (PCEN.19-PGQ.19)/HHSZ.19
1044: HPRE.20 == 0
1045: HPRE.21 == 0
1046: HPRE.22 == 0
1047: HPRE.23 == 0

1048: HPRE.ST == HPRE.01+HPRE.02+HPRE.03+HPRE.04+HPRE.05+
 HPRE.06+HPRE.07+HPRE.08+HPRE.09+HPRE.10+HPRE.11+HPRE.12+
 HPRE.13+HPRE.14+HPRE.15+HPRE.16+HPRE.17+HPRE.18+HPRE.19+
 HPRE.20+HPRE.21+HPRE.22+HPRE.23

1049: ADJHH == HH/HPRE.ST

Households (HHCEN.cc) for region cc (1980 Census Divisions)

1050: HHCEN.01 == HPRE.01*ADJHH

1051: HHCEN.02 == HPRE.02*ADJHH

1052: HHCEN.03 == HPRE.03*ADJHH

1053: HHCEN.04 == HPRE.04*ADJHH

1054: HHCEN.05 == HPRE.05*ADJHH

1055: HHCEN.06 == HPRE.06*ADJHH

1056: HHCEN.07 == HPRE.07*ADJHH

1057: HHCEN.08 == HPRE.08*ADJHH

1058: HHCEN.09 == HPRE.09*ADJHH

1059: HHCEN.10 == HPRE.10*ADJHH

1060: HHCEN.11 == HPRE.11*ADJHH

1061: HHCEN.12 == HPRE.12*ADJHH

1062: HHCEN.13 == HPRE.13*ADJHH

1063: HHCEN.14 == HPRE.14*ADJHH

1064: HHCEN.15 == HPRE.15*ADJHH

1065: HHCEN.16 == HPRE.16*ADJHH

1066: HHCEN.17 == HPRE.17*ADJHH

1067: HHCEN.18 == HPRE.18*ADJHH

1068: HHCEN.19 == HPRE.19*ADJHH

1069: HHCEN.20 == HPRE.20*ADJHH

1070: HHCEN.21 == HPRE.21*ADJHH
1071: HHCEN.22 == HPRE.22*ADJHH
1072: HHCEN.23 == HPRE.23*ADJHH
1073: HHCEN.ST == HHCEN.01+HHCEN.02+HHCEN.03+HHCEN.04+HHCEN.05
 +HHCEN.06+HHCEN.07+HHCEN.08+HHCEN.09+HHCEN.10+HHCEN.11+
 HHCEN.12+HHCEN.13+HHCEN.14+HHCEN.15+HHCEN.16+HHCEN.17+
 HHCEN.18+HHCEN.19+HHCEN.20+HHCEN.21+HHCEN.22+HHCEN.23
1074: B.IR == B.RB-B.26
1075: G.IR == G.RB-G.26
1076: S.IR == S.RB-S.26
1077: M.IR == M.RB-M.26
1078: P.IR == P.RB-P.26

Households (HH.aa) in region aa (1970 Census Divisions)

1079: HH.AM == HHCEN.12+HHCEN.13
1080: HH.AG == HH.AM+HHCEN.14
1081: HH.FG == HHCEN.05+HHCEN.06*(P.24/PCEN.06)
1082: HH.IR == HH.AG+HH.FG

PARAMETERS:

A.01.01	0.16	A.01.02	0.	A.01.03	0.
A.01.04	0.	A.01.05	0.	A.01.06	0.
A.01.07	0.	A.01.08	0.	A.01.09	0.
A.01.10	0.	A.01.11	0.	A.01.12	0.
A.01.13	0.	A.01.14	0.	A.01.15	0.
A.01.16	0.	A.01.17	0.	A.01.18	0.
A.01.19	0.	A.01.20	0.	A.01.21	0.
A.01.22	0.	A.01.23	0.	A.01.24	0.
A.01.25	0.	A.01.26	0.	A.01.27	0.
A.01.28	0.	A.01.29	0.	A.02.01	0.84
A.02.02	1.	A.02.03	0.	A.02.04	0.73
A.02.05	0.	A.02.06	0.44	A.02.07	0.
A.02.08	0.41	A.02.09	0.	A.02.10	0.
A.02.11	0.19	A.02.12	0.08	A.02.13	0.
A.02.14	0.01	A.02.15	0.43	A.02.16	0.
A.02.17	0.	A.02.18	0.	A.02.19	0.
A.02.20	0.	A.02.21	0.28	A.02.22	0.
A.02.23	0.	A.02.24	0.7	A.02.25	0.
A.02.26	0.21	A.02.27	0.	A.02.28	0.
A.02.29	0.25	A.03.01	0.	A.03.02	0.
A.03.03	0.	A.03.04	0.	A.03.05	0.
A.03.06	0.	A.03.07	0.	A.03.08	0.
A.03.09	0.	A.03.10	0.	A.03.11	0.
A.03.12	0.	A.03.13	0.	A.03.14	0.
A.03.15	0.	A.03.16	0.	A.03.17	0.
A.03.18	0.	A.03.19	0.	A.03.20	0.
A.03.21	0.	A.03.22	0.	A.03.23	0.
A.03.24	0.	A.03.25	0.	A.03.26	0.
A.03.27	0.	A.03.28	0.	A.03.29	0.
A.04.01	0.	A.04.02	0.	A.04.03	0.
A.04.04	0.27	A.04.05	0.	A.04.06	0.
A.04.07	0.	A.04.08	0.	A.04.09	0.
A.04.10	0.	A.04.11	0.	A.04.12	0.
A.04.13	0.	A.04.14	0.	A.04.15	0.
A.04.16	0.	A.04.17	0.	A.04.18	0.
A.04.19	0.	A.04.20	0.	A.04.21	0.
A.04.22	0.	A.04.23	0.	A.04.24	0.
A.04.25	0.	A.04.26	0.	A.04.27	0.
A.04.28	0.	A.04.29	0.	A.05.01	0.
A.05.02	0.	A.05.03	0.	A.05.04	0.
A.05.05	1.	A.05.06	0.	A.05.07	0.
A.05.08	0.	A.05.09	0.	A.05.10	0.
A.05.11	0.	A.05.12	0.	A.05.13	0.
A.05.14	0.	A.05.15	0.	A.05.16	0.

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A.05.17	0.	A.05.18	0.	A.05.19	0.
A.05.20	0.	A.05.21	0.	A.05.22	0.
A.05.23	0.	A.05.24	0.	A.05.25	0.
A.05.26	0.	A.05.27	0.49	A.05.28	0.
A.05.29	0.	A.06.01	0.	A.06.02	0.
A.06.03	0.	A.06.04	0.	A.06.05	0.
A.06.06	0.56	A.06.07	0.	A.06.08	0.
A.06.09	0.	A.06.10	0.	A.06.11	0.
A.06.12	0.	A.06.13	0.	A.06.14	0.
A.06.15	0.	A.06.16	0.	A.06.17	0.
A.06.18	0.	A.06.19	0.	A.06.20	0.
A.06.21	0.	A.06.22	0.	A.06.23	0.
A.06.24	0.	A.06.25	0.	A.06.26	0.
A.06.27	0.	A.06.28	0.	A.06.29	0.
A.07.01	0.	A.07.02	0.	A.07.03	0.
A.07.04	0.	A.07.05	0.	A.07.06	0.
A.07.07	0.	A.07.08	0.	A.07.09	0.
A.07.10	0.	A.07.11	0.	A.07.12	0.
A.07.13	0.	A.07.14	0.	A.07.15	0.
A.07.16	0.	A.07.17	0.	A.07.18	0.
A.07.19	0.	A.07.20	0.	A.07.21	0.
A.07.22	0.	A.07.23	0.	A.07.24	0.
A.07.25	0.	A.07.26	0.	A.07.27	0.
A.07.28	0.	A.07.29	0.	A.08.01	0.
A.08.02	0.	A.08.03	0.	A.08.04	0.
A.08.05	0.	A.08.06	0.	A.08.07	0.
A.08.08	0.59	A.08.09	0.	A.08.10	0.
A.08.11	0.	A.08.12	0.	A.08.13	0.
A.08.14	0.	A.08.15	0.	A.08.16	0.
A.08.17	0.	A.08.18	0.	A.08.19	0.
A.08.20	0.	A.08.21	0.	A.08.22	0.
A.08.23	0.	A.08.24	0.	A.08.25	0.
A.08.26	0.	A.08.27	0.	A.08.28	0.
A.08.29	0.	A.09.01	0.	A.09.02	0.
A.09.03	0.	A.09.04	0.	A.09.05	0.
A.09.06	0.	A.09.07	0.	A.09.08	0.
A.09.09	1.	A.09.10	0.	A.09.11	0.
A.09.12	0.	A.09.13	0.	A.09.14	0.
A.09.15	0.	A.09.16	0.45	A.09.17	0.
A.09.18	0.	A.09.19	0.	A.09.20	0.
A.09.21	0.	A.09.22	0.	A.09.23	0.
A.09.24	0.	A.09.25	0.41	A.09.26	0.
A.09.27	0.	A.09.28	0.	A.09.29	0.24
A.10.01	0.	A.10.02	0.	A.10.03	0.
A.10.04	0.	A.10.05	0.	A.10.06	0.
A.10.07	0.	A.10.08	0.	A.10.09	0.

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A.10.10	0.	A.10.11	0.	A.10.12	0.
A.10.13	0.	A.10.14	0.	A.10.15	0.
A.10.16	0.	A.10.17	0.	A.10.18	0.
A.10.19	0.	A.10.20	0.	A.10.21	0.
A.10.22	0.	A.10.23	0.	A.10.24	0.
A.10.25	0.	A.10.26	0.	A.10.27	0.
A.10.28	0.	A.10.29	0.	A.11.01	0.
A.11.02	0.	A.11.03	0.	A.11.04	0.
A.11.05	0.	A.11.06	0.	A.11.07	0.
A.11.08	0.	A.11.09	0.	A.11.10	0.
A.11.11	0.81	A.11.12	0.	A.11.13	0.
A.11.14	0.	A.11.15	0.	A.11.16	0.
A.11.17	0.	A.11.18	0.	A.11.19	0.
A.11.20	0.	A.11.21	0.	A.11.22	0.
A.11.23	0.	A.11.24	0.	A.11.25	0.
A.11.26	0.	A.11.27	0.	A.11.28	0.
A.11.29	0.	A.12.01	0.	A.12.02	0.
A.12.03	0.	A.12.04	0.	A.12.05	0.
A.12.06	0.	A.12.07	0.	A.12.08	0.
A.12.09	0.	A.12.10	0.	A.12.11	0.
A.12.12	0.92	A.12.13	0.	A.12.14	0.
A.12.15	0.	A.12.16	0.	A.12.17	0.
A.12.18	0.	A.12.19	0.	A.12.20	0.
A.12.21	0.	A.12.22	0.	A.12.23	0.
A.12.24	0.	A.12.25	0.	A.12.26	0.
A.12.27	0.	A.12.28	0.	A.12.29	0.
A.13.01	0.	A.13.02	0.	A.13.03	0.
A.13.04	0.	A.13.05	0.	A.13.06	0.
A.13.07	0.	A.13.08	0.	A.13.09	0.
A.13.10	0.	A.13.11	0.	A.13.12	0.
A.13.13	0.	A.13.14	0.	A.13.15	0.
A.13.16	0.	A.13.17	0.	A.13.18	0.
A.13.19	0.	A.13.20	0.	A.13.21	0.
A.13.22	0.	A.13.23	0.	A.13.24	0.
A.13.25	0.	A.13.26	0.	A.13.27	0.
A.13.28	0.	A.13.29	0.	A.14.01	0.
A.14.02	0.	A.14.03	0.	A.14.04	0.
A.14.05	0.	A.14.06	0.	A.14.07	0.
A.14.08	0.	A.14.09	0.	A.14.10	0.
A.14.11	0.	A.14.12	0.	A.14.13	0.
A.14.14	0.71	A.14.15	0.	A.14.16	0.
A.14.17	0.	A.14.18	0.	A.14.19	0.
A.14.20	0.	A.14.21	0.	A.14.22	0.
A.14.23	0.	A.14.24	0.	A.14.25	0.
A.14.26	0.	A.14.27	0.	A.14.28	0.
A.14.29	0.	A.15.01	0.	A.15.02	0.

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A.15.03	0.	A.15.04	0.	A.15.05	0.
A.15.06	0.	A.15.07	0.	A.15.08	0.
A.15.09	0.	A.15.10	0.	A.15.11	0.
A.15.12	0.	A.15.13	0.	A.15.14	0.
A.15.15	0.57	A.15.16	0.	A.15.17	0.
A.15.18	0.	A.15.19	0.	A.15.20	0.
A.15.21	0.	A.15.22	0.	A.15.23	0.
A.15.24	0.	A.15.25	0.	A.15.26	0.
A.15.27	0.	A.15.28	0.	A.15.29	0.
A.16.01	0.	A.16.02	0.	A.16.03	0.
A.16.04	0.	A.16.05	0.	A.16.06	0.
A.16.07	0.	A.16.08	0.	A.16.09	0.
A.16.10	0.	A.16.11	0.	A.16.12	0.
A.16.13	0.	A.16.14	0.	A.16.15	0.
A.16.16	0.55	A.16.17	0.	A.16.18	0.
A.16.19	0.	A.16.20	0.	A.16.21	0.
A.16.22	0.	A.16.23	0.	A.16.24	0.
A.16.25	0.	A.16.26	0.	A.16.27	0.
A.16.28	0.	A.16.29	0.	A.17.01	0.
A.17.02	0.	A.17.03	0.	A.17.04	0.
A.17.05	0.	A.17.06	0.	A.17.07	0.
A.17.08	0.	A.17.09	0.	A.17.10	0.
A.17.11	0.	A.17.12	0.	A.17.13	0.
A.17.14	0.	A.17.15	0.	A.17.16	0.
A.17.17	1.	A.17.18	0.	A.17.19	0.
A.17.20	0.	A.17.21	0.	A.17.22	0.
A.17.23	0.	A.17.24	0.	A.17.25	0.
A.17.26	0.	A.17.27	0.	A.17.28	0.
A.17.29	0.	A.18.01	0.	A.18.02	0.
A.18.03	0.	A.18.04	0.	A.18.05	0.
A.18.06	0.	A.18.07	0.	A.18.08	0.
A.18.09	0.	A.18.10	0.	A.18.11	0.
A.18.12	0.	A.18.13	0.	A.18.14	0.28
A.18.15	0.	A.18.16	0.	A.18.17	0.
A.18.18	1.	A.18.19	0.	A.18.20	0.
A.18.21	0.	A.18.22	0.	A.18.23	0.
A.18.24	0.	A.18.25	0.	A.18.26	0.
A.18.27	0.	A.18.28	0.	A.18.29	0.
A.19.01	0.	A.19.02	0.	A.19.03	0.
A.19.04	0.	A.19.05	0.	A.19.06	0.
A.19.07	0.	A.19.08	0.	A.19.09	0.
A.19.10	0.	A.19.11	0.	A.19.12	0.
A.19.13	0.	A.19.14	0.	A.19.15	0.
A.19.16	0.	A.19.17	0.	A.19.18	0.
A.19.19	0.	A.19.20	0.	A.19.21	0.
A.19.22	0.	A.19.23	0.	A.19.24	0.

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A.19.25	0.	A.19.26	0.	A.19.27	0.
A.19.28	0.	A.19.29	0.	A.20.01	0.
A.20.02	0.	A.20.03	0.	A.20.04	0.
A.20.05	0.	A.20.06	0.	A.20.07	0.
A.20.08	0.	A.20.09	0.	A.20.10	0.
A.20.11	0.	A.20.12	0.	A.20.13	0.
A.20.14	0.	A.20.15	0.	A.20.16	0.
A.20.17	0.	A.20.18	0.	A.20.19	0.
A.20.20	0.	A.20.21	0.	A.20.22	0.
A.20.23	0.	A.20.24	0.	A.20.25	0.
A.20.26	0.	A.20.27	0.	A.20.28	0.
A.20.29	0.	A.21.01	0.	A.21.02	0.
A.21.03	0.	A.21.04	0.	A.21.05	0.
A.21.06	0.	A.21.07	0.	A.21.08	0.
A.21.09	0.	A.21.10	0.	A.21.11	0.
A.21.12	0.	A.21.13	0.	A.21.14	0.
A.21.15	0.	A.21.16	0.	A.21.17	0.
A.21.18	0.	A.21.19	0.	A.21.20	0.
A.21.21	0.72	A.21.22	0.	A.21.23	0.
A.21.24	0.	A.21.25	0.	A.21.26	0.
A.21.27	0.	A.21.28	0.	A.21.29	0.
A.22.01	0.	A.22.02	0.	A.22.03	0.
A.22.04	0.	A.22.05	0.	A.22.06	0.
A.22.07	0.	A.22.08	0.	A.22.09	0.
A.22.10	0.	A.22.11	0.	A.22.12	0.
A.22.13	0.	A.22.14	0.	A.22.15	0.
A.22.16	0.	A.22.17	0.	A.22.18	0.
A.22.19	0.	A.22.20	0.	A.22.21	0.
A.22.22	0.	A.22.23	0.	A.22.24	0.
A.22.25	0.	A.22.26	0.	A.22.27	0.
A.22.28	0.	A.22.29	0.	A.23.01	0.
A.23.02	0.	A.23.03	0.	A.23.04	0.
A.23.05	0.	A.23.06	0.	A.23.07	0.
A.23.08	0.	A.23.09	0.	A.23.10	0.
A.23.11	0.	A.23.12	0.	A.23.13	0.
A.23.14	0.	A.23.15	0.	A.23.16	0.
A.23.17	0.	A.23.18	0.	A.23.19	0.
A.23.20	0.	A.23.21	0.	A.23.22	0.
A.23.23	0.	A.23.24	0.	A.23.25	0.
A.23.26	0.	A.23.27	0.	A.23.28	0.
A.23.29	0.	A.24.01	0.	A.24.02	0.
A.24.03	0.	A.24.04	0.	A.24.05	0.
A.24.06	0.	A.24.07	0.	A.24.08	0.
A.24.09	0.	A.24.10	0.	A.24.11	0.
A.24.12	0.	A.24.13	0.	A.24.14	0.
A.24.15	0.	A.24.16	0.	A.24.17	0.

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A.24.18	0.	A.24.19	0.	A.24.20	0.
A.24.21	0.	A.24.22	0.	A.24.23	0.
A.24.24	0.3	A.24.25	0.	A.24.26	0.
A.24.27	0.	A.24.28	0.	A.24.29	0.
A.25.01	0.	A.25.02	0.	A.25.03	0.
A.25.04	0.	A.25.05	0.	A.25.06	0.
A.25.07	0.	A.25.08	0.	A.25.09	0.
A.25.10	0.	A.25.11	0.	A.25.12	0.
A.25.13	0.	A.25.14	0.	A.25.15	0.
A.25.16	0.	A.25.17	0.	A.25.18	0.
A.25.19	0.	A.25.20	0.	A.25.21	0.
A.25.22	0.	A.25.23	0.	A.25.24	0.
A.25.25	0.59	A.25.26	0.	A.25.27	0.
A.25.28	0.	A.25.29	0.	A.26.01	0.
A.26.02	0.	A.26.03	0.	A.26.04	0.
A.26.05	0.	A.26.06	0.	A.26.07	0.
A.26.08	0.	A.26.09	0.	A.26.10	0.
A.26.11	0.	A.26.12	0.	A.26.13	0.
A.26.14	0.	A.26.15	0.	A.26.16	0.
A.26.17	0.	A.26.18	0.	A.26.19	0.
A.26.20	0.	A.26.21	0.	A.26.22	0.
A.26.23	0.	A.26.24	0.	A.26.25	0.
A.26.26	0.79	A.26.27	0.	A.26.28	0.
A.26.29	0.	A.27.01	0.	A.27.02	0.
A.27.03	0.	A.27.04	0.	A.27.05	0.
A.27.06	0.	A.27.07	0.	A.27.08	0.
A.27.09	0.	A.27.10	0.	A.27.11	0.
A.27.12	0.	A.27.13	0.	A.27.14	0.
A.27.15	0.	A.27.16	0.	A.27.17	0.
A.27.18	0.	A.27.19	0.	A.27.20	0.
A.27.21	0.	A.27.22	0.	A.27.23	0.
A.27.24	0.	A.27.25	0.	A.27.26	0.
A.27.27	0.51	A.27.28	0.	A.27.29	0.
A.28.01	0.	A.28.02	0.	A.28.03	0.
A.28.04	0.	A.28.05	0.	A.28.06	0.
A.28.07	0.	A.28.08	0.	A.28.09	0.
A.28.10	0.	A.28.11	0.	A.28.12	0.
A.28.13	0.	A.28.14	0.	A.28.15	0.
A.28.16	0.	A.28.17	0.	A.28.18	0.
A.28.19	0.	A.28.20	0.	A.28.21	0.
A.28.22	0.	A.28.23	0.	A.28.24	0.
A.28.25	0.	A.28.26	0.	A.28.27	0.
A.28.28	0.	A.28.29	0.	A.29.01	0.
A.29.02	0.	A.29.03	0.	A.29.04	0.
A.29.05	0.	A.29.06	0.	A.29.07	0.
A.29.08	0.	A.29.09	0.	A.29.10	0.

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A.29.11	0.	A.29.12	0.	A.29.13	0.
A.29.14	0.	A.29.15	0.	A.29.16	0.
A.29.17	0.	A.29.18	0.	A.29.19	0.
A.29.20	0.	A.29.21	0.	A.29.22	0.
A.29.23	0.	A.29.24	0.	A.29.25	0.
A.29.26	0.	A.29.27	0.	A.29.28	0.
A.29.29	0.51	B.03	0.	B.07	0.
B.10	0.	B.13	0.	B.19	0.
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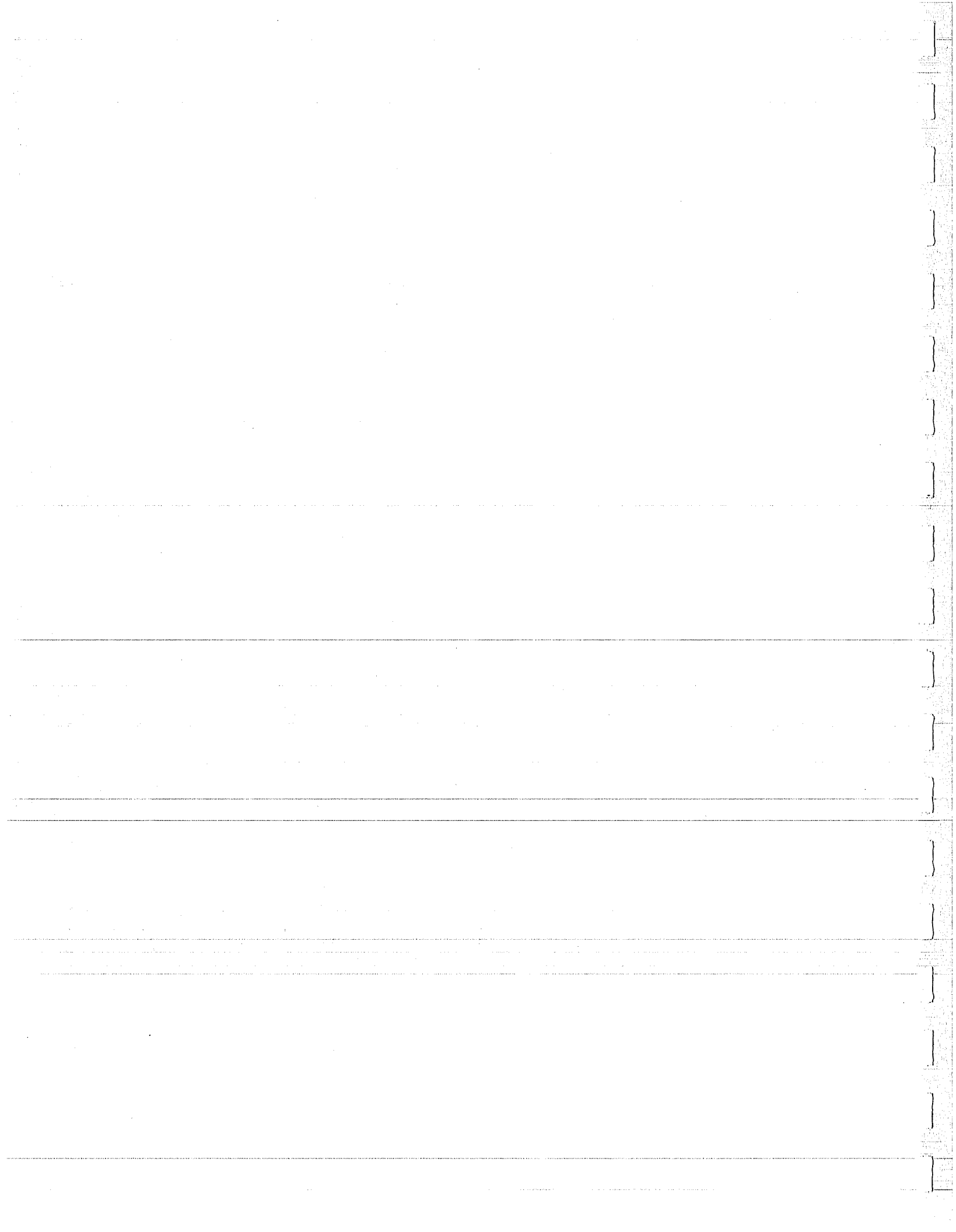
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IM.28.10	0.	IM.28.11	0.	IM.28.12	0.
IM.28.13	0.	IM.28.14	0.	IM.28.15	0.
IM.28.16	0.	IM.28.17	0.	IM.28.18	0.
IM.28.19	0.	IM.28.20	0.	IM.28.21	0.
IM.28.22	0.	IM.28.23	0.	IM.28.24	0.
IM.28.25	0.	IM.28.26	0.	IM.28.27	0.
IM.28.28	0.	IM.28.29	0.	IM.29.01	0.
IM.29.02	0.	IM.29.03	0.	IM.29.04	0.005
IM.29.05	0.	IM.29.06	0.	IM.29.07	0.
IM.29.08	0.	IM.29.09	0.	IM.29.10	0.
IM.29.11	0.	IM.29.12	0.	IM.29.13	0.
IM.29.14	0.	IM.29.15	0.	IM.29.16	0.
IM.29.17	0.	IM.29.18	0.	IM.29.19	0.
IM.29.20	0.	IM.29.21	0.	IM.29.22	0.
IM.29.23	0.	IM.29.24	0.	IM.29.25	0.
IM.29.26	0.	IM.29.27	0.	IM.29.28	0.
IM.29.29	0.611	PC.04.16	0.5079	PC.04.25	0.9475
PC.06.25	0.0525	PC.08.16	0.4921	PGQ.01	0.365
PGQ.02	0.048	PGQ.03	0.088	PGQ.04	0.614
PGQ.05	3.339	PGQ.06	0.399	PGQ.07	0.055
PGQ.08	0.118	PGQ.09	0.	PGQ.10	0.339
PGQ.11	2.548	PGQ.12	0.324	PGQ.13	4.848
PGQ.14	0.32	PGQ.15	0.681	PGQ.16	0.702
PGQ.17	0.	PGQ.18	0.	PGQ.19	1.418
PGQ.20	0.	PGQ.21	0.	PGQ.22	0.
PGQ.23	0.	PM.01	3.374	PM.02	2.066
PM.03	0.	PM.04	7.1	PM.05	3.211
PM.06	2.977	PM.07	0.	PM.08	2.629
PM.09	2.239	PM.10	0.	PM.11	2.036
PM.12	2.624	PM.13	0.	PM.14	3.127
PM.15	1.782	PM.16	5.506	PM.17	3.093
PM.18	3.961	PM.19	0.	PM.20	0.
PM.21	3.893	PM.22	0.	PM.23	0.
PM.24	3.895	PM.25	3.534	PM.26	2.141
PM.27	4.388	PM.28	0.	PM.29	3.076



APPENDIX J.
MAP ECONOMIC MODEL SENSITIVITY ANALYSIS

Procedure

A large number of sensitivity tests were run using the MAP economic model to gauge the sensitivity of the results to variations in (1) the economic development scenario, (2) national economic growth assumptions, (3) state fiscal variable assumptions, and (4) model coefficient (regression-determined) and parameter (nonstochastically-determined) values, as well as model specification (form of equations).¹

The procedure for running the tests involved four steps. The first was to compile a list of those input variables, parameters, and model structural features, variations of which had previously been shown to affect, were suspected to affect, or might be thought to affect the level of MAP economic model output variables. This resulted in a list of about 29 different cases--including variables (data vectors) and parameters (or parameter sets)--for analysis.

The second step was to choose for each variable or parameter the lowest and highest possible values which might be conceivable in the year 2000. The idea was to bracket the most likely value, used in the control simulation, with the effective end points of the distribution of the variable. Choosing these values was, of necessity, a subjective exercise based upon a combination of historical patterns, knowledge of the economy and its structure, and statistics. For each case examined, the most likely lowest and highest values used are shown in Table J.1.²

¹These tests were based upon a version of the model, A83.1, which was used to generate projections in February 1983. The model, A.83.1SEN, input data files A.83.1SEN and A83SEN, and control program, &A83RUNSE, are similar to those used to produce the projections for this report. The model gives slightly different results, but this does not materially affect the results of this analysis which are applicable to interpreting the results of model version A83.2.

²In general, a data vector was adjusted so that it trended over time from its actual 1982 value to the year 2000 value, while parameters and coefficients were set at their alternative value for the entire range of simulation. The only exception was the parameter LFPART, which was trended toward its 2000 value of .68.

TABLE J.1. MAP SENSITIVITY TESTS RESULTS

Case	Variable	Value in 2000 (000)			Households in 2000 (000)	
		Lowest	Most Likely	Highest	Lowest	Highest
<u>Exogenous Employment Variables</u>						
Control Case		-	-	-	215.824(a)	
1	Petroleum (EMP9)	3.990	9.911	19.107	200.458	229.782
2	Military (EMGM)	16.892	23.323	33.000	209.936	224.575
3	Tourists	1066	1566	2566	209.724	224.567
4	Gasline Construction (1994 Peak Completion)	-	-	-	-	221.725
5	Current Manufacturing (EMMX2)	8.205	12.122	16.000	210.106	220.833
6	Enclave Construction (EMCNX1)	0	1.000	2.000	212.523	217.971
7	Federal Civilian (EMGC)	17.800	20.019	21.719	212.372	217.962
8	Fish Harvesting (EMFISH)	4.536	7.096	9.192	213.557	217.744
9	Construction (EMCNX2)	0	0	1.000	215.119	217.579
10	Agriculture (EMAGRI)	.160	.508	2.000	215.436	217.352
11	Pipelines (EMT9X)	1.100	1.968	2.968	214.306	217.223
12	High Wage Manu- facturing (EMMX1)	0	0	.486	215.824	216.610
<u>National Economic Variables</u>						
13	Real Wage Growth (GRRWEUS)	.005	.01	.015	211.335	223.723
14	Unemployment (UUS)	.05	.06	.075	211.161	222.178
15	Price Level Growth (GRUSCPI)	.09	.065	.05	205.924	222.305
16	Price Level Growth with Petroleum Revenues Adjusted	.09	.065	.05	212.080	216.486
17	Real Income Growth (GRDIRPU)	.005	.015	.025	215.493	216.272

(a) In 1981 households total 137.018.

TABLE J.1. (continued)

Case	Variable	<u>State Fiscal Variables</u>			Households in 2000 (000)	
		Rate				
		Lowest	Most Likely	Highest	Lowest	Highest
18	Petroleum Revenues (RPTS, RPRY, RTCSPX)	10%	50%	90%	195.969	224.855
18a	Post 1999 Petroleum Revenues (Extrapolation Rate - period of calculation)	1995-99		1997-99	241.491(2010)	243.218(2010)
19	Operations - Capital Split (5/6 Operations, 1/6 Capital)	-	-	-	-	219.958
<u>Model Parameters</u>						
20	Average Household Size (b)	2.932	2.549	2.2	187.631	250.062
21	Labor Force Participation Rate LFPART	.9338	.78	.68	177.84	238.145
22	Support Sector Elasticities (to Wealth)					
	C71E	.00003	.00005	.00008	193.821	243.698
	C84D	.00005	.00009	.00015		
23	Migration Sensitivity					
	CMIG2	3.32	14.12	24.92	195.413	240.146
	CMIG3	21.8	49.22	76.62		
	CMIG4	.76	.96	1.15		
24	Alaskan Price Level C67A	-.1	-.3	-.5	215.781	227.165

(b) No simulation necessary to obtain the result.

TABLE J.1. (continued)

Case	Variable	Model Parameters			Households in 2000 (000)	
		Rate			Lowest	Highest
		Lowest	Most Likely	Highest		
25	Support Sector Elasticities (to Income)					
	C71B	.0084	.017	.0252	206.592	225.466
	C84B	.0234	.047	.0702		
26	Alaska Relative Wage Rate Growth					
	CxxB	.5	various	2	213.738	220.350
27	Federal Tax Bite					
	C26B	1.042	1.00	.966	212.608	218.656
28	Wealth Variable	-	-	-	-	216.221
	C68i					
	C71i					
	C80i					
	C83i					
	C84i					
29	Construction Sector Activity specification	-	-	-	213.976	-
	C54i					

The sensitivity tests involving the gas pipeline, the mix of government expenditures, the specification of wealth, and the specification of exogenous construction employment involved only one rather than a high and low alternative to the control case.

Third, each variable or parameter in turn was perturbed from the control case level and the model simulated. Summary results for each of these simulations are shown in Table J.1. Detailed results are available upon request from ISER.

Finally, the cases were informally ranked in terms of the sensitivity of the number of households statewide to the variable or parameter perturbation to the highest possible value (in relation to increasing the number of households). Households was chosen because the electricity load is most sensitive to this output variable.

Results

The most important result of the sensitivity tests is the demonstration that the simulation results are more sensitive to the values chosen for several of the parameters than to variation in employment and state fiscal assumptions. In particular, the number of household is most sensitive to average household size and the labor force participation rate. A substantial reduction in either the average household size or in the labor force participation rate, other things equal, could raise the number of households in 2000 16 percent and 10 percent, respectively, above the control case. In contrast, the highest likely level of petroleum employment would increase households over the base case by 6.5 percent, while the highest likely level of petroleum revenues would increase households by 4.2 percent.

The implication of this conclusion is that a substantial portion of the potential error of projection can arise not from the economic scenario or fiscal policy assumptions, but rather in incorrect parameter values within the structure of the model. This is a source of potential error that cannot be altogether eliminated and is understandably large for the Alaska economic model. The reasons relate to three factors: (1) poor quality data, (2) substantial structural change in the past, and (3) small size of the economy. Consequently, past structural relationships are difficult to specify as well as might be hoped, and future values defining those relationships are subject to substantial variations which are not possible to eliminate by additional analysis of existing data.

In short, reasonable arguments can be raised for a number of different values for parameters such as household size and the labor force participation rate in future years. None can be proven correct or incorrect.

When interpreting the results of these sensitivity tests, the assumption of other things constant (*ceteris parabis*) should be kept in mind. In fact, it is unlikely that variation in one parameter or variable would not be accompanied by change in other parameters affecting output either in the same or opposite direction. For example, if the average household size did actually fall to 2.2 persons in 2000, it is likely that the labor force participation rate would rise from its current level. These two countervailing movements would have opposing effects and would tend to moderate change in the number of households.

Closely related to household size and labor force participation rate in affecting population and, thus, households, is the specification of the net migration equation. Simultaneously increasing and decreasing all coefficients of this equation by two standard errors shows the possible range of outcomes which this equation can generate. This equation tends to be self-correcting, since higher net migration rates increase unemployment, which increases outmigration.

Economic activity and, consequently, households, are sensitive to the growth in support sector employment. This was tested by examining the coefficients on income and wealth as well as the specification of wealth in the equations determining support sector demand levels. Since wealth is highly correlated with income, the sensitivity reported here is an overestimate; but it is clear that this is one of the critical model areas.

A final sensitive area in terms of parameters is the Alaskan price level. If the Alaska price level were to move within 9 percent of the U.S. average level by 2000 this would provide a significant impetus to economic growth.

The simulations are relatively insensitive to variation in three areas of model specification. First, there is little sensitivity to the share of personal income siphoned off as federal taxes. Second, variation in the elasticity of real wage rate growth compared to the U.S. average has only a modest effect. Third, an adjustment for a possible misspecification of the construction demand equation has a small effect.³

³Current practice in the model treats only Alyeska pipeline construction employment as exogenous during the historical period. This test arbitrarily assumes a constant positive historical level of other exogenous construction employment and a new construction demand equation is estimated.

Turning to fiscal policy variables, if the level of petroleum revenues is increased from the 50 to 90 percent Alaska Department of Revenue case, this has a larger impact than changing the mix of activities. Since the Department of Revenue projections only cover the years through 1999, the method used for extrapolation to the year 2010 was tested. Households was insensitive to this.

The simulation is moderately sensitive to the values chosen for two national variables which affect the Alaskan economy. These are the growth in the average real weekly wage and the U.S. unemployment rate. The growth in the price level, *ceteris paribus*, is a sensitive variable, but it operates primarily by affecting the level of real petroleum revenues. When real, rather than nominal, petroleum revenues are held constant and the test is repeated, the sensitivity of simulation to the national price level falls to practically zero.

The number of households in 2000 is insensitive to variation in most of the exogenous employment variables. Tests on most employment variables produce less sensitivity than most of the parameters, fiscal variables, and national growth rates. The most sensitive employment variables are petroleum, military, and tourists; primarily due to their large size, but also their potential range of variation. The sensitivity of several industries is quite modest.

Although the analysis has been presented in terms of the increase in the number of households to variations in parameters and variables, it is instructive to examine the downside sensitivity also. It is clear from an examination of Table J-1 that the distribution of households in some tests is not symmetrical, but rather is skewed towards higher values. This results basically from more uncertainty about maximum values parameters and variables may assume.

APPENDIX K
MAN-IN-THE-ARCTIC PROGRAM (MAP)
TECHNICAL DOCUMENTATION REPORT

SCENARIO DOCUMENTATION

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K.1. Summary of Base Case Assumptions

The base case assumptions currently in place for simulating with the MAP Economic Modeling System are summarized in Table K.1. This table describes the assumptions used in three areas--national variables, exogenous employment variables (economic scenario), and state fiscal variables.

The base case assumptions have been developed to represent, in the aggregate, a median outcome for future economic and fiscal conditions affecting the Alaskan economy. This is in contrast to both the most likely outcome (mode) and the average outcome (mean). The difference among the three measures can be discussed with reference to Figure K.1 which portrays the hypothetical distribution of all the possible values that an exogenous employment variable may assume in, for example, the year 2000.

The distribution is skewed to the right because very large positive values are possible with some small probability greater than zero, while values less than zero are impossible. The most likely outcome (mode) has the highest probability of occurrence, but may have a value (in this case, one thousand) less than the majority of the possible outcomes. The median is the value where 50 percent of the outcomes have lower values, while 50 percent have higher values. The mean (simple average) exceeds the median since it is the average of the values of all possible outcomes.

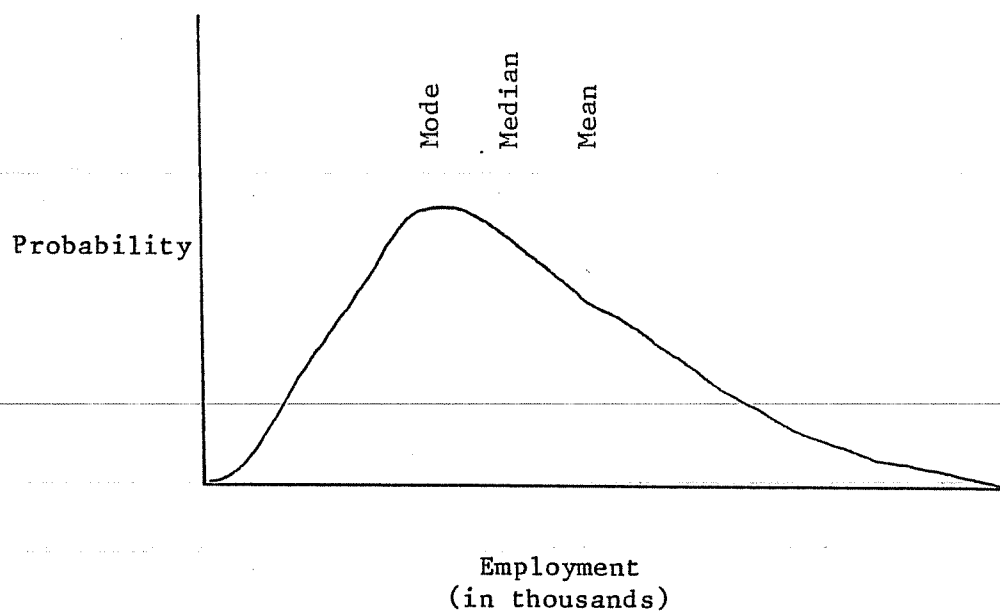
Only one value from the distribution will be the actual outcome in the year 2000, and the question is which measure of central tendency best represents that unknown outcome in a base case simulation. The median is used because of obvious deficiencies in the other two measures.

Although the model is the most likely outcome, the majority of outcomes could be higher, as in Figure K.1, or lower. Use of the mode could then be unrepresentative of the universe of possible outcomes. For example, the three possible uses of North Slope gas and their respective probabilities could be (1) pipeline to lower--48-40 percent, (2) conversion to methanol--30 percent, (3) reinjection--30 percent. Although the pipeline alternative alone has the highest probability because it is unrepresentative of the other outcomes which together are more likely, choice of the mode would produce a biased result.

Likewise, the choice of the mean value can result in bias if the distribution of possible outcomes is skewed as in Figure K.1. For example, there is a small probability of very large petroleum revenues in the year 2000. Most outcomes have smaller associated revenues. Since only a single outcome is possible, the low probability high outcomes should be discounted in the calculation of the base case because they are so unlikely.

FIGURE K 1

Distribution
of
Possible Values for Exogenous Employment



With that general framework in mind, the base case assumptions have been chosen on the basis of consensus among the economists at ISER. The process builds upon a documented eight-year experience of scenario construction for the MAP models which has, from time to time, utilized a large number of sources, individuals within and without ISER, and techniques including probability encoding and interagency committee. The base case scenario is constructed so that in the aggregate, rather than in any of its individual elements, it represents the median outcome.

Each national variable assumption is represented by a time series of values. These time series are set to represent the best judgement of ISER economists on the future trends in these values as they influence the Alaskan economy. That influence is primarily upon the growth in the real wage, the price level, and the equilibrium rate of unemployment.

The exogenous employment assumptions consist of a series of case file assumptions about economic behavior in particular industries or particular projects. Detail on all of the case files included in individual case files are chosen from the library of case files in the scenario generator mode and are combined by that model to form industry-wide basic employment assumptions. These aggregated employment series (as well as tourists visiting Alaska) are presented in Table K.2. The particular shape of the time paths of the employment variables takes account of the fact that activity in some industries such as fish harvesting is resource base constrained, while in others the level is more strongly influenced by demand such as mining employment.

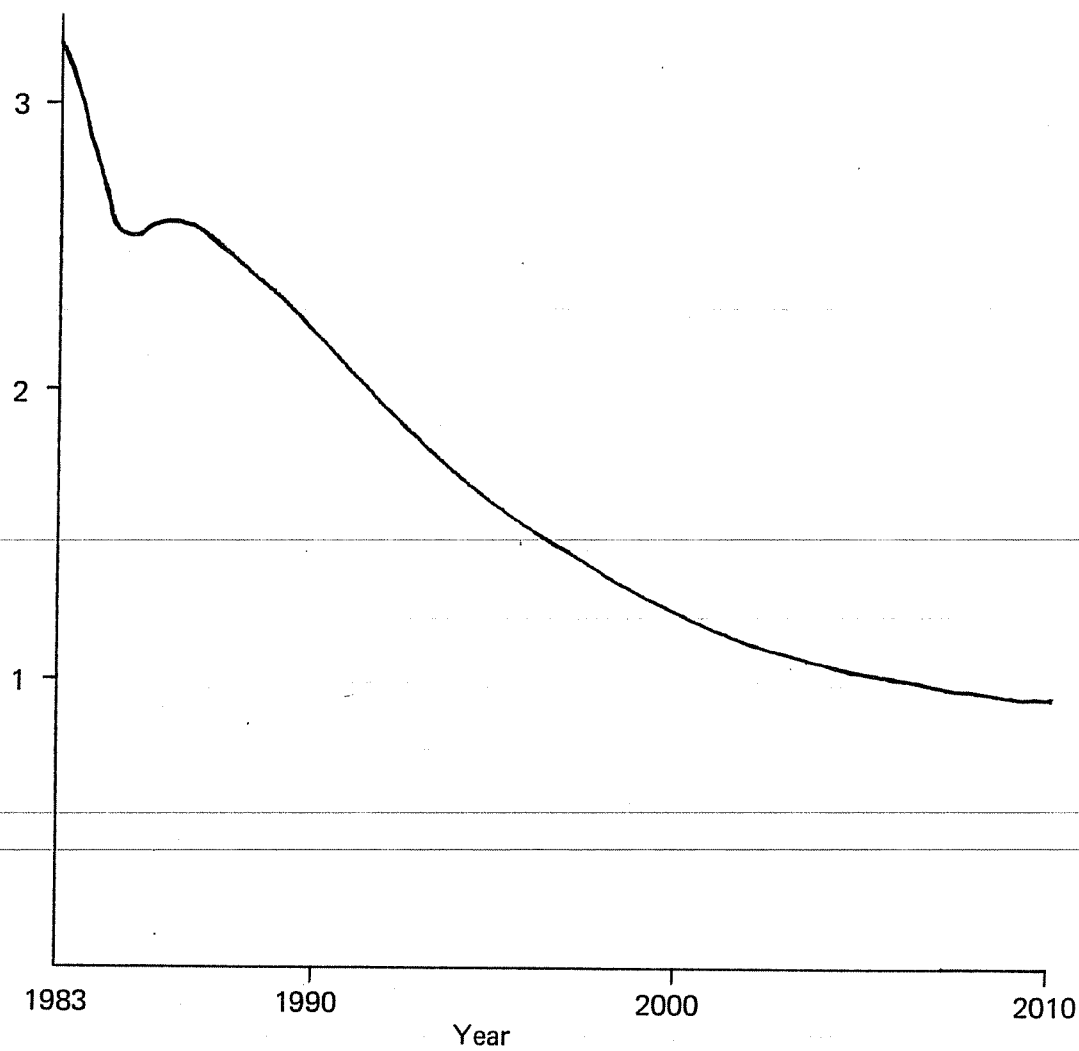
State revenue and expenditure assumptions consist of exogenous vectors of petroleum revenues, which are chosen from the scenario generator library of cases, and a set of options chosen by the model user which together are loosely called the fiscal rule.

Values for the most important petroleum revenues--royalties and severance taxes--are taken from the Alaska Department of Revenue. Since these projections end in 1999, they are extrapolated to 2010 using the growth rate over the interval 1996 to 1999. This interval is felt to be representative of the subsequent decline in production on state fields, particularly prudhoe Bay. Consequently, the time series of total petroleum revenues in real dollars in the base case has the shape shown in Figure K.2.

The other petroleum revenue source of consequence, the corporate income tax, is extremely difficult to project because it is dependent not only on the levels of production and prices of Alaskan petroleum but upon all aspects of worldwide operations of the major international oil companies operating in Alaska. The base case assumptions for this revenue source is that it grows at 7 percent annually, slightly faster than inflation. The petroleum property tax depends upon taxable property of the oil companies.

FIGURE K.2. BASE CASE SIMULATION
TOTAL PETROLEUM REVENUES

(billion 1982 \$)



A "fiscal rule" is necessary for the determination of the level and composition of state expenditures for two reasons. First, the historical pattern of state expenditure behavior provides no state guide to future spending patterns. Second, the potential for revenue surpluses on current account allows for considerable flexibility in the timing and composition of spending. In 1982 Alaskan voters approved a spending limit which limits spending to \$2.5 billion adjusted annually for the change in population and the price level.

The limit covers all state spending except Permanent Fund dividends and debt service. Special capital appropriations over the limit and special contributions to the Permanent Fund can be done with voter approval. The limit also requires that at least one-third of spending be for capital appropriations. Excess revenues accrue in the General Fund until needed, earning positive real interest.

The limit provides a useful set of guidelines for the fiscal rule when current revenues plus General Fund balances are sufficient to allow spending to be at the limit established by the limit. The outstanding obligations to the Permanent Fund is not paid off. When a simulation indicates that current revenues and the fund balance do not provide revenues sufficient to spend up to the limit, then an alternate set of guidelines defining spending must be invoked. Since there is no historical experience to base these guidelines upon, they are defined by what appears reasonable politically in an era of declining revenues. The basic assumption is "last in-first out" referring to the fact that newer programs, initiated in years when revenues are increasing rapidly, are most likely to be cut back the most when revenues are falling. All programs would experience cuts to some degree at the same time that some newer programs are eliminated.

The sequence of events which is triggered by a shortfall of revenues below the spending limit is as follows: Total expenditures for programs funded under the limit are reduced. Permanent Fund dividends and debt service payments are not directly affected. Capital expenditures are reduced more than operating expenditures over a two-year period until operations represents 75 percent of spending. The reduction of operations results in a reduction in local transfers. As the retrenchment continues, the subsidy half of the capital budget is eliminated and replaced by "bricks and mortar" spending. Capital spending financed by bonds and federal grants continues to be a fixed portion of capital spending under the limit.

In addition to subsidies, the Permanent Fund dividend program is eliminated.

Two revenue enhancement measures are subsequently introduced. The first is the reintroduction of the personal income tax at the rates prevailing when it was eliminated in the 1970s. The second is the annual transfer of all Permanent Fund earnings, both real and nominal, to the General Fund. This produces current income but erodes the real value of the Permanent Fund.

TABLE K.1. SUMMARY OF BASE CASE ASSUMPTIONS FOR MAP MODEL
RAILBELT ECONOMIC STUDY, MAY 1983
(SB87.3 - CB87.3)

<u>ASSUMPTIONS</u>	<u>DESCRIPTION (a)</u>
<u>National Variables Assumptions</u>	
U.S. Inflation Rate	Consumer prices rise at approximately 6.5 percent annually after 1985.
Real Average Weekly Earnings	Growth in real average weekly earnings averages 1 percent annually.
Real Per Capita Income	Growth in real per capita income averages 1.5 percent annually after 1984.
Unemployment Rate	Long-run rate of 6 percent.
<u>Exogenous Employment Assumptions</u>	
Trans-Alaska Oil Pipeline	Operating employment remains constant at 1,500 through 2010 (TAP.083).
North Slope Petroleum Development	Construction employment developing Prudhoe Bay and Kuparuk fields peaks at 2,400 in 1983 and 1986. Operating employment remains at 2,502 through 2010 for overall North Slope production (NSO.082).
Upper Cook Inlet Petroleum Production	Employment declines gradually beginning in 1983 so as to reach 50 percent of the 1982 level (778) by 2010 (UPC.082).

(a) Codes in parentheses indicate ISER names for MAP Model SCEN_ case files. These are presented in detail starting in Table K.3 of this appendix.

Tertiary Recovery of
North Slope Oil

Tertiary oil recovery project utilizing North Slope natural gas occurs in early 1990s with a peak annual employment of 2,000 (NSO.TRC).

OCS Exploration and Development

The current OCS five-year leasing schedule calls for 16 OCS lease sales subsequent to October 1982, including the Beaufort, Norton, and St. George Sales, which have already taken place (Sales 71, 57, and 70). Development is assumed to occur only in the Navarin Basin (1.14 billion barrels of oil) and the Beaufort Sea (6.1 billion barrels of oil). All other sales are assumed to result in exploration employment only (OCS.G01, OCS.G03, OCS.G04, OCS.G05, OCS.G06, OCS.G07, OCS.G09, OCS.G10, OCS.G11, OCS.G12, OCS.G13, OCS.G14).

Anchorage Oil Headquarters

Several oil companies establish regional headquarters in Alaska in mid-1980s (OHQ.083).

Beluga Chuitna Coal Production

Development of 4.4 million ton/year mine for export beginning in 1990 provides total employment of 524 (BCL.04T(-4)).

Hydroelectric Projects

Employment peaks at 725 in 1990 for construction of several state-funded hydroelectric projects around the state (SHP.082, SHP.PJH).

U.S. Borax Mine

The U.S. Borax mine near Ketchikan is brought into production with operating employment of 790 by 1988 (BXM.PJM).

Greens Creek Mine

Production from the Greens Creek Mine on Admiralty Island results in employment of 315 people from 1986 through 1996 (GCM.082).

Red Dog Mine	The Red Dog Mine in the Western Brooks Range reaches full production with operating employment of 448 by 1988 (RED.PJH).
Other Mining Activity	Employment increases from a 1982 level of 5,267 at 1 percent annually (OMN.083).
Agriculture	Moderate state support results in expansion of agriculture to employment of 508 in 2000 (AGR.PJM).
Forest and Lumber Products	Employment expands to over 3,200 by 1990 before beginning to decline gradually after 2000 to about 2,800 by 2010 (FLL.083).
Pulp Mills	Employment declines at a rate of 1 percent per year after 1983 (FPU.082).
Commercial Fishing-Nonbottomfish	Employment levels in fishing and fish processing remain constant at 6,323 and 7,123, respectively (TCF.002).
Commercial Fishing-Bottomfish	The total U.S. bottomfish catch expands at a constant rate to allowable catch in 2000, with Alaska resident harvesting employment rising to 733. Onshore processing capacity expands in the Aleutians and Kodiak census divisions to provide total resident employment of 971 by 2000 (BCF.183).
Federal Military Employment	Employment remains constant at 23,323 (GFM.082).
Federal Civilian Employment	Rises at 0.5 percent annual rate from 17,900 in 1982 to 20,583 by 2010 (GFC.083).

Tourism Assumptions

Number of visitors to Alaska increases by 50,000 per year from 680,000 in 1982 to over 2 million by 2010 (TRS.082).

State Revenue and Expenditure Assumptions

Petroleum Revenues

State petroleum revenues from the severance tax and royalties are based upon Alaska Department of Revenue projections published in March of 1983. Subsequent to 1999, they are extrapolated at the growth rate over the interval 1996-1999. Oil and gas corporate income tax revenues are projected to grow at a nominal rate of 7 percent per year after 1985. Petroleum property taxes are a function of petroleum industry capital stock (DOR.5M83).

Expenditures

State expenditures are at the levels allowed by the recently passed spending limit, with combined subsidies and capital expenditures equaling one-third of total expenditures. As revenue growth slows, the income tax is reinstated, subsidies are eliminated, the Permanent Fund dividend program is phased out, and proportional cuts in the operating and capital budgets are made to keep total expenditures equal to total revenues. Capital expenditures fall to one-fourth of total spending. After the Permanent Fund dividend program is phased out, all Permanent Fund earnings are annually transferred to the general fund.

K.2 Aggregate Base Case Variables

Table K.2 presents the values in the base case for the sixteen variables which form the output of the scenario generator model for the state economic model. These variables are aggregated from the individual case files presented in Section K.3.

TABLE K.2. APA BASE CASE
EXOGENOUS EMPLOYMENT ASSUMPTIONS FOR MAP STATEWIDE MODEL

(thousands of employees)

	Agricultural Employment	Mining Employment	High Wage Exogenous Construction Employment	Low Wage Exogenous Construction Employment	Exogenous Transportation Employment
1982	0.194	8.411	2.269	0.125	1.500
1983	0.203	9.387	3.261	0.290	1.552
1984	0.211	9.983	2.203	0.726	1.631
1985	0.219	11.279	2.627	0.863	1.949
1986	0.228	12.400	2.911	0.850	2.157
1987	0.239	13.149	3.069	0.613	2.471
1988	0.250	14.062	3.128	0.401	2.804
1989	0.263	14.526	3.244	0.875	2.440
1990	0.276	14.797	4.276	1.025	2.752
1991	0.291	15.671	1.667	1.125	2.063
1992	0.306	16.557	6.301	1.075	2.753
1993	0.325	16.068	5.164	0.563	2.348
1994	0.343	16.969	2.141	0.100	3.147
1995	0.365	17.329	1.529	0.000	3.055
1996	0.389	17.501	1.303	0.000	3.291
1997	0.414	17.390	1.303	0.000	3.351
1998	0.442	16.994	1.070	0.000	3.423
1999	0.474	16.620	1.070	0.000	3.423
2000	0.508	16.226	1.070	0.000	3.423
2001	0.527	15.957	1.070	0.000	3.423
2002	0.546	15.888	1.070	0.000	3.423
2003	0.568	16.089	1.070	0.000	3.423
2004	0.589	16.143	1.070	0.000	3.423
2005	0.611	16.197	1.070	0.000	3.423
2006	0.634	16.253	1.070	0.000	3.423
2007	0.660	16.309	1.063	0.000	3.351
2008	0.686	16.340	1.063	0.000	3.351
2009	0.712	16.223	1.056	0.000	3.279
2010	0.740	16.282	1.056	0.000	3.279

SOURCE: SCENARIOSB87.3--CREATED 4/83

TABLE K.2. APA BASE CASE (continued)
EXOGENOUS EMPLOYMENT ASSUMPTIONS FOR MAP STATEWIDE MODEL

(thousands of employees)

	High Wage Exogenous Manufacturing Employment	Low Wage Exogenous Manufacturing Employment	Fish Harvesting Employment	Active Duty Military Employment	Civilian Federal Employment
1982	0.000	8.771	5.217	23.323	17.900
1983	0.000	10.433	6.421	23.323	17.989
1984	0.000	10.571	6.444	23.323	18.079
1985	0.000	10.749	6.471	23.323	18.170
1986	0.000	10.929	6.499	23.323	18.261
1987	0.000	11.107	6.527	23.323	18.352
1988	0.000	11.196	6.544	23.323	18.444
1989	0.000	11.240	6.579	23.323	18.536
1990	0.000	11.292	6.592	23.323	18.629
1991	0.000	11.299	6.608	23.323	18.722
1992	0.000	11.315	6.629	23.323	18.815
1993	0.000	11.335	6.655	23.323	18.909
1994	0.000	11.366	6.689	23.323	19.004
1995	0.000	11.413	6.731	23.323	19.099
1996	0.000	11.478	6.784	23.323	19.194
1997	0.000	11.571	6.851	23.323	19.290
1998	0.000	11.704	6.935	23.323	19.387
1999	0.000	11.887	7.041	23.323	19.484
2000	0.000	12.122	7.096	23.323	19.581
2001	0.000	12.018	7.096	23.323	19.679
2002	0.000	11.807	7.096	23.323	19.777
2003	0.000	11.776	7.096	23.323	19.876
2004	0.000	11.747	7.096	23.323	19.976
2005	0.000	11.718	7.096	23.323	20.076
2006	0.000	11.641	7.096	23.323	20.176
2007	0.000	11.634	7.096	23.323	20.277
2008	0.000	11.626	7.096	23.323	20.378
2009	0.000	11.623	7.096	23.323	20.480
2010	0.000	11.617	7.096	23.323	20.583

SOURCE: SCENARIOSB87.3--CREATED 4/83

TABLE K.2. APA BASE CASE (continued)
EXOGENOUS REVENUE ASSUMPTIONS FOR MAP STATEWIDE MODEL

(millions of current dollars)

	State Production Tax Revenue	State Royalty Income	State Bonus Payment Revenue	State Property Tax Revenue	State Corporate Petroleum Tax Revenue
1982	1590.000	1530.000	6.700	142.700	668.900
1983	1480.000	1430.000	26.100	148.600	235.000
1984	1220.000	1200.000	11.066	153.200	272.000
1985	1260.000	1240.000	4.692	158.000	295.000
1986	1350.000	1350.000	1.990	163.456	315.650
1987	1430.000	1450.000	0.844	169.101	337.745
1988	1500.000	1520.000	0.358	174.940	361.387
1989	1380.000	1650.000	0.152	180.981	386.684
1990	1420.000	1710.000	0.064	187.231	413.751
1991	1230.000	1570.000	0.027	244.697	442.714
1992	1150.000	1550.000	0.012	253.385	473.704
1993	1110.000	1520.000	0.005	334.305	506.863
1994	1090.000	1500.000	0.002	360.464	542.343
1995	1000.000	1410.000	0.001	372.870	580.306
1996	910.000	1290.000	0.000	386.531	620.927
1997	930.000	1330.000	0.000	399.458	664.392
1998	910.000	1340.000	0.000	412.658	710.899
1999	860.000	1350.000	0.000	425.141	760.662
2000	843.918	1370.384	0.000	438.917	813.907
2001	828.136	1391.076	0.000	452.996	870.881
2002	812.650	1412.081	0.000	465.389	931.842
2003	797.453	1433.402	0.000	480.106	997.070
2004	782.541	1455.046	0.000	494.158	1066.865
2005	767.907	1477.016	0.000	506.558	1141.545
2006	753.547	1499.318	0.000	519.317	1221.453
2007	739.456	1521.957	0.000	530.447	1306.954
2008	725.628	1544.938	0.000	542.962	1398.440
2009	712.058	1568.266	0.000	554.874	1496.331
2010	698.743	1591.946	0.000	564.198	1601.073

SOURCE: SCENARIOSB87.3--CREATED 4/83

TABLE K.2. APA BASE CASE (continued)
EXOGENOUS TOURISM ASSUMPTIONS FOR MAP STATEWIDE MODEL

(thousands of tourists)

Tourists Visiting Alaska	
1982	680.000
1983	730.000
1984	780.000
1985	830.000
1986	880.000
1987	930.000
1988	980.000
1989	1030.000
1990	1080.000
1991	1130.000
1992	1180.000
1993	1230.000
1994	1280.000
1995	1330.000
1996	1380.000
1997	1430.000
1998	1480.000
1999	1530.000
2000	1580.000
2001	1630.000
2002	1680.000
2003	1730.000
2004	1780.000
2005	1830.000
2006	1880.000
2007	1930.000
2008	1980.000
2009	2030.000
2010	2080.000

SOURCE: SCENARIOSB87.3---CREATED 4/83

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K.3. Scenario Case Files for Base Case

This section contains a written description plus the actual file contents in table form of each case file used to form the base case output of the scenario generator.

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1. Trans-Alaska Oil Pipeline

Trans-Alaska Pipeline Service (TAPS) employment through 1977 included only the exogenous construction employment engaged in the initial construction of the pipeline. After completion in 1977, employment has been of two types. First, there has been additional construction of four pump stations (see Oil and Gas Journal, 2/25/80, p. 72), and second, there is exogenous transportation sector employment associated with operation of the line.

SOURCE: Construction estimate based on assumed installation of four pump stations adding capacity of .15 mmbd each, from Beaufort OCS Development Scenarios, Dames and Moore, 1978.

Operations employment from Alaska Economic Trends, Alaska Dept. of Labor, October 1978.

TABLE K.3a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
TRANS-ALASKA OIL PIPELINE

(thousands of employees)

	High Wage Exogenous Construction Employment	Exogenous Transportation Employment
1982	0.090	1.500
1983	0.000	1.500
1984	0.000	1.500
1985	0.000	1.500
1986	0.000	1.500
1987	0.000	1.500
1988	0.000	1.500
1989	0.000	1.500
1990	0.000	1.500
1991	0.000	1.500
1992	0.000	1.500
1993	0.000	1.500
1994	0.000	1.500
1995	0.000	1.500
1996	0.000	1.500
1997	0.000	1.500
1998	0.000	1.500
1999	0.000	1.500
2000	0.000	1.500
2001	0.000	1.500
2002	0.000	1.500
2003	0.000	1.500
2004	0.000	1.500
2005	0.000	1.500
2006	0.000	1.500
2007	0.000	1.500
2008	0.000	1.500
2009	0.000	1.500
2010	0.000	1.500

SOURCE: MAP MODEL CASE TAP.083
VARIABLES: EMCNX1 EMT9X

TABLE K.3b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
TRANS-ALASKA OIL PIPELINE

(thousands of employees)

	Barrow- North Slope	Fairbanks	Southeast Fairbanks	Valdez/Chitina/ Whittier	Yukon/ Koyukuk
1982	0.474	0.079	0.079	0.406	0.552
1983	0.474	0.079	0.079	0.316	0.552
1984	0.474	0.079	0.079	0.316	0.552
1985	0.474	0.079	0.079	0.316	0.552
1986	0.474	0.079	0.079	0.316	0.552
1987	0.474	0.079	0.079	0.316	0.552
1988	0.474	0.079	0.079	0.316	0.552
1989	0.474	0.079	0.079	0.316	0.552
1990	0.474	0.079	0.079	0.316	0.552
1991	0.474	0.079	0.079	0.316	0.552
1992	0.474	0.079	0.079	0.316	0.552
1993	0.474	0.079	0.079	0.316	0.552
1994	0.474	0.079	0.079	0.316	0.552
1995	0.474	0.079	0.079	0.316	0.552
1996	0.474	0.079	0.079	0.316	0.552
1997	0.474	0.079	0.079	0.316	0.552
1998	0.474	0.079	0.079	0.316	0.552
1999	0.474	0.079	0.079	0.316	0.552
2000	0.474	0.079	0.079	0.316	0.552
2001	0.474	0.079	0.079	0.316	0.552
2002	0.474	0.079	0.079	0.316	0.552
2003	0.474	0.079	0.079	0.316	0.552
2004	0.474	0.079	0.079	0.316	0.552
2005	0.474	0.079	0.079	0.316	0.552
2006	0.474	0.079	0.079	0.316	0.552
2007	0.474	0.079	0.079	0.316	0.552
2008	0.474	0.079	0.079	0.316	0.552
2009	0.474	0.079	0.079	0.316	0.552
2010	0.474	0.079	0.079	0.316	0.552

SOURCE: MAP MODEL CASE TAP.083
VARIABLES: B04 B09 B24 B26 B29

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2. North Slope Petroleum Development

North Slope developments include employment associated with primary recovery operations from the Sadlerochit formation, secondary recovery (using waterflooding) of that formation, development of the Kuparuk formation west of Prudhoe Bay, and the permanent work force of Atlantic Richfield Company (ARCO) and British Petroleum (BP) at the main Prudhoe base headquarters, and a variety of exploration and development efforts on state leases outside of the Sadlerochit and Kuparuk areas. The key assumptions serving as the basis for the employment forecasts are the following:

- o A total of nine rigs continue to drill approximately 50-55 wells at the Prudhoe Bay field and 50 wells at the Kuparuk field a year through 1985.
- o The Prudhoe waterflood project is completed in 1984, adding 300 new permanent operating employees.
- o Construction employment involved in development of primary and secondary recovery facilities at the Kuparuk field peaks at 1,300 in 1985.
- o Construction employment for additional recovery facilities at Kuparuk and Prudhoe, as well as for developing production facilities at other North Slope oil fields under state lease, maintains total construction employment at 1,500 through 1990 and at 1,000 through 2010.

SOURCE: U.S. Army Corps of Engineers, Final EIS, Prudhoe Bay Oilfield Waterflood Project, pp. 2-60; and personal communication, D. A. Casey, ARCO Oil and Gas Co.

TABLE K.4a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
NORTH SLOPE PETROLEUM DEVELOPMENT

(thousands of employees)

	High Wage Exogenous Construction Employment	Mining Employment
1982	2.000	2.300
1983	2.400	2.502
1984	1.800	2.502
1985	2.000	2.502
1986	2.400	2.502
1987	1.800	2.502
1988	1.500	2.502
1989	1.500	2.502
1990	1.500	2.502
1991	1.000	2.502
1992	1.000	2.502
1993	1.000	2.502
1994	1.000	2.502
1995	1.000	2.502
1996	1.000	2.502
1997	1.000	2.502
1998	1.000	2.502
1999	1.000	2.502
2000	1.000	2.502
2001	1.000	2.502
2002	1.000	2.502
2003	1.000	2.502
2004	1.000	2.502
2005	1.000	2.502
2006	1.000	2.502
2007	1.000	2.502
2008	1.000	2.502
2009	1.000	2.502
2010	1.000	2.502

SOURCE: MAP MODEL CASE NSO.082
VARIABLES: EMCNX1 EMP9

TABLE K.4b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
NORTH SLOPE PETROLEUM DEVELOPMENT

(thousands of employees)

Barrow-North Slope

1982	4.300
1983	4.902
1984	4.302
1985	4.502
1986	4.902
1987	4.302
1988	4.002
1989	4.002
1990	4.002
1991	3.502
1992	3.502
1993	3.502
1994	3.502
1995	3.502
1996	3.502
1997	3.502
1998	3.502
1999	3.502
2000	3.502
2001	3.502
2002	3.502
2003	3.502
2004	3.502
2005	3.502
2006	3.502
2007	3.502
2008	3.502
2009	3.502
2010	3.502

SOURCE: MAP MODEL CASE NSO.082
VARIABLE: B04

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3. Upper Cook Inlet Petroleum Production

Petroleum sector employment in the Kenai-Cook Inlet census division was 778 in 1979 (four-quarter average employment taken from Alaska Department of Labor, Statistical Quarterly, 1979 issues), consisting of exploration, development, and production associated with the Kenai oil and gas fields. Currently, the 120,000 barrels per day output of oil is expected to decline drastically over the forecast period, possibly as fast as 15 to 20 percent per year. The decline may be partially slowed, however, by a possible redrilling program being considered by the operators (see Oil and Gas Journal, 2/4/80, p. 36). We assume a gradual employment decline to 383 by 2010 as oil wells are abandoned. Gas production is assumed to remain relatively stable at around 5,000 mmcf/day.

SOURCE: Oil and Gas Journal, 2/4/80; and personal communication, D. A. Casey, ARCO Oil and Gas Co.

TABLE K.5a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
UPPER COOK INLET PETROLEUM

(thousands of employees)

Mining
Employment

1982	0.778
1983	0.759
1984	0.740
1985	0.721
1986	0.703
1987	0.685
1988	0.668
1989	0.652
1990	0.635
1991	0.619
1992	0.604
1993	0.589
1994	0.574
1995	0.560
1996	0.546
1997	0.532
1998	0.519
1999	0.506
2000	0.493
2001	0.481
2002	0.469
2003	0.457
2004	0.446
2005	0.435
2006	0.424
2007	0.413
2008	0.403
2009	0.393
2010	0.383

SOURCE: MAP MODEL CASE UPC.082
VARIABLE: EMP9

TABLE K.5b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
UPPER COOK INLET PETROLEUM

(thousands of employees)

Kenai-Cook Inlet

1982	0.778
1983	0.759
1984	0.740
1985	0.721
1986	0.703
1987	0.685
1988	0.668
1989	0.652
1990	0.635
1991	0.619
1992	0.604
1993	0.589
1994	0.574
1995	0.560
1996	0.546
1997	0.532
1998	0.519
1999	0.506
2000	0.493
2001	0.481
2002	0.469
2003	0.457
2004	0.446
2005	0.435
2006	0.424
2007	0.413
2008	0.403
2009	0.393
2010	0.383

SOURCE: MAP MODEL CASE UPC.082
VARIABLE: B12

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4. Tertiary Recovery of North Slope Oil

There is currently no firm plan for the disposition of North Slope natural gas, and recent studies have demonstrated the various problems faced by all the current proposals (for example, Booz, Allen and Hamilton, Inc., report to the state of Alaska, 1983; and "Use in Alaska of North Slope Natural Gas," Alaska Review of Social and Economic Conditions, April 1983). In light of the dim prospects for transport of the gas to market, an alternative use would be in tertiary recovery of North Slope oil. A pilot tertiary recovery project is currently underway at Prudhoe Bay involving the reinjection of natural gas liquids in a small portion of the field. Alternative tertiary recovery methods are technically feasible but have yet to be attempted in severe Arctic conditions. (See Options for North Slope Gas Utilization, Michael Economides and Russell Osterman, April 1982, for State of Alaska Division of Energy and Power Development.)

This case assumes tertiary recovery project for Pruhoe Bay oil. Since the dimensions of such a project have yet to be worked out, the case is generic in its employment assumptions. Employment is assumed to be on the same order of magnitude as the waterflooding project.

TABLE K.6a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
TERTIARY RECOVERY OF NORTH SLOPE OIL

(thousands of employees)

Mining
Employment

1982	0.000
1983	0.000
1984	0.000
1985	0.000
1986	0.000
1987	0.000
1988	0.000
1989	0.500
1990	1.000
1991	2.000
1992	2.000
1993	1.000
1994	0.500
1995	0.000
1996	0.000
1997	0.000
1998	0.000
1999	0.000
2000	0.000
2001	0.000
2002	0.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000

SOURCE: MAP MODEL CASE NSO.TRC
VARIABLE: EMP9

TABLE K.6b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
TERTIARY RECOVERY OF NORTH SLOPE OIL

(thousands of employees)

Barrow-North Slope	
1982	0.000
1983	0.000
1984	0.000
1985	0.000
1986	0.000
1987	0.000
1988	0.000
1989	0.500
1990	1.000
1991	2.000
1992	2.000
1993	1.000
1994	0.500
1995	0.000
1996	0.000
1997	0.000
1998	0.000
1999	0.000
2000	0.000
2001	0.000
2002	0.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000

SOURCE: MAP MODEL CASE NSO.TRC
VARIABLE: B04

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5. Federal OCS Exploration and Development

Our assumptions of employment associated with federal OCS exploration and development are based on the current five-year federal OCS lease schedule. For each planning area we assumed a total level of resources to be discovered and developed. We developed employment assumptions based on these resource levels. The basic method used to derive the resource development assumptions is described in pp. 17-28 of Edward D. Porter, "The Five-Year OCS Leasing Schedule, 1982-87, Alaska Impacts," Bureau of Land Management, Alaska OCS office, August 1982. Estimates of recoverable resources and probability of occurrence in each planning area have been updated to May 1983 with information from the Alaska OCS office.

Table K.7 summarizes the current federal OCS five-year leasing schedule and the resources which we assumed to be developed by 2010 in each planning area. This table updates Table 7 in E. D. Porter, op. cit. (p. 26). In the most likely case, we assume that no offshore gas resources are developed. Offshore oil resources are developed only in the Beaufort Sea and the Navarin Basin. Exploration continues in all areas, however, following the lease sale schedule.

Based on the resource estimates for each planning area, we developed employment assumptions for each lease sale. There is a great deal of uncertainty with respect to the actual level of employment which might be associated with any given sale. Employment would depend not only on the resources discovered, but also on factors such as the location of the discovery and the extent to which exploration and development had taken place in connection with earlier sales.

There is no consistent source for developing employment assumptions for all sales. The employment assumptions used by the Minerals Management Service, Alaska OCS office, for environmental impact studies and technical reports are available only for lease sales which have already been studied. These employment assumptions are often based on differing assumptions about resources which are developed than those we have used. In addition, the methodology used to develop them appears to vary widely between different reports. Despite these difficulties with past Minerals Management Service employment assumptions, they remain the best source available. We have used these assumptions as the primary basis for our own OCS employment assumptions, modifying them to take account of differences in assumptions such as resource discoveries and locations.

On the following pages, we present the employment assumptions associated with the OCS planning areas listed in Table K.7, in the order in which they are listed in the table.

TABLE K.7. OCS RESOURCE DEVELOPMENT ASSUMPTIONS

Planning Area	Sales	Dates	Low Case		Medium Case		High Case	
			Oil	Gas	Oil	Gas	Oil	Gas
Beaufort	71	(1982)	3.8	0	6.1	0	10.8	35.0
	87	(1984)						
	97	(1986)						
Norton	57	(1983)	0	0	0	0	0	0
	100	(1985)						
St. George	70	(1983)	0	0	0	0	1.12	0
	89	(1984)						
	101	(1986)						
Navarin	83	(1984)	0	0	1.14	0	1.14	0
	107	(1986)						
Barrow Arch	85	(1985)	0	0	0	0	.9	0
	109	(1987)						
North Aleutian	92	(1985)	0	0	0	0	.45	2.2
Cook Inlet	88	(1984)	0	0	0	0	.85	5.0
Kodiak and Shumagin	99	(1986)	0	0	0	0	0	0
Total			3.8	0	7.14	0	14.56	42.2

^aBillion barrels of oil, trillion cubic feet of gas.

5a. Beaufort Sea OCS Employment Assumptions (Sales 71, 87, and 97)

For the most likely case, we assume development of a total of 6.1 billion barrels of oil in the Beaufort Sea. We assumed that roughly half of this oil will be developed on tracts leased in Sale 71, and that half will be developed on tracts leased in Sales 87 and 97. Our employment assumptions are based on unpublished information provided by the Minerals Management Service, Alaska OCS office, in April 1983, which assumed development of 3.0 billion barrels of oil for Sale 87. We used these assumptions for Sales 87 and 97, and assumed slightly lower levels of employment for Sale 71.

TABLE K.8a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
BEAUFORT SEA OCS (SALE 71)

(thousands of employees)
(millions of current \$)

	High Wage Exogenous Construction Employment	Mining Employment	Exogenous Transportation Employment	State Property Tax Revenue
1982	0.000	0.000	0.000	0.000
1983	0.341	0.375	0.052	0.000
1984	0.208	0.375	0.052	0.000
1985	0.250	0.535	0.104	0.000
1986	0.250	0.575	0.117	0.000
1987	0.800	0.575	0.384	0.000
1988	0.800	0.546	0.683	0.000
1989	0.340	0.568	0.200	0.000
1990	0.952	1.001	0.411	0.000
1991	0.327	0.980	0.257	51.000
1992	0.873	1.265	0.752	53.000
1993	0.361	1.203	0.461	55.000
1994	0.268	1.448	0.508	57.000
1995	0.268	1.720	0.538	59.000
1996	0.035	1.484	0.610	61.000
1997	0.035	1.350	0.610	63.000
1998	0.035	1.341	0.610	65.000
1999	0.035	1.350	0.610	66.000
2000	0.035	1.341	0.610	68.000
2001	0.035	1.341	0.610	70.000
2002	0.035	1.341	0.610	71.000
2003	0.035	1.341	0.610	72.000
2004	0.035	1.341	0.610	74.000
2005	0.035	1.341	0.610	74.000
2006	0.035	1.341	0.610	75.000
2007	0.028	1.341	0.538	75.000
2008	0.028	1.315	0.538	75.000
2009	0.028	1.315	0.538	75.000
2010	0.028	1.315	0.538	73.000

SOURCE: MAP MODEL CASE OCS.G14
VARIABLES: EMCNX1 EMP9 EMT9X RPPS

TABLE K.8b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
BEAUFORT SEA OCS (SALE 71)

(thousands of employees)

	Anchorage	Barrow- North Slope
1982	0.000	0.000
1983	0.000	0.768
1984	0.000	0.635
1985	0.000	0.889
1986	0.000	0.942
1987	0.000	1.759
1988	0.000	2.029
1989	0.007	1.101
1990	0.011	2.353
1991	0.015	1.549
1992	0.059	2.831
1993	0.087	1.938
1994	0.100	2.124
1995	0.111	2.415
1996	0.120	2.009
1997	0.126	1.869
1998	0.126	1.860
1999	0.126	1.869
2000	0.126	1.860
2001	0.126	1.860
2002	0.126	1.860
2003	0.126	1.860
2004	0.126	1.860
2005	0.126	1.860
2006	0.126	1.860
2007	0.126	1.781
2008	0.126	1.755
2009	0.126	1.755
2010	0.126	1.755

SOURCE: MAP MODEL CASE OCS.G14
VARIABLES: B01 B04

TABLE K.9a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
BEAUFORT SEA OCS (SALES 87, 97)

(thousands of employees)
(millions of current \$)

	High Wage Exogenous Construction Employment	Mining Employment	Exogenous Transportation Employment	State Property Tax Revenue
1982	0.000	0.000	0.000	0.000
1983	0.000	0.000	0.000	0.000
1984	0.000	0.000	0.000	0.000
1985	0.341	0.375	0.052	0.000
1986	0.208	0.375	0.052	0.000
1987	0.416	0.535	0.104	0.000
1988	0.468	0.575	0.117	0.000
1989	1.080	0.575	0.384	0.000
1990	1.824	0.546	0.713	0.000
1991	0.340	0.568	0.230	0.000
1992	0.952	1.001	0.501	0.000
1993	0.327	0.980	0.387	72.000
1994	0.873	1.265	0.912	75.000
1995	0.261	1.203	0.651	78.000
1996	0.268	1.448	0.728	81.000
1997	0.268	1.720	0.788	84.000
1998	0.035	1.484	0.860	87.000
1999	0.035	1.350	0.860	89.000
2000	0.035	1.341	0.860	92.000
2001	0.035	1.350	0.860	95.000
2002	0.035	1.341	0.860	97.000
2003	0.035	1.490	0.860	100.000
2004	0.035	1.490	0.860	102.000
2005	0.035	1.490	0.860	104.000
2006	0.035	1.490	0.860	105.000
2007	0.035	1.490	0.860	106.000
2008	0.035	1.490	0.860	107.000
2009	0.028	1.315	0.788	108.000
2010	0.028	1.315	0.788	107.000

SOURCE: MAP MODEL CASE OCS.G01
VARIABLES: EMCNX1 EMP9 EMT9X RPPS

TABLE K.9b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
BEAUFORT SEA OCS (SALES 87, 97)

(thousands of employees)

	Anchorage	Barrow- North Slope
1982	0.000	0.000
1983	0.000	0.000
1984	0.000	0.000
1985	0.000	0.768
1986	0.000	0.635
1987	0.000	1.055
1988	0.000	1.160
1989	0.000	2.039
1990	0.000	3.083
1991	0.007	1.131
1992	0.011	2.443
1993	0.015	1.679
1994	0.059	2.991
1995	0.087	2.028
1996	0.100	2.344
1997	0.111	2.665
1998	0.120	2.259
1999	0.126	2.119
2000	0.126	2.110
2001	0.126	2.119
2002	0.126	2.110
2003	0.126	2.259
2004	0.126	2.259
2005	0.126	2.259
2006	0.126	2.259
2007	0.126	2.259
2008	0.126	2.259
2009	0.126	2.005
2010	0.126	2.005

SOURCE: MAP MODEL CASE OCS.G01
VARIABLES: B02 B04

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5b. Norton Basin OCS Employment Assumptions (OCS Sales 57 and 100)

We assume that no oil resources are developed in the Norton Basin. We assume only exploration employment only for Sales 57 and 100. Our Sale 57 exploration employment assumptions are based on an exploration-only scenario from U.S. Department of the Interior, BLM Alaska--OCS office, Bering-Norton Petroleum Development Scenarios, Socioeconomic Studies Program, Technical Report Number 49 (January 1980), p. 106. Our Sale 100 exploration employment assumptions are identical to these for Sale 57, but are assumed to occur two years later.

TABLE K.10a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
Norton Basin OCS (Sale 57)

(thousands of employees)

	High Wage Exogenous Construction Employment	Mining Employment	Exogenous Transportation Employment
1982	0.000	0.000	0.000
1983	0.000	0.000	0.000
1984	0.000	0.046	0.022
1985	0.036	0.092	0.044
1986	0.036	0.046	0.022
1987	0.000	0.000	0.000
1988	0.000	0.000	0.000
1989	0.000	0.000	0.000
1990	0.000	0.000	0.000
1991	0.000	0.000	0.000
1992	0.000	0.000	0.000
1993	0.000	0.000	0.000
1994	0.000	0.000	0.000
1995	0.000	0.000	0.000
1996	0.000	0.000	0.000
1997	0.000	0.000	0.000
1998	0.000	0.000	0.000
1999	0.000	0.000	0.000
2000	0.000	0.000	0.000
2001	0.000	0.000	0.000
2002	0.000	0.000	0.000
2003	0.000	0.000	0.000
2004	0.000	0.000	0.000
2005	0.000	0.000	0.000
2006	0.000	0.000	0.000
2007	0.000	0.000	0.000
2008	0.000	0.000	0.000
2009	0.000	0.000	0.000
2010	0.000	0.000	0.000

SOURCE: MAP MODEL CASE OCS.G10
VARIABLES: EMCNX1 EMP9 EMT9X

TABLE K.10b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
Norton Basin OCS (Sale 57)

(thousands of employees)

	Nome
1982	0.000
1983	0.000
1984	0.068
1985	0.172
1986	0.104
1987	0.000
1988	0.000
1989	0.000
1990	0.000
1991	0.000
1992	0.000
1993	0.000
1994	0.000
1995	0.000
1996	0.000
1997	0.000
1998	0.000
1999	0.000
2000	0.000
2001	0.000
2002	0.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000

SOURCE: MAP MODEL CASE OCS.G10
VARIABLE: B18

TABLE K.11a. STATEWIDE BASE CASE ECONOMIC ASSUMPTIONS
Norton Basin OCS (Sale 100)

(thousands of employees)

	High Wage Exogenous Construction Employment	Mining Employment	Exogenous Transportation Employment
1982	0.000	0.000	0.000
1983	0.000	0.000	0.000
1984	0.000	0.000	0.000
1985	0.000	0.000	0.000
1986	0.000	0.046	0.022
1987	0.036	0.092	0.044
1988	0.036	0.046	0.022
1989	0.000	0.000	0.000
1990	0.000	0.000	0.000
1991	0.000	0.000	0.000
1992	0.000	0.000	0.000
1993	0.000	0.000	0.000
1994	0.000	0.000	0.000
1995	0.000	0.000	0.000
1996	0.000	0.000	0.000
1997	0.000	0.000	0.000
1998	0.000	0.000	0.000
1999	0.000	0.000	0.000
2000	0.000	0.000	0.000
2001	0.000	0.000	0.000
2002	0.000	0.000	0.000
2003	0.000	0.000	0.000
2004	0.000	0.000	0.000
2005	0.000	0.000	0.000
2006	0.000	0.000	0.000
2007	0.000	0.000	0.000
2008	0.000	0.000	0.000
2009	0.000	0.000	0.000
2010	0.000	0.000	0.000

SOURCE: MAP MODEL CASE OCS.G09
VARIABLES: EMCNX1 EMP9 EMT9X

TABLE K.11b. REGIONAL BASE CASE ECONOMIC ASSUMPTIONS
Norton Basin OCS (Sale 100)

(thousands of employees)

	Nome
1982	0.000
1983	0.000
1984	0.000
1985	0.000
1986	0.068
1987	0.172
1988	0.104
1989	0.000
1990	0.000
1991	0.000
1992	0.000
1993	0.000
1994	0.000
1995	0.000
1996	0.000
1997	0.000
1998	0.000
1999	0.000
2000	0.000
2001	0.000
2002	0.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000

SOURCE: MAP MODEL CASE OCS.G09
VARIABLE: B18

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