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MAN-IN-THE-ARCTIC-PROGRAM

ALASKAN ECONOMIC MODEL

DOCUMENTATION

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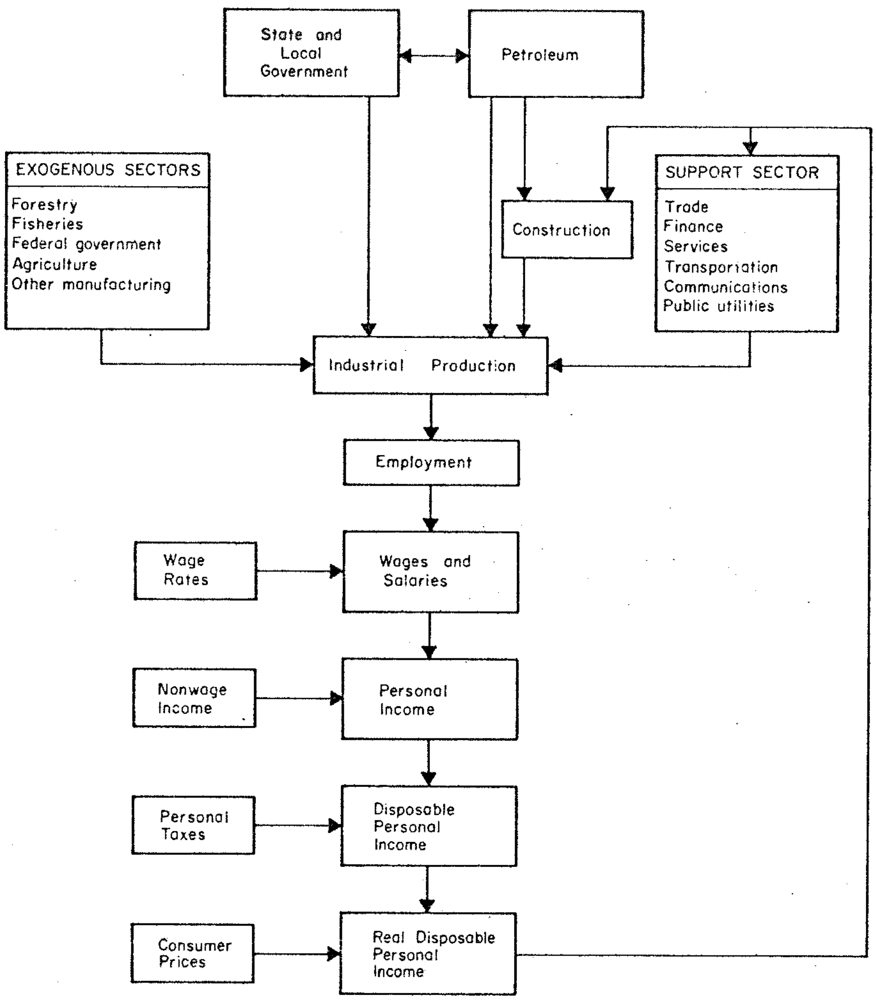

MAP ECONOMIC MODEL: SUMMARY DESCRIPTION

The level of economic activity is a function of both export and residentiary oriented production. The output in the export sectors is determined exogenously while that of the residentiary sectors is a function of local demand reflected by disposable personal income. Export and residentiary production generate wages and salaries which form the major component, after personal taxes are deducted, of disposable personal income. Thus demand and supply are simultaneously determined each year.

The export sectors are the following two-digit SIC categories--agriculture-forestry-fisheries, manufacturing, federal government, petroleum and other mining, and construction related to these activities. All other sectors are classified as residentiary. State and local government output is an important component of economic activity which is determined by policy choice.

The Alaskan economy is linked to the national economy through the average U.S. weekly wage, the consumer price index, and real disposable personal income per capita. The Alaskan versions of these variables are related to their national counterparts but are strongly affected by local conditions such as excess labor demand.

Labor is the only input which is not infinitely elastic in supply. Thus a change in the general price level does not directly effect supplies.

Data for model construction is primarily from the Alaska Department of Labor employment statistics, the U.S. Department of Commerce Bureau of Economic Analysis personal income statistics and the gross product by industry series developed by the Institute of Social & Economic Research.

MAP ECONOMIC MODEL: DESCRIPTION

THE DEMAND EQUATIONS - GROSS PRODUCT

In the residentiary sectors of the economy the level of activity is demand determined with real disposable personal income the determinant of that demand. A change in the level of real income results in a change in the level of real output in the residentialy sectors. Two components of real disposable personal income are identified as having different effects on local demand. Real disposable personal income net of "enclave" income (DPI3R) is the primary source of demand and "enclave" income (DPIXR) is a secondary, generally weaker, source. Real gross product, or output, in the transportation (XXT9), public utility (XXPU), communications (XXCM), trade (XXD9), and finance (XXFI) sectors is detemrined solely by these indicators of local demand. A lag term is introduced to capture delayed producer and consumer reactions to changes in real income levels.

Value added in the construction industry (XXCN) is the sum of three components. Residentiary construction activity (XXCN8) is a function of the two components of disposable personal income with a dummy variable to account for the earthquake recovery years of 1964-65. Real value added from state government capital construction activity (VACAP) is added to this to arrive at endogenous construction activity (XXCN1). Finally since the level of exogenous construction activity is set by exogenous construction employment the value added by exogenous construction activity can be determined by the ratio of total to endogenous construction employment (EMCN/EMCN1).

Value added in services (XXS9) is the sum of two components. Residentiary value added (XXS91) is a function of disposable personal income. Native corporation employment is within the service sector and is treated as an exogenous component of value added. The ratio of total sector employment to residentiary employment in the sector is used to calculate total value added (EMS9/EMS91).

MAP ECONOMIC MODEL: EQUATIONS

THE DEMAND EQUATIONS - GROSS PRODUCT

XXT9 = C64A+C64B*DPIXR+C64C*DPI3R(-1)

XXPU = C72A+C72B*DPIXR+C72C*DPI3R(-1)

XXCM = C68A+C68B*DPIXR+C68C*DPI3R(-1)

XXD9 = C76A+C76B*DPI3R+C76C*DPIXR+C76D*DPI3R(-1)

XXFI = C80A+C80B*DPI3R+C80C*DPIXR+C80D*DPI3R(-1)

DPIXR - real disposable personal income of "enclave" construction employees
DPI3R - real disposable personal income net of "enclave" construction employee related personal income
XXab - gross product in communication (CM), trade (D9), finance (FI), public utilities (PU) or transportation (T9).

XXCN8 = C54A+C54B*DPI3R+C54C*DPIXR+C54D*D64.65

XXCN1 = XXCN8+VACAP

XXCN = EMCN/EMCN1*XXCN1

D64.65 - dummy with value of 1 in 1964 and 1965
EMCN - construction employment
EMCN1 - construction employment net of exogenous construction employment
VACAP - real value added in contract construction accounted for by state government purchases from private contracting industry
XXCN - gross product in construction
XXCN1 - residentiary plus state government construction real gross product
XXCN8 - residentiary construction real gross product

XXS91 = C84A+C84B*DPI3R+C84C*DPIXR+C84D*DPI3R(-1)

XXS9 = EMS9/EMS91*XXS91

EMS9 - service sector employment
EMS91 - service sector employment net of direct Native Corporation employment
XXS9 - service sector gross product
XXS91 - service sector gross product net of direct Native Corporation employment

Value added is determined by employment in the mining (XXP9), federal government (XXGF), and state and local government sectors (XXGA). Since it is difficult to value the output of government, gross product in the government sectors is essentially the level of wage payments. In mining and federal government the level of employment is set exogenously and gross product follows from employment. In state and local government expenditures determine employment and gross product derives from that.

Total value added (XX99) is the sum of value added in all sectors except "other" employment for which no value added is calculated. Output in manufacturing is exogenous and consists of two components--existing types of manufacturing (XXM9) and large scale exogenous additions (XXMX). Agriculture-forestry-fisheries gross product (XXA9) is also exogenous.

EMPLOYMENT

The determination of employment in most sectors is based upon derived demand where given a production function relating output to the inputs, the demand for labor becomes a function of the demand for output. This is the case for the equations determining the level of employment in communications (EMCM), public utilities (EMPU), trade (EMD9) and finance (EMFI).

Employment in state and local government (EMGA) is an exception since it is the ratio of state and local government wages and salaries (WSGA) to the wage rate in that sector (WRGA). Government decides upon the level of personnel expenditures and with a given wage rate the number of employees is determined. State government employment (EMGS) is state government wages and salaries (WSGS) divided by the state government wage. This is calculated to be PSLWR times the combined state and local wage rate. Local government employment (EMGL) is the residual.

LOG(XXP9) = C52A+C52B*LOG(EMP9)

LOG(XXGF) = PC88A+PC88B*LOG(EMGF)

LOG(XXGA) = PC94A+PC94B*LOG(EMGA)

EMab - employment in state & local government (GA), federal government (GF), or mining (P9)
XXab - gross product in state & local government (GA), federal government (GF), or mining (P9)

XX99 = XXP9+XXCN+XXM91+XXMX+XXT9+XXCM+XXPU+XXD9+XXFI+XXS9+XXGF+XXGA+XXA9

XXab - gross product in total (99), manufacturing (M91), large project manufacturing (MX) or agriculture-forestry-fisheries (A9)

EMPLOYMENT

LOG(EMCM) = C69A+C69B*LOG(XXCM)

LOG(EMPU) = C73A+C73B*LOG(XXPU)

LOG(EMD9) = C77A+C77B*LOG(XXD9)

LOG(EMFI) = C81A+C81B*LOG(XXFI)

EMab - employment in communications (CM), trade (D9), finance (FI) or public utilities (PU)

EMGA == WSGA/WRGA*1000

EMGS == WSGS/(WRGA*PSLWR)*1000

EMGL == EMGA-EMGS

EMab - employment in state and local government (GA), state government (GS), or local government (GL)
PSLWR - percentage by which the state government wage rate exceeds the combined state and local rates
WRGA - state and local government wage rate
WSGA - state and local government wages and salaries

LOG(EMT91) = C65A+C65B*LOG(XXT9)

EMT9 == EMT91+EMT9X

In the transportation, manufacturing, and services sectors there are two components of employment. Transportation employment (EMT9) has a residentiary component (EMT91) determined by its historical relationship to output and an exogenous component (EMT9X) which is the level of employment associated with the operation of large pipelines. Manufacturing employment consists of a component composed of existing types of manufacturing (EMM91) and an exogenous component (EMMX) composed of employment in new large scale facilities of a different nature from the predominantly low relative wage industries of which manufacturing presently consists. The existing manufacturing employment equation includes its own lagged value because of the somewhat unstable nature of the production function in this sector from season to season.

Services employment (EMS9) is composed of a residentiary component (EMS91) and those individuals employed by the native corporations (EMNC). The former is a function of time to reflect the "maturation" of the services sector in the Alaskan economy. The latter is determined implicitly from total wages and salaries paid in the sector. (See below).

Construction employment (EMCN) consists of an endogenous component (EMCN1) and an exogenous component (ECONX). Exogenous construction employment consists of "enclave" type exogenous employment (ECONX1) such as the Alyeska pipeline construction employment and non-"enclave" exogenous construction employment (ECONX2).

Wage and salary employmemnt including the military personnel (EM991) is the sum of these sectors as well as agriculture-forestry-fisheries (EMA9), federal government (EMGF), and mining (EMP9), all of which are exogenous.

Other employment (EMOT), which is non-wage and salary employment, is a function of wage and salary employment. Together they sum to total employment (EM99). Non-agriculture wage and salary employment (EMNAWS) is total net of military personnel and non-wage and salary employment. Civilian employment (EC) is the total net of military personnel.

EMT9 - transportation employment
EMT9X - large pipeline project related transportation employment
EMT91 - transportation employment net of large scale pipeline projects

LOG(EMM91) = C61A+C61B*LOG(XXM91)+C61C*LOG(EMM91(-1))

EMM9 == EMM91+EMMX

EMMX - exogenous manufacturing employment of large project nature
EMM9 - manufacturing employment
EMM91 - manufacturing employment net of large projects

LOG(EMS91) = C85A+C85B*LOG(XXS91)+C85C/T

EMS9 == WSS9/WRS9*1000

EMNC == EMS9-EMS91

EMNC - Native Corporation direct employment
EMS9 - service sector employment
EMS91 - manufacturing employment net of large projects
T - time, 1978=18
WRS9 - service sector wage rate
WSS9 - service sector wages and salaries

LOG(EMCN1) = C56A+C56B*LOG(XXCN1)

ECONX = ECONX1+ECONX2

EMCN = EMCN1+ECONX

ECONX - exogenous construction employment
ECONX1 - "enclave" or premium wage construction employment
ECONX2 - non-"enclave" exogenous construction employment
EMCN - construction employment
EMCN1 - construction employment net of exogenous construction employment

EM991 = EMP9+EMCN+EMM9+EMT9+EMCM+EMPU+EMD9+EMFI+EMS9+EMGF+EMGA+EMA9

EMab - employment in agriculture-forestry-fisheries (A9), federal government (GF), or mining (P9)
EM991 - wage and salary and military employment

LOG(EMOT)+C100A+C100B*LOG(EM991)

EMOT - other (non-wage and salary) employment

Several additional employment variables are also calculated. Extractive industry type employment (EMX) is the sum of exogenous construction and mining employment. Communications and public utilities employment are combined to form total utilities employment (EMCU). Civilian federal government employment (EMGC) is total federal employment net of military personnel. Miscellaneous employment (EMMS) is the sum of non-wage and salary employment and agriculture-forestry-fisheries.

Infrastructure employment (EMS1) consists of transportation, communications, and public utilities. Distributive industry employment (EMS2) consists of trade, finance, and services. Total service-type sectors (EMSP) is the sum of these two groups. Total government employment (EMG9) is local, state, and federal employment. Renewable resource employment (EMNR) is manufacturing, agriculture-forestry-fisheries, and other. Total employment net of service-type sectors and government yields non-support type employment (EMNS).

EM99 = EM991+EMOT

EMNAWS == EM99-EMOT-POPM

EC = EM99-POPM

EMNAWS - non-agricultural wage & salary employment
EM99 - total wage and salary non-wage and salary and military employment
POPM - armed forces employment

EMX = ECONX+EMP9

EMCU == EMCM+EMPU

EMGC == EMGF-POPM

EMMS == EMOT+EMA9

EMCU - communications plus public utilities employment
EMGC - federal civilian employment
EMMS - non-wage and salary combined with agriculture-forestry-fishery employment
EMX - extractive industries related employment--mining and exogenous construction

EMS1 == EMT9+EMCM+EMPU

EMS2 == EMD9+EMFI+EMS9

EMSP == EMS1+EMS2

EMG9 == EMGF+EMGA

EMNR==EM99-EMSP-EMG9-EMCN-EMP9

EMNS == EM99-EMSP-EMG9

EMG9 - federal, state, and local government employment
EMNR - renewable resource employment - manufacturing, agriculture-forestry-fisheries, and non-wage & salary employment
EMNS - manufacturing, mining, construction, agriculture-forestry-fisheries, and non-wages and salary employment
EMSP - transport, communication, public utility, trade, finance, and service employment
EMS1 - transport, communication, and public utility employment
EMS2 - trade, finance, and service employment

WAGE RATES

Real wage rates by industry (WRab) are determined by both national economic conditions and conditions in the Alaskan labor market. The real wage in the U.S. is represented by the average weekly wage (WEUS) deflated by the consumer price index (USCPI). As the real wage in the U.S. rises the real wage in Alaska tends to move in the same direction. When the demand for labor grows more rapidly than the supply in Alaska "tight" labor markets develop with a resulting upward pressure on wage rates. This tightness tends to occur when large exogenous construction projects occur (which inply a large value for ECONX). This upward pressure on the real wage eventually dissipate but the presence of the lag term indicates that the tightness in the market will be reflected in wage rates for more than one year.

The only exception to this form of the wage rate equation is in federal government (WRGF), where the nominal wage rate is a function of national real wage rate movements and the Alaskan relative price index. Tight labor market conditions only indirectly effect this wage rate through Alaskan relative prices. The civilian federal wage rate (WRGC) is a multiple (PCIVPY) of the total federal wage.

In addition to the average wage rate in the construction industry there is an "enclave" type construction wage (WRCNP) which is much higher than the industry average and a non-"enclave" construction wage (WRCNNP) which is lower than the average in those years when there is "enclave" construction. The "enclave" and non-"enclave" wage rates are determined by making an adjustment (PIPADJ) which represents the difference between the "enclave" and non-"enclave" wage rates.

The wage rate for large project manufacturing (WRM9X) is exogenous as it would be much higher than the existing rate.

An average wage rate for wage and salary employment (WR99) is calculated as is the real wage (WR99R) and a wage rate for total utilities is also generated (WRCU).

WAGE RATES

```
LOG(WRab/RPI) = CnnA+CnnB+LOG(WEUS/USCPI)+CnnC*LOG(1+ECONX/
                  (EM991-ECONX))+CnnD*LOG(1+ECONX(-1)/(EM991(-1)-
                  ECONX(-1)))

          WEUS  - average weekly wage & salary earnings in U.S.
          WRab  - average annual wage rate for industry ab (except
                    federal government)
          USCPI - U.S. consumer price index (1967=100)

LOG(WRGF) = C89A+C89B*LOG(WEUS/USCPI)+C89C*LOG(RPI)

WRGC == WRGF*PCIVPY

          PCIVPY - ratio of federal civilian to military wage rate
          RPI    - Alaskan relative price index, 1967 value is 1.425
                     times U.S. CPI which in 1967 was 100
          WRGC   - federal civilian wage rate
          WRGF   - federal government wage rate

WRCNNP == WSCN*1000/(EMCN1+ECONX2+PIPADJ*ECONX1)

WRCNP = WRCNNP*PIPADJ

          PIPADJ - ratio of "enclave" to regular construction wage rate
          WRCNNP - non-"enclave" construction wage rate
          WRCNP  - pipeline or "enclave" construction wage rate
          WSCN   - construction wages and salaries

WR99 == WS99*100./(EM99-EMOT)

WR99R = WR99*100/RPI

          WR99  - average nominal wage rate
          WR99R - average real wage rate
          WS99  - total wage and salary income (does not include
                    income of "other" employment)

WRCU == (WSCM+WSPU)/EMCU*1000

          WRCU - average wage rate in communications and public
                   utilities sectors
```

WAGES AND SALARIES

Wages and salaries in each sector (WSab) is simply the product of the wage rate and employment. Manufacturing has an exogenous component of wages and salaries (WRM9X) associated with large scale projects.

Federal wages and salaries is divided into military (WSGM) and civilian (WSGC) components.

State and local government wages and salaries (WSGA) is the sum of state and local components.

Wages and salaries of the "enclave" construction sector which do not directly "leak out" of the economy (WSCNADJ) is a percentage (PCNADJ) of total "enclave" wages and salaries.

Service sector wages and salaries (WSS9) is composed of an endogenous component and native corporation wage and salary payments (NCWS).

Total wages and salaries (WS99) is the sum of all wage and salary paying sectors of the economy.

WAGES & SALARIES

WSab == EMab*WRab/1000

WSab - total wages and salaries in agriculture-forestries-fisheries (A9), communications (CM), trade (D9), finance (FI), public utilities (PU), mining (P9), or transportation (T9)

WSM9 == EMM91*WRM9/1000+EMMX*WRM9X/1000

WSM9X == EMMX*WRM9X/1000

WRM9X - wage rate for exogenous large project manufacturing employment
WSM9 - wages and salaries in manufacturing
WSM9X - wages and salaries paid in exogenous large project manufacturing

WSGF == EMGF*WRGF/1000

WSGM = WSGF-WSGC

WSGC = WRGC*EMGC/1000

WSGC - federal civilian wages and salaries
WSGF - federal total wages and salaries
WSGM - military personnel wages and salaries

WSGA = WSGS+WSGL

WSGA - state and local government wages and salaries
WSGL - local government wages and salaries
WSGS - state government wages and salaries

WSCN = EMCN*WRCN/1000

WSCNADJ = PCNADJ*WRCNP*ECONX1/1000

PCNADJ - proportion of "enclave" construction wages and salaries that directly leaks out of Alaskan economy
WSCN - construction wages and salaries
WSCNADJ - "enclave" construction wages and salaries which directly leaks out of the economy

WSS9 == EMS91*WRS9/100+NCWS

NCWS - wages and salaries paid by Native Corporations
WSS9 - service sector wages and salaries

PERSONAL INCOME & DISPOSABLE PERSONAL INCOME

The initial estimate of personal income (PI1) is a function of wages and salaries, with "enclave" construction employment separately entered as an explanatory variable. This is the only residence adjustment made. Implicit in this relationship is all non-wage and salary components of personal income including proprietors' income, interest, dividends, and most transfers. Wage and salary income is by place of work while other income is by place of residence. Total personal income (PI) includes transfers and other income related to Native claims payments (NCPI). An additional personal income concept is total personal income net of "enclave" construction related income (PI3). Personal income per capita (PIPC), real personal income (PIR), and real personal income per capita (PIRPC) are also calculated.

An initial estimate of Native personal income (YNA1) is based upon Native wages and salaries (WSNA) weighted by an adjustment factor (PCYNA1) on the overall ratio of personel income to wages and salaries. Total Native income (YNA) is this initial estimate plus Native claims personal income or the amount calculated by the income distribution model (RNAT) if it is activated (IDIST = 1). Non Native income (YNNR) is calculated as are Native (YNAPC), non Native (YNNPC), and Native claims income (YNCPC) per capita, and Native (YNARPC) and non Native (YNNRPC) real per capita income.

```
WS99 = (WRP9*EMP9+WRCN*ENCN+EMM91*WRM9+EMMX*WRM9X+WRT9*EMT9+WRCM*
        EMCM+WRPU*EMPU+WRD9*EMD9+WRFI*EMFI+WRS9*EMS9+WRGF*EMGF+
        WRGA*EMGA+WRA9*EMA9)/1000

         WS99 - total wage and salary income (does not include
                 income of "other" employment)
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PERSONAL INCOME & DISPOSABLE PERSONAL INCOME

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PI1 = C44A+C44B*(WS99-ECONX1*WRCNP/1000.)+C44C*(ECONX1*WRCNP/1000)

         PI1 - personal income net of Native claims transfers
                to individuals

P1 = PI1+NCPI

PI3 = PI-PI/WS99*WRCNP*ECONX1/1000

         PI  - personal income-not residence adjusted for wages
                & salaries earned
         PI3 - personal income net of "enclave" construction
                employee personal income

PIR == PI*100./RPI

PIRPC = PIR*1000./POP

PIPC == PI*1000./POP

         PIPC  - personal income per capita
         PIR   - real personal income
         PIRPC - real personal income per capita
         POP   - population

YNA1 == PCYNA1*(PI1/WS99)*WSNA

YNA == IF IDIST EQ 1 THEN RNAT(-1)*PI ELSE YNA1+NCPI

YNN == PI-YNA

         IDIST  - model switch which results in retrieval of Native
                   employment and wages values from income distri-
                   bution model if it takes value of one
         NCPI   - Native personal income from ANCSA-related
                   activities
         PCYNA1 - proportion by which the ratio of personal income to
                   wages and salaries for Natives exceeds that of the
                   total population
         RNAT   - Native personal income calculated using the income
                   distribution model
```

Disposable personal income (DPI) is calculated separately for Natives and non-Natives and then summed. A proportion (RAT1) of federal (RTPIF), state (RTISCP), and local (RES) income type taxes are subtracted from non Native personal income. From this disposable personal income per capita of non-Natives is derived (YDNNPC). For Natives the remainder of income type taxes is subtracted from their income to get the initial estimate of per capita disposable personal income of Natives (YDNAPC1). To this is added the non-taxed portion of Native income consisting of direct Native claims payments to get total disposable income. The ratio used to allocate taxes between Natives and non Natives is based upon the ratio of Native to non Native taxable income.

Real disposable personal income (DPIR) is calculated as is real disposable personal income per capita (DPIRPC). Real disposable personal income is divided into two components. "Enclave" construction employment related real disposable income (DPIXR) is subtracted out of the total to get a net real disposable personal income concept (DPI3R).

Real per capita non Native disposable personal income (YDNNRPC) and real per capita Native disposable personal income (YDNARPC) are calculated as are real Native claims expenditures per capita (NCXRPC) and real Native income plus Native claims expenditures per capita (YXNARPC).

WSNA - wages and salaries paid to Natives
YNA - Native personal income including Native claim income to individuals
YNA1 - Native personal income net of Native claims income to individuals
YNN - total non-Native income

YNAR == YNA*100/RPI

YNNR == YNN*100/RPI

YNAR - Native real personal income
YNNR - Non-native real personal income

YNAPC == YNA*1000/POPNE

YNNPC == YNN*1000/(POP-POPNE)

YNCPC == NCPI*1000/POPNE

POPNE - Native population based upon Native Corporation enrollment records
YNAPC - Native per capita personal income
YNCPC - Native claims personal income per capita
YNNPC - non-Native per capita personal income

YNARPC == YNAR*1000/POPNE

YNNRPC == YNNR*1000/(POP-POPNE)

YNARPC - Native real personal income per capita
YNNRPC - non-Native real personal income per capita

RAT1 == YNN/(PI-PC12N*PC12RN*PCNC1*ANCSA)

ANCSA - payment to Alaska Natives by federal and state government under Alaska Native Claims
PCNC1 - proportion of ANCSA payments paid directly to individuals
PC12N - proportion of ANCSA payments made to 12 regional Native Corporations in Alaska
PC12RN - proportion of members of 12 regional corporations residing in Alaska
RAT1 - ratio of non-Native income to total taxable income

YDNNPC = 1000*(YNN-RAT1*(RES+RTPIF+RTISCP))/(POP-POPNE)

YDNAPC1 == 1000*(YNA-PC12N*PC12RN*PCNC1*ANCSA-(1-RAT1)*(RES+RTPIF+RTISCP))/POPNE

NATIVE CLAIMS INCOME

Native claims related personal income (NCPI) consists of four components. The first is the direct payments to Alaska resident Natives under the program (ANCSA). This is a portion of the total percentage actually distributed to individuals (PCNC1) consisting of that proportion distributed to the Natives of the 12 corporations in Alaska (PC12N), and the proportion of Alaska Natives residing in Alaska (PC12RN). Proportions of royalty payments (PCNC2*NCRP) and bonus payments (PCNC4*NCPB) to Native Corporations also are distributed to Alaskan Natives as personal

RES - non-federal and non-state tax component of difference between personal income and disposable personal income
RTISCP - state income taxes paid out of resident Alaskan personal income
RTPIF - federal income taxes paid out of Alaskan personal income
YDNAPC1 - Native disposable personal income per capita net of taxable ANCSA payments
YDNNPC - non-Native disposable personal income per capita

DPI = PC12N*PC12RN*PCNC1*ANCSA+(YDNNPC*(POP-POPNE)+YDNAPC1*POPNE)/1000

DPI - disposable personal income

DPIR = 100.*DPI/RPI

DPIRPC == DPIR*1000/POP

DPI3R = DPI*100/RPI-DPIXR

DPIXR = DPI/PI*WRCNP*ECONX1/10/RPI

DPIR - real disposable personal income
DPIRPC - real disposable personal income per capita

YDNNRPC = YDNNPC*100/RPI

NCXRPC == NCEXP/POPNE/RPI*100000

YXNARPC == YNARPC+NCXRPC

YDNARPC == YDNAPC1*100/RPI+PC12N*PC12RN*PCNC1*ANCSA/POPNE*100000/RPI

NCEXP - current expenditures of Native corporation
NCXRPC - real current expenditures of Native corporation per native
YDNARPC - Native real disposable personal income per capita
YDNNRPC - non-Native real disposable income per capita
YXNARPC - Native real personal income per capita plus real current expenditures of Native corporations per capita

NATIVE CLAIMS INCOME

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

NCCI = PC12N*(1-PCNC1)*ANCSA+(1-PCNC2)*NCRP+(1-PCNC3)*RORNC*NCCAP(-1) income although not to members of the thirteenth Native Corporation. In addition a proportion (PCNC3) of the earnings on the assets of the Native corporations (RORNC*NCCAP(-1)) is distributed to individuals.

The activities of the Native corporations produce current income (NCCI) which is not distributed to individuals. This consists of a portion of Native claims settlement payments, royalties, and earnings on assets. A proportion of current income (PCNCSV) is spent on capital assets (NCCAP) with the remainder spent on current expenditures (NCEXP). Bonus payments are also distributed (PCNCSV1) between capital and current expenditures. From current expenditures Native Corporation wages and salaries (NCWS) are calculated as a percentage (PCNCWS).

PRICE LEVEL

Changes in the level of the Alaskan relative price index (RPI) are the sum of two factors. Over time the growth of the Alaskan economy will result in the introduction of economies of scale in the production of goods and services which will be reflected in a secular trend of the Alaskan price index at a slightly lower rate than the U.S. consumer price index (USCPI). Without such economies the Alaskan index would move at the same rate as the national index. This is reflected by the scale effect (RSCALE) which is a function of growth in the U.S. CPI. In addition the price level will be influenced by conditions in local factor markets, notably the labor market. When there is growing demand on labor there will be upward pressure on prices. This is reflected in the cyclical price level factor (RCYCL) which is a function of employment level growth. The variable R.C. is an intermediate variable used in the estimation of the scale factor in the growth in the price index.

Separate price deflators are calculated for the operating expenditures of the government sector (PDEXOPS) and for state government funded capital construction projects (PDCON). The former is a weighted average

NCBP - bonus income to Natives from lease sales on Native lands
NCCAP - accumulated capital of Native Corporations
NCCI - Native Corporation income from ANCSA-related activities
NCPI - Native personal income from ANCSA-related activities
NCRP - Native recurrent income from petroleum development on native lands
PCNC2 - proportion of recurring income from petroleum development on Native lands paid directly to individuals
PCNC3 - proportion of earnings on Native Corporation accumulated capital paid directly to individuals
PCNC4 - proportion of bonus income from lease sales on Native lands paid directly to individuals
RORNC - rate of return on accumulated capital of Native corporations

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

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

NCWS == PCNCWS*NCEXP

NCWS - wages and salaries paid by Native Corporations
PCNCSV - proportion of Native Corporation income used for investment
PCNCSV1 - proportion of bonus income from lease sales on Native lands and retained by Native Corporations which is used for investment
PCNCWS - proportion of current expenditures of Native Corporations paid in wages and salaries

PRICE LEVEL

R.C = 1+EXP(CRCA+CRCB*(EM991+EM991(-1))/2)

RSCALE == DEL(1:R.C*USCPI)/(R.C.(-1)*USCPI(-1))

RCYCL = IF DEL(1:EM991)GT 0 THEN C2A+C2B*(DEL(1:EM991)/EM991(-1))**2 ELSE C2A-C2B*(DEL(1:EM991)/EM991(-1))**2

DEL(1:RPI)/RPI(-1) = RSCALE+RCYCL

R.C. - the ratio of RPI to USCPI obtained by regression and used to estimate the scale component of the growth of RPI
RCYCL - the percent change in RPI attributable to "boom-bust" economic conditions

of the growth rates of costs of the labor and non-labor components of the operating budget. The later is a function of the wage rate in construction.

NATIONAL ECONOMIC CONDITIONS

The national variables real per capita disposable personal income (DIRPU), the consumer price index (USCPI), and the average weekly wage (WEUS), all grow at exogenously determined, but functionally related growth rates GRDIRPU, GRUSCPI and GRWEUS respectively.

RSCALE - the percent change in RPI attributable to change in the scale of the economy
USCPI - U.S. consumer price index

PDEXOPS = WSGSFY(-1)/EXOPS(-1)*(WRGA*100/WRBASE)+(EXOPS(-1)-WSGSFY(-1))/EXOPS(-1)*RPI

PDCON = CCX3A+CCX3B*WRCNNP

EXOPS - state government operating expenditures
PDCON - price deflator for state government construction projects
PDEXOPS - price deflator for state government operating expenditures
WRBASE - average 1967 U.S. government wage rate
WSGSFY - state government wages and salaries on fiscal year base

NATIONAL ECONOMIC CONDITIONS

DIRPU = DIRPU(-1)*(1+GRDIRPU)

USCPI = USCPI(-1)*(1+GRUSCPI)

WEUS = WEUS(-1)*(1+GRWEUS)

DIRPU - U.S. real disposable personal income per capita
GRDIRPU - annual growth rate of U.S. real disposable personal income per capita
GRUSCPI - annual growth rate of U.S. consumer price index
GRWEUS - annual growth rate of U.S. average weekly earnings

MAP ECONOMIC MODEL: STOCHASTIC EQUATIONS & STATISTICS

DEMAND EQUATIONS

XXCM - GROSS STATE PRODUCT IN COMMUNICATIONS

XXCM = C68A+C68B*DPIXR+C68C*DPI3R(-1)

NOB = 16 NOVAR = 3
RANGE = 1962 TO 1977
RSQ = 0.96533 CRSQ = 0.96 F(2/13) = 181.000
SER = 10.6248 SSR = 1467.530 DW(0) = 1.25 COND(X) = 8.56

COEF	VALUE	ST ER	T-STAT
C68A	-19.96200	9.55767	-2.08858
C68B	0.13313	0.03894	3.41886
C68C	0.14436	0.01400	10.31310

XXCN8 - GROSS STATE PRODUCT IN CONSTRUCTION NET OF EXOGENOUS PROJECTS AND STATE GOVERNMENT CONSTRUCTION

Data not available on state government construction activity for recent years.

Dummy variable corresponds to earthquake recovery years.

"Enclave" construction employment disposable income is included in specification for theoretical reasons in spite of low explanatory power. It represents a "boom" term.

XXCN8 = C54A+C54B*DPIRG+C54C*DPIRX+C54D*D64.65

NOB = 14 NOVAR = 4
RANGE = 1962 TO 1975
RSQ = 0.91996 CRSQ = 0.89595 F(3/10) = 38.312
SER = 4.4753 SSR = 200.284 DW(0) = 2.19 COND(X) = 11.75

COEF	VALUE	ST ER	T-STAT
C54A	2.77430	6.22286	0.44582
C54B	0.05705	0.00880	6.48030
C54C	0.02034	0.02683	0.75818
C54D	6.60000	3.70368	1.78201

KEY:

COEF	- coeffecient value	NOVAR	- number of variables
COND(X)	- multicollinearity statistic	RSQ	- R^2
CRSQ	- corrected R^2	SER	- standard error of regression
DW	- Durbin-Watson statistic	SSR	- sum of squared residuals
F	- F statistic	ST ER	- standard error of coefficient
NOB	- number of observation	T-STAT	- T statistic

XXD9 - GROSS STATE PRODUCT IN TRADE

XXD9 = C76A+C76B*DPIRG+C76C*DPIRX

NOB = 16 NOVAR = 3
RANGE = 1961 TO 1976
RSQ = 0.99413 CRSQ = 0.99322 F(2/13) = 1100.410
SER = 5.6895 SSR = 420.815 DW(0) = 1.44 COND(X) = 10.83

COEF	VALUE	ST ER	T-STAT
C76A	-31.70470	6.41623	-4.94133
C76B	0.22014	0.00959	22.96140
C76C	0.08971	0.02578	3.47977

XXFI - GROSS STATE PRODUCT IN FINANCE-INSURANCE-REAL ESTATE

XXFI = C80A+C80B*DPIRG+C80C*DPIRX

NOB = 16 NOVAR = 3
RANGE = 1961 TO 1976
RSQ = 0.99163 CRSQ = 0.99034 F(2/13) = 769.958
SER = 4.5857 SSR = 273.372 DW(0) = 1.73 COND(X) = 10.83

COEF	VALUE	ST ER	T-STAT
C80A	-21.06830	5.17144	-4.07398
C80B	0.14623	0.00773	18.92280
C80C	0.06721	0.02078	3.23465

XXPU - GROSS STATE PRODUCT IN PUBLIC UTILITIES

XXPU = C72A+C72B*DPIXR+C72C*DPI3R(-1)

NOB = 16 NOVAR = 3
RANGE = 1962 TO 1977
RSQ = 0.98934 CRSQ = 0.9877 F(2/13) = 603.336
SER = 2.7300 SSR = 96.886 DW(0) = 2.36 COND(X) = 8.56

COEF	VALUE	ST ER	T-STAT
C72A	-20.55470	2.45577	-8.36996
C72B	0.02148	0.01001	2.14736
C72C	0.07969	0.00360	22.15660

XXP9 - GROSS STATE PRODUCT IN MINING (INCLUDES PETROLEUM)

LOG(XXP9) = C52A+C52B*LOG(EMP9)

NOB = 17   NOVAR = 2
RANGE = 1961 TO 1977
RSQ = 0.88682   CRSQ = 0.87928   F(1/15) = 117.536
SER = 0.3488   SSR = 1.824   DW(0) = 0.53   COND(X) = 3.40

COEF	VALUE	ST ER	T-STAT
C52A	3.73686	0.15635	23.90020
C52B	1.90230	0.17547	10.84120

XXS91 - GROSS STATE PRODUCT IN SERVICES NET OF NATIVE CORPORATION GROSS PRODUCT

XXS91 = C84A+C84B*DPIRG+C84C*DPIRX

NOB = 16   NOVAR = 3
RANGE = 1961 TO 1976
RSQ = 0.99751   CRSQ = 0.99713   F(2/13) = 2608.450
SER = 2.1759   SSR = 61.552   DW(0) = 1.87   COND(X) = 10.83

COEF	VALUE	ST ER	T-STAT
C84A	-17.33570	2.45388	-7.06459
C84B	0.11467	0.00367	31.27230
C84C	0.09791	0.00986	9.93009

XXT9 - GROSS STATE PRODUCT IN TRANSPORTATION

XXT9 = C64A+C64B*DPIXR+C64C*DPI3R(-1)

NOB = 16   NOVAR = 3
RANGE = 1962 TO 1977
RSQ = 0.94388   CRSQ = 0.93525   F(2/13) = 109.321
SER = 14.3090   SSR = 2661.720   DW(0) = 2.38   COND(X) = 8.56

COEF	VALUE	ST ER	T-STAT
C64A	-30.79550	12.87180	-2.39248
C64B	0.07668	0.05244	1.46227
C64C	0.16969	0.01885	9.00139

EMPLOYMENT EQUATIONS

EMCM - EMPLOYMENT IN COMMUNICATIONS

LOG(EMCM) = C69A+C69B*LOG(XXCM)

```
NOB = 17       NOVAR = 2
RANGE =  1961 TO 1977
RSQ =    0.89645       CRSQ =    0.88954       F(1/15) =    129.852
SER =    0.0880        SSR =     0.116         DW(0) =   0.68       COND(X) =     19.61
```

COEF	VALUE	ST ER	T-STAT
C69A	-1.53928	0.20969	-7.34071
C69B	0.53944	0.04734	11.39530

EMCN1 - EMPLOYMENT IN CONSTRUCTION NET OF EXOGENOUS CONSTRUCTION EMPLOYMENT

LOG(EMCN1) = C56A+C56B*LOG(XXCN1)

```
NOB = 16       NOVAR = 2
RANGE =  1961 TO 1976
RSQ =    0.99801       CRSQ =    0.99786       F(1/14) =   7006.950
SER =    0.0164        SSR = 3.775E-03         DW(0) =    1.54      COND(X) =     24.94
```

COEF	VALUE	ST ER	T-STAT
C56A	-2.36572	0.05127	-46.14030
C56B	1.07479	0.01284	83.70670

EMD9 - EMPLOYMENT IN TRADE

LOG(EMD9) = C77A+C77B*LOG(XXD9)

```
NOB = 16       NOVAR = 2
RANGE =  1961 TO 1976
RSQ =    0.99658       CRSQ =    0.99634       F(1/14) =   4084.000
SER =    0.0242        SSR = 8.212E-03         DW(0) =   0.70       COND(X) =     21.30
```

COEF	VALUE	ST ER	T-STAT
C77A	-1.50310	0.06462	-23.26070
C77B	0.85653	0.01340	63.90510

EMFI - EMPLOYMENT IN FINANCE-INSURANCE-REAL ESTATE

LOG(EMFI) = C81A+C81B*LOG(XXFI)

NOB = 16 NOVAR = 2
RANGE = 1961 TO 1976
RSQ = 0.99722 CRSQ = 0.99702 F(1/14) = 5014.560
SER = 0.0249 SSR = 8.689E-03 DW(0) = 0.69 COND(X) = 19.62

COEF	VALUE	ST ER	T-STAT
C81A	-3.25418	0.06126	-53.12350
C81B	0.98202	0.01387	70.81340

EM991 - EMPLOYMENT IN MANUFACTURING NET OF LARGE EXOGENOUS PROJECTS

The lagged value of the dependent variable is included as an explanatory variable because manufacturing gross product varies over time more widely than manufacturing employment.

LOG(EMM91) = C61A+C61B*LOG(XXM9)+C61C*LOG(EMM91(-1))

NOB = 15 NOVAR = 3
RANGE = 1962 TO 1976
RSQ = 0.96884 CRSQ = 0.96365 F(2/12) = 186.566
SER = 0.0395 SSR = 1.873E-02 DW(0) = 2.19 COND(X) = 100.51

COEF	VALUE	ST ER	T-STAT
C61A	-0.63980	0.26323	-2.43056
C61B	0.31185	0.10604	2.94090
C61C	0.62414	0.13329	4.68249

EMOT - "OTHER" (NON WAGE AND SALARY) EMPLOYMENT

The short data series for this variable reflects the poor quality of recent data on proprietor employment.

LOG(EMOT) = C100A+C100B*LOG(EM991)

NOB = 14 NOVAR = 2
RANGE = 1961 TO 1974
RSQ = 0.87484 CRSQ = 0.86441 F(1/12) = 83.878
SER = 0.0317 SSR = 1.204E-02 DW(0) = 0.78 COND(X) = 59.5(

COEF	VALUE	ST ER	T-STAT
C100A	0.16963	0.25193	0.67334
C100B	0.48779	0.05327	9.15775

EMPU - EMPLOYMENT IN PUBLIC UTILITIES

LOG(EMPU) = C73A+C73B*LOG(XXPU)

NOB = 17 NOVAR = 2
RANGE = 1961 TO 1977
RSQ = 0.96987 CRSQ = 0.96786 F(1/15) = 482.866
SER = 0.0595 SSR = 5.302E-02 DW(0) = 0.32 COND(X) = 11.84

COEF	VALUE	ST ER	T-STAT
C73A	-2.11852	0.08597	-24.64370
C73B	0.53729	0.02445	21.97420

EMS91 - EMPLOYMENT IN SERVICES NET OF NATIVE CORPORATION EMPLOYMENT

The explanatory variable 1/T reflects the maturation of the services sector with the growth of the economy over time.

LOG(EMS91) = C85A+C85B*LOG(XXS91)+C85C/T

NOB = 16 NOVAR = 3
RANGE = 1961 TO 1976
RSQ = 0.99701 CRSQ = 0.99655 F(2/13) = 2168.600
SER = 0.0289 SSR = 1.084E-02 DW(0) = 0.64 COND(X) = 27.00

COEF	VALUE	ST ER	T-STAT
C85A	-1.81523	0.08936	-20.31380
C85B	1.00600	0.02002	50.24640
C85C	0.05349	0.04128	1.29581

EMT91 - EMPLOYMENT IN TRANSPORTATION NET OF EXOGENOUS PIPELINE EMPLOYMENT

LOG(EMT91) = C65A+C65B*LOG(XXT9)

NOB = 17   NOVAR = 2
RANGE = 1961 TO 1977
RSQ = 0.94884   CRSQ = 0.94542   F(1/15) = 278.174
SER = 0.0775   SSR = 9.000E-02   DW(0) = 1.27   COND(X) = 17.45

COEF	VALUE	ST ER	T-STAT
C65A	-0.90791	0.16442	-5.52194
C65B	0.61538	0.03690	16.67820

ANNUAL WAGE RATE EQUATIONS

WRA9 - WAGE RATE IN AGRICULTURE-FORESTRY-FISHERIES

The agriculture-forestry-fisheries and manufacturing sectors are combined for the purpose of estimating a wage rate. Subsequently, the intercepts on the individual equations are adjusted to reflect differences in the 1977 values in the two sectors.

LOG(WRM9A9/RPI) = C95A+C95B*LOG(WEUS/USCPI)+C95C*LOG(1+ECONX/(EM991-ECONX))+
C95D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.82597 CRSQ = 0.78247 F(3/12) = 18.985
SER = 0.0374 SSR = 1.682E-02 DW(0) = 1.61 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C95A	4.11268	0.01206	340.88100
C95B	1.46249	0.25901	5.64645
C95C	1.07100	0.48233	2.22046
C95D	0.60663	0.48730	1.24486

WRCM - WAGE RATE IN COMMUNICATIONS

The communication and public utility sectors are combined for the purpose of estimating a wage rate. Subsequently, the intercepts on the individual equations are adjusted to reflect differences in the 1977 values in the two sectors.

LOG(WRCMPU/RPI) = C74A+C74B*LOG(WEUS/USCPI)+C74C*LOG(1+ECONX/(EM991-ECONX))+
C74D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.84453 CRSQ = 0.80567 F(3/12) = 21.729
SER = 0.0346 SSR = 1.439E-02 DW(0) = 2.00 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C74A	4.50484	0.01116	403.80900
C74B	0.49212	0.23950	2.05480
C74C	1.15423	0.44599	2.58801
C74D	1.41611	0.45059	3.14281

WRCN - WAGE RATE IN CONSTRUCTION

LOG(WRCN/RPI) = C59A+C59B*LOG(WEUS/USCPI)+C59C*LOG(1+ECONX/(EM991-ECONX))+
C59D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.95577 CRSQ = 0.94471 F(3/12) = 86.439
SER = 0.0557 SSR = 3.717E-02 DW(0) = 2.25 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C59A	4.63404	0.01793	258.42700
C59B	1.89871	0.38496	4.93221
C59C	5.73988	0.71688	8.00673
C59D	2.25924	0.72427	3.11934

WRD9 - WAGE RATE IN TRADE

LOG(WRD9/RPI) = C78A+C78B*LOG(WEUS/USCPI)+C78C*LOG(1+ECONX/(EM991-ECONX))+
C78D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.92013 CRSQ = 0.90016 F(3/12) = 46.081
SER = 0.0125 SSR = 1.879E-03 DW(0) = 1.98 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C78A	3.94724	0.00403	978.92800
C78B	0.51995	0.08656	6.00655
C78C	0.98869	0.16120	6.13327
C78D	0.15249	0.16286	0.93629

WRFI - WAGE RATE IN FINANCE-INSURANCE-REAL ESTATE

LOG(WRFI/RPI) = C82A+C82B*LOG(WEUS/USCPI)+C82C*LOG(1+ECONX/(EM991-ECONX))+
C82D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.92668 CRSQ = 0.90835 F(3/12) = 50.553
SER = 0.0239 SSR = 6.874E-03 DW(0) = 1.35 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C82A	3.95261	0.00771	512.54400
C82B	1.72268	0.16556	10.40530
C82C	0.82272	0.30830	2.66853
C82D	0.53518	0.31148	1.71818

WRGA - WAGE RATE IN STATE AND LOCAL GOVERNMENT

```
LOG(WRGA/RPI) = C92A+C92B*LOG(WEUS/USCPI)+C92C*LOG(1+ECONX/(EM991-ECONX))+
                C92D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))
```

```
NOB = 16       NOVAR = 4
RANGE =  1962 TO 1977
RSQ =    0.93484       CRSQ =    0.91855       F(3/12) =      57.384
SER =    0.0369        SSR = 1.632E-02         DW(0) =    1.50       COND(X) =      3.22
```

COEF	VALUE	ST ER	T-STAT
C92A	4.02497	0.01188	338.70400
C92B	2.39946	0.25512	9.40540
C92C	1.63568	0.47508	3.44295
C92D	1.40532	0.47998	2.92790

WRGF - WAGE RATE IN FEDERAL GOVERNMENT

The federal government wage rate is calculated based on the federal civilian wage (WRGC) since the military wage has been unrepresentative of long term trends in recent years. The intercept is subsequently adjusted to reflect the 1977 average value for all federal employment.

```
LOG(WRGC) = C89A+C89B*LOG(WEUS/USCPI)+C89C*LOG(RPI)
```

```
NOB = 17       NOVAR = 3
RANGE =  1961 TO 1977
RSQ =    0.98546       CRSQ =    0.98338       F(2/14) =    474.265
SER =    0.0401        SSR = 2.256E-02         DW(0) =    1.64       COND(X) =     61.35
```

COEF	VALUE	ST ER	T-STAT
C89A	2.64645	0.28062	9.43061
C89B	1.30715	0.26662	4.90259
C89C	1.28690	0.05554	23.17210

WRM9 - WAGE RATE IN MANUFACTURING

See wage rate in agriculture-forestry-fisheries

WRPU - WAGE RATE IN PUBLIC UTILITIES

See wage rate in communications

WRP9 - WAGE RATE IN MINING

LOG(WRP9/RPI) = C53A+C53B*LOG(WEUS/USCPI)+C53C*LOG(1+ECONX/(EM991-ECONX))+
C53D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.90783 CRSQ = 0.88478 F(3/12) = 39.396
SER = 0.0632 SSR = 4.793E-02 DW(0) = 1.99 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C53A	4.50670	0.02036	221.30800
C53B	2.96614	0.43718	6.78476
C53C	2.57678	0.81412	3.16512
C53D	2.35022	0.82251	2.85739

WRS9 - WAGE RATE IN SERVICES

LOG(WRS9/RPI) = C86A+C86B*LOG(WEUS/USCPI)+C86C*LOG(1+ECONX/(EM991-ECONX))+
C86D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.96176 CRSQ = 0.95219 F(3/12) = 100.590
SER = 0.0386 SSR = 1.790E-02 DW(0) = 1.74 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C86A	3.82589	0.01244	307.47700
C86B	0.98063	0.26713	3.67104
C86C	3.89629	0.49745	7.83261
C86D	2.34699	0.50257	4.66998

WRT9 - WAGE RATE IN TRANSPORTATION

LOG(WRT9/RPI) = C66A+C66B*LOG(WEUS/USCPI)+C66C*LOG(1+ECONX/(EM991-ECONX))+
C66D*LOG(1+ECONX(-1)/(EM991(-1)-ECONX(-1)))

NOB = 16 NOVAR = 4
RANGE = 1962 TO 1977
RSQ = 0.93591 CRSQ = 0.91989 F(3/12) = 58.414
SER = 0.0513 SSR = 3.153E-02 DW(0) = 2.14 COND(X) = 3.22

COEF	VALUE	ST ER	T-STAT
C66A	4.11181	0.01652	248.96700
C66B	1.65623	0.35456	4.67126
C66C	4.46324	0.66026	6.75980
C66D	1.44035	0.66707	2.15924

PERSONAL INCOME AND PRICES

PDCON - STATE GOVERNMENT CONSTRUCTION PRICE DEFLATOR

This equation is based upon a national time series. The equation is reported in Kresge and Thomas, "Estimated Gross State Product for Alaska", Alaska Review of Business and Economic Conditions, Vol. XI, No. 1.

PDCON = -22.381 + .0215*WRCN R^2 =.997

PI1 - PERSONAL INCOME NET OF NATIVE CLAIMS PAYMENTS TO INDIVIDUALS

PI1 = C44A+C44B*(WS99-ECONX1*WRCNP/1000.)+C44C*(ECONX1*WRCNP/1000.)

```
NOB = 16      NOVAR = 3
RANGE =  1961 TO 1976
RSQ =    0.99983     CRSQ =    0.9998      F(2/13) =    3.83E+04
SER =  17.0092       SSR =  3761.070       DW(0) =   1.09      COND(X) =      8.55
```

COEF	VALUE	ST ER	T-STAT
C44A	-10.46540	12.97630	-0.80650
C44B	1.21089	0.01227	98.64990
C44C	0.96740	0.03382	28.60270

R.C - ESTIMATED RATIO OF RPI TO USCPI

This equation is estimated over the period during which the Alaskan price level was growing slower than the national price level. It is assumed that the underlying relationship during this period was a reflection of economies of scale in the Alaskan economy.

LOG(R.C-1) = CRCA+CRCB*(EM991+EM991(-1))/2

```
NOB = 12      NOVAR = 2
RANGE =  1962 TO 1973
RSQ =    0.73891     CRSQ =    0.7128      F(1/10) =      28.301
SER =    0.0596      SSR = 3.553E-02       DW(0) =   0.80      COND(X) =     16.10
```

COEF	VALUE	ST ER	T-STAT
CRCA	-0.15404	0.13908	-1.10761
CRCB	-0.00662	0.00124	-5.31988

RCYCL - PERCENT CHANGE IN RPI ATTRIBUTABLE TO "BOOM-BUST" ECONOMIC CONDITIONS

The dependent variable is created as the difference between the actual ratio of RPI to USCPI and the estimated ratio R.C. This residual is then regressed over the historical period including the "boom-bust" years of the Alyeska pipeline. EMGRO is employment growth.

RCYCL - IF EMGRO GT 0 THEN C2A+C2B*(EMGRO/EM991(-1))**2 ELSE C2A-C2B*(EMGRO/EM991(-1))**2

```
NOB = 15        NOVAR = 2
RANGE =  1963 TO 1977
RSQ =    0.55418       CRSQ =    0.51989       F(1/13) =     16.160
SER =    0.0206        SSR = 5.540E-03         DW(0) =  1.83      COND(X) =   1.65
```

COEF	VALUE	ST ER	T-STAT
C2A	-0.00119	0.00602	-0.19719
C2B	2.28017	0.56722	4.01993

MAP ECONOMIC MODEL: MODEL LINKS

The economic model receives inputs from the fiscal model, population models, native employment auxiliary component, and if activated, the income distribution model.

The fiscal model links are

ANCSA (Alaska Native Claims Settlement Act payments) This is determinant of personal income.

EXOPS (state government operating expenditures) This is a determinant of the state government operating budget price deflator.

RES (non-federal, non-state tax payments out of personal income) This is a determinant of disposable personal income.

RTISCP (state income tax payments from Alaskan residents) This is a determinant of disposable personal income.

RTPIF (federal income tax payments from Alaska) This is a determinant of disposable personal income.

WSGA (state and local government wages and salaries) This is a determinant of total wage and salary payments.

WSGSFY (state government wages and salaries on a fiscal year basis) This is a determinant of the state government operating budget price deflator.

VACAP (state capital expenditures value added in construction) This is a determinant of the value added in capital construction.

The population model links are

POP (total population) This is a determinant of per capita income.

POPM (military employment) This is a determinant of civilian employment

POPNE (Native population based on Native claims enrollment) This is a determinant of Native per capita income.

The Native auxiliary component links are

WSNA (Native wages and salaries) This is a determinant of Native personal income.

EMNA (Native employment) This is a determinant of civilian non-Native employment.

In addition if the income distribution model is activated then Native personal income is determined by the income distribution model.

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MAP ECONOMIC MODEL: VARIABLES

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
ANCSA	payment to Alaska Natives by federal and state government under Alaska Native Claims Settlement Act; million $ (POL)	Alaska Native Land Claims, Arnold and BEA personal income data
DIRPU	U.S. real disposable personal income per capita; 1967 U.S. $ (EN)	U.S. Department of Commerce
DPI	disposable personal income; million $ (EN)	BEA disposable personal income data & ADA, Annual Financial Report
DPIR	real disposable personal income; million 1967 U.S. $ (EN)	-

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Model Variable Types:

CON	construct	EN	endogenous	PAR	parameter
DEF	definition	EX	exogenous	POL	policy

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

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
DPIRPC	real disposable personal income per capita; 1967 U.S. $ (CON)	-
DPIXR	real disposable personal income of "enclave" construction employees; million 1967 U.S. $ (EN)	constructed using ADL, Statistical Quarterly
DPI3R	real disposable personal income net of "enclave" construction employee related personal income; million 1967 U.S. $ (EN)	-
D****	dummy variable with value of 1 for year or period of years indicated; units (EX)	-
EC	non-armed forces personal employment; thousand (EN)	-
ECONX	exogenous construction employment; thousand (EN)	ADL, unpublished data
ECONX1	"enclave" or premium wage construction employment; thousand (POL)	-
ECONX2	non-"enclave" exogenous construction employment; thousand (POL)	-
EMab	* employment by industry; ab=CM CN D9 FI PU (EN); ab=GA M9 S9 T9 (DEF); ab=A9 GF P9 (POL); thousand	ADL, Alaska Labor Force Estimates
EMCN1	construction employment net of exogenous construction employment; thousand (EN)	-
EMCU	communications plus public utilities employment; thousand (DEF)	-
EMGC	federal civilian employment; thousand (DEF)	ADL, Alaska Labor Force Estimates
EMGL	local government employment; thousand (DEF)	ADL, Alaska Labor Force Estimates
EMGS	state government employment; thousand (DEF)	ADL, Alaska Labor Force Estimates

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
EMG9	federal, state, and local government employment; thousand (DEF)	-
EMMS	non-wage and salary combined with agriculture-forestry-fishery employment; thousand (DEF)	-
EMMX	exogenous manufacturing employment of large project nature; thousand (POL)	-
EMM91	manufacturing employment net of large projects; thousand (EN)	ADL, Alaska Labor Force Estimates
EMNAWS	non-agricultural wage & salary employment; thousand (DEF)	ADL, Alaska Labor Force Estimates
EMNC	Native Corporation direct employment; thousand (DEF)	-
EMNR (DEF)	renewable resource employment - manufacturing, agriculture-forestry-fisheries, and non-wage & salary employment; thousand (DEF)	-
EMNS	manufacturing, mining, construction, agriculture-forestry-fisheries, and non-wage and salary employment; thousand (DEF)	-
EMOT	other (non-wage and salary) employment; thousand (EN)	ADC, Alaska Statistical Review
EMSP	transport, communication, public utility, trade, finance, and service employment; thousand (DEF)	-
EMS1	transport, communication, and public utility employment; thousand (DEF)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
EMS2	trade, finance, and service employment; thousand (DEF)	-
EMS91	service sector employment net of direct Native Corporation employment; thousand (EN)	-
EMT9X	large pipeline project related transportation employment; thousand (POL)	-
EMT91	transportation employment net of large scale pipeline project; thousand (EN)	ADL, Alaska Labor Force Estimates
EMX	extractive industries related employment--mining and exogenous construction; thousand (EN)	-
EM99	total wage and salary, non-wage and salary and military employment; thousand (EN)	-
EM991	wage and salary and military employment; thousand (EN)	-
EXOPS	state government operating expenditures; million $ (EN)	constructed from ADA, Executive Budget
GRDIRPU	annual growth rate of U.S. real disposable personal income per capita; percent (POL)	-
GRUSCPI	annual growth rate of U.S. consumer price index; percent (POL)	-
GRWEUS	annual growth rate of U.S. average weekly earnings; percent (POL)	-
IDIST	model switch which results in retrieval of Native employment and wages and salaries from income distribution model if it takes value of one; units (PAR)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
NCBP	bonus income to Natives from lease sales on Native lands; million $ (POL)	-
NCCAP	accumulated capital of Native Corporation; million $ (EN)	-
NCCI	Native Corporation income from ANCSA-related activities; million $ (EN)	-
NCPI	Native personal income from ANCSA-related activities; million $ (EN)	BEA, personal income data
NCEXP	current expenditures of Native Corporation; million $ (DEF)	-
NCRP	Native recurrent income from petroleum development on Native lands; million $ (POL)	-
NCWS	wages and salaries paid by Native Corporations; million $ (DEF)	-
NCXRPC	real current expenditures of Native Corporations per Native; 1967 U.S. $ (CON)	-
PCIVPY	ratio of federal civilian to military wage rate; percent (PAR)	-
PCNADJ	proportion of "enclave" construction wages and salaries that directly leaks out of Alaskan economy; percent (EX)	-
PCNCSV	proportion of Native Corporation income used for investment; percent (PAR)	-
PCNCSV1	proportion of bonus income from lease sales on Native lands and retained by Native Corporations which is used for investment; percent (PAR)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
PCNCWS	proportion of current expenditures of Native Corporations paid in wages and salaries; percent (PAR)	-
PCNC1	proportion of ANCSA payments paid directly to individuals; percent (POL)	Alaska Native Land Claims, Arnold
PCNC2	proportion of recurring income from petroleum development on Native lands paid directly to individuals; percent (POL)	-
PCNC3	proportion of earnings on Native Corporation accumulated capital paid directly to individuals; percent (POL)	-
PCNC4	proportion of bonus income from lease sales on Native lands paid directly to individuals; percent (PAR)	-
PCYNA1	proportion by which the ratio of personal income to wages and salaries for Native exceeds that of the total population; percent (PAR)	-
PC12N	proportion of ANCSA payments made to 12 regional Native Corporation in Alaska; percent (PAR)	-
PC88A	intercept term on federal government gross product equation; (PAR)	-
PC88B	slope term on federal government gross product equation; (PAR)	-
PC94A	intercept term on state and local government gross product equation; (PAR)	-
PC94B	slope term on state and local government gross product equation; (PAR)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
PDCON	state government construction price deflator; index (EN)	for construction methodologies see Kresge and Thomas "Estimating Alaska Gross Product by Industry", Alaska Review of Business & Economic Conditions, Vol. XI, No.1
PDEXOPS	state government operating expenditures price deflator; index (EN)	ADL Statistical Quarterly, BEA personal income and employment data
PI	personal income-not residence adjusted for wages & salaries earned; million \$ (EN)	BEA personal income data and ADL Statistical Quarterly
PIPADJ	ratio of "enclave" to regular construction wage rate; percent (EX)	ADL Statistical Quarterly
PIPC	personal income per capita; \$ (CON)	-
PIR	real personal income; million 1967 U.S. \$ (CON)	-
PIRPC	real personal income per capita; 1967 U.S. \$ (EN)	-
PI1	personal income net of Native claims transfers to individuals; million \$ (EN)	BEA personal income data and ADL, Statistical Quarterly
PI3	personal income net of "enclave" construction employee personal income; million \$ (EN)	-
POP	population; thousand (EN)	1970 U.S. Census, Census Bureau, and ADL
POPM	armed forces employment; thousand (EN)	ADL, unpublished data

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
POPNE	Native population based upon Native Corporation enrollment records; thousand (EN)	2(c) Report-Federal Program & Alaska Natives by Robert Nathan Associates, for U.S. Department of Interior
PSLWR	percentage by which the state government wage rate exceeds the combined state and local rates; percent (PAR)	-
RAT1	ratio of non-Native income to total taxable income; percent (DEF)	-
R.C.	the ratio of RPI to USCPI obtained by regression and used to estimate the scale component of the growth of RPI; percent (EN)	-
RCYCL	the percent change in RPI attributable to "boom-bust" economic conditions; percent (EN)	-
RES	non-federal and non-state tax component of difference between personal income and disposable personal income; million $ (EN)	BEA, disposable personal income data
RNAT	Native personal income calculated using the income distribution model; million $ (DEF)	-
RORNC	rate of return on accumulated capital of Native Corporations; percent (PAR)	-
RPI	Alaskan relative price index, 1967 value is 1.425 times U.S. CPI which in 1967 was 100; index (EN)	constructed from U.S. Department of Labor Statistics and University of Alaska, Agricultural Extension Service, Quarterly Food Price Survey of 13 Alaskan Cities

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
RSCALE	the percent change in RPI attributable to change in the scale of the economy; percent (DEF)	-
RTISCP	state income taxes paid out of Alaskan resident personal income; million $ (DEF)	-
RTPIF	federal income taxes paid out of Alaskan personal income; million $ (EN)	BEA, disposable personal income data
T	time, 1978=18; units (EX)	-
USCPI	U.S. consumer price index (1967=100); index (EN)	U.S. Department of Labor, Bureau of Labor Statistics
VACAP	real value added in contract construction accounted for by state government purchases from private contracting industry; million 1958 U.S. $ (DEF)	-
WEUS	average weekly wage & salary earnings in U.S.; $ (EN)	U.S. Department of Labor, Bureau of Labor Statistics
WRab	average annual wages in industry sector ab; $ (EN)	ADL, <u>Statistical Quarterly</u>
WRBASE	average U.S. wages paid in government in 1967; $ (PAR)	-
WRCNP	pipeline or "enclave" construction wage rate; $ (EN)	ADL, <u>Statistical Quarterly</u>
WRCNNP	non-"enclave" construction wage rate; $ (EN)	ADL, <u>Statistical Quarterly</u>
WRCU	average wage rate in communications and public utilities sector; $ (DEF)	ADL, <u>Statistical Quarterly</u>
WRGC	federal civilian wage rate; $ (DEF)	ADL, <u>Statistical Quarterly</u>

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
WRM9X	wage rate for exogenous large project manufacturing employment; $ (POL)	-
WR99	average nominal wage rate; $ (DEF)	-
WR99R	average real wage rate; 1967 U.S. $ (CON)	-
WSab	wages and salaries paid in industry ab; ab=CN GA (EN); ab=A9 CM D9 FI GF M9 PU P9 S(T9 (DEF); million $	ADL, Statistical Quarterly
WSCNADJ	"enclave" construction wages and salaries which directly leaks out of the economy; million $ (EN)	-
WSGC	federal civilian wages and salaries; million $ (EN)	ADL, Statistical Quarterly
WSGL	local government wages and salaries; million $ (EN)	ADL, Statistical Quarterly
WSGM	military personnel wages and salaries; million $ (EN)	BEA, personal income data
WSGS	state government wages and salaries; million $ (EN)	ADL, Statistical Quarterly
WSGSFY	state government wages and salaries on fiscal year basis; million $ (DEF)	ADL, Statistical Quarterly
WSM9X	wages and salaries paid in exogenous large project manufacturing; million $ (DEF)	-
WSNA	wages and salaries paid to Natives; million $ (DEF)	-
WS99	total wage and salary income (does not include income of "other" employment; million $ (EN)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
XXab	real gross product in industry ab; ab=A9 (POL); ab=CM CN D9 FI GA GF PU P9 S9 T9 (EN); million 1958 U.S. $	for construction methodologies see Kresge and Thomas "Estimating Alaska Gross Product by Industry", Alaska Review of Business & Economic Conditions, Vol. XI, No.1
XXCN1	residentiary construction plus state government construction real gross product; million 1958 U.S. $ (EN)	-
XXCN8	residentiary construction real gross product; million 1958 U.S. $ (EN)	-
XXMX	large project manufacturing real gross product; million 1958 U.S. $ (POL)	-
XXM91	manufacturing real gross product net of large projects; million 1958 U.S. $ (POL)	for construction methodologies see Kresge and Thomas "Estimating Alaska Gross Product by Industry", Alaska Review of Business & Economic Conditions, Vol. XI, No.1
XXS91	service sector real gross product net of direct Native Corporation employment; million 1958 U.S. $ (EN)	-
XX99	total state real gross product in wage and salary industries; million 1958 U.S. $ (EN)	-
YDNAPC1	Native disposable personal income per capita net of taxable ANCSA payment; $ (CON)	-
YDNARPC	Native real disposable personal income per capita; 1967 U.S. $ (CON)	-
YDNNPC	non-Native disposable personal income per capita; $ (EN)	-

VARIABLE	DEFINITION; UNITS (VARIABLE TYPE)	HISTORICAL DATA SOURCE
YDNNRPC	non-Native real disposable income per capita; 1967 U.S. $ (EN)	-
YNA	Native personal income including Native claim income to individuals; million $ (DEF)	-
YNA1	Native personal income net of Native claims income to individuals, million $ (DEF)	-
YNAR	Native real personal income; million 1967 U.S. $ (CON)	-
YNAPC	Native per capita personal income; $ (CON)	-
YNARPC	Native real personal income per capita; 1967 U.S. $ (CON)	-
YNCPC	Native claims personal income per capita; $ (CON)	-
YNN	total non-Native income; million $ (DEF)	-
YNNR	non-Native real personal income; million 1967 U.S. $ (CON)	-
YNNPC	non-Native per capita personal income; $ (CON)	-
YNNRPC	non-Native real personal income per capita; 1967 U.S. $ (CON)	-
YXNARPC	Native real personal income per capita plus real current expenditures of Native Corporation per capita; 1967 U.S. $ (CON)	-

MAP ECONOMIC MODEL: PARAMETER VALUES

VARIABLE	VALUE	DEFINITION	SOURCE FOR SIMULATION VALUE
IDIST	0	model switch which results in retrieval of Native employment and wages and salaries from income distribution model if it takes a value of one	assumes value of 1 if income distribution model activated
PCIVPY	1.136	ratio of federal civilian to military wage rate	1977 data from Alaska Department of Labor Statistical Quarterly and U.S. Department of Commerce, Bureau of Economic Analysis personal income data
PCNCSV	.5	proportion of Native Corporation income used for investment	neutral assumption based upon Native Corporation objectives
PCNCSV1	1	proportion of bonus income from lease sales on Native Corporations and retained by Native Corporations which is used for investment	assumes all non-recurring income not distributed is invested
PCNCWS	.25	proportion of current expenditures of Native Corporations paid in wages and salaries	assumes labor intensity comparable to service type industry
PCNC4	0	proportion of bonus income from lease sales on Native lands paid directly to individuals	assumes all non-recurring income retained by corporation
PCYNA1	1.01545	proportion by which the ratio of personal income to wages and salaries for Natives exceeds that of the total population	1970 U.S. Census, public use samples

VARIABLE	VALUE	DEFINITION	SOURCE FOR SIMULATION VALUE
PC12N	.922	proportion ANCSA payment made to 12 regional Native Corporations in Alaska	2(c) Report-Federal Programs and Alaska Natives by Robert Nathan Associates for U.S. Department of Interior
PC12RN	.833	proportion of members of 12 regional corporations residing in Alaska	2(c) Report-Federal Programs and Alaska Natives by Robert Nathan Assosiates for U.S. Department of Interior
PC88A	1.607	intercept term in federal government gross product equation	historical average of difference between employment and gross product
PC88B	1	slope term in federal government gross product equation	set at unity to indicate close relationship between employment and gross product
PC94A	1.389	intercept term in state government gross product equation	historical average of difference between employment and gross product
PC94B	1	slope term in state government gross product equation	set at unity to indicate close relationship between employment and gross product
PSLWR	1.19	percentage by which the state government wage rate exceeds the combined state and local rates	1977 data from Alaska Department of Labor, Statistical Quarterly
RORNC	.07	rate of return on accumulated capital of Native Corporations	conservation estimate based upon Corporation objectives and initial investments
WRBASE	5473	average U.S. wages paid in government in 1967	1967 state government and employment data from U.S. Department of Commerce, Bureau of Economic Analysis

MAP ECONOMIC MODEL: EXOGENOUS & POLICY VARIABLES

VARIABLE	DEFINITION; UNITS	SOURCE OF SIMULATION VALUES
ANCSA	payment to Alaska Natives by federal and state government under Alaska Native Claims Settlement Act; million $	Based on the estimate that $690 million of the original $962.5 million remained to be paid out at the start of 1977. Payments increase when Prudhoe Bay oil production begins and cease in 1983. See <u>Alaska Native Land Claims</u>, Arnold
D****	dummy variable with value of 1 for year or period of years indicated; units	-
ECONX1	"enclave" or premium wage construction employment; thousand	DEVELOPMENT SCENARIO
ECONX2	non-"enclave" exogenous construction employment; thousand	DEVELOPMENT SCENARIO
EMA9	employment in agriculture-forestry-fisheries (note that this is only a portion of the industry employment since most is not covered in the Department of Labor data and is reflected in EMOT); thousand	DEVELOPMENT SCENARIO
EMGF	employment in federal government; thousand	Assumed to remain constant at present levels. This is consistent with historic pattern which has been a constant total with an increasing civilian component
EMMX	exogenous manufacturing employment of large project nature; thousand	Assumed to be zero unless values are obtained from DEVELOPMENT SCENARIO
EMP9	employment in mining, including petroleum; thousand	DEVELOPMENT SCENARIO

MAP ECONOMIC MODEL: EXOGENOUS AND POLICY VARIABLE VALUES

	ANCSA	ECONX1	ECONX2	EMA9	EMGF	EMMX	EMP9
1977	53.077	5.3	0.07	1.1	42.921	0.	4.514
1978	91.32	0.	0.127	1.2	42.921	0.	4.281
1979	114.891	0.09	0.127	1.2	42.921	0.	4.242
1980	124.523	0.09	0.273	1.2	42.921	0.	4.44
1981	128.521	1.515	0.971	1.3	42.921	0.	4.059
1982	122.31	4.853	1.45	1.3	42.921	0.	3.806
1983	31.788	4.663	0.547	1.4	42.921	0.	3.554
1984	0.	0.265	0.127	1.4	42.921	0.06	3.561
1985	0.	0.	0.127	1.4	42.921	0.06	3.644
1986	0.	0.	0.127	1.5	42.921	0.06	3.655
1987	0.	0.	0.127	1.5	42.921	0.06	3.712
1988	0.	0.	0.127	1.6	42.921	0.06	3.747
1989	0.	0.	0.088	1.6	42.921	0.06	3.806
1990	0.	0.	0.047	1.7	42.921	0.06	3.841
1991	0.	0.	0.048	1.7	42.921	0.06	3.402
1992	0.	0.	0.049	1.8	42.921	0.06	3.402
1993	0.	0.	0.05	1.8	42.921	0.06	3.322
1994	0.	0.	0.051	1.8	42.921	0.06	3.268
1995	0.	0.	0.052	1.9	42.921	0.06	3.268
1996	0.	0.	0.053	2.	42.921	0.06	3.268
1997	0.	0.	0.054	2.1	42.921	0.06	3.268
1998	0.	0.	0.055	2.1	42.921	0.06	3.268
1999	0.	0.	0.056	2.2	42.921	0.06	3.268
2000	0.	0.	0.058	2.2	42.921	0.06	3.268

Note: The DEVELOPMENT SCENARIO values are taken from the case NOCS created for the Alaskan OCS Office of the Bureau of Land Management.

VARIABLE	DEFINITION; UNITS	SOURCE OF SIMULATION VALUES
EMT9X	large pipeline project related transportation employment; thousand	Alyeska employment based upon Alaska Department of Labor estimates. Additional employment may be generated by DEVELOPMENT SCENARIO
GRDIRPU	annual growth rate of U.S. real disposable personal income per capita; percent	Between 1950 and 1977 the average annual growth rate of real disposable personal incomes was 2.2 percent. Within the period the growth ranged from 1.23 percent in the period 1950 to 1960 to 2.98 percent in the period 1960 to 1970. The simulation values are based upon slower than normal growth in the early 1980's with a gradual return to a long run trend similar to the historical rate. See U.S. Department of Commerce, Bureau of Economic Analysis, The National Income and Product Accounts of the U.S. 1929-74 and Survey of Current Business
GRUSCPI	annual growth rate of U.S. consumer price index; percent	Historic annual average growth rates of the consumer price index are as follows: 1960 to 1965 - 1.3%, 1965-70 - 4.2%, 1970 to 1975 - 6.7%, 1975 to 1977 - 6.1%. The simulation values are based upon the assumption of a very gradual moderation in the present rate of growth of the index. See U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business
GRWEUS	annual growth rate of U.S. average weekly earnings; percent	The historic annual average growth rate has varied with the rate of inflation. Its values are as follows: 1960 to 1965 - 3.34%, 1965 to 1970 - 4.6%, 1970 to 1975 - 6.52%, 1975 to 1977 - 7.53%. Wages are assumed in the projection period to grow initially 1% and subsequently 1.25% faster than the price level, implying a productivity increase of a similar magnitude. See U.S. Dept. of Labor, Bureau of Labor Statistics, Monthly Labor Review

	EMT9X	GRDIRPU	GRUSCPI	GRWEUS
1977	0.3	0.026	0.065	0.075
1978	0.85	0.015	0.077	0.078
1979	0.85	0.015	0.075	0.085
1980	0.85	0.015	0.075	0.085
1981	0.85	0.015	0.07	0.08
1982	0.85	0.015	0.07	0.08
1983	0.85	0.017	0.065	0.075
1984	0.85	0.017	0.065	0.075
1985	0.946	0.017	0.065	0.075
1986	0.946	0.02	0.06	0.072
1987	0.946	0.02	0.06	0.072
1988	0.946	0.02	0.06	0.072
1989	0.946	0.02	0.06	0.072
1990	0.946	0.02	0.06	0.072
1991	0.946	0.02	0.055	0.067
1992	0.946	0.02	0.055	0.067
1993	0.946	0.02	0.055	0.067
1994	0.946	0.02	0.055	0.067
1995	0.946	0.02	0.055	0.067
1996	0.946	0.02	0.05	0.063
1997	0.946	0.02	0.05	0.063
1998	0.946	0.02	0.05	0.063
1999	0.946	0.02	0.05	0.063
2000	0.946	0.02	0.05	0.063

VARIABLE	DEFINITION; UNITS	SOURCE OF SIMULATION VALUES
NCBP	bonus income to Natives from lease sales; million $	Assumed to be zero unless generated by DEVELOPMENT SCENARIO
NCRP	Native recurrent income from petroleum development on Native land; million $	Assumed to be zero unless generated by DEVELOPMENT SCENARIO
PCNADJ	proportion of "enclave" construction wages and salaries that directly leaks out of Alaskan economy; percent	Assumed constant at level informally estimated during Alyeska pipeline construction period
PCNC1	proportion of ANCSA payments paid directly to individuals; percent	Based upon a 10% distribution to stockholders in village corporations and a 45% distribution to at-large stockholders. See _Alaska Native Land Claims_, Arnold
PCNC2	proportion of recurring income from petroleum development on Native lands paid directly in individuals; percent	Based upon assumption of conservative dividend distribution policy of Native Corporations
PCNC3	proportion of earnings on Native Corporation accumulated capital paid directly to individuals; percent	Based upon a conservative dividend distribution policy of Native Corporations
PIPADJ	* ratio of "enclave" to regular construction employee personal income; million $	Assumed constant based upon ratio of wages paid to heavy construction and all other construction categories during Alyeska pipeline construction period. See Alaska Department of Labor, _Statistical Quarterly_
T	time, 1978=18; units	-
WRM9X	wage rate of exogenous large project manufacturing employment; $	DEVELOPMENT SCENARIO

	NCBP	NCRP	PCNADJ	PCNC1	PCNC2	PCNC3	PIPADJ	WRM9X
1977	0.	0.	0.5	0.15	0.15	0.15	1.62	30000.
1978	0.	0.	0.5	0.15	0.15	0.15	1.62	31500.
1979	0.	0.	0.5	0.15	0.15	0.15	1.62	33075.
1980	0.	0.	0.5	0.15	0.15	0.15	1.62	34729.
1981	0.	0.	0.5	0.15	0.15	0.15	1.62	36465.
1982	0.	0.	0.5	0.15	0.15	0.15	1.62	38288.
1983	0.	0.	0.5	0.15	0.15	0.15	1.62	40202.
1984	0.	0.	0.5	0.15	0.15	0.15	1.62	42213.
1985	0.	0.	0.5	0.15	0.15	0.15	1.62	44324.
1986	0.	0.	0.5	0.15	0.15	0.15	1.62	46540.
1987	0.	0.	0.5	0.15	0.15	0.15	1.62	48867.
1988	0.	0.	0.5	0.15	0.15	0.15	1.62	51310.
1989	0.	0.	0.5	0.15	0.15	0.15	1.62	53876.
1990	0.	0.	0.5	0.15	0.15	0.15	1.62	56569.
1991	0.	0.	0.5	0.15	0.15	0.15	1.62	59397.
1992	0.	0.	0.5	0.15	0.15	0.15	1.62	62368.
1993	0.	0.	0.5	0.15	0.15	0.15	1.62	65486.
1994	0.	0.	0.5	0.15	0.15	0.15	1.62	68761.
1995	0.	0.	0.5	0.15	0.15	0.15	1.62	72199.
1996	0.	0.	0.5	0.15	0.15	0.15	1.62	75809.
1997	0.	0.	0.5	0.15	0.15	0.15	1.62	79599.
1998	0.	0.	0.5	0.15	0.15	0.15	1.62	83579.
1999	0.	0.	0.5	0.15	0.15	0.15	1.62	87758.
2000	0.	0.	0.5	0.15	0.15	0.15	1.62	92146.

VARIABLE	DEFINITION: UNITS	SOURCE OF SIMULATION VALUES
XXA9	agriculture-forestry-fisheries real gross product; million 1958 U.S. $	DEVELOPMENT SCENARIO
XXMX	large project manufacturing real gross product; million 1958 U.S. $	Assumed to be zero unless values are obtained from DEVELOPMENT SCENARIO
XXM91	manufacturing real gross product net of large projects; million 1958 U.S. $	DEVELOPMENT SCENARIO

	XXA9	XXMX	XXM91
1977	48.3	0.	162.8
1978	49.8	0.	169.3
1979	51.2	0.	176.
1980	52.8	0.	183.1
1981	54.4	0.	190.4
1982	56.	0.	198.
1983	57.7	0.	205.9
1984	59.4	0.	214.2
1985	61.2	0.	222.7
1986	63.	0.	231.7
1987	64.9	0.	240.9
1988	66.9	0.	250.6
1989	68.9	0.	260.6
1990	70.9	0.	271.
1991	73.1	0.	281.8
1992	75.3	0.	293.1
1993	77.5	0.	304.8
1994	79.8	0.	317.
1995	82.2	0.	329.7
1996	84.7	0.	342.9
1997	87.2	0.	356.6
1998	89.9	0.	370.9
1999	92.6	0.	385.7
2000	95.4	0.	401.2