BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR LICENSE FOR MAJOR PROJECT

SUSITNA HYDROELECTRIC PROJECT

VOLUME 3

D R A F T

APPENDIX B1

HARZA-EBASCO
SUSITNA JOINT VENTURE

Alaska Power Authority

BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR LICENSE FOR MAJOR PROJECT

SUSITNA HYDROELECTRIC PROJECT
DRAFT LICENSE APPLICATION

VOLUME 3

EXHIBIT B

APPENDIX B1
MAN-IN-THE-ARCTIC-PROGRAM (MAP)
TECHNICAL DOCUMENTATION REPORT

STATE MODEL (VERSION A85.1)
REGIONALIZATION MODEL (VERSION A84.CD)
SCENARIO GENERATOR

November 1985

VOLUME COMPARISON

VOLUME NUMBER COMPARISON

LICENSE APPLICATION AMENDMENT VS. JULY 29, 1983 LICENSE APPLICATION

EXHIBIT	CHAPTER	DESCRIPTION	AMENDMENT VOLUME NO.	JULY 29, 1983 APPLICATION VOLUME NO.
A	Entire	Project Description	1	1
B	Entire	Project Operation and Resource Utilization	2	2 & 2A
	App. B1	MAP Model Documentation Report	3	2B
	App. B2	RED Model Documentation Report	4	2C
	App. B3	RED Model Update	4	--
C	Entire	Proposed Construction Schedule	5	1
D	Entire	Project Costs and Financing	5	1
	App. D1	Fuels Pricing	5	1
E	1	General Description of Locale	6	5A
	2	Water Use and Quality	6	5A
	Tables Figures		7	5A 5B
	Figures		8	5B
	3	Fish, Wildlife and Botanical Resources (Sect. 1 and 2)	9	6A 6B
		Fish, Wildlife and Botanical Resources (Sect. 3)	10	6A 6B
		Fish, Wildlife and Botanical Resources (Sect. 4, 5, 6, & 7)	11	6A 6B
	4	Historic & Archaeological Resources	12	7
	5	Socioeconomic Impacts	12	7
	6	Geological and Soil Resources	12	7
	7	Recreational Resources	13	8
	8	Aesthetic Resources	13	8
	9	Land Use	13	8
	10	Alternative Locations, Designs and Energy Sources	14	9
	11	Agency Consultation	14	10A 10B
F	Entire	Project Design Plates	15	3
F	Entire	Supporting Design Report	16	--
G	Entire	Project Limits and Land Ownership Plates	17	4

SUMMARY TABLE OF CONTENTS

SUSITNA HYDROELECTRIC PROJECT
LICENSE APPLICATION

SUMMARY TABLE OF CONTENTS

EXHIBIT A
PROJECT DESCRIPTION

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT A
PROJECT DESCRIPTION

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT A
PROJECT DESCRIPTION

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT B
PROJECT OPERATION AND RESOURCE UTILIZATION

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT B - APPENDIX B1

MAN-IN-THE-ARCTIC PROGRAM (MAP)
TECHNICAL DOCUMENTATION REPORT
STAGE MODEL (VERSION A85.1)
REGIONALIZATION MODEL (VERSION A84.CD)
SCENARIO GENERATOR

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT B - APPENDIX B2
RAILBELT ELECTRICITY DEMAND (RED) MODEL
TECHNICAL DOCUMENTATION REPORT (1983 VERSION)

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT B - APPENDIX B3
RAILBELT ELECTRICITY DEMAND (RED) MODEL
CHANGES MADE JULY 1983 TO AUGUST 1985

EXHIBIT C
PROPOSED CONSTRUCTION SCHEDULE

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT D
PROJECT COSTS AND FINANCING

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT D
PROJECT COSTS AND FINANCING

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT D - APPENDIX D1
FUELS PRICING

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 1
GENERAL DESCRIPTION OF THE LOCALE

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 2
WATER USE AND QUALITY

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 2
WATER USE AND QUALITY

EXHIBIT E - CHAPTER 3
FISH, WILDLIFE, AND BOTANICAL RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 3
FISH, WILDLIFE, AND BOTANICAL RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 4
HISTORIC AND ARCHEOLOGICAL RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 5
SOCIOECONOMIC IMPACTS

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 5
SOCIOECONOMIC IMPACTS

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 6
GEOLOGICAL AND SOIL RESOURCES

Title	Page No.

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 7
RECREATIONAL RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 7
RECREATIONAL RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 8
AESTHETIC RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 8
AESTHETIC RESOURCES

APPENDICES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 8
AESTHETIC RESOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 9
LAND USE

Title	Page No.

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 10
ALTERNATIVE LOCATIONS, DESIGNS, AND ENERGY SOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 10
ALTERNATIVE LOCATIONS, DESIGNS, AND ENERGY SOURCES

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT E - CHAPTER 11
AGENCY CONSULTATION

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT F
SUPPORTING DESIGN REPORT (PRELIMINARY)

SUMMARY TABLE OF CONTENTS (cont'd)

EXHIBIT F
SUPPORTING DESIGN REPORT (PRELIMINARY)

STATE MODEL

ISER MAP ALASKA ECONOMIC MODEL: STATE MODEL DOCUMENTATION

Appendixes

LIST OF FIGURES AND TABLES

Introduction

This report describes the core of the Institute for Social and Economic Research (ISER) Man-in-the-Arctic Program (MAP) Alaska Economic Model. It consists of modules representing the economic, fiscal, and demographic structure of the state. The Native economic activity, state capital stock, and income distribution model linking modules are documented elsewhere. A scenario generator model provides input for running the model. The ISER MAP Alaska Economic Model was developed at the University of Alaska in the early 1970s under a grant from the National Science Foundation. Since its original use to demonstrate the economic, demographic, and fiscal impacts on Alaska of different schedules of federally imposed petroleum development scenarios, it has been used in a variety of types of analyses. These range from analyzing the economic and fiscal effects of specific private sector projects, to the analysis of the implications of different aggregate state wealth management strategies, to the projection of likely economic futures for the state to assist in electricity load forecasting.

These uses reflect the fact that the MAP model is designed for and primarily used for long-run policy analyses, impact analyses, and projections. The analyses are not predictions, but rather "what if" experiments. As such, the model has a different structure from one designed specifically for prediction. Whereas a model designed for prediction may not place a priority on describing how an economy works, a policy analysis model such as the MAP model will trade off some predictive ability for the more useful attribute of accurately reflecting within its structure how the economy works.

Because it is a long-run model, furthermore, the MAP model is not concerned with capturing all the short-run fluctuations which affect the economy over the course of the business cycle (or the seasons). Rather, the model attempts to capture the underlying structural changes affecting the longer-run growth trajectory of the state. For this purpose, the other types of regional models in common use--economic base models and input-output models--are inadequate.

The economic base model is the easiest type of model to construct and use, requiring in its simplest formulation only that the basic and nonbasic sectors of the economy be identified by one of several established techniques. The ratio of nonbasic to basic activity becomes the estimate of activity which would be generated by an increase in basic activity. The simplicity of the model means that it can be widely used, but only for a narrow range of state analyses. All variations of economic activity are assumed to originate in changes in basic sector activity and the ratio of nonbasic to basic activity is assumed constant. Neither assumption makes sense for the analysis of economic growth in Alaska.

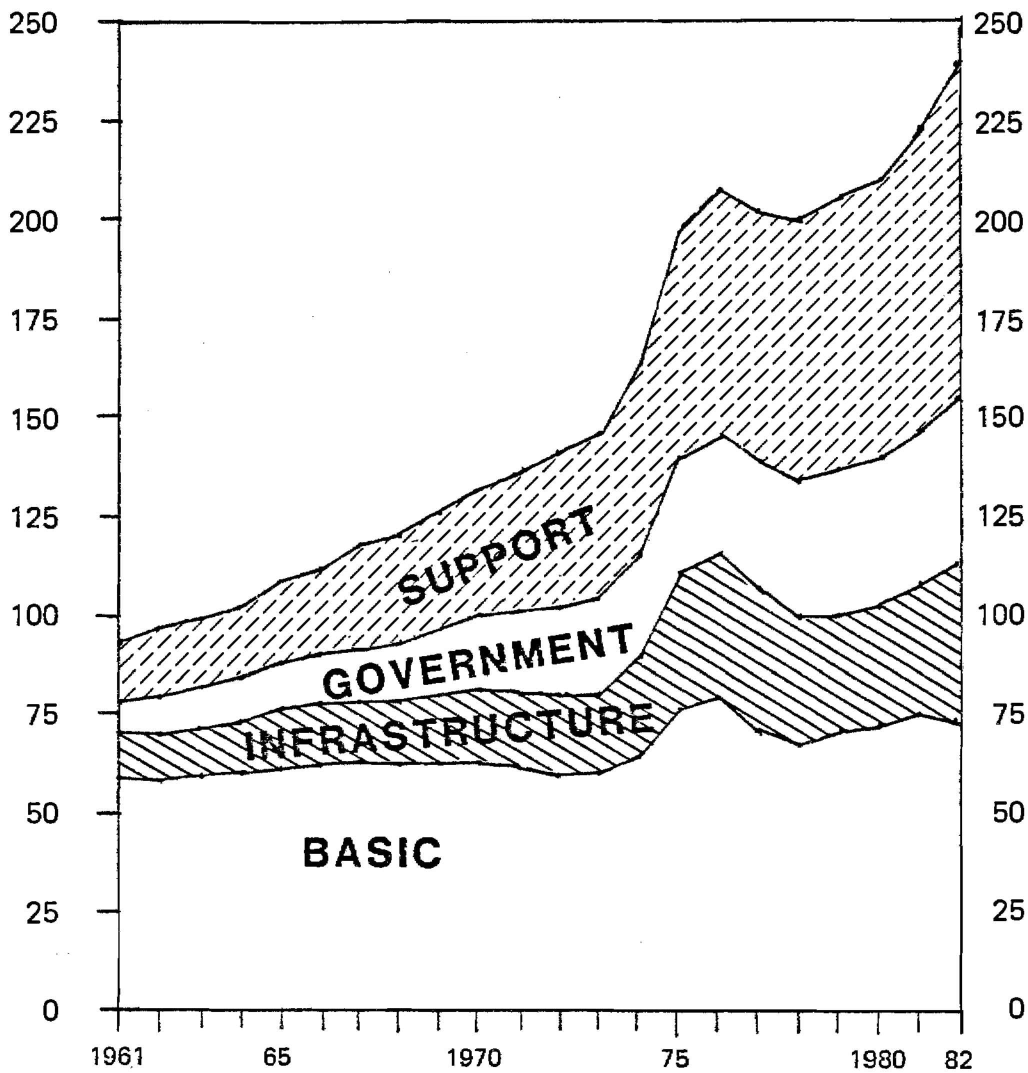
The input-output model provides much more detail on the interrelationships among industries within a regional economy and can trace the impact of a change in basic sector activity in much greater detail than an economic base model. Differential impacts from changes in different sectors of the economy can be traced. Data requirements are the largest problem in model implementation, although techniques have been developed to regionalize input-output models and make them transferable from region to region. The basic conceptual problems with input-output models are the assumption of constant coefficients over time and the fact that all economic change originates in the export sector. Constant coefficients for interindustry flows and interregional trade flows assume away economies of scale, other types of agglomeration economies such as urbanization, technological change, and import substitution. Input-output analysis is better suited for economies more mature than Alaska which have significant interindustry flows in manufacturing. Most Alaskan industry involves the extraction and exporting of natural resources or support activities such as trade and services. Neither is amenable to input-output analysis.

Econometric models offer much more flexibility in modeling regions than either economic base or input-output-type models in the sense that they can incorporate other facets of growth into the analysis. They can include the ideas from economic base and input-output models, but in addition they can treat other sources of growth and the evolution of the regional economy over time as it changes form. Some of these capabilities include the ability to handle a changing ratio of basic-to-nonbasic employment, to incorporate a fiscal sector into the model of the economy, to include relative regional prices in the model, and to handle the determination of personal income and popuation based on activity within the region. The more comprehensive modeling approach also forces consistency and independent checks into any analysis.

To illustrate the importance of the evolution of the economy over time, Figure 1 shows the growth since 1960 of the economy as measured by four categories of employment. It is clear that the relationship between basic and support sector employment has changed dramatically over the years. Any long-run analysis done in 1960 using an economic base or input-output model projecting into the future would have vastly underestimated actual growth. In the same manner, it would underestimate the level of impacts in a growing economy. This type of misunderstanding was definitely a factor in the underestimation of impacts for all a priori analyses of the Alyeska pipeline.

FIG. 1: ALASKA EMPLOYMENT

(THOUSANDS)



Source: ISER Economic Data Base.

The choice of model type is based upon uses anticipated for the model. The choice of actual structure depends upon this factor as well as the data which is available and the perceptions of economic interrelationships by the model builder. Both of these factors change over time, and, consequently, the model structure is constantly evolving in a way which maintains and improves its ability to analyze regional economic issues for a rapidly changing economy. The fact that the Alaskan economy is relatively underdeveloped by national standards makes analysis more subject to error than in a larger, more mature economy where the size and stability of the sectors provide not only a more stable track record of past change against which to analyze the future but also the confidence that change will continue to be gradual.

In Alaska, economic change has been and will continue to be dramatic and abrupt. Analysis of past events and relationships do not always provide clear guides to future relationships. Consequently, policy analyses using any Alaskan economic model must recognize and accept a larger degree of uncertainty than elsewhere as well as the fact that different interpretations can be placed upon past events which have different future implications. Three particular areas where this is true are (1) the relationship between employment and population, (2) the growth of support relative to basic sector activity, and (3) the impact of state and local government on the economy.[1]

[1]The base case projection produced using this model is called UP85.17 using scenario S85.SUB6. An alternative base case is UP85.16 using scenario S85.SUB4.

2. Description of the Economic Module of the MAP Economic Model

2.1. Summary

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

The export sectors are portions of the following two-digit SIC categories: agriculture-forestry-fisheries, manufacturing, federal government, petroleum and other mining, transportation, and construction related to these activities. Tourism crosses sectoral boundaries and is also exogenous. All other sectors are classified as nonbasic. 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 U.S. consumer price index, the unemployment rate, 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.

The close transport link to the contiguous United States means that the supplies of most inputs are infinitely elastic. Thus, a change in demand does not directly affect the price level of these inputs which are not locally supplied. Labor and natural resources are locally supplied and thus changes in demand do affect price, particularly for labor in the short run. In the long run the supply of labor is also infinitely elastic.

Data for model construction comes 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 and Economic Research.

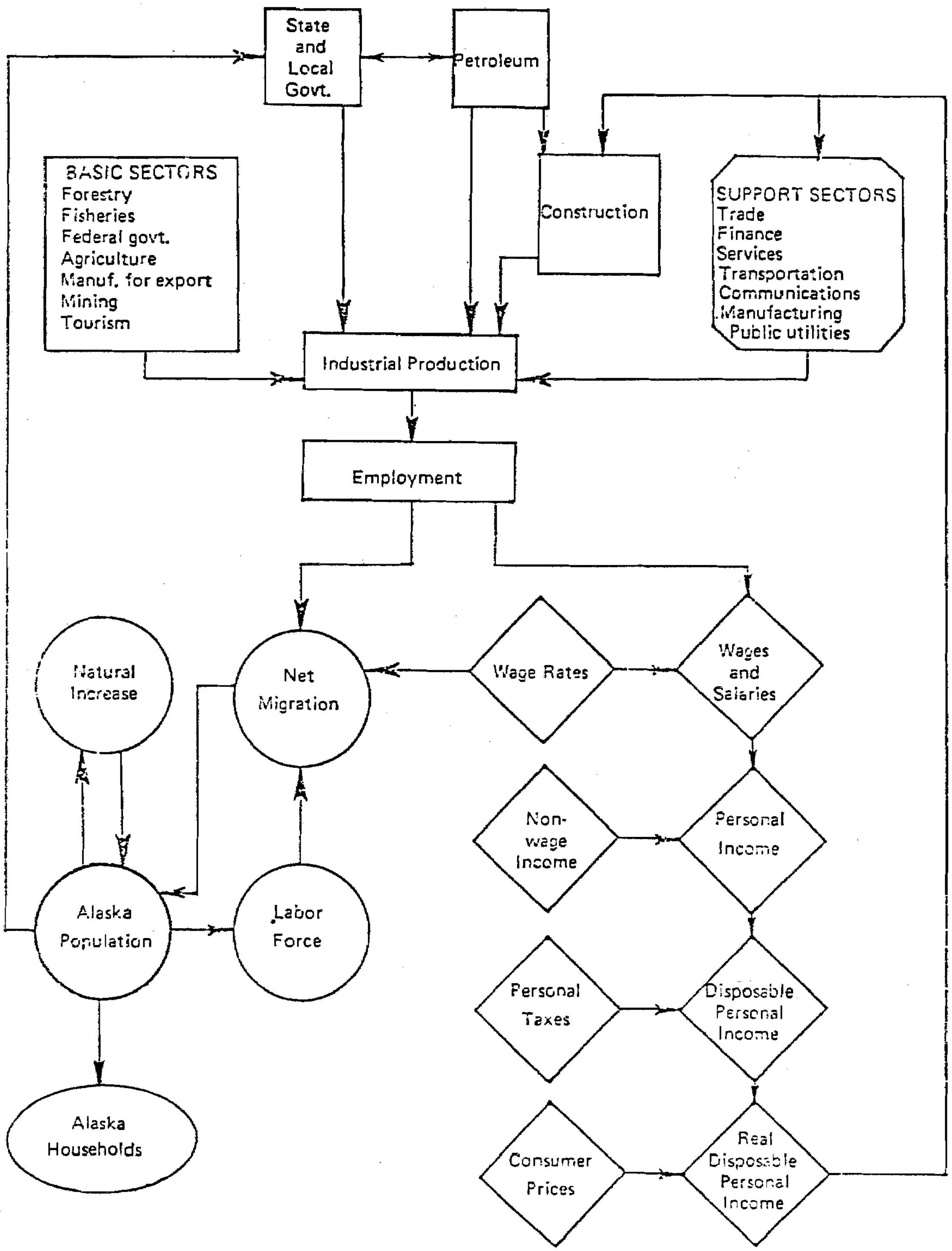
2.2. Introduction

The structure of the economic module of the MAP model (as well as the demographic) is illustrated in highly simplified form in Figure 2. In general terms, the model proceeds sequentially to estimate industrial output, industry employment, wages and salaries, and finally real disposable personal income. However, the outputs of certain industries are themselves dependent on the level of personal income. Because of this interrelationship, total output and income are simultaneously determined in the model. For example, an increase in personal income, by increasing the demand for services, leads to increased output of the service sector. The extra output will, in turn, require additional workers, and the wages and salaries paid to these workers will add further to personal income. Thus, the process has come full circle, demonstrating that industrial output and personal income are indeed simultaneously interdependent.

The model uses several different approaches in determining the level of production in each industrial sector.. This reflects the fact that the relevant causal mechanisms vary significantly from one industrial sector to another. In determining production levels, the model classifies industrial sectors into three broad categories: (1) those industries whose output is determined primarily by outside factors, (2) those industries whose output is determined by policy decisions, and (3) those industries whose output responds to changes in the level of economic activity within Alaska. These categories are, however, not mutually exclusive. Several of Alaska's important industries have their outputs determined by combinations of the above factors.

The principal industries whose output is determined by outside forces are forestry, fisheries, agriculture, tourism, and the federal government. Production levels in forestry and fisheries, Alaska's traditional resource-based industries, are determined by factors such as prices on world markets, supplies of natural resources, and policy decisions made by the federal and state governments concerning the appropriate utilization rates for Alaska's natural resources. Agriculture, now and in the future, is severely constrained by Alaska's harsh climate. Within the limits imposed by the climate, agricultural output in Alaska is determined by factors such as the availability of suitable land, prices of agricultural products, and government transportation policies. Tourism is constrained by the demand created by tourists from the United States and abroad, a demand which, nonetheless, can be stimulated by an improvement in the quantity and quality of tourist facilities. In addition to its regulatory and general policy-making role, the federal government sector has been, and undoubtedly will continue to be, a major direct element in the Alaska economy. The level of federal activity is determined primarily by national needs, with decisions concerning national defense playing a particularly

FIGURE 2. MAP ECONOMIC MODEL STRUCTURE



important role. Clearly, the decisions affecting federal activity in Alaska are influenced to only a minor extent by economic conditions within Alaska.

The petroleum industry is also largely controlled by forces outside the Alaska economy; but because of its importance, it is given special and much more detailed treatment. Petroleum employment and output are projected in accordance with detailed petroleum development scenarios. On the basis of present information, Alaska's petroleum resources appear to be potentially so vast and so widespread that there are countless alternative ways in which these resources might be developed.

In contrast to the industries influenced primarily by outside forces or policy decisions, the output of the other private sector industries (consisting of trade, finance, services, transportation, communication, public utilities, local-serving manufacturing, and proprietors) is produced to meet local demands and thus responds to changes in the level of economic activity in Alaska. It is clear that there has been a close link between personal income and output of these industries in the past, and this relationship has remained stable over time.

The cause of this relationship is the fact that a major portion of the demand for output of these sectors originates in the household or consumer sector. The trade, finance (including real estate), and service industries are very closely linked to the spending decisions of Alaska households. Thus, there is a clear causal mechanism producing an increase in output in response to an increase in real personal income. Any action, public or private, which adds to personal income will induce an expansion in output. To reflect this, nonbasic private output in the model is generally made a function of Alaska real disposable personal income and real wealth.

Analyses indicate that in most instances the output of these industries increases more than in proportion to the increase in personal income. That is, if personal income rises 1 percent, the output of the typical support sector industry increases by somewhat more than 1 percent. There are two separate factors which operate to produce this result. First, other studies show that in the postwar years, the service sector in the U.S. economy has tended to expand relative to other industries. Consumers have been devoting an increasing share of their total expenditures to the purchase of various kinds of services. It is not surprising to observe this same phenomenon in the Alaska economy.

The second factor causing the relatively rapid rise in support sector output is more specific to the Alaska situation. As the Alaska economy expands, it becomes feasible to have more of the support sector output produced locally rather than imported from the

Lower 48. The trade, finance, and service industries in particular benefit from the general expansion in the size of the Alaska economy. The share of output produced locally tends to increase relative to the share supplied from the outside. As a result, the rate of growth in the output of these industries is greater than the rate of growth in total consumer expenditures or total personal income.

The output of the construction industry is determined by a combination of internal and external factors. Part of construction activity is designed to supply the needs of the expanding Alaska economy. As in the support sector, this portion of construction output is made a function of real disposable personal income. An increase in personal income and the associated rise in general economic activity produce an increase in the demand for the construction of both residential and commercial structures. A second part of construction supplies the needs of state government capital spending. In addition to the construction required by the general expansion in economic activity, there is likely to be considerable construction activity involved in the building of pipelines, terminals, and other facilities required for petroleum production and other industrial development. This portion of construction output is exogenously determined in accordance with the relevant development scenario.

Proceeding sequentially, after output has been determined in each of the major industrial sectors, the next step in the model is to calculate industry employment. A statistical relationship derived from the Alaska data is used in most industries to project industry employment as a function of industry output. This relationship can be interpreted as a demand-for-labor equation; it specifies the number of workers required to produce a given level of industry output. The supply of labor in Alaska is effectively brought into balance with the demand through the process of migration. When an expansion in economic activity raises the demand for labor, new workers migrate into the state to take advantage of the additional job opportunities. Past experience, most recently in connection with the construction of the trans-Alaska oil pipeline, indicates that the supply of labor adjusts quite quickly. With the supply of labor being so flexible, it is the demand for labor which deterines the actual levels of employment in most industries in the Alaska economy. Table 1 shows in detail the industry classifications currently in use in the model.

There are, however, a few industries for which a different procedure is used to project industry employment. This occurs where there is no discernible systematic relationship between output and employment such as in petroleum and fish harvesting. It seems apparent, for example, that the number of persons who choose to engage in commercial fishing is determined primarily by factors such as culture, tradition, and personal preference, rather than by purely economic factors.

TABLE 1. EMPLOYMENT VARIABLES USED IN MAP ECONOMIC MODEL

	Variable Name			
CONSTRUCTION				EMCN
Endogenous			EMCN1	
Exogenous			EMCNX	
exogenous high wage (enclave)		EMCNX1		
exogenous low wage		EMCNX2		
MINING (including petroleum)				EMP9
MANUFACTURING				EMM9
Endogenous			EMMO	
Exogenous			EMMX	
exogenous high wage		EMMX1		
exogenous low wage		EMMX2		
fish processing	EMMF			
lumber	EMML			
pulp	EMMP			
TRANSPORTATION				EMT9
Endogenous			EMT91	
nontourism related		EMTNT		
tourism related		EMTTOUR		
Exogenous			EMT9X	
COMMUNICATION				EMCM
PUBLIC UTILITIES				EMPU
TRADE				EMD9
Wholesale			EMDW	
Retail			EMDR	
retail, nontourism related		EMDRNT		
retail, tourism related		EMDTOUR		
FINANCE-INSURANCE-REAL ESTATE				EMFI
SERVICES				EMS9
Non-Native Corp.-Related Services			EMS91	
business services		EMSB		
nonbusiness & nontourism-related services		EMS8NT		
tourism-related services		EMSTOUR		
Native Corp.-Related Services			EMNC	

TABLE 1. (continued)

	Variable Name	
FEDERAL GOVERNMENT		EMGF
Civilian	EMGC	
Military[a]	EMGM	
STATE-LOCAL GOVERNMENT		EMGA
State	EMGS	
Local	EMGL	
AGRICULTURE-FORESTRY-FISHERY (and Unclassified)		EMA9
Fishing	EMAFISH	
Agriculture	EMAGRI	
Forestry and Unclassified	EMAUN	
PROPRIETOR[a]		EMPRO
Nonfish Harvesting	EMPRO1	
Fish Harvesting	EMPROFIS	
TOTAL CIVILIAN		EM96
TOTAL NON-AGRICULTURAL WAGE & SALARY		EM97
TOTAL NON-AGRICULTURAL WAGE & SALARY PLUS MILITARY		EM98
GRAND TOTAL		EM99
Basic	EM9BASE	
Government (State & Local)	EM9GOV	
Support	EM9SUPRT	
Infrastructure	EM9INFR	
SPECIAL CATEGORIES		
FISH HARVESTING		EMFISH
Proprietor fish harvesting	EMPROFIS	
Salaried fish harvesting	EMAFISH	
TOURISM		EMTOUR
Transporation	EMTTOUR	
Trade	EMDTOUR	
Services	EMSTOUR	

[a]These are categories not covered in employment data of state Department of Labor.

Economic activity in the state and local government sector is determined ultimately by government policies. Although economic conditions in Alaska certainly influence the decision process, the process itself is essentially political rather than economic in nature. Since the art of modeling is not nearly so advanced as to enable adequate simulation of the political decision process, the decisions are specified outside the model by a set of "fiscal rules." What is included in the model is a set of relationships that trace out the economic implications of the alternative political decisions. Indeed, one of the principal functions of the MAP model is to project the outcomes associated with alternative social choices. The relationships in the model are, therefore, designed so that they can be readily altered to reflect alternative policy choices at each step in the decision process.

Following the determination of industry output and employment, the next major element in the model is the calculation of industry wage rates. Average wages in each industry are made a function of average earnings in the United States, the cost of living in Alaska, and the "tightness" of the Alaska labor market. Since the cost of living in Alaska is linked to U.S. prices, the net effect is that wage rates in Alaska are very closely related to wages and prices in the United States as a whole. It would be impossible for it to be otherwise so long as Alaska is open to migration to and from the Lower 48. If wages in Alaska became excessively high relative to the rest of the United States, large numbers of workers would migrate into the state, thus tending to force wages down. Conversely, if wages in Alaska were too low, there would be a shortage of labor, tending to force wages up. Thus, over the long run, Alaska wages have to maintain some sort of reasonable relationship with wages in the United States as a whole.

The final piece of industry information generated by the model is total wage and salary payments. Total earnings in each industry are computed by multiplying the industry wage rate times industry employment. To review, this makes four pieces of information that are provided on an annual basis for each industry in the model: (1) real output, (2) employment, (3) wage rates, and (4) wage and salary payments.

After wages and salaries are calculated for each industry, the figures are combined to estimate total wage earnings in the Alaska economy as a whole. This forms the basis for estimating the personal income available to Alaska residents. Although wages and salaries are by far the largest single component, personal income also includes interest, dividends, rental income, proprietors' income, and miscellaneous other labor income. For the United States, these nonwage components make up about a third of total personal income. The elements of personal income are shown in Table 2. In Alaska, the nonwage components are less significant and make up less than 20 percent of personal income, although they are growing.

TABLE 2. PERSONAL INCOME VARIABLES USED IN MAP ECONOMIC MODEL

			Variable Name
	Wage and salary disbursements		WS98
Plus:	Other labor income		PIOLI
	Proprietors' income		PIPRO
	fishery proprietor income	PIPROF	
	nonfishery proprietor income	PIPRO1	
Equals:	Total labor and proprietor income by place of work (total earnings)		PITE
Minus:	Personal contributions to Social Security		PISSC
Equals:	Net labor and proprietors income by place of work (net earnings)		PINE
Plus:	Residence adjustment		PIRADJ
Equals:	Net labor and proprietors' income by place of residence (net earnings)		PINERADJ
Plus:	Dividends, interest, and rent		PIDIR
	Transfers		PITRAN
	non-Permanent Fund dividend	PITRAN1	
	Permanent Fund dividend	EXTRNS	
Equals:	Personal income by place of residence		PI
	net of enclave employee (EMCNX1) income	PI3	
	plus residence adjustment	PI8	
Minus:	Federal income-related taxes		RTPIF
	State income-related taxes		RTISCP
	Local income-related taxes		DPIRES
Equals:	Disposable personal income		DPI
	plus residence adjustment ("purchasing power")	DPI8	

Disposable personal income is derived from the estimate of personal income--the difference between the two measures being personal tax and nontax payments. Personal taxes in the United States amount to about 15 percent of personal income. This ratio is somewhat higher for Alaska because of the progressive nature of the federal income tax structure; that is, individuals with large incomes pay higher tax rates than individuals with low incomes. Because of the high cost of living in Alaska, the typical Alaska taxpayer receives a higher income than the U.S. average. This means that the typical Alaska taxpayer also pays a higher-than-average effective tax rate.

The final element in the personal income component of the MAP economic model is an adjustment for the effects of inflation. Disposable personal income measured in current dollars is deflated by the Alaska relative price index to produce an estimate of real disposable personal income in terms of constant 1967 prices. Since virtually all consumer goods are imported from the Lower 48 and since wage rates in Alaska are closely tied to wages in the United States, relative prices in Alaska are projected as a function of the U.S. consumer price index. The empirical studies used to derive this relationship indicate that, over the long run, prices in Alaska may be expected to increase somewhat less rapidly than prices in the United States. This is consistent with the expectation that as the Alaska economy expands, there will be a certain amount of import substitution and economies of scale that will tend to lower costs in some Alaska industries.

Real disposable personal income provides a measure of the effective purchasing power of Alaska consumers after taking into account tax payments and after making allowance for the effects of inflation. This is, of course, the income measure that was used previously in determining the demand for the output of the support sector industries. At this point, the circle is closed: personal income depends on industry output and industry output depends on personal income.

2.3. State Economic Module Detail

Economic activity is measured by four variables in each industry: employment (EM**), wages and salaries (WS**), the wage rate (WR**), and gross product (XX**). The equations describing activity in each industry differ.

Each industry is identified by a suffix. Coefficients for the stochastic equations are identified by a prefix C followed by a number and a suffix letter. In this section, the equations used for each industry are described.

Finance, Insurance, Real Estate (**FI)
Public Utilities (**PU)
Communications (**CM)

These three industries are modeled in a similar manner which reflects the underlying structure of all the nonbasic support sector industries in the model. In each, the level of output of the industry, measured as real gross product (XX**), is determined by available real disposable personal income. Different combinations of current and lagged values of both regular disposable personal income (R.DPI8N) and the disposable personal income generated directly by premium wage rate enclave construction projects (such as construction of the Alyeska pipeline) (R.DPI8X) as well as the average level of wealth in the economy (WEALTH) work best to explain output in each case.

Average annual employment (EM**) in each case is determined by the output of the industry. This equation represents the production function. A pipeline dummy (PIPE) improves the fit of the equation for the public utilities industry.

The real annual average wage rate (WR**/PDRPI) for each industry (PDRPI is an Alaskan price index) is a function of both national and regional economic factors. The change in the real average U.S. wage rate (WEUS/PDUSCPI) is the major determinant of local wage rates because of the direct link between the Alaska and national labor markets. When the local demand for labor is growing rapidly, there may be upward pressure on wage rates because of temporary supply constraints or because of a temporary increase in premium wage rate employment opportunities. The ratio of premium wage construction employment to total employment (EMCNRT) measures this local labor market tightness. Premium wage construction employment is enclave construction employment at high wages. The oil pipeline is an example of a project which generated premium wage construction employment. A dummy variable (D.80DEC6) reflects the fact that wage rates have proved to be "sticky" in the downward direction since 1980 in the presence of a declining differential between Alaskan and lower 48 price levels.

Finance-Insurance-Real Estate (**FI)

389: XXFI = C80A+C80C*D71.73+C80B*WEALTH(-1)*POP(-1)

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

391: LOG(WRFI/PDRPI) = C82A+C82F*D.80DEC6+C82B*LOG(WEUS/
PDUSCPI)+C82D*LOG(1+EMCNRT)+C82C*LOG(1+EMCNRT(-1))

392: WSFI == EMFI*WRFI/1000.

Public Utilities (**PU)

372: XXPU = C72A+C72B*R.DPI8N(-1)+C72C*R.DPI8X+
C72D*R.DPI8N(-2)

373: LOG(EMPU) = C73A+C73C*PIPE(-1)+C73B*LOG(XXPU)

374: LOG(WRPU/PDRPI) = C74A+C74F*D.80DEC6+C74B*LOG(WEUS/
PDUSCPI)+C74C*LOG(1+EMCNRT(-2))+C74D*LOG(1+EMCNRT(-1))

375: WSPU == EMPU*WRPU/1000.

Communications (**CM)

368: XXCM = C68A+C68B*R.DPI8N(-1)+C68C*D61.74+C68D*
WEALTH(-1)*POP(-1)

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

370: LOG(WRCM/PDRPI) = C70A+C70F*D.80DEC6+C70B*LOG(WEUS/
PDUSCPI)+C70C*LOG(1+EMCNRT(-2))+C70D*LOG(1+EMCNRT(-1))

371: WSCM == EMCM*WRCM/1000.

Mining (Including Petroleum) (**P9)

Mining industry employment (EMP9), which consists primarily of petroleum exploration and development, is determined outside the model as part of a growth "scenario." Output (XXP9) is calculated from employment. The wage rate and total wages and salaries are calculated in a manner similar to all other industries.

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

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

349: WSP9 == EMP9*WRP9/1000

Agriculture, Forestry, Fisheries, Unclassified (**A9)

Wage and salary employment in this sector (EMA9) consists of that small portion of the fish harvesting industry employing workers covered by unemployment insurance programs (EMAFISH), agricultural workers (EMAGRI), and unclassified workers plus foresters (EMAUN). The part of fish harvesting employment is a constant proportion of the total (EMFISH). All of agricultural employment (determined in a "scenario") is within this sector. Unclassified and forestry employment is exogenous and not related to the development scenario.

Output and wages and salaries are determined in the same way as in the mining industry. The wage rate is set equal to the federal civilian wage rate because the small size of this industry has precluded the development of a smooth and representative historical data series on the wage rate for regression purposes. Output in this sector consists of the gross product of all fish harvesting, not only that of those workers who work for a wage.

422: EMA9 = EMAFISH+EMAGRI+EMAUN

423: XXA9 = C90A+C90B*(EMA9+EMPROFIS)

424: WRA9 = WRGC

425: WSA9 == EMA9*WRA9/1000.

Transportation (**T9)

Transportation industry employment has three components: a support component (EMTNT) and two basic sector components--tourist-related employment (EMTTOUR) and large pipeline employment (EMT9X). Gross product in the support component of the industry (XXTNT) is determined by real disposable personal income (R.DPI8N and R.DPI8X). This, in turn, determines support employment in transportation. Tourist-related employment is a constant portion of total tourist-related employment in the economy (EMTOUR). Large pipeline activity is determined outside the model as part of the growth "scenario."

Total industry gross product (XXT9) is the ratio of total to support employment multiplied by support gross product.

There is one wage rate for the whole industry which is calculated in the usual way. Total wages and salaries is also calculated in the usual way.

360: XXTNT = C64A+C64B*R.DPI8X+C64D*R.DPI8X*R.DPI8X(-1)+
C64C*R.DPI8N+C64E*D71.73

361: LOG(EMTNT) = C65A+C65B*LOG(XXTNT)

362: EMTTOUR = PTOURT*EMTOUR

363: EMT91 = EMTNT+EMTTOUR

364: EMT9 = EMT91+EMT9X

365: XXT9 = XXTNT*(EMT9/EMTNT)

366: LOG(WRT9/PDRPI) = C66A+C66F*D.80DEC6+C66D*D61.76+C66B*
LOG(WEUS/PDUSCPI)+C66C*LOG(1+EMCNRT)+C66E*
LOG(1+EMCNRT(-1))

367: WST9 == EMT9*WRT9/1000.

Manufacturing (**M9)

Manufacturing employment consists of a small component sensitive to local demand (EMMO) as well as a basic sector component (EMMX), itself consisting of two elements--one which commands a premium wage rate (EMMX1) and another with the same wage as the support component (EMMX2). As in the mining industry, exogenous output is a function of employment. Locally sensitive output (XXMO) is determined by disposable income (R.DPI8N). Basic sector employment is determined outside the model as part of the growth "scenario."

The manufacturing industry wage rate (WRM9) consists of two separate wage rates. One is for locally sensitive manufacturing and all the current basic manufacturing activity consisting primarily of fish processing, pulp and paper, and timber (WRM91). The other is a premium wage (WRMX1) associated with certain prospective manufacturing activities (EMMX1) such as a petrochemical plant or aluminum smelter. The premium wage is a simple multiple (PADJ) of the regular wage. Wages and salaries in total and for premium wage employment are calculated in the usual way.

```
350:  XXMO = C60A+C60B*R.DPI8N+C60C*D61.77

351:  LOG(EMMO) = C109A+C109B*LOG(XXMO)

352:  LOG(XXMX2) = C61A+C61B*LOG(EMMX2)

353:  XXM9 == XXMX1+XXMX2+XXMO

354:  EMM9 = EMMO+EMMX1+EMMX2

355:  LOG(WRM91/PDRPI) = C62A+C62F*D.80DEC6+C62B*LOG(WEUS/
      PDUSCPI)+C62C*LOG(1+EMCNRT)+C62D*LOG(1+EMCNRT(-1))

356:  WRMX1 == WRM91*PADJ

357:  WSM9 == (EMMO+EMMX2)*WRM91/1000+EMMX1*WRMX1/1000

358:  WSMX1 == EMMX1*WRMX1/1000

359:  WRM9 == WSM9/EMM9*1000
```

Trade (**D9)

Employment in wholesale (EMDW) and retail (EMDR) trade are handled as separate industries. In addition, retail trade contains a tourist-related component (EMDTOUR).

Output in wholesale (XXDW) and retail trade (net of tourist-related employment) (XXDRNT) is determined as functions of real disposable personal income (R.DPI8N and R.DPI8X) and average wealth (WEALTH). Employment, in turn, is a function of output. Tourist-related employment in trade is a constant proportion of total tourist employment (EMTOUR), which is added to other retail employment to get total retail trade employment. Wage rates and wages and salaries are calculated in the usual way. Total output (XXD9) includes a tourist-related component calculated at the same ratio to employment as the rest of the industry.

```
376:  XXDW = C71A+C71B*R.DPI8N+C71C*R.DPI8X+C71D*R.DPI8X(-1)*
      R.DPI8X+C71E*WEALTH(-1)*POP(-1)

377:  XXDRNT = C76A+C76B*R.DPI8N+C76C*R.DPI8X+C76D*
      R.DPI8N(-1)+C76E*R.DPI8X(-1)

378:  LOG(EMDW) = C77A+C77B*LOG(XXDW)

379:  LOG(EMDRNT) = C75A+C75B*LOG(XXDRNT)

380:  EMDR = EMDRNT+EMDTOUR

381:  LOG(WRDW/PDRPI) = C78A+C78F*D.80DEC6+C78B*LOG(WEUS/
      PDUSCPI)+C78C*LOG(1+EMCNRT)+C78D*LOG(1+EMCNRT(-1))+
      C78E*LOG(1+EMCNRT(-2))

382:  LOG(WRDR/PDRPI) = C79A+C79F*D.80DEC6+C79B*LOG(WEUS/
      PDUSCPI)+(+C79D)*LOG(1+EMCNRT(-1))+C79E*
      LOG(1+EMCNRT(-2))

383:  EMDTOUR = PTOURD*EMTOUR

384:  EMD9 = EMDRNT+EMDW+EMDTOUR

385:  WSD9 == (EMDRNT+EMDTOUR)*WRDR/1000+EMDW*WRDW/1000

386:  WRD9 = WSD9/EMD9*1000

387:  XXD9 = (XXDW+XXDRNT)/(EMDW+EMDRNT)*EMD9

388:  XXDR = XXD9-XXDW
```

Services (**S9)

Services employment consists of four components: support sector (EMS8NT), tourism (EMTOUR), business services (EMSB), and Native corporations (not explicit). Output of support sector services (XXS8NT) and business-related services (XXSB) is determined by functions of disposable personal income (R.DPI8N and R.DPI8X) and average wealth (WEALTH). Employment in each of these sectors is a function of output.

Tourism-related employment (EMSTOUR) is a constant portion of total tourist employment (EMTOUR). Separate wage rates are calculated for business services (WRSB) and other services net of business services (WRSNB).

Native corporation-related employment equals Native corporation wages and salaries (NCWS) divided by the average wage rate for the whole industry (WRS9).

Industry wages and salaries are calculated in the usual way.

Total output is the same ratio to total employment as is output in the support and business service components of the industry.

393: XXS8NT = C84A+C84B*R.DPI8N+C84C*R.DPI8X(-1)+C84D*
WEALTH(-1)*POP(-1)

394: XXSB = C83A+(+C83C)*R.DPI8X+C83D*R.DPI8X(-1)+C83E*
WEALTH(-1)*POP(-1)

395: LOG(EMS8NT) = C85A+C85B*LOG(XXS8NT)

396: LOG(EMSB) = C87A+C87B*LOG(XXSB)

397: 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))

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

399: EMSTOUR = PTOURS*EMTOUR

400: EMS91 = EMSB+EMS8NT+EMSTOUR

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

402: WSS9 == WSS91+NCWS

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

404: WRS9 = WSS91/EMS91*1000

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

Federal Government (**GF)

Federal government employment (EMGF) is the sum of civilian (EMGC) and military (EMGM) employment, both of which are determined in the growth "scenario." Output (XXGF) is a function of employment. A wage rate for civilian employment is calculated (which is not responsive to local market conditions), and the military wage rate is a fixed proportion of the civilian wage (PCIVPY). Nominal wages and salaries are calculated as a function of nominal wage rate growth in the United States, reflecting the relative insensitivity of federal wage rates to local conditions.

406: EMGF = EMGM+EMGC

407: LOG(XXGF) = C101A+C101B*LOG(EMGF)

408: LOG(WRGC) = C89A+LOG(WEUS)

409: WRGM = WRGC*PCIVPY

410: WSGC = WRGC*EMGC/1000

411: WSGM = WRGM*EMGM/1000

412: WSGF == WSGC+WSGM

413: WRGF = WSGF/EMGF*1000

Construction (**CN)

Employment in the construction industry is in four categories: two endogenous cateogries (EMCN1)--support and government expenditure related--and two types of basic employment (EMCNX). Support sector output (XXCN8) is a function of disposable personal income (R.DPI8N and R.DPI8X). To this is added the value of capital expenditures made by state government (XXVACAP) to get total endogenous output (XXCN1). Exogenous output is the residual (XXCNX). Endogenous employment (EMCN1) is a function of this output.

Basic employment consists of normal wage basic employment (EMCNX2) which receives the same wage as support sector and government-related construction employment (WRCNNP) and premium wage construction employment (EMCNX1) which is defined as remote site, specialized employment commanding a high annual wage (WRCNP). This wage is a multiple of the regular wage (PIPADJ). Wages and salaries for the industry are calculated in the usual way.

Premium wage employment interacts with several other model components. First, it directly affects wage rates and the price level in most other industries through the variable EMCNRT, which is a measure of excess demand in the labor market. Second, it forms the basis for the special component of disposable personal income, R.DPI8X, which is a variable in some of the equations explaining support sector output.

```
334:  EMCNRT = IF EMCNX1/4 LT EMCN1(-1) THEN 0 ELSE
      EMCNX1/(EM98-EMCNX1)

335:  XXCN8 = C54A+C54B*R.DPI8N+C54D*D65+C54E*D73+C54F*
      R.DPI8X(-1)+C54G*R.DPI8X

336:  XXCN1 = XXCN8+XXVACAP

337:  LOG(EMCN1) = C56A+C56B*LOG(XXCN1)+C56C*D61.67

338:  EMCNX = EMCNX1+EMCNX2

339:  EMCN = EMCN1+EMCNX

340:  XXCN = EMCN/EMCN1*XXCN1

341:  XXCNX == XXCN-XXVACAP-XXCN8
```

342: 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))

343: WRCNP = WRCNNP*PIPADJ

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

345: WRCN = WSCN/EMCN*1000

346: WSCNP = EMCNX1*WRCNP/1000

State and Local Government (**GA)

Government expenditures on wages and salaries at the state (WSGS) and local (WSGL) levels are determined by the operating budgets of state and local government, respectively. Wage rates are calculated for state government (WRGS) and local government (WRGL) in the usual way with the added constraint that neither may fall in nominal dollars. Employment is calculated as total wages and salaries divided by the wage rate for state (EMGS) and local government (EMGL). Output in the combined state and local government sector (XXGA) is a function of combined employment (EMGA).

414: LOG(WRGS/PDRPI) = IF C92A+C92F*D.80DEC6+C92B*LOG(WEUS/
PDUSCPI)+C92C*D61.73+C92D*D74.75 LT LOG(WRGS(-1-/
PDRPI(-1)) THEN LOG(WRGS(-1)/PDRPI(-1)) ELSE C92A+C92F*
D.80DEC6+C92B*LOG(WEUS/PDUSCPI)+C92C*D61.73+C92D*D74.75

415: EMGS = WSGS/WRGS*1000

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

417: EMGL = WSGL/WRGL*1000

418: EMGA = EMGS+EMGL

419: WSGA = WSGS+WSGL

420: WRGA = WSGA/EMGA*1000

421: LOG(XXGA) = C104A+C104B*LOG(EMGA)

Tourism

The number of tourists (TOURIST) is determined in the growth "scenario." Total employment in tourism (EMTOUR), consisting of portions of the trade, services, and transportation industries, grows as a function of the number of tourists.

455: LOG(EMTOUR) = PTOURB+PTOURE*LOG(TOURIST)

Fish Harvesting

Employment in fish harvesting (EMFISH) is determined in the growth "scenario." It is allocated by a proportion (PFISH1) into a wage and salary component (EMAFISH) and a proprietor component which consists of all fishermen who do not work for a wage (EMPROFIS).

Wages and salaries paid to those fishermen who earn a wage is calculated as part of the Agricultural-Forestry-Fishery-Unclassified (**A9) industry. Other fishermen earn proprietor income (PIPROF), which is constant in real per fisherman terms at the present level.

301: PIPROF = EMPROFIS*(4.523*(PDRPI/340))

434: EMPROFIS = PFISH1*EMFISH

435: EMAFISH = (1-PFISH1)*EMFISH

Proprietor Activity

Proprietor activity (all non-wage and -salary activity) consists of fish harvesting and all other proprietor activity. Fish harvesting employment (EMPROFIS) and income (PIPROF) are determined by total fish harvesting activity.

Other employment (EMPRO1) is a function of all wages and salary employment (EM98). Personal income associated with this employment (PIPRO1) grows with the level of employment in nonfish processing proprietor activity.

Total proprietor employment (EMPRO) and income (PIPRO) are each the sum of their component parts.

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

302: PIPRO == PIPRO1+PIPROF

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

436: EMPRO = EMPRO1+EMPROFIS

Total Employment

Total wage and salary employment (EM98) is defined as the sum of civilian employment covered by unemployment insurance in all industries (EM97) plus military employment (EMGM). Total employment (EM99) includes, in addition to employment covered by unemployment insurance and the military, proprietor employment (EMPRO). Total civilian employment (EM96) is net of military employment.

Note that tourism employment (EMTOUR) is all subsumed within the transportation, trade, and service sectors. Also, fish harvesting employment (EMFISH) is divided into wage and salary and proprietor components.

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

428: EM97 = EM98-EMGM

437: EM99 == EM98+EMPRO

438: EM96 = EM99-EMGM

Total Output

Total output (XX98) includes all industries except nonfish harvesting-related proprietor activity.

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

Total Wages and Salaries

Total wages and salaries (WS98) is the sum of the wages and salaries paid in all industries and is thus net of proprietor income. Nonagricultural wage and salary employment (WS97) excludes military wages and salaries. The average wage rate for total (WR98) and nonagricultural (WR97) wages and salaries are calculated.

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

430: WS97 = WS98-WSGM

431: WR98 = WS98*1000/EM98

432: WR97 == WS97*1000/EM97

Personal Income

Personal income by place of residence (PI) is built up from wages and salaries. It includes, in addition to wages and salaries (WS98), other labor income (PIOLI); proprietor income (PIPRO); dividends, interest, and rents (PIDIR); and transfers (PITRAN); it is net of both social security contributions (PISSC) and a residency adjustment (PIRADJ). Other labor income is a function of wages and salaries, as are social security contributions. Dividends, interest, and rents are a function of disposable income. Transfers consist of an exogenous state government component (EXTRNS) and all others (PITRAN1). Endogenous transfers grow with the growth in the population over 65 (POPGER).

Personal income prior to netting out the residence adjustment is calculated (PI8). The residency adjustment is a function of employment.

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

296: PITRAN1 = IF YR LE 1982 THEN PITRAN6 ELSE
PITRAN1(-1)/POPGER(-1)*(1+GRUSCPI)*POPGER

297: PITRAN/PDRPI = IF YR GE 1984 THEN PITRAN1/PDRPI+EXTRNS/
PDRPI ELSE (IF YR EQ 1983 OR YR EQ 1982 THEN PITRAN1/
PDRPI+EXTRNSPI/PDRPI ELSE C34A+C34B*POP+C34C*D61.72+
EXTRNS/PDRPI)

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

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

303: PI8 = WS98+PIOLI+PIPRO-PISSC+PIDIR+PITRAN

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

310: PI = PI8-PIRADJ

Components of Real Disposable Personal Income

Disposable personal income (DPI) is personal income net of federal (RTPIF), state (RTISCP), and local (DPIRES) income-related taxes paid by Alaskan residents. Disposable personal income before the residency adjustment is also calculated (DPI8). This definition of disposable income is used to construct two real disposable income or "purchasing power" measures. One (R.DPI8X) is the real disposable personal income associated with premium wage construction employment. This is set to zero in simulation. The other (R.DPI8N) includes all other real disposable personal income as well as the income equivalent of state subsidies (EXSUB2*EXSUBS) but nets out the excess proportion of Permanent Fund dividends which are saved (EXPF2*EXTRNS).

317: DPI = PI-RTPIF-RTISCP-DPIRES+RTISXX

318: DPI8 = DPI+PIRADJ

321: R.DPI8N = (DPI8+EXSUB2*EXSUBS-EXPF2*EXTRNS)*
100/PDRPI-R.DPI8X

322: R.DPI8X = 0

Price Indexes

There are three price indexes used in the model. The most important, PDRPI, is an index for deflating consumer prices to the 1967 U.S. level. At each point in time, this index is equal to the U.S. consumer price index, PDUSCPI, multiplied by the ratio of prices in Anchorage and the United States as measured by the Bureau of Labor Statistics moderate-family budget, PDRATIO. This ratio is a negative function of the growth in the size of the support sector of the economy as reflected by employment in trade, finance, and services as well as transportation, communication, and public utilities, EMSP. It is a positive function of tightness in the local labor market as reflected in the variable EMCNRT, which is the proportion of total employment accounted for by high wage, exogenous construction.

A price deflator for state government operating expenditures, PDEXOPS, is a weighted average of government wage rates, WRGA, and the nonpersonnel expenditure price level using PDRPI as a proxy. A price deflator for capital expenditures is based upon the wage rate in construction (nonpipeline), WRCNNP.

Many variables are deflated to a 1984 Alaska base using the 1984 level of PDRPI. All such variables have the prefix DF.

4: PDRATIO = IF YR LE 1983 THEN PDRATIO6 ELSE (IF RTIS(-2)-RTIS(-1)NE 0 AND RTIS(-2) EQ 0 AND G.EMSP GT 0 THEN PDRATIO(-1)+C67A*(1+G.EMSP**0.5)+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))-C67C+C67D*(1+G.EMSP**0.5)*D68.71 ELSE (IF RTIS(-1)-RTIS(-1) NE 0 AND RTIS(-2)EQ 0 THEN PDRATIO(-1)+C67A+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))-C67C-C67D*D68.71 ELSE (IF G.EMSP LE 0 THEN PDRATIO(-1)+C67A+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))+C67D*D68.71 ELSE PDRATIO(-1)+C67A*(1+G.EMSP**0.5)+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))+C67D*(1+G.EMSP**0.5)*D68.71)))

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

National Variables

Real per capita disposable personal income in the United States (PR.DPIUS), the USCPI (PDUSCPI), and the average weekly wage in the United States (WEUS) each grow at exogenous rates. These are as follows: GRDIRPU, GRUSCPI, and GRRWEUS.

1: PR.DPIUS = IF YR LE 1983 THEN PR.DPIU6 ELSE PR.DPIUS(-1)* (1+GRDIRPU)

2: PDUSCPI = IF YR LE 1983 THEN PDUSCPI6 ELSE PDUSCPI(-1)* (1+GRUSCPI)

3: WEUS = IF YR LE 1983 THEN WEUS6 ELSE WEUS(-1)*(1+GRUSCPI+GRRWEUS)

3. Description of the Fiscal Module of the MAP Economic Model

There are four categories of state government revenues. Petroleum-related revenues are exogenously provided from information on production, wellhead price, and other characteristics. Endogenous revenues are functionally related directly to the level of economic activity in the economy. Federal transfers are a function of the price level, and fund earnings are determined by the balances in the general and Permanent Funds.

Total state government operating expenditures, operating expenditures by program, and capital expenditures can be determined by a variety of rules specified by the model user. These include the choice of the spending limit, historical relationships, simple growth rates, or relating spending to specific variables like population or the size of the general fund balance.

Local government revenues consist of state-local transfers, federal-local transfers, and endogenously generated revenues. Expenditures are determined by income and population.

Government expenditures affect the private economy primarily through wage and salary payments and purchases of capital. In addition, government personal income taxes and transfers determine what proportion of income is retained by individuals as disposable personal income.

Data sources for the fiscal model are primarily the Executive Budget and Annual Financial Report of the Department of Administration, Revenue Sources of the Department of Revenue, and the various state and local government fiscal summaries of the U.S. Department of Commerce, Bureau of the Census.

State fiscal activity can be analyzed in terms of revenues and expenditures moving through the various state funds. The general structure of these accounts are shown in Tables 3 and 4. The most important of these funds are the general fund and the Permanent Fund, although there are a number of smaller funds which affect the level of economic activity stimulated by government spending. These include the Enterprise Funds, Capital Projects Funds, Special Revenue Funds, and Loan Funds.

TABLE 3. STATE REVENUES

<u>GENERAL FUND</u>

INVESTMENT EARNINGS		RSIN	
General Fund Earnings	RSIG		
Permanent Fund Earnings Transferred to General Fund	RSIPGF		
PETROLEUM REVENUES		RP9SGF	
Taxes			
severance taxes	RPTS		
property taxes	RPPS		
corporate income taxes	RTCSPX		
unclassified petroleum	RP9X		
Nontaxes			
bonuses	RPBSGF		
rents	RPENGF		
royalties	RPRYGF		
federal shared royalties	RSFDNPXG		
ENDOGENOUS REVENUES		RSENGF	
Nonpetroleum Taxes			
corporate income tax	RTCS1		
personal income tax	RTIS		
business license tax	RTBS		
motor fuel tax	RTMF		
alcohol tax	RTAS		
ad valorem tax	RTVS		
cigarette tax (net of special fund allocation)	RTCIS		
school tax	RTSS		
miscellaneous	RTOTS		
Other			
fees and licenses	ROFTS		
ferry receipts	ROFERS		
miscellaneous	RMIS		
STATE ANCSA PAYMENTS*		(SANCSA)	
<u>GENERAL FUND UNRESTRICTED REVENUES</u> [Dept. of Revenue]			RSGFBM
Add: GENERAL FUND RESTRICTED REVENUES [Dept. of Revenue]			RSGFRS
Federal Grants-in-Aid to General Fund		RSFDN	
Miscellaneous Restricted General Fund Revenues		RMISRES	

*Net out this item before calculation of General Fund revenues.

TABLE 3 (continued)

Equals: <u>TOTAL GENERAL FUND REVENUES</u> [Dept. of Revenue] (Restricted + Unrestricted)		RSGF
Add: INTERAGENCY RECEIPTS		EXINREC
Equals: <u>TOTAL GENERAL FUND REVENUES</u> [Dept. of Administration]		RSGF.AFR
<u>PERMANENT FUND</u>		
<u>GROSS REVENUES</u>		EXPFCON9
RESOURCE REVENUES	RP7SPF	
GENERAL FUND CONTRIBUTIONS	EXPFCONX	
GROSS EARNINGS	RSIP	
Minus: General Fund Transfers		
to General Fund		(RSIPGF)
from General Fund		(EXPFCONX)
Equals: <u>NET PERMANENT FUND REVENUES</u> (before dividend)		EXPFCON1
RETAINED EARNINGS RSIPPF		
RESOURCE REVENUES RP7SGF		
DIVIDENDS EXTRNS		
<u>COMBINED FUNDS</u>		
PETROLEUM	RP9S	
Severance taxes RPTS		
Property tax RPPS		
Corporate income tax RTCSPX		
Unclassified taxes RP9X		
Bonuses RPBS		
Rents RPEN		
Royalties RPRY		
Federal shared royalties RSFDNPX		
FUND EARNINGS	RSI99	
FEDERAL TRANSFERS	RSFDN	
ENDOGENOUS	RSEN	
<u>TOTAL REVENUES</u>		R99S
<u>MISCELLANEOUS FUNDS</u>		
ENTERPRISE FUND REVENUES		RSIAS
SPECIAL FUND REVENUES (not including Permanent Fund)		RSFS

TABLE 4. STATE EXPENDITURES

APPROPRIATIONS				APGF
Under Expenditure Limit			EXLIM	
Operations (net of debt service)			APGFOPS	
Nonoperations			APGFCAP	
subsidy		EXSUBS		
Other				
Special Permanent Fund Contributions		APPFCONX		
Special Capital		EXSPCAP		
Debt Service		EXDSS		
EXPENDITURES UNDER EXPENDITURE LIMIT				
Operations (net of debt service)			EXGFOPS	
Nonoperations			EXGFCAP	
capital		EXGFCAP1		
noncapital		EXGFCOT		
subsidy	EXSUBS			
local capital grants	RLTMCAP			
Add: Debt Service				EXDSS
Special Capital Appropriations				EXSPCAP
Special Permanent Fund Contributions				EXPFCONX
Permanent Fund Distribution Augmentation				EXTRNSX
Equals: GENERAL FUND UNRESTRICTED EXPENDITURES				EXGFBM
Add: Federal Grants-in-Aid to General Fund				RSFDN
Miscellaneous Restricted General Fund Revenues				RMISRES
Equals: TOTAL GENERAL FUND EXPENDITURES				EXGF
Add: Interagency Receipts				EXINREC
Equals: TOTAL GENERAL FUND EXPENDITURES [Dept. of Administration]				EXGF.AFR

TABLE 4 (continued)

Minus:	Special Capital Appropriations		EXSPCAP
	General Fund Capital		EXGFCAP
	Special Permanent Fund Contributions		EXPFCONX
	Permanent Fund Distribution Augmentation		EXTRNSX
	Federal Grants-in-Aid for Capital		RSFDNCAX
	Statistical Discrepancy		(EXINREC-EXINRECB)
Add:	Special Fund Receipts		RSFS
	Enterprise Fund Receipts		RSIAS
	Non-General Fund University of Alaska Receipts		PARNONGF * EXUA
Equals:	<u>TOTAL OPERATING BUDGET</u>		EXBUD
	Operations	EXOPS	
	Debt Service	EXDSS	
	Non-General Fund U of A Receipts	PARNONGF * EXUA	
Add:	Capital Expenditures		EXCAP
	general fund	EXGFCAP	
	capital projects fund (bond sales and federal grants)	EXCPS	
	Special Capital Expenditures		EXSPCAP
	Permanent Fund Dividends		EXTRNS
Equals:	<u>TOTAL STATE SPENDING</u>		EX99S

Two constant difficulties in modeling state fiscal behavior are the lack of consistency in the data among the primary sources utilized and the evolution over time in programs, organizational structure, and methods and formats for the presentation of data. This evolution is often rapid and radical.

In order to obtain a complete picture of state government fiscal activities, three major sources of data--the Department of Revenue Revenue Sources and Petroleum Production Revenue Forecast, the Department of Administration Annual Financial Report, and the Office of the Governor Budget Document--as well as a number of other data sources are used. Different accounting conventions as well as different definitions of such items as the general fund balance, general fund revenues, etc., among these sources and also between these sources and other sources of information on government fiscal activity such as the legislature make it impossible, particularly during periods of rapid growth in government activity reflected in the appearance of new programs, to model state fiscal activity consistently from the perspective of all data sources. The guiding principle in the development and evolution of the fiscal model is that it be the best consistent representation of all fiscal aspects of state government and clearly incorporate into its structure the most important linking mechanisms between state spending, fund balances, and the size and composition of the private economy.

The general fund is the main state government fund into which the majority of state revenues flow and from which general appropriations for government operations, including capital expenditures, and transfers to local governments originate. Unappropriated funds accumulate in the general fund until they are appropriated and spent. These funds are, in general, available for any purpose, with two exceptions. First, a large portion of general fund appropriations fund entitlement programs which are budgeted on the basis of formulas linked to population, price level, and other economic and demographic variables. The formulas may be altered by law, but absent such changes, these program budgets will vary automatically with economic and demographic change. Second, a portion of general fund revenues termed "restricted" consists of federal grants-in-aid, interagency receipts, and other minor sources of income that are restricted in use to certain programs. These restricted revenues form a part of the overall budget but are not a source of discretionary state spending.

The Permanent Fund is the other major fund of the state. A constitutionally specified portion of state royalties and bonuses from the sale and production of natural resources, principally petroleum, is deposited in the Permanent Fund. These deposits can be supplemented by special contributions and the reinvestment of earnings. Fund earnings can also be transferred to the general fund or also directly into a cash distribution program.

State government activity affects the private economy in several ways which are listed and described in Table 5.

TABLE 5. LINKS BETWEEN FISCAL AND ECONOMIC ACTIVITY

WSGS	State government wages and salaries combine with a state government wage rate to determine employment. The level of wages and salaries is a function of both the size and composition of the state operating budget.
XXVACAP	The value added by state-funded (including local grants RLTMCAP) capital construction contributes to the total value added of the construction industry. Value added is a function of the size and composition of the state capital budget.
EXTRNS	Permanent Fund dividends increase individual disposable personal income.
RTIS	State personal income tax payments reduce individual disposable personal income.
EXSUBS	Subsidies increase discretionary income and stimulate the activity being subsidized in the short run but have no effect in the long run.
WSGL	Local government wages and salaries combine with a local government wage rate to determine employment. This is a function of the size of the local government budget.
RLT99	Transfers from state to local government increase local spending and reduce state spending. State spending is reduced by education transfers, tax sharing, revenue sharing, capital grants, and exogenous transfers. Local spending is increased by education transfers, tax sharing, revenue sharing, and exogenous transfers. Capital grants remain as a portion of state-funded construction activity.

Modeling of local fiscal activity is subject to the same problems of historical consistency and data availability as state fiscal activity modeling. The main data source is the annual report on local government fiscal activity from the U.S. Department of Commerce. The data in these documents is based upon survey rather than census, and the definitions are not always consistent with either the state of Alaska or the various local governments in the state. The major problem area is linking of the state and local fiscal sectors through the modeling of state-local transfers. Not only have the programs themselves changed form on an almost annual basis in recent years, but the local response to increased state assistance has varied by program. Local government can, and does, both increase its programs and reduce local taxes when state aid increases. These links consequently are modeled in a very general way.

The level of local government activity is essentially determined by state transfers and average per capita wealth.

Fiscal Rule

The state fiscal model is guided by a "fiscal rule" which is a set of user-specified parameters which control the level and composition of state spending (and thus indirectly influence the level of local government spending). The "fiscal rule" is necessary because the size and composition of state appropriations is the result of a political process which in years past has displayed no stability or consistency. Consequently, the past cannot serve as an adequate basis for modeling future spending.

In addition, the various uses to which the model is put require that alternative specifications of future state spending patterns be available for particular analyses. Because of the large relative size and economic importance of state spending in the Alaska economy, it is important to be able to vary the pattern of state spending when performing different analyses with the model.

Specifically, the model has been used for the following types of analyses, each requiring a different formulation of the "fiscal rule":

1. Projections. In these analyses, the most likely fiscal behavior is assumed.

2. Fiscal Policy Analysis. In these analyses, the fiscal and economic effects of particular fiscal policies are examined, for example, the effects of the Permanent Fund dividend distribution program.

3. <u>Aggregate Spending Analyses</u>. In these analyses, the fiscal and economic effects of different aggregate state spending strategies are analyzed.

4. <u>Public Service Demand Analyses</u>. In these analyses, demand for public services determines the level of spending. Demand can be in the form of population, price level, personal income, exogenous growth rates, or other variables.

5. <u>Impact Analyses</u>. In these analyses, the fiscal and economic effects of specific private sector economic activities are examined. The state fiscal response to a change in private sector activity can be specified in a variety of ways.

Because of the constantly changing modeling requirements dictated by different analyses as well as changing state fiscal behavior, the "fiscal rules" are constantly changing, and rather than reflecting a model weakness, this is actually a reflection of the continuing instability and volatility within the state fiscal sector.

At present, the "fiscal rule" is controlled by the spending limit when revenues and fund balances are sufficient to spend the amount allowed by the limit and by available revenues otherwise. Table 6 shows the parameters (each is actually a vector of values) which the user must select in choosing a "fiscal rule" within the framework of the spending limit. One important policy change occurs automatically in response to elimination of the Permanent Fund dividend distribution. This is reinstatement of the personal income tax after two years.

TABLE 6. PARAMETERS OF CHOICE: STATE "FISCAL RULE" FOR SPENDING LIMIT CASE (EXRL5)[a]

<u>LIKELY TO CHANGE BETWEEN SCENARIOS</u> (POLICY)

APPFCONX	state general fund appropriations to the Permanent Fund
BALGFUNA	state general fund balance unavailable for appropriation
EXDFPCNT	percent of development fund earnings withdrawn
EXDF1	percent of state current account balance placed into development fund (hypothetical)
EXGFOPSX	exogenous component of state unrestricted general fund operating expenditures
EXPFCONX	Permanent Fund contributions appropriated from the general fund
EXPFDIST	percent of Permanent Fund earnings (calculated as five-year moving average) distributed to individuals as dividends
EXPFTOGF	percent of Permanent Fund earnings net of dividends transferred to the General Fund
EXPF1	percent contribution from available funds to Permanent Fund
EXSAVX	if EXRLOP7 is invoked in determination of state operating expenditures, this is the exogenous amount of revenues not spent
EXSPCAP	special capital appropriations over the spending limit
EXSPLITX	the target allocation to operations when state spending falls below the authorized spending limit
EXSUBSX	the level of exogenous state subsidies under programs initiated since 1980
EXSUB1	stimulative effect of state subsidies on construction industry
EXSUB2	stimulative effect of state subsidies on consumer spending

[a]Not including petroleum revenues.

TABLE 6 (continued)

EXTRNSX	state Permanent Fund dividend distribution funded through the general fund
LBOND1	proportion of state general obligation bonds for highways
LFED1	proportion of federal capital grants for highways
LGF1	proportion of general fund capital expenditures for highways
RLPTX	exogenous local property tax
RLTFPX	petroleum-related federal-local government transfers
RLTMCAP	municipal capital grants from the state
RLTX	exogenous state-local transfers
RSFDNX	exogenous federal-state transfer payments
RTCSX	exogenous corporate income tax

<u>UNLIKELY TO CHANGE BETWEEN SCENARIOS</u> (EXOGENOUS)

EXDSSX	annual debt service payment to service general obligation bonds outstanding at beginning of simulation period
EXPFDVX1	accounting adjustment to Permanent Fund retained earnings in early years
EXPFDVX2	accounting adjustment to Permanent Fund dividend program in early years
EXTRNSPI	state Permanent Fund dividends in 1982 and 1983 incorporated in state personal income
GODTX	general obligation bonded indebtedness of the state from debt incurred before start of simulation
LPTRAT	percentage of pipeline property within local jurisdictions actually subject to local tax because of limitations imposed by state statutes
P9PTPER	percentage of petroleum property which is taxable by state which falls within local taxing jurisdiction

TABLE 6 (continued)

RSFDNCAX	federal grants-in-aid to state general fund for capital expenditures
RSIP5	state Permanent Fund interest--initial adjustment
RTISXX	adjustment of disposable income to cover lag in refund in state personal income taxes after repeal
TCRED	individual tax credit beginning after 12/31/77
TXBASE	change in the floor of personal income tax rate schedule
TXCRPC	state personal income tax credit adjustment (percentage of tax liability)
TXPTXX	adjustment to withold from state expenditures a portion of any personal income tax reduction
TXRT	percentage change in state personal income tax rate

SPECIAL STARTUP VALUES REQUIRED (EXOGENOUS)

BALDF6	EXGFCAP6	RLTMA6
BALGF6	EXGFCOT6	RLTRS6
BALPF6	EXOPS6	RMISRES6
BIU6	EXUA6	RSFDN6
EXCPSFD6	PITRAN6	RSIG6
EXCPSGB6	RLTEB6	RTOTS6

STATE FISCAL MODULE DETAIL

Petroleum Revenues

Petroleum revenues (RP9S) are divided between the general fund (RP9SGF) and the Permanent Fund (RP7SPF) which receives a portion (EXPF1) of bonuses (RPBS), royalties (RPRY), rents (RPEN), and federal-shared royalties (RSFDNPX). In addition to those sources of petroleum revenues split between the general and Permanent Funds (RP7S), other petroleum revenues which go into the general fund consist of the state portion of property taxes (RPPS), severance taxes (RPTS), corporate income taxes (RTCSPX), and miscellaneous (RP9X). All are exogenous. The cumulative discounted value of petroleum revenues from 1984 is calculated (DF.RSVP).

```
18:  RP7S == RPBS+RPRY+RPEN+RSFDNPX

19:  RPBSGF == (1-EXPF1)*RPBS

20:  RPRYGF == (1-EXPF1)*RPRY

21:  RPENGF == (1-EXPF1)*RPEN

22:  RSFDNPXG == (1-EXPF1)*RSFDNPX

23:  RP7SGF == RPBSGF+RPRYGF+RPENGF+RSFDNPXG

24:  RP7SPF == RP7S-RP7SGF

25:  RP9S == RP7S+RPPS+RPTS+RTCSPX+RP9X

26:  RP9SGF == RP9S-RP7SPF

27:  DF.RSVP = IF YR LT 1984 THEN 0 ELSE DF.RSVP(-1)+RP9S*
     (PDRPIBAS/PDRPI)*(1/(1+RORDISK)**(YR-1983))
```

Personal Income Taxes[1]

Although Alaska does not presently impose an income tax on individuals, the personal income tax equations remain in the model for several reasons. It is possible to calculate what the tax receipts would be if reimposed, the model structure is ready if it is reimposed, and the similar structure of the federal and state personal income taxes means it is easier to calculate the federal tax receipts with some information about the structure of the state tax.

---

[1]Including Federal and local for purposes of calculating disposable personal income

Personal taxes netted out of income to arrive at disposable income include state income taxes paid by residents on a calendar-year basis (RTISCP), federal income taxes (RTPIF), and local taxes (DPIRES). Total calendar-year state income taxes (RTISC) and fiscal year taxes (RTIS) are also calculated.

The state income tax is calculated on a per-taxpayer basis (RTISCA) using Alaska taxable income (ATI) and the number of taxpayers (ATT). Alaska taxable income is derived from federal adjusted gross income earned in Alaska (FAGI) by first netting out nontaxable military pay (WSGM) and Native claims payments (ANCSA) and adding in the taxable federal cost-of-living allowance (COLA) to derive Alaskan adjusted gross income (AGI). This is next reduced by exemptions (AEX) each of which has a value (VAEX) and deductions (ATD).

Several policy variables allow for examination of changes in the tax structure (TXBASE, TXRT, TXCRPC, TCRED). Finally, the difference between tax receipts using the historical (pre-1978 schedule) and the structure under examination is calculated (RTISLOS).

Federal adjusted gross income reported in Alaska (FAGII), smaller than federal adjusted gross income earned in the state because of transient workers, forms the base for federal personal income tax collections.

```
28:  LOG(FAGI) = C21A+C21B*LOG(PI8)+C21C*LOG(EMCNX1+EMP9)

29:  LOG(FAGII) = C22A+C22B*LOG(PI)

30:  COLA = (1-1/(1+PCOLART))*WSGC

31:  AGI = FAGI+COLA-WSGM-PC12N*PC12RN*ANCSA*PCNC1

32:  AEX*1000 = C10A+C10B*POPC+C10C*(EMCNX1+EMP9)

33:  ATT = C28A+C28B*(EM99-EMGM)+C28C*EMCNX1

34:  LOG(ATD/ATT) = C23A+C23B*LOG(AGI/ATT)+C23C*D69+C23D*D72

35:  VAEX = IF YR LT 1983 THEN VAEX6 ELSE VAEX(-1)*(1+GRUSCPI)

36:  ATI = AGI-AEX*VAEX-ATD

37:  ATI.TT = ATI/ATT

38:  LOG(RTISCA1) = C24A-TXBASE+C24B*(1-TXRT)*LOG(ATI.TT)

39:  LOG(RTISCA2) = C24A+C24B*LOG(ATI.TT)
```

```
40:  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)

41:  RTISLOS == (RTISCA2-RTISCA)*ATT

42:  RTISC = RTISCA*ATT

43:  RTIS = IF YR EQ 1980 THEN 0 ELSE C25A*RTISC(-1)+C25B*RTISC

44:  RTISCP = C105A+C105B*PI8+C105C*RTISC

45:  LOG(RTPIF/ATT) = C26A+C26B*LOG(FAGII/ATT+TCRED/1000/ATT+
     RTISLOS/ATT-EXPF3*EXTRNS/ATT)+C26C*D61.68*LOG(FAGII/ATT+
     TCRED/1000/ATT+RTISLOS/ATT-EXPF3*EXTRNS/ATT)

46:  DPIRES = C27A+C27B*PI3+C27C*WSCNP
```

Other Taxes

A number of other small sources of revenues complete the modeling of state taxes. Of these, the most important is the corporate income tax composed of petroleum industry taxes (RTCSPX), endogenous taxes (RTCS1), and exogenous taxes associated with some future large activities (RTCSX).

The gross receipts tax (RTBS) has been largely eliminated since 1979, but its structure is still modeled using business licenses (BL) and gross receipts (GR) as the tax base. From the latter, gross taxable receipts (GTR) are calculated. Only a fraction (PBLTBL) of revenues which would have been received prior to 1980 are now collected.

The motor fuel tax (RTMF) is next in order of importance. It is a function of the volume of fuel oil sales (THG) which, in turn, is a product of the number of vehicles on the road (TPTV) and average consumption per vehicle (AHG).

Other endogenous taxes are ad valorem taxes, which are similar to a gross receipts tax but levied only on insurance companies and public utilities (RTVS), alcohol (RTAS) and cigarette (RTCIS) sales taxes, and the school tax (RTSS) which was eliminated in 1981. Finally, there is a residual category of other taxes (RTOTS) consisting of fish processing taxes and miscellaneous small revenue producers.

Total taxes (RT99) includes all general fund taxes except for a portion of cigarette taxes (PECIG) earmarked for a special revenue fund.

```
47:  RTCS1*100/PDRPI = C43A+C43E*D80+C43D*(EM97(-1)-EM97(-2))+
     C43B*EMCNX1(-1)+C43C*EM97(-1)

48:  RTCS == RTCS1+RTCSPX+RTCSX

49:  BL = C39A+C39B*(XX98-XXP9)

50:  LOG(GR) = C40A+C40B*LOG(XX98-XXP9)

51:  RTBS1 == BL*1000*PBTRATE

52:  GTR = GR-BL(-1)*PNTGR*1000

53:  LOG(RTBS2*10**3/BL(-1)) = C29A+C29B*LOG(GTR(-1)*10**3/BL(-1))

54:  RTBS == IF YR GE 1979 THEN RTBS1+RTBS2*PBLTBL ELSE
     RTBS1+RTBS2

55:  TPTV = C38A+C38B*POP

56:  LOG(AHG) = C37A+C37B*LOG(PR.PI)

57:  THG == AHG*TPTV

58:  LOG(RTMF) = C46A+C46B*LOG(THG)

59:  LOG(RTVS) = C47A+C47B*LOG(R.DPI8N(-1))

60:  LOG(RTAS) = C48A+C48B*LOG(R.DPI(-1))

61:  LOG(RTCIS) = C49A+C49B*LOG(R.DPI(-1))

62:  RTSS = IF YR GT 1980 THEN 0 ELSE C50A+C50B*(EM99-EMGM)

63:  RTOTS = IF YR LE 1984 THEN RTOTS6 ELSE RTOTS(-1)*(1+GRUSCPI+
     GRDIRPU)

64:  RT99 == RTIS+RTCS+RPPS+RPTS+RP9X+RTBS+RTMF+RTAS+(1-PECIG)*
     RTCIS+RTVS+RTSS+RTOTS
```

Other State General Fund Unrestricted Revenues

Licenses and fees (ROFTS) consist of auto licenses and fees (ROFAS) and business and some nonbusiness licenses and fees (ROFOS). State ferry income (RFERS) is a component of general fund revenues, which grows with income. The final element is miscellaneous nontax revenues consisting of such things as nonpetroleum royalties and user fees.

65: LOG(ROFAS) = C30A+C30B*LOG(TPTV(-1))

66: LOG(ROFOS) = C33A+C33B*LOG(PI3(-1))

67: ROFTS == ROFAS+ROFOS

68: ROFERS = ROFERS(-1)*(1+GRUSCPI+GRDIRPU)

69: LOG(RMIS) = C35A+C35B*LOG(PI3(-1))

State Investment Earnings

State investment earnings from all state funds (RSI99), including the general fund (RSIG), Permanent Fund (RSIP), and a (hypothetical) development fund (RSID), are calculated based upon the balance in each fund and a fund-specific real rate of return. They are as follows: general fund--ROR, Permanent Fund--ROR+RORPPF, development fund--ROR-RORPDF.

Net earnings of each fund, after accounting for Alaskan inflation, is also calculated for each fund (RSIPNET, RSIDNET, RSIGNET, RSI99NET).

A portion (EXPFTOGF) of the earnings of the Permanent Fund (RSIPGF) is transferred to the general fund which, together with general fund earnings, comprise total investment revenues of the general fund (RSIN).

70: RSIP = RSIP5+(ROR+GRUSCPI+RORPPF)*(BALPF(-1)+
(RP7SPF+EXPFCONX)/2)

71: RSIPGF = IF YR LT 1984 THEN EXPFTOGF*RSIP ELSE EXPFTOGF*
(RSIP-EXTRNS)

72: RSID == (ROR+GRUSCPI-RORPDF)*BALDF(-1)

73: RSIG == IF YR LE 1983 THEN RSIG6 ELSE (ROR+GRUSCPI)*
BALGF9(-1)

74: RSIN == RSIG+RSIPGF

75: RSI99 == RSIG+RSID+RSIP

76: RSIPNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1)+RORPPF)*
BALPF(-1)

77: RSIDNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1)-RORPDF)*
BALDF(-1)

78: RSIGNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1))*BALGF9(-1)

79: RSI99NET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1))*BAL99+RORPPF*
BALPF(-1)-RORPDF*BALDF(-1)

Total Unrestricted, Restricted, and Total General Fund Revenues

Total unrestricted general fund revenues (RSGFBM) is the sum of taxes and other revenues, including any transfers into the general fund from the (hypothetical) development fund (EXDFWITH), net of state ANCSA payments (SANCSA).

Total general fund revenues (RSGF) consist of restricted (RSGFRS) as well as unrestricted (RSGFBM) funds. Restricted funds include federal program augmentation (RSFDN) and state program augmentation as well as miscellaneous restricted receipts (RMISRES). These are both categories for funds earmarked for specific purposes. Total general fund revenues defined by the Annual Financial Report (RSGF.AFR) also includes interagency receipts (EXINREC).

80: RSGFBM == RT99+RP7SGF+ROFTS+ROFERS+RSIN+RMIS-SANCSA+EXDFWITH

81: RSFDN = IF YR LE 1983 THEN RSFDN6 ELSE RSFDNX+RSFDN(-1)*
(1+GRUSCPI+GRDIRPU)

82: RMISRES = IF YR LE 1983 THEN RMISRES6 ELSE RMISRES(-1)*
(1+GRUSCPI+GRDIRPU)

83: RSGFRS == RSFDN+RMISRES

84: RSGF = RSGFBM+RSGFRS

85: RSGF.AFR == RSGF+EXINREC

Permanent Fund and Development Fund (hypothetical)

Gross Permanent Fund contributions (EXPFCON9) consist of three elements: statutorially required contributions (RP7SPF), earnings (RSIP), and general fund appropriations actually paid (EXPFCONX). Permanent fund earnings are allocated between the general fund (RSIPGF), the dividend distribution program (EXTRNS), and reinvestment (RSIPPF). Earnings not transferred to the general fund (RSIPPF1) plus statutory contributions (RP7SPF) comprise net fund revenues (EXPFCON1). Net fund additions (EXPFCON) are retained earnings (RSIPPF), plus statutory contributions (RP7SPF), plus special appropriations (EXPFCONX). The dividend amount is P.EXTRNS.

A development fund does not currently exist but has periodically been suggested for the specific purpose of investing in Alaskan infrastructure development. If it did, a certain portion of excess current account revenues plus annual investment earnings net of withdrawals might form the annual contributions (EXDFCON). Withdrawals might be a percentage of net earnings (EXDFPCNT).

```
93:  RSIPPF1 == RSIP-RSIPGF

94:  RSIPPF == IF YR LT 1984 THEN RSIPPF1-EXPFDVX1 ELSE
     (IF YR EQ 1984 THEN RSIPPF1-(EXTRNS-50) ELSE RSIPPF1-EXTRNS)

95:  EXPFCON1 = RP7SPF+RSIPPF1

96:  EXPFCON9 == RSIP+RP7SPF+EXPFCONX

97:  EXPFCON = RSIPPF+RP7SPF+EXPFCONX

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

99:  EXDFWITH = EXDFPCNT*RSIDNET
```

Total Revenues and Miscellaneous Fund Revenues

Total revenues (R99S) is defined to include general fund revenues, net Permanent Fund revenues (EXPFCON1), and (hypothetical) development fund earnings, all net of state required ANCSA payments (SANCSA), which were completed in 1981. Since deposits and withdrawals can occur between these funds, care is taken to avoid double counting.

Endogenous revenues (RSEN) is the residual of total revenues minus petroleum revenues, investment earnings, and federal transfers. Total general fund unrestricted revenues can be divided into three categories: petroleum (RP9SGF), fund earnings (RSIN), and endogenous revenues (RSENGF).

Revenues into two other small families of funds are calculated. Special revenue funds (RSFS) consist of some special fees and licenses (RSFFS), a portion (PECIG) of cigarette taxes, and some miscellaneous items like federal revenue sharing. The international airport enterprise fund (RSIAS) is the final category.

86: R99S = RSGF+EXPFCON1+(RSID-EXDFWITH)

91: RSEN == SANCSA+R99S-RP9S-RSI99-RSFDN

92: RSENGF == SANCSA+RSGFBM-RP9SGF-RSIN

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

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

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

90: RSIAS = RSIAS(-1)*(1+GRUSCPI+GRDIRPU)

State Expenditures--Major Categories

The constitutional amendment establishing the expenditure limit (EXLIM) places a ceiling on state appropriations from the general fund except for debt service (EXDSS), voter-approved capital expenditures (EXSPCAP), and supplementary Permanent Fund contributions (APPFCONX). The ceiling has been set at $2.5 billion for 1982, and is annually adjusted for inflation and population change. The allowable limit (EXLIMOK) may be less than this if current revenues plus the balance in the general fund are less than the spending limit ceiling. The difference between these amounts is defined as the revenue gap (RSGFGAP).

The spending limit also requires that a portion (EXSPLIT), no more than two-thirds of appropriations, be allocated toward operations (APGFOPS), with at least one-third for capital (APGFCAP), including subsidies (EXSUBS) and municipal capital grants (RLTMCAP). If the limit is not in effect, this rule may be inoperative, depending upon interpretation of the amendment. Total general fund appropriations (APGF) exceeds that under the limit since it includes debt service (EXDSS), special capital appropriations (EXSPCAP), supplementary Permanent Fund contributions (APPFCONX), and ANCSA payments (SANCSA).

Total operating expenditures (net of debt service) funded from all sources (EXOPS) is the sum of the operating portion of the general fund (EXGFOPS) which equals appropriations (APGFOPS) and operating expenditures funded from sources not constrained by the limit. These sources are interagency receipts (EXINRECB), restricted general fund revenues (RSGFRS) net of those federal transfers earmarked for capital expenditures (RSFDNCAX), special revenue fund receipts (RSFS), and the international airport enterprise fund (RSIAS).

A number of other rules for determining state operating expenditures are possible but are currenty not utilized. These involve linking spending to demand factors such as income and population, allowing spending to grow at some fixed rate, allowing spending to grow as some function of a base case (BASEXOPS), or spending some annuity amount (EXANSAV or EXSAVS).

Total capital expenditures (EXCAP) is determined in the model as capital expenditures from the general fund (EXGFCAP), augmented by capital expenditures funded out of capital projects funds (EXCPS). Special capital expenditures (EXSPCAP) are not included in this definition of capital expenditures.

As with the operating budget, several other options are available, but not currently in use, for formulating state government capital expenditure behavior. These alternatives parallel those for the operating budget but include, in addition, the alternative of programming capital spending to maintain a specified level of real per capita state capital stock (PR.BALCP).

The other main elements of state spending are the Permanent Fund dividend program (EXTRNS) and subsidy programs (EXSUBS) as well as municipal capital grants (RLTMCAP) in the capital budget. The dividends are determined as a proportion (EXPFDIST) of Permanent Fund earnings over the previous five years plus general fund augmenting appropriations (EXTRNSX). Municipal capital grants are set exogenously. Subsidies are exogenous. Interagency receipts defined in the Annual Financial Report (EXINREC) are a function of the operating budget; interagency receipts defined by the Executive Budget (EXINRECB) are a function of EXINREC.

```
110: EXLIM = IF YR EQ 1982 THEN EXLIM82 ELSE EXLIM82*
     (PDRPI/364.23)*(POP/460)

111: EXLIMOK = IF YR LT 1985 THEN EXLIM ELSE (IF RSGFBM-EXDSS+
     BALGFAFA(-1) GT EXLIM THEN EXLIM ELSE RSGFBM-EXDSS)

112: RSGFGAP == EXLIM-EXLIMOK

113: 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))

114: APGFOPS == EXLIMOK*EXSPLIT

115: APGFCAP == EXLIMOK*(1-EXSPLIT)

116: APGF == APGFOPS+APGFCAP+EXDSS+EXSPCAP+APPFCONX+SANCSAX

117: EXGFOPS == APGFOPS+EXGFOPSX

118: EXOPS = IF YR LE 1985 THEN EXOPS6 ELSE EXRL5*(EXGFOPS+
     EXINRECB+RSGFRS-RSFDNCAX+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))))

119: EXANSAV = RP9S+RSIG+RSIP-EXANNU*(1+RORANGRO)**(YR-1983)
```

120: EXSAVS = EXSAVX+EXPFCON+TXPTXX*RTISLOS

121: EXGFCAP == IF YR LE 1985 THEN EXGFCAP6 ELSE 0.3*APGFCAP+0.7*APGFCAP(-1)

122: EXCAP = IF YR LE 1985 THEN EXGFCAP+EXCPS ELSE EXRL5*(EXGFCAP+EXCPS)+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)))

123: EXSUBS = IF YR LT 2011 THEN EXSUBSX ELSE (IF EXRL5 EQ 1 THEN (IF RSGFBM(-1)+RSGFBM(-2)-1 LT EXGFBM(-1)+EXGFBM(-2) OR EXSUBS(-1) EQ0 THEN 0 ELSE EXLIMOK*(0.5*(1-EXSPLIT))) ELSE EXSUBS(-1)*(1+GRUSCPI))

124: EXTRNS = IF YR LT 1984 THEN EXTRNSX+EXPFDVX2 ELSE EXTRNSX+EXPFDVX2+EXPFDIST*(RSIP(-1)+RSIP(-2)+RSIP(-3)+RSIP(-4)+RSIP)/5

125: EXINREC = C17A+C17B*(EXOPS-RLT99)+C17C*D82

126: EXINRECB = C108A+C108B*EXINREC

State Expenditure Totals

Total general fund expenditures, including restricted and unrestricted accounts (EXGF), consists of operations (EXGFOPS+RSGFRS), debt service (EXDSS), general fund capital expenditures (EXGFCAP), special capital expenditures (EXSPCAP), special Permanent Fund appropriation (EXPFCONX), and Permanent Fund dividend augmentation (EXTRNSX). Unrestricted general fund expenditures (EXGFBM) nets out restricted revenues (RSGFRS).

General fund expenditures defined by the Annual Financial Report is also calculated (EXGF.AFR). Traditional general fund operating expenditures defined by the Annual Financial Report (EXGFOT.A) is also calculated.

Operating expenditures defined by the state budget (EXBUD) includes debt service expenditures and nongeneral fund University of Alaska receipts as well as operating expenditures defined above (EXOPS).

Two other variables calculated are total expenditures (EX99S) and nonoperating expenditures (EXNOPS).

186: EXGF = EXGFOPS+EXDSS+EXGFCAP+EXSPCAP+EXPFCONX+RSGFRS+EXTRNSX

187: EXGFBM = EXGF-RSGFRS

188: EXGF.AFR == EXGF+EXINREC

189: EXGFOT.A == EXGFOPS+EXINREC+RSGFRS-RSFDNCAX

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

191: EX99S = EXBUD+EXTRNS+EXCAP+EXSPCAP

192: EXNOPS = EX99S-EXOPS

State Operating Expenditure Detail

An initial estimate of state operating expenditures net of debt service in each of nine functional categories (EXaaa4) is calculated as a function of total operating expenditures. From these, the ratio RATIO1 is formed with total operating expenditures, and the initial estimates are ratioed down or up so that the final values (EXaaa) sum exactly to total operating expenditures. In the commerce and economic development program (EXCDS), exogenous state local transfers (RLTX) are added in before the adjustment occurs.

University of Alaska expenditures (EXUA) are a large part of the total education budget and are thus calculated separately.

Personnel expenditures by program category (EXPRaaa) are a function of expenditures. For two program categories, education and commerce, this is net of transfers to local government. Preliminary estimates of total education transfers (RLTE994), tax sharing (RLTT94), and revenue sharing (RLTRS4) come from the local government model. These are adjusted for consistency with total operating expenditures by RATIO1 and then netted out of their respective categories.

Total personnel expenditures (EXPR99) and state government wages and salaries fiscal-year (WSGSFY) and calendar-year basis (WSGS) are derived from the detailed categories.

127-135: LOG(EXaaa4) = CbbA+CbbB*LOG(EXOPS)

136: RATIO1 == EXOPS/(EXEDS4+EXSSS4+EXHES4+EXNRS4+EXPPS4+
EXJUS4+EXCDS4+RLTX+EXTRS4+EXGGS4)

137: EXUA = IF YR LE 1983 THEN EXUA6 ELSE EXUA(-1)*
(EXOPS/EXOPS(-1))

138-145: EXaaa = RATIO1*EXaaa4

146: EXCDS = RATIO1*(EXCDS4+RLTX)

147: RLTE99 = RLTE994*RATIO1

148: EXEDSNT == EXEDS-RLTE99

149: RLTT9 = RLTT94*RATIO1

150: RLTRS = RLTRS4*RATIO1

151: EXCDSNT = EXCDS-RLTT9-RLTRS-RLTX

152: EXPRCDS = C7A+C7B*EXCDSNT

153: EXPREDS1 = C1A+C1B*EXEDSNT+C1C*D61.75*EXEDSNT

154-161: EXPRaaa = CbA+CbB*EXaaa

162: EXPR99 = EXPREDS1+EXPRSSS+EXPRHES+EXPRNRS+EXPRPPS+
EXPRJUS+EXPRCDS+EXPRGGS+EXPRTRS+EXPRUA

163: WSGSFY = PCWS1*EXPR99

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

State Capital Expenditure Detail

The sources of revenues for the capital projects fund (EXCPS) are federal capital grants (EXCPSFED) and general obligation bonds of the state (EXCPSGOB). This latter funding source determines the ongoing debt service requirement of the state (EXDSS) based upon the schedule of debt outstanding from previous bond sales (EXDSSX) plus debt service on debt newly incurred after 1983 (DEBTP83). This new debt is paid off at a constant rate over a fifteen-year period, like a mortgage, according to the capital recovery factor (RORCRF) applied to the newly incurred debt (retired after fifteen years using EXCPSM).

The proper measure of the current bonded debt of the state is GODT, consisting of the schedule of debt outstanding from bond sales through 1983 (GODTX) and the remaining debt from bond sales made after 1983. This debt is assumed paid off at the rate of about 7 percent annually for fifteen years.

Capital expenditures for purchases of state capital goods are divided into four major categories according to funding source and expenditure type. Highway and nonhighway capital expenditures may be funded out of the general fund (EXGFCHY and EXGFCNH) or from the capital projects fund which receives its revenues from general obligation bond sales and federal capital grants (EXCPSHY and EXCPSNH). The proportion of each funding source allocated to highway expenditures is LGF1 for the general fund, LFED1 for federal funds, and LBOND1 for bonds. Total highway (EXHYCAP) and nonhighway (EXNHYCP) capital expenditures are also calculated. Ferry capital expenditures (EXCAPFR) are calculated separately since they represent purchases outside the state.

Capital budget expenditures of the general fund includes traditional "bricks and mortar" expenditures (EXGFCAP1) as well as nontraditional items. These are calculated for the general fund (EXGFCOT) and total funds (EXCAPOT). They consist of subsidies (EXSUBS) and municipal grants (RLTMCAP) from the general fund.

The value added to the construction industry from state government capital expenditures (XXVACAP) consists of the nominal value of highway (XXVHY) and nonhighway (XXVNHY) value added, deflated by the price deflator for construction (PDCON). Special capital spending (EXSPCAP), municipal capital grants (RLTMCAP), and a portion of the value of subsidies (EXSUB1) contribute to nonhighway construction value added.

```
165:  RORCRF == (GRUSCPI+RORBOND)*(1+GRUSCPI+RORBOND)**15/
      ((1+GRUSCPI+RORBOND)**15-1)

166:  EXCPSGOB == IF YR LE 1985 THEN EXCPSGB6 ELSE IF EXDSS(-1)/
      RSGFBM(-1) GT 0.05 THEN 0 ELSE(0.05*RSGFBM(-1)-EXDSS(-1))/
      RORCRF

167:  EXCPSFED = IF YR LE 1983 THEN EXCPSFD6 ELSE EXCPSFED(-1)*
      (1+GRUSCPI)

168:  EXCPS = EXCPSGOB+EXCPSFED

169:  EXGFCOT = IF YR LE 1983 THEN EXGFCOT6 ELSE EXSUBS+RLTMCAP

170:  EXGFCAP1 == EXGFCAP-EXGFCOT

171:  EXCAPOT == EXGFCOT

172:  EXGFCHY = LGF1*(EXGFCAP-EXSUBS)

173:  EXGFCNH = (1-LGF1)*(EXGFCAP-(1-EXSUB1)*EXSUBS)

174:  EXCPSHY = LFED1*EXCPSFED+LBOND1*EXCPSGOB

175:  EXCPSNH = (1-LFED1)*EXCPSFED+(1-LBOND1)*EXCPSGOB

176:  EXNHYCP == EXGFCNH+EXCPSNH
```

177: EXHYCAP == EXGFCHY+EXCPSHY

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

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

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

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

182: EXDSS = IF YR LT 1984 THEN EXDSSX ELSE EXDSSX+RORCRF*
DEBTP83(-1)

183: EXCPSM = IF YR LT 1984 THEN 0 ELSE EXCPSGOB

184: DEBTP83 = IF YR LT 1984 THEN 0 ELSE DEBTP83(-1)+
EXCPSGOB-EXCPSM(-15)

185: GODT = IF YR LT 1984 THEN GODTX ELSE GODTX+EXCPSM(-14)*
0.067+EXCPSM(-13)*0.13+EXCPSM(-12)*0.2+EXCPSM(-11)*0.27+
EXCPSM(-10)*0.33+EXCPSM(-9)*0.4+EXCPSM(-8)*0.47+EXCPSM(-7)*
0.53+EXCPSM(-6)*0.6+EXCPSM(-5)*0.67+EXCPSM(-4)*0.73+
EXCPSM(-3)*0.8+EXCPSM(-2)*0.87+EXCPSM(-1)*0.93+EXCPSGOB

State Fund Balances

Two measures of current account balance are calculated. The first is the current account balance for the general fund account (BALCABGF), and the second is the current account balance for the general plus Permanent Fund accounts (BALCAB).

The model calculates several fund balances. The general fund balance (BALGF9) is calculated. The general fund balance available for appropriations is calculated (BALGFAFA) by netting out the portion which is not available for appropriations (BALGFUNA). The Permanent Fund (BALPF); the (hypothetical) development fund (BALDF); and the sum of the general fund, Permanent Fund, and development fund (BAL99) are calculated. Total balances available for appropriations is calculated (BAL99AFA).

Two special indicators of the general fund balance are calculated. The first shows only positive fund values (BALGFP); the second shows positive changes in the balance (BALGFCP).

193: BALCAB == R99S-EXGF-EXTRNS

194: BALCABGF == RSGF-EXGF

195: BALGF9 = IF YR LE 1983 THEN BALGF6 ELSE BALGF9(-1)+RSGF-EXGF

196: BALGFAFA = BALGF9(-1)+RSGF-EXGF-BALGFUNA

197: BALDF = IF YR LE 1983 THEN BALDF6 ELSE BALDF(-1)+EXDFCON

198: BALPF = IF YR LE 1983 THEN BALPF6 ELSE BALPF(-1)+EXPFCON

199: BAL99 = BALGF9+BALPF+BALDF

200: BAL99AFA = BALGFAFA+BALPF

201: BALGFP = IF BALGF9 LT 0 THEN 0 ELSE BALGF9

202: BALGFCP = IF BALGF9-BALGF9(-1) GT 0 THEN BALGF9-BALGF9(-1) ELSE 0

State Capital Stock and Operations, Maintenance, and Replacement Costs

The real value (R.BALCAP) and real per capita value of the capital stock (PR.BALCP) are calculated on the basis of the depreciation rate (RORCPDEP).

A set of equations calculates the cost of operations and maintenance (EXOM84) and replacement (EXRP84) of the state capital stock put in place beginning in 1984 (BALCAP84). Operations and maintenance is a constant proportion of the capital stock (EXOMCOST) while replacement is the rate necessary to offset depreciation (RORCPDEP). The running total for the capital stock put in place beginning in 1984 is augmented annually by new additions to the capital stock (EXCAPNEW). These annual new additions are net of replacement capital (EXCAPREP), consisting of the replacement of the depreciated pre-1984 capital stock in the annual amount of EXCAPOLD and replacement of the new stock (EXRP84).

203: R.BALCAP = R.BALCAP(-1)*(1/(1+RORCPDEP))+(EXGFCHY+EXGFCNH+EXCPS)*100/PDCON

204: PR.BALCP = R.BALCAP*1000/POP

205: EXCAPREP == IF YR LT 1984 THEN 0 ELSE RORCPDEP*BALCAP84(-1)+EXCAPOLD*(PDRPI/PDRPIBAS)

206: EXCAPNEW == IF YR LT 1984 THEN 0 ELSE EXGFCHY+EXGFCNH+EXCPS-EXCAPREP

207: BALCAP84 = IF YR LT 1984 THEN 0 ELSE BALCAP84(-1)*PDRPI/PDRPI(-1)+EXCAPNEW

208: EXOM84 == BALCAP84(-1)*EXOMCOST

209: EXRP84 == RORCPDEP*BALCAP84(-1)

LOCAL GOVERNMENT FISCAL MODULE DETAIL

Local Tax Revenues

The local property tax base has one component (LPTB1) which is related to the level of personal income and population. This component of the value of real property in the state is based upon local assessments. A "full-value" assessment (LPTB1FV) is calculated by the state for revenue sharing purposes and is higher by the ratio of full value to local value (PARLVFV).

The second component of the local property tax base is derived from the value of petroleum-related capital equipment subject to the state property tax (PTBP9). This value is calculated by multiplying the tax (RPPS) by the inverse of the tax rate (PTRTS) adjusted for the portion in local jurisdictions. Only a portion (P9PTPER) of petroleum property actually lies within the boundaries of local government, and it is this amount which is the actual base for local taxes (LPTBP9). The complete local property tax base (LPTB) is the sum of the endogenous component (LPTB1) and the proportion (LPTRAT) of petroleum property within local boundaries which is actually taxable because of the per capita maximum valuation restriction. In addition, the model generates the "full value" of local property (LPTBFV) which is the sum of endogenous "full value" property and petroleum property within local boundaries. Finally, the full value of personal property in the state (PPVAL) is calculated as the full value of the local endogenous base and the value of petroleum property.

Local property tax receipts (RLPT1) is a function of the value of property. If there is exogenous activity which generates additional property taxes, this is added (RLPTX) to get a grand total (RLPT). Other taxes (RLOT) consists primarily of sales taxes.

220: LOG(LPTB1) = C57A+C57B*LOG(P.PI(-1))+C57C*LOG(POP(-1))

221: LPTB1FV == LPTB1*1/PARLVFV

222: PTBP9 == RPPS*(1/PTRTS)/(1-P9PTPER*LPTRAT)

223: LPTBP9 == P9PTPER*PTBP9

224: LPTB = LPTB1+LPTBP9*LPTRAT

225: LPTBFV == LPTB1FV+LPTBP9

226: PPVAL == LPTB1FV+PTBP9

227: RLPT1 = C18A+C18B*LPTB1(-1)+C18C*PTBP9(-1)+C18D*D61.73

228: RLPT == RLPT1+RLPTX

229: LOG(RLOT*1000/POP(-1)) = C31A+C31B*LOG(PI(-1)*1000/POP(-1))

Local Transfers

The programs and formulas used to provide local government assistance have changed considerably in recent years, making modeling of these programs difficult. Preliminary values for all types of local transfers are calculated based upon the formulas currently used to determine transfer amounts (suffix 4). These are subsequently adjusted using RATIO1 for consistency with total state operating expenditures.

Total transfers (RLT99) consist of five categories as follows: tax sharing (RLTT9), revenue sharing (RLTRS), education (RLTE99), miscellaneous (RLTMS), and exogenous (RLTX).

The most important shared tax is a portion (PESLTC) of the corporate tax before 1982. After 1981, this program was replaced by the municipal assistance program (RLTMA). Other shared taxes are portions of ad valorem taxes (RLTVS) and other taxes (RLTOT), primarily the fish processing taxes.

State local revenue sharing (RLTRS) is a separate category of assistance. Miscellaneous transfers (RLTMS) is another which currently is composed of the municipal capital grants (RLTMCAP).

Educational transfers is the largest category (RLTE99), consisting of primary and secondary education transfers (RLTEA) and other (nonprimary and nonsecondary) education transfers (RLTEB). Primary and secondary education transfers are further divided into the following categories: cigarette tax transfers (RLTEC), Foundation program transfers (RLTEF), transportation transfers (RLTET), and other education transfers (RLTEO). The Foundation program is the basic program in support of education, and it is a function of the number of students (ADMSD) and the basic instructional unit allotment (BIU) which is a basic funding level. The number of students is calculated for district schools (ADMDIS) and for the rural educational attendance area schools (ADMREA).

```
230:  RLTCS4 = IF YR GT 1981 THEN 0 ELSE PESLTC*RTCS1

231:  RLTVS4 = C63A+C63B*RTVS

232:  RLTOT4 == PESLT*RTOTS

233:  RLTMA4 = IF YR LE 1983 THEN RLTMA6 ELSE RLTMA(-1)/
      PDRPI(-1)/POP(-1)*POP*PDRPI

234:  RLTT94 = RLTVS4+RLTOT4+RLTCS4+RLTMA4

235:  RLTRS4 = IF YR LE 1983 THEN RLTRS6 ELSE RLTRS(-1)*
      (1+GRUSCPI+GRDIRPU)

236:  RLTMS = RLTMCAP

237:  RLTEC4 == PECIG*RTCIS

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

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

240:  ADMSD = ADMDIS+ADMREA

241:  BIU = IF YR LE 1983 THEN BIU6 ELSE BIU(-1)*(1+GRUSCPI)

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

243:  RLTET4 = (POP/POP(-1)+PDRPI/PDRPI(-1)-1)*RLTET(-1)

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

245:  RLTEA4 == RLTEC4+RLTEF4+RLTET4+RLTEO4

246:  RLTEB4 = IF YR LE 1983 THEN RLTEB6 ELSE RLTEB(-1)*
      (1+GRUSCPI+GRDIRPU)

247:  RLTE994 = RLTEA4+RLTEB4

248:  RLTCS = RLTCS4*RATIO1

249:  RLTVS == RLTVS4*RATIO1

250:  RLTOT == RLTOT4*RATIO1

251:  RLTMA = RLTMA4*RATIO1

252:  RLTEC == RLTEC4*RATIO1

253:  RLTEF == RLTEF4*RATIO1
```

254: RLTET = RLTET4*RATIO1

255: RLTEO = RLTEO4*RATIO1

256: RLTEA == RLTEA4*RATIO1

257: RLTEB = RLTEB4*RATIO1

258: RLT99 = RLTT9+RLTRS+RLTE99+RLTMS+RLTX

Other Local Revenues

Other local revenues consist of federal transfers (RLTF), special petroleum-related federal transfers (RLTFPX), and miscellaneous fees and charges (RLMC). The level of miscellaneous fees and charges is set to maintain a zero balance on current account for local government accounts.

274: RLTF = RLTF(-1)*(1+GRUSCPI+GRDIRPU)

275: RL991 == RLPT+RLOT+RLT99+RLTF+RLTFPX

276: RLMC = EL99-RL991-(GOBONDL-GOBONDL(-1))

277: RL99 == RL991+RLMC

Local Government Expenditures

Total local government expenditures (EL99) consist of several components--education expenditures (ELED), non-education expenditures (ELNED1), and debt service expenditures (not including those provided by state government) (ELBD) as well as exogenous state-local transfers (RLTX), and federal-local petroleum-related transfers (RLTFPX). Education expenditures are the sum of revenues from state-local transfers (RLTE99) and those from local sources (ELED1). Local education expenditures from own sources are a function of personal income net of "enclave" employment income. Non-education expenditures are determined in real terms as a function of wealth and non-education transfers. Debt service is a function of the level of outstanding general obligation bonds (GOBONDL).

The capital portion of the education component of the budget (ELEDCP) is a function of education expenditures in total (ELED). The amount of capital expenditures financed by general obligation bonds grows with prices and per capita income.

Local government personnel expenditures (ELPERS) is calculated from total local expenditures net of education capital expenditures, miscellaneous transfers, and debt service expenditures. From this, local government wages and salaries (WSGL) is calculated.

Total state and local government expenditures (SLGEXP) are the sum of state and local expenditures net of state-local transfers. Local (BALOCAL) and combined state and local (BALLANDS) current account balances are calculated.

```
269:  ELED1 = C11A+C11B*PI3(-1)

270:  ELED = RLTE99+ELED1

271:  ELBD = C14A+C14C*D61.77*GOBONDL(-1)+C14B*GOBONDL(-1)

272:  EL99 = ELED+ELNED1+ELBD+RLTX+RLTFPX

273:  ELNED1*100/PDRPI = C16A+C16B*WEALTH+C16C*(RLTRS+RLTT9+
      RLTMS)/PDRPI


278:  ELEDCP = C15A+C15B*ELED

279:  ELPERS = C12A+C12B*(EL99-ELEDCP-RLTMS-ELBD)

280:  WSGL = (IF YR EQ 1983 THEN 1.23 ELSE (IF YR EQ 1984 THEN
      1.23 ELSE (IF YR EQ 1985 THEN 1.27 ELSE PCWS2)))*ELPERS

281:  GOBONDL = GOBONDL(-1)*(1+GRUSCPI+GRDIRPU)

282:  SLGEXP == EX99S+EL99-RLT99

283:  BALOCAL == RL99-(EL99-ELBD)

284:  BALLANDS == BALOCAL+BALCAB
```

4. Description of the Demographic Module of the MAP Economic Model

4.1. Summary

The population module of the Alaska economic model (Figure 3) provides annual forecasts of total population and the detailed population characteristics for the State of Alaska, shown in Table 7. 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 primarily 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. A small element of out-migration of the elderly occurs independently of employment opportunities.

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, death, and net migration are not calculated for this component of the population. Its age-sex structure essentially remains constant in simulation, independent of the level of this element of population, 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 treated individually 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 distribution is constant at 1980 values. Thus, 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. Changes in

FIGURE 3. MAP ECONOMIC POPULATION MODULE

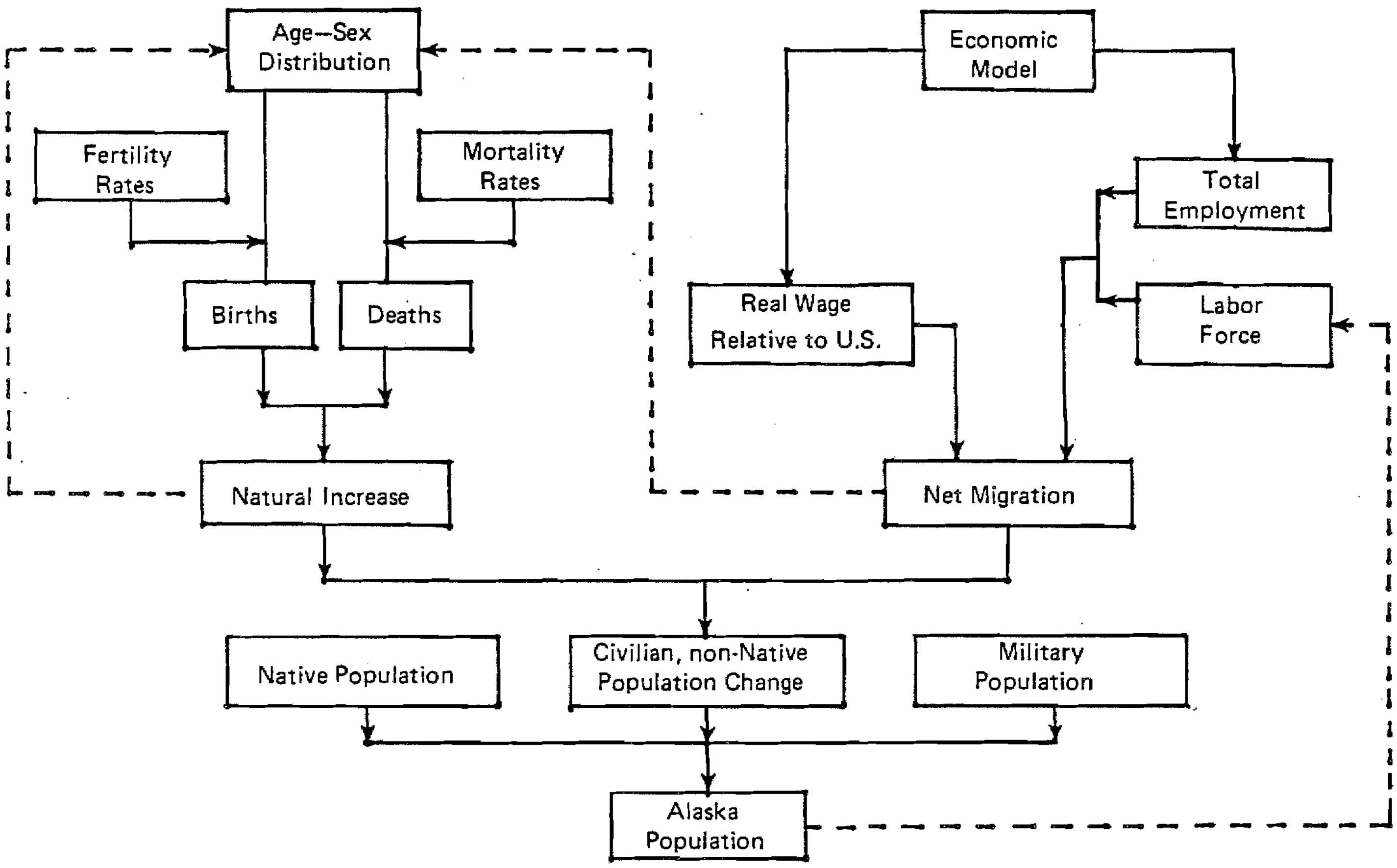


TABLE 7. DEMOGRAPHIC MODEL OUTPUT

Population Aggregates

POP	total Alaska population
CNNTOT	total Alaska civilian non-Native population
NATTOT	total Alaska Native population (civilian)
POPM	Alaska active duty military personnel
POPC	Alaska population not in military service
POPAVAGE	average age of Alaska population
POPij	total Alaska population in cohort ij
CNNPij	Alaska civilian non-Native population in cohort ij
NATPij	Alaska Native population in cohort ij
BTOT	total Alaska civilian births
DTOT	total Alaska civilian deaths
POPNI9	total Alaska civilian natural increase

Civilian Non-Native Natural Increase

Cij	Alaska civilian non-Native population in cohort ij 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 ij 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

POPMIG	total net civilian migration to Alaska
MIGOUT	exogenous civilian migration to Alaska
MIGIN	endogenous civilian migration to Alaska

TABLE 7 (continued)

Labor Force and Unemployment

PLFDOMC	Alaska potential civilian non-Native labor force (population age 15 to 64)
PLFDOMN	Alaska potential civilian Native labor force
PLFDOMM	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	change in the relative real wage rate, Alaska to U.S.
U.AK.US	relative unemployment rate, Alaska to U.S.
UNEMRATE	Alaska unemployment rate

Households

HH	total Alaska households
HHC	total Alaska civilian non-Native households
HHN	total Alaska civilian Native households
HHM	total Alaska military households
CHHij	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

Population in Group Quarters

POPCGQ	Alaska civilian non-Native population in group quarters
POPMGQ	Alaska military population in group quarters in 1980
POPNGQ	Alaska Native population in group quarters
POPGQ	total Alaska population in group quarters

Average Household Size

HHSIZEM	average Alaska military household size
HHSIZEN	average Alaska Native household size
HHSIZEC	average Alaska civilian non-Native household size
HHSIZE	average Alaska household size, all households

TABLE 7 (continued)

Special Population Aggregates

POPSKUL	total Alaska population age 5-19
POPKIDS	total Alaska population under 15
POPGER	total Alaska population 65 and over
POPADS	total Alaska population age 15-64

Population Ratios

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

Birth and Death Rates

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

military employment cause total military population and each age-sex cohort to change proportionately.[1]

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.

---

[1]The variable MILPCT scales the 1980 military population distribution to correspond to total military population in any particular 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.

Households. Households are determined by applying age-sex-race-specific headship rates to each population cohort after subtracting the population in group housing.

4.2. Demographic Module Detail [i = M, F and j = 2 to 15]

Total Population

601: POP = CNNTOT+NATTOT+MILPCT*(AFTOT+MDTOT)

602: POPC = POP-POPM

603-632: POPij == CNNPij+NATPij+MILPCT*MILij

Civilian/Non-Native Natural Increase

466-493: Cij == Gj*Sij*CNNPij(-1)+(1-Gj-1)*Si,j-1*CNNPi,j-1(-1)

494: $BTHTOT == \left(\sum_{j=4}^{11} (CFj*FERTj) \right) - BADD$

495: CM1 == SEXDIV*BTHTOT*SURINFM

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

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

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

499: $NATINC == BTHTOT-DTHTOT$

(Civilian) Native Natural Increase

531-558: $NCij == Gj*NSij*NATPij(-1)+(1-Gj-1)*NSi,j-1*NATPi,j-1(-1)$

559: $$NBTHTOT == \left(\sum_{j=4}^{11} (NCFj*NFERTj) \right)+BADD$$

560: $NCM1 == NSEXDIV*NBTHTOT*NSURINFM$

561: $NCF1 == (1-NSEXDIV)*NBTHTOT*NSURINFF$

562-591: $NATPij = NCij*(1+NMij)$

592: $NDTHINF == NBTHTOT-NCM1-NCF1$

593: $$NDTHTOT == NDTHINF+ \sum_{i=M,F} \sum_{j=1}^{15} (NCij(-1)*(1-NSij))$$

594: $$NATTOT = \sum_{i=M,F} \sum_{j=1}^{15} NATPij$$

595: $POPNE = POPNE(-1)*NATTOT/NATTOT(-1)$

596: $NNATINC == NBTHTOT-NDTHTOT$

Civilian Migration and Total Civilian Population

663: $POPMIG = CMIG1+CMIG2*1/U.AK.US(-1)+CMIG3*WR.AK.US(-1)+$
$CMIG4*DELEMP$

597: $$MIGOUT = \sum_{i=M,F} \sum_{j=1}^{15} ((OEMij*Cij)+(NMij*NCij))$$

598: MIGIN = POPMIG-MIGOUT

500-529: CNNPij = MIGIN*Mij+Cij*(1+OEMij)

530: $$CNNTOT = \sum_{i=M,F} \sum_{j=1}^{15} CNNPij$$

Labor Force and Unemployment

653: $$PLFDOMC == \sum_{i} \sum_{j=5}^{14} CNNPij$$

654: $$PLFDOMM == \sum_{i} \sum_{j=5}^{14} NATPij$$

655: $$PLFDOMM == MILPCT * (\sum_{i} \sum_{j=5}^{14} MILij) - AFTOT$$

656: PLFD9 == PLFDOMC+PLFDOMN+PLFDOMM

657: LF == LAFPRT*PLFD9

658: UNEMP == LF-EM96

659: UNEMRATE == UNEMP/LF

660: U.AK.US == UNEMP/LF/U.US

661: DELEMP == EM96-EM96(-1)

662: WR.AK.US == LOG(R.WR97)-LOG(WEUS*100/PDUSCPI)-(LOG(R.WR97(-1))-
LOG(WEUS(-1)*100/PDUSCPI(-1)))

Military Population

599: POPM == EMGM/MILRAT

600: MILPCT = POPM/AFTOT

Natural Increase

633: BTOT == BTHTOT+NBTHTOT

634: DTOT == DTHTOT+NDTHTOT

635: POPNI9 == BTOT-DTOT

Birth and Death Rates

636: NCBR == NBTHTOT/NATTOT*1000

637: NCDR == NDTHTOT/NATTOT*1000

638: CBR == BTHTOT/CNNTOT*1000

639: CDR == DTHTOT/CNNTOT*1000

640: BCRUDE == BTOT/(CNNTOT+NATTOT)*1000

641: DCRUDE == DTOT/(CNNTOT+NATTOT)*1000

Population Aggregates

642: POPSKUL == POPM3+POPM4+POPM5+POPF3+POPF4+POPF5

643: POPKIDS == POPSKUL+POPM1+POPM2+POPF1+POPF2-POPM5-POPF5

644: POPGER = POPM15+POPF15

645: POPADS == POP-POPKIDS-POPGER

652: POPAVAGE == 0.5*((POPM1+POPF1)/POP)+3*((POPM2+POPF2)/
POP)+7.5*((POPM3+POPF3)/POP)+12.5*((POPM4+POPF4)/
POP)+17.5*((POPM5+POPF5)/POP)+22.5*((POPM6+POPF6)/
POP)+27.5*((POPM7+POPF7)/POP)+32.5*((POPM8+POPF8)/
POP)+37.5*((POPM9+POPF9)/POP)+42.5*((POPM10+POPF10)/
POP)+47.5*((POPM11+POPF11)/POP)+52.5*((POPM12+POPF12)/
POP)+57.5*((POPM13+POPF13)/POP)+62.5*((POPM14+POPF14)/
POP)+67.5*((POPM15+POPF15)/POP)

Households

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 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.

745: $$HH = \sum_{ij}\sum HHij$$

The total number of households in sex cohort i and age cohort j (HHij) describes the number of households with household head or primary individual in the ith sex and jth age cohort. This total is, in turn, composed of three components: the number of civilian/non-Native households in cohort ij (CHHij), the number of Native households in cohort ij (NHHij), and the number of military households in cohort ij (MHHij).

675+: $$HHij = CHHij+NHHij+MHHij*MILPCT$$

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 multiplied by the cohort population (CNNPij for civilian/non-Natives and NATPij for Natives) net of the proportion of the population in group quarters (CPGQij for civilian/non-Natives and NPGQij for Natives).

673+: $$CHHij = CNNPij*(1-CPGQij)*(HHRij+RCij/TP*(YR-1980))$$

674+: $$NHHij = NATPij*(1-NPGQij)*(NHHRij+NRCij/NTP*(YR-1980))$$

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 RCij (NRCij) is the specified target change for non-Natives (Natives) and TP (NTP) is the time period in which the change is assumed to take place while HHRij and NHHRij are 1980 headship rates.[1]

The cohort distribution of military households (MHHij) is assumed to remain constant throughout the projection period. The number of military households equals the number in 1980, multiplied by the ratio of current year to 1980 active duty military (MILPCT).

The model calculates Native, civilian/non-Native, and total population in group quarters.

746: $POPCGQ == \sum_{ij}\sum (CNNPij*CPGQij)$

747: $POPNGQ == \sum_{ij}\sum (NATPij*NPGQij)$

748: POPGQ == POPNGQ+POPCGQ+POPMGQ*MILPCT

Total households is also determined for Native, civilian non-Native, and military elements of the population.

749: $HHC == \sum_{ij}\sum CHHij$

750: $HHN == \sum_{ij}\sum NHHij$

751: $HHM == MILPCT * \sum_{ij}\sum MHHij$

The model calculates average household size for Natives, civilian/non-Natives, military, and total population.

752: HHSIZEN == (NATTOT-POPNGQ)/HHN

753: HHSIZEC == (CNNTOT-POPCGQ)/HHC

754: HHSIZEM == MILPCT*(AFTOT+MDTOT-POPMGQ)/HHM

755: HHSIZE == (POP-POPGQ)/HH

---

[1]Because of the structure of these equations, the period over which the rates change must be set to exceed the length of simulations.

5. Input Variables

A value for each of these variables for each year of simulation must be entered by the user.

5.1. Policy Inputs

Values for these variables are likely to change from one simulation to the next.

Employment

*EMAGRI	agriculture
*EMCNX1	high wage (enclave) exogenous construction
*EMCNX2	normal wage exogenous construction
*EMFISH	fish harvesting
*EMGC	civilian federal government
*EMGM	military active duty
*EMMX1	high wage exogenous manufacturing
*EMMX2	sectoral average wage exogenous manufacturing
*EMP9	mining (including petroleum)
*EMT9X	exogenous part of transportation

State Expenditures

APPFCONX	general fund appropriations to the Permanent Fund
EXDFPCNT	development fund withdrawal rate
EXDF1	development fund contribution rate
EXGFOPSX	exogenous general fund operating expenditures
EXPFCONX	extraordinary Permanent Fund contribution
EXPFDIST	Permanent Fund distribution rate
EXPF1	Permanent Fund contribution rate
EXPFTOGF	percent of Permanent Fund earnings transferred to the general fund
EXSAVX	savings out of current revenues
EXSPCAP	special capital expenditures
EXSPLITX	operation expenditures as a proportion of total
EXSUBSX	exogenous subsidy level
EXSUB1	stimulative effect of state subsidies on construction industry
EXSUB2	stimulative effect of state subsidies on consumer spending
LBOND1	proportion of state general obligation bonds for highways
LFED1	proportion of federal capital grants for highways
LGF1	proportion of state general fund capital expenditures for highways

*May be provided by scenario generator model if desired.

Growth Rates[a]

GRDIRPU	U.S. disposable income per capita
GRRWEUS	U.S. real average weekly earnings
GRUSCPI	U.S. consumer price index

Local Revenues

RLPTX	exogenous property taxes
RLTFPX	petroleum-related federal transfers
RLTMCAP	municipal capital grants from state to local government
RLTX	unspecified state-local transfers

State Petroleum Revenues

*RPBS	bonus payments
RPEN	rental payments
*RPPS	property taxes
*RPRY	royalties
*RPTS	severance taxes
RP9X	unspecified revenues
RSFDNPX	petroleum-related federal-shared revenues
*RTCSPX	petroleum corporate income tax

State Nonpetroleum Revenues

RSFDNX	exogenous federal-state transfers
RTCSX	exogenous corporate income tax

Miscellaneous

LAFPRT	pseudo labor force participation rate
*TOURIST	tourist visitors
UUS	U.S. unemployment rate
XXMX1	exogenous large-project manufacturing real gross state product

---

*May be provided by scenario generator model if desired.

[a]Other growth rates used only with certain fiscal rule options are as follows:

GREXCAP - state capital expenditures
GREXOPS - state operating expenditures
GRRPCEX - real per capita state expenditures
GRSSCP - state per capita capital stock

5.2. Other Exogenous Inputs

Values for these variables are less likely to vary across simulations.

Dummy Variables

Dgg	a dummy variable with a value of unity in the year gg only
Dgg.hh.	a dummy variable with a value of unity from year gg to year hh
DggDECj	a dummy variable with a value of unity in year gg and declining to zero in j years

Initial Adjustment Variables

RSIP5	initial adjustment to Permanent Fund earnings level

Initial Values

BALgg6	known historical values for the balance in the state fund gg
BIU6	known historical values for basic instructional unit for allocating state education funds to districts
EXaaa6	known historical values for state expenditure category aaa
PDUSCPI6	known historical values for USCPI
PITRAN6	known historical values for transfers component of personal income
PR.DPIU6	known historical values for real per capita disposable income in U.S.
RLTEB6	known historical values for state aid to local government for education net of district and REAA aid
RLTMA6	known historical values for state-local transfers under municipal assistance
RLTRS6	known historical values for state-local revenue sharing

RMISRES6	known historical values for miscellaneous restricted general fund revenues
RSFDN6	known historical values for total federal grants-in-aid to state general fund
RSIG6	known historical values for state general fund interest
RTOTS6	known historical values for other state taxes (fiduciary, inheritance, estate, mining, conservation, prepaid, and fish taxes)
VAEX6	known historical values for exemption value on federal income tax
WEUS6	known historical values for U.S. average weekly earnings

Impact Variables

BASaaaa or BASEaaaa	values from a previously run "base case" used in certain impact study calculations

State Personal Income Tax Variables

RTISXX	adjustment of disposable income to cover lag in refund of state personal income taxes after repeal
TCRED	individual tax credit beginning after 12/31/77
TXBASE	change in the floor of personal income tax rate schedule
TXCRPC	state personal income tax credit adjustment
TXPTXX	allows model user to withold from state expenditures a portion of any personal income tax reduction
TXRT	percentage change in state personal income tax rate

Native Income Variables

ANCSA	payment to Alaska Natives by federal and state government under Alaska Native Claims Settlement Act (ANCSA)

EMNATX	Native employment rate obtained from the income distribution model
NCBP	bonus income to Natives from lease sales on Native lands
NCRP	Native recurrent income from petroleum development on Native lands
PCNC1	proportion of ANCSA payments paid directly to individuals
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
RNATX	Native personal income calculated using the income distribution model
SANCSA	payment to Alaska Natives by state government under ANCSA
SANCSAX	special state appropriation to pay off ANSCA debt

Miscellaneous Exogenous Variables

BADD	adjustment factor to account for birth of Native children to non-Native women (see demographic module)
BALGFUNA	state general fund balance unavailable for appropriations
EMAUN	forestry and unclassified employment
EXDSSX	annual debt service payment to service general obligation bonds outstanding at beginning of simulation period
EXPFDVX1	accounting adjustment to Permanent Fund retained earnings in early years
EXPFDVX2	accounting adjustment to Permanent Fund dividend in early years
EXTRNSPI	state Permanent Fund dividends in 1982 and 1983 incorporated in state personal income

EXTRNSX	Permanent Fund dividend distribution funded through the general fund
GODTX	general obligation bonded indebtedness of the state from debt incurred before start of simulation
LPTRAT	percentage of pipeline property within local jurisdictions actually subject to local tax because of limitations imposed by state statutes
PCOLART	cost of living differential for federal employees
PIPADJ	ratio of "enclave" to regular construction wage rate
P9PTPER	percentage of petroleum property which is taxable by state which falls within local taxing jurisdiction
RSFDNCAX	federal grants-in-aid to state general fund for capital expenditures
YR	year

<u>State Capital Stock</u>

Lca	proportion of funding of state capital projects type a from initial funding source type c
LMUNCAP	proportion of state-funded municipal capital grants spent of capital projects
OMba	rate of operations and maintenance cost for state capital stock type a from funding source b
RCDEPa	rate of depreciation of state capital stock type a
REPba	rate of replacement of state capital stock type a from funding source b

6. Variable and Parameter Name Conventions

6.1. Prefixes

A prefix not followed by a period indicates a variable within a general category.

BALaaa	state government fund balance
BASaaaa	base level for a variable (used only in certain impact analyses)
CEaaN	proportion of Native employment in industry aa
D.aa.aa	dummy variable with a value of unity for the indicated range of years
DPIaaa	disposable personal income
ELaaa	local government expenditure
EMaaa	employment
EXaaa	state government expenditure variable
EXPRaaa	state government personnel expenditures
GRaaa	growth rate
NCaaa	Native claims variable
NEMaaN	Native employment
NWSaaN	Native wages and salaries
PDaaa	price index
PIaaa	personal income
POPaaa	population aggregate
Raaa	state government revenue (except RLaaa)
RLaaa	local government revenue
UNaaa	unemployment
WRaaa	average annual wage rate

WRGaa	average annual wage rate growth rate
WSaaa	wages and salaries
XXaaa	gross product

A prefix followed by a period and a variable name indicates the variable is operated on in the manner dictated by the prefix.

DF.aaaa	variable deflated to 1984 base-year dollars (PDRPIBAS is base-year index)
DFP.aaa	variable deflated to 1984 per capita base-year dollars
EM.aaaa	variable is a proportion of total employment (EM99)
EX.aaaa	variable is a proportion of total state general fund expenditures (EXGF)
EXBM.aaa	variable is a proportion of total state general fund expenditures (EXGFBM)
G.aaa	change in the level of the variable from the previous year
IM.aaa	variable is difference calculated from a previously run simulation with outputs specified by exogenous variables with prefix BAS
INX.aa	a specially constructed variable for monitoring model simulation behavior
P.aaa	variable in per capita terms (POP)
PI.aaaa	variable is a proportion of personal income (PI)
POP.aaa	variable is a proportion of population (POP)
PR.aaa	variable in real per capita terms (deflated using PDRPI where 1967 US = 100)
R.aaa	variable is deflated to 1967 US price level (PDRPI)
RL99.aaa	variable is a proportion of total local revenues (RL99)
RS.aaaa	variable is a proportion of total state general and Permanent Fund revenues (R99S)
RSBM.aaa	variable is a proportion of unrestricted state general fund revenues (RSGFBM)

6.2. Suffixes

a. Industries: used with employment (EMaa), wage rate (WRaa), wages and salaries (WSaa), and gross state product (XXaa).

AGRI	Agriculture
AUN	Forestry and Unclassified
A9	Agriculture-Forestry-Fishery
CM	Communications
CN	Construction
CNNP	Nonpipeline Construction
CNP	Pipeline Construction (Premium Wage, Enclave)
CU	Communications
DR	Retail Trade
DW	Wholesale Trade
D9	Total Trade
FI	Finance-Insurance-Real Estate
FISH	Fish Harvesting
AFISH	Fish Harvesting-Wages and Salary Component
GA	State and Local Government
GC	Federal Civilian Government
GF	Federal Government (Military plus Civilian)
GL	Local Government
GM	Military
GS	State Government
GSFY	State Government (Fiscal Year)
M9	Manufacturing
MX1	Exogenous Premium Wage Manufacturing
MX2	Exogenous Normal Wage Manufacturing
MO	Endogenous Manufacturing
PRO	Proprietor
PROFIS	Proprietor-Fish Harvesting Component
PU	Public Utilities
P9	Mining
S9	Total Services
SB	Business Services
SP	SUP + TCU
SUP	Trade, Finance, Service
TCU	Transport, Communication, Public Utilities
T9	Transportation
TOUR	Tourism
DTOUR	Tourism-Retail Trade
STOUR	Tourism-Services
TTOUR	Tourism-Transportation

96	Total Civilian (Non-Ag. Wage & Salary plus Proprietors)
97	Total Non-Ag. Wage and Salary
98	Total Non-Ag. Wage & Salary Plus Military
99	Grand Total
NT	Non-Tourism

b. Components of Income: used with personal income (PIaa)

DIR	Dividends, Interest, Rent
OLI	Other Labor Income
PRO	Proprietor Income
PRO1	Nonfishing Proprietor Income
PROF	Fishery Proprietor Income
RADJ	Residence Adjustment
SSC	Personal Contributions to Social Security
TRAN	Transfers
WS	Wages and Salaries
3	Personal Income Net of Enclave Employment Income
8	Personal Income plus Residence Adjustment

c. State Expenditures by major program categories: used with expenditures (EXaa) and personnel expenditures (EXPRaa)

CDS	Development
EDS	Education
GGS	General Government
HES	Health and Social Services
GF	General Fund
GFBM	Unrestricted General Fund
DF	Development Fund (hypothetical)
PF	Permanent Fund
JUS	Justice
NRS	Natural Resources
PPS	Public Protection
SSS	Social Services
TRS	Transportation
UA	University of Alaska

d. Population Cohorts

F	Female
M	Male
1	Under 1 Year of Age
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

e. Special Suffixes

1	a component of a total variable
2	a component of a total variable
4	a preliminary estimate of the value for a variable prior to application of a ratio
5	an increment to a model-determined value
6	an exogenous initial value
8	a component of a total variable
99 or 9	a grand total
X	an exogenous variable

7. Parameter Values, Definitions, and Sources

7.1. Economic and Fiscal Modules

Variable	Value	Definition; Units	Historical Data Source
Caab	-	a stochastic coefficient, where aa is a number associated with a particular equation and b is a letter associated with the position within the equation	-
EXANNU	800	if EXRLOP8 is in effect, the amount of the annual annuity which contributes to funding state operating expenditures; million $	set by model user at level consistent with continued positive state treasury balance and maximum expenditure levels
EXCAPIMP	.1432	per capital impact state capital expenditure used with fiscal rule EXRL4	Goldsmith and Mogford, The Relationship Between the Alaska Natural Gas Pipeline & State & Local Government Expenditures
EXCAPOLD	1000	state spending to replace capital stock put in place prior to 1984	Department of Administration, Annual Financial Report
EXEL1	1	elasticity of state expenditures with respect to population	set by model user; default value consistent with idea that expenditures rise with population
EXEL2	1	elasticity of state expenditures with respect to prices	set by model user; default value consistent with idea that expenditures rise with prices
EXEL3	1	elasticity of state expenditures with respect to real per capita personal income	set by model user; default value assumes state operating expenditures neither inferior or superior good
EXEL4	0	elasticity of state expenditures with respect to personal income	set by model user; default value assumes state expenditures are inferior goods
EXEL5	0	elasticity of state expenditures to personal income net of "enclave" employment-related income (PI3)	set by model user; default value assumes state expenditures are inferior goods
EXEL6	0	elasticity of state expenditures to population net of "enclave" construction employment	set by model user; default value assumes state expenditures are inferior goods

Variable	Value	Definition; Units	Historical Data Source
EXLIM82	2500	constitutionally mandated 1982 spending limit; million $	current law
EXOMCOST	.15	annual operations and maintenance cost of incremental state capital stock as a percentage of original cost	author's estimate
EXOPSIMP	7.678	per capita impact state operation expenditure used with fiscal rule EXRL4	Goldsmith and Mogford, The Relationship Between the Alaska Natural Gas Pipeline and State and Local Government Expenditures
EXPF2	.162	portion of Permanent Fund dividend income not entering purchasing power expression; percent	Knapp et al., The Alaska Permanent Fund Dividend Program: Economic Effects and Public Attitudes
EXPF3	.31	portion of Permanent Fund dividend income not subject to personal income tax; percent	Knapp et al., The Alaska Permanent Fund Dividend Program: Economic Effects and Public Attitudes
EXRL1	0	policy switch for determination of state expenditure growth based primarily upon aggregate demand variables, including prices, population, and income	set by model user; default value zero
EXRL2	0	policy switch for determination of state expenditure growth based upon a specified exogenous growth rate	set by model user; default value zero
EXRL3	0	policy switch for determination of state expenditure growth based upon a specified growth rate in real per capita operating expenditures and real per capita level of capital stock	set by model user; default value zero
EXRL4	0	policy switch for determination of state expenditure growth based upon a specified expenditure level per impact individual (for use in impact analysis)	set by model user; default value zero

Variable	Value	Definition; Units	Historical Data Source
EXRL4OP	0	policy switch used with EXRL4 with value of one if enclave construction employment not counted in impact population	set by model user; default value zero
EXRL5	1	policy switch for determination of state expenditure growth based upon constitutionally imposed spending limit	set by model user; default value one
EXRLOP6	0	policy switch for determination of state operating expenditure growth based upon annual change in level of general fund balance	set by model user; default value zero
EXRLOP7	0	policy switch for determination of state expenditure growth based upon saving a specified amount (EXSAVS)	set by model user; default value zero
EXRLOP8	0	policy switch for determination of state operating expenditure growth based upon spending an annuity (EXANSAV)	set by model user; default value zero
P1-P6	0,0,0,1,1,1	variables to facilitate printing population distribution model results; units	values internal to model to allow income distribution model to work
PAD1	.7	proportion of population aged 5 to 19 attending district schools; percent	Department of Education, <u>Annual Financial Report</u>, and population model
PAD2	.082	proportion of population aged 5 to 19 attending REAA schools; percent	Department of Education, <u>Annual Financial Report</u>, and population model
PADJ	1.5	ratio of premium (WRM9P) to low wage (WRM91) in manufacturing sector	Department of Labor (DOL), <u>Statistical Quarterly</u>
PARLVFV	.919	ratio of local value to full value of local property according to state appraiser; percent	average of past values from Alaska Dept. of Community and Regional Affairs, <u>Alaska Taxable</u>
PARNONGF	.2	proportion of University of Alaska revenues not from the general fund; percent	Department of Administration, <u>Executive Budget</u>

Variable	Value	Definition; Units	Historical Data Source
PBLTBL	.13	proportion of gross business receipts taxable after 1978 tax law change; percent	ratio of predicted receipts under new law and old law using information from Alaska Dept. of Revenue, Commissioner's Newsletter (under new law, only banks, trusts, and savings & loans taxed)
PBTRATE	.000025	state business license tax rate; million $ per business	existing state tax law
PC12N	.922	proportion of ANCSA payments made to 12 regional Native corporations in Alaska; percent	2(c) Report: Federal Programs and Alaska Natives by Robert Nathan Assoc. for U.S. Department of Interior
PC12RN	.833	proportion of members of 12 regional Native corporations residing in Alaska; percent	2(c) Report: Federal Programs and Alaska Natives by Robert Nathan Assoc. for U.S. Department of Interior
PCINDA	.1	proportion of gap between average industry employment share and Native industry employment share that is closed within one time period; percent	author's estimate
PCIVPY	.65	ratio of military to federal civilian wage rate	Alaska Department of Labor, Statistical Quarterly, and U.S. Dept. of Commerce, Bureau of Economic Analysis personal income data
PCNC4	0	proportion of bonus income from lease sales on Native lands paid directly to individuals	author's estimate
PCNCSV	.5	proportion of Native corporation income used for investment	author's estimate
PCNCSV1	1	proportion of bonus income from lease sales on Native corporation lands and retained by Native corporations which is used for investment	author's estimate
PCNCWS	.25	proportion of current expenditures of Native Corporations paid in wages and salaries	author's estimate

Variable	Value	Definition; Units	Historical Data Source
PCWS1	.9	ratio of state government wage and salary payments to personnel expenditures	Alaska Department of Labor, Statistical Quarterly, and Alaska Dept. of Administration, Executive Budget
PCWS2	1.3	ratio of local government wage and salary payments to local government personal services expenditures	Alaska Department of Labor, Statistical Quarterly, and U.S. Dept. of Commerce, Government Finances
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
PDCONBAS	633.398	value of construction price deflator in base year	Gross State Product for Alaska: Technical Documentation, ISER
PDRPIBAS	385	1984 Alaskan price level using 1967 U.S. as base; index	variable PDRPI in database
PECIG	.625	proportion of cigarette tax receipts paid to special fund; percent	existing state tax law
PERNA1	0	proportion of change in state employment rate reflected in change in Native employment rate; percent	author's estimate
PERNA2	.005	proportion of gap between Native and state employment rates that is closed in one year; percent	author's estimate
PERNA3	1	percentage of Native corporation jobs held by Natives; percent	author's estimate
PESLT	.4	proportion of "other" state taxes shared with local government; percent	existing state tax law
PESLTC	.1	proportion of state corporate income tax shared with local government; percent	existing state tax law
PFISH1	.97	percentage of fish harvesting employment reported as proprietors	DOL Statistical Quarterly, BEA employment data, and G. Rogers, Measuring the Socioeconomic Impact of Alaska's Fisheries

Variable	Value	Definition; Units	Historical Data Source
PIDIST	0	model switch which results in retrieval of Native employment and wages and salaries from income distribution model if value of one is chosen	-
PNTGR	.02	gross receipts per business exempt from state gross receipts tax; million $	existing state tax law
PRINT2	0	variable from income distribution model which allows results to be printed if value of one is chosen	-
PTOURB	-4.75	intercept term on tourist industry employment equation	Improvements to Specification of the MAP Model, ISER, January 1982
PTOURD	.4	proportion of tourist industry employment in trade	Improvements to Specification of the MAP Model, ISER, January 1982
PTOURE	1	elasticity of tourism employment to growth in number of tourists	Improvements to Specification of the MAP Model, ISER, January 1982
PTOURS	.4	proportion of tourist industry employment in services	Improvements to Specification of the MAP Model, ISER, January 1982
PTOURT	.2	proportion of tourist industry employment in transportation	Improvements to Specification of the MAP Model, ISER, January 1982
PTRTS	.02	tax rate on state petroleum-related property; percent	existing state tax law
PWRBASE	5473	1967 U.S. average wage paid in government	1967 state government and employment data from U.S. Department of Commerce, Bureau of Economic Analysis
ROR	.02	real rate of return on general fund balance; percent	author's estimate
RORANGRO	.08	rate at which state operating expenditure annuity grows; percent	set by model user in conjunction with EXANNU
RORBOND	.02	real interest rate on state general obligation bonds	author's estimate
RORCPDEP	.03	real rate of depreciation of state capital; percent	author's estimate

Variable	Value	Definition; Units	Historical Data Source
RORDISK	.02	discount rate applied to future petroleum revenues to calculate present value in 1982 dollars (DF.RSVP)	author's estimate
RORNC	.07	nominal rate of return on accumulated capital of Native Corporations	author's estimate
RORPDF	0	real rate of return premium applied to development fund over general fund; percent	author's estimate
RORPPF	.01	real rate of return premium applied to Permanent Fund over general fund; percent	author's estimate

7.2. Demographic Module

Variable	Value	Definition; Units	Historical Data Source
Military Population			
AFTOT	23.323	total armed forces personnel in 1980	Alaska Air Command and Kruse, Design and Implementation of Alaska, 1980 Reapportionment Data Collection Effort
MDPij	-	military dependents in 1980 in cohort ij; thousand	BOC, 1980 Census of Population, extrapolated from military census tracts
MDTOT	25.131	total military dependents in 1980; thousand	Alaska Air Command and Kruse, Design and Implementation of Alaska, 1980 Reapportionment Data Collection Effort
MILij	Table 8	armed forces personnel and military dependents in cohort ij in 1980; thousand	BOC, 1980 Census of Population, extrapolated from military census tracts
MILRAT	1	the ratio of military employment (EMGM) to military population (POPM)	-

Variable	Value	Definition; Units	Historical Data Source
Civilian Non-Native Natural Increase			
FERTj	Table 9	non-Native fertility rate for female cohort j	Alaska Department of Health and Social Services and Alaska Native Medical Center
Gj	.2	shift factor for aging of cohorts	-
Sij	Table 10	non-Native survival rate for cohort ij	Alaska Department of Health and Social Services
SEXDIV	.518	non-Native male sex proportion at birth; percent	Alaska Department of Health and Social Services
SURINFi	Table 10	non-Native infant survival rates; percent	Alaska Department of Health and Social Services
Civilian Native Natural Increase			
NFERTij	Table 9	Native fertility rate in female cohort j	Alaska Department of Health and Social Services and Alaska Native Medical Center
NSij	Table 10	Native survival rate for cohort ij	Alaska Department of Health and Social Services
NSEXDIV	.513	Native male sex proportion at birth; percent	Alaska Department of Health and Social Services
NSURINFi	Table 10	Native infant survival rates; percent	Alaska Department of Health and Social Services
Civilian Migration			
CMIGi	-	stochastic coefficient of migration equation	See regression results
Mij	from Tables 12-13	fraction of total endogenous civilian (non-Native) migration assigned to cohort ij	Alaska Public Survey
NMij	0	migration rate (positive for in; negative for out) for Native population in cohort ij; percent	-
OEMij	Table 11	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

Variable	Value	Definition; Units	Historical Data Source
Household Formation			
CPGQij	Table 15	fraction of civilian non-Native population in cohort ij in group quarters	BOC, 1980 Census Tape STF2B
HHRij	Table 14	1980 household formation rate for civilian non-Native population in cohort ij	BOC, 1980 Census of Population, Census Tape STF2
MHHij	Table 16	1980 military households headed by individual in cohort ij; thousand	BOC, 1980 Census of Population
NHHRij	Table 14	1980 household formation rate for civilian Native population in cohort ij; percent	BOC, Census of Population, Census Tape STF2
NPGQij	Table 15	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	See MAP Technical Documentation Report, 1983
NTP	40	period over which Native household formation rates trend; years	See MAP Technical Documentation Report, 1983
POPMGQ	9.443	military population in group quarters; thousand	BOC, Census of Population
RCij	-	targeted total change in civilian household formation rate for cohort ij	See MAP Technical Documentation Report, 1983
TP	30	period over which civilian household formation rates trend; years	See MAP Technical Documentation Report, 1983

TABLE 8. ALASKA POPULATION, APRIL 1, 1980

	Native Population			Civilian Non-Native			Military Population[a]			Total Population		
Age	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
0 - 1	1,646	806	840	5,648	2,763	2,885	1,459	732	727	8,753	4,301	4,452
1 - 4	5,674	2,734	2,940	19,061	9,020	10,041	5,461	2,854	2,607	30,196	14,608	15,588
5 - 9	6,867	3,390	3,477	22,502	10,983	11,519	5,674	2,727	2,947	35,043	17,100	17,943
10 - 14	7,433	3,638	3,795	23,264	11,206	12,058	3,585	1,718	1,867	34,282	16,562	17,720
15 - 19	8,346	4,091	4,255	25,048	11,965	13,083	3,760	1,279	2,481	37,154	17,335	19,817
20 - 24	6,899	3,445	3,454	27,681	14,168	13,513	10,510	3,291	7,219	45,090	20,904	24,186
25 - 29	5,639	2,798	2,841	35,490	17,029	18,461	7,516	3,254	4,262	48,645	23,081	25,564
30 - 34	4,373	2,179	2,194	32,480	14,929	17,551	5,310	2,379	2,931	42,163	19,487	22,676
35 - 39	3,539	1,753	1,786	24,961	11,506	13,455	2,847	1,001	1,846	31,347	14,260	17,087
40 - 44	2,802	1,376	1,426	18,280	8,008	10,272	1,593	816	777	22,675	10,200	12,475
45 - 49	2,657	1,301	1,356	15,440	6,992	8,448	298	120	178	18,395	8,413	9,982
50 - 54	2,176	1,074	1,102	13,442	5,938	7,484	250	125	125	15,848	7,137	8,711
55 - 59	1,802	857	945	10,734	4,940	5,794	81	43	38	12,617	5,840	6,777
60 - 64	1,307	679	628	6,751	3,095	3,656	38	19	19	8,096	3,793	4,303
65 +	2,875	1,411	1,464	8,600	4,263	4,337	72	57	15	11,547	5,731	5,816
	64,035	31,532	32,503	289,362	136,805	152,557	48,454	20,415	28,039	401,851	188,752	213,099

[a]Active duty military plus dependents.

SOURCE: 1980 U.S. Census

TABLE 9. 1980 BIRTHS: NUMBER OF BIRTHS AND BIRTH RATES PER THOUSAND WOMEN IN FIVE-YEAR AGE COHORTS, ALASKA RESIDENTS

	Native		Non-Native	
Age of Mother	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)

[a]Rate 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 10. 1980 DEATHS: NUMBER OF DEATHS AND DEATH RATES PER THOUSAND, ALASKA RESIDENTS

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

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

TABLE 11. ESTIMATED EXOGENOUS OUT-MIGRATION RATES

	Percent of Migrants		Percent of Age-Sex Cohort	
Age Group	Female	Male	Female	Male
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 +	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 12. CIVILIAN MIGRATION TO ANCHORAGE
ALASKA PUBLIC SURVEY SAMPLE
(N = 1,867 Individuals)

	Interstate Migrants		Alaska Natives		Non-Native Intrastate		Total	
Age Group	Female	Male	Female	Male	Female	Male	Female	Male
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 +	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 13. ESTIMATED CIVILIAN MIGRATION RATES TO ANCHORAGE

(percent of migrants in each category)

	Interstate Migrants		Alaska Natives		All Non-Native Migrants	
Age Group	Female	Male	Female	Male	Female	Male
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 +	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 14. 1980 ALASKA CIVILIAN HEADSHIP RATES

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

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 15. ALASKA CIVILIAN POPULATION IN GROUP QUARTERS, 1980

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

SOURCE: U.S. Census Tape STF2B

TABLE 16. ALASKA MILITARY HOUSEHOLDS

(percent)

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

SOURCE: 1980 Census, Census Tapes

8. Model Validation and Properties

Several types of analyses are done to test the validity of the MAP model.[1]

8.1. Statistical Tests

Statistical tests are normally applied to the stochastic equations of the model. All stochastic equations in the MAP model are estimated using ordinary least squares regression. Two-staged least squares estimations have been found in the past not to change significantly the results of simulations. In general, specifications for these equations are chosen which have good predictive qualities (R^2, standard error of regression) and structural properties (t tests, F test). Sometimes, however, it is necessary to compromise on the quality of the statistical tests of the model to obtain an equation specification which does well in simulation. This is because when simulating with all the equations together in a model, equations that appear correct may not always interact to produce reasonable results.

Individual equation statistical tests are applied during estimation. At the same time, the stability of the structure of the individual equations can be reviewed. As might be expected in the rapidly evolving Alaskan economy, the structures of some equations may need to be altered over time.

8.2. Historical Simulation

Second, the model is tested by seeing how accurately it can predict the actual historical data upon which it is based (ex post forecast). There are no formal statistical tests of this capability except that a model that comes closer to the actual historical values is better. One value of this test is that it indicates variables or sections of the model which may require additional attention.

The results of historical simulation of the current version of the MAP model are presented in Table 17 for the most important endogenous variables of the model: personal income, wages and salaries, and employment.

---

[1]The model used to do the tests presented in this section was developed in early 1984.

TABLE 17. HISTORICAL SIMULATION OF
ECONOMIC MODULE

Personal Income (million $)

	Historical Data	Simulated Value	Error	Percent Error
1963	678.623	653.422	-25.202	-3.714
1964	763.415	736.542	-26.873	-3.52
1965	827.373	813.878	-13.495	-1.631
1966	894.177	871.322	-22.855	-2.556
1967	987.882	928.313	-59.569	-6.03
1968	1068.36	1052.9	-15.463	-1.447
1969	1215.8	1174.94	-40.856	-3.36
1970	1388.01	1276.23	-111.782	-8.053
1971	1519.28	1423.89	-95.394	-6.279
1972	1677.57	1594.13	-83.446	-4.974
1973	1958.88	1900.5	-58.385	-2.981
1974	2391.46	2228.78	-162.683	-6.803
1975	3454.69	3211.74	-242.953	-7.033
1976	4128.95	4231.62	102.672	2.487
1977	4260.56	4293.15	32.59	0.765
1978	4323.98	4282.7	-41.273	-0.955
1979	4554.01	4678.71	124.699	2.738
1980	5152.	5393.18	241.176	4.681
1981	6166.58	6339.27	172.684	2.8
1982	7384.34	7437.61	53.273	0.721
Mean	2739.8	2726.14	-13.657	-2.257
Root Mean Squared	3379.33	3405.83	110.602	4.267
Standard Deviation	2029.62	2094.57	112.607	3.716

TABLE 17 (continued)

Wages and Salaries (million $)

	Historical Data	Simulated Value	Error	Percent Error
1963	589.3	585.755	-3.545	-0.602
1964	668.2	664.317	-3.883	-0.581
1965	721.2	728.942	7.743	1.074
1966	770.5	778.598	8.098	1.051
1967	851.7	818.01	-33.69	-3.956
1968	929.5	929.749	0.249	0.027
1969	1072.4	1036.49	-35.912	-3.349
1970	1203.2	1121.32	-81.879	-6.805
1971	1308.4	1252.58	-55.824	-4.267
1972	1444.	1403.42	-40.584	-2.811
1973	1566.9	1572.79	5.893	0.376
1974	2110.8	1958.53	-152.273	-7.214
1975	3412.9	3252.88	-160.017	-4.689
1976	4236.	4222.02	-13.98	0.33
1977	3787.61	3792.36	4.751	0.125
1978	3600.07	3480.9	-119.169	-3.31
1979	3802.52	3803.29	0.765	0.02
1980	4280.07	4389.82	109.75	2.564
1981	5108.52	5236.51	127.996	2.506
1982	5937.61	5962.65	25.047	0.422
Mean	2307.07	2349.55	-20.523	-1.487
Root Mean Squared	2896.81	2891.8	72.92	3.166
Standard Deviation	1708.89	1729.66	71.791	2.868

TABLE 17 (continued)

Nonagriculture Wage and Salary Employment
(thousands)

	Historical Data	Simulated Value	Error	Percent Error
1963	62.093	59.626	-2.467	-3.973
1964	65.38	65.553	0.173	0.265
1965	70.529	68.377	-2.152	-3.051
1966	73.195	71.469	-1.726	-2.358
1967	76.784	73.792	-2.992	-3.897
1968	79.803	80.388	0.585	0.733
1969	86.563	85.494	-1.069	-1.234
1970	92.465	90.949	-1.516	-1.639
1971	97.584	97.541	-0.043	-0.044
1972	104.243	102.154	-2.089	-2.004
1973	109.849	109.559	-0.29	-0.264
1974	128.164	120.276	-7.888	-6.154
1975	161.315	155.908	-5.407	-3.352
1976	171.185	171.404	0.219	0.128
1977	164.063	163.267	-0.796	-0.485
1978	163.293	161.173	-2.12	-1.298
1979	166.406	163.727	-2.679	-1.61
1980	170.807	165.323	-5.484	-3.211
1981	185.219	180.591	-4.628	-2.499
1982	199.545	195.99	-3.555	-1.781
Mean	121.424	119.128	-2.296	-1.886
Root Mean Squared	129.528	127.088	3.153	2.531
Standard Deviation	46.267	45.42	2.217	1.731

The results are summarized for each variable in terms of a MAPE value, which is the mean-absolute percent error of the predicted value from the actual value. The MAPE are as follows: personal income, 2.26; wages and salaries, 1.49; and nonagricultural wage and salary employment, 1.89. The results for the MAP Alaska model fall within the range reported for other regional econometric models, and the pattern of forecast errors and percent errors shows that the model has been successful in tracking a historical period during which significant growth and structural change occurred.

8.3. Demographic Module Validation

The demographic 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 migraton flows provides a reliable indicator of the type and magnitude of likely future forecasting errors. Table 18 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 18. COMPARISON OF ACTUAL AND PREDICTED NET MIGRATION TO ALASKA

Year	Implied Net Civilian Migration[1]	Regression Prediction[2]	Difference
1971	6.78	NA	NA
1972	5.98	1.569	4.361
1973	2.08	-0.164	2.244
1974	8.29	10.669	-2.378
1975	30.49	30.066	0.424
1976	20.84	21.238	-0.398
1977	1.51	1.074	0.436
1978	-11.11	-7.744	-3.366
1979	-5.07	-4.531	-0.539
1980	-0.75	-2.983	2.233
1981	8.05	12.996	-4.946
1982	17.94	16.01	1.98

[1]Net 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.

[2]Using the equation presented in Section 4, including the estimate of serial correlation in the error term.

8.4. Sensitivity Analysis

The sensitivity of simulation results to changes in parameter and exogenous variable values has been investigated. The model is sensitive to the elasticity of the support sector, government spending levels, the labor force participation rate, and the real wage rate growth as well as to the exogenous employment variables.

8.5. Simulation Tests

After these foregoing tests have been made, the model is run under different conditions to assess its reasonableness and stability in as many types of situations as possible as well as its ability to identify turning points. These tests include straight simulation, impact analyses, simulation under conditions of no growth, and simulation under conditions of decline. Certain variables are monitored to make sure that their values remain within a reasonable range.

Several ratios which are closely monitored are shown in Table 19 for a typical simulation. The civilian employment rate (EMRATE) holds fairly constant and jumps during boom periods. The ratio of disposable-to-total personal income (PI.DPI) trends downward except during boom periods. The Alaskan price index relative to the United States (PDRATIO) trends downward but ratchets up during boom periods. The ratio of price-adjusted personal income per capita in Alaska to the United States (INX.DI) jumps during booms but eventually falls below one as it has been historically. The ratio of the real wage in Alaska to the United States trends upward slightly (INX.WG). The ratio of wage and salary to total income falls (PI.WS98). The ratios of support (INX.S1) and infrastructure (INX.S2) employment to Alaskan real disposable personal income are relatively stable. The ratios of support (EM.EMSUP) and infrastructure (EM.EMTCU) employment to total employment show continued growth.

TABLE 19. VARIABLES USED TO MONITOR SIMULATION

	EMRATE	PI.DPI	PDRATIO	INX.DI	INX.WG	PI.WS98
1983	0.511	0.824	1.275	1.124	1.572	0.81
1984	0.502	0.824	1.267	1.05	1.512	0.822
1985	0.499	0.823	1.259	1.021	1.458	0.807
1986	0.503	0.822	1.251	1.004	1.42	0.802
1987	0.501	0.821	1.243	0.975	1.375	0.793
1988	0.499	0.82	1.236	0.974	1.374	0.784
1989	0.499	0.818	1.228	0.98	1.371	0.773
1990	0.507	0.817	1.219	0.963	1.39	0.803
1991	0.513	0.792	1.211	0.944	1.412	0.811
1992	0.51	0.79	1.256	0.927	1.404	0.809
1993	0.508	0.789	1.248	0.916	1.403	0.81
1994	0.504	0.788	1.24	0.913	1.394	0.796
1995	0.509	0.787	1.232	0.915	1.405	0.802
1996	0.499	0.786	1.224	0.901	1.396	0.789
1997	0.5	0.785	1.216	0.898	1.404	0.792
1998	0.485	0.784	1.208	0.891	1.395	0.781
1999	0.493	0.783	1.2	0.884	1.39	0.775
2000	0.491	0.782	1.192	0.879	1.389	0.772
2001	0.496	0.781	1.184	0.884	1.397	0.773
2002	0.498	0.779	1.176	0.885	1.402	0.772
2003	0.499	0.778	1.168	0.883	1.404	0.771
2004	0.498	0.777	1.159	0.879	1.404	0.768
2005	0.498	0.776	1.151	0.877	1.407	0.766
2006	0.498	0.775	1.143	0.875	1.412	0.764
2007	0.498	0.774	1.135	0.874	1.417	0.763
2008	0.499	0.772	1.127	0.874	1.423	0.763
2009	0.5	0.771	1.119	0.872	1.427	0.762
2010	0.5	0.77	1.111	0.869	1.431	0.761

SOURCE: BAT14

KEY: See text.

TABLE 19 (continued)

	INX.S1	INX.S2	EM.EMTCU	EM.EMSUP
1983	0.048	0.011	0.078	0.335
1984	0.051	0.012	0.078	0.342
1985	0.052	0.012	0.08	0.348
1986	0.053	0.012	0.08	0.348
1987	0.053	0.012	0.08	0.348
1988	0.053	0.012	0.08	0.349
1989	0.052	0.012	0.08	0.352
1990	0.052	0.012	0.082	0.35
1991	0.053	0.013	0.084	0.348
1992	0.053	0.013	0.085	0.353
1993	0.054	0.013	0.084	0.36
1994	0.054	0.012	0.085	0.365
1995	0.054	0.013	0.087	0.368
1996	0.054	0.013	0.088	0.379
1997	0.054	0.013	0.089	0.383
1998	0.054	0.012	0.088	0.39
1999	0.055	0.012	0.088	0.397
2000	0.055	0.012	0.087	0.403
2001	0.054	0.012	0.087	0.404
2002	0.054	0.012	0.087	0.41
2003	0.054	0.011	0.087	0.416
2004	0.055	0.011	0.088	0.423
2005	0.055	0.011	0.089	0.43
2006	0.055	0.011	0.089	0.436
2007	0.055	0.011	0.09	0.442
2008	0.055	0.011	0.09	0.448
2009	0.055	0.011	0.09	0.454
2010	0.055	0.011	0.091	0.461

SOURCE: BAT14

KEY: See text.

Table 20 shows the results of a no-growth, or flat projection done to test the stability of the model. In this projection, the values for all exogenous variables associated with basic sectors of the economy are set at constant levels. Any growth in economic activity in the absence of changes in these variables comes about as a result of one of two things. First, real wage rate increases necessary to maintain parity with real wage rate growth elsewhere in the United States will lead to some increase in disposable personal income in the absence of employment growth. Second, some activities which have not bee explicitly identified as basic sector in the economic scenario will continue to trend upward.

This case is unrealistic, both in its assumptions of no growth and of a continuation of wage rate parity with the rest of the United States in a no-growth regional economy. Nevertheless, the simulation is important because it allows investigation of the simulation properties of the model independent of and underlying any particular economic scenario.

In general, in such a simulation, one would expect some growth, but not a large amount. This is, in fact, the result. After about 1985, when government spending finally flattens out, employment holds fairly constant. Private sector employment is growing while public sector employment is falling as rising costs squeeze employment out of a constant-level budget. Population grows slowly. In this particular case, the slow growth obviates the need to reinstitute the personal income tax, so the relative price level falls continuously, and this is a stimulus to support sector growth. There is no formal standard against which to measure this case except reasonableness, economic theory, and the experience of other regions. By these criteria, the simulation appears satisfactory.

TABLE 20. NO-GROWTH PROJECTION RESULTS

	POP	EM99	POPMIG	POPNI9	R.DPI
1983	480.352	255.885	12.303	8.013	1781.64
1984	492.698	257.886	4.778	8.348	1723.76
1985	499.989	259.935	-0.421	8.463	1726.71
1986	499.359	253.048	-9.078	8.438	1659.38
1987	498.805	250.596	-8.759	8.181	1627.11
1988	499.107	249.524	-7.68	7.959	1645.48
1989	501.674	250.413	-5.235	7.779	1674.8
1990	504.525	251.855	-4.84	7.678	1706.72
1991	507.627	253.716	-4.501	7.593	1741.31
1992	510.403	255.148	-4.784	7.525	1772.71
1993	513.436	257.016	-4.463	7.457	1807.78
1994	516.988	259.436	-3.895	7.406	1847.07
1995	520.304	261.325	-4.101	7.377	1882.59
1996	523.652	263.212	-4.042	7.348	1918.77
1997	527.085	265.09	-3.937	7.326	1958.49
1998	531.141	267.546	-3.296	7.311	2003.13
1999	535.923	270.682	-2.578	7.319	2053.24
2000	541.343	274.267	-1.971	7.35	2107.05
2001	547.41	278.255	-1.374	7.4	2164.44
2002	553.956	282.349	-0.961	7.467	2223.13
2003	560.553	286.003	-0.991	7.546	2278.7
2004	567.308	289.537	-0.911	7.625	2334.1
2005	574.38	293.163	-0.679	7.707	2393.97
2006	582.161	297.304	-0.052	7.797	2460.
2007	590.841	203.133	0.729	7.905	2532.37
2008	599.918	306.915	0.997	8.036	2604.51
2009	608.592	310.775	0.465	8.174	2668.96
2010	617.161	314.479	0.237	8.296	2733.31

KEY: POP Population (thousands)
EM99 Employment (thousands)
POPMIG Net migration (thousands)
POPNI9 Natural Increase (thousands)
R.DPI Real disposable income (millions of 1967 U.S. $)

SOURCE: FLAT14

TABLE 20 (continued)

	EMGA	PR.DPI	EMRATE	PDRATIO
1983	46.688	3709.03	0.511	1.275
1984	46.456	3498.61	0.502	1.267
1985	45.152	3453.5	0.499	1.259
1986	43.115	3323.01	0.485	1.252
1987	42.252	3262.01	0.481	1.245
1988	41.853	3296.84	0.478	1.238
1989	41.633	3338.43	0.477	1.23
1990	41.65	3382.83	0.477	1.223
1991	41.776	3430.3	0.478	1.215
1992	41.928	3473.15	0.478	1.207
1993	42.072	3520.95	0.479	1.199
1994	42.235	3572.75	0.481	1.191
1995	42.405	3618.25	0.481	1.183
1996	42.594	3664.2	0.482	1.175
1997	42.398	3715.69	0.482	1.167
1998	42.196	3771.38	0.483	1.159
1999	42.028	3831.22	0.485	1.151
2000	41.896	3892.25	0.487	1.143
2001	41.793	3953.97	0.489	1.135
2002	41.709	4013.19	0.49	1.127
2003	41.626	4065.1	0.491	1.119
2004	41.533	4114.35	0.492	1.111
2005	41.126	4167.93	0.492	1.102
2006	40.614	4225.64	0.492	1.094
2007	40.133	4286.04	0.493	1.086
2008	39.678	4341.45	0.494	1.078
2009	39.219	4385.46	0.493	1.07
2010	38.74	4428.84	0.492	1.062

KEY: EMGA State and local government employment (thousands)
PR.DPI Real disposable income per capita (1967 U.S. $)
EMRATE Civilian employment rate
PDRATIO Alaskan relative price index

SOURCE: FLAT14

8.6. Some Properties of the Model

Important properties of the model can be observed by examining select impact experiments. Table 21 shows the results of a one-time increase in construction employment of 1,000 in 1985. The upper portion of the table is premium wage, remote site, enclave employment (EMCNX1), while the lower is regular construction (EMCNX2). This exercise, although unlikely to be encountered in any actual situation, demonstrates several model features.

First, the size of the employment impact multiplier is demonstrated to be 1.54 for regular construction and 1.88 for special construction. It can be shown by further impact tests that the impact multiplier for other basic sectors is smaller. For example, for federal government employment, it is approximately 1.4. Thus, the size of the impact multiplier varies with the type of basic (or exogenous) change which occurs, and its value is within a reasonable range. The total employment effect includes, in addition to the direct employment, the indirect employment (which an I-O analysis would measure), the induced employment (which an augmented I-O model that included consumer spending would measure), the investment effect (which is endogenous to the MAP model but treated as exogenous in most models including I-O models), and the structural change effect. This last effect consists of new types of activities stimulated by changing economic opportunities produced by the direct employment. A static model would capture only the first or the first and second components of nondirect employment, and a growth model is necessary to capture all effects. The MAP model does this.

Second, if the exogenous change is not sustained, the employment impact will not be sustained but will diminish over time and eventually disappear. The total effect is felt over a period of several years rather than instantaneously. Population impact is dissipated more slowly than employment.

Table 22 presents a more likely time pattern for exogenous impact--that of the construction of the natural gas pipeline.

In contrast to these impact multipliers, a third impact analysis, reported in Table 23, shows the effect of an increase in construction employment of 1,000 sustained in all future years. This clearly puts the economy onto a new long-run growth trajectory after about four years. The employment and population responses are larger than in the case of an impulse-type impact both because they are initialed in a later year when the economy is larger and because the higher level of activity is permanent and causes a permanent response in other sectors of the economy. Notice that the remote site employment impact is slightly smaller because a larger proportion of those construction employees are nonresidents.

TABLE 21. IMPACTS OF A ONE-TIME INCREASE
IN CONSTRUCTION EMPLOYMENT
(thousands)

Premium Wage, Remote Site, Enclave Employment (EMCNX1)

	EMCNX	EMCN	EMTCU	EMSUP	EMGA	EM99	POP
1985	1.	1.118	0.159	0.476	0.011	1.882	1.423
1986	0.	0.17	0.008	-0.024	0.018	0.186	0.834
1987	0.	0.019	0.014	0.111	0.026	0.181	0.507
1988	0.	0.012	0.008	0.067	0.018	0.112	0.417
1989	0.	0.008	0.006	0.051	0.012	0.083	0.378
1990	0.	0.005	0.004	0.029	0.009	0.05	0.331
1991	0.	0.004	0.003	0.021	0.006	0.037	0.282
1992	0	0.004	0.002	0.014	0.004	0.026	0.224
1993	0.	0.004	0.001	0.009	0.002	0.017	0.182
1994	0.	0.003	0.001	0.005	0.002	0.012	0.15
1995	0.	0.002	0.001	0.005	0.001	0.009	0.126
1996	0.	0.	0.	0.001	-0.015	-0.015	0.085

Regular Construction Employment (EMCNX2)

	EMCNX	EMCN	EMTCU	EMSUP	EMGA	EM99	POP
1985	1.	1.075	0.055	0.281	0.022	1.536	1.158
1986	0.	0.02	0.025	0.249	0.068	0.388	0.725
1987	0.	0.02	0.019	0.152	0.042	0.249	0.532
1988	0.	0.015	0.015	0.127	0.038	0.209	0.511
1989	0.	0.013	0.014	0.119	0.019	0.176	0.484
1990	0.	0.008	0.006	0.051	0.014	0.084	0.404
1991	0.	0.006	0.004	0.035	0.01	0.059	0.349
1992	0.	0.005	0.003	0.024	0.006	0.041	0.281
1993	0.	0.004	0.002	0.015	0.003	0.026	0.23
1994	0.	0.003	0.001	0.009	0.002	0.017	0.184
1995	0.	0.002	0.001	0.005	0.001	0.01	0.155
1996	0.	0.	0.	0.001	-0.017	-0.017	0.106

KEY:
- EMCNX Exogenous construction employment
- EMCN Total construction employment
- EMTCU Transportation/communication/public utility employment
- EMSUP Trade/finance/service employment
- EMGA State/local government employment
- EM99 Total employment
- POP Population

SOURCE: BAT14.A and BAT14.B

TABLE 22. GAS PIPELINE CONSTRUCTION IMPACT

	EMCNX	EMCN	EMTCU	EMSUP	EMGA	EM99
1987	0.217	0.241	0.03	0.093	0.012	0.401
1988	0.217	0.275	0.032	0.089	0.014	0.438
1989	0.563	0.666	0.086	0.262	0.037	1.123
1990	2.435	2.818	0.371	1.113	0.154	4.762
1991	7.103	8.331	0.958	3.075	0.447	13.695
1992	10.589	13.049	1.201	4.613	0.81	21.214
1993	6.074	8.817	0.894	3.389	0.79	15.086
1994	0.468	2.146	0.503	2.093	0.574	5.919
1995	0.	0.744	0.38	2.052	0.507	4.167
1996	0.	0.418	0.316	1.552	0.497	3.202
1997	0.	0.27	0.273	1.194	0.459	2.573
1998	0.	0.234	0.251	1.011	0.405	2.257
1999	0.	0.118	0.234	0.875	0.365	1.926
2000	0.	-0.016	0.22	0.772	0.346	1.637

	POP	R.WR98	PR.PI	HH	WS98
1987	0.306	8.039	-0.512	0.106	21.801
1988	0.465	8.805	-0.723	0.161	25.434
1989	1.056	22.184	-1.328	0.365	69.441
1990	4.091	91.289	-3.086	1.412	319.277
1991	12.451	252.582	-9.852	4.294	998.836
1992	24.319	386.461	-30.098	8.394	1731.57
1993	25.99	247.703	-49.883	9.007	1250.55
1994	19.344	36.629	-56.27	6.765	388.641
1995	16.154	2.277	-59.965	5.694	241.168
1996	14.192	2.086	-56.355	5.04	199.488
1997	13.077	2.645	-56.625	4.677	176.242
1998	12.109	4.27	-54.242	4.365	170.687
1999	11.282	4.074	-52.855	4.103	157.457
2000	10.541	3.117	-51.125	3.87	143.25

KEY:
- EMCNX Exogenous construction employment (thousand)
- EMCN Total construction employment (thousand)
- EMTCU Trans/comm/public utility employment (thousand)
- EMSUP Trade/finance/service employment (thousand)
- EMGA State/local government employment (thousand)
- EM99 Total employment (thousand)
- POP Population (thousand)
- R.WR98 Real wage rate (1967 U.S. $)
- PR.PI Real per capita personal income (1967 U.S. $)
- HH Households (thousand)
- WS98 Wages and salaries (million $)

SOURCE: BAT14.GP

TABLE 23. IMPACTS OF A SUSTAINED INCREASE IN CONSTRUCTION EMPLOYMENT

Regular Construction Employment (EMCNX2)

	EMCNX	EMCN	EMTCU	EMSUP	EMGA	EM99
1987	1.	1.112	0.093	0.647	0.169	2.165
1988	1.	1.132	0.107	0.759	0.199	2.351
1989	1.	1.148	0.12	0.868	0.211	2.514
1990	1.	1.152	0.125	0.911	0.221	2.582
1991	1.	1.15	0.126	0.931	0.23	2.613
1992	1.	1.154	0.13	0.965	0.235	2.663
1993	1.	1.169	0.134	1.001	0.241	2.73
1994	1.	1.18	0.138	1.031	0.244	2.781
1995[a]	1.	0.705	0.005	0.336	-2.924	-2.01
1996	1.	0.196	0.065	0.331	1.068	1.781
1997	1.	0.294	0.059	0.486	0.247	1.166
1998	1	0.977	0.089	0.579	0.263	2.048
1999	1.	1.216	0.111	0.761	0.31	2.574
2000	1.	1.277	0.141	1.022	0.304	2.946

	POP	R.WR98	PR.PI	HH	WS98
1987	2.43	10.219	13.078	0.844	78.316
1988	2.895	10.305	12.707	1.007	89.672
1989	3.316	10.262	11.801	1.156	101.332
1990	3.664	9.238	10.43	1.28	110.98
1991	4.005	8.168	7.844	1.402	120.156
1992	4.362	8.738	6.125	1.53	136.852
1993	4.657	9.043	5.23	1.638	150.176
1994	4.891	9.805	4.34	1.726	163.91
1995	1.408	-4.191	-32.367	0.54	-125.137
1996	3.281	4.758	1.137	1.182	116.578
1997	2.924	1.637	-4.621	1.066	77.059
1998	3.529	12.01.	5.328	1.278	170.207
1999	4.088	15.297	8.785	1.475	227.906
2000	4.554	14.914	11.273	1.643	270.051

[a]A negative impact occurs in 1995 because the increase in population causes a revenue shortfall one year earlier than in the base case.

KEY: See Table 22.
SOURCE: BAT14.D

TABLE 23 (continued)

Premium Wage Remote Site, Enclave Employment (EMCNX1)

	EMCNX	EMCN	EMTCU	EMSUP	EMGA	EM99
1987	1.	1.29	0.154	0.51	0.097	2.192
1988	1.	1.297	0.164	0.564	0.103	2.273
1989	1.	1.311	0.176	0.599	0.105	2.343
1990	1.	1.315	0.18	0.612	0.109	2.369
1991	1.	1.314	0.169	0.602	0.114	2.352
1992	1.	1.317	0.173	0.627	0.12	2.394
1993	1.	1.335	0.178	0.658	0.124	2.457
1994	1.	1.349	0.186	0.691	0.13	2.522
1995[a]	1.	0.877	0.058	0.009	-3.018	-2.225
1996	1.	0.371	0.12	0.013	0.979	1.585
1997	1.	0.475	0.116	0.181	0.161	0.995
1998	1.	1.162	0.147	0.284	0.18	1.898
1999	1.	1.406	0.181	0.483	0.23	2.462
2000	1.	1.473	0.216	0.758	0.226	2.864

	POP	R.WR98	PR.PI	HH	WS98
1987	2.714	39.027	-6.066	0.943	114.16
1988	3.056	39.759	-6.715	1.064	125.262
1989	3.369	40.492	-7.531	1.176	137.379
1990	3.634	39.348	-8.102	1.271	148.793
1991	3.858	38.066	-9.625	1.353	159.441
1992	4.106	38.887	-10.02	1.444	180.926
1993	4.336	39.59	-9.926	1.528	197.91
1994	4.533	40.859	-9.879	1.603	216.453
1995	1.054	27.195	-45.594	0.418	-65.746
1996	2.953	36.75	11.793	1.068	181.824
1997	2.603	33.879	-16.609	0.954	149.137
1998	3.213	44.937	-5.969	1.168	249.457
1999	3.8	48.738	-1.77	1.375	316.273
2000	4.292	48.832	1.367	1.551	367.809

[a]A negative impact occurs in 1995 because the increase in population causes a revenue shortfall one year earlier than in the base case.

KEY: See Table 22.
SOURCE: BAT14.D

The large size of this impact is due to several factors. First, the measure of exogenous impact in Table 23 is only construction employment (including engineers, managers, and clerical). The actual construction of a project like a pipeline involves, in addition to construction employees, a substantial support staff in transportation, trade, and services. Thus, the direct employment observed to be directly associated with construction will be larger, by perhaps one-third than the direct construction employment. (For example, only about 68 percent of Alyeska pipeline employment was categorized as construction.) In the model, this support employment appears with indirect support employment. Second in the model, investment is endogenous rather than exogenous, and this increases the size of any impact response because investment activity is a result of an increase in the basic sector. Finally, the model describes the development process within the economy, and this is reflected in impact analysis. The economic development process may be described as an increase in the ratio of support-to-basic activity. Obviously, if the <u>average</u> ratio of support-to-basic employment is increasing, then the <u>incremental</u> or <u>marginal</u> ratio must be <u>above</u> the average ratio.

9. Input Data Sources

Variable	Definition	Source
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 1981. See Alaska Native Land Claims, Arnold
APPFCONX	general fund appropriations to the Permanent Fund	author's estimate
BADD	birth adjustment factor to account for birth of Native children to non-Native women	zero in simulation
BALDF6	initial state development fund (hypothetical) balance; million $	historical data
BALGFUNA	state general fund balance unavailable for appropriations	author's estimate
BALGF6	initial state general fund balance; million $	historical data
BALPF6	initial state Permanent Fund balance; million $	historical data
BASEMCNX	a base case vector of EMCNX values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	default values all one; alternate values obtained from a base case
BASEPOP	a base case vector of POP values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	default values all one; alternate values obtained from a base case
BASEXCAP	a base case vector of EXCAP values used for fiscal impact analysis in conjunction with fiscal policy variables EXRL4	default values all one; alternate values obtained from a base case
BASEXGF	base case expenditure value to be placed in impact run to calculate difference in state expenditures in real per capita terms	default values all one; alternate values obtained from a base case

Variable	Definition	Source
BASEXOPS	a base case vector of EXOPS values used for fiscal impact analysis in conjunction with fiscal policy variables EXRL4	default values all one; alternate values obtained from a base case
BASPDRPI	base case value of RPI to be input into impact run to calculate difference in state expenditures in real per capita terms; index	default values all one; alternate values obtained from a base case
BIU6	initial value of the Basic Instructional Unit for School Foundations' distribution program; thousand $	zero in simulation
D***	dummy variable taking value of one in year or interval indicated; unit	-
D.80DEC6	dummy variable with value of unity in 1980, tapering off to zero in 6 years, reflecting the fact that Alaskan wage rates are "sticky downward"	-
EMAGRI	agricultural employment component of agriculture/forestry/fisheries (EMA9); thousands	DEVELOPMENT SCENARIO
EMAUN	forestry and unclassified employment	constant at most recent historical level
EMCNX1	"enclave" or premium wage construction employment; thousand	DEVELOPMENT SCENARIO
EMCNX2	non-"enclave" exogenous construction employment; thousand	DEVELOPMENT SCENARIO
EMFISH	fish harvesting employment; thousand	DEVELOPMENT SCENARIO
EMGC	federal civilian employment; thousand	DEVELOPMENT SCENARIO
EMGM	federal military employment; thousand	DEVELOPMENT SCENARIO
EMMX1	premium wage manufacturing employment; thousand	DEVELOPMENT SCENARIO
EMMX2	low wage manufacturing employment; thousand	DEVELOPMENT SCENARIO
EMNATX	Native employment rate obtained from the income distribution model; percent	values derived from income distribution model (currently inoperative)

Variable	Definition	Source
EMP9	mining employment; thousand	DEVELOPMENT SCENARIO
EMT9X	large pipeline project-related transportation employment; thousand	Alyeska employment based upon Alaska Department of Labor estimates; additional employment from DEVELOPMENT SCENARIO
EXCPSFD6	initial values for portion of capital project fund	historical data
EXCPSGB6	initial value for EXCPSGOB; million $	historical data
EXDF1	percent of state current account balance placed into development fund (hypothetical); percent	-
EXDFPCNT	development fund (hypothetical) withdrawals as percent of earnings; percent	-
EXDSSX	annual debt service payment to service general obligation bonds outstanding at beginning of simulation period; million $	Department of Administration, <u>Annual Financial Report</u>
EXGFCAP6	initial value for EXGFCAP; million $	historical data
EXGFCOT6	initial value for EXGFCOT; million $	historical data
EXGFOPSX	exogenous component of state unrestricted general fund operating expenditures; million $	-
EXOPS6	initial total state operating expenditures net of debt service and University of Alaska nongeneral fund assistance; it is the sum of the 9 functional categories; million $	estimated from Department of Administration, <u>Executive Budget</u>
EXPFTOGF	percent of Permanent Fund earnings transferred to the general fund	author's estimate
EXPF1	percent contribution from available funds to Permanent Fund; percent	present law requires 25 percent contribution rate on areas leased before 1981 and 50 percent subsequently
EXPFCONX	Permanent Fund contributions appropriated from the general fund; million $	historical data

Variable	Definition	Source
EXPFDIST	percent of Permanent Fund earnings transferred to general fund which are distributed to individuals; percent	author's estimate
EXPFDVX1	accounting adjustment to Permanent Fund retained earnings in early years; million $	ADR, The Alaska Permanent Fund: Overview and March 1984 Projections
EXPFDVX2	accounting adjustment to Permanent Fund dividend program in early years; million $	ADR, The Alaska Permanent Fund: Overview and March 1984 Projections
EXSAVX	if EXRLOP7 is invoked in determination of state operating expenditures, this is the amount of revenues not spent; million $	zero in default case
EXSPCAP	special state capital appropriations; million $	author's estimate
EXSPLITX	the target allocation to operations when state spending falls below the authorized spending limit; percent	author's estimate
EXSUBSX	exogenous values for state subsidy programs initiated after 1980; million $	author's estimate
EXSUB1	stimulative effect of state subsidies on construction industry; percent	author's estimate
EXSUB2	stimulative effect of state subsidies on consumer spending; percent	author's estimate
EXTRNSPI	state Permanent Fund dividends in 1982 and 1983 incorporated in state personal income	author's estimate
EXTRNSX	Permanent Fund dividend distribution funded through the general fund	historical data
EXUA6	initial value for University of Alaska operating budget; million $	historical data
GODTX	general obligation bonded indebtedness of the state from debts incurred before start of simulation period; million $	Department of Administration, Annual Financial Report

Variable	Definition	Source
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 1980s, with a gradual return to a long-run trend somewhat below the historical rate. See U.S. Dept. of Commerce, Bureau of Economic Analysis, The National Income and Product Accounts of the U.S. 1929-74 & Survey of Current Business
GREXCAP	growth rate of state capital expenditures if fiscal rule EXRL2 is used	inoperative in default case
GREXOPS	nominal growth rate for state operating expenditures if EXRL4 is chosen in the state operating expenditure equation; percent	inoperative in default case
GRRPCEX	growth rate real per capita state operating expenditures if fiscal rule EXRL3 is used	inoperative in default case
GRRWEUS	annual growth rate of real U.S. average weekly earnings; percent	the nominal historical annual average growth rate has varied with the rate of inflation. Its values are as follows: 1960-65, 3.34%; 1965-70, 4.6%; 1970-75, 6.52%; 1975-77, 7.53%. Wages are assumed in the projection period to grow 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
GRSSCP	growth rate of real state capital stock per capita when fiscal policy variable EXRL3 is used	inoperative in default case

Variable	Definition	Source
GRUSCPI	annual growth rate of U.S. consumer price index; percent	Historical annual average growth rates of the consumer price index are as follows: 1960-65, 1.3%; 1965-70, 4.2%; 1970-75, 6.7%; 1975-77, 6.1%. The simulation values are based upon projections by the Alaska Department of Revenue. See also U.S. Dept. of Commerce, Bureau of Economic Analysis, Survey of Current Business
LAFPRT	pseudo labor force participation rate--employment by place of work divided by labor force by place of residence; percent	Set to calibrate total population for the model employment estimate
LBOND1	proportion of state general obligation bonds for highways	historical data
LFED1	proportion of federal capital grants for highways	historical data
LGF1	proportion of state general fund capital expenditures for highways	historical data
LPTRAT	percentage of pipeline property within local jurisdictions actually subject to local tax because of limitations imposed by state statutes; percent	based upon Department of Community and Regional Affairs, Alaska Taxable
NCBP	bonus income to Natives from lease sales; million $	author's estimate
NCRP	Native recurrent income from petroleum development on Native land; million $	author's estimate
P9PTPER	percentage of petroleum property which is taxable by state which falls within local taxing jurisdiction; percentage	Department of Community and Regional Affairs, Alaska Taxable
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

Variable	Definition	Source
PCNC2	proportion of recurring income from petroleum development on Native lands paid directly in individuals; percent	author's estimate
PCNC3	proportion of earnings on Native corporation accumulated capital paid directly to individuals; percent	author's estimate
PCOLART	cost of living differential for federal employees; percentage	author's estimate
PDRATIO6	initial values for ratio of Alaskan relative price index to U.S. consumer price index	historical data
PDUSCPI6	initial value for U.S. consumer price index; index	historical data
PIPADJ	ratio of "enclave" to regular construction employee wage rate	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
PITRAN6	known historical values for transfers component of personal income	historical data
PR.DPIU6	initial value for U.S. real per capita disposable personal income; $	historical data
RLPTX	exogenous local property tax receipts; million $	zero in default case
RLTEB6	known historical values for state aid to local government for education net of district and REAA aid	historical data
RLTFPX	petroleum-related federal-local transfers; million $	author's estimate
RLTMA6	known historical values for state-local transfers under municipal assistance	historical data
RLTMCAP	municipal capital grants from state to local government	author's estimate

Variable	Definition	Source
RLTRS6	known historical values for state-local revenue sharing	historical data
RLTX	exogenous state-local transfers; million $	zero in default case
RMISRES6	known historical values for miscellaneous restricted general fund revenues	historical data
RNATX	Native personal income as percent of total personal income calculated using income distribution model	values derived from income distribution model; currently inoperative
RP9X	exogenous miscellaneous petroleum revenues; million $	author's estimate
RPBS	state petroleum bonuses; million $	DEVELOPMENT SCENARIO
RPEN	state petroleum rents before Permanent Fund deduction; million $	author's estimate
RPPS	state petroleum property tax; million $	DEVELOPMENT SCENARIO
RPRY	state petroleum royalty revenues; million $	DEVELOPMENT SCENARIO
RPTS	petroleum production taxes consisting of oil and gas severance tax; million $	DEVELOPMENT SCENARIO
RSFDN6	initial values for total federal grants-in-aid to state general fund; million $	historical data
RSFDNCAX	federal grants-in-aid to state general fund for capital expenditures	author's estimate
RSFDNPX	federal-state shared petroleum royalties; million $	author's estimate
RSFDNX	exogenous federal-state transfer payments; million $	default value is zero
RSIG6	known historical values for state general fund interest	historical data
RSIP5	state Permanent Fund interest—initial adjustment; million $	ADR, Revenue Sources
RTCSPX	state corporate tax receipts from petroleum sector; million $	DEVELOPMENT SCENARIO

Variable	Definition	Source
RTCSX	exogenous corporate income tax; million $	zero in default case
RTISXX	adjustment of disposable income to cover lag in refund in state personal income taxes after repeal; million $	author's estimate
RTOTS6	known historical values for other state taxes (fiduciary, inheritance, estate, mining, conservation, prepaid, & fish taxes)	historical data
SANCSA	payments to Alaska Natives under ANCSA out of state royalty revenues; million $	16 percent of state royalty revenues until $493.1 million paid out
SANCSAX	special state appropriation to pay off ANSCA debt	historical data
TCRED	individual tax credit beginning after 12/31/77; dollars	zero in default case
TOURIST	number of tourist visitors to Alaska; thousands	DEVELOPMENT SCENARIO
TXBASE	change in the floor of personal income tax rate schedule; units	zero in default case
TXCRPC	state personal income tax credit (percentage of tax liability) adjustment; percentage	zero in default case
TXPTXX	allows model user to withhold from state expenditures a portion of any personal income tax reduction; percent	default value is zero
TXRT	percentage change in state personal income tax rate; percentage	zero in default case
UUS	U.S. unemployment rate; percent	author's estimate
VAEX6	value of a personal exemption on personal income tax; dollars	author's estimate
WEUS6	initial value for average weekly U.S. wage rate; $	historical data
XXMX1	large projection manufacturing real gross product	zero in default case
YR	year	-

10. Programs for Model Use

A85.1RUN	Sets searches and calls state model for simulation
A85DBCOM	Prints initial year simulation values for selected variables for comparison to historical data tables
A85PRE	Prints summary tables of output of economic model
A85PRFIN	Prints summary tables of inputs of fiscal model
A85PRFOT	Prints summary tables of output of fiscal model
A85PRPOP	Prints detailed output from the demographic module
A85PRSCN	Prints model inputs from the scenario generator
A85SIMAD	Macro describing all model adjustments necessary for simulation
A85XPAR	Prints model economic parameter values
A84DEFLT	Deflates user-specified simulation output to 1984 real dollars using PDCPI
A84INIT	Prints selected simulation results and compares values to actual historical data; prints difference and percent difference
A84MERGE	Combines individual historical data archives into a single archive called AKDATA
A84RUNCD	Sets searches and calls regionalization model (A84.CD) for disaggregation of employment and population to census division level.
A84RUNH	Sets searches and calls model for historical simulation
A84TRANS	Performs transformations on raw data files to create archive AKHIST

NOTE: Programs (MACROs) without A85 prefix have not been updated for this version of the model.

A83REG	Sets searches for regression analysis
LOOK	Lists all archives in specified account

11. Model Adjustments for Simulation

After preliminary estimation of all parameters and construction of the model as well as whenever significant new data becomes available, the model must be adjusted for simulation. The objectives of the adjustments are to initialize the model so that simulation values begin as closely as possible to actual historical values, to correct any imbalances within the model structure which show up in initial simulations, or to handle special conditions which arise each year as the structure of the economy evolves. Model initialization is difficult because the data for a particular year becomes available over a period of more than one year. Thus, at any point in time the most current historical data available will vary over a two-year period, depending upon the variable and source. As a general rule, the most important variables for initializing the model are employment in total and by sector, total population, wage rates by industry, and the price level.

Adjustments and initialization procedures used in the economic and fiscal modules for A85.1 are as follows:

Price ratio equation. The term relating the relative Alaskan price level (PDRATIO) to the growth in local support sector employment (C67A) has the correct sign and is significant in the regression but in simulation performs poorly. Its value is decreased (to -.007) so that the Alaskan price level is less responsive to growth in support employment. The rationale for this adjustment is that the Alaskan price level is sticky downward, and the recent historical trend, reflecting downward pressure on Alaskan relative prices, must moderate in the future.

This equation is also adjusted to incorporate the possibility of a one-time upward adjustment in some future year, using the coefficient C67C, resulting from a reimposition of the state personal income tax. This change would be essentially symmetrical, but opposite in sign, to the fall in the price level which occurred in 1980 when the tax was eliminated.

State and local government wage rate equations. The equations used to simulate state and local government wage rates are altered so that the real wage in these sectors never falls below the level of the previous year.

Exogenous construction employment. In simulation, EMCNRT is defined as nonzero only when the change is significant from the previous year.

Federal civilian wage rate equation. The elasticity of the federal civilian wage rate with respect to the real wage is reduced to 1.025 in simulation (C89B). This requires that the intercept (C89A) be initialized.

Migration equation. The migration equation estimation procedure contains a correction for autocorrelation. The autocorrelation coefficient is not utilized in simulation for two reasons. Net migration is initialized on the most recent data value which is an estimate rather than an observed value. Also, the influence of the autocorrelation term quickly falls to zero in a few years and can consequently be ignored in the long-run MAP model.

High wage exogenous construction income. Because the endogenous construction gross product equation was estimated on construction net of North Slope, petroleum-related construction activity consistency required setting R.DPI8X to zero in simulation.

12. Key to Regressions

Variable	Symbol	Range (may vary with particular variable)
State operating budget component	EXaaa	1962 to 1981
State personnel expenditure component	EXPRaaa	1962 to 1981
State revenues	Raaa	various
Local revenues and expenditures	RLaa, ELaa	various
Wage rates	WRaa	1961 to 1982
Gross product	XXaa	1961 to 1982
Employment	EMaa	1961 to 1982
Migration	POPMIG	1971 to 1982

NOTES: 1. Regressions are run on a version of the model called REG84.2. See Section 11 for explanation of differences between the regression and simulation models.

2. Regressions are based upon the database as of the fall of 1984.

13. Input Data Archives

Historical Data

AKDATA	All historical data series which are either (1) used in regression analysis, (2) are required to provide a startup value for simulation, or (3) interesting and relevant but not used in the model or not necessary to model simulation (created by MACRO A83MERGE from raw data files).
AKRAW1	Raw employment and wages data from Alaska Department of Labor, Statistical Quarterly.
AKRAW2	Raw state expenditures data from Office of the Governor, Executive Budget.
AKRAW3	Raw state budget data from Alaska Department of Administration, Annual Financial Report.
AKRAW4	Raw state revenue data from Alaska Department of Revenue, Revenue Sources and Petroleum Revenue Forecast.
AKRAW5	Raw state income data from U.S. Department of Commerce, Bureau of Economic Analysis, unpublished printouts.
AKRAW6	Raw local fiscal data from U.S. Department of Commerce, Bureau of Census, Government Finances and State Government Finances.
AKRAW7	Raw data from miscellaneous sources.
AKRAW8	Alaskan gross state product data from model IPDAK.
AKRAW9	National variables from various sources.
AKRAW10	Raw local government data from Alaska Department of Community and Regional Affairs, Alaska Taxable.
AKRAW11	Miscellaneous data from Alaska Department of Labor
AKRAW12	New miscellaneous data and data files under construction.
AKHIST	Data created by transformations of raw data in archives AKRAW1 to AKRAW12 (using A83TRANS).

Simulation Data

CONHIST — Startup and control data specifically used for historical simulation of the economic model.

CONTROL — Default values for all exogenous and policy variables for projective simulation (except the state capital stock module). In certain instances, historical data is also included. Many of these variables are overridden in simulation by the scenario model output.

FCAST — Values for endogenous variables for which a complete historical series does not exist for use in non-simultaneous historical simulation (TROLL FORECAST procedure). Where historical values do not exist, estimates are used.

FLAT2 — Constant levels for exogenous employment variables used to test model steady state properties.

STARTUP — Startup values for all endogenous variables in the economic and fiscal components of the model for which a complete historical time series (up to the last year before the first year of simulation) does not exist. The values contained in these data files are values specifically created for model simulation and should not be used for any other purpose. In most cases, the specific value for the variable is immaterial to the output of the simulation since the purpose of these variables is to give TROLL an initial value from which to search for a solution to the simulation.

POPST3 — Startup values for all endogenous variables in the population component of the model for which a complete historical time series (up to the last year before the first year of simulation) does not exist. This includes estimated 1980, 1981, and 1982 population by age, race, and sex on an average annual basis (in contrast to the census which uses an April 1 definition). The procedure for creation of this archive is as follows:

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 POPST3, were computed using the formula:

   POPST3_POPijk = 0.25*[POPijk(1981)-POPijk(1980)] where POPST3_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.

3. The population module was then simulated for two years (1981 and 1982) under the restriction that total civilian population matched the July 1 Alaska Department of Labor population estimates. This produces population estimates by age, sex, and race for 1981 and 1982, allowing full model simulation to begin in 1983.

CAPSTK — Startup and control data specifically for the state capital stock module.

APPENDIX A
ISER MAP ALASKA ECONOMIC MODEL: EQUATION LIST

1. Fiscal Module
2. Economic Module
3. Demographic Module
4. Native Economic Activity Module
5. Definitional Equations Module
6. Links to Income Distribution Model Module
7. State Government Capital Stock Module

MODEL: A85.1

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

DATE: December 1984

SYMBOL DECLARATIONS

ENDOGENOUS:

ADMSD AEX AGI AHG ATD ATI ATI.TT ATT BALCAP84 BALDF
BALGFAFA BALGFCP BALGFP BALGF9 BALPF BAL99 BAL99AFA 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
DEBTP83 DF.RSVP DPI DPIRES DPI8 ELBD ELED ELEDCP ELED1
ELNED1 ELPERS EL99 EMAFISH EMA9 EMCM EMCN EMCNRT EMCNX
EMCN1 EMDR EMDRNT EMDTOUR EMDW EMD9 EMFI EMGA EMGF EMGL
EMGS EMMO EMM9 EMPRO EMPROFIS EMPRO1 EMPU EMRATE EMRATN1
EMSB EMSP EMSTOUR EMSUP EMS8NT EMS9 EMS91 EMTCU EMTNT
EMTOUR EMTTOUR EMT9 EMT91 EMX EM9INFR EM96 EM97 EM98 EM99
EXANSAV EXCAP EXCAPFR EXCDS EXCDSNT EXCDS4 EXCPS EXCPSFED
EXCPSHY EXCPSM EXCPSNH EXC10 EXC15 EXC4 EXC5 EXC7 EXDFCON
EXDFWITH EXDSS EXEDS EXEDS4 EXGF EXGFBM EXGFCHY EXGFCNH
EXGFCOT EXGGS EXGGS4 EXHES EXHES4 EXINREC EXINRECB EXJUS
EXJUS4 EXLIM EXLIMOK EXNOPS EXNRS EXNRS4 EXOPS EXPFCON
EXPFCON1 EXPPS EXPPS4 EXPRCDS EXPREDS1 EXPRGGS EXPRHES
EXPRJUS EXPRNRS EXPRPPS EXPRSSS EXPRTRS EXPRUA EXPR99 EXSAVS
EXSSS EXSSS4 EXSUBS EXTRNS EXTRS EXTRS4 EXUA EX99S FAGI

FAGII G.EMSP 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.CAP1
R.CAP10 R.CAP11 R.CAP12 R.CAP13 R.CAP14 R.CAP15 R.CAP2 R.CAP3
R.CAP4 R.CAP5 R.CAP6 R.CAP7 R.CAP8 R.CAP9 R.DPI R.DPI8N
R.DPI8X R.WR97 RLMC RLOT RLPT1 RLTCS RLTCS4 RLTEB RLTEB4
RLTEF4 RLTEO RLTEO4 RLTET RLTET4 RLTE99 RLTE994 RLTF RLTMA
RLTMA4 RLTMS RLTRS RLTRS4 RLTT9 RLTT94 RLTVS4 RLT99 RMIS
RMISRES ROFAS ROFERS ROFOS RSFDN RSFFS RSFS1 RSGF RSGFBM
RSIAS RSIP RSIPGF 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 WRPU 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 XXMO XXMX2 XXPU XXP9 XXSB
XXS8NT XXS9 XXTNT XXT9 XXVHY XXVNHY XX98

CONSTRUCT:

DF.APGFC DF.APGFO DF.BALDF DF.BALGF DF.BALPF DF.BAL99 DF.DPI
DF.EL99 DF.EXDSS DF.EXGF DF.EXGFB DF.EXLOK DF.GOXBM DF.PI
DF.RLPT DF.RLT99 DF.RP9S DF.RP9SG DF.RSEN DF.RSENG DF.RSFD
DF.RSGF DF.RSGFA DF.RSGFB DF.RSGFG DF.RSIDN DF.RSIGN DF.RSIN
DF.RSIP DF.RSIPG DF.RSIPN DF.RTCS1 DF.RTIS DF.R99S DF.WRG9
DF.WRNS DF.WRSP DF.WSG9 DF.WSNS DF.WSSP DF.WS98 DFP.APGC
DFP.APGO DFP.BAL9 DFP.DPI DFP.EXGF DFP.EXLK DFP.PI EM.EMCN
EM.EMGA EM.EMGF EM.EMSP EM.EMSUP EM.EMTCU EX.DSS EX.NRP9
EX.RP9S EX.RSEN EX.RSIN 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
IM.BALPC IM.BALR IM.BAL99 IM.BLRPC IM.REV INX.DI INX.DINN
INX.DI8N INX.S1 INX.S2 INX.WG P.BALPF P.BAL99 P.DPINN1 P.ELED
P.ELNED1 P.EL99 P.EXBM P.EXCAP P.EXOPS P.EXTRNS P.EX99S
P.GEXP P.GODT P.PI P.PIN P.PINCL P.PINN P.RLT99 P.RSEN
P.RSIN P.RSIP P.RTIS 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 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.DPI8N 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.EXOPS PR.EXPPS PR.EXSSS PR.EXTRS PR.EX99S PR.GEXP
PR.GFC PR.GFCN PR.GODT PR.NCEXP PR.PIN PR.PINCL PR.PINN
PR.RLT99 PR.RSEN PR.RSIN PR.RSIP PR.RTIS PR.R99S R.PI R.PIN

R.PINN R.WR98 RL99.PT RL99.RT RS.FED RS.PET RS.REC RS.RP9S
RS.RSEN RS.RSIN RSBM.B99 RSBM.GF RSBM.PET RSBM.PF RSBM.REN
RSBM.RP9 U.AK.US WR.AK.US Z0.0 Z0.1 Z0.2 Z0.3 Z0.4 Z0.5
Z0.6 Z0.7 Z0.8 Z0.9 Z1.0 Z1.1 Z1.2 Z1.3 Z1.4 Z1.5 Z1.6
Z1.7 Z1.8 Z1.9 Z10.0 Z10.1 Z10.2 Z10.3 Z10.4 Z10.5 Z10.6
Z10.7 Z10.8 Z10.9 Z11.0 Z11.1 Z11.2 Z11.3 Z11.4 Z11.5 Z11.6
Z11.7 Z11.8 Z11.9 Z2.0 Z2.1 Z2.2 Z2.3 Z2.4 Z2.5 Z2.6 Z2.7
Z2.8 Z2.9 Z3.0 Z3.1 Z3.2 Z3.3 Z3.4 Z3.5 Z3.6 Z3.7 Z3.8
Z3.9 Z4.0 Z4.1 Z4.2 Z4.3 Z4.4 Z4.5 Z4.6 Z4.7 Z4.8 Z4.9
Z5.0 Z5.1 Z5.2 Z5.3 Z5.4 Z5.5 Z5.6 Z5.7 Z5.8 Z5.9 Z6.0
Z6.1 Z6.2 Z6.3 Z6.4 Z6.5 Z6.6 Z6.7 Z6.8 Z6.9 Z7.0 Z7.1
Z7.2 Z7.3 Z7.4 Z7.5 Z7.6 Z7.7 Z7.8 Z8.0 Z8.1 Z8.2 Z8.3
Z8.4 Z8.5 Z8.6 Z8.7 Z8.8 Z8.9 Z9.0 Z9.1 Z9.2 Z9.3 Z9.4
Z9.5 Z9.6 Z9.7 Z9.8 Z9.9 Z9.10

DEFINITION:

ADMDIS ADMREA APGF APGFCAP APGFOPS BALCAB BALCABGF 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
DF.RSI99 DTHINF DTHTOT DTOT EMCU EMG9 EMNA EMNAT EMNC EMNNC
EMNR EMNS EMOCSX EMRATN EM9BASE EM9GOV EM9SUPRT EXBUD
EXCAPNEW EXCAPOT EXCAPREP EXCNT EXCN1 EXCN10 EXCN11 EXCN12
EXCN13 EXCN14 EXCN15 EXCN2 EXCN3 EXCN4 EXCN5 EXCN6 EXCN7
EXCN8 EXCN9 EXCPSGOB EXCRFT EXCRF1 EXCRF10 EXCRF11 EXCRF12
EXCRF13 EXCRF14 EXCRF15 EXCRF2 EXCRF3 EXCRF4 EXCRF5 EXCRF6
EXCRF7 EXCRF8 EXCRF9 EXCRLT EXCRL1 EXCRL10 EXCRL11 EXCRL12
EXCRL13 EXCRL14 EXCRL15 EXCRL2 EXCRL3 EXCRL4 EXCRL5 EXCRL6
EXCRL7 EXCRL8 EXCRL9 EXCRST EXCRS1 EXCRS10 EXCRS11 EXCRS12
EXCRS13 EXCRS14 EXCRS15 EXCRS2 EXCRS3 EXCRS4 EXCRS5 EXCRS6
EXCRS7 EXCRS8 EXCRS9 EXCRTT EXCRT1 EXCRT10 EXCRT11 EXCRT12
EXCRT13 EXCRT14 EXCRT15 EXCRT2 EXCRT3 EXCRT4 EXCRT5 EXCRT6
EXCRT7 EXCRT8 EXCRT9 EXCRUT EXCRU1 EXCRU10 EXCRU11 EXCRU12
EXCRU13 EXCRU14 EXCRU15 EXCRU2 EXCRU3 EXCRU4 EXCRU5 EXCRU6
EXCRU7 EXCRU8 EXCRU9 EXCT EXC1 EXC101 EXC11 EXC12 EXC13
EXC14 EXC2 EXC3 EXC6 EXC8 EXC9 EXEDSNT EXGF.AFR EXGFCAP
EXGFCAP1 EXGFOPS EXGFOT.A EXHYCAP EXNHYCP EXOMFT EXOMF1
EXOMF10 EXOMF11 EXOMF12 EXOMF13 EXOMF14 EXOMF15 EXOMF2 EXOMF3
EXOMF4 EXOMF5 EXOMF6 EXOMF7 EXOMF8 EXOMF9 EXOMLT EXOML1
EXOML10 EXOML11 EXOML12 EXOML13 EXOML14 EXOML15 EXOML2 EXOML3
EXOML4 EXOML5 EXOML6 EXOML7 EXOML8 EXOML9 EXOMST EXOMS1
EXOMS10 EXOMS11 EXOMS12 EXOMS13 EXOMS14 EXOMS15 EXOMS2 EXOMS3
EXOMS4 EXOMS5 EXOMS6 EXOMS7 EXOMS8 EXOMS9 EXOMTT EXOMT1
EXOMT10 EXOMT11 EXOMT12 EXOMT13 EXOMT14 EXOMT15 EXOMT2 EXOMT3
EXOMT4 EXOMT5 EXOMT6 EXOMT7 EXOMT8 EXOMT9 EXOMUT EXOMU1
EXOMU10 EXOMU11 EXOMU12 EXOMU13 EXOMU14 EXOMU15 EXOMU2 EXOMU3
EXOMU4 EXOMU5 EXOMU6 EXOMU7 EXOMU8 EXOMU9 EXOM84 EXPFCON9

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 HHSIZEM 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 NWSA9N NWSCMN NWSCNN NWSD9N NWSFIN NWSGAN
NWSGFN NWSM9N NWSPUN NWSP9N NWSS9N NWST9N P.BALGF9 PF PFN
PIL PIN PINN PIN1 PIPRO PLFDOMC PLFDOMM PLFDOMN PLFD9 PM
PMN POPADS POPAVAGE 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 R.CAPT RATIO1 RAT1 RLPT
RLTEA RLTEA4 RLTEC RLTEC4 RLTEF RLTOT RLTOT4 RLTVS RL99
RL991 RNAT ROFTS RORCRF RPBSGF RPENGF RPRYGF RP7S RP7SGF
RP7SPF RP9S RP9SGF RSBM.EXD RSEN RSENGF RSFDNPXG RSFS
RSGF.AFR RSGFGAP RSGFRS RSID RSIDNET RSIG RSIGNET RSIN
RSIPNET RSIPPF RSIPPF1 RSI99 RSI99NET RTBS RTBS1 RTCS RTISCA
RT99 SLGEXP THG UNEMP UNEMRATE WRCU WRGCN WRGCU WRGD9 WRGFI
WRGGA WRGGC WRGMS WRGM9 WRGP9 WRGS9 WRGT9 WRMX1 WRM9 WR97
WSA9 WSCM WSD9 WSFI WSGF WSMX1 WSM9 WSNA WSPU WSP9 WSS9
WSS91 WST9 WS98L XXCNX XXM9 XXVACAP X1 X2 X3 X4 X5 X6

EXOGENOUS:

ANCSA BADD BALDF6 BALGF6 BALPF6 BASEMCNX BASEPOP BASEXCAP
BASEXGF BASEXOPS BASPDRPI BIU6 D.80DEC6 D61.64 D61.66 D61.67
D61.68 D61.69 D61.70 D61.72 D61.73 D61.74 D61.75 D61.76
D61.77 D61.81 D64.65 D68.71 D69 D71.00 D71.73 D72 D73
D74.75 D75 D79 D80 D81.00 D82 EMNATX EXCPSFD6 EXCPSGB6
EXDSSX EXGFCAP6 EXGFCOT6 EXOPS6 EXPFDVX1 EXPFDVX2 EXTRNSPI
EXUA6 GODTX LPTRAT NCBP NCRP PCNC1 PCNC2 PCNC3 PCOLART
PDRATIO6 PDUSCPI6 PIPADJ PITRAN6 PR.DPIU6 P9PTPER RLTEB6
RLTMA6 RLTRS6 RMISRES6 RNATX RSFDNCAX RSFDN6 RSIG6 RSIP5
RTISXX RTOTS6 SANCSA SANCSAX TCRED TXBASE TXCRPC TXPTXX TXRT
VAEX6 WEUS6 XXMX1 YR

POLICY:

APPFCONX BALGFUNA EMAGRI EMAUN EMCNX1 EMCNX2 EMFISH EMGC EMGM EMMX1 EMMX2 EMP9 EMT9X EXDFPCNT EXDF1 EXGFOPSX EXPFCONX EXPFDIST EXPFTOGF EXPF1 EXSAVX EXSPCAP EXSPLITX EXSUBSX EXSUB1 EXSUB2 EXTRNSX GRDIRPU GREXCAP GREXOPS GRRPCEX GRRWEUS GRSSCP GRUSCPI LAFPRT LBOND1 LBOND10 LBOND11 LBOND12 LBOND13 LBOND14 LBOND15 LBOND2 LBOND3 LBOND4 LBOND5 LBOND6 LBOND7 LBOND8 LBOND9 LFED1 LFED10 LFED11 LFED12 LFED13 LFED14 LFED15 LFED2 LFED3 LFED4 LFED5 LFED6 LFED7 LFED8 LFED9 LGF1 LGF10 LGF11 LGF12 LGF13 LGF14 LGF15 LGF2 LGF3 LGF4 LGF5 LGF6 LGF7 LGF8 LGF9 LMUNCAP LSGF1 LSGF10 LSGF11 LSGF12 LSGF13 LSGF14 LSGF15 LSGF2 LSGF3 LSGF4 LSGF5 LSGF6 LSGF7 LSGF8 LSGF9 OMF1 OMF10 OMF11 OMF12 OMF13 OMF14 OMF15 OMF2 OMF3 OMF4 OMF5 OMF6 OMF7 OMF8 OMF9 OML1 OML10 OML11 OML12 OML13 OML14 OML15 OML2 OML3 OML4 OML5 OML6 OML7 OML8 OML9 OMS1 OMS10 OMS11 OMS12 OMS13 OMS14 OMS15 OMS2 OMS3 OMS4 OMS5 OMS6 OMS7 OMS8 OMS9 OMU1 OMU10 OMU11 OMU12 OMU13 OMU14 OMU15 OMU2 OMU3 OMU4 OMU5 OMU6 OMU7 OMU8 OMU9 RCDEP1 RCDEP10 RCDEP11 RCDEP12 RCDEP13 RCDEP14 RCDEP2 RCDEP3 RCDEP5 RCDEP6 RCDEP7 RCDEP8 RCDEP9 REPF1 REPF10 REPF11 REPF12 REPF13 REPF14 REPF15 REPF2 REPF3 REPF4 REPF5 REPF6 REPF7 REPF8 REPF9 REPL1 REPL10 REPL11 REPL12 REPL13 REPL14 REPL15 REPL2 REPL3 REPL4 REPL5 REPL6 REPL7 REPL8 REPL9 REPS1 REPS10 REPS11 REPS12 REPS13 REPS14 REPS15 REPS2 REPS3 REPS4 REPS5 REPS6 REPS7 REPS8 REPS9 REPU1 REPU10 REPU11 REPU12 REPU13 REPU14 REPU15 REPU2 REPU3 REPU4 REPU5 REPU6 REPU7 REPU8 REPU9 RLPTX RLTFPX RLTMCAP RLTX RPBS RPEN RPPS RPRY RPTS RP9X RSFDNPX RSFDNX RTCSPX RTCSX TOURIST UUS

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 C108A C108B C109A C109B C11A C11B C12A C12B C14A C14B C14C C15A C15B C16A C16B C16C C17A C17B C17C C18A C18B C18C C18D 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 C32C C32D 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 C43D C43E 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 C54D C54E C54F C54G C54H C55A C55B C55C C56A C56B C56C 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 C67D C68A

C68B C68C C68D C69A C69B C7A C7B C70A C70B C70C C70D C70E
C70F C71A C71B C71C C71D C71E C72A C72B C72C C72D C73A
C73B 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 C89B C9A C9B C9C
C90A C90B C91A C91B C92A C92B C92C C92D C92F C93A C93B
C94A C94B 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 EXPF2 EXPF3 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 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 PCNCSV PCNCSV1 PCNCWS PCNC4 PCWS1 PCWS2 PCYNA1 PC12N
PC12RN PDCONBAS 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 RORBOND RORCPDEP 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 LE 1983 THEN PR.DPIU6 ELSE PR.DPIUS(-1)*
    (1+GRDIRPU)

2:  PDUSCPI = IF YR LE 1983 THEN PDUSCPI6 ELSE PDUSCPI(-1)*
    (1+GRUSCPI)

3:  WEUS = IF YR LE 1983 THEN WEUS6 ELSE WEUS(-1)*(1+GRUSCPI+
    GRRWEUS)
```

Price Deflators

```
4:  PDRATIO = IF YR LE 1983 THEN PDRATIO6 ELSE (IF RTIS(-2)-RTIS(-1)
    NE 0 AND RTIS(-2) EQ 0 AND G.EMSP GT 0 THEN PDRATIO(-1)+
    C67A*(1+G.EMSP**0.5)+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))-
    C67C+C67D*(1+G.EMSP**0.5)*D68.71 ELSE (IF RTIS(-2)-RTIS(-1)
    NE 0 AND RTIS(-2) EQ 0 THEN PDRATIO(-1)+C67A+C67B*(EMCNRT/
    (EM98(-1)/(EM98-EMCNX1)))-C67C-C67D*D68.71 ELSE (IF G.EMSP LE
    0 THEN PDRATIO(-1)+C67A+C67B*(EMCNRT/(EM98(-1)/(EM98-EMCNX1)))+
    C67D*D68.71 ELSE PDRATIO(-1)+C67A*(1+G.EMSP**0.5)+C67B*(EMCNRT/
    (EM98(-1)/(EM98-EMCNX1)))+C67D*(1+G.EMSP**0.5)*D68.71)))

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

8: Z0.9 == 0

9: Z0.8 == 0

10: Z0.7 == 0

11: Z0.6 == 0

12: Z0.5 == 0

13: Z0.4 == 0

14: Z0.3 == 0

15: Z0.2 == 0

16: Z0.1 == 0

17: Z0.0 == 0

FISCAL MODULE

State Petroleum Revenues

18: RP7S == RPBS+RPRY+RPEN+RSFDNPX

19: RPBSGF == (1-EXPF1)*RPBS

20: RPRYGF == (1-EXPF1)*RPRY

21: RPENGF == (1-EXPF1)*RPEN

22: RSFDNPXG == (1-EXPF1)*RSFDNPX

23: RP7SGF == RPBSGF+RPRYGF+RPENGF+RSFDNPXG

24: RP7SPF == RP7S-RP7SGF

25: RP9S == RP7S+RPPS+RPTS+RTCSPX+RP9X

26: RP9SGF == RP9S-RP7SPF

27: DF.RSVP = IF YR LT 1984 THEN 0 ELSE DF.RSVP(-1)+RP9S*(PDRPIBAS/
PDRPI)*(1/(1+RORDISK)**(YR-1983))

State Nonpetroleum Revenues

28: LOG(FAGI) = C21A+C21B*LOG(PI8)+C21C*LOG(EMCNX1+EMP9)

29: LOG(FAGII) = C22A+C22B*LOG(PI)

30: COLA = (1-1/(1+PCOLART))*WSGC

31: AGI = FAGI+COLA-WSGM-PC12N*PC12RN*ANCSA*PCNC1

32: AEX*1000 = C10A+C10B*POPC+C10C*(EMCNX1+EMP9)

33: ATT = C28A+C28B*(EM99-EMGM)+C28C*EMCNX1

34: LOG(ATD/ATT) = C23A+C23B*LOG(AGI/ATT)+C23C*D69+C23D*D72

35: VAEX = IF YR LT 1983 THEN VAEX6 ELSE VAEX(-1)*(1+GRUSCPI)

36: ATI = AGI-AEX*VAEX-ATD

37: ATI.TT = ATI/ATT

38: LOG(RTISCA1) = C24A-TXBASE+C24B*(1-TXRT)*LOG(ATI.TT)

39: LOG(RTISCA2) = C24A+C24B*LOG(ATI.TT)

40: 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)

41: RTISLOS == (RTISCA2-RTISCA)*ATT

42: RTISC = RTISCA*ATT

43: RTIS = IF YR EQ 1980 THEN 0 ELSE C25A*RTISC(-1)+C25B*RTISC

44: RTISCP = C105A+C105B*PI8+C105C*RTISC

45: LOG(RTPIF/ATT) = C26A+C26B*LOG(FAGII/ATT+TCRED/1000/ATT+RTISLOS/ATT-EXPF3*EXTRNS/ATT)+C26C*D61.68*LOG(FAGII/ATT+TCRED/1000/ATT+RTISLOS/ATT-EXPF3*EXTRNS/ATT)

46: DPIRES = C27A+C27B*PI3+C27C*WSCNP

47: RTCS1*100/PDRPI = C43A+C43E*D80+C43D*(EM97(-1)-EM97(-2))+C43B*EMCNX1(-1)+C43C*EM97(-1)

48: RTCS == RTCS1+RTCSPX+RTCSX

49: BL = C39A+C39B*(XX98-XXP9)

```
50:  LOG(GR) = C40A+C40B*LOG(XX98-XXP9)

51:  RTBS1 == BL*1000*PBTRATE

52:  GTR = GR-BL(-1)*PNTGR*1000

53:  LOG(RTBS2*10**3/BL(-1)) = C29A+C29B*LOG(GTR(-1)*10**3/BL(-1))

54:  RTBS == IF YR GE 1979 THEN RTBS1+RTBS2*PBLTBL ELSE RTBS1+
     RTBS2

55:  TPTV = C38A+C38B*POP

56:  LOG(AHG) = C37A+C37B*LOG(PR.PI)

57:  THG == AHG*TPTV

58:  LOG(RTMF) = C46A+C46B*LOG(THG)

59:  LOG(RTVS) = C47A+C47B*LOG(R.DPI8N(-1))

60:  LOG(RTAS) = C48A+C48B*LOG(R.DPI(-1))

61:  LOG(RTCIS) = C49A+C49B*LOG(R.DPI(-1))

62:  RTSS = IF YR GT 1980 THEN 0 ELSE C50A+C50B*(EM99-EMGM)

63:  RTOTS = IF YR LE 1984 THEN RTOTS6 ELSE RTOTS(-1)*(1+GRUSCPI+
     GRDIRPU)

64:  RT99 == RTIS+RTCS+RPPS+RPTS+RP9X+RTBS+RTMF+RTAS+(1-PECIG)*
     RTCIS+RTVS+RTSS+RTOTS

65:  LOG(ROFAS) = C30A+C30B*LOG(TPTV(-1))

66:  LOG(ROFOS) = C33A+C33B*LOG(PI3(-1))

67:  ROFTS == ROFAS+ROFOS

68:  ROFERS = ROFERS(-1)*(1+GRUSCPI+GRDIRPU)

69:  LOG(RMIS) = C35A+C35B*LOG(PI3(-1))

70:  RSIP = RSIP5+(ROR+GRUSCPI+RORPPF)*(BALPF(-1)+(RP7SPF+EXPFCONX)/2)

71:  RSIPGF = IF YR LT 1984 THEN EXPFTOGF*RSIP ELSE EXPFTOGF*(RSIP
     -EXTRNS)

72:  RSID == (ROR+GRUSCPI-RORPDF)*BALDF(-1)
```

73: RSIG == IF YR LE 1983 THEN RSIG6 ELSE (ROR+GRUSCPI)*BALGF9(-1)

74: RSIN == RSIG+RSIPGF

75: RSI99 == RSIG+RSID+RSIP

76: RSIPNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1)+RORPPF)*BALPF(-1)

77: RSIDNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1)-RORPDF)*BALDF(-1)

78: RSIGNET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1))*BALGF9(-1)

79: RSI99NET == (ROR+GRUSCPI-(PDRPI/PDRPI(-1)-1))*BAL99+RORPPF*
BALPF(-1)-RORPDF*BALDF(-1)

80: RSGFBM == RT99+RP7SGF+ROFTS+ROFERS+RSIN+RMIS-SANCSA+EXDFWITH

81: RSFDN = IF YR LE 1983 THEN RSFDN6 ELSE RSFDNX+RSFDN(-1)*(1+
GRUSCPI+GRDIRPU)

82: RMISRES = IF YR LE 1983 THEN RMISRES6 ELSE RMISRES(-1)*(1+
GRUSCPI+GRDIRPU)

83: RSGFRS == RSFDN+RMISRES

84: RSGF = RSGFBM+RSGFRS

85: RSGF.AFR == RSGF+EXINREC

86: R99S = RSGF+EXPFCON1+(RSID-EXDFWITH)

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

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

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

90: RSIAS = RSIAS(-1)*(1+GRUSCPI+GRDIRPU)

91: RSEN == SANCSA+R99S-RP9S-RSI99-RSFDN

92: RSENGF == SANCSA+RSGFBM-RP9SGF-RSIN

93: RSIPPF1 == RSIP-RSIPGF

94: RSIPPF == IF YR LT 1984 THEN RSIPPF1-EXPFDVX1 ELSE (IF YR EQ
1984 THEN RSIPPF1-(EXTRNS-50) ELSE RSIPPF1-EXTRNS)

95: EXPFCON1 = RP7SPF+RSIPPF1

96: EXPFCON9 == RSIP+RP7SPF+EXPFCONX

97: EXPFCON = RSIPPF+RP7SPF+EXPFCONX

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

99: EXDFWITH = EXDFPCNT*RSIDNET

100: Z1.9 == 0

101: Z1.8 == 0

102: Z1.7 == 0

103: Z1.6 == 0

104: Z1.5 == 0

105: Z1.4 == 0

106: Z1.3 == 0

107: Z1.2 == 0

108: Z1.1 == 0

109: Z1.0 == 0

State Expenditures: Aggregates

110: EXLIM = IF YR EQ 1982 THEN EXLIM82 ELSE EXLIM82*(PDRPI/364.23)*
(POP/460)

111: EXLIMOK = IF YR LT 1985 THEN EXLIM ELSE (IF RSGFBM-EXDSS+
BALGFAFA(-1) GT EXLIM THEN EXLIM ELSE RSGFBM-EXDSS)

112: RSGFGAP == EXLIM-EXLIMOK

113: 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))

114: APGFOPS == EXLIMOK*EXSPLIT

115: APGFCAP == EXLIMOK*(1-EXSPLIT)

116: APGF == APGFOPS+APGFCAP+EXDSS+EXSPCAP+APPFCONX+SANCSAX

```
117:  EXGFOPS == APGFOPS+EXGFOPSX

118:  EXOPS = IF YR LE 1985 THEN EXOPS6 ELSE EXRL5*(EXGFOPS+
      EXINRECB+RSGFRS-RSFDNCAX+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))))

119:  EXANSAV = RP9S+RSIG+RSIP-EXANNU*(1+RORANGRO)**(YR-1983)

120:  EXSAVS = EXSAVX+EXPFCON+TXPTXX*RTISLOS

121:  EXGFCAP == IF YR LE 1985 THEN EXGFCAP6 ELSE 0.3*APGFCAP+0.7*
      APGFCAP(-1)

122:  EXCAP = IF YR LE 1985 THEN EXGFCAP+EXCPS ELSE EXRL5*(EXGFCAP+
      EXCPS)+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)))

123:  EXSUBS = IF YR LT 2011 THEN EXSUBSX 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))

124:  EXTRNS = IF YR LT 1984 THEN EXTRNSX+EXPFDVX2 ELSE EXPFDVX2+
      EXTRNSX+EXPFDIST*(RSIP(-1)+RSIP(-2)+RSIP(-3)+RSIP(-4)+RSIP)/5

125:  EXINREC = C17A+C17B*(EXOPS-RLT99)+C17C*D82

126:  EXINRECB = C108A+C108B*EXINREC
```

<u>State Expenditures: Operating Expenditures</u>

```
127:  LOG(EXJUS4) = C20A+C20B*LOG(EXOPS)

128:  LOG(EXPPS4) = C91A+C91B*LOG(EXOPS)

129:  LOG(EXNRS4) = C93A+C93B*LOG(EXOPS)
```

```
130:  LOG(EXHES4) = C94A+C94B*LOG(EXOPS)

131:  LOG(EXSSS4) = C96A+C96B*LOG(EXOPS)

132:  LOG(EXEDS4) = C19A+C19B*LOG(EXOPS)

133:  LOG(EXCDS4) = C97A+C97B*LOG(EXOPS)

134:  LOG(EXTRS4) = C98A+C98B*LOG(EXOPS)

135:  LOG(EXGGS4) = C99A+C99B*LOG(EXOPS)

136:  RATIO1 == EXOPS/(EXEDS4+EXSSS4+EXHES4+EXNRS4+EXPPS4+EXJUS4+
      EXCDS4+RLTX+EXTRS4+EXGGS4)

137:  EXUA = IF YR LE 1983 THEN EXUA6 ELSE EXUA(-1)*(EXOPS/EXOPS(-1))

138:  EXEDS = RATIO1*EXEDS4

139:  EXSSS = RATIO1*EXSSS4

140:  EXHES = RATIO1*EXHES4

141:  EXNRS = RATIO1*EXNRS4

142:  EXPPS = RATIO1*EXPPS4

143:  EXJUS = RATIO1*EXJUS4

144:  EXTRS = RATIO1*EXTRS4

145:  EXGGS = RATIO1*EXGGS4

146:  EXCDS = RATIO1*(EXCDS4+RLTX)

147:  RLTE99 = RLTE994*RATIO1

148:  EXEDSNT == EXEDS-RLTE99

149:  RLTT9 = RLTT94*RATIO1

150:  RLTRS = RLTRS4*RATIO1

151:  EXCDSNT = EXCDS-RLTT9-RLTRS-RLTX

152:  EXPRCDS = C7A+C7B*EXCDSNT

153:  EXPREDS1 = C1A+C1B*EXEDSNT+C1C*D61.75*EXEDSNT

154:  EXPRSSS = C2A+C2B*EXSSS
```

155: EXPRUA = C32A+C32B*EXUA+C32C*D61.70*EXUA+C32D*D61.70

156: EXPRHES = C3A+C3B*EXHES

157: EXPRNRS = C4A+C4B*EXNRS

158: EXPRPPS = C5A+C5B*EXPPS

159: EXPRGGS = C8A+C8B*EXGGS

160: EXPRJUS = C6A+C6B*EXJUS

161: EXPRTRS = C9A+C9B*EXTRS+C9C*D61.64

162: EXPR99 = EXPREDS1+EXPRSSS+EXPRHES+EXPRNRS+EXPRPPS+EXPRJUS+
(+EXPRCDS)+EXPRGGS+EXPRTRS+EXPRUA

163: WSGSFY = PCWS1*EXPR99

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

State Expenditures: Capital Expenditures

165: RORCRF == (GRUSCPI+RORBOND)*(1+GRUSCPI+RORBOND)**15/((1+
GRUSCPI+RORBOND)**15-1)

166: EXCPSGOB == IF YR LE 1985 THEN EXCPSGB6 ELSE (IF EXDSS(-1)/
RSGFBM(-1) GT 0.05 THEN 0 ELSE (0.05*RSGFBM(-1)-EXDSS(-1))/
RORCRF)

167: EXCPSFED = IF YR LE 1983 THEN EXCPSFD6 ELSE EXCPSFED(-1)*(1+
GRUSCPI)

168: EXCPS = EXCPSGOB+EXCPSFED

169: EXGFCOT = IF YR LE 1983 THEN EXGFCOT6 ELSE EXSUBS+RLTMCAP

170: EXGFCAP1 == EXGFCAP-EXGFCOT

171: EXCAPOT == EXGFCOT

172: EXGFCHY = LGF1*(EXGFCAP-EXSUBS)

173: EXGFCNH = (1-LGF1)*(EXGFCAP-(1-EXSUB1)*EXSUBS)

174: EXCPSHY = LFED1*EXCPSFED+LBOND1*EXCPSGOB

175: EXCPSNH = (1-LFED1)*EXCPSFED+(1-LBOND1)*EXCPSGOB

```
176:  EXNHYCP == EXGFCNH+EXCPSNH

177:  EXHYCAP == EXGFCHY+EXCPSHY

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

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

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

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

182:  EXDSS = IF YR LT 1984 THEN EXDSSX ELSE EXDSSX+RORCRF*DEBTP83(-1)

183:  EXCPSM = IF YR LT 1984 THEN 0 ELSE EXCPSGOB

184:  DEBTP83 = IF YR LT 1984 THEN 0 ELSE DEBTP83(-1)+EXCPSGOB-
      EXCPSM(-15)

185:  GODT = IF YR LT 1984 THEN GODTX ELSE GODTX+EXCPSM(-14)*0.067+
      EXCPSM(-13)*0.13+EXCPSM(-12)*0.2+EXCPSM(-11)*0.27+EXCPSM(-10)*
      0.33+EXCPSM(-9)*0.4+EXCPSM(-8)*0.47+EXCPSM(-7)*0.53+EXCPSM(-6)*
      0.6+EXCPSM(-5)*0.67+EXCPSM(-4)*0.73+EXCPSM(-3)*0.8+EXCPSM(-2)*
      0.87+EXCPSM(-1)*0.93+EXCPSGOB

186:  EXGF = EXGFOPS+EXDSS+EXGFCAP+EXSPCAP+EXPFCONX+RSGFRS+EXTRNSX

187:  EXGFBM = EXGF-RSGFRS

188:  EXGF.AFR == EXGF+EXINREC

189:  EXGFOT.A == EXGFOPS+EXINREC+RSGFRS-RSFDNCAX

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

191:  EX99S = EXBUD+EXTRNS+EXCAP+EXSPCAP

192:  EXNOPS = EX99S-EXOPS

193:  BALCAB == R99S-EXGF-EXTRNS

194:  BALCABGF == RSGF-EXGF

195:  BALGF9 = IF YR LE 1981 THEN BALGF6 ELSE BALGF9(-1)+RSGF-EXGF

196:  BALGFAFA = BALGF9(-1)+RSGF-EXGF-BALGFUNA

197:  BALDF = IF YR LE 1983 THEN BALDF6 ELSE BALDF(-1)+EXDFCON
```

```
198:  BALPF = IF YR LE 1981 THEN BALPF6 ELSE BALPF(-1)+EXPFCON

199:  BAL99 = BALGF9+BALPF+BALDF

200:  BAL99AFA = BALGFAFA+BALPF

201:  BALGFP = IF BALGF9 LT 0 THEN 0 ELSE BALGF9

202:  BALGFCP = IF BALGF9-BALGF9(-1) GT 0 THEN BALGF9-BALGF9(-1)
      ELSE 0

203:  R.BALCAP = R.BALCAP(-1)*(1/(1+RORCPDEP))+(EXGFCHY+EXGFCNH+
      EXCPS)*100/PDCON

204:  PR.BALCP = R.BALCAP*1000/POP

205:  EXCAPREP == IF YR LT 1984 THEN 0 ELSE RORCPDEP*BALCAP84(-1)+
      EXCAPOLD*(PDRPI/PDRPIBAS)

206:  EXCAPNEW == IF YR LT 1984 THEN 0 ELSE EXGFCHY+EXGFCNH+EXCPS-
      EXCAPREP

207:  BALCAP84 = IF YR LT 1984 THEN 0 ELSE BALCAP84(-1)*PDRPI/
      PDRPI(-1)+EXCAPNEW

208:  EXOM84 == BALCAP84(-1)*EXOMCOST

209:  EXRP84 == RORCPDEP*BALCAP84(-1)

210:  Z2.9 == 0

211:  Z2.8 == 0

212:  Z2.7 == 0

213:  Z2.6 == 0

214:  Z2.5 == 0

215:  Z2.4 == 0

216:  Z2.3 == 0

217:  Z2.2 == 0

218:  Z2.1 == 0

219:  Z2.0 == 0
```

Local Revenues

220: LOG(LPTB1) = C57A+C57B*LOG(PI(-1)*1000/POP(-1))+C57C*LOG(POP(-1))

221: LPTB1FV == LPTB1*1/PARLVFV

222: PTBP9 == RPPS*(1/PTRTS)/(1-P9PTPER*LPTRAT)

223: LPTBP9 == P9PTPER*PTBP9

224: LPTB = LPTB1+LPTBP9*LPTRAT

225: LPTBFV == LPTB1FV+LPTBP9

226: PPVAL == LPTB1FV+PTBP9

227: RLPT1 = C18A+C18D*D61.73+C18B*LPTB1(-1)+C18C*PTBP9(-1)

228: RLPT == RLPT1+RLPTX

229: LOG(RLOT*1000/POP(-1)) = C31A+C31B*LOG(PI(-1)*1000/POP(-1))

230: RLTCS4 = IF YR GT 1981 THEN 0 ELSE PESLTC*RTCS1

231: RLTVS4 = C63A+C63B*RTVS

232: RLTOT4 == PESLT*RTOTS

233: RLTMA4 = IF YR LE 1983 THEN RLTMA6 ELSE RLTMA(-1)/PDRPI(-1)/
POP(-1)*POP*PDRPI

234: RLTT94 = RLTVS4+RLTOT4+RLTCS4+RLTMA4

235: RLTRS4 = IF YR LE 1983 THEN RLTRS6 ELSE RLTRS(-1)*(1+GRUSCPI+
GRDIRPU)

236: RLTMS = RLTMCAP

237: RLTEC4 == PECIG*RTCIS

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

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

240: ADMSD = ADMDIS+ADMREA

241: BIU = IF YR LE 1983 THEN BIU6 ELSE BIU(-1)*(1+GRUSCPI)

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

```
243:  RLTET4 = (POP/POP(-1)+PDRPI/PDRPI(-1)-1)*RLTET(-1)

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

245:  RLTEA4 == RLTEC4+RLTEF4+RLTET4+RLTEO4

246:  RLTEB4 = IF YR LE 1983 THEN RLTEB6 ELSE RLTEB(-1)*(1+GRUSCPI+
      GRDIRPU)

247:  RLTE994 = RLTEA4+RLTEB4

248:  RLTCS = RLTCS4*RATIO1

249:  RLTVS == RLTVS4*RATIO1

250:  RLTOT == RLTOT4*RATIO1

251:  RLTMA = RLTMA4*RATIO1

252:  RLTEC == RLTEC4*RATIO1

253:  RLTEF == RLTEF4*RATIO1

254:  RLTET = RLTET4*RATIO1

255:  RLTEO = RLTEO4*RATIO1

256:  RLTEA == RLTEA4*RATIO1

257:  RLTEB = RLTEB4*RATIO1

258:  RLT99 = RLTT9+RLTRS+RLTE99+RLTMS+RLTX

259:  Z3.1 == 0

260:  Z3.2 == 0

261:  Z3.3 == 0

262:  Z3.4 == 0

263:  Z3.5 == 0

264:  Z3.6 == 0

265:  Z3.7 == 0

266:  Z3.8 == 0
```

267: Z3.9 == 0

268: Z3.0 == 0

Local Expenditures

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

270: ELED = RLTE99+ELED1

271: ELBD = C14A+C14C*D61.77*GOBONDL(-1)+C14B*GOBONDL(-1)

272: EL99 = ELED+ELNED1+ELBD+RLTX+RLTFPX

273: ELNED1*100/PDRPI = C16A+C16B*WEALTH+C16C*(RLTRS+RLTT9+RLTMS)/
PDRPI

274: RLTF = RLTF(-1)*(1+GRUSCPI+GRDIRPU)

275: RL991 == RLPT+RLOT+RLT99+RLTF+RLTFPX

276: RLMC = EL99-RL991-(GOBONDL-GOBONDL(-1))

277: RL99 == RL991+RLMC

278: ELEDCP = C15A+C15B*ELED

279: ELPERS = C12A+C12B*(EL99-ELEDCP-RLTMS-ELBD)

280: WSGL = (IF YR EQ 1983 THEN 1.23 ELSE (IF YR EQ 1984 THEN
1.23 ELSE (IF YR EQ 1985 THEN 1.27 ELSE PCWS2)))*ELPERS

281: GOBONDL = GOBONDL(-1)*(1+GRUSCPI+GRDIRPU)

282: SLGEXP == EX99S+EL99-RLT99

283: BALOCAL == RL99-(EL99-ELBD)

284: BALLANDS == BALOCAL+BALCAB

285: Z4.9 == 0

286: Z4.8 == 0

287: Z4.7 == 0

288: Z4.6 == 0

289: Z4.5 == 0

```
290:  Z4.4 == 0

291:  Z4.3 == 0

292:  Z4.2 == 0

293:  Z4.1 == 0

294:  Z4.0 == 0
```

ECONOMIC MODULE

Personal Income

```
295:  PIDIR = C51A+C51B*(DPI+DPI(-1)+DPI(-2)+DPI(-3)+DPI(-4))

296:  PITRAN1 = IF YR LE 1982 THEN PITRAN6 ELSE ITRAN1(-1)/POPGER(-1)*
      (1+GRUSCPI)*POPGER

297:  PITRAN/PDRPI = IF YR GE 1984 THEN PITRAN1/PDRPI+EXTRNS/PDRPI
      ELSE (IF YR EQ 1983 OR YR EQ 1982 THEN PITRAN1/PDRPI+EXTRNSPI/
      PDRPI ELSE C34A+C34B*POP+C34C*D61.72+EXTRNS/PDRPI)

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

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

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

301:  PIPROF = EMPROFIS*(4.523*(PDRPI/340))

302:  PIPRO == PIPRO1+PIPROF

303:  PI8 = WS98+PIOLI+PIPRO-PISSC+PIDIR+PITRAN

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

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

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

307:  NCWS == PCNCWS*NCEXP

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

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

310: PI = PI8-PIRADJ

311: PI3 = PI-PI/WS98*WRCNP*EMCNX1/1000

312: R.PI == PI*100./PDRPI

313: P.PI == PI*1000./POP

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

315: PR.PI = R.PI*1000./POP

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

317: DPI = PI-RTPIF-RTISCP-DPIRES+RTISXX

318: DPI8 = DPI+PIRADJ

319: R.DPI = 100.*DPI/PDRPI

320: PR.DPI == R.DPI*1000/POP

321: R.DPI8N = (DPI8+EXSUB2*EXSUBS-EXPF2*EXTRNS)*100/PDRPI-R.DPI8X

322: R.DPI8X = 0

323: PR.DPI8N == R.DPI8N*1000/POP

324: Z5.9 == 0

325: Z5.8 == 0

326: Z5.7 == 0

327: Z5.6 == 0

328: Z5.5 == 0

329: Z5.4 == 0

330: Z5.3 == 0

331: Z5.2 == 0

332: Z5.1 == 0

333: Z5.0 == 0

Sectoral Activity

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

335: XXCN8 = C54A+C54B*R.DPI8N+C54D*D65+C54E*D73+C54F*R.DPI8X(-1)+C54G*R.DPI8X

336: XXCN1 = XXCN8+XXVACAP

337: LOG(EMCN1) = C56A+C56C*D61.67+C56B*LOG(XXCN1)

338: EMCNX = EMCNX1+EMCNX2

339: EMCN = EMCN1+EMCNX

340: XXCN = EMCN/EMCN1*XXCN1

341: XXCNX == XXCN-XXVACAP-XXCN8

342: 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))

343: WRCNP = WRCNNP*PIPADJ

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

345: WRCN = WSCN/EMCN*1000

346: WSCNP = EMCNX1*WRCNP/1000

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

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

349: WSP9 == EMP9*WRP9/1000

350: XXMO = C60A+C60B*R.DPI8N+C60C*D61.77

351: LOG(EMMO) = C109A+C109B*LOG(XXMO)

352: LOG(XXMX2) = C61A+C61B*LOG(EMMX2)

353: XXM9 == XXMX1+XXMX2+XXMO

354: EMM9 = EMMO+EMMX1+EMMX2

355: LOG(WRM91/PDRPI) = C62A+C62F*D.80DEC6+C62B*LOG(WEUS/PDUSCPI)+C62C*LOG(1+EMCNRT)+C62D*LOG(1+EMCNRT(-1))

356: WRMX1 == WRM91*PADJ

357: WSM9 == (EMMO+EMMX2)*WRM91/1000+EMMX1*WRMX1/1000

358: WSMX1 == EMMX1*WRMX1/1000

359: WRM9 == WSM9/EMM9*1000

360: XXTNT = C64A+C64B*R.DPI8X+C64D*R.DPI8X*R.DPI8X(-1)+C64C*
R.DPI8N+C64E*D71.73

361: LOG(EMTNT) = C65A+C65B*LOG(XXTNT)

362: EMTTOUR = PTOURT*EMTOUR

363: EMT91 = EMTNT+EMTTOUR

364: EMT9 = EMT91+EMT9X

365: XXT9 = XXTNT*(EMT9/EMTNT)

366: LOG(WRT9/PDRPI) = C66A+C66F*D.80DEC6+C66D*D61.76+C66B*LOG(WEUS/
PDUSCPI)+C66C*LOG(1+EMCNRT)+C66E*LOG(1+EMCNRT(-1))

367: WST9 == EMT9*WRT9/1000.

368: XXCM = C68A+C68B*R.DPI8N(-1)+C68C*D61.74+C68D*WEALTH(-1)*POP(-1)

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

370: LOG(WRCM/PDRPI) = C70A+C70E*D61.70+C70F*D.80DEC6+C70B*LOG(WEUS/
PDUSCPI)+C70C*LOG(1+EMCNRT(-2))+C70D*LOG(1+EMCNRT(-1))

371: WSCM == EMCM*WRCM/1000.

372: XXPU = C72A+C72B*R.DPI8N(-1)+C72C*R.DPI8X+C72D*R.DPI8N(-2)

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

374: LOG(WRPU/PDRPI) = C74A+C74F*D.80DEC6+C74B*LOG(WEUS/PDUSCPI)+
C74C*LOG(1+EMCNRT(-2))+C74D*LOG(1+EMCNRT(-1))

375: WSPU == EMPU*WRPU/1000.

376: XXDW = C71A+C71B*R.DPI8N+C71C*R.DPI8X+C71D*R.DPI8X(-1)*
R.DPI8X+C71E*WEALTH(-1)*POP(-1)

377: XXDRNT = C76A+C76B*R.DPI8N+C76C*R.DPI8X+C76D*R.DPI8N(-1)+C76E
*R.DPI8X(-1)

378: LOG(EMDW) = C77A+C77B*LOG(XXDW)

379: LOG(EMDRNT) = C75A+C75B*LOG(XXDRNT)

380: EMDR = EMDRNT+EMDTOUR

381: LOG(WRDW/PDRPI) = C78A+C78F*D.80DEC6+C78B*LOG(WEUS/PDUSCPI)+
C78C*LOG(1+EMCNRT)+C78D*LOG(1+EMCNRT(-1))+C78E*LOG(1+EMCNRT(-2))

382: LOG(WRDR/PDRPI) = C79A+C79F*D.80DEC6+C79B*LOG(WEUS/PDUSCPI)+
(+C79D)*LOG(1+EMCNRT(-1))+C79E*LOG(1+EMCNRT(-2))

383: EMDTOUR = PTOURD*EMTOUR

384: EMD9 = EMDRNT+EMDW+EMDTOUR

385: WSD9 == (EMDRNT+EMDTOUR)*WRDR/1000+EMDW*WRDW/1000

386: WRD9 = WSD9/EMD9*1000

387: XXD9 = (XXDW+XXDRNT)/(EMDW+EMDRNT)*EMD9

388: XXDR = XXD9-XXDW

389: XXFI = C80A+C80C*D71.73+C80B*WEALTH(-1)*POP(-1)

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

391: LOG(WRFI/PDRPI) = C82A+C82F*D.80DEC6+C82B*LOG(WEUS/PDUSCPI)+
C82D*LOG(1+EMCNRT)+C82C*LOG(1+EMCNRT(-1))

392: WSFI == EMFI*WRFI/1000.

393: XXS8NT = C84A+C84B*R.DPI8N+C84C*R.DPI8X(-1)+C84D*WEALTH(-1)*
POP(-1)

394: XXSB = C83A+(+C83C)*R.DPI8X+C83D*R.DPI8X(-1)+C83E*WEALTH(-1)*
POP(-1)

395: LOG(EMS8NT) = C85A+C85B*LOG(XXS8NT)

396: LOG(EMSB) = C87A+C87B*LOG(XXSB)

397: 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))

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

399: EMSTOUR = PTOURS*EMTOUR

400: EMS91 = EMSB+EMS8NT+EMSTOUR

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

402: WSS9 == WSS91+NCWS

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

404: WRS9 = WSS91/EMS91*1000

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

406: EMGF = EMGM+EMGC

407: LOG(XXGF) = C101A+C101B*LOG(EMGF)

408: LOG(WRGC) = C89A+C89B*LOG(WEUS)

409: WRGM = WRGC*PCIVPY

410: WSGC = WRGC*EMGC/1000

411: WSGM = WRGM*EMGM/1000

412: WSGF == WSGC+WSGM

413: WRGF = WSGF/EMGF*1000

414: LOG(WRGS/PDRPI) = IF C92A+C92F*D.80DEC6+C92B*LOG(WEUS/PDUSCPI)+ C92C*D61.73+C92D*D74.75 LT LOG(WRGS(-1)/PDRPI(-1)) THEN LOG (WRGS(-1)/PDRPI(-1)) ELSE C92A+C92F*D.80DEC6+C92B*LOG(WEUS/ PDUSCPI)+C92C*D61.73+C92D*D74.75

415: EMGS = WSGS/WRGS*1000

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

417: EMGL = WSGL/WRGL*1000

418: EMGA = EMGS+EMGL

419: WSGA = WSGS+WSGL

420: WRGA = WSGA/EMGA*1000

421: LOG(XXGA) = C104A+C104B*LOG(EMGA)

422: EMA9 = EMAFISH+EMAGRI+EMAUN

423: XXA9 = C90A+C90B*(EMA9+EMPROFIS)

424: WRA9 = WRGC

425: WSA9 == EMA9*WRA9/1000.

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

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

428: EM97 = EM98-EMGM

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

430: WS97 = WS98-WSGM

431: WR98 = WS98*1000/EM98

432: WR97 == WS97*1000/EM97

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

434: EMPROFIS = PFISH1*EMFISH

435: EMAFISH = (1-PFISH1)*EMFISH

436: EMPRO = EMPRO1+EMPROFIS

437: EM99 == EM98+EMPRO

438: EM96 = EM99-EMGM

439: EM9BASE == EMCNX+EMM9-EMMO+EMP9+EMTOUR+EMGF+EMA9+EMPROFIS+
EMT9X

440: EM9GOV == EMGS+EMGL

441: EM9INFR = EMTCU+EMCN1+EMSB-EMT9X-EMTTOUR

442: EM9SUPRT == EMD9+EMFI+EMS9-EMDTOUR-EMSTOUR-EMSB+EMMO+EMPRO1

443: EMX = EMCNX+EMP9

```
444:  EMOCSX == EMP9+EMT9X+EMCNX1+EMCNX2+EMMX1

445:  EMCU == EMCM+EMPU

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

447:  EMNC == EMS9-EMS91

448:  EMTCU = EMT9+EMCM+EMPU

449:  EMSUP = EMD9+EMFI+EMS9

450:  EMSP = EMTCU+EMSUP

451:  EMG9 == EMGF+EMGA

452:  G.EMSP = (EMSP-EMSP(-1))/EMSP(-1)

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

454:  EMNS == EM99-EMSP-EMG9

455:  LOG(EMTOUR) = PTOURB+PTOURE*LOG(TOURIST)

456:  Z6.9 == 0

457:  Z6.8 == 0

458:  Z6.7 == 0

459:  Z6.6 == 0

460:  Z6.5 == 0

461:  Z6.4 == 0

462:  Z6.3 == 0

463:  Z6.2 == 0

464:  Z6.1 == 0

465:  Z6.0 == 0
```

DEMOGRAPHIC MODULE

Civilian Non-Native Population

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
489:  CF13 == G13*SF13*CNNPF13(-1)+(1-G12)*CNNPF12(-1)*SF12

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

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

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

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

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

495:  CM1 == SEXDIV*BTHTOT*SURINFM

496:  CF1 == (1-SEXDIV)*BTHTOT*SURINFF

497:  DTHINF == BTHTOT-CM1-CF1

498:  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)

499:  NATINC == BTHTOT-DTHTOT

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

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

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

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

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

505:  CNNPF12 = CF12*(1+OEMF12)+MIGIN*MF12

506:  CNNPM13 = CM13*(1+OEMM13)+MIGIN*MM13

507:  CNNPF13 = CF13*(1+OEMF13)+MIGIN*MF13

508:  CNNPM14 = CM14*(1+OEMM14)+MIGIN*MM14

509:  CNNPF14 = CF14*(1+OEMF14)+MIGIN*MF14
```

510: CNNPM15 = CM15*(1+OEMM15)+MIGIN*MM15

511: CNNPF15 = CF15*(1+OEMF15)+MIGIN*MF15

512: CNNPM1 = CM1*(1+OEMM1)+MIGIN*MM1

513: CNNPF1 = CF1*(1+OEMF1)+MIGIN*MF1

514: CNNPM2 = CM2*(1+OEMM2)+MIGIN*MM2

515: CNNPF2 = CF2*(1+OEMF2)+MIGIN*MF2

516: CNNPM3 = CM3*(1+OEMM3)+MIGIN*MM3

517: CNNPF3 = CF3*(1+OEMF3)+MIGIN*MF3

518: CNNPM4 = CM4*(1+OEMM4)+MIGIN*MM4

519: CNNPF4 = CF4*(1+OEMF4)+MIGIN*MF4

520: CNNPM5 = CM5*(1+OEMM5)+MIGIN*MM5

521: CNNPF5 = CF5*(1+OEMF5)+MIGIN*MF5

522: CNNPM6 = CM6*(1+OEMM6)+MIGIN*MM6

523: CNNPF6 = CF6*(1+OEMF6)+MIGIN*MF6

524: CNNPM7 = CM7*(1+OEMM7)+MIGIN*MM7

525: CNNPF7 = CF7*(1+OEMF7)+MIGIN*MF7

526: CNNPM8 = CM8*(1+OEMM8)+MIGIN*MM8

527: CNNPF8 = CF8*(1+OEMF8)+MIGIN*MF8

528: CNNPM9 = CM9*(1+OEMM9)+MIGIN*MM9

529: CNNPF9 = CF9*(1+OEMF9)+MIGIN*MF9

530: 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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
555:  NCM14 == G14*NSM14*NATPM14(-1)+(1-G13)*NATPM13(-1)*NSM13

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

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

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

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

560:  NCM1 == NSEXDIV*NBTHTOT*NSURINFM

561:  NCF1 == (1-NSEXDIV)*NBTHTOT*NSURINFF

562:  NATPM1 = NCM1*(1+NMM1)

563:  NATPF1 = NCF1*(1+NMF1)

564:  NATPM2 = NCM2*(1+NMM2)

565:  NATPF2 = NCF2*(1+NMF2)

566:  NATPM3 = NCM3*(1+NMM3)

567:  NATPF3 = NCF3*(1+NMF3)

568:  NATPM4 = NCM4*(1+NMM4)

569:  NATPF4 = NCF4*(1+NMF4)

570:  NATPM5 = NCM5*(1+NMM5)

571:  NATPF5 = NCF5*(1+NMF5)

572:  NATPM6 = NCM6*(1+NMM6)

573:  NATPF6 = NCF6*(1+NMF6)

574:  NATPM7 = NCM7*(1+NMM7)

575:  NATPF7 = NCF7*(1+NMF7)

576:  NATPM8 = NCM8*(1+NMM8)

577:  NATPF8 = NCF8*(1+NMF8)

578:  NATPM9 = NCM9*(1+NMM9)

579:  NATPF9 = NCF9*(1+NMF9)
```

```
580:  NATPM10 = NCM10*(1+NMM10)

581:  NATPF10 = NCF10*(1+NMF10)

582:  NATPM11 = NCM11*(1+NMM11)

583:  NATPF11 = NCF11*(1+NMF11)

584:  NATPM12 = NCM12*(1+NMM12)

585:  NATPF12 = NCF12*(1+NMF12)

586:  NATPM13 = NCM13*(1+NMM13)

587:  NATPF13 = NCF13*(1+NMF13)

588:  NATPM14 = NCM14*(1+NMM14)

589:  NATPF14 = NCF14*(1+NMF14)

590:  NATPM15 = NCM15*(1+NMM15)

591:  NATPF15 = NCF15*(1+NMF15)

592:  NDTHINF == NBTHTOT-NCM1-NCF1

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

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

595:  POPNE = POPNE(-1)*NATTOT/NATTOT(-1)

596:  NNATINC == NBTHTOT-NDTHTOT
```

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

598:  MIGIN = POPMIG-MIGOUT

599:  POPM = EMGM/MILRAT

600:  MILPCT = POPM/AFTOT
```

<u>Total Population</u>

```
601:  POP = CNNTOT+NATTOT+MILPCT*(AFTOT+MDTOT)

602:  POPC = POP-POPM

603:  POPM1 == CNNPM1+MILPCT*MILM1+NATPM1

604:  POPM2 == CNNPM2+MILPCT*MILM2+NATPM2

605:  POPM3 == CNNPM3+MILPCT*MILM3+NATPM3

606:  POPM4 == CNNPM4+MILPCT*MILM4+NATPM4

607:  POPM5 == CNNPM5+MILPCT*MILM5+NATPM5

608:  POPM6 == CNNPM6+MILPCT*MILM6+NATPM6

609:  POPM7 == CNNPM7+MILPCT*MILM7+NATPM7

610:  POPM8 == CNNPM8+MILPCT*MILM8+NATPM8

611:  POPM9 == CNNPM9+MILPCT*MILM9+NATPM9

612:  POPM10 == CNNPM10+MILPCT*MILM10+NATPM10

613:  POPM11 == CNNPM11+MILPCT*MILM11+NATPM11

614:  POPM12 == CNNPM12+MILPCT*MILM12+NATPM12

615:  POPM13 == CNNPM13+MILPCT*MILM13+NATPM13
```

616: POPM14 == CNNPM14+MILPCT*MILM14+NATPM14

617: POPM15 == CNNPM15+MILPCT*MILM15+NATPM15

618: POPF1 == CNNPF1+MILPCT*MILF1+NATPF1

619: POPF2 == CNNPF2+MILPCT*MILF2+NATPF2

620: POPF3 == CNNPF3+MILPCT*MILF3+NATPF3

621: POPF4 == CNNPF4+MILPCT*MILF4+NATPF4

622: POPF5 == CNNPF5+MILPCT*MILF5+NATPF5

623: POPF6 == CNNPF6+MILPCT*MILF6+NATPF6

624: POPF7 == CNNPF7+MILPCT*MILF7+NATPF7

625: POPF8 == CNNPF8+MILPCT*MILF8+NATPF8

626: POPF9 == CNNPF9+MILPCT*MILF9+NATPF9

627: POPF10 == CNNPF10+MILPCT*MILF10+NATPF10

628: POPF11 == CNNPF11+MILPCT*MILF11+NATPF11

629: POPF12 == CNNPF12+MILPCT*MILF12+NATPF12

630: POPF13 == CNNPF13+MILPCT*MILF13+NATPF13

631: POPF14 == CNNPF14+MILPCT*MILF14+NATPF14

632: POPF15 == CNNPF15+MILPCT*MILF15+NATPF15

633: BTOT == BTHTOT+NBTHTOT

634: DTOT == DTHTOT+NDTHTOT

635: POPNI9 == BTOT-DTOT

636: NCBR == NBTHTOT/NATTOT*1000

637: NCDR == NDTHTOT/NATTOT*1000

638: CBR == BTHTOT/CNNTOT*1000

639: CDR == DTHTOT/CNNTOT*1000

640: BCRUDE == BTOT/(CNNTOT+NATTOT)*1000

641: DCRUDE == DTOT/(CNNTOT+NATTOT)*1000

642: POPSKUL == POPM3+POPM4+POPM5+POPF3+POPF4+POPF5

643: POPKIDS == POPSKUL+POPM1+POPM2+POPF1+POPF2-POPM5-POPF5

644: POPGER = POPM15+POPF15

645: POPADS == POP-POPKIDS-POPGER

646: POP.AD == POPADS/POP

647: POP.KID == POPKIDS/POP

648: POP.GER == POPGER/POP

649: POP.MIL == MILPCT*(AFTOT+MDTOT)/POP

650: POP.NAT == NATTOT/POP

651: POP.CIV == CNNTOT/POP

652: POPAVAGE == 0.5*((POPM1+POPF1)/POP)+3*((POPM2+POPF2)/POP)+7.5*((POPM3+POPF3)/POP)+12.5*((POPM4+POPF4)/POP)+17.5*((POPM5+POPF5)/POP)+22.5*((POPM6+POPF6)/POP)+27.5*((POPM7+POPF7)/POP)+32.5*((POPM8+POPF8)/POP)+37.5*((POPM9+POPF9)/POP)+42.5*((POPM10+POPF10)/POP)+47.5*((POPM11+POPF11)/POP)+52.5*((POPM12+POPF12)/POP)+57.5*((POPM13+POPF13)/POP)+62.5*((POPM14+POPF14)/POP)+67.5*((POPM15+POPF15)/POP)

Labor Force and Migration

653: PLFDOMC == CNNPM5+CNNPM6+CNNPM7+CNNPM8+CNNPM9+CNNPM10+CNNPM11+11+CNNPM12+CNNPM13+CNNPM14+CNNPF5+CNNPF6+CNNPF7+CNNPF8+CNNPF9+CNNPF10+CNNPF11+CNNPF12+CNNPF13+CNNPF14

654: PLFDOMN == NATPM5+NATPM6+NATPM7+NATPM8+NATPM9+NATPM10+NATPM11+NATPM12+NATPM13+NATPM14+NATPF5+NATPF6+NATPF7+NATPF8+NATPF9+NATPF10+NATPF11+NATPF12+NATPF13+NATPF14

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

656: PLFD9 == PLFDOMC+PLFDOMN+PLFDOMM

657: LF == LAFPRT*PLFD9

658: UNEMP == LF-EM96

659: UNEMRATE == UNEMP/LF

660: U.AK.US == UNEMP/LF/UUS

661: DELEMP == EM96-EM96(-1)

662: WR.AK.US == LOG(R.WR97)-LOG(WEUS*100/PDUSCPI)-(LOG(R.WR97(-1))-
LOG(WEUS(-1)*100/PDUSCPI(-1)))

663: POPMIG = CMIG1+CMIG2*1/U.AK.US(-1)+CMIG3*WR.AK.US(-1)+CMIG4*
DELEMP

664: Z7.8 == 0

665: Z7.7 == 0

666: Z7.6 == 0

667: Z7.5 == 0

668: Z7.4 == 0

669: Z7.3 == 0

670: Z7.2 == 0

671: Z7.1 == 0

672: Z7.0 == 0

Household Formation

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

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

675: HHM4 == CHHM4+NHHM4

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

711: HHF4 == CHHF4+NHHF4

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

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

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

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

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

```
717:  HHF6 == CHHF6+NHHF6+MHHF6*MILPCT

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

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

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

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

722:  NHHF8 == IF YR LT 1980 THEN 1 ELSE ATPF8*(1-NPGQF8)*(NHHRF8+
      NRCF8/NTP*(YR-1980))

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

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

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

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

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

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

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

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

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

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

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

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

735:  HF12 == CHHF12+NHHF12+MHHF12*MILPCT
```

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

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

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

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

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

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

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

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

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

745: 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

746: 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

747: 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

748: POPGQ == POPNGQ+POPCGQ+MILPCT*POPMGQ

749: 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

750: 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

751: HHM == MILPCT*(MHHM5+MHHM6+MHHM7+MHHM8+MHHM9+MHHM10+MHHM11+
MHHM12+MHHM13+MHHM14+MHHM15+MHHF5+MHHF6+MHHF7+MHHF8+MHHF9+
MHHF10+MHHF11+MHHF12+MHHF13+MHHF14+MHHF15)

752: HHSIZEN == (NATTOT-POPNGQ)/HHN

753: HHSIZEC == (CNNTOT-POPCGQ)/HHC

754: HHSIZEM == MILPCT*(AFTOT+MDTOT-POPMGQ)/HHM

755: HHSIZE == (POP-POPNGQ-POPCGQ-MILPCT*POPMGQ)/HH

756: HH24 == HHF4+HHF5+HHF6+HHM4+HHM5+HHM6

757: HH25.29 == HHF7+HHM7

758: HH30.54 == HHF8+HHF9+HHF10+HHF11+HHF12+HHM8+HHM9+HHM10+HHM11+
HHM12

759: HH55 == HHF13+HHF14+HHF15+HHM13+HHM14+HHM15

760: Z8.9 == 0

761: Z8.8 == 0

762: Z8.7 == 0

763: Z8.6 == 0

764: Z8.5 == 0

765: Z8.4 == 0

766: Z8.3 == 0

767: Z8.2 == 0

768: Z8.1 == 0

769: Z8.0 == 0

NATIVE ECONOMIC ACTIVITY MODULE

770: EMNAT == EMNATX

771: RNAT == RNATX

772: EMRATE = EM96/POPC

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

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

775: EMNNC == EM99-EMGM-EMNA

776: EMRATN == EMNA/POPNE

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

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

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

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

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

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

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

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

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

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

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

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

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

790:  NWSA9N == WRA9*NEMA9N/1000

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

792:  NWSP9N == WRP9*NEMP9N/1000

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

794:  NWSCNN == WRCN*NEMCNN/1000

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

796:  NWSM9N == WRM9*NEMM9N/1000

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

798:  NWST9N == WRT9*NEMT9N/1000

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

800:  NWSCMN == WRCM*NEMCMN/1000

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

802:  NWSPUN == WRPU*NEMPUN/1000

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

804:  NWSD9N == WRD9*NEMD9N/1000

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

806:  NWSFIN == WRFI*NEMFIN/1000

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

808:  NWSS9N == WRS9*NEMS9N/1000

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

810:  NWSGFN == WRGF*NEMGFN/1000
```

```
811:  NEMGAN == CEGAN*(EMNA-PERNA3*EMNC)

812:  NWSGAN == WRGA*NEMGAN/1000

813:  WSNA == NWSA9N+NWSP9N+NWSCNN+NWSM9N+NWST9N+NWSCMN+NWSPUN+
      NWSD9N+NWSFIN+NWSS9N+NWSGFN+NWSGAN

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

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

816:  PINN == PI-PIN

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

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

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

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

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

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

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

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

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

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

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

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

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

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

831:  Z9.10 == 0

832:  Z9.9 == 0

833:  Z9.8 == 0

834:  Z9.7 == 0
```

835: Z9.6 == 0

836: Z9.5 == 0

837: Z9.4 == 0

838: Z9.3 == 0

839: Z9.2 == 0

840: Z9.1 == 0

841: Z9.0 == 0

DEFINITIONAL EQUATIONS MODULE

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

843: R.WR97 = WR97*100/PDRPI

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

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

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

847: P.EXBM == EXGFBM*1000/POP

848: P.R99S == R99S*1000./POP

849: P.RTIS == RTIS*1000./POP

850: P.EXTRNS == EXTRNS*1000/POP

851: P.EL99 == EL99*1000./POP

852: P.ELED == ELED*1000./POP

853: P.ELNED1 == ELNED1*1000/POP

854: P.RLT99 == RLT99*1000./POP

855: P.GEXP == SLGEXP*1000/POP

856: P.BAL99 == BAL99*1000/POP

857: P.BALPF == BALPF*1000/POP

858: P.BALGF9 == BALGF9*1000/POP

859: P.RSIN == RSIN*1000/POP

860: P.RSIP == RSIP*1000/POP

861: P.RSEN == RSEN*1000/POP

862: P.GODT == GODT*1000/POP

863: PR.EX99S == P.EX99S*100/PDRPI

864: PR.EXBM == EXGFBM*10**5/PDEXOPS/POP

865: PR.EXCAP == P.EXCAP*100/PDCON

866: PR.EXOPS == P.EXOPS*100/PDEXOPS

867: PR.R99S == P.R99S*100/PDRPI

868: PR.RTIS == P.RTIS*100/PDRPI

869: PR.EL99 == P.EL99*100/PDRPI

870: PR.ELED == P.ELED*100/PDRPI

871: PR.ELNED == P.ELNED1*100/PDRPI

872: PR.GEXP == P.GEXP*100/PDRPI

873: PR.GFC == EXGFCHY*10**5/PDRPI/POP

874: PR.ECP == EXCPSHY*10**5/PDRPI/POP

875: PR.GFCN == EXGFCNH*10**5/PDRPI/POP

876: PR.ECPN == EXCPSNH*10**5/PDRPI/POP

877: PR.EXEDS == EXEDS*10**5/PDEXOPS/POP

878: PR.EXSSS == EXSSS*10**5/PDEXOPS/POP

879: PR.EXHES == EXHES*10**5/PDEXOPS/POP

880: PR.EXNRS == EXNRS*10**5/PDEXOPS/POP

881: PR.EXPPS == EXPPS*10**5/PDEXOPS/POP

882: PR.EXJUS == EXJUS*10**5/PDEXOPS/POP

883: PR.EXCDS == EXCDS*10**5/PDEXOPS/POP

884: PR.EXTRS == EXTRS*10**5/PDEXOPS/POP

885: PR.EXGGS == EXGGS*10**5/PDEXOPS/POP

886: PR.RLT99 == RLT99*10**5/PDRPI/POP

887: PR.ELEDC == ELEDCP*10**5/PDRPI/POP

888: PR.BAL99 == P.BAL99*(100/PDRPI)

889: PR.BALPF == P.BALPF*(100/PDRPI)

890: PR.BALG1 == P.BALGF9*(100/PDRPI)

891: PR.BALP2 == P.BALPF*(100/PDEXOPS)

892: PR.BALG2 == P.BALGF9*(100/PDEXOPS)

893: PR.RSIN == P.RSIN*(100/PDRPI)

894: PR.RSIP == P.RSIP*(100/PDRPI)

895: PR.RSEN == P.RSEN*(100/PDRPI)

896: PR.GODT == P.GODT*(100/PDRPI)

897: PI.TXS == RT99/PI

898: PI.EXS == EXGF/PI

899: PI.TXL == (RL99-RLT99-RLTF)/PI

900: PI.EXL == (EL99-(GOBONDL-GOBONDL(-1)))/PI

901: PI.EXT == (EXGF+(EL99-(GOBONDL-GOBONDL(-1)))-RLT99)/PI

902: PI.RSEN == RSEN/PI

903: PI.GODT == GODT/PI

904: PI.EX99S == EX99S/PI

905: PI.EL99 == EL99/PI

906: PI.RL99 == RL99/PI

907: PI.RLPT == RLPT/PI

908: PI.WS98 == WS98/PI

909: PI.DPI == DPI/PI

910: RL99.PT == RLPT/RL99

911: RL99.RT == RLT99/RL99

912: RS.FED == RSFDN/R99S

913: RS.RP9S == RP9S/R99S

914: RS.RSIN == RSIN/R99S

915: RS.RSEN == RSEN/R99S

916: RS.PET == (RP9S+RSIN)/R99S

917: RS.REC == (RSIN+RSEN)/R99S

918: RSBM.RP9 == RP9SGF/RSGFBM

919: RSBM.PET == (RP9SGF+RSIG+RSID+EXPFTOGF*RSIP)/RSGFBM

920: RSBM.EXD == EXDSS/RSGFBM

921: RSBM.GF == RSIG/RSGFBM

922: RSBM.B99 == (RSIG+RSID+RSIPGF)/RSGFBM

923: RSBM.PF == RSIPGF/RSGFBM

924: RSBM.REN == RSENGF/RSGFBM

925: EX.R99S == R99S/EXGF

926: EX.NRP9 == (RSEN+RSIN+RSFDN)/EXGF

927: EX.RSIN == RSIN/EXGF

928: EX.RP9S == 1-EX.NRP9

929: EX.RSEN == RSEN/EXGF

930: EX.DSS == EXDSS/EXGF

931: EXBM.RV == RSGFBM/EXGFBM

932: EXBM.CAB == BALCABGF/EXGFBM

933: EXBM.FD == BAL99/EXGFBM

934: EXBM.GR1 == (RSGFBM+EXPFCON1-RP9S)/EXGFBM

935: EXBM.END == EXDFWITH/EXGFBM

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

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

938: DF.RSGF == RSGF*PDRPIBAS/PDRPI

939: DF.RSGFB == RSGFBM*PDRPIBAS/PDRPI

940: DF.R99S == R99S*PDRPIBAS/PDRPI

941: DF.RSEN == RSEN*PDRPIBAS/PDRPI

942: DF.RSIN == RSIN*PDRPIBAS/PDRPI

943: DF.EXGF == EXGF*PDRPIBAS/PDRPI

944: DF.EXGFB == EXGFBM*PDRPIBAS/PDRPI

945: DF.GOXBM == (EXGFBM-EXGFCAP)*376.536/PDEXOPS

946: DF.BAL99 == BAL99*PDRPIBAS/PDRPI

947: DF.BALDF == BALDF*PDRPIBAS/PDRPI

948: DF.BALGF == BALGF9*PDRPIBAS/PDRPI

949: DF.RSIP == RSIP*PDRPIBAS/PDRPI

950: DF.BALPF == BALPF*PDRPIBAS/PDRPI

951: DF.RSIPN == RSIPNET*PDRPIBAS/PDRPI

952: DF.RSIDN == RSIDNET*PDRPIBAS/PDRPI

953: DF.RSIGN == RSIGNET*PDRPIBAS/PDRPI

954: DF.RSI99 == RSI99NET*PDRPIBAS/PDRPI

955: DF.PI == PI*PDRPIBAS/PDRPI

956: DF.WS98 == WS98*PDRPIBAS/PDRPI

957: DF.WSG9 == (WSGS+WSGL+WSGC+WSGM)*PDRPIBAS/PDRPI

958: DF.WSSP == (WST9+WSCM+WSPU+WSD9+WSFI+WSS9)*PDRPIBAS/PDRPI

959: DF.WSNS == (WSA9+WSM9+WSCN+WSP9)*PDRPIBAS/PDRPI

960: DF.WRG9 == DF.WSG9*1000/EMG9

961: DF.WRSP == DF.WSSP*1000/EMSP

962: DF.WRNS == DF.WSNS*1000/(EMA9+EMM9+EMCN+EMP9)

963: DF.RSGFA == RSGF.AFR*PDRPIBAS/PDRPI

964: DF.RP9SG == RP9SGF*PDRPIBAS/PDRPI

965: DF.RSENG == RSENGF*PDRPIBAS/PDRPI

966: DF.RTCS1 == RTCS1*PDRPIBAS/PDRPI

967: DF.RTIS == RTIS*PDRPIBAS/PDRPI

968: DF.RLPT == RLPT*PDRPIBAS/PDRPI

969: DF.RLT99 == RLT99*PDRPIBAS/PDRPI

970: DF.EL99 == EL99*PDRPIBAS/PDRPI

971: DF.RSIPG == RSIPGF*PDRPIBAS/PDRPI

972: DF.DPI == DPI*PDRPIBAS/PDRPI

973: DF.EXLOK == EXLIMOK*PDRPIBAS/PDRPI

974: DF.RSGFG == RSGFGAP*PDRPIBAS/PDRPI

975: DF.APGFO == APGFOPS*PDRPIBAS/PDRPI

976: DF.APGFC == APGFCAP*PDRPIBAS/PDRPI

977: DF.EXDSS == EXDSS*PDRPIBAS/PDRPI

978: DFP.DPI == DF.DPI*1000/POP

979: DFP.PI == DF.PI*1000/POP

980: DFP.EXGF == DF.EXGF*1000/POP

981: DFP.BAL9 == DF.BAL99*1000/POP

982: DFP.EXLK == DF.EXLOK*1000/POP

```
 983:  DFP.APGO == DF.APGFO*1000/POP

 984:  DFP.APGC == DF.APGFC*1000/POP

 985:  IM.REV == (EXGF/PDRPI/POP-BASEXGF/BASPDRPI/BASEPOP)*PDRPI*POP

 986:  IM.BALRV = IM.BAL(-1)*(ROR+RORPPF)+IM.REV

 987:  IM.BAL = IF YR EQ 1977 THEN 0 ELSE IM.BAL(-1)+IM.BALRV

 988:  IM.BAL99 == BAL99+IM.BAL

 989:  IM.BALPC == IM.BAL*1000/POP

 990:  IM.BALR == IM.BAL*100/PDRPI

 991:  IM.BLRPC == IM.BALR*1000/POP

 992:  EM.EMTCU == EMTCU/EM99

 993:  EM.EMSUP == EMSUP/EM99

 994:  EM.EMSP == EMSP/EM99

 995:  EM.EMGA == EMGA/EM99

 996:  EM.EMGF == EMGF/EM99

 997:  EM.EMCN == EMCN/EM99

 998:  G.PI == PI/PI(-1)-1

 999:  G.PR.PI == PR.PI/PR.PI(-1)-1

1000:  G.PR.DPI == PR.DPI/PR.DPI(-1)-1

1001:  G.RSEN == RSEN/RSEN(-1)-1

1002:  G.EX99S == EX99S/EX99S(-1)-1

1003:  G.EL99 == EL99/EL99(-1)-1

1004:  G.PDRPI == PDRPI/PDRPI(-1)-1

1005:  G.POP == POP/POP(-1)-1

1006:  G.EM99 == EM99/EM99(-1)-1

1007:  G.SRPC == PR.EX99S/PR.EX99S(-1)-1
```

1008: G.RNSPC == P.RSEN/P.RSEN(-1)-1

1009: G.BAL99 == BAL99/BAL99(-1)-1

1010: G.BAL9PC == P.BAL99/P.BAL99(-1)-1

1011: G.R.WR98 == R.WR98/R.WR98(-1)-1

1012: INX.DI == PR.DPI/PR.DPIUS

1013: INX.DINN == PR.DPINN/PR.DPIUS

1014: INX.DI8N == PR.DPI8N/PR.DPIUS

1015: INX.WG == R.WR97/(WEUS*52*100/PDUSCPI)

1016: INX.S1 == EMSUP/R.DPI

1017: INX.S2 == EMTCU/R.DPI

1018: Z10.9 == 0

1019: Z10.8 == 0

1020: Z10.7 == 0

1021: Z10.6 == 0

1022: Z10.5 == 0

1023: Z10.4 == 0

1024: Z10.3 == 0

1025: Z10.2 == 0

1026: Z10.1 == 0

1027: Z10.0 == 0

INCOME DISTRIBUTION MODEL LINKS MODULE

1028: NNPM1 == CNNPM5+MILPCT*MDPM5

1029: NNPM2 == CNNPM6+MILPCT*MDPM6

1030: NNPM3 == CNNPM7+CNNPM8+MILPCT*(MDPM7+MDPM8)

1031: NNPM4 == CNNPM9+CNNPM10+MILPCT*(MDPM9+MDPM10)

1032: NNPM5 == CNNPM11+CNNPM12+MILPCT*(MDPM11+MDPM12)

1033: NNPM6 == CNNPM13+CNNPM14+MILPCT*(MDPM13+MDPM14)

1034: NNPM7 == CNNPM15+MILPCT*MDPM15

1035: NNPF1 == CNNPF5+MILPCT*MDPF5

1036: NNPF2 == CNNPF6+MILPCT*MDPF6

1037: NNPF3 == CNNPF7+CNNPF8+MILPCT*(MDPF7+MDPF8)

1038: NNPF4 == CNNPF9+CNNPF10+MILPCT*(MDPF9+MDPF10)

1039: NNPF5 == CNNPF11+CNNPF12+MILPCT*(MDPF11+MDPF12)

1040: NNPF6 == CNNPF13+CNNPF14+MILPCT*(MDPF13+MDPF14)

1041: NNPF7 == CNNPF15+MILPCT*MDPF15

1042: NAPM1 == NATPM5

1043: NAPM2 == NATPM6

1044: NAPM3 == NATPM7+NATPM8

1045: NAPM4 == NATPM9+NATPM10

1046: NAPM5 == NATPM11+NATPM12

1047: NAPM6 == NATPM13+NATPM14

1048: NAPM7 == NATPM15

1049: NAPF1 == NATPF5

1050: NAPF2 == NATPF6

1051: NAPF3 == NATPF7+NATPF8

1052: NAPF4 == NATPF9+NATPF10

1053: NAPF5 == NATPF11+NATPF12

1054: NAPF6 == NATPF13+NATPF14

1055: NAPF7 == NATPF15

1056: PF == CNNPF1+CNNPF2+CNNPF3+CNNPF4+MILPCT*(MDPF1+MDPF2+MDPF3+MDPF4)

1057: PM == CNNPM1+CNNPM2+CNNPM3+CNNPM4+MILPCT*(MDPM1+MDPM2+MDPM3+MDPM4)

1058: PFN == NATPF1+NATPF2+NATPF3+NATPF4

1059: PMN == NATPM1+NATPM2+NATPM3+NATPM4

1060: WRGMS == (PI8-WS98)/(EMPRO*PDRPI)/((PI8(-1)-WS98(-1))/(EMPRO(-1)*PDRPI(-1)))

1061: WRGP9 == WRP9/PDRPI/(WRP9(-1)/PDRPI(-1))

1062: WRGCN == WRCN/PDRPI/(WRCN(-1)/PDRPI(-1))

1063: WRGM9 == WRM9/PDRPI/(WRM9(-1)/PDRPI(-1))

1064: WRGT9 == WRT9/PDRPI/(WRT9(-1)/PDRPI(-1))

1065: WRGCU == WRCU/PDRPI/(WRCU(-1)/PDRPI(-1))

1066: WRGD9 == WRD9/PDRPI/(WRD9(-1)/PDRPI(-1))

1067: WRGFI == WRFI/PDRPI/(WRFI(-1)/PDRPI(-1))

1068: WRGS9 == WRS9/PDRPI/(WRS9(-1)/PDRPI(-1))

1069: WRGGC == WRGC/PDRPI/(WRGC(-1)/PDRPI(-1))

1070: WRGGA == WRGA/PDRPI/(WRGA(-1)/PDRPI(-1))

1071: PRINT == PRINT2

1072: X1 == P1

1073: X2 == P2

1074: X3 == P3

1075: X4 == P4

```
1076:  X5 == P5

1077:  X6 == P6

1078:  WS98L == WS98(-1)

1079:  PIL == PI(-1)

1080:  Z11.9 == 0

1081:  Z11.8 == 0

1082:  Z11.7 == 0

1083:  Z11.6 == 0

1084:  Z11.5 == 0

1085:  Z11.4 == 0

1086:  Z11.3 == 0

1087:  Z11.2 == 0

1088:  Z11.1 == 0

1089:  Z11.0 == 0
```

STATE GOVERNMENT CAPITAL STOCK MODULE

```
1090:  EXC1 == LGF1*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED1*(EXCPSFED+
       LFED15*EXCPSFED(-1))+LBOND1*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
       LSGF1*(EXSPCAP+LSGF15*EXSPCAP(-1))

1091:  EXC2 == LGF2*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED2*(EXCPSFED+
       LFED15*EXCPSFED(-1))+LBOND2*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
       LSGF2*(EXSPCAP+LSGF15*EXSPCAP(-1))

1092:  EXC3 == LGF3*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED3*(EXCPSFED+
       LFED15*EXCPSFED(-1))+LBOND3*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
       LSGF3*(EXSPCAP+LSGF15*EXSPCAP(-1))

1093:  EXC4 == LGF4*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED4*(EXCPSFED+
       LFED15*EXCPSFED(-1))+LBOND4*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
       LSGF4*(EXSPCAP+LSGF15*EXSPCAP(-1))
```

1094: EXC5 == LGF5*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED5*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND5*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF5*(EXSPCAP+LSGF15*EXSPCAP(-1))

1095: EXC6 == LGF6*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED6*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND6*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF6*(EXSPCAP+LSGF15*EXSPCAP(-1))

1096: EXC7 == LGF7*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED7*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND7*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF7*(EXSPCAP+LSGF15*EXSPCAP(-1))

1097: EXC8 == LGF8*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED8*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND8*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF8*(EXSPCAP+LSGF15*EXSPCAP(-1))

1098: EXC9 == LGF9*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED9*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND9*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF9*(EXSPCAP+LSGF15*EXSPCAP(-1))

1099: EXC101 == LGF10*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED10*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND10*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF10*(EXSPCAP+LSGF15*EXSPCAP(-1))

1100: EXC10 == EXC101*LMUNCAP

1101: EXC11 == LGF11*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED11*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND11*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF11*(EXSPCAP+LSGF15*EXSPCAP(-1))

1102: EXC12 == LGF12*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED12*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND12*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF12*(EXSPCAP+LSGF15*EXSPCAP(-1))

1103: EXC13 == LGF13*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED13*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND13*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF13*(EXSPCAP+LSGF15*EXSPCAP(-1))

1104: EXC14 == LGF14*(EXGFCAP+LGF15*EXGFCAP(-1))+LFED14*(EXCPSFED+
LFED15*EXCPSFED(-1))+LBOND14*(EXCPSGOB+LBOND15*EXCPSGOB(-1))+
LSGF14*(EXSPCAP+LSGF15*EXSPCAP(-1))

1105: EXC15 == LGF15*EXGFCAP+LFED15*EXCPSFED+LBOND15*EXCPSGOB+
LSGF15*EXSPCAP

1106: EXCT == EXC1+EXC2+EXC3+EXC5+EXC6+EXC7+EXC8+EXC9+EXC10+EXC11+
EXC12+EXC13+EXC14

1107: EXCRF1 == REPF1*R.CAP1(-1)*(PDCON/PDCONBAS)

1108: EXCRS1 == REPS1*R.CAP1(-1)*(PDCON/PDCONBAS)

```
1109:  EXCRL1 == REPL1*R.CAP1(-1)*(PDCON/PDCONBAS)

1110:  EXCRU1 == REPU1*R.CAP1(-1)*(PDCON/PDCONBAS)

1111:  EXCRF2 == REPF2*R.CAP2(-1)*(PDCON/PDCONBAS)

1112:  EXCRS2 == REPS2*R.CAP2(-1)*(PDCON/PDCONBAS)

1113:  EXCRL2 == REPL2*R.CAP2(-1)*(PDCON/PDCONBAS)

1114:  EXCRU2 == REPU2*R.CAP2(-1)*(PDCON/PDCONBAS)

1115:  EXCRF3 == REPF3*R.CAP3(-1)*(PDCON/PDCONBAS)

1116:  EXCRS3 == REPS3*R.CAP3(-1)*(PDCON/PDCONBAS)

1117:  EXCRL3 == REPL3*R.CAP3(-1)*(PDCON/PDCONBAS)

1118:  EXCRU3 == REPU3*R.CAP3(-1)*(PDCON/PDCONBAS)

1119:  EXCRF4 == REPF4*R.CAP4(-1)*(PDCON/PDCONBAS)

1120:  EXCRS4 == REPS4*R.CAP4(-1)*(PDCON/PDCONBAS)

1121:  EXCRL4 == REPL4*R.CAP4(-1)*(PDCON/PDCONBAS)

1122:  EXCRU4 == REPU4*R.CAP4(-1)*(PDCON/PDCONBAS)

1123:  EXCRF5 == REPF5*R.CAP5(-1)*(PDCON/PDCONBAS)

1124:  EXCRS5 == REPS5*R.CAP5(-1)*(PDCON/PDCONBAS)

1125:  EXCRL5 == REPL5*R.CAP5(-1)*(PDCON/PDCONBAS)

1126:  EXCRU5 == REPU5*R.CAP5(-1)*(PDCON/PDCONBAS)

1127:  EXCRF6 == REPF6*R.CAP6(-1)*(PDCON/PDCONBAS)

1128:  EXCRS6 == REPS6*R.CAP6(-1)*(PDCON/PDCONBAS)

1129:  EXCRL6 == REPL6*R.CAP6(-1)*(PDCON/PDCONBAS)

1130:  EXCRU6 == REPU6*R.CAP6(-1)*(PDCON/PDCONBAS)

1131:  EXCRF7 == REPF7*R.CAP7(-1)*(PDCON/PDCONBAS)

1132:  EXCRS7 == REPS7*R.CAP7(-1)*(PDCON/PDCONBAS)

1133:  EXCRL7 == REPL7*R.CAP7(-1)*(PDCON/PDCONBAS)

1134:  EXCRU7 == REPU7*R.CAP7(-1)*(PDCON/PDCONBAS)
```

1135: EXCRF8 == REPF8*R.CAP8(-1)*(PDCON/PDCONBAS)

1136: EXCRS8 == REPS8*R.CAP8(-1)*(PDCON/PDCONBAS)

1137: EXCRL8 == REPL8*R.CAP8(-1)*(PDCON/PDCONBAS)

1138: EXCRU8 == REPU8*R.CAP8(-1)*(PDCON/PDCONBAS)

1139: EXCRF9 == REPF9*R.CAP9(-1)*(PDCON/PDCONBAS)

1140: EXCRS9 == REPS9*R.CAP9(-1)*(PDCON/PDCONBAS)

1141: EXCRL9 == REPL9*R.CAP9(-1)*(PDCON/PDCONBAS)

1142: EXCRU9 == REPU9*R.CAP9(-1)*(PDCON/PDCONBAS)

1143: EXCRF10 == REPF10*R.CAP10(-1)*(PDCON/PDCONBAS)

1144: EXCRS10 == REPS10*R.CAP10(-1)*(PDCON/PDCONBAS)

1145: EXCRL10 == REPL10*R.CAP10(-1)*(PDCON/PDCONBAS)

1146: EXCRU10 == REPU10*R.CAP10(-1)*(PDCON/PDCONBAS)

1147: EXCRF11 == REPF11*R.CAP11(-1)*(PDCON/PDCONBAS)

1148: EXCRS11 == REPS11*R.CAP11(-1)*(PDCON/PDCONBAS)

1149: EXCRL11 == REPL11*R.CAP11(-1)*(PDCON/PDCONBAS)

1150: EXCRU11 == REPU11*R.CAP11(-1)*(PDCON/PDCONBAS)

1151: EXCRF12 == REPF12*R.CAP12(-1)*(PDCON/PDCONBAS)

1152: EXCRS12 == REPS12*R.CAP12(-1)*(PDCON/PDCONBAS)

1153: EXCRL12 == REPL12*R.CAP12(-1)*(PDCON/PDCONBAS)

1154: EXCRU12 == REPU12*R.CAP12(-1)*(PDCON/PDCONBAS)

1155: EXCRF13 == REPF13*R.CAP13(-1)*(PDCON/PDCONBAS)

1156: EXCRS13 == REPS13*R.CAP13(-1)*(PDCON/PDCONBAS)

1157: EXCRL13 == REPL13*R.CAP13(-1)*(PDCON/PDCONBAS)

1158: EXCRU13 == REPU13*R.CAP13(-1)*(PDCON/PDCONBAS)

1159: EXCRF14 == REPF14*R.CAP14(-1)*(PDCON/PDCONBAS)

1160: EXCRS14 == REPS14*R.CAP14(-1)*(PDCON/PDCONBAS)

1161: EXCRL14 == REPL14*R.CAP14(-1)*(PDCON/PDCONBAS)

1162: EXCRU14 == REPU14*R.CAP14(-1)*(PDCON/PDCONBAS)

1163: EXCRF15 == REPF15*R.CAP15(-1)*(PDCON/PDCONBAS)

1164: EXCRS15 == REPS15*R.CAP15(-1)*(PDCON/PDCONBAS)

1165: EXCRL15 == REPL15*R.CAP15(-1)*(PDCON/PDCONBAS)

1166: EXCRU15 == REPU15*R.CAP15(-1)*(PDCON/PDCONBAS)

1167: EXCRFT == EXCRF1+EXCRF2+EXCRF3+EXCRF4+EXCRF5+EXCRF6+EXCRF7+
EXCRF8+EXCRF9+EXCRF10+EXCRF11+EXCRF12+EXCRF13+EXCRF14+EXCRF15

1168: EXCRST == EXCRS1+EXCRS2+EXCRS3+EXCRS4+EXCRS5+EXCRS6+EXCRS7+
EXCRS8+EXCRS9+EXCRS10+EXCRS11+EXCRS12+EXCRS13+EXCRS14+EXCRS15

1169: EXCRLT == EXCRL1+EXCRL2+EXCRL3+EXCRL4+EXCRL5+EXCRL6+EXCRL7+
EXCRL8+EXCRL9+EXCRL10+EXCRL11+EXCRL12+EXCRL13+EXCRL14+EXCRL15

1170: EXCRUT == EXCRU1+EXCRU2+EXCRU3+EXCRU4+EXCRU5+EXCRU6+EXCRU7+
EXCRU8+EXCRU9+EXCRU10+EXCRU11+EXCRU12+EXCRU13+EXCRU14+EXCRU15

1171: EXCRT1 == EXCRF1+EXCRS1+EXCRL1+EXCRU1

1172: EXCRT2 == EXCRF2+EXCRS2+EXCRL2+EXCRU2

1173: EXCRT3 == EXCRF3+EXCRS3+EXCRL3+EXCRU3

1174: EXCRT4 == EXCRF4+EXCRS4+EXCRL4+EXCRU4

1175: EXCRT5 == EXCRF5+EXCRS5+EXCRL5+EXCRU5

1176: EXCRT6 == EXCRF6+EXCRS6+EXCRL6+EXCRU6

1177: EXCRT7 == EXCRF7+EXCRS7+EXCRL7+EXCRU7

1178: EXCRT8 == EXCRF8+EXCRS8+EXCRL8+EXCRU8

1179: EXCRT9 == EXCRF9+EXCRS9+EXCRL9+EXCRU9

1180: EXCRT10 == EXCRF10+EXCRS10+EXCRL10+EXCRU10

1181: EXCRT11 == EXCRF11+EXCRS11+EXCRL11+EXCRU11

1182: EXCRT12 == EXCRF12+EXCRS12+EXCRL12+EXCRU12

1183: EXCRT13 == EXCRF13+EXCRS13+EXCRL13+EXCRU13

1184: EXCRT14 == EXCRF14+EXCRS14+EXCRL14+EXCRU14

1185: EXCRT15 == EXCRF15+EXCRS15+EXCRL15+EXCRU15

1186: EXCRTT == EXCRFT+EXCRST+EXCRLT+EXCRUT

1187: EXOMF1 == OMF1*R.CAP1(-1)*(PDCON/PDCONBAS)

1188: EXOMS1 == OMS1*R.CAP1(-1)*(PDCON/PDCONBAS)

1189: EXOML1 == OML1*R.CAP1(-1)*(PDCON/PDCONBAS)

1190: EXOMU1 == OMU1*R.CAP1(-1)*(PDCON/PDCONBAS)

1191: EXOMF2 == OMF2*R.CAP2(-1)*(PDCON/PDCONBAS)

1192: EXOMS2 == OMS2*R.CAP2(-1)*(PDCON/PDCONBAS)

1193: EXOML2 == OML2*R.CAP2(-1)*(PDCON/PDCONBAS)

1194: EXOMU2 == OMU2*R.CAP2(-1)*(PDCON/PDCONBAS)

1195: EXOMF3 == OMF3*R.CAP3(-1)*(PDCON/PDCONBAS)

1196: EXOMS3 == OMS3*R.CAP3(-1)*(PDCON/PDCONBAS)

1197: EXOML3 == OML3*R.CAP3(-1)*(PDCON/PDCONBAS)

1198: EXOMU3 == OMU3*R.CAP3(-1)*(PDCON/PDCONBAS)

1199: EXOMF4 == OMF4*R.CAP4(-1)*(PDCON/PDCONBAS)

1200: EXOMS4 == OMS4*R.CAP4(-1)*(PDCON/PDCONBAS)

1201: EXOML4 == OML4*R.CAP4(-1)*(PDCON/PDCONBAS)

1202: EXOMU4 == OMU4*R.CAP4(-1)*(PDCON/PDCONBAS)

1203: EXOMF5 == OMF5*R.CAP5(-1)*(PDCON/PDCONBAS)

1204: EXOMS5 == OMS5*R.CAP5(-1)*(PDCON/PDCONBAS)

1205: EXOML5 == OML5*R.CAP5(-1)*(PDCON/PDCONBAS)

1206: EXOMU5 == OMU5*R.CAP5(-1)*(PDCON/PDCONBAS)

1207: EXOMF6 == OMF6*R.CAP6(-1)*(PDCON/PDCONBAS)

1208: EXOMS6 == OMS6*R.CAP6(-1)*(PDCON/PDCONBAS)

1209: EXOML6 == OML6*R.CAP6(-1)*(PDCON/PDCONBAS)

1210: EXOMU6 == OMU6*R.CAP6(-1)*(PDCON/PDCONBAS)

1211: EXOMF7 == OMF7*R.CAP7(-1)*(PDCON/PDCONBAS)

1212: EXOMS7 == OMS7*R.CAP7(-1)*(PDCON/PDCONBAS)

1213: EXOML7 == OML7*R.CAP7(-1)*(PDCON/PDCONBAS)

1214: EXOMU7 == OMU7*R.CAP7(-1)*(PDCON/PDCONBAS)

1215: EXOMF8 == OMF8*R.CAP8(-1)*(PDCON/PDCONBAS)

1216: EXOMS8 == OMS8*R.CAP8(-1)*(PDCON/PDCONBAS)

1217: EXOML8 == OML8*R.CAP8(-1)*(PDCON/PDCONBAS)

1218: EXOMU8 == OMU8*R.CAP8(-1)*(PDCON/PDCONBAS)

1219: EXOMF9 == OMF9*R.CAP9(-1)*(PDCON/PDCONBAS)

1220: EXOMS9 == OMS9*R.CAP9(-1)*(PDCON/PDCONBAS)

1221: EXOML9 == OML9*R.CAP9(-1)*(PDCON/PDCONBAS)

1222: EXOMU9 == OMU9*R.CAP9(-1)*(PDCON/PDCONBAS)

1223: EXOMF10 == OMF10*R.CAP10(-1)*(PDCON/PDCONBAS)

1224: EXOMS10 == OMS10*R.CAP10(-1)*(PDCON/PDCONBAS)

1225: EXOML10 == OML10*R.CAP10(-1)*(PDCON/PDCONBAS)

1226: EXOMU10 == OMU10*R.CAP10(-1)*(PDCON/PDCONBAS)

1227: EXOMF11 == OMF11*R.CAP11(-1)*(PDCON/PDCONBAS)

1228: EXOMS11 == OMS11*R.CAP11(-1)*(PDCON/PDCONBAS)

1229: EXOML11 == OML11*R.CAP11(-1)*(PDCON/PDCONBAS)

1230: EXOMU11 == OMU11*R.CAP11(-1)*(PDCON/PDCONBAS)

1231: EXOMF12 == OMF12*R.CAP12(-1)*(PDCON/PDCONBAS)

1232: EXOMS12 == OMS12*R.CAP12(-1)*(PDCON/PDCONBAS)

1233: EXOML12 == OML12*R.CAP12(-1)*(PDCON/PDCONBAS)

1234: EXOMU12 == OMU12*R.CAP12(-1)*(PDCON/PDCONBAS)

1235: EXOMF13 == OMF13*R.CAP13(-1)*(PDCON/PDCONBAS)

1236: EXOMS13 == OMS13*R.CAP13(-1)*(PDCON/PDCONBAS)

1237: EXOML13 == OML13*R.CAP13(-1)*(PDCON/PDCONBAS)

1238: EXOMU13 == OMU13*R.CAP13(-1)*(PDCON/PDCONBAS)

1239: EXOMF14 == OMF14*R.CAP14(-1)*(PDCON/PDCONBAS)

1240: EXOMS14 == OMS14*R.CAP14(-1)*(PDCON/PDCONBAS)

1241: EXOML14 == OML14*R.CAP14(-1)*(PDCON/PDCONBAS)

1242: EXOMU14 == OMU14*R.CAP14(-1)*(PDCON/PDCONBAS)

1243: EXOMF15 == OMF15*R.CAP15(-1)*(PDCON/PDCONBAS)

1244: EXOMS15 == OMS15*R.CAP15(-1)*(PDCON/PDCONBAS)

1245: EXOML15 == OML15*R.CAP15(-1)*(PDCON/PDCONBAS)

1246: EXOMU15 == OMU15*R.CAP15(-1)*(PDCON/PDCONBAS)

1247: EXOMT1 == EXOMF1+EXOMS1+EXOML1+EXOMU1

1248: EXOMT2 == EXOMF2+EXOMS2+EXOML2+EXOMU2

1249: EXOMT3 == EXOMF3+EXOMS3+EXOML3+EXOMU3

1250: EXOMT4 == EXOMF4+EXOMS4+EXOML4+EXOMU4

1251: EXOMT5 == EXOMF5+EXOMS5+EXOML5+EXOMU5

1252: EXOMT6 == EXOMF6+EXOMS6+EXOML6+EXOMU6

1253: EXOMT7 == EXOMF7+EXOMS7+EXOML7+EXOMU7

1254: EXOMT8 == EXOMF8+EXOMS8+EXOML8+EXOMU8

1255: EXOMT9 == EXOMF9+EXOMS9+EXOML9+EXOMU9

1256: EXOMT10 == EXOMF10+EXOMS10+EXOML10+EXOMU10

1257: EXOMT11 == EXOMF11+EXOMS11+EXOML11+EXOMU11

1258: EXOMT12 == EXOMF12+EXOMS12+EXOML12+EXOMU12

1259: EXOMT13 == EXOMF13+EXOMS13+EXOML13+EXOMU13

1260: EXOMT14 == EXOMF14+EXOMS14+EXOML14+EXOMU14

1261: EXOMT15 == EXOMF15+EXOMS15+EXOML15+EXOMU15

1262: EXOMFT == EXOMF1+EXOMF2+EXOMF3+EXOMF4+EXOMF5+EXOMF6+EXOMF7+
EXOMF8+EXOMF9+EXOMF10+EXOMF11+EXOMF12+EXOMF13+EXOMF14+EXOMF15

1263: EXOMST == EXOMS1+EXOMS2+EXOMS3+EXOMS4+EXOMS5+EXOMS6+EXOMS7+
EXOMS8+EXOMS9+EXOMS10+EXOMS11+EXOMS12+EXOMS13+EXOMS14+EXOMS15

1264: EXOMLT == EXOML1+EXOML2+EXOML3+EXOML4+EXOML5+EXOML6+EXOML7+
EXOML8+EXOML9+EXOML10+EXOML11+EXOML12+EXOML13+EXOML14+EXOML15

1265: EXOMUT == EXOMU1+EXOMU2+EXOMU3+EXOMU4+EXOMU5+EXOMU6+EXOMU7+
EXOMU8+EXOMU9+EXOMU10+EXOMU11+EXOMU12+EXOMU13+EXOMU14+EXOMU15

1266: EXOMTT == EXOMFT+EXOMST+EXOMLT+EXOMUT

1267: EXCN1 == EXC1-EXCRS1

1268: EXCN2 == EXC2-EXCRS2

1269: EXCN3 == EXC3-EXCRS3

1270: EXCN4 == EXC4-EXCRS4

1271: EXCN5 == EXC5-EXCRS5

1272: EXCN6 == EXC6-EXCRS6

1273: EXCN7 == EXC7-EXCRS7

1274: EXCN8 == EXC8-EXCRS8

1275: EXCN9 == EXC9-EXCRS9

1276: EXCN10 == EXC10-EXCRS10

1277: EXCN11 == EXC11-EXCRS11

1278: EXCN12 == EXC12-EXCRS12

1279: EXCN13 == EXC13-EXCRS13

1280: EXCN14 == EXC14-EXCRS14

1281: EXCN15 == EXC15-EXCRS15

1282: EXCNT == EXCN1+EXCN2+EXCN3+EXCN5+EXCN6+EXCN7+EXCN8+EXCN9+
EXCN10+EXCN11+EXCN12+EXCN13+EXCN14

1283: R.CAP1 = IF YR EQ 1982 THEN 3000 ELSE R.CAP1(-1)*
(1/(1+RCDEP1))+EXC1*(PDCONBAS/PDCON)

1284: R.CAP2 = IF YR EQ 1982 THEN 333 ELSE R.CAP2(-1)*(1/(1+RCDEP2))+
EXC2*(PDCONBAS/PDCON)

1285: R.CAP3 = IF YR EQ 1982 THEN 250 ELSE R.CAP3(-1)*(1/(1+RCDEP3))+
EXC3*(PDCONBAS/PDCON)

1286: R.CAP4 = 0

1287: R.CAP5 = IF YR EQ 1982 THEN 3097 ELSE R.CAP5(-1)*(1/(1+RCDEP5))+
EXC5*(PDCONBAS/PDCON)

1288: R.CAP6 = IF YR EQ 1982 THEN 963 ELSE R.CAP6(-1)*(1/(1+RCDEP6))+
EXC6*(PDCONBAS/PDCON)

1289: R.CAP7 = IF YR EQ 1982 THEN 677 ELSE R.CAP7(-1)*(1/(1+RCDEP7))+
EXC7*(PDCONBAS/PDCON)

1290: R.CAP8 = IF YR EQ 1982 THEN 0 ELSE R.CAP8(-1)*(1/(1+RCDEP8))+
EXC8*(PDCONBAS/PDCON)

1291: R.CAP9 = IF YR EQ 1982 THEN 0 ELSE R.CAP9(-1)*(1/(1+RCDEP9))+
EXC9*(PDCONBAS/PDCON)

1292: R.CAP10 = IF YR EQ 1982 THEN 271 ELSE R.CAP10(-1)*(1/
(1+RCDEP10))+EXC10*(PDCONBAS/PDCON)

1293: R.CAP11 = IF YR EQ 1982 THEN 0 ELSE R.CAP11(-1)*(1/
(1+RCDEP11))+EXC11*(PDCONBAS/PDCON)

1294: R.CAP12 = IF YR EQ 1982 THEN 0 ELSE R.CAP12(-1)*(1/
(1+RCDEP12))+EXC12*(PDCONBAS/PDCON)

1295: R.CAP13 = IF YR EQ 1982 THEN 0 ELSE R.CAP13(-1)*(1/
(1+RCDEP13))+EXC13*(PDCONBAS/PDCON)

1296: R.CAP14 = IF YR EQ 1982 THEN 0 ELSE R.CAP14(-1)*(1/
(1+RCDEP14))+EXC14*(PDCONBAS/PDCON)

1297: R.CAP15 = IF YR EQ 1982 THEN 764 ELSE EXC15*(PDCONBAS/PDCON)

1298: R.CAPT == R.CAP1+R.CAP2+R.CAP3+R.CAP4+R.CAP5+R.CAP6+R.CAP7+
R.CAP8+R.CAP9+R.CAP10+R.CAP11+R.CAP12+R.CAP13+R.CAP14+R.CAP15

APPENDIX B
ISER MAP ALASKA ECONOMIC MODEL: COEFFICIENT AND PARAMETER VALUES

A85.1 CONSTANT FILE FOR MODEL A85.1 OF THE ALASKA 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 DECEMBER 1984.

AFTOT	23.323	CMIG1	-13.5649	CMIG2	13.7169
CMIG3	35.7941	CMIG4	0.802671	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	23.4911
C10B	0.861373	C10C	7.49112	C100A	-4.28484
C100B	1.23652	C100C	-0.997673	C101A	4.26682
C101B	0.466883	C102A	4.10141	C102B	1.81641
C102C	1.62414	C102D	-0.098536	C102F	0.306609
C103A	-19.9032	C103B	15.9107	C103C	0.707235
C104A	2.14567	C104B	0.992416	C105A	3.33749
C105B	0.009737	C105C	0.828288	C106A	-15.8977
C106B	0.067035	C107A	-55.8648	C107B	0.015623
C108A	-2.79176	C108B	0.479263	C109A	-1.92152
C109B	0.755283	C11A	-2.50986	C11B	0.023634
C12A	7.17255	C12B	0.523824	C14A	3.33343
C14B	0.162868	C14C	-0.113976	C15A	-9.09127
C15B	0.301513	C16A	-70.4036	C16B	0.04051
C16C	137.48	C17A	-10.9796	C17B	0.119691
C17C	76.4453	C18A	27.1904	C18B	0.011735
C18C	0.003742	C18D	-21.1564	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	-0.898424
C22B	1.08262	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	-6.17432	C27B	0.01118	C27C	-0.008996

C28A	80.1874	C28B	1.09189	C28C	3.14996
C29A	-3.76751	C29B	0.802598	C3A	2.7822
C3B	0.246103	C30A	-4.09671	C30B	1.19138
C31A	-6.63097	C31B	1.21304	C32A	-1.8791
C32B	0.663336	C32C	1.	C32D	5.
C33A	-5.44842	C33B	0.8965	C34A	0.286354
C34B	0.002698	C34C	-0.649464	C35A	-1.94609
C35B	0.592204	C36A	-46.9736	C36B	-126.31
C36C	7.96933	C36D	1.06682	C36F	93.4497
C37A	-5.49422	C37B	0.642659	C38A	-182.034
C38B	1.05111	C39A	-6.87313	C39B	0.015955
C4A	-1.6632	C4B	0.672086	C40A	-13.9151
C40B	2.99018	C41A	-4.96533	C41B	0.261135
C42A	0.925213	C42B	0.171959	C43A	-2.04504
C43B	0.427355	C43C	0.064835	C43D	-0.053429
C43E	-2.99594	C44A	10.228	C44B	0.067055
C44C	0.025531	C44D	-37.5112	C45A	27.3602
C45B	4.28865	C45C	5.06706	C45D	-7.20871
C46A	-1.82278	C46B	0.907323	C47A	-11.0252
C47B	1.83943	C48A	-4.69794	C48B	0.942175
C49A	-3.70365	C49B	0.726185	C5A	0.106732
C5B	0.596163	C50A	-0.314253	C50B	0.01542
C51A	-80.4494	C51B	0.035444	C52A	3.70393
C52B	1.80441	C53A	4.79314	C53B	3.02946
C53C	3.83987	C53D	-0.273211	C53F	0.3458
C54A	26.357	C54B	.049	C54D	14.791
C54E	-13.852	C54F	.096	C54G	-.042
C54H	.085	C55A	0.169745	C55B	0.978561
C55C	0.043843	C56A	-2.86578	C56B	1.08251
C56C	-0.067495	C57A	-10.6876	C57B	1.08079
C57C	1.64652	C58A	-18.7299	C58B	3.34048
C59A	4.64239	C59B	1.96795	C59C	2.68763
C59D	0.934046	C59E	1.46085	C59F	0.338783
C6A	-0.757478	C6B	0.648296	C60A	9.49124
C60B	0.023899	C60C	-10.6719	C61A	1.7984
C61B	1.50223	C62A	4.13839	C62B	1.2269
C62C	0.659103	C62D	0.841715	C62F	0.121036
C63A	-0.039147	C63B	0.129479	C64A	18.9595
C64B	0.20385	C64C	0.098751	C64D	-0.00053
C64E	-8.63463	C65A	-2.09365	C65B	0.844682
C66A	4.37898	C66B	1.74487	C66C	5.7626
C66D	-0.255419	C66E	-0.902879	C66F	0.181534
C67A	-0.007	C67B	0.552349	C67C	-0.052675
C67D	-0.010381	C68A	26.1807	C68B	-0.040408
C68C	-27.4533	C68D	0.000131	C69A	-2.01416
C69B	0.662754	C7A	0.908821	C7B	0.209675
C70A	4.54932	C70B	0.709893	C70C	1.30633
C70D	1.17991	C70E	0.033177	C70F	0.193705
C71A	-17.0365	C71B	0.06144	C71C	0.099012
C71D	-0.000253	C71E	2.407734E-05	C72A	5.88549
C72B	0.02392	C72C	-0.00475	C72D	0.004886

C73A	-3.40732	C73B	0.975722	C74A	4.37324
C74B	2.18954	C74C	1.08894	C74D	2.98271
C74F	0.429727	C75A	-2.29685	C75B	0.992615
C76A	-17.9348	C76B	0.131153	C76C	0.023213
C76D	0.044384	C76E	-0.088811	C77A	-2.28187
C77B	0.859508	C78A	4.34579	C78B	0.71098
C78C	1.69549	C78D	0.144154	C78E	0.586829
C78F	0.083435	C79A	3.8396	C79B	0.604405
C79D	0.960814	C79E	-0.91324	C79F	-0.034216
C8A	1.14384	C8B	0.455656	C80A	-48.9126
C80B	0.000237	C80C	-18.3501	C81A	-3.62316
C81B	0.984746	C82A	3.9719	C82B	1.84677
C82C	0.772129	C82D	0.6003	C82F	0.244149
C83A	-11.3818	C83C	0.149699	C83D	0.018428
C83E	4.356817E-05	C84A	-34.8153	C84B	0.069629
C84C	-0.076037	C84D	8.480865E-05	C85A	-2.24398
C85B	0.998891	C86A	3.78055	C86B	1.30523
C86C	2.80068	C86D	-0.261595	C86E	2.17424
C86F	0.294562	C87A	-2.3839	C87B	0.990857
C88A	3.90497	C88B	0.5569	C88C	9.24559
C88D	-0.185504	C88E	0.235023	C88F	0.280157
C88G	4.46196	C89A	4.36947	C89B	1.025
C9A	-0.394295	C9B	0.553834	C9C	-0.684496
C90A	4.52937	C90B	12.2905	C91A	-5.36404
C91B	1.24213	C92A	4.3122	C92B	2.34831
C92C	-0.262528	C92D	-0.07913	C92F	0.286098
C93A	-2.52615	C93B	0.965943	C94A	-2.81492
C94B	1.01315	C96A	-2.89633	C96B	1.11355
C97A	-4.63823	C97B	1.26652	C98A	-1.02656
C98B	0.83204	C99A	-1.31799	C99B	0.817804
EXANNU	800.	EXCAPIMP	0.1432	EXCAPOLD	1000.
EXEL1	1.	EXEL2	1.	EXEL3	1.
EXEL4	0.	EXEL5	0.	EXEL6	0.
EXLIM82	2500.	EXOMCOST	0.15	EXOPSIMP	7.678
EXPF2	0.162	EXPF3	0.31	EXRLOP6	0.
EXRLOP7	0.	EXRLOP8	0.	EXRL1	0.
EXRL2	0.	EXRL3	0.	EXRL4	0.
EXRL4OP	0.	EXRL5	1.	FERT10	0.0043
FERT11	0.	FERT4	0.0004	FERT5	0.0516
FERT6	0.1436	FERT7	0.12	FERT8	0.0697
FERT9	0.0223	G1	0.	G10	0.8
G11	0.8	G12	0.8	G13	0.8
G14	0.8	G15	1.	G2	0.75
G3	0.8	G4	0.8	G5	0.8
G6	0.8	G7	0.8	G8	0.8
G9	0.8	HHRF10	0.216	HHRF11	0.224
HHRF12	0.223	HHRF13	0.262	HHRF14	0.32
HHRF15	0.466	HHRF4	0.009	HHRF5	0.036
HHRF6	0.201	HHRF7	0.234	HHRF8	0.237
HHRF9	0.215	HHRM10	0.914	HHRM11	0.943
HHRM12	0.931	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	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	NFERT10	0.0131	NFERT11	0.
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
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	PBTRATE	2.500000E-05	PCINDA	0.1
PCIVPY	0.65	PCNCSV	0.5	PCNCSV1	1.
PCNCWS	0.25	PCNC4	0.	PCWS1	0.9
PCWS2	1.3	PCYNA1	1.01545	PC12N	0.922
PC12RN	0.833	PDCONBAS	633.398	PDRPIBAS	385
PECIG	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	RORBOND	0.02
RORCPDEP	0.03	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 C
ISER MAP ALASKA ECONOMIC MODEL: STOCHASTIC EQUATIONS

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 A85.1).

Each equation is first printed, followed by the summary statistics and, finally, the coefficient values. Abbreviations have the following notations.

COND	Condition number of x matrix (for monitoring least squares solution algorithm)
CRSQ	Corrected R squared
DFFITS	Regression diagnostic: standardized change in fit when one observation is removed.
DW(i)	Durbin Watsin test
ESTIMATE	Value of coefficient
F(i/j)	F test
MAX:HAT	Regression diagnostic: maximum diagonal of the projection matrix of X in OLS
NOB	Number of observations
NOVAR	Number of variables
PROB>£T£	Significance level for coefficient
RANGE	Range of observations
RSQ	R squared
RSTUDENT	Regression diagnostic: "studentized" residual when one observation is removed
SER	Standard error of regression
SSR	Sum of squared residuals
ST ER	Standard error of coefficient
T-STAT	T Statistic

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

4: PDRATIO = PDRATIO(-1)+C67A*(1+G.EMSP**0.5)+C67B*(EMCNX1/EM98(-1))+
C67C*D80+C67D*(1+G.EMSP**0.5)*D68.71

NOB = 21		NOVAR = 4		RANGE:	1962 TO 1982
RSQ =	0.844	CRSQ =	0.816	F(4/17) =	NA
PROB>F =	NA	SER =	0.011	SSR =	0.002
DW(0) =	2.371	COND =	2.142	MAX:HAT =	1.
RSTUDENT =	NA	DFFITS =	NA		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C67A	-0.009	0.002	-3.527	0.003
C67B	0.552	0.091	6.064	0.
C67C	-0.053	0.011	-4.759	0.
C67D	-0.01	0.005	-2.158	0.046

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

7: PDCON = C107A+C107B*WRCNNP

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.942	CRSQ =	0.939	F(1/20) =	325.651
PROB>F =	0.	SER =	45.949	SSR =	42225.8
DW(0) =	0.545	COND =	4.504	MAX:HAT =	0.232
RSTUDENT =	4.081	DFFITS =	1.314		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C107A	-55.865	23.149	-2.413	0.026
C107B	0.016	0.001	18.046	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

28: LOG(FAGI) = C21A+C21B*LOG(PI8)+C21C*LOG(EMCNX1+EMP9)

NOB = 16		NOVAR = 3		RANGE:	1961 TO 1976
RSQ =	0.998	CRSQ =	0.998	F(2/13) =	3741.28
PROB>F =	0.	SER =	0.027	SSR =	0.01
DW(0) =	1.552	COND =	72.633	MAX:HAT =	0.485
RSTUDENT =	2.703	DFFITS =	-2.347		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C21A	0.363	0.205	1.768	0.101
C21B	0.93	0.031	30.018	0.
C21C	0.042	0.021	2.013	0.065

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

29: LOG(FAGII) = C22A+C22B*LOG(PI)

NOB = 20		NOVAR = 2		RANGE:	1961 TO 1980
RSQ =	0.998	CRSQ =	0.998	F(1/18) =	8493.05
PROB>F =	0.	SER =	0.038	SSR =	0.026
DW(0) =	2.418	COND =	20.595	MAX:HAT =	0.176
RSTUDENT =	1.796	DFFITS =	0.634		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C22A	-0.898	0.087	-10.283	0.
C22B	1.083	0.012	92.158	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

32: AEX*1000 = C10A+C10B*POPC+C10C*(EMCNX1+EMP9)

NOB = 16		NOVAR = 3		RANGE:	1961 TO 1976
RSQ =	0.972	CRSQ =	0.967	F(2/13) =	223.24
PROB>F =	0.	SER =	15.989	SSR =	3323.27
DW(0) =	2.127	COND =	20.077	MAX:HAT =	0.54
RSTUDENT =	2.299	DFFITS =	1.83		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C10A	23.491	32.863	0.715	0.487
C10B	0.861	0.137	6.308	0.
C10C	7.491	1.233	6.077	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

33: ATT = C28A+C28B*(EM99-EMGM)+C28C*EMCNX1

NOB = 19		NOVAR = 3		RANGE:	1961 TO 1979
RSQ =	0.995	CRSQ =	0.994	F(2/16) =	1518.35
PROB>F =	0.	SER =	4.57	SSR =	334.102
DW(0) =	2.806	COND =	7.273	MAX:HAT =	0.524
RSTUDENT =	-3.774	DFFITS =	3.508		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C28A	80.187	3.35	23.935	0.
C28B	1.092	0.031	35.564	0.
C28C	3.15	0.278	11.343	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

34: LOG(ATD/ATT) = C23A+C23B*LOG(AGI/ATT)+C23C*D69+C23D*D72

NOB = 16		NOVAR = 4		RANGE:	1961 TO 1976
RSQ =	0.945	CRSQ =	0.931	F(3/12) =	68.169
PROB>F =	0.	SER =	0.168	SSR =	0.339
DW(0) =	1.499	COND =	9.205	MAX:HAT =	1.
RSTUDENT =	-2.699	DFFITS =	-6.217		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C23A	-2.757	0.186	-14.85	0.
C23B	1.342	0.106	12.684	0.
C23C	0.93	0.174	5.348	0.
C23D	0.431	0.175	2.459	0.03

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

38: LOG(RTISCA1) = C24A-TXBASE+C24B*(1-TXRT)*LOG(ATI.TT)

NOB = 16		NOVAR = 2		RANGE:	1961 TO 1976
RSQ =	0.971	CRSQ =	0.969	F(1/14) =	469.863
PROB>F =	0.	SER =	0.098	SSR =	0.136
DW(0) =	1.575	COND =	6.202	MAX:HAT =	0.367
RSTUDENT =	3.377	DFFITS =	0.964		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C24A	-3.451	0.078	-44.048	0.
C24B	1.199	0.055	21.676	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

39: LOG(RTISCA2) = C24A+C24B*LOG(ATI.TT)

NOB = 16		NOVAR = 2		RANGE:	1961 TO 1976
RSQ =	0.971	CRSQ =	0.969	F(1/14) =	469.863
PROB>F =	0.	SER =	0.098	SSR =	0.136
DW(0) =	1.575	COND =	6.202	MAX:HAT =	0.367
RSTUDENT =	3.377	DFFITS =	0.964		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C24A	-3.451	0.078	-44.048	0.
C24B	1.199	0.055	21.676	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

43: RTIS = IF YR EQ 1980 THEN 0 ELSE C25A*RTISC(-1)+C25B*RTISC

NOB = 19		NOVAR = 2		RANGE:	1961 TO 1979
RSQ =	0.989	CRSQ =	0.988	F(2/17) =	NA
PROB>F =	NA	SER =	8.8	SSR =	1316.49
DW(0) =	2.345	COND =	7.19	MAX:HAT =	0.617
RSTUDENT =	17.449	DFFITS =	10.805		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C25A	0.468	0.096	4.891	0.
C25B	0.527	0.09	5.859	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

44: RTISCP = C105A+C105B*PI8+C105C*RTISC

NOB = 22		NOVAR = 3		RANGE:	1961 TO 1982
RSQ =	0.984	CRSQ =	0.982	F(2/19) =	584.988
PROB>F =	0.	SER =	7.909	SSR =	1188.6
DW(0) =	1.692	COND =	3.405	MAX:HAT =	0.459
RSTUDENT =	3.859	DFFITS =	-2.184		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C105A	3.337	2.86	1.167	0.258
C105B	0.01	0.001	11.595	0.
C105C	0.828	0.032	25.786	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

45: 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 =	0.994	CRSQ =	0.993	F(2/16) =	1225.39
PROB>F =	0.	SER =	0.05	SSR =	0.04
DW(0) =	1.573	COND =	14.471	MAX:HAT =	0.294
RSTUDENT =	-1.892	DFFITS =	0.875		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C26A	-1.769	0.08	-22.066	0.
C26B	1.004	0.038	26.454	0.
C26C	-0.119	0.031	-3.839	0.001

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

46: DPIRES = C27A+C27B*PI3+C27C*WSCNP

NOB = 22		NOVAR = 3		RANGE:	1961 TO 1982
RSQ =	0.987	CRSQ =	0.986	F(2/19) =	749.447
PROB>F =	0.	SER =	2.597	SSR =	128.164
DW(0) =	1.362	COND =	3.079	MAX:HAT =	0.618
RSTUDENT =	-3.946	DFFITS =	-1.339		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C27A	-6.174	0.903	-6.84	0.
C27B	0.011	0.	38.699	0.
C27C	-0.009	0.002	-3.955	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

47: RTCS1*100/PDRPI = C43A+C43E*D80+C43D*(EM97(-1)-
EM97(-2))+C43B*EMCNX1(-1)+C43C*EM97(-1)

NOB = 21		NOVAR = 5		RANGE:	1963 TO 1983
RSQ =	0.967	CRSQ =	0.959	F(4/16) =	117.797
PROB>F =	0.	SER =	0.835	SSR =	11.143
DW(0) =	2.068	COND =	7.285	MAX:HAT =	1.
RSTUDENT =	NA	DFFITS =	NA		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C43A	-2.045	0.529	-3.868	0.001
C43B	0.427	0.048	8.827	0.
C43C	0.065	0.005	14.068	0.
C43D	-0.053	0.027	-1.966	0.67
C43E	-2.996	0.906	-3.307	0.004

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

49: BL = C39A+C39B*(XX98-XXP9)

NOB = 17		NOVAR = 2		RANGE:	1961 TO 1977
RSQ =	0.976	CRSQ =	0.975	F(1/15) =	613.671
PROB>F =	0.	SER =	1.226	SSR =	22.537
DW(0) =	1.336	COND =	6.724	MAX:HAT =	0.31
RSTUDENT =	-3.361	DFFITS =	-2.253		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C39A	-6.873	1.022	-6.728	0.
C39B	0.016	0.001	24.772	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

50: LOG(GR) = C40A+C40B*LOG(XX98-XXP9)

NOB = 17		NOVAR = 2		RANGE:	1961 TO 1977
RSQ =	0.977	CRSQ =	0.976	F(1/15) =	645.46
PROB>F =	0.	SER =	0.135	SSR =	0.274
DW(0) =	1.074	COND =	52.368	MAX:HAT =	0.271
RSTUDENT =	2.893	DFFITS =	-1.143		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C40A	-13.915	0.858	-16.22	0.
C40B	2.99	0.118	25.406	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

53: LOG(RTBS2*10**3/BL(-1)) = C29A+C29B*LOG(GTR(-1)*10**3/BL(-1))

NOB = 16		NOVAR = 2		RANGE:	1962 TO 1977
RSQ =	0.88	CRSQ =	0.872	F(1/14) =	103.096
PROB>F =	0.	SER =	0.149	SSR =	0.312
DW(0) =	1.504	COND =	50.087	MAX:HAT =	0.295
RSTUDENT =	-3.925	DFFITS =	-1.74		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C29A	-3.768	0.934	-4.032	0.001
C29B	0.803	0.079	10.154	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

55: TPTV = C38A+C38B*POP

NOB = 19		NOVAR = 2		RANGE:	1961 TO 1979
RSQ =	0.981	CRSQ =	0.979	F(1/17) =	860.927
PROB>F =	0.	SER =	9.58	SSR =	1560.13
DW(0) =	1.328	COND =	10.487	MAX:HAT =	0.19
RSTUDENT =	2.31	DFFITS =	0.959		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C38A	-182.034	11.629	-15.654	0.
C38B	1.051	0.036	29.342	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

56: LOG(AHG) = C37A+C37B*LOG(PR.PI)

NOB = 11		NOVAR = 2		RANGE:	1966 TO 1976
RSQ =	0.718	CRSQ =	0.686	F(1/9) =	22.876
PROB>F =	0.001	SER =	0.085	SSR =	0.065
DW(0) =	1.574	COND =	84.224	MAX:HAT =	0.373
RSTUDENT =	4.75	DFFITS =	3.659		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C37A	-5.494	1.08	-5.089	0.
C37B	0.643	0.134	4.783	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

58: LOG(RTMF) = C46A+C46B*LOG(THG)

NOB = 11		NOVAR = 2		RANGE:	1966 TO 1976
RSQ =	0.987	CRSQ =	0.985	F(1/9) =	672.217
PROB>F =	0.	SER =	0.048	SSR =	0.021
DW(0) =	0.858	COND =	22.667	MAX:HAT =	0.498
RSTUDENT =	-1.999	DFFITS =	-1.079		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C46A	-1.823	0.164	-11.125	0.
C46B	0.907	0.035	25.927	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

59: LOG(RTVS) = C47A+C47B*LOG(R.DPI8N(-1))

NOB = 22		NOVAR = 2		RANGE:	1962 TO 1983
RSQ =	0.977	CRSQ =	0.976	F(1/20) =	851.423
PROB>F =	0.	SER =	0.134	SSR =	0.358
DW(0) =	0.65	COND =	30.031	MAX:HAT =	0.157
RSTUDENT =	2.764	DFFITS =	0.834		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C47A	-11.025	0.429	-25.726	0.
C47B	1.839	0.063	29.179	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

60: LOG(RTAS) = C48A+C48B*LOG(R.DPI(-1))

NOB = 22		NOVAR = 2		RANGE:	1962 TO 1983
RSQ =	0.991	CRSQ =	0.99	F(1/20) =	2103.69
PROB>F =	0.	SER =	0.043	SSR =	0.038
DW(0) =	1.197	COND =	29.856	MAX:HAT =	0.159
RSTUDENT =	-2.54	DFFITS =	-0.863		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C48A	-4.698	0.138	-33.935	0.
C48B	0.942	0.021	45.866	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

61: LOG(RTCIS) = C49A+C49B*LOG(R.DPI(-1))

NOB = 19		NOVAR = 2		RANGE:	1962 TO 1980
RSQ =	0.98	CRSQ =	0.979	F(1/17) =	832.882
PROB>F =	0.	SER =	0.046	SSR =	0.036
DW(0) =	2.387	COND =	31.864	MAX:HAT =	0.173
RSTUDENT =	3.206	DFFITS =	1.022		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C49A	-3.704	0.167	-22.145	0
C49B	0.726	0.025	28.86	0

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

62: RTSS = IF YR GT 1980 THEN 0 ELSE C50A+C50B*(EM99-EMGM)

NOB = 19		NOVAR = 2		RANGE:	1962 TO 1980
RSQ =	0.996	CRSQ =	0.996	F(2/17) =	NA
PROB>F =	NA	SER =	0.111	SSR =	0.21
DW(0) =	1.291	COND =	5.617	MAX:HAT =	0.175
RSTUDENT =	-1.999	DFFITS =	-0.742		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C50A	-0.314	0.074	-4.255	0.
C50B	0.015	0.001	26.901	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

65: LOG(ROFAS) = C30A+C30B*LOG(TPTV(-1))

NOB = 19		NOVAR = 2		RANGE:	1962 TO 1980
RSQ =	0.961	CRSQ =	0.959	F(1/17) =	420.077
PROB>F =	0.	SER =	0.106	SSR =	0.191
DW(0) =	1.102	COND =	23.665	MAX:HAT =	0.18
RSTUDENT =	-2.611	DFFITS =	-0.999		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C30A	-4.097	0.288	-14.21	0.
C30B	1.191	0.058	20.496	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

66: LOG(ROFOS) = C33A+C33B*LOG(PI3(-1))

NOB = 19		NOVAR = 2		RANGE:	1962 TO 1980
RSQ =	0.989	CRSQ =	0.988	F(1/17) =	1518.98
PROB>F =	0.	SER =	0.065	SSR =	0.072
DW(0) =	1.732	COND =	22.566	MAX:HAT =	0.208
RSTUDENT =	-2.636	DFFITS =	-1.107		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C33A	-5.448	0.169	-32.281	0.
C33B	0.896	0.023	38.974	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

69: LOG(RMIS) = C35A+C35B*LOG(PI3(-1))

NOB = 18 NOVAR = 2 RANGE: 1962 TO 1964, 1968 TO 1982

RSQ =	0.648	CRSQ =	0.626	F(1/16) =	29.492
PROB>F =	0.	SER =	0.334	SSR =	1.788
DW(1) =	0.933	COND =	20.962	MAX:HAT =	0.202
RSTUDENT =	2.405	DFFITS =	0.874		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C35A	-1.946	0.828	-2.351	0.032
C35B	0.592	0.109	5.431	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 21 NOVAR = 2 RANGE: 1963 TO 1983

RSQ =	0.966	CRSQ =	0.964	F(1/19) =	538.685
PROB>F =	0.	SER =	0.134	SSR =	0.343
DW(0) =	1.211	COND =	57.069	MAX:HAT =	0.169
RSTUDENT =	-2.752	DFFITS =	-0.762		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C58A	-18.73	0.836	-22.394	0.
C58B	3.34	0.144	23.21	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

125: EXINREC = C17A+C17B*(EXOPS-RLT99)+C17C*D82

NOB = 12		NOVAR = 3		RANGE:	1971 TO 1982
RSQ =	0.95	CRSQ =	0.939	F(2/9) =	85.997
PROB>F =	0.	SER =	14.496	SSR =	1891.27
DW(0) =	2.273	COND =	5.09	MAX:HAT =	1.
RSTUDENT =	NA	DFFITS =	NA		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C17A	-10.98	9.714	-1.13	0.288
C17B	0.12	0.015	7.766	0.
C17C	76.445	18.574	4.116	0.003

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

126: EXINRECB = C108A+C108B*EXINREC

NOB = 13		NOVAR = 2		RANGE:	1971 TO 1983
RSQ =	0.847	CRSQ =	0.833	F(1/11) =	61.016
PROB>F =	0.	SER =	14.79	SSR =	2406.25
DW(0) =	2.012	COND =	2.784	MAX:HAT =	0.396
RSTUDENT =	8.416	DFFITS =	6.812		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C108A	-2.792	6.447	-0.433	0.673
C108B	0.479	0.061	7.811	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

127: LOG(EXJUS4) = C20A+C20B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.995	CRSQ =	0.995	F(1/18) =	3726.93
PROB>F =	0.	SER =	0.071	SSR =	0.092
DW(0) =	1.138	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	-2.599	DFFITS =	-1.28		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C20A	-2.683	0.097	-27.692	0.
C20B	1.017	0.017	61.049	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

128: LOG(EXPPS4) = C91A+C91B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.983	CRSQ =	0.982	F(1/18) =	1023.31
PROB>F =	0.	SER =	0.166	SSR =	0.497
DW(0) =	1.048	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	-2.576	DFFITS =	-1.017		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C91A	-5.364	0.226	-23.761	0.
C91B	1.242	0.039	31.989	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

129: LOG(EXNRS4) = C93A+C93B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.991	CRSQ =	0.99	F(1/18) =	1936.61
PROB>F =	0.	SER =	0.094	SSR =	0.159
DW(0) =	0.807	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	2.436	DFFITS =	1.096		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C93A	-2.526	0.128	-19.795	0.
C93B	0.966	0.022	44.007	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

130: LOG(EXHES4) = C94A+C94B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.976	CRSQ =	0.974	F(1/18) =	719.323
PROB>F =	0.	SER =	0.162	SSR =	0.471
DW(0) =	0.45	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	1.932	DFFITS =	0.775		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C94A	-2.815	0.22	-12.817	0.
C94B	1.013	0.038	26.82	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

131: LOG(EXSSS4) = C96A+C96B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.99	CRSQ =	0.989	F(1/18) =	1758.22
PROB>F =	0.	SER =	0.114	SSR =	0.233
DW(0) =	1.072	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	-2.4	DFFITS =	-0.966		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C96A	-2.896	0.154	-18.759	0.
C96B	1.114	0.027	41.931	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

132: LOG(EXEDS4) = C19A+C19B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.995	CRSQ =	0.995	F(1/18) =	3720.98
PROB>F =	0.	SER =	0.073	SSR =	0.096
DW(0) =	1.115	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	-3.981	DFFITS =	-1.348		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C19A	-1.183	0.099	-11.959	0.
C19B	1.038	0.017	61.	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

133: LOG(EXCDS4) = C97A+C97B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.981	CRSQ =	0.98	F(1/18) =	930.683
PROB>F =	0.	SER =	0.178	SSR =	0.569
DW(0) =	1.496	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	3.353	DFFITS =	1.651		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C97A	-4.638	0.241	-19.217	0.
C97B	1.267	0.042	30.507	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

134: LOG(EXTRS4) = C98A+C98B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.998	CRSQ =	0.997	F(1/18) =	7372.56
PROB>F =	0.	SER =	0.041	SSR =	0.031
DW(0) =	1.375	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	-1.884	DFFITS =	-0.638		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C98A	-1.027	0.056	-18.221	0.
C98B	0.832	0.01	85.864	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

135: LOG(EXGGS4) = C99A+C99B*LOG(EXOPS)

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.916	CRSQ =	0.912	F(1/18) =	197.46
PROB>F =	0.	SER =	0.249	SSR =	1.117
DW(0) =	1.734	COND =	12.063	MAX:HAT =	0.195
RSTUDENT =	4.891	DFFITS =	1.656		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C99A	-1.318	0.338	-3.895	0.001
C99B	0.818	0.058	14.052	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

152: EXPRCDS = C7A+C7B*EXCDSNT

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.849	CRSQ =	0.841	F(1/18) =	101.318
PROB>F =	0.	SER =	1.088	SSR =	21.32
DW(0) =	1.054	COND =	1.96	MAX:HAT =	0.763
RSTUDENT =	3.174	DFFITS =	-5.461		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C7A	0.909	0.301	3.023	0.007
C7B	0.21	0.021	10.066	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

153: EXPREDS1 = C1A+C1B*EXEDSNT+C1C*D61.75*EXEDSNT

NOB = 17		NOVAR = 3		RANGE:	1965 TO 1981
RSQ =	0.981	CRSQ =	0.979	F(2/14) =	369.988
PROB>F =	0.	SER =	1.534	SSR =	32.945
DW(0) =	1.8	COND =	4.639	MAX:HAT =	0.459
RSTUDENT =	3.103	DFFITS =	-1.374		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C1A	0.427	0.893	0.478	0.64
C1B	0.05	0.005	9.975	0.
C1C	0.371	0.014	26.984	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

154: EXPRSSS = C2A+C2B*EXSSS

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.978	CRSQ =	0.977	F(1/18) =	797.781
PROB>F =	0.	SER =	2.091	SSR =	78.666
DW(0) =	0.744	COND =	2.621	MAX:HAT =	0.328
RSTUDENT =	-3.526	DFFITS =	-2.463		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C2A	1.509	0.702	2.151	0.045
C2B	0.274	0.01	28.245	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

155: EXPRUA = C32A+C32B*EXUA

NOB = 11		NOVAR = 2		RANGE:	1971 TO 1981
RSQ =	0.968	CRSQ =	0.965	F(1/9) =	276.16
PROB>F =	0.	SER =	6.879	SSR =	425.92
DW(0) =	1.396	COND =	3.613	MAX:HAT =	0.366
RSTUDENT =	-2.552	DFFITS =	-0.809		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C32A	-1.879	4.034	-0.466	0.652
C32B	0.663	0.04	16.618	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

156: EXPRHES = C3A+C3B*EXHES

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.965	CRSQ =	0.963	F(1/18) =	489.935
PROB>F =	0.	SER =	1.665	SSR =	49.918
DW(0) =	1.048	COND =	2.371	MAX:HAT =	0.435
RSTUDENT =	-4.208	DFFITS =	-3.694		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C3A	2.782	0.52	5.351	0.
C3B	0.246	0.011	22.134	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

157: EXPRNRS = C4A+C4B*EXNRS

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.996	CRSQ =	0.996	F(1/18) =	4366.41
PROB>F =	0.	SER =	1.294	SSR =	30.143
DW(0) =	0.745	COND =	2.571	MAX:HAT =	0.373
RSTUDENT =	-2.317	DFFITS =	0.943		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C4A	-1.663	0.428	-3.884	0.001
C4B	0.672	0.01	66.079	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

158: EXPRPPS = C5A+C5B*EXPPS

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.995	CRSQ =	0.995	F(1/18) =	3471.24
PROB>F =	0.	SER =	0.492	SSR =	4.363
DW(0) =	1.508	COND =	2.413	MAX:HAT =	0.261
RSTUDENT =	-7.039	DFFITS =	-1.909		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C5A	0.107	0.156	0.686	0.502
C5B	0.596	0.01	58.917	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

159: EXPRGGS = C8A+C8B*EXGGS

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.955	CRSQ =	0.953	F(1/18) =	385.656
PROB>F =	0.	SER =	3.572	SSR =	229.687
DW(0) =	0.875	COND =	2.733	MAX:HAT =	0.295
RSTUDENT =	-3.077	DFFITS =	-1.067		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C8A	1.144	1.237	0.924	0.368
C8B	0.456	0.023	19.638	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

160: EXPRJUS = C6A+C6B*EXJUS

NOB = 20		NOVAR = 2		RANGE:	1962 TO 1981
RSQ =	0.998	CRSQ =	0.998	F(1/18) =	7683.64
PROB>F =	0.	SER =	1.048	SSR =	19.763
DW(0) =	0.621	COND =	2.664	MAX:HAT =	0.294
RSTUDENT =	3.001	DFFITS =	1.412		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C6A	-0.757	0.356	-2.128	0.047
C6B	0.648	0.007	87.656	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

161: EXPRTRS = C9A+C9B*EXTRS+C9C*D61.64

NOB = 20		NOVAR = 3		RANGE:	1962 TO 1981
RSQ =	0.999	CRSQ =	0.998	F(2/17) =	6220.39
PROB>F =	0.	SER =	0.97	SSR =	16.004
DW(0) =	0.895	COND =	3.658	MAX:HAT =	0.41
RSTUDENT =	2.754	DFFITS =	0.878		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C9A	-0.394	0.426	-0.926	0.367
C9B	0.554	0.005	101.15	0.
C9C	-0.684	0.667	-1.026	0.319

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 16		NOVAR = 3		RANGE:	1965 TO 1980
RSQ =	0.998	CRSQ =	0.998	F(2/13) =	3104.13
PROB>F =	0.	SER =	0.033	SSR =	0.015
DW(0) =	2.17	COND =	15.491	MAX:HAT =	1.
RSTUDENT =	2.415	DFFITS =	196.83		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C55A	0.17	0.063	2.693	0.018
C55B	0.979	0.013	77.392	0.
C55C	0.044	0.035	1.249	0.234

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 12		NOVAR = 2		RANGE:	1964 TO 1975
RSQ =	0.788	CRSQ =	0.766	F(1/10) =	37.088
PROB>F =	0.	SER =	5.837	SSR =	340.691
DW(0) =	1.471	COND =	6.908	MAX:HAT =	0.451
RSTUDENT =	2.013	DFFITS =	1.825		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C41A	-4.965	5.942	-0.836	0.423
C41B	0.261	0.043	6.09	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 11		NOVAR = 2		RANGE:	1965 TO 1975
RSQ =	0.87	CRSQ =	0.855	F(1/9) =	60.201
PROB>F =	0.	SER =	3.553	SSR =	113.646
DW(0) =	1.937	COND =	3.686	MAX:HAT =	0.333
RSTUDENT =	2.326	DFFITS =	0.736		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C42A	0.925	2.12	0.436	0.673
C42B	0.172	0.022	7.759	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

220: LOG(LPTB1) = C57A+C57B*LOG(P.PI(-1))+C57C*LOG(POP(-1))

NOB = 20		NOVAR = 3		RANGE:	1963 TO 1982
RSQ =	0.991	CRSQ =	0.99	F(2/17) =	988.073
PROB>F =	0.	SER =	0.091	SSR =	0.142
DW(0) =	0.928	COND =	538.999	MAX:HAT =	0.38
RSTUDENT =	-2.571	DFFITS =	1.055		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C57A	-10.688	2.463	-4.339	0.
C57B	1.081	0.32	3.375	0.004
C57C	1.647	0.896	1.838	0.084

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

227: RLPT1 = C18A+C18D*D61.73+C18B*LPTB1(-1)+C18C*PTBP9(-1)

NOB = 19		NOVAR = 4		RANGE:	1964 TO 1982
RSQ =	0.997	CRSQ =	0.996	F(3/15) =	1698.2
PROB>F =	0.	SER =	4.251	SSR =	271.024
DW(0) =	1.375	COND =	11.197	MAX:HAT =	0.607
RSTUDENT =	-2.585	DFFITS =	-1.788		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C18A	27.19	3.922	6.932	0.
C18B	0.012	0.001	14.857	0.
C18C	0.004	0.001	5.331	0.
C18D	-21.156	3.264	-6.481	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

229: LOG(RLOT*1000/POP(-1)) = C31A+C31B*LOG(PI(-1)*1000/POP(-1))

NOB = 21		NOVAR = 2		RANGE:	1962 TO 1982
RSQ =	0.988	CRSQ =	0.987	F(1/19) =	1535.23
PROB>F =	0.	SER =	0.079	SSR =	0.118
DW(0) =	1.694	COND =	30.936	MAX:HAT =	0.19
RSTUDENT =	2.234	DFFITS =	-0.859		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C31A	-6.631	0.267	-24.86	0.
C31B	1.213	0.031	39.182	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

231: RLTVS4 = C63A+C63B*RTVS

NOB = 21		NOVAR = 2		RANGE:	1962 TO 1982
RSQ =	0.815	CRSQ =	0.806	F(1/19) =	83.859
PROB>F =	0.	SER =	0.278	SSR =	1.465
DW(0) =	1.779	COND =	2.924	MAX:HAT =	0.221
RSTUDENT =	7.308	DFFITS =	3.314		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C63A	-0.039	0.099	-0.396	0.697
C63B	0.129	0.014	9.157	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 20		NOVAR = 5		RANGE:	1963 TO 1982
RSQ =	0.994	CRSQ =	0.993	F(4/15) =	658.896
PROB>F =	0.	SER =	7.579	SSR =	861.632
DW(0) =	2.063	COND =	35.506	MAX:HAT =	0.523
RSTUDENT =	4.28	DFFITS =	4.481		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C36A	-46.974	19.186	-2.448	0.027
C36B	-126.31	14.095	-8.962	0.
C36C	7.969	0.581	13.723	0.
C36D	1.067	0.305	3.501	0.003
C36F	93.45	9.487	9.851	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 18		NOVAR = 2		RANGE:	1965 TO 1982
RSQ =	0.887	CRSQ =	0.88	F(1/16) =	125.094
PROB>F =	0.	SER =	14.656	SSR =	3436.97
DW(0) =	2.264	COND =	3.33	MAX:HAT =	0.339
RSTUDENT =	-2.255	DFFITS =	0.812		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C11A	-2.51	6.271	-0.4	0.694
C11B	0.024	0.002	11.185	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

271: ELBD = C14A+C14C*D61.77*GOBONDL(-1)+C14B*GOBONDL(-1)

NOB = 13		NOVAR = 3		RANGE:	1970 TO 1982
RSQ =	0.97	CRSQ =	0.964	F(2/10) =	163.575
PROB>F =	0.	SER =	11.436	SSR =	1307.81
DW(0) =	2.582	COND =	6.317	MAX:HAT =	0.488
RSTUDENT =	-3.611	DFFITS =	-1.74		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C14A	3.333	10.096	0.33	0.748
C14B	0.163	0.014	11.541	0.
C14C	-0.114	0.027	-4.232	0.002

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

273: ELNED1*100/PDRPI = C16A+C16B*WEALTH+C16C*(RLTRS+RLTT9+RLTMS)/PDRPI

NOB = 18		NOVAR = 3		RANGE:	1965 TO 1982
RSQ =	0.969	CRSQ =	0.964	F(2/15) =	231.851
PROB>F =	0.	SER =	10.389	SSR =	1618.98
DW(0) =	1.396	COND =	12.443	MAX:HAT =	0.796
RSTUDENT =	-4.117	DFFITS =	-1.428		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C16A	-70.404	13.236	-5.319	0.
C16B	0.041	0.004	9.281	0.
C16C	137.48	13.422	10.243	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

278: ELEDCP = C15A+C15B*ELED

NOB = 21		NOVAR = 2		RANGE:	1962 TO 1982
RSQ =	0.873	CRSQ =	0.866	F(1/19) =	130.675
PROB>F =	0.	SER =	16.045	SSR =	4891.59
DW(0) =	1.109	COND =	2.723	MAX:HAT =	0.314
RSTUDENT =	3.683	DFFITS =	1.61		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C15A	-9.091	5.41	-1.68	0.109
C15B	0.302	0.026	11.431	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

279: ELPERS = C12A+C12B*(EL99-ELEDCP-RLTMS-ELBD)

NOB = 18		NOVAR = 2		RANGE:	1965 TO 1982
RSQ =	0.988	CRSQ =	0.987	F(1/16) =	1273.59
PROB>F =	0.	SER =	16.274	SSR =	4237.48
DW(0) =	1.998	COND =	2.862	MAX:HAT =	0.367
RSTUDENT =	6.012	DFFITS =	2.276		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C12A	7.173	6.159	1.165	0.261
C12B	0.524	0.015	35.687	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 18		NOVAR = 2		RANGE:	1965 TO 1982
RSQ =	0.972	CRSQ =	0.97	F(1/16) =	548.391
PROB>F =	0.	SER =	40.02	SSR =	25626.1
DW(0) =	0.499	COND =	3.387	MAX:HAT =	0.295
RSTUDENT =	2.547	DFFITS =	1.469		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C51A	-80.449	17.367	-4.632	0.
C51B	0.035	0.002	23.418	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

296: PITRAN/PDRPI = C34A+C34B*POP+C34C*D61.72+EXTRNS/PDRPI

NOB = 21		NOVAR = 3		RANGE:	1961 TO 1981
RSQ =	0.94	CRSQ =	0.934	F(2/17) =	141.826
PROB>F =	0.	SER =	0.133	SSR =	0.317
DW(0) =	0.69	COND =	27.956	MAX:HAT =	0.302
RSTUDENT =	5.391	DFFITS =	3.55		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C34A	0.286	0.381	0.752	0.462
C34B	0.003	0.001	2.836	0.011
C34C	-0.649	0.128	-5.077	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 4		RANGE:	1961 TO 1982
RSQ =	0.995	CRSQ =	0.994	F(3/18) =	1176.52
PROB>F =	0.	SER =	9.903	SSR =	1765.28
DW(0) =	1.983	COND =	15.47	MAX:HAT =	0.632
RSTUDENT =	-2.993	DFFITS =	-2.081		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C44A	10.228	15.827	0.646	0.526
C44B	0.067	0.003	20.421	0.
C44C	0.026	0.011	2.31	0.033
C44D	-37.511	12.543	-2.991	0.008

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.993	CRSQ =	0.993	F(1/20) =	2930.77
PROB>F =	0.	SER =	9.288	SSR =	1725.22
DW(0) =	1.078	COND =	2.973	MAX:HAT =	0.306
RSTUDENT =	-3.086	DFFITS =	-2.05		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C106A	-15.898	3.277	-4.852	0.
C106B	0.067	0.001	54.136	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 20		NOVAR = 4		RANGE:	1961 TO 1979, 1981
RSQ =	0.639	CRSQ =	0.571	F(3/16) =	9.442
PROB>F =	0.001	SER =	8.595	SSR =	1182.01
DW(1) =	0.364	COND =	10.076	MAX:HAT =	1.
RSTUDENT =	NA	DFFITS =	NA		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C45A	27.36	9.455	2.894	0.011
C45B	4.289	1.336	3.21	0.005
C45C	5.067	8.264	0.613	0.548
C45D	-7.209	9.308	-0.774	0.45

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 3		RANGE:	1961 TO 1982
RSQ =	0.985	CRSQ =	0.984	F(2/19) =	627.591
PROB>F =	0.	SER =	11.961	SSR =	2718.4
DW(0) =	2.151	COND =	5.905	MAX:HAT =	0.519
RSTUDENT =	5.597	DFFITS =	5.816		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C103A	-19.903	7.014	-2.838	0.011
C103B	15.911	0.62	25.673	0.
C103C	0.707	0.06	11.834	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

335: XXCN8 = C54A+C54B*R.DPI8N+C54H*R.DPI8X(1)+C54D*D65+C54E*D73+C54F*R.DPI8X(-1)+C54G*R.DPI8X

NOB = 21		NOVAR = 7		RANGE:	1962 TO 1982
RSQ =	0.959	CRSQ =	0.941	F(6/14) =	54.506
PROB>F =	0.	SER =	6.445	SSR =	581.501
DW(0) =	1.552	COND =	7.287	MAX:HAT =	1.
RSTUDENT =	NA	DFFITS =	NA		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C54A	26.357	4.015	6.565	0.
C54B	0.049	0.004	12.395	0.
C54D	14.791	6.81	2.172	0.048
C54E	-13.852	6.726	-2.059	0.059
C54F	0.096	0.027	3.578	0.003
C54G	-0.042	0.034	-1.219	0.243
C54H	0.085	0.026	3.258	0.006

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

337: LOG(EMCN1) = C56A+C56C*D61.67+C56B*LOG(XXCN1)

NOB = 22		NOVAR = 3		RANGE:	1961 TO 1982
RSQ =	0.998	CRSQ =	0.998	F(2/19) =	4949.89
PROB>F =	0.	SER =	0.019	SSR =	0.007
DW(0) =	1.221	COND =	40.875	MAX:HAT =	0.227
RSTUDENT =	-2.526	DFFITS =	-0.87		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C56A	-2.866	0.078	-36.594	0.
C56B	1.083	0.016	65.99	0.
C56C	-0.067	0.013	-5.34	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

342: 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))

NOB = 22		NOVAR = 6		RANGE:	1961 TO 1982
RSQ =	0.932	CRSQ =	0.911	F(5/16) =	44.136
PROB>F =	0.	SER =	0.044	SSR =	0.031
DW(0) =	1.36	COND =	5.906	MAX:HAT =	0.71
RSTUDENT =	-2.409	DFFITS =	-1.358		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C59A	4.642	0.013	370.035	0.
C59B	1.968	0.247	7.968	0.
C59C	2.688	0.696	3.861	0.001
C59D	0.934	0.953	0.98	0.342
C59E	1.461	0.706	2.068	0.055
C59F	0.339	0.034	9.867	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.96	CRSQ =	0.958	F(1/20) =	477.805
PROB>F =	0.	SER =	0.257	SSR =	1.325
DW(0) =	0.834	COND =	3.371	MAX:HAT =	0.186
RSTUDENT =	1.663	DFFITS =	-0.617		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C52A	3.704	0.101	36.799	0.
C52B	1.804	0.083	21.859	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.957	CRSQ =	0.946	F(4/17) =	93.531
PROB>F =	0.	SER =	0.052	SSR =	0.046
DW(0) =	1.478	COND =	6.162	MAX:HAT =	0.502
RSTUDENT =	2.525	DFFITS =	1.197		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C53A	4.793	0.033	144.884	0.
C53B	3.029	0.294	10.296	0.
C53C	3.84	0.46	8.351	0.
C53D	-0.273	0.034	-8.065	0.
C53F	0.346	0.053	6.48	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

350: XXMO = C60A+C60B*R.DPI8N+C60C*D61.77

NOB = 22		NOVAR = 3		RANGE:	1961 TO 1982
RSQ =	0.98	CRSQ =	0.978	F(2/19) =	474.113
PROB>F =	0.	SER =	2.066	SSR =	81.109
DW(0) =	1.058	COND =	11.092	MAX:HAT =	0.276
RSTUDENT =	2.767	DFFITS =	1.399		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C60A	9.491	2.379	3.99	0.
C60B	0.024	0.001	16.499	0.
C60C	-10.672	1.457	-7.322	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

351: LOG(EMMO) = C109A+C109B*LOG(XXMO)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.991	CRSQ =	0.99	F(1/20) =	2118.98
PROB>F =	0.	SER =	0.045	SSR =	0.04
DW(0) =	1.063	COND =	10.529	MAX:HAT =	0.151
RSTUDENT =	3.051	DFFITS =	1.031		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C109A	-1.922	0.051	-37.879	0.
C109B	0.755	0.016	46.032	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

352: LOG(XXMX2) = C61A+C61B*LOG(EMMX2)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.873	CRSQ =	0.867	F(1/20) =	137.771
PROB>F =	0.	SER =	0.172	SSR =	0.593
DW(0) =	0.621	COND =	13.575	MAX:HAT =	0.189
RSTUDENT =	-2.422	DFFITS =	0.779		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C61A	1.798	0.251	7.177	0.
C61B	1.502	0.128	11.738	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

355: LOG(WRM91/PDRPI) = C62A+C62F*D.80DEC6+C62B*LOG(WEUS/PDUSCPI)+
C62C*LOG(1+EMCNRT)+C62D*LOG(1+EMCNRT(-1))

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.725	CRSQ =	0.661	F(4/17) =	11.222
PROB>F =	0.	SER =	0.043	SSR =	0.031
DW(0) =	1.472	COND =	2.94	MAX:HAT =	0.654
RSTUDENT =	-1.755	DFFITS =	1.009		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C62A	4.138	0.012	350.027	0.
C62B	1.227	0.236	5.188	0.
C62C	0.659	0.523	1.26	0.225
C62D	0.842	0.526	1.599	0.128
C62F	0.121	0.034	3.613	0.002

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

360: XXTNT = C64A+C64B*R.DPI8X+C64D*R.DPI8X*R.DPI8X(-1)+C64C*R.DPI8N+
C64E*D71.73

NOB = 21		NOVAR = 5		RANGE:	1962 TO 1982
RSQ =	0.985	CRSQ =	0.982	F(4/16) =	268.93
PROB>F =	0.	SER =	6.381	SSR =	651.472
DW(0) =	1.586	COND =	6.443	MAX:HAT =	0.908
RSTUDENT =	-6.068	DFFITS =	-3.999		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C64A	18.96	3.822	4.961	0.
C64B	0.204	0.032	6.401	0.
C64C	0.099	0.004	27.009	0.
C64D	-0.001	0.	-3.685	0.002
C64E	-8.635	4.038	-2.139	0.048

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

361: LOG(EMTNT) = C65A+C65B*LOG(XXTNT)

NOB = 21		NOVAR = 2		RANGE:	1962 TO 1982
RSQ =	0.99	CRSQ =	0.989	F(1/19) =	1796.79
PROB>F =	0.	SER =	0.036	SSR =	0.025
DW(0) =	1.761	COND =	24.018	MAX:HAT =	0.162
RSTUDENT =	-3.639	DFFITS =	-1.307		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C65A	-2.094	0.094	-22.206	0.
C65B	0.845	0.02	42.389	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

366: LOG(WRT9/PDRPI) = C66A+C66F*D.80DEC6+C66D*D61.76+C66B*
LOG(WEUS/PDUSCPI)+C66C*LOG(1+EMCNRT)+C66E*LOG(1+EMCNRT(-1))

NOB = 22		NOVAR = 6		RANGE:	1961 TO 1982
RSQ =	0.955	CRSQ =	0.941	F(5/16) =	67.919
PROB>F =	0.	SER =	0.047	SSR =	0.035
DW(0) =	1.797	COND =	9.121	MAX:HAT =	0.691
RSTUDENT =	2.149	DFFITS =	-2.025		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C66A	4.379	0.039	113.198	0.
C66B	1.745	0.263	6.623	0.
C66C	5.763	0.672	8.577	0.
C66D	-0.255	0.04	-6.383	0.
C66E	-0.903	0.755	-1.195	0.249
C66F	0.182	0.054	3.345	0.004

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

368: XXCM = C68A+C68B*R.DPI8N(-1)+C68C*D61.74+C68D*WEALTH(-1)*POP(-1)

NOB = 18		NOVAR = 4		RANGE:	1965 TO 1982
RSQ =	0.97	CRSQ =	0.964	F(3/14) =	152.312
PROB>F =	0.	SER =	11.038	SSR =	1705.84
DW(0) =	0.621	COND =	52.359	MAX:HAT =	0.554
RSTUDENT =	3.057	DFFITS =	1.862		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C68A	26.181	25.779	1.016	0.327
C68B	-0.04	0.052	-0.777	0.45
C68C	-27.453	13.412	-2.047	0.06
C68D	0.	0.	3.11	0.008

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.968	CRSQ =	0.967	F(1/20) =	607.498
PROB>F =	0.	SER =	0.065	SSR =	0.083
DW(0) =	0.667	COND =	17.694	MAX:HAT =	0.163
RSTUDENT =	2.076	DFFITS =	0.6		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C69A	-2.014	0.122	-16.48	0.
C69B	0.663	0.027	24.647	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

370: LOG(WRCM/PDRPI) = C70A+C70E*D61.70+C70F*D.80DEC6+C70B*
LOG(WEUS/PDUSCPI)+C70C*LOG(1+EMCNRT(-2))+C70D*LOG(1+EMCNRT(-1))

NOB = 22		NOVAR = 6		RANGE:	1961 TO 1982
RSQ =	0.721	CRSQ =	0.634	F(5/16) =	8.265
PROB>F =	0.001	SER =	0.047	SSR =	0.035
DW(0) =	1.771	COND =	6.192	MAX:HAT =	0.657
RSTUDENT =	2.426	DFFITS =	-1.941		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C70A	4.549	0.028	161.794	0.
C70B	0.71	0.342	2.075	0.054
C70C	1.306	0.586	2.228	0.041
C70D	1.18	0.601	1.964	0.067
C70E	0.033	0.033	1.014	0.326
C70F	0.194	0.054	3.615	0.002

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

372: XXPU = C72A+C72B*R.DPI8N(-1)+C72C*R.DPI8X+C72D*R.DPI8N(-2)

NOB = 20		NOVAR = 4		RANGE:	1963 TO 1982
RSQ =	0.974	CRSQ =	0.969	F(3/16) =	201.927
PROB>F =	0.	SER =	1.975	SSR =	62.423
DW(0) =	1.868	COND =	45.001	MAX:HAT =	0.612
RSTUDENT =	2.326	DFFITS =	2.073		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C72A	5.885	1.222	4.815	0.
C72B	0.024	0.008	3.033	0.008
C72C	-0.005	0.006	-0.736	0.472
C72D	0.005	0.008	0.621	0.543

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.989	CRSQ =	0.988	F(1/20) =	1755.53
PROB>F =	0.	SER =	0.043	SSR =	0.037
DW(0) =	1.137	COND =	17.295	MAX:HAT =	0.226
RSTUDENT =	3.416	DFFITS =	0.749		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C73A	-3.407	0.079	-43.084	0.
C73B	0.976	0.023	41.899	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

374: LOG(WRPU/PDRPI) = C74A+C74F*D.80DEC6+C74B*LOG(WEUS/PDUSCPI)+
C74C*LOG(1+EMCNRT(-2))+C74D*LOG(1+EMCNRT(-1))

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.815	CRSQ =	0.772	F(4/17) =	18.744
PROB>F =	0.	SER =	0.082	SSR =	0.114
DW(0) =	1.324	COND =	2.991	MAX:HAT =	0.655
RSTUDENT =	3.179	DFFITS =	-1.79		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C74A	4.373	0.022	195.687	0.
C74B	2.19	0.459	4.775	0.
C74C	1.089	1.014	1.074	0.298
C74D	2.983	0.999	2.987	0.008
C74F	0.43	0.064	6.727	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

376: XXDW = C71A+C71B*R.DPI8N+C71C*R.DPI8X+C71D*R.DPI8X(-1)*
R.DPI8X+C71E*WEALTH(-1)*POP(-1)

NOB = 18		NOVAR = 5		RANGE:	1965 TO 1982
RSQ =	0.99	CRSQ =	0.987	F(4/13) =	330.132
PROB>F =	0.	SER =	4.128	SSR =	221.53
DW(0) =	1.759	COND =	33.372	MAX:HAT =	0.909
RSTUDENT =	2.726	DFFITS =	4.11		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C71A	-17.036	3.176	-5.365	0.
C71B	0.061	0.011	5.443	0.
C71C	0.099	0.024	4.122	0.001
C71D	-0.	0.	-2.617	0.021
C71E	0.	0.	2.536	0.025

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

377: XXDRNT = C76A+C76B*R.DPI8N+C76C*R.DPI8X+C76D*R.DPI8N(-1)+
C76E*R.DPI8X(-1)

NOB = 21		NOVAR = 5		RANGE:	1962 TO 1982
RSQ =	0.995	CRSQ =	0.994	F(4/16) =	857.554
PROB>F =	0.	SER =	5.392	SSR =	465.198
DW(0) =	1.651	COND =	49.573	MAX:HAT =	0.773
RSTUDENT =	-2.555	DFFITS =	2.747		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C76A	-17.935	3.219	-5.571	0.
C76B	0.131	0.02	6.49	0.
C76C	0.023	0.023	0.991	0.336
C76D	0.044	0.022	2.059	0.056
C76E	-0.089	0.023	-3.891	0.001

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

378: LOG(EMDW) = C77A+C77B*LOG(XXDW)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.997	CRSQ =	0.997	F(1/20) =	6118.78
PROB>F =	0.	SER =	0.03	SSR =	0.019
DW(0) =	0.558	COND =	13.833	MAX:HAT =	0.143
RSTUDENT =	2.627	DFFITS =	0.709		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C77A	-2.282	0.045	-50.508	0.
C77B	0.86	0.011	78.223	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

379: LOG(EMDRNT) = C75A+C75B*LOG(XXDRNT)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.998	CRSQ =	0.998	F(1/20) =	11839.1
PROB>F =	0.	SER =	0.021	SSR =	0.009
DW(0) =	1.559	COND =	20.077	MAX:HAT =	0.163
RSTUDENT =	-2.923	DFFITS =	-0.89		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C75A	-2.297	0.045	-51.285	0.
C75B	0.993	0.009	108.808	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

381: LOG(WRDW/PDRPI) = C78A+C78F*D.80DEC6+C78B*LOG(WEUS/PDUSCPI)+
C78C*LOG(1+EMCNRT)+C78D*LOG(1+EMCNRT(-1))+C78E*LOG(1+EMCNRT(-2))

NOB = 22		NOVAR = 6		RANGE:	1961 TO 1982
RSQ =	0.874	CRSQ =	0.834	F(5/16) =	22.127
PROB>F =	0.	SER =	0.026	SSR =	0.011
DW(0) =	1.645	COND =	5.906	MAX:HAT =	0.71
RSTUDENT =	3.448	DFFITS =	2.64		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C78A	4.346	0.007	582.165	0.
C78B	0.711	0.147	4.838	0.
C78C	1.695	0.414	4.093	0.
C78D	0.144	0.567	0.254	0.803
C78E	0.587	0.42	1.396	0.182
C78F	0.083	0.02	4.084	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

382: LOG(WRDR/PDRPI) = C79A+C79F*D.80DEC6+C79B*LOG(WEUS/PDUSCPI)+(+C79D)*
LOG(1+EMCNRT(-1))+C79E*LOG(1+EMCNRT(-2))

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.764	CRSQ =	0.709	F(4/17) =	13.788
PROB>F =	0.	SER =	0.026	SSR =	0.011
DW(0) =	2.147	COND =	2.991	MAX:HAT =	0.655
RSTUDENT =	-4.889	DFFITS =	3.64		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C79A	3.84	0.007	545.693	0.
C79B	0.604	0.144	4.187	0.
C79D	0.961	0.314	3.056	0.007
C79E	-0.913	0.319	-2.861	0.011
C79F	-0.034	0.02	-1.701	0.107

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

389: XXFI = C80A+C80C*D71.73+C80B*WEALTH(-1)*POP(-1)

NOB = 18		NOVAR = 3		RANGE:	1965 TO 1982
RSQ =	0.984	CRSQ =	0.982	F(2/15) =	463.199
PROB>F =	0.	SER =	14.695	SSR =	3239.22
DW(0) =	0.935	COND =	5.849	MAX:HAT =	0.335
RSTUDENT =	3.366	DFFITS =	1.454		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C80A	-48.913	10.118	-4.834	0.
C80B	0.	0.	29.177	0.
C80C	-18.35	9.535	-1.924	0.073

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.996	CRSQ =	0.996	F(1/20) =	5342.82
PROB>F =	0.	SER =	0.038	SSR =	0.029
DW(0) =	0.256	COND =	16.726	MAX:HAT =	0.153
RSTUDENT =	-1.575	DFFITS =	-0.612		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C81A	-3.623	0.068	-52.932	0.
C81B	0.985	0.013	73.095	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

391: LOG(WRFI/PDRPI) = C82A+C82F*D.80DEC6+C82B*LOG(WEUS/PDUSCPI)+C82D*
LOG(1+EMCNRT)+C82C*LOG(1+EMCNRT(-1))

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.899	CRSQ =	0.875	F(4/17) =	37.818
PROB>F =	0.	SER =	0.032	SSR =	0.018
DW(0) =	1.492	COND =	2.94	MAX:HAT =	0.654
RSTUDENT =	3.538	DFFITS =	2.534		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C82A	3.972	0.009	445.742	0.
C82B	1.847	0.178	10.361	0.
C82C	0.772	0.397	1.946	0.068
C82D	0.6	0.394	1.523	0.146
C82F	0.244	0.025	9.669	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

393: XXS8NT = C84A+C84B*R.DPI8N+C84C*R.DPI8X(-1)+C84D*WEALTH(-1)*POP(-1)

NOB = 17		NOVAR = 4		RANGE:	1965 TO 1981
RSQ =	0.992	CRSQ =	0.99	F(3/13) =	524.819
PROB>F =	0.	SER =	5.905	SSR =	453.342
DW(0) =	1.682	COND =	27.784	MAX:HAT =	0.659
RSTUDENT =	-4.983	DFFITS =	-1.636		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C84A	-34.815	5.308	-6.559	0.
C84B	0.07	0.015	4.499	0.
C84C	-0.076	0.018	-4.15	0.001
C84D	0.	0.	6.989	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

394: XXSB = C83A+(+C83C)*R.DPI8X+C83D*R.DPI8X(-1)+C83E*WEALTH(-1)*POP(-1)

NOB = 18		NOVAR = 4		RANGE:	1965 TO 1982
RSQ =	0.949	CRSQ =	0.938	F(3/14) =	86.096
PROB>F =	0.	SER =	7.087	SSR =	703.126
DW(0) =	1.128	COND =	6.669	MAX:HAT =	0.766
RSTUDENT =	2.906	DFFITS =	1.81		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C83A	-11.382	4.719	-2.412	0.03
C83C	0.15	0.023	6.395	0.
C83D	0.018	0.025	0.739	0.472
C83E	0.	0.	10.48	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

395: LOG(EMS8NT) = C85A+C85B*LOG(XXS8NT)

NOB = 21		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.999	CRSQ =	0.999	F(1/19) =	17300.2
PROB>F =	0.	SER =	0.02	SSR =	0.008
DW(0) =	1.018	COND =	16.139	MAX:HAT =	0.154
RSTUDENT =	-3.593	DFFITS =	- .973		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C85A	-2.244	0.035	-63.749	0.
C85B	0.999	0.008	131.53	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

396: LOG(EMSB) = C87A+C87B*LOG(XXSB)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.999	CRSQ =	0.999	F(1/20) =	18731.9
PROB>F =	0.	SER =	0.025	SSR =	0.013
DW(0) =	0.558	COND =	9.076	MAX:HAT =	0.178
RSTUDENT =	-1.959	DFFITS =	-0.777		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C85A	-2.384	0.025	-95.63	0.
C85B	0.991	0.007	136.865	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

397: 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 = 22		NOVAR = 6		RANGE:	1961 TO 1982
RSQ =	0.833	CRSQ =	0.781	F(5/16) =	15.984
PROB>F =	0.	SER =	0.061	SSR =	0.059
DW(0) =	0.961	COND =	5.906	MAX:HAT =	0.71
RSTUDENT =	1.79	DFFITS =	1.602		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C86A	3.781	0.017	218.036	0.
C86B	1.305	0.341	3.824	0.001
C86C	2.801	0.962	2.911	0.01
C86D	-0.262	1.317	-0.199	0.845
C86E	2.174	0.976	2.227	0.041
C86F	0.295	0.047	6.207	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 22		NOVAR = 7		RANGE:	1961 TO 1982
RSQ =	0.94	CRSQ =	0.916	F(6/15) =	39.3
PROB>F =	0.	SER =	0.065	SSR =	0.062
DW(0) =	1.813	COND =	9.293	MAX:HAT =	0.72
RSTUDENT =	3.056	DFFITS =	1.95		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C88A	3.905	0.049	79.201	0.
C88B	0.557	0.5	1.113	0.283
C88C	9.246	1.243	7.437	0.
C88D	-0.186	1.48	-0.125	0.902
C88E	0.235	0.055	4.285	0.
C88F	0.28	0.085	3.312	0.005
C88G	4.462	1.201	3.714	0.002

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

407: LOG(XXGF) = C101A+C101B*LOG(EMGF)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.758	CRSQ =	0.746	F(1/20) =	62.554
PROB>F =	0.	SER =	0.023	SSR =	0.011
DW(0) =	0.772	COND =	90.285	MAX:HAT =	0.165
RSTUDENT =	3.171	DFFITS =	0.697		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C101A	4.267	0.226	18.919	0.
C101B	0.467	0.059	7.909	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

408: LOG(WRGC) = C89A+C89B*LOG(WEUS)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	0.994	CRSQ =	0.994	F(1/20) =	3495.79
PROB>F =	0.	SER =	0.033	SSR =	0.022
DW(0) =	1.3	COND =	26.614	MAX:HAT =	0.188
RSTUDENT =	-1.951	DFFITS =	-0.621		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C89A	3.899	0.093	41.814	0.
C89B	1.115	0.019	59.125	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

414: LOG(WRGS/PDRPI) = C92A+C92F*D.80DEC6+C92B*LOG(WEUS/PDUSCPI)+
C92C*D61.73+C92D*D74.75

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.962	CRSQ =	0.954	F(4/17) =	108.806
PROB>F =	0.	SER =	0.041	SSR =	0.028
DW(0) =	1.27	COND =	5.014	MAX:HAT =	0.507
RSTUDENT =	2.502	DFFITS =	1.167		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C92A	4.312	0.023	191.473	0.
C92B	2.348	0.232	10.134	0.
C92C	-0.263	0.024	-10.838	0.
C92D	-0.079	0.036	-2.227	0.04
C92F	0.286	0.04	7.222	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

416: LOG(WRGL/PDRPI) = C102A+C102F*D.80DEC6+C102B*LOG(WEUS/PDUSCPI)+
C102C*LOG(1+EMCNRT)+C102D*D61.69

NOB = 22		NOVAR = 5		RANGE:	1961 TO 1982
RSQ =	0.925	CRSQ =	0.907	F(4/17) =	52.353
PROB>F =	0.	SER =	0.044	SSR =	0.033
DW(0) =	1.582	COND =	5.469	MAX:HAT =	0.504
RSTUDENT =	3.038	DFFITS =	2.2		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C102A	4.101	0.025	162.752	0.
C102B	1.816	0.333	5.449	0.
C102C	1.624	0.451	3.603	0.002
C102D	-0.099	0.031	-3.186	0.005
C102F	0.307	0.05	6.072	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

421: LOG(XXGA) = C104A+C104B*LOG(EMGA)

NOB = 22		NOVAR = 2		RANGE:	1961 TO 1982
RSQ =	1.	CRSQ =	1.	F(1/20) =	5.291E+05
PROB>F =	0.	SER =	0.003	SSR =	0.
DW(0) =	0.907	COND =	12.294	MAX:HAT =	0.198
RSTUDENT =	23.908	DFFITS =	9.57		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C104A	2.146	0.004	515.967	0.
C104B	0.992	0.001	727.382	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

423: XXA9 = C90A+C90B*(EMA9+EMPROFIS)

NOB = 21		NOVAR = 2		RANGE:	1961 TO 1981
RSQ =	0.84	CRSQ =	0.832	F(1/19) =	100.016
PROB>F =	0.	SER =	8.732	SSR =	1448.75
DW(0) =	0.6	COND =	7.021	MAX:HAT =	0.307
RSTUDENT =	2.426	DFFITS =	0.676		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C90A	4.529	6.825	0.664	0.515
C90B	12.29	1.229	10.001	0.

ORDINARY LEAST SQUARES

MODEL NAME: A85.1

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

NOB = 21		NOVAR = 3		RANGE:	1961 TO 1981
RSQ =	0.946	CRSQ =	0.94	F(2/18) =	158.599
PROB>F =	0.	SER =	0.192	SSR =	0.664
DW(0) =	0.824	COND =	56.491	MAX:HAT =	0.207
RSTUDENT =	-4.18	DFFITS =	-1.929		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
C100A	-4.285	1.098	-3.903	0.001
C100B	1.237	0.218	5.678	0.
C100C	-0.998	0.136	-7.311	0.

COCHRANE-ORCUTT PROCEDURE

ITERATION	RHO1	SSR
*********	****	***
1	-0.524	75.057
2	-0.543	75.025
3	-0.544	75.025

MODEL NAME: A85.1

663: POPMIG = CMIG1+CMIG2*1/U.AK.US(-1)+CMIG3*WR.AK.US(-1)+CMIG4*DELEMP

NOB = 11		NOVAR = 5		RANGE:	1971 TO 1982
RSQ =	0.971	CRSQ =	0.952	F(3/6) =	50.547
PROB>F =	0.	SER =	3.536	SSR =	75.025
DW(0) =	2.186	COND =	29.723	MAX:HAT =	0.651
RSTUDENT =	-3.418	DFFITS =	-3.463		

COEF	ESTIMATE	STER	TSTAT	PROB>£T£
CMIG1	-13.565	8.195	-1.655	0.142
CMIG2	13.717	8.441	1.625	0.148
CMIG3	35.794	20.298	1.763	0.121
CMIG4	0.803	0.143	5.632	0.
RHO1	-0.544	0.293	-1.859	0.105

APPENDIX D
ISER MAP ALASKA ECONOMIC MODEL: INPUT VARIABLE VALUES--EXOGENOUS AND POLICY VARIABLES

	ANCSA	APPFCONX	BADD	BALDF6	BALGFUNA	BALGF6
1983	0.	0.	0.	0.	2454.6	2315.7
1984	0.	0.	0.	0.	2000.	0.
1985	0.	0.	0.	0.	1500.	0.
1986	0.	0.	0.	0.	1000.	0.
1987	0.	0.	0.	0.	500.	0.
1988	0.	0.	0.	0.	500.	0.
1989	0.	0.	0.	0.	500.	0.
1990	0.	0.	0.	0.	500.	0.
1991	0.	0.	0.	0.	500.	0.
1992	0.	0.	0.	0.	500.	0.
1993	0.	0.	0.	0.	500.	0.
1994	0.	0.	0.	0.	500.	0.
1995	0.	0.	0.	0.	500.	0.
1996	0.	0.	0.	0.	500.	0.
1997	0.	0.	0.	0.	500.	0.
1998	0.	0.	0.	0.	500.	0.
1999	0.	0.	0.	0.	500.	0.
2000	0.	0.	0.	0.	500.	0.
2001	0.	0.	0.	0.	500.	0.
2002	0.	0.	0.	0.	500.	0.
2003	0.	0.	0.	0.	500.	0.
2004	0.	0.	0.	0.	500.	0.
2005	0.	0.	0.	0.	500.	0.
2006	0.	0.	0.	0.	500.	0.
2007	0.	0.	0.	0.	500.	0.
2008	0.	0.	0.	0.	500.	0.
2009	0.	0.	0.	0.	500.	0.
2010	0.	0.	0.	0.	500.	0.

SOURCE: Dset A85.1

	BALPF6	BASEMCNX	BASEPOP	BASEXCAP	BASEXGF	BASEXOPS
1983	4375.	1.	1.	1.	1.	1.
1984	0.	1.	1.	1.	1.	1.
1985	0.	1.	1.	1.	1.	1.
1986	0.	1.	1.	1.	1.	1.
1987	0.	1.	1.	1.	1.	1.
1988	0.	1.	1.	1.	1.	1.
1989	0.	1.	1.	1.	1.	1.
1990	0.	1.	1.	1.	1.	1.
1991	0.	1.	1.	1.	1.	1.
1992	0.	1.	1.	1.	1.	1.
1993	0.	1.	1.	1.	1.	1.
1994	0.	1.	1.	1.	1.	1.
1995	0.	1.	1.	1.	1.	1.
1996	0.	1.	1.	1.	1.	1.
1997	0.	1.	1.	1.	1.	1.
1998	0.	1.	1.	1.	1.	1.
1999	0.	1.	1.	1.	1.	1.
2000	0.	1.	1.	1.	1.	1.
2001	0.	1.	1.	1.	1.	1.
2002	0.	1.	1.	1.	1.	1.
2003	0.	1.	1.	1.	1.	1.
2004	0.	1.	1.	1.	1.	1.
2005	0.	1.	1.	1.	1.	1.
2006	0.	1.	1.	1.	1.	1.
2007	0.	1.	1.	1.	1.	1.
2008	0.	1.	1.	1.	1.	1.
2009	0.	1.	1.	1.	1.	1.
2010	0.	1.	1.	1.	1.	1.

	BASPDRPI	BIU6	D.80DEC6	D61.64	D61.66	D61.67
1983	1.	42.5	0.8	0.	0.	0.
1984	1.	0.	0.6	0.	0.	0.
1985	1.	0.	0.4	0.	0.	0.
1986	1.	0.	0.2	0.	0.	0.
1987	1.	0.	0.	0.	0.	0.
1988	1.	0.	0.	0.	0.	0.
1989	1.	0.	0.	0.	0.	0.
1990	1.	0.	0.	0.	0.	0.
1991	1.	0.	0.	0.	0.	0.
1992	1.	0.	0.	0.	0.	0.
1993	1.	0.	0.	0.	0.	0.
1994	1.	0.	0.	0.	0.	0.
1995	1.	0.	0.	0.	0.	0.
1996	1.	0.	0.	0.	0.	0.
1997	1.	0.	0.	0.	0.	0.
1998	1.	0.	0.	0.	0.	0.
1999	1.	0.	0.	0.	0.	0.
2000	1.	0.	0.	0.	0.	0.
2001	1.	0.	0.	0.	0.	0.
2002	1.	0.	0.	0.	0.	0.
2003	1.	0.	0.	0.	0.	0.
2004	1.	0.	0.	0.	0.	0.
2005	1.	0.	0.	0.	0.	0.
2006	1.	0.	0.	0.	0.	0.
2007	1.	0.	0.	0.	0.	0.
2008	1.	0.	0.	0.	0.	0.
2009	1.	0.	0.	0.	0.	0.
2010	1.	0.	0.	0.	0.	0.

	D61.68	D61.69	D61.70	D61.72	D61.73	D61.74
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	D61.75	D61.76	D61.77	D64.65	D68.71	D69
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	D71.00	D71.73	D72	D73	D74.75	D75
1983	1.	0.	0.	0.	0.	0.
1984	1.	0.	0.	0.	0.	0.
1985	1.	0.	0.	0.	0.	0.
1986	1.	0.	0.	0.	0.	0.
1987	1.	0.	0.	0.	0.	0.
1988	1.	0.	0.	0.	0.	0.
1989	1.	0.	0.	0.	0.	0.
1990	1.	0.	0.	0.	0.	0.
1991	1.	0.	0.	0.	0.	0.
1992	1.	0.	0.	0.	0.	0.
1993	1.	0.	0.	0.	0.	0.
1994	1.	0.	0.	0.	0.	0.
1995	1.	0.	0.	0.	0.	0.
1996	1.	0.	0.	0.	0.	0.
1997	1.	0.	0.	0.	0.	0.
1998	1.	0.	0.	0.	0.	0.
1999	1.	0.	0.	0.	0.	0.
2000	1.	0.	0.	0.	0.	0.
2001	1.	0.	0.	0.	0.	0.
2002	1.	0.	0.	0.	0.	0.
2003	1.	0.	0.	0.	0.	0.
2004	1.	0.	0.	0.	0.	0.
2005	1.	0.	0.	0.	0.	0.
2006	1.	0.	0.	0.	0.	0.
2007	1.	0.	0.	0.	0.	0.
2008	1.	0.	0.	0.	0.	0.
2009	1.	0.	0.	0.	0.	0.
2010	1.	0.	0.	0.	0.	0.

	D79	D80	D81.00	D82	EMAGRI	EMAUN
1983	0.	0.	1.	0.		1.438
1984	0.	0.	1.	0.		1.438
1985	0.	0.	1.	0.		1.438
1986	0.	0.	1.	0.	F	1.438
1987	0.	0.	1.	0.	R	1.438
1988	0.	0.	1.	0.	O	1.438
1989	0.	0.	1.	0.	M	1.438
1990	0.	0.	1.	0.		1.438
					S	
1991	0.	0.	1.	0.	C	1.438
1992	0.	0.	1.	0.	E	1.438
1993	0.	0.	1.	0.	N	1.438
1994	0.	0.	1.	0.	A	1.438
1995	0.	0.	1.	0.	R	1.438
					I	
1996	0.	0.	1.	0.	O	1.438
1997	0.	0.	1.	0.		1.438
1998	0.	0.	1.	0.	G	1.438
1999	0.	0.	1.	0.	E	1.438
2000	0.	0.	1.	0.	N	1.438
					E	
2001	0.	0.	1.	0.	R	1.438
2002	0.	0.	1.	0.	A	1.438
2003	0.	0.	1.	0.	T	1.438
2004	0.	0.	1.	0.	O	1.438
2005	0.	0.	1.	0.	R	1.438
2006	0.	0.	1.	0.		1.438
2007	0.	0.	1.	0.		1.438
2008	0.	0.	1.	0.		1.438
2009	0.	0.	1.	0.		1.438
2010	0.	0.	1.	0.		1.438

	EMCNX1	EMCNX2	EMFISH	EMGC	EMGM	EMMX1
1983						
1984						
1985						
1986	F	F	F	F	F	F
1987	R	R	R	R	R	R
1988	O	O	O	O	O	O
1989	M	M	M	M	M	M
1990						
	S	S	S	S	S	S
1991	C	C	C	C	C	C
1992	E	E	E	E	E	E
1993	N	N	N	N	N	N
1994	A	A	A	A	A	A
1995	R	R	R	R	R	R
	I	I	I	I	I	I
1996	O	O	O	O	O	O
1997						
1998	G	G	G	G	G	G
1999	E	E	E	E	E	E
2000	N	N	N	N	N	N
	E	E	E	E	E	E
2001	R	R	R	R	R	R
2002	A	A	A	A	A	A
2003	T	T	T	T	T	T
2004	O	O	O	O	O	O
2005	R	R	R	R	R	R
2006						
2007						
2008						
2009						
2010						

	EMMX2	EMNATX	EMP9	EMT9X	EXCPSFD6	EXCPSGB6
1983		0.17			110.491	127.692
1984		0.17			0.	125.
1985		0.17			0.	125.
1986	F	0.17	F	F	0.	0.
1987	R	0.17	R	R	0.	0.
1988	O	0.17	O	O	0.	0.
1989	M	0.17	M	M	0.	0.
1990		0.17			0.	0.
	S		S	S		
1991	C	0.17	C	C	0.	0.
1992	E	0.17	E	E	0.	0.
1993	N	0.17	N	N	0.	0.
1994	A	0.17	A	A	0.	0.
1995	R	0.17	R	R	0.	0.
	I		I	I		
1996	O	0.17	O	O	0.	0.
1997		0.17			0.	0.
1998	G	0.17	G	G	0.	0.
1999	E	0.17	E	E	0.	0.
2000	N	0.17	N	N	0.	0.
	E		E	E		
2001	R	0.17	R	R	0.	0.
2002	A	0.17	A	A	0.	0.
2003	T	0.17	T	T	0.	0.
2004	O	0.17	O	O	0.	0.
2005	R	0.17	R	R	0.	0.
2006		0.17			0.	0.
2007		0.17			0.	0.
2008		0.17			0.	0.
2009		0.17			0.	0.
2010		0.17			0.	0.

	EXDFPCNT	EXDF1	EXDSSX	EXGFCAP6	EXGFCOT6	EXGFOPSX
1983	0.	0.	142.488	1086.35	608.	0.
1984	0.	0.	163.4	1050.	0.	0.
1985	0.	0.	156.2	1100.	0.	0.
1986	0.	0.	150.6	0.	0.	0.
1987	0.	0.	142.8	0.	0.	0.
1988	0.	0.	136.3	0.	0.	0.
1989	0.	0.	124.5	0.	0.	0.
1990	0.	0.	109.8	0.	0.	0.
1991	0.	0.	85.6	0.	0.	0.
1992	0.	0.	58.9	0.	0.	0.
1993	0.	0.	51.	0.	0.	0.
1994	0.	0.	25.8	0.	0.	0.
1995	0.	0.	23.1	0.	0.	0.
1996	0.	0.	21.5	0.	0.	0.
1997	0.	0.	16.7	0.	0.	0.
1998	0.	0.	14.4	0.	0.	0.
1999	0.	0.	9.	0.	0.	0.
2000	0.	0.	2.6	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	EXOPS6	EXPFCONX	EXPFDIST	EXPFDVX1	EXPFDVX2	EXPFTOGF
1983	2220.	400.	0.6	107.9	176.	0.23
1984	2330.	300.	0.5	0.	50.	0.
1985	2440.	300.	0.5	0.	0.	0.
1986	0.	0.	0.5	0.	0.	0.
1987	0.	0.	0.5	0.	0.	0.
1988	0.	0.	0.5	0.	0.	0.
1989	0.	0.	0.5	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.5
1992	0.	0.	0.	0.	0.	0.5
1993	0.	0.	0.	0.	0.	0.5
1994	0.	0.	0.	0.	0.	0.5
1995	0.	0.	0.	0.	0.	0.5
1996	0.	0.	0.	0.	0.	0.5
1997	0.	0.	0.	0.	0.	0.5
1998	0.	0.	0.	0.	0.	0.5
1999	0.	0.	0.	0.	0.	0.5
2000	0.	0.	0.	0.	0.	0.5
2001	0.	0.	0.	0.	0.	1.
2002	0.	0.	0.	0.	0.	1.
2003	0.	0.	0.	0.	0.	1.
2004	0.	0.	0.	0.	0.	1.
2005	0.	0.	0.	0.	0.	1.
2006	0.	0.	0.	0.	0.	1.
2007	0.	0.	0.	0.	0.	1.
2008	0.	0.	0.	0.	0.	1.
2009	0.	0.	0.	0.	0.	1.
2010	0.	0.	0.	0.	0.	1.

	EXPF1	EXSAVX	EXSPCAP	EXSPLITX	EXSUBSX	EXSUB1
1983	0.25	0.	0.	0.75	275.	0.05
1984	0.25	0.	0.	0.75	200.	0.05
1985	0.25	0.	0.	0.75	200.	0.05
1986	0.25	0.	0.	0.75	150.	0.05
1987	0.25	0.	0.	0.75	150.	0.05
1988	0.25	0.	0.	0.75	100.	0.05
1989	0.25	0.	0.	0.75	100.	0.05
1990	0.25	0.	0.	0.75	50.	0.05
1991	0.275	0.	0.	0.75	50.	0.05
1992	0.275	0.	0.	0.75	0.	0.05
1993	0.3	0.	0.	0.75	0.	0.05
1994	0.3	0.	0.	0.75	0.	0.05
1995	0.3	0.	0.	0.75	0.	0.05
1996	0.3	0.	0.	0.75	0.	0.05
1997	0.3	0.	0.	0.75	0.	0.05
1998	0.3	0.	0.	0.75	0.	0.05
1999	0.3	0.	0.	0.75	0.	0.05
2000	0.3	0.	0.	0.75	0.	0.05
2001	0.3	0.	0.	0.75	0.	0.05
2002	0.3	0.	0.	0.75	0.	0.05
2003	0.3	0.	0.	0.75	0.	0.05
2004	0.3	0.	0.	0.75	0.	0.05
2005	0.3	0.	0.	0.75	0.	0.05
2006	0.3	0.	0.	0.75	0.	0.05
2007	0.3	0.	0.	0.75	0.	0.05
2008	0.3	0.	0.	0.75	0.	0.05
2009	0.3	0.	0.	0.75	0.	0.05
2010	0.3	0.	0.	0.75	0.	0.05

	EXSUB2	EXTRNSPI	EXTRNSX	EXUA6	GODTX	GRDIRPU
1983	0.05	291.	0.	210.	947.2	0.005
1984	0.05	0.	0.	0.	847.	0.01
1985	0.05	0.	0.	0.	747.	0.015
1986	0.05	0.	0.	0.	644.5	0.015
1987	0.05	0.	0.	0.	543.9	0.015
1988	0.05	0.	0.	0.	443.	0.015
1989	0.05	0.	0.	0.	347.	0.015
1990	0.05	0.	0.	0.	259.2	0.015
1991	0.05	0.	0.	0.	189.5	0.015
1992	0.05	0.	0.	0.	141.2	0.015
1993	0.05	0.	0.	0.	97.7	0.015
1994	0.05	0.	0.	0.	77.1	0.015
1995	0.05	0.	0.	0.	58.	0.015
1996	0.05	0.	0.	0.	39.4	0.015
1997	0.05	0.	0.	0.	24.5	0.015
1998	0.05	0.	0.	0.	11.1	0.015
1999	0.05	0.	0.	0.	2.5	0.015
2000	0.05	0.	0.	0.	0.	0.015
2001	0.05	0.	0.	0.	0.	0.015
2002	0.05	0.	0.	0.	0.	0.015
2003	0.05	0.	0.	0.	0.	0.015
2004	0.05	0.	0.	0.	0.	0.015
2005	0.05	0.	0.	0.	0.	0.015
2006	0.05	0.	0.	0.	0.	0.015
2007	0.05	0.	0.	0.	0.	0.015
2008	0.05	0.	0.	0.	0.	0.015
2009	0.05	0.	0.	0.	0.	0.015
2010	0.05	0.	0.	0.	0.	0.015

	GREXCAP	GREXOPS	GRRPCEX	GRRWEUS	GRSSCP	GRUSCPI
1983	0.2	0.15	0.02	0.01	0.02	0.03
1984	0.15	0.1	0.02	0.01	0.02	0.045
1985	0.15	0.1	0.02	0.01	0.02	0.06
1986	0.1	0.1	0.02	0.01	0.02	0.065
1987	0.1	0.1	0.02	0.01	0.02	0.065
1988	0.1	0.1	0.02	0.01	0.02	0.065
1989	0.1	0.1	0.02	0.01	0.02	0.065
1990	0.1	0.1	0.02	0.01	0.02	0.065
1991	0.1	0.1	0.02	0.01	0.02	0.065
1992	0.1	0.1	0.02	0.01	0.02	0.065
1993	0.1	0.1	0.02	0.01	0.02	0.065
1994	0.1	0.1	0.02	0.01	0.02	0.065
1995	0.1	0.1	0.02	0.01	0.02	0.065
1996	0.1	0.1	0.02	0.01	0.02	0.065
1997	0.1	0.1	0.02	0.01	0.02	0.065
1998	0.1	0.1	0.02	0.01	0.02	0.065
1999	0.1	0.1	0.02	0.01	0.02	0.065
2000	0.1	0.1	0.02	0.01	0.02	0.065
2001	0.1	0.1	0.02	0.01	0.02	0.065
2002	0.1	0.1	0.02	0.01	0.02	0.065
2003	0.1	0.1	0.02	0.01	0.02	0.065
2004	0.1	0.1	0.02	0.01	0.02	0.065
2005	0.1	0.1	0.02	0.01	0.02	0.065
2006	0.1	0.1	0.02	0.01	0.02	0.065
2007	0.1	0.1	0.02	0.01	0.02	0.065
2008	0.1	0.1	0.02	0.01	0.02	0.065
2009	0.1	0.1	0.02	0.01	0.02	0.065
2010	0.1	0.1	0.02	0.01	0.02	0.065

	LAFPRT	LBOND1	LBOND10	LBOND11	LBOND12	LBOND13
1983	0.75	0.229	0.	0.	0.	0.
1984	0.76	0.229	0.	0.	0.	0.
1985	0.76	0.229	0.	0.	0.	0.
1986	0.76	0.229	0.	0.	0.	0.
1987	0.76	0.229	0.	0.	0.	0.
1988	0.76	0.229	0.	0.	0.	0.
1989	0.76	0.229	0.	0.	0.	0.
1990	0.76	0.229	0.	0.	0.	0.
1991	0.76	0.229	0.	0.	0.	0.
1992	0.76	0.229	0.	0.	0.	0.
1993	0.76	0.229	0.	0.	0.	0.
1994	0.76	0.229	0.	0.	0.	0.
1995	0.76	0.229	0.	0.	0.	0.
1996	0.76	0.229	0.	0.	0.	0.
1997	0.76	0.229	0.	0.	0.	0.
1998	0.76	0.229	0.	0.	0.	0.
1999	0.76	0.229	0.	0.	0.	0.
2000	0.76	0.229	0.	0.	0.	0.
2001	0.76	0.229	0.	0.	0.	0.
2002	0.76	0.229	0.	0.	0.	0.
2003	0.76	0.229	0.	0.	0.	0.
2004	0.76	0.229	0.	0.	0.	0.
2005	0.76	0.229	0.	0.	0.	0.
2006	0.76	0.229	0.	0.	0.	0.
2007	0.76	0.229	0.	0.	0.	0.
2008	0.76	0.229	0.	0.	0.	0.
2009	0.76	0.229	0.	0.	0.	0.
2010	0.76	0.229	0.	0.	0.	0.

	LBOND14	LBOND15	LBOND2	LBOND3	LBOND4	LBOND5
1983	0.	0.1	0.	0.022	0.	0.
1984	0.	0.1	0.	0.022	0.	0.
1985	0.	0.1	0.	0.022	0.	0.
1986	0.	0.1	0.	0.022	0.	0.
1987	0.	0.1	0.	0.022	0.	0.
1988	0.	0.1	0.	0.022	0.	0.
1989	0.	0.1	0.	0.022	0.	0.
1990	0.	0.1	0.	0.022	0.	0.
1991	0.	0.1	0.	0.022	0.	0.
1992	0.	0.1	0.	0.022	0.	0.
1993	0.	0.1	0.	0.022	0.	0.
1994	0.	0.1	0.	0.022	0.	0.
1995	0.	0.1	0.	0.022	0.	0.
1996	0.	0.1	0.	0.022	0.	0.
1997	0.	0.1	0.	0.022	0.	0.
1998	0.	0.1	0.	0.022	0.	0.
1999	0.	0.1	0.	0.022	0.	0.
2000	0.	0.1	0.	0.022	0.	0.
2001	0.	0.1	0.	0.022	0.	0.
2002	0.	0.1	0.	0.022	0.	0.
2003	0.	0.1	0.	0.022	0.	0.
2004	0.	0.1	0.	0.022	0.	0.
2005	0.	0.1	0.	0.022	0.	0.
2006	0.	0.1	0.	0.022	0.	0.
2007	0.	0.1	0.	0.022	0.	0.
2008	0.	0.1	0.	0.022	0.	0.
2009	0.	0.1	0.	0.022	0.	0.
2010	0.	0.1	0.	0.022	0.	0.

	LBOND6	LBOND7	LBOND8	LBOND9	LFED1	LFED10
1983	0.392	0.	0.	0.257	0.738	0.
1984	0.392	0.	0.	0.257	0.738	0.
1985	0.392	0.	0.	0.257	0.738	0.
1986	0.392	0.	0.	0.257	0.738	0.
1987	0.392	0.	0.	0.257	0.738	0.
1988	0.392	0.	0.	0.257	0.738	0.
1989	0.392	0.	0.	0.257	0.738	0.
1990	0.392	0.	0.	0.257	0.738	0.
1991	0.392	0.	0.	0.257	0.738	0.
1992	0.392	0.	0.	0.257	0.738	0.
1993	0.392	0.	0.	0.257	0.738	0.
1994	0.392	0.	0.	0.257	0.738	0.
1995	0.392	0.	0.	0.257	0.738	0.
1996	0.392	0.	0.	0.257	0.738	0.
1997	0.392	0.	0.	0.257	0.738	0.
1998	0.392	0.	0.	0.257	0.738	0.
1999	0.392	0.	0.	0.257	0.738	0.
2000	0.392	0.	0.	0.257	0.738	0.
2001	0.392	0.	0.	0.257	0.738	0.
2002	0.392	0.	0.	0.257	0.738	0.
2003	0.392	0.	0.	0.257	0.738	0.
2004	0.392	0.	0.	0.257	0.738	0.
2005	0.392	0.	0.	0.257	0.738	0.
2006	0.392	0.	0.	0.257	0.738	0.
2007	0.392	0.	0.	0.257	0.738	0.
2008	0.392	0.	0.	0.257	0.738	0.
2009	0.392	0.	0.	0.257	0.738	0.
2010	0.392	0.	0.	0.257	0.738	0.

	LFED11	LFED12	LFED13	LFED14	LFED15	LFED2
1983	0.	0.	0.	0.	0.1	0.028
1984	0.	0.	0.	0.	0.1	0.028
1985	0.	0.	0.	0.	0.1	0.028
1986	0.	0.	0.	0.	0.1	0.028
1987	0.	0.	0.	0.	0.1	0.028
1988	0.	0.	0.	0.	0.1	0.028
1989	0.	0.	0.	0.	0.1	0.028
1990	0.	0.	0.	0.	0.1	0.028
1991	0.	0.	0.	0.	0.1	0.028
1992	0.	0.	0.	0.	0.1	0.028
1993	0.	0.	0.	0.	0.1	0.028
1994	0.	0.	0.	0.	0.1	0.028
1995	0.	0.	0.	0.	0.1	0.028
1996	0.	0.	0.	0.	0.1	0.028
1997	0.	0.	0.	0.	0.1	0.028
1998	0.	0.	0.	0.	0.1	0.028
1999	0.	0.	0.	0.	0.1	0.028
2000	0.	0.	0.	0.	0.1	0.028
2001	0.	0.	0.	0.	0.1	0.028
2002	0.	0.	0.	0.	0.1	0.028
2003	0.	0.	0.	0.	0.1	0.028
2004	0.	0.	0.	0.	0.1	0.028
2005	0.	0.	0.	0.	0.1	0.028
2006	0.	0.	0.	0.	0.1	0.028
2007	0.	0.	0.	0.	0.1	0.028
2008	0.	0.	0.	0.	0.1	0.028
2009	0.	0.	0.	0.	0.1	0.028
2010	0.	0.	0.	0.	0.1	0.028

	LFED3	LFED4	LFED5	LFED6	LFED7	LFED8
1983	0.086	0.004	0.	0.034	0.011	0.
1984	0.086	0.004	0.	0.034	0.011	0.
1985	0.086	0.004	0.	0.034	0.011	0.
1986	0.086	0.004	0.	0.034	0.011	0.
1987	0.086	0.004	0.	0.034	0.011	0.
1988	0.086	0.004	0.	0.034	0.011	0.
1989	0.086	0.004	0.	0.034	0.011	0.
1990	0.086	0.004	0.	0.034	0.011	0.
1991	0.086	0.004	0.	0.034	0.011	0.
1992	0.086	0.004	0.	0.034	0.011	0.
1993	0.086	0.004	0.	0.034	0.011	0.
1994	0.086	0.004	0.	0.034	0.011	0.
1995	0.086	0.004	0.	0.034	0.011	0.
1996	0.086	0.004	0.	0.034	0.011	0.
1997	0.086	0.004	0.	0.034	0.011	0.
1998	0.086	0.004	0.	0.034	0.011	0.
1999	0.086	0.004	0.	0.034	0.011	0.
2000	0.086	0.004	0.	0.034	0.011	0.
2001	0.086	0.004	0.	0.034	0.011	0.
2002	0.086	0.004	0.	0.034	0.011	0.
2003	0.086	0.004	0.	0.034	0.011	0.
2004	0.086	0.004	0.	0.034	0.011	0.
2005	0.086	0.004	0.	0.034	0.011	0.
2006	0.086	0.004	0.	0.034	0.011	0.
2007	0.086	0.004	0.	0.034	0.011	0.
2008	0.086	0.004	0.	0.034	0.011	0.
2009	0.086	0.004	0.	0.034	0.011	0.
2010	0.086	0.004	0.	0.034	0.011	0.

	LFED9	LGF1	LGF10	LGF11	LGF12	LGF13
1983	0.	0.048	0.27	0.	0.	0.
1984	0.	0.048	0.27	0.	0.	0.
1985	0.	0.048	0.27	0.	0.	0.
1986	0.	0.048	0.27	0.	0.	0.
1987	0.	0.048	0.27	0.	0.	0.
1988	0.	0.048	0.27	0.	0.	0.
1989	0.	0.048	0.27	0.	0.	0.
1990	0.	0.048	0.27	0.	0.	0.
1991	0.	0.048	0.27	0.	0.	0.
1992	0.	0.048	0.27	0.	0.	0.
1993	0.	0.048	0.27	0.	0.	0.
1994	0.	0.048	0.27	0.	0.	0.
1995	0.	0.048	0.27	0.	0.	0.
1996	0.	0.048	0.27	0.	0.	0.
1997	0.	0.048	0.27	0.	0.	0.
1998	0.	0.048	0.27	0.	0.	0.
1999	0.	0.048	0.27	0.	0.	0.
2000	0.	0.048	0.27	0.	0.	0.
2001	0.	0.048	0.27	0.	0.	0.
2002	0.	0.048	0.27	0.	0.	0.
2003	0.	0.048	0.27	0.	0.	0.
2004	0.	0.048	0.27	0.	0.	0.
2005	0.	0.048	0.27	0.	0.	0.
2006	0.	0.048	0.27	0.	0.	0.
2007	0.	0.048	0.27	0.	0.	0.
2008	0.	0.048	0.27	0.	0.	0.
2009	0.	0.048	0.27	0.	0.	0.
2010	0.	0.048	0.27	0.	0.	0.

	LGF14	LGF15	LGF2	LGF3	LGF4	LGF5
1983	0.	0.1	0.014	0.013	0.089	0.
1984	0.	0.1	0.014	0.013	0.089	0.
1985	0.	0.1	0.014	0.013	0.089	0.
1986	0.	0.1	0.014	0.013	0.089	0.
1987	0.	0.1	0.014	0.013	0.089	0.
1988	0.	0.1	0.014	0.013	0.089	0.
1989	0.	0.1	0.014	0.013	0.089	0.
1990	0.	0.1	0.014	0.013	0.089	0.
1991	0.	0.1	0.014	0.013	0.089	0.
1992	0.	0.1	0.014	0.013	0.089	0.
1993	0.	0.1	0.014	0.013	0.089	0.
1994	0.	0.1	0.014	0.013	0.089	0.
1995	0.	0.1	0.014	0.013	0.089	0.
1996	0.	0.1	0.014	0.013	0.089	0.
1997	0.	0.1	0.014	0.013	0.089	0.
1998	0.	0.1	0.014	0.013	0.089	0.
1999	0.	0.1	0.014	0.013	0.089	0.
2000	0.	0.1	0.014	0.013	0.089	0.
2001	0.	0.1	0.014	0.013	0.089	0.
2002	0.	0.1	0.014	0.013	0.089	0.
2003	0.	0.1	0.014	0.013	0.089	0.
2004	0.	0.1	0.014	0.013	0.089	0.
2005	0.	0.1	0.014	0.013	0.089	0.
2006	0.	0.1	0.014	0.013	0.089	0.
2007	0.	0.1	0.014	0.013	0.089	0.
2008	0.	0.1	0.014	0.013	0.089	0.
2009	0.	0.1	0.014	0.013	0.089	0.
2010	0.	0.1	0.014	0.013	0.089	0.

	LGF6	LGF7	LGF8	LGF9	LMUNCAP	LPTRAT
1983	0.213	0.092	0.139	0.021	0.75	0.6
1984	0.213	0.092	0.139	0.021	0.75	0.6
1985	0.213	0.092	0.139	0.021	0.75	0.6
1986	0.213	0.092	0.139	0.021	0.75	0.6
1987	0.213	0.092	0.139	0.021	0.75	0.6
1988	0.213	0.092	0.139	0.021	0.75	0.6
1989	0.213	0.092	0.139	0.021	0.75	0.6
1990	0.213	0.092	0.139	0.021	0.75	0.6
1991	0.213	0.092	0.139	0.021	0.75	0.6
1992	0.213	0.092	0.139	0.021	0.75	0.6
1993	0.213	0.092	0.139	0.021	0.75	0.6
1994	0.213	0.092	0.139	0.021	0.75	0.6
1995	0.213	0.092	0.139	0.021	0.75	0.6
1996	0.213	0.092	0.139	0.021	0.75	0.6
1997	0.213	0.092	0.139	0.021	0.75	0.6
1998	0.213	0.092	0.139	0.021	0.75	0.6
1999	0.213	0.092	0.139	0.021	0.75	0.6
2000	0.213	0.092	0.139	0.021	0.75	0.6
2001	0.213	0.092	0.139	0.021	0.75	0.6
2002	0.213	0.092	0.139	0.021	0.75	0.6
2003	0.213	0.092	0.139	0.021	0.75	0.6
2004	0.213	0.092	0.139	0.021	0.75	0.6
2005	0.213	0.092	0.139	0.021	0.75	0.6
2006	0.213	0.092	0.139	0.021	0.75	0.6
2007	0.213	0.092	0.139	0.021	0.75	0.6
2008	0.213	0.092	0.139	0.021	0.75	0.6
2009	0.213	0.092	0.139	0.021	0.75	0.6
2010	0.213	0.092	0.139	0.021	0.75	0.6

	LSGF1	LSGF10	LSGF11	LSGF12	LSGF13	LSGF14
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	LSGF15	LSGF2	LSGF3	LSGF4	LSGF5	LSGF6
1983	0.	0.	0.	0.	0.	1.
1984	0.	0.	0.	0.	0.	1.
1985	0.	0.	0.	0.	0.	1.
1986	0.	0.	0.	0.	0.	1.
1987	0.	0.	0.	0.	0.	1.
1988	0.	0.	0.	0.	0.	1.
1989	0.	0.	0.	0.	0.	1.
1990	0.	0.	0.	0.	0.	1.
1991	0.	0.	0.	0.	0.	1.
1992	0.	0.	0.	0.	0.	1.
1993	0.	0.	0.	0.	0.	1.
1994	0.	0.	0.	0.	0.	1.
1995	0.	0.	0.	0.	0.	1.
1996	0.	0.	0.	0.	0.	1.
1997	0.	0.	0.	0.	0.	1.
1998	0.	0.	0.	0.	0.	1.
1999	0.	0.	0.	0.	0.	1.
2000	0.	0.	0.	0.	0.	1.
2001	0.	0.	0.	0.	0.	1.
2002	0.	0.	0.	0.	0.	1.
2003	0.	0.	0.	0.	0.	1.
2004	0.	0.	0.	0.	0.	1.
2005	0.	0.	0.	0.	0.	1.
2006	0.	0.	0.	0.	0.	1.
2007	0.	0.	0.	0.	0.	1.
2008	0.	0.	0.	0.	0.	1.
2009	0.	0.	0.	0.	0.	1.
2010	0.	0.	0.	0.	0.	1.

	LSGF7	LSGF8	LSGF9	NCBP	NCRP	OMF1
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	OMF10	OMF11	OMF12	OMF13	OMF14	OMF15
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	OMF2	OMF3	OMF4	OMF5	OMF6	OMF7
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	OMF8	OMF9	OML1	OML10	OML11	OML12
1983	0.	0.	0.	0.05	0.	0.
1984	0.	0.	0.	0.05	0.	0.
1985	0.	0.	0.	0.05	0.	0.
1986	0.	0.	0.	0.05	0.	0.
1987	0.	0.	0.	0.05	0.	0.
1988	0.	0.	0.	0.05	0.	0.
1989	0.	0.	0.	0.05	0.	0.
1990	0.	0.	0.	0.05	0.	0.
1991	0.	0.	0.	0.05	0.	0.
1992	0.	0.	0.	0.05	0.	0.
1993	0.	0.	0.	0.05	0.	0.
1994	0.	0.	0.	0.05	0.	0.
1995	0.	0.	0.	0.05	0.	0.
1996	0.	0.	0.	0.05	0.	0.
1997	0.	0.	0.	0.05	0.	0.
1998	0.	0.	0.	0.05	0.	0.
1999	0.	0.	0.	0.05	0.	0.
2000	0.	0.	0.	0.05	0.	0.
2001	0.	0.	0.	0.05	0.	0.
2002	0.	0.	0.	0.05	0.	0.
2003	0.	0.	0.	0.05	0.	0.
2004	0.	0.	0.	0.05	0.	0.
2005	0.	0.	0.	0.05	0.	0.
2006	0.	0.	0.	0.05	0.	0.
2007	0.	0.	0.	0.05	0.	0.
2008	0.	0.	0.	0.05	0.	0.
2009	0.	0.	0.	0.05	0.	0.
2010	0.	0.	0.	0.05	0.	0.

	OML13	OML14	OML15	OML2	OML3	OML4
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	OML5	OML6	OML7	OML8	OML9	OMS1
1983	0.	0.	0.	0.	0.	0.02
1984	0.	0.	0.	0.	0.	0.02
1985	0.	0.	0.	0.	0.	0.02
1986	0.	0.	0.	0.	0.	0.02
1987	0.	0.	0.	0.	0.	0.02
1988	0.	0.	0.	0.	0.	0.02
1989	0.	0.	0.	0.	0.	0.02
1990	0.	0.	0.	0.	0.	0.02
1991	0.	0.	0.	0.	0.	0.02
1992	0.	0.	0.	0.	0.	0.02
1993	0.	0.	0.	0.	0.	0.02
1994	0.	0.	0.	0.	0.	0.02
1995	0.	0.	0.	0.	0.	0.02
1996	0.	0.	0.	0.	0.	0.02
1997	0.	0.	0.	0.	0.	0.02
1998	0.	0.	0.	0.	0.	0.02
1999	0.	0.	0.	0.	0.	0.02
2000	0.	0.	0.	0.	0.	0.02
2001	0.	0.	0.	0.	0.	0.02
2002	0.	0.	0.	0.	0.	0.02
2003	0.	0.	0.	0.	0.	0.02
2004	0.	0.	0.	0.	0.	0.02
2005	0.	0.	0.	0.	0.	0.02
2006	0.	0.	0.	0.	0.	0.02
2007	0.	0.	0.	0.	0.	0.02
2008	0.	0.	0.	0.	0.	0.02
2009	0.	0.	0.	0.	0.	0.02
2010	0.	0.	0.	0.	0.	0.02

	OMS10	OMS11	OMS12	OMS13	OMS14	OMS15
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	OMS2	OMS3	OMS4	OMS5	OMS6	OMS7
1983	0.	0.04	0.	0.	0.065	0.06
1984	0.	0.04	0.	0.	0.065	0.06
1985	0.	0.04	0.	0.	0.065	0.06
1986	0.	0.04	0.	0.	0.065	0.06
1987	0.	0.04	0.	0.	0.065	0.06
1988	0.	0.04	0.	0.	0.065	0.06
1989	0.	0.04	0.	0.	0.065	0.06
1990	0.	0.04	0.	0.	0.065	0.06
1991	0.	0.04	0.	0.	0.065	0.06
1992	0.	0.04	0.	0.	0.065	0.06
1993	0.	0.04	0.	0.	0.065	0.06
1994	0.	0.04	0.	0.	0.065	0.06
1995	0.	0.04	0.	0.	0.065	0.06
1996	0.	0.04	0.	0.	0.065	0.06
1997	0.	0.04	0.	0.	0.065	0.06
1998	0.	0.04	0.	0.	0.065	0.06
1999	0.	0.04	0.	0.	0.065	0.06
2000	0.	0.04	0.	0.	0.065	0.06
2001	0.	0.04	0.	0.	0.065	0.06
2002	0.	0.04	0.	0.	0.065	0.06
2003	0.	0.04	0.	0.	0.065	0.06
2004	0.	0.04	0.	0.	0.065	0.06
2005	0.	0.04	0.	0.	0.065	0.06
2006	0.	0.04	0.	0.	0.065	0.06
2007	0.	0.04	0.	0.	0.065	0.06
2008	0.	0.04	0.	0.	0.065	0.06
2009	0.	0.04	0.	0.	0.065	0.06
2010	0.	0.04	0.	0.	0.065	0.06

	OMS8	OMS9	OMU1	OMU10	OMU11	OMU12
1983	0.	0.	0.	0.05	0.	0.
1984	0.	0.	0.	0.05	0.	0.
1985	0.	0.	0.	0.05	0.	0.
1986	0.	0.	0.	0.05	0.	0.
1987	0.	0.	0.	0.05	0.	0.
1988	0.	0.	0.	0.05	0.	0.
1989	0.	0.	0.	0.05	0.	0.
1990	0.	0.	0.	0.05	0.	0.
1991	0.	0.	0.	0.05	0.	0.
1992	0.	0.	0.	0.05	0.	0.
1993	0.	0.	0.	0.05	0.	0.
1994	0.	0.	0.	0.05	0.	0.
1995	0.	0.	0.	0.05	0.	0.
1996	0.	0.	0.	0.05	0.	0.
1997	0.	0.	0.	0.05	0.	0.
1998	0.	0.	0.	0.05	0.	0.
1999	0.	0.	0.	0.05	0.	0.
2000	0.	0.	0.	0.05	0.	0.
2001	0.	0.	0.	0.05	0.	0.
2002	0.	0.	0.	0.05	0.	0.
2003	0.	0.	0.	0.05	0.	0.
2004	0.	0.	0.	0.05	0.	0.
2005	0.	0.	0.	0.05	0.	0.
2006	0.	0.	0.	0.05	0.	0.
2007	0.	0.	0.	0.05	0.	0.
2008	0.	0.	0.	0.05	0.	0.
2009	0.	0.	0.	0.05	0.	0.
2010	0.	0.	0.	0.05	0.	0.

	OMU13	OMU14	OMU15	OMU2	OMU3	OMU4
1983	0.	0.	0.	0.02	0.	0.
1984	0.	0.	0.	0.02	0.	0.
1985	0.	0.	0.	0.02	0.	0.
1986	0.	0.	0.	0.02	0.	0.
1987	0.	0.	0.	0.02	0.	0.
1988	0.	0.	0.	0.02	0.	0.
1989	0.	0.	0.	0.02	0.	0.
1990	0.	0.	0.	0.02	0.	0.
1991	0.	0.	0.	0.02	0.	0.
1992	0.	0.	0.	0.02	0.	0.
1993	0.	0.	0.	0.02	0.	0.
1994	0.	0.	0.	0.02	0.	0.
1995	0.	0.	0.	0.02	0.	0.
1996	0.	0.	0.	0.02	0.	0.
1997	0.	0.	0.	0.02	0.	0.
1998	0.	0.	0.	0.02	0.	0.
1999	0.	0.	0.	0.02	0.	0.
2000	0.	0.	0.	0.02	0.	0.
2001	0.	0.	0.	0.02	0.	0.
2002	0.	0.	0.	0.02	0.	0.
2003	0.	0.	0.	0.02	0.	0.
2004	0.	0.	0.	0.02	0.	0.
2005	0.	0.	0.	0.02	0.	0.
2006	0.	0.	0.	0.02	0.	0.
2007	0.	0.	0.	0.02	0.	0.
2008	0.	0.	0.	0.02	0.	0.
2009	0.	0.	0.	0.02	0.	0.
2010	0.	0.	0.	0.02	0.	0.

	OMU5	OMU6	OMU7	OMU8	OMU9	PCNC1
1983	0.	0.	0.	0.01	0.1	0.15
1984	0.	0.	0.	0.01	0.1	0.15
1985	0.	0.	0.	0.01	0.1	0.15
1986	0.	0.	0.	0.01	0.1	0.15
1987	0.	0.	0.	0.01	0.1	0.15
1988	0.	0.	0.	0.01	0.1	0.15
1989	0.	0.	0.	0.01	0.1	0.15
1990	0.	0.	0.	0.01	0.1	0.15
1991	0.	0.	0.	0.01	0.1	0.15
1992	0.	0.	0.	0.01	0.1	0.15
1993	0.	0.	0.	0.01	0.1	0.15
1994	0.	0.	0.	0.01	0.1	0.15
1995	0.	0.	0.	0.01	0.1	0.15
1996	0.	0.	0.	0.01	0.1	0.15
1997	0.	0.	0.	0.01	0.1	0.15
1998	0.	0.	0.	0.01	0.1	0.15
1999	0.	80.	0.	0.01	0.1	0.15
2000	0.	0.	0.	0.01	0.1	0.15
2001	0.	0.	0.	0.01	0.1	0.15
2002	0.	0.	0.	0.01	0.1	0.15
2003	0.	0.	0.	0.01	0.1	0.15
2004	0.	0.	0.	0.01	0.1	0.15
2005	0.	0.	0.	0.01	0.1	0.15
2006	0.	0.	0.	0.01	0.1	0.15
2007	0.	0.	0.	0.01	0.1	0.15
2008	0.	0.	0.	0.01	0.1	0.15
2009	0.	0.	0.	0.01	0.1	0.15
2010	0.	0.	0.	0.01	0.1	0.15

	PCNC2	PCNC3	PCOLART	PDRATIO6	PDUSCPI6	PIPADJ
1983	0.15	0.15	0.25	1.234	297.	1.62
1984	0.15	0.15	0.25	0.	0.	1.62
1985	0.15	0.15	0.25	0.	0.	1.62
1986	0.15	0.15	0.25	0.	0.	1.62
1987	0.15	0.15	0.25	0.	0.	1.62
1988	0.15	0.15	0.25	0.	0.	1.62
1989	0.15	0.15	0.25	0.	0.	1.62
1990	0.15	0.15	0.25	0.	0.	1.62
1991	0.15	0.15	0.25	0.	0.	1.62
1992	0.15	0.15	0.25	0.	0.	1.62
1993	0.15	0.15	0.25	0.	0.	1.62
1994	0.15	0.15	0.25	0.	0.	1.62
1995	0.15	0.15	0.25	0.	0.	1.62
1996	0.15	0.15	0.25	0.	0.	1.62
1997	0.15	0.15	0.25	0.	0.	1.62
1998	0.15	0.15	0.25	0.	0.	1.62
1999	0.15	0.15	0.25	0.	0.	1.62
2000	0.15	0.15	0.25	0.	0.	1.62
2001	0.15	0.15	0.25	0.	0.	1.62
2002	0.15	0.15	0.25	0.	0.	1.62
2003	0.15	0.15	0.25	0.	0.	1.62
2004	0.15	0.15	0.25	0.	0.	1.62
2005	0.15	0.15	0.25	0.	0.	1.62
2006	0.15	0.15	0.25	0.	0.	1.62
2007	0.15	0.15	0.25	0.	0.	1.62
2008	0.15	0.15	0.25	0.	0.	1.62
2009	0.15	0.15	0.25	0.	0.	1.62
2010	0.15	0.15	0.25	0.	0.	1.62

	PITRAN6	PR.DPIU6	P9PTPER	RCDEP1	RCDEP10	RCDEP11
1983	0.	3350.	0.75	0.055	0.055	0.
1984	0.	0.	0.75	0.055	0.055	0.
1985	0.	0.	0.75	0.055	0.055	0.
1986	0.	0.	0.75	0.055	0.055	0.
1987	0.	0.	0.75	0.055	0.055	0.
1988	0.	0.	0.75	0.055	0.055	0.
1989	0.	0.	0.75	0.055	0.055	0.
1990	0.	0.	0.75	0.055	0.055	0.
1991	0.	0.	0.75	0.055	0.055	0.
1992	0.	0.	0.75	0.055	0.055	0.
1993	0.	0.	0.75	0.055	0.055	0.
1994	0.	0.	0.75	0.055	0.055	0.
1995	0.	0.	0.75	0.055	0.055	0.
1996	0.	0.	0.75	0.055	0.055	0.
1997	0.	0.	0.75	0.055	0.055	0.
1998	0.	0.	0.75	0.055	0.055	0.
1999	0.	0.	0.75	0.055	0.055	0.
2000	0.	0.	0.75	0.055	0.055	0.
2001	0.	0.	0.75	0.055	0.055	0.
2002	0.	0.	0.75	0.055	0.055	0.
2003	0.	0.	0.75	0.055	0.055	0.
2004	0.	0.	0.75	0.055	0.055	0.
2005	0.	0.	0.75	0.055	0.055	0.
2006	0.	0.	0.75	0.055	0.055	0.
2007	0.	0.	0.75	0.055	0.055	0.
2008	0.	0.	0.75	0.055	0.055	0.
2009	0.	0.	0.75	0.055	0.055	0.
2010	0.	0.	0.75	0.055	0.055	0.

	RCDEP12	RCDEP13	RCDEP14	RCDEP2	RCDEP3	RCDEP5
1983	0.	0.	0.	0.05	0.055	0.
1984	0.	0.	0.	0.05	0.055	0.
1985	0.	0.	0.	0.05	0.055	0.
1986	0.	0.	0.	0.05	0.055	0.
1987	0.	0.	0.	0.05	0.055	0.
1988	0.	0.	0.	0.05	0.055	0.
1989	0.	0.	0.	0.05	0.055	0.
1990	0.	0.	0.	0.05	0.055	0.
1991	0.	0.	0.	0.05	0.055	0.
1992	0.	0.	0.	0.05	0.055	0.
1993	0.	0.	0.	0.05	0.055	0.
1994	0.	0.	0.	0.05	0.055	0.
1995	0.	0.	0.	0.05	0.055	0.
1996	0.	0.	0.	0.05	0.055	0.
1997	0.	0.	0.	0.05	0.055	0.
1998	0.	0.	0.	0.05	0.055	0.
1999	0.	0.	0.	0.05	0.055	0.
2000	0.	0.	0.	0.05	0.055	0.
2001	0.	0.	0.	0.05	0.055	0.
2002	0.	0.	0.	0.05	0.055	0.
2003	0.	0.	0.	0.05	0.055	0.
2004	0.	0.	0.	0.05	0.055	0.
2005	0.	0.	0.	0.05	0.055	0.
2006	0.	0.	0.	0.05	0.055	0.
2007	0.	0.	0.	0.05	0.055	0.
2008	0.	0.	0.	0.05	0.055	0.
2009	0.	0.	0.	0.05	0.055	0.
2010	0.	0.	0.	0.05	0.055	0.

	RCDEP6	RCDEP7	RCDEP8	RCDEP9	REPF1	REPF10
1983	0.04	0.1	0.02	0.04	0.	0.
1984	0.04	0.1	0.02	0.04	0.	0.
1985	0.04	0.1	0.02	0.04	0.	0.
1986	0.04	0.1	0.02	0.04	0.	0.
1987	0.04	0.1	0.02	0.04	0.	0.
1988	0.04	0.1	0.02	0.04	0.	0.
1989	0.04	0.1	0.02	0.04	0.	0.
1990	0.04	0.1	0.02	0.04	0.	0.
1991	0.04	0.1	0.02	0.04	0.	0.
1992	0.04	0.1	0.02	0.04	0.	0.
1993	0.04	0.1	0.02	0.04	0.	0.
1994	0.04	0.1	0.02	0.04	0.	0.
1995	0.04	0.1	0.02	0.04	0.	0.
1996	0.04	0.1	0.02	0.04	0.	0.
1997	0.04	0.1	0.02	0.04	0.	0.
1998	0.04	0.1	0.02	0.04	0.	0.
1999	0.04	0.1	0.02	0.04	0.	0.
2000	0.04	0.1	0.02	0.04	0.	0.
2001	0.04	0.1	0.02	0.04	0.	0.
2002	0.04	0.1	0.02	0.04	0.	0.
2003	0.04	0.1	0.02	0.04	0.	0.
2004	0.04	0.1	0.02	0.04	0.	0.
2005	0.04	0.1	0.02	0.04	0.	0.
2006	0.04	0.1	0.02	0.04	0.	0.
2007	0.04	0.1	0.02	0.04	0.	0.
2008	0.04	0.1	0.02	0.04	0.	0.
2009	0.04	0.1	0.02	0.04	0.	0.
2010	0.04	0.1	0.02	0.04	0.	0.

	REPF11	REPF12	REPF13	REPF14	REPF15	REPF2
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	REPF3	REPF4	REPF5	REPF6	REPF7	REPF8
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	REPF9	REPL1	REPL10	REPL11	REPL12	REPL13
1983	0.	0.	0.055	0.	0.	0.
1984	0.	0.	0.055	0.	0.	0.
1985	0.	0.	0.055	0.	0.	0.
1986	0.	0.	0.055	0.	0.	0.
1987	0.	0.	0.055	0.	0.	0.
1988	0.	0.	0.055	0.	0.	0.
1989	0.	0.	0.055	0.	0.	0.
1990	0.	0.	0.055	0.	0.	0.
1991	0.	0.	0.055	0.	0.	0.
1992	0.	0.	0.055	0.	0.	0.
1993	0.	0.	0.055	0.	0.	0.
1994	0.	0.	0.055	0.	0.	0.
1995	0.	0.	0.055	0.	0.	0.
1996	0.	0.	0.055	0.	0.	0.
1997	0.	0.	0.055	0.	0.	0.
1998	0.	0.	0.055	0.	0.	0.
1999	0.	0.	0.055	0.	0.	0.
2000	0.	0.	0.055	0.	0.	0.
2001	0.	0.	0.055	0.	0.	0.
2002	0.	0.	0.055	0.	0.	0.
2003	0.	0.	0.055	0.	0.	0.
2004	0.	0.	0.055	0.	0.	0.
2005	0.	0.	0.055	0.	0.	0.
2006	0.	0.	0.055	0.	0.	0.
2007	0.	0.	0.055	0.	0.	0.
2008	0.	0.	0.055	0.	0.	0.
2009	0.	0.	0.055	0.	0.	0.
2010	0.	0.	0.055	0.	0.	0.

	REPL14	REPL15	REPL2	REPL3	REPL4	REPL5
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	REPL6	REPL7	REPL8	REPL9	REPS1	REPS10
1983	0.	0.	0.	0.	0.055	0.
1984	0.	0.	0.	0.	0.055	0.
1985	0.	0.	0.	0.	0.055	0.
1986	0.	0.	0.	0.	0.055	0.
1987	0.	0.	0.	0.	0.055	0.
1988	0.	0.	0.	0.	0.055	0.
1989	0.	0.	0.	0.	0.055	0.
1990	0.	0.	0.	0.	0.055	0.
1991	0.	0.	0.	0.	0.055	0.
1992	0.	0.	0.	0.	0.055	0.
1993	0.	0.	0.	0.	0.055	0.
1994	0.	0.	0.	0.	0.055	0.
1995	0.	0.	0.	0.	0.055	0.
1996	0.	0.	0.	0.	0.055	0.
1997	0.	0.	0.	0.	0.055	0.
1998	0.	0.	0.	0.	0.055	0.
1999	0.	0.	0.	0.	0.055	0.
2000	0.	0.	0.	0.	0.055	0.
2001	0.	0.	0.	0.	0.055	0.
2002	0.	0.	0.	0.	0.055	0.
2003	0.	0.	0.	0.	0.055	0.
2004	0.	0.	0.	0.	0.055	0.
2005	0.	0.	0.	0.	0.055	0.
2006	0.	0.	0.	0.	0.055	0.
2007	0.	0.	0.	0.	0.055	0.
2008	0.	0.	0.	0.	0.055	0.
2009	0.	0.	0.	0.	0.055	0.
2010	0.	0.	0.	0.	0.055	0.

	REPS11	REPS12	REPS13	REPS14	REPS15	REPS2
1983	0.	0.	0.	0.	0.	0.05
1984	0.	0.	0.	0.	0.	0.05
1985	0.	0.	0.	0.	0.	0.05
1986	0.	0.	0.	0.	0.	0.05
1987	0.	0.	0.	0.	0.	0.05
1988	0.	0.	0.	0.	0.	0.05
1989	0.	0.	0.	0.	0.	0.05
1990	0.	0.	0.	0.	0.	0.05
1991	0.	0.	0.	0.	0.	0.05
1992	0.	0.	0.	0.	0.	0.05
1993	0.	0.	0.	0.	0.	0.05
1994	0.	0.	0.	0.	0.	0.05
1995	0.	0.	0.	0.	0.	0.05
1996	0.	0.	0.	0.	0.	0.05
1997	0.	0.	0.	0.	0.	0.05
1998	0.	0.	0.	0.	0.	0.05
1999	0.	0.	0.	0.	0.	0.05
2000	0.	0.	0.	0.	0.	0.05
2001	0.	0.	0.	0.	0.	0.05
2002	0.	0.	0.	0.	0.	0.05
2003	0.	0.	0.	0.	0.	0.05
2004	0.	0.	0.	0.	0.	0.05
2005	0.	0.	0.	0.	0.	0.05
2006	0.	0.	0.	0.	0.	0.05
2007	0.	0.	0.	0.	0.	0.05
2008	0.	0.	0.	0.	0.	0.05
2009	0.	0.	0.	0.	0.	0.05
2010	0.	0.	0.	0.	0.	0.05

	REPS3	REPS4	REPS5	REPS6	REPS7	REPS8
1983	0.055	0.	0.	0.04	0.1	0.
1984	0.055	0.	0.	0.04	0.1	0.
1985	0.055	0.	0.	0.04	0.1	0.
1986	0.055	0.	0.	0.04	0.1	0.
1987	0.055	0.	0.	0.04	0.1	0.
1988	0.055	0.	0.	0.04	0.1	0.
1989	0.055	0.	0.	0.04	0.1	0.
1990	0.055	0.	0.	0.04	0.1	0.
1991	0.055	0.	0.	0.04	0.1	0.
1992	0.055	0.	0.	0.04	0.1	0.
1993	0.055	0.	0.	0.04	0.1	0.
1994	0.055	0.	0.	0.04	0.1	0.
1995	0.055	0.	0.	0.04	0.1	0.
1996	0.055	0.	0.	0.04	0.1	0.
1997	0.055	0.	0.	0.04	0.1	0.
1998	0.055	0.	0.	0.04	0.1	0.
1999	0.055	0.	0.	0.04	0.1	0.
2000	0.055	0.	0.	0.04	0.1	0.
2001	0.055	0.	0.	0.04	0.1	0.
2002	0.055	0.	0.	0.04	0.1	0.
2003	0.055	0.	0.	0.04	0.1	0.
2004	0.055	0.	0.	0.04	0.1	0.
2005	0.055	0.	0.	0.04	0.1	0.
2006	0.055	0.	0.	0.04	0.1	0.
2007	0.055	0.	0.	0.04	0.1	0.
2008	0.055	0.	0.	0.04	0.1	0.
2009	0.055	0.	0.	0.04	0.1	0.
2010	0.055	0.	0.	0.04	0.1	0.

	REPS9	REPU1	REPU10	REPU11	REPU12	REPU13
1983	0.04	0.	0.	0.	0.	0.
1984	0.04	0.	0.	0.	0.	0.
1985	0.04	0.	0.	0.	0.	0.
1986	0.04	0.	0.	0.	0.	0.
1987	0.04	0.	0.	0.	0.	0.
1988	0.04	0.	0.	0.	0.	0.
1989	0.04	0.	0.	0.	0.	0.
1990	0.04	0.	0.	0.	0.	0.
1991	0.04	0.	0.	0.	0.	0.
1992	0.04	0.	0.	0.	0.	0.
1993	0.04	0.	0.	0.	0.	0.
1994	0.04	0.	0.	0.	0.	0.
1995	0.04	0.	0.	0.	0.	0.
1996	0.04	0.	0.	0.	0.	0.
1997	0.04	0.	0.	0.	0.	0.
1998	0.04	0.	0.	0.	0.	0.
1999	0.04	0.	0.	0.	0.	0.
2000	0.04	0.	0.	0.	0.	0.
2001	0.04	0.	0.	0.	0.	0.
2002	0.04	0.	0.	0.	0.	0.
2003	0.04	0.	0.	0.	0.	0.
2004	0.04	0.	0.	0.	0.	0.
2005	0.04	0.	0.	0.	0.	0.
2006	0.04	0.	0.	0.	0.	0.
2007	0.04	0.	0.	0.	0.	0.
2008	0.04	0.	0.	0.	0.	0.
2009	0.04	0.	0.	0.	0.	0.
2010	0.04	0.	0.	0.	0.	0.

	REPU14	REPU15	REPU2	REPU3	REPU4	REPU5
1983	0.	0.	0.	0.	0.	0.
1984	0.	0.	0.	0.	0.	0.
1985	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	REPU6	REPU7	REPU8	REPU9	RLPTX	RLTEB6
1983	0.	0.	0.02	0.	0.	10.
1984	0.	0.	0.02	0.	0.	0.
1985	0.	0.	0.02	0.	0.	0.
1986	0.	0.	0.02	0.	0.	0.
1987	0.	0.	0.02	0.	0.	0.
1988	0.	0.	0.02	0.	0.	0.
1989	0.	0.	0.02	0.	0.	0.
1990	0.	0.	0.02	0.	0.	0.
1991	0.	0.	0.02	0.	0.	0.
1992	0.	0.	0.02	0.	0.	0.
1993	0.	0.	0.02	0.	0.	0.
1994	0.	0.	0.02	0.	0.	0.
1995	0.	0.	0.02	0.	0.	0.
1996	0.	0.	0.02	0.	0.	0.
1997	0.	0.	0.02	0.	0.	0.
1998	0.	0.	0.02	0.	0.	0.
1999	0.	0.	0.02	0.	0.	0.
2000	0.	0.	0.02	0.	0.	0.
2001	0.	0.	0.02	0.	0.	0.
2002	0.	0.	0.02	0.	0.	0.
2003	0.	0.	0.02	0.	0.	0.
2004	0.	0.	0.02	0.	0.	0.
2005	0.	0.	0.02	0.	0.	0.
2006	0.	0.	0.02	0.	0.	0.
2007	0.	0.	0.02	0.	0.	0.
2008	0.	0.	0.02	0.	0.	0.
2009	0.	0.	0.02	0.	0.	0.
2010	0.	0.	0.02	0.	0.	0.

	RLTFPX	RLTMA6	RLTMCAP	RLTRS6	RLTX	RMISRES6
1983	0.	71.	333.3	56.	0.	34.797
1984	0.	0.	300.	0.	0.	0.
1985	0.	0.	200.	0.	0.	0.
1986	0.	0.	100.	0.	0.	0.
1987	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	0.
1991	0.	0.	0.	0.	0.	0.
1992	0.	0.	0.	0.	0.	0.
1993	0.	0.	0.	0.	0.	0.
1994	0.	0.	0.	0.	0.	0.
1995	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.
1997	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.
1999	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	0.
2002	0.	0.	0.	0.	0.	0.
2003	0.	0.	0.	0.	0.	0.
2004	0.	0.	0.	0.	0.	0.
2005	0.	0.	0.	0.	0.	0.
2006	0.	0.	0.	0.	0.	0.
2007	0.	0.	0.	0.	0.	0.
2008	0.	0.	0.	0.	0.	0.
2009	0.	0.	0.	0.	0.	0.
2010	0.	0.	0.	0.	0.	0.

	RNATX	RPBS	RPEN	RPPS	RPRY	RPTS
1983	0.07		5.7			
1984	0.07		7.9			
1985	0.07		8.			
1986	0.07	F	8.	F	F	F
1987	0.07	R	8.	R	R	R
1988	0.07	O	8.	O	O	O
1989	0.07	M	8.	M	M	M
1990	0.07		8.			
		S		S	S	S
1991	0.07	C	9.	C	C	C
1992	0.07	E	9.	E	E	E
1993	0.07	N	9.	N	N	N
1994	0.07	A	9.	A	A	A
1995	0.07	R	9.	R	R	R
		I		I	I	I
1996	0.07	O	10.	O	O	O
1997	0.07		10.			
1998	0.07	G	10.	G	G	G
1999	0.07	E	10.	E	E	E
2000	0.07	N	10.	N	N	N
		E		E	E	E
2001	0.07	R	11.	R	R	R
2002	0.07	A	11.	A	A	A
2003	0.07	T	11.	T	T	T
2004	0.07	O	11.	O	O	O
2005	0.07	R	11.	R	R	R
2006	0.07		12.			
2007	0.07		12.			
2008	0.07		12.			
2009	0.07		12.			
2010	0.07		12.			

	RP9X	RSFDNCAX	RSFDNPX	RSFDNX	RSFDN6	RSIG6
1983	0.	20.438	23.	0.	184.917	266.3
1984	0.	20.	24.	0.	0.	0.
1985	0.	20.	25.	0.	0.	0.
1986	0.	20.	26.	0.	0.	0.
1987	0.	20.	27.	0.	0.	0.
1988	0.	20.	28.	0.	0.	0.
1989	0.	20.	29.	0.	0.	0.
1990	0.	20.	30.	0.	0.	0.
1991	0.	25.	31.	0.	0.	0.
1992	0.	25.	32.	0.	0.	0.
1993	0.	25.	33.	0.	0.	0.
1994	0.	25.	34.	0.	0.	0.
1995	0.	25.	45.	0.	0.	0.
1996	0.	25.	56.	0.	0.	0.
1997	0.	25.	57.	0.	0.	0.
1998	0.	25.	58.	0.	0.	0.
1999	0.	25.	59.	0.	0.	0.
2000	0.	25.	60.	0.	0.	0.
2001	0.	30.	61.	0.	0.	0.
2002	0.	30.	62.	0.	0.	0.
2003	0.	30.	63.	0.	0.	0.
2004	0.	30.	64.	0.	0.	0.
2005	0.	30.	65.	0.	0.	0.
2006	0.	30.	66.	0.	0.	0.
2007	0.	30.	67.	0.	0.	0.
2008	0.	30.	68.	0.	0.	0.
2009	0.	30.	69.	0.	0.	0.
2010	0.	30.	70.	0.	0.	0.

	RSIP5	RTCSPX	RTCSX	RTISXX	RTOTS6	SANCSA
1983	255.		0.	0.	25.6	0.
1984	188.		0.	0.	23.4	0.
1985	0.		0.	0.	0.	0.
1986	0.	F	0.	0.	0.	0.
1987	0.	R	0.	0.	0.	0.
1988	0.	O	0.	0.	0.	0.
1989	0.	M	0.	0.	0.	0.
1990	0.		0.	0.	0.	0.
		S				
1991	0.	C	0.	0.	0.	0.
1992	0.	E	0.	0.	0.	0.
1993	0.	N	0.	0.	0.	0.
1994	0.	A	0.	0.	0.	0.
1995	0.	R	0.	0.	0.	0.
		I				
1996	0.	O	0.	0.	0.	0.
1997	0.		0.	0.	0.	0.
1998	0.	G	0.	0.	0.	0.
1999	0.	E	0.	0.	0.	0.
2000	0.	N	0.	0.	0.	0.
		E				
2001	0.	R	0.	0.	0.	0.
2002	0.	A	0.	0.	0.	0.
2003	0.	T	0.	0.	0.	0.
2004	0.	O	0.	0.	0.	0.
2005	0.	R	0.	0.	0.	0.
2006	0.		0.	0.	0.	0.
2007	0.		0.	0.	0.	0.
2008	0.		0.	0.	0.	0.
2009	0.		0.	0.	0.	0.
2010	0.		0.	0.	0.	0.

	SANCSAX	TCRED	TOURIST	TXBASE	TXCRPC	TXPTXX
1983	0.	0.		0.	0.	0.
1984	0.	0.		0.	0.	0.
1985	0.	0.		0.	0.	0.
1986	0.	0.	F	0.	0.	0.
1987	0.	0.	R	0.	0.	0.
1988	0.	0.	O	0.	0.	0.
1989	0.	0.	M	0.	0.	0.
1990	0.	0.		0.	0.	0.
			S			
1991	0.	0.	C	0.	0.	0.
1992	0.	0.	E	0.	0.	0.
1993	0.	0.	N	0.	0.	0.
1994	0.	0.	A	0.	0.	0.
1995	0.	0.	R	0.	0.	0.
			I			
1996	0.	0.	O	0.	0.	0.
1997	0.	0.		0.	0.	0.
1998	0.	0.	G	0.	0.	0.
1999	0.	0.	E	0.	0.	0.
2000	0.	0.	N	0.	0.	0.
			E			
2001	0.	0.	R	0.	0.	0.
2002	0.	0.	A	0.	0.	0.
2003	0.	0.	T	0.	0.	0.
2004	0.	0.	O	0.	0.	0.
2005	0.	0.	R	0.	0.	0.
2006	0.	0.		0.	0.	0.
2007	0.	0.		0.	0.	0.
2008	0.	0.		0.	0.	0.
2009	0.	0.		0.	0.	0.
2010	0.	0.		0.	0.	0.

	TXRT	UUS	VAEX6	WEUS6	XXMX1	YR
1983	0.	0.12	1000.	280.	0.	1983.
1984	0.	0.1	0.	0.	0.	1984.
1985	0.	0.08	0.	0.	0.	1985.
1986	0.	0.07	0.	0.	0.	1986.
1987	0.	0.06	0.	0.	0.	1987.
1988	0.	0.06	0.	0.	0.	1988.
1989	0.	0.06	0.	0.	0.	1989.
1990	0.	0.06	0.	0.	0.	1990.
1991	0.	0.06	0.	0.	0.	1991.
1992	0.	0.06	0.	0.	0.	1992.
1993	0.	0.06	0.	0.	0.	1993.
1994	0.	0.06	0.	0.	0.	1994.
1995	0.	0.06	0.	0.	0.	1995.
1996	0.	0.06	0.	0.	0.	1996.
1997	0.	0.06	0.	0.	0.	1997.
1998	0.	0.06	0.	0.	0.	1998.
1999	0.	0.06	0.	0.	0.	1999.
2000	0.	0.06	0.	0.	0.	2000.
2001	0.	0.06	0.	0.	0.	2001.
2002	0.	0.06	0.	0.	0.	2002.
2003	0.	0.06	0.	0.	0.	2003.
2004	0.	0.06	0.	0.	0.	2004.
2005	0.	0.06	0.	0.	0.	2005.
2006	0.	0.06	0.	0.	0.	2006.
2007	0.	0.06	0.	0.	0.	2007.
2008	0.	0.06	0.	0.	0.	2008.
2009	0.	0.06	0.	0.	0.	2009.
2010	0.	0.06	0.	0.	0.	2010.

APPENDIX E
ISER MAP ALASKA ECONOMIC MODEL: STARTUP VALUES

ADMSD	1982	91.656	NA
AEX	1982	0.4	NA
AGI	1982	5500.	NA
AHG	1982	1.	NA
ATD	1982	800.	NA
ATI	1982	5000.	NA
ATI.TT	1982	10.	NA
ATT	1982	340.	NA
BALCAP84	1982	0.	0.
BALDF	1982	0.	0.
BALGFAFA	1982	-1417.5	-138.9
BALGFCP	1982	0.	NA
BALGFP	1982	0.	NA
BALGF9	1982	2668.6	2315.7
BALPF	1982	3212.8	4375.
BAL99	1982	5881.4	6690.7
BAL99AFA	1982	1795.3	4236.1
BIU	1982	38.6	42.5
BL	1982	36.	NA
CEA9N	1982	0.034	NA
CECMN	1982	0.012	NA
CECNN	1982	0.072	NA
CED9N	1982	0.12	NA
CEFIN	1982	0.015	NA
CEGAN	1982	0.197	NA
CEGFN	1982	0.207	NA
CEM9N	1982	0.093	NA
CEPUN	1982	0.018	NA
CEP9N	1982	0.021	NA
CES9N	1982	0.152	NA
CET9N	1982	0.06	NA
CNNPF1	1982	3.36	NA
CNNPF10	1982	10.475	NA
CNNPF11	1982	8.249	NA
CNNPF12	1982	5.845	NA

SOURCE: Dset A85.1

CNNPF13	1982	5.282	NA
CNNPF14	1982	3.387	NA
CNNPF15	1982	5.264	NA
CNNPF2	1982	11.405	NA
CNNPF3	1982	13.5	NA
CNNPF4	1982	12.091	NA
CNNPF5	1982	12.71	NA
CNNPF6	1982	20.05	NA
CNNPF7	1982	20.021	NA
CNNPF8	1982	18.981	NA
CNNPF9	1982	14.083	NA
CNNPM1	1982	3.6	NA
CNNPM10	1982	13.206	NA
CNNPM11	1982	10.267	NA
CNNPM12	1982	7.372	NA
CNNPM13	1982	6.324	NA
CNNPM14	1982	4.514	NA
CNNPM15	1982	5.31	NA
CNNPM2	1982	12.225	NA
CNNPM3	1982	14.215	NA
CNNPM4	1982	12.856	NA
CNNPM5	1982	14.595	NA
CNNPM6	1982	18.533	NA
CNNPM7	1982	21.764	NA
CNNPM8	1982	21.186	NA
CNNPM9	1982	16.103	NA
COLA	1982	70.	NA
DEBTP83	1982	0.	0.
DF.RSVP	1982	0.	NA
DPI	1982	6094.73	NA
DPIRES	1982	74.548	NA
DPI8	1982	6525.59	NA
ELBD	1982	160.	NA
ELED	1982	400.	NA
ELEDCP	1982	110.	NA
ELED1	1982	112.	NA
ELNED1	1982	600.	NA
ELPERS	1982	450.	NA
EL99	1982	1200.	NA
EMAFISH	1982	0.21	NA

EMA9	1982	2.003	NA
EMCM	1982	4.491	NA
EMCN	1982	16.778	NA
EMCNRT	1982	0.	NA
EMCNX	1982	0.	NA
EMCN1	1982	16.778	NA
EMDR	1982	30.341	NA
EMDRNT	1982	28.041	NA
EMDTOUR	1982	2.3	NA
EMDW	1982	7.205	NA
EMD9	1982	37.546	NA
EMFI	1982	9.054	NA
EMGA	1982	40.901	NA
EMGF	1982	39.744	NA
EMGL	1982	22.906	NA
EMGS	1982	17.995	NA
EMMO	1982	2.832	NA
EMM9	1982	12.656	NA
EMPRO	1982	18.944	NA
EMPROFIS	1982	7.5	NA
EMPRO1	1982	10.6	NA
EMPU	1982	1.553	NA
EMRATE	1982	0.498	NA
EMRATN1	1982	0.17	NA
EMSB	1982	6.894	NA
EMSP	1982	100.613	NA
EMSTOUR	1982	2.5	NA
EMSUP	1982	82.293	NA
EMS8NT	1982	25.362	NA
EMS9	1982	35.693	NA
EMS91	1982	34.756	NA
EMTCU	1982	18.32	NA
EMTNT	1982	9.976	NA
EMTOUR	1982	6.	NA
EMTTOUR	1982	1.2	NA
EMT9	1982	12.276	NA
EMT91	1982	11.176	NA
EMX	1982	8.946	NA
EM9INFR	1982	39.692	NA
EM96	1982	218.489	NA

EM97	1982	199.545	NA
EM98	1982	221.648	NA
EM99	1982	240.592	NA
EXANSAV	1982	0.	NA
EXCAP	1982	944.515	1324.53
EXCAPFR	1982	0.	NA
EXCDS	1982	170.	NA
EXCDSNT	1982	55.	NA
EXCDS4	1982	170.	NA
EXCPS	1982	267.398	238.183
EXCPSFED	1982	105.021	110.491
EXCPSHY	1982	150.115	165.403
EXCPSM	1982	0.	0.
EXCPSNH	1982	117.283	72.78
EXC10	1982	0.	NA
EXC15	1982	0.	NA
EXC4	1982	0.	NA
EXC5	1982	0.	NA
EXC7	1982	0.	NA
EXDFCON	1982	0.	NA
EXDFWITH	1982	0.	NA
EXDSS	1982	102.325	143.624
EXEDS	1982	600.	NA
EXEDS4	1982	600.	NA
EXGF	1982	6852.71	NA
EXGFBM	1982	6648.	NA
EXGFCHY	1982	140.017	202.041
EXGFCNH	1982	343.1	276.
EXGFCOT	1982	194.	608.305
EXGGS	1982	120.	NA
EXGGS4	1982	120.	NA
EXHES	1982	130.	NA
EXHES4	1982	130.	NA
EXINREC	1982	216.396	217.197
EXINRECB	1982	72.636	136.995
EXJUS	1982	110.	NA
EXJUS4	1982	110.	NA
EXLIM	1982	0.	0.
EXLIMOK	1982	0.	0.
EXNOPS	1982	5141.89	NA

EXNRS	1982	110.	NA
EXNRS4	1982	110.	NA
EXOPS	1982	1933.9	NA
EXPFCON	1982	1370.6	1037.7
EXPFCON1	1982	641.7	745.6
EXPPS	1982	34.	NA
EXPPS4	1982	34.	NA
EXPRCDS	1982	10.	NA
EXPREDS1	1982	15.	NA
EXPRGGS	1982	50.	NA
EXPRHES	1982	30.	NA
EXPRJUS	1982	70.	NA
EXPRNRS	1982	70.	NA
EXPRPPS	1982	20.	NA
EXPRSSS	1982	45.	NA
EXPRTRS	1982	100.	NA
EXPRUA	1982	130.	NA
EXPR99	1982	600.	NA
EXSAVS	1982	0.	NA
EXSSS	1982	170.	NA
EXSSS4	1982	170.	NA
EXSUBS	1982	634.	NA
EXTRNS	1982	425.	NA
EXTRS	1982	170.	NA
EXTRS4	1982	170.	NA
EXUA	1982	180.	NA
EX99S	1982	7075.8	NA
FAGI	1982	5500.	NA
FAGII	1982	5000.	NA
G.EMSP	1982	0.109	NA
GOBONDL	1982	1200.	NA
GODT	1982	842.413	946.183
GR	1982	17000.	NA
GTR	1982	14000.	NA
IM.BAL	1982	0.	NA
IM.BALRV	1982	0.	NA
LPTB	1982	14000.	NA
LPTB1	1982	14000.	NA
MIGIN	1982	41.344	NA
MIGOUT	1982	-22.03	NA

MILPCT	1982	0.948	NA
NATPF1	1982	1.102	NA
NATPF10	1982	1.529	NA
NATPF11	1982	1.341	NA
NATPF12	1982	1.143	NA
NATPF13	1982	0.928	NA
NATPF14	1982	0.736	NA
NATPF15	1982	1.616	NA
NATPF2	1982	3.305	NA
NATPF3	1982	3.462	NA
NATPF4	1982	3.541	NA
NATPF5	1982	3.879	NA
NATPF6	1982	3.648	NA
NATPF7	1982	3.063	NA
NATPF8	1982	2.438	NA
NATPF9	1982	1.937	NA
NATPM1	1982	1.161	NA
NATPM10	1982	1.557	NA
NATPM11	1982	1.382	NA
NATPM12	1982	1.181	NA
NATPM13	1982	0.981	NA
NATPM14	1982	0.714	NA
NATPM15	1982	1.538	NA
NATPM2	1982	3.505	NA
NATPM3	1982	3.609	NA
NATPM4	1982	3.673	NA
NATPM5	1982	4.01	NA
NATPM6	1982	3.668	NA
NATPM7	1982	3.062	NA
NATPM8	1982	2.45	NA
NATPM9	1982	1.947	NA
NCCAP	1982	424.	NA
NCCI	1982	148.	NA
NCPI	1982	22.	NA
P.DPINN	1982	10000.	10000.
PDCON	1982	633.398	NA
PDEXOPS	1982	406.	NA
PDRATIO	1982	1.262	NA
PDRPI	1982	364.23	366.938
PDUSCPI	1982	288.6	NA

PI	1982	7384.34	NA
PIDIR	1982	787.67	NA
PIOLI	1982	411.624	NA
PIPROF	1982	30.155	NA
PIPRO1	1982	172.819	NA
PIRADJ	1982	430.85	NA
PISSC	1982	362.139	NA
PITRAN	1982	837.461	NA
PITRAN1	1982	571.619	NA
PI3	1982	7384.34	NA
PI8	1982	7815.19	NA
POP	1982	460.8	NA
POPC	1982	438.7	NA
POPGER	1982	13.744	NA
POPM	1982	22.1	NA
POPMIG	1982	18.317	NA
POPNE	1982	74.775	NA
POPSKUL	1982	110.851	NA
PR.BALCP	1982	1400.	NA
PR.DPINN	1982	4308.	4200.
PR.DPIUS	1982	3248.44	NA
PR.PI	1982	4399.7	NA
PR.PI3	1982	4399.7	NA
R.BALCAP	1982	600.	NA
R.CAP1	1982	3000.	NA
R.CAP10	1982	271.	NA
R.CAP11	1982	0.	NA
R.CAP12	1982	0.	NA
R.CAP13	1982	0.	NA
R.CAP14	1982	0.	NA
R.CAP15	1982	764.	NA
R.CAP2	1982	333.	NA
R.CAP3	1982	250.	NA
R.CAP4	1982	0.	NA
R.CAP5	1982	3097.	NA
R.CAP6	1982	963.	NA
R.CAP7	1982	677.	NA
R.CAP8	1982	0.	NA
R.CAP9	1982	0.	NA
R.DPI	1982	1673.32	NA

R.DPI8N	1982	1791.61	NA
R.DPI8X	1982	0.	NA
R.WR97	1982	7594.36	NA
RLMC	1982	340.	NA
RLOT	1982	52.	NA
RLPT1	1982	200.	NA
RLTCS	1982	0.	NA
RLTCS4	1982	0.	NA
RLTEB	1982	10.	NA
RLTEB4	1982	10.	NA
RLTEF4	1982	340.826	415.211
RLTEO	1982	71.536	93.262
RLTEO4	1982	71.536	93.262
RLTET	1982	18.814	19.98
RLTET4	1982	18.814	19.98
RLTE99	1982	300.	NA
RLTE994	1982	300.	NA
RLTF	1982	80.	NA
RLTMA	1982	87.9	NA
RLTMA4	1982	87.9	NA
RLTMS	1982	50.	NA
RLTRS	1982	55.603	NA
RLTRS4	1982	55.603	NA
RLTT9	1982	95.757	NA
RLTT94	1982	95.757	NA
RLTVS4	1982	1.182	NA
RLT99	1982	450.	NA
RMIS	1982	29.	38.2
RMISRES	1982	16.739	34.797
ROFAS	1982	11.	NA
ROFERS	1982	20.	8.
ROFOS	1982	8.	NA
RSFDN	1982	187.968	184.917
RSFFS	1982	4.516	6.329
RSFS1	1982	3.297	2.821
RSGF	1982	4313.1	3850.71
RSGFBM	1982	4108.4	3631.
RSIAS	1982	31.12	30.969
RSIP	1982	317.	471.
RSIPGF	1982	71.1	109.5

RTAS	1982	9.	10.4
RTBS2	1982	12.	NA
RTCIS	1982	1.9	2.
RTCS1	1982	34.8	30.3
RTIS	1982	0.	0.
RTISC	1982	0.	0.
RTISCA1	1982	0.44	NA
RTISCA2	1982	0.44	NA
RTISCP	1982	68.189	NA
RTISLOS	1982	150.	NA
RTMF	1982	30.3	36.7
RTOTS	1982	26.3	25.6
RTPIF	1982	1146.86	NA
RTSS	1982	0.	0.
RTVS	1982	13.7	15.2
R99S	1982	4954.8	4596.31
TPTV	1982	260.	NA
VAEX	1982	1000.	NA
WEALTH	1982	4017.14	NA
WEUS	1982	266.9	NA
WRA9	1982	24375.4	NA
WRCM	1982	40266.5	NA
WRCN	1982	47174.6	NA
WRCNNP	1982	47174.6	NA
WRCNP	1982	0.	NA
WRDR	1982	15670.3	NA
WRDW	1982	29365.	NA
WRD9	1982	18298.3	NA
WRFI	1982	22956.7	NA
WRGA	1982	29442.5	NA
WRGC	1982	24246.2	NA
WRGF	1982	21279.5	NA
WRGL	1982	28365.8	NA
WRGM	1982	18911.7	NA
WRGS	1982	30812.9	NA
WRM91	1982	23461.1	NA
WRPU	1982	39452.	NA
WRP9	1982	50329.5	NA
WRSB	1982	24394.8	NA
WRSNB	1982	20618.1	NA

WRS9	1982	21347.6	NA
WRT9	1982	32682.7	NA
WR98	1982	26788.4	NA
WSCN	1982	791.496	NA
WSCNP	1982	0.	NA
WSGA	1982	1204.23	NA
WSGC	1982	427.727	NA
WSGL	1982	649.748	NA
WSGM	1982	418.005	NA
WSGS	1982	554.478	NA
WSGSFY	1982	575.	NA
WS97	1982	5519.6	NA
WS98	1982	5937.61	NA
XXA9	1982	93.938	NA
XXCM	1982	208.529	NA
XXCN	1982	188.342	NA
XXCN1	1982	188.342	NA
XXCN8	1982	152.251	NA
XXDR	1982	254.556	NA
XXDRNT	1982	290.016	NA
XXDW	1982	133.766	NA
XXD9	1982	388.323	NA
XXFI	1982	388.745	NA
XXGA	1982	344.316	NA
XXGF	1982	402.274	NA
XXMO	1982	50.498	NA
XXMX2	1982	223.407	NA
XXPU	1982	52.73	NA
XXP9	1982	1619.95	NA
XXSB	1982	77.31	NA
XXS8NT	1982	240.727	NA
XXS9	1982	350.98	NA
XXTNT	1982	177.919	NA
XXT9	1982	218.939	NA
XXVHY	1982	116.5	NA
XXVNHY	1982	112.1	NA
XX98	1982	4530.97	NA

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

Variable	Definition; Units	Historical Data Source[a]
ADMDIS	average daily membership in district schools; thousand	ADE, Annual Report
ADMREA	average daily membership in REAA schools; thousand	ADE, Annual Report
ADMSD	average daily membership in district and REAA schools; thousand	ADE, Annual Report
AEX	Alaskan personal income tax exemptions; million $	Constructed from IRS, Statistics of Income, ADL, Statistical Quarterly and unpublished data, and 1970 U.S. Census
AFTOT	total armed forces personnel in 1980	Alaska Air Command and Kruse, Design and Implementation of Alaska, 1980 Reapportionment Data Collection Effort
AGI	gross income reported on Alaskan state personal income tax returns; million $	Constructed from IRS, Statistics of Income, ADL, Statistical Quarterly 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 Native Land Claims, 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

Variable	Definition; Units	Historical Data Source[a]
APGF	state general fund appropriations; million $	-
APGFCAP	state general fund capital appropriations (not including subsidies); million $	-
APGFOPS	state general fund operating appropriations (not including debt service); million $	-
APPFCONX	state general fund appropriations to the Permanent Fund; million $	-
ATD	Alaska personal income tax deductions; million $	Constructed from IRS, Statistics of Income, ADL Statistical Quarterly and unpublished data, and 1970 U.S. Census
ATI	Alaska state personal income tax taxable income; million $	Constructed from IRS, Statistics of Income, ADL Statistical Quarterly 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 Statistics of Income and ADL Statistical Quarterly
BADD	birth adjustment factor to account for birth of Native children to non-Native women	-
BAL99	combined state fund balances; million $	ADA, Annual Financial Report
BAL99AFA	combined state fund balances available for appropriations; million $	ADA, Annual Financial Report
BALCAB	state general fund revenues minus general fund expenditures; million $	-
BALCABGF	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 $	-

Variable	Definition; Units	Historical Data Source[a]
BALDF6	initial state development fund (hypothetical) balance; million $	-
BALGF6	initial state general fund balance; million $	-
BALGF9	total state general fund balance; million $	ADA, Annual Financial Report
BALGFAFA	state general fund balance (available for appropriations); million $	ADA, Annual Financial Report
BALGFCP	positive change in general fund balance from year to year (if change negative, this takes zero value); million $	-
BALGFP	state general fund balance if positive; if state general fund balance negative, then zero; million $	-
BALGFUNA	state general fund balance unavailable for appropriation; million $	ADA, Annual Financial Report
BALLANDS	state plus local government current account balance; million $	-
BALOCAL	local government revenues minus nondebt financed expenditures; million $	-
BALPF	Permanent Fund balance; million $	ADA, Annual Financial Report
BALPF6	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	-

Variable	Definition; Units	Historical Data Source[a]
BASEXOPS	a base case vector of EXOPS values used for fiscal impact analysis in conjunction with fiscal policy variable EXRL4	-
BASPDRPI	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, Annual Report
BIU6	initial value of Basic Instructional Unit for School Foundation distribution program; thousand $	-
BL	Alaska business licenses issued; thousand	ADR, unpublished data
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 Statistical Quarterly 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	-

Variable	Definition; Units	Historical Data Source[a]
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	-
DEBTP83	sum of general obligation bonded debt incurred by the state after 1983; million $	-
DELEMP	annual change in civilian employment (EM96); thousand	-
DF.***	variable deflated to 1984 dollars (PDRPIBAS is base year index);	-
DFP.***	variable deflated to 1984 per capita dollars	-
DF.RSVP	cumulative discounted value of petroleum revenues received from 1984; million 1984 $	-
DPI	Alaska disposable personal income; million $	BEA disposable personal income data & ADA, Annual Financial Report
DPI8	Alaska disposable personal income plus residency adjustment; million $	BEA disposable personal income data & ADA, Annual Financial Report
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	-
DTHTOT	total Alaska civilian non-Native deaths	-
DTOT	total Alaska civilian deaths	-
EL99	total local government expenditures; million $	-
ELBD	local government debt service; million $	BOC, Governmental Finances
ELED	local government education expenditures; million $	BOC, Governmental Finances

Variable	Definition; Units	Historical Data Source[a]
ELED1	local government education expenditures from own sources; million $	Constructed from ADA, Executive Budget and BOC, State Government Finances
ELEDCP	local government education expenditures for capital outlays; million $	BOC, Governmental Finances
ELNED1	local government non-education expenditures net of debt service; million $	BOC, Governmental Finances
ELPERS	local government personal services expenditures; million $	BOC, Governmental Finances
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	-
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, Alaska Labor Force Estimates and Statistical Quarterly
EM98	wage and salary and military employment; thousand	-

Variable	Definition; Units	Historical Data Source[a]
EM99	total wage and salary, nonwage and salary (proprietor), and military employment; thousand	-
EM9BASE	basic employment; thousand	-
EM9GOV	state and local government employment; thousand	-
EM9INFR	infrastructure employment; thousand	-
EM9SUPRT	support employment; thousand	-
EMab	employment by industry; ab=CM CN D9 FI PU GS GL M9 S9 T9 A9 GM GC P9; thousand	ADL, Statistical Quarterly
EMAFISH	wage and salary component of fish harvesting employment; thousand	-
EMAGRI	wage and salary component of agriculture employment; thousand	ADL, Statistical Quarterly
EMAUN	forestry and unclassified employment; thousand	ADL, Statistical Quarterly
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	-
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, Statistical Quarterly
EMDW	employment in wholesale trade; thousand	ADL, Statistical Quarterly
EMDRNT	employment in retail trade net of tourism; thousand	-

Variable	Definition; Units	Historical Data Source[a]
EMDTOUR	tourism employment in trade sector; thousand	Improvements to Specification of the MAP Model
EMFISH	fish harvesting employment; thousand	G. Rogers, Measuring the Socio-economic Impact of Alaska's Fisheries
EMG9	federal, state, and local government employment; thousand	-
EMGA	state and local government employment; thousand	-
EMGC	federal civilian employment; thousand	ADL, Statistical Quarterly
EMGF	federal civilian and military employment; thousand	-
EMGL	local government employment; thousand	ADL, Statistical Quarterly
EMGM	military employment; thousand	ADL
EMGS	state government employment; thousand	ADL, Statistical Quarterly
EMMO	employment in endogenous manufacturing; thousand	ADL, Statistical Quarterly
EMMX1	high (premium) wage exogenous manufacturing employment; thousand	-
EMMX2	low wage exogenous manufacturing employment; thousand	ADL, Statistical Quarterly
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	-

Variable	Definition; Units	Historical Data Source[a]
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, Statistical Quarterly
EMPRO	total proprietor employment; thousand	BEA employment data
EMPROFIS	fish harvesting proprietor employment; thousand	DOL, Statistical Quarterly; BEA employment data; and G. Rogers, Measuring the Socioeconomic Impact of Alaska's Fisheries
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	-
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, Statistical Quarterly
EMSP	transport, communication, public utility, trade, finance, and service employment; thousand	-
EMSTOUR	tourism employment in service sector; thousand	Improvements to Specification of the MAP Model
EMSUP	trade, finance, and service employment; thousand	-
EMT91	transportation employment net of exogenous employment; thousand	-

Variable	Definition; Units	Historical Data Source[a]
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	Improvements to Specification of the MAP Model
EMTTOUR	transportation-related tourism employment; thousand	Improvements to Specification of the MAP Model
EMX	extractive industries-related employment consisting of mining and exogenous construction; thousand	-
EX.DSS	ratio of debt service expenditures to total state general fund expenditures	-
EX.NRP9	ratio of state nonpetroleum 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	-
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 $	-

Variable	Definition; Units	Historical Data Source[a]
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+EXPFCON1-RP9S) to unrestricted general fund expenditures	-
EXBM.RV	ratio of general fund unrestricted revenues to unrestricted general fund expenditures	-
EXBUD	state operating expenditures as defined in the budget; million $	ADA, Executive Budget
EXCa	state capital expenditures of type a; million $	-
EXCAP	total 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, The Relationship Between the Alaska Natural Gas Pipeline and State and Local Government Expenditures
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	-
EXCAPOT	state capital expenditures for nontraditional items; million $	ADA, Annual Financial Report
EXCAPREP	capital expenditures necessary to replace state capital stock which depreciates each year; million $	-

Variable	Definition; Units	Historical Data Source[a]
EXCDS	state development operating expenditures net of debt service; million $	ADA, Executive Budget
EXCDS4	initial model estimate of state development operating expenditures net of debt service before application of RATIO1; million $	-
EXCDSNT	development component of the state operating budget net of transfers to local government; million $	-
EXCNa	state capital expenditures on new capital type a; million $	-
EXCPS	construction expenditures from state capital project funds; million $	ADA, Annual Financial Report
EXCPSFED	portion of capital project fund revenues from federal capital grants; million $	ADA, Annual Financial Report
EXCPSFD6	initial values for portion of capital project fund revenues from federal capital grants; million $	ADA, Annual Financial Report
EXCPSGOB	portion of capital project fund revenues from bond sales; million $	ADA, Annual Financial Report
EXCPSGB6	initial value for EXCPSGOB; million $	-
EXCPSHY	highway construction expenditures out of state capital project construction funds; million $	ADA, Annual Financial Report
EXCPSM	portion of capital project fund revenues from bond sales (used to calculate bond maturation); million $	ADA, Annual Financial Report
EXCPSNH	nonhighway construction expenditure out of state capital project construction funds; million $	ADA, Annual Financial Report
EXCRba	state capital expenditures on replacement of capital stock type a from funding source b; million $	-
EXDF1	percent of state current account balance placed into development fund (hypothetical); percent	-
EXDFCON	development fund contribution; million $	-

Variable	Definition; Units	Historical Data Source[a]
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, Annual Financial Report
EXDSSX	annual debt service payment to service general obligation bonds outstanding at beginning of simulation period; million $	ADA, Annual Financial Report
EXEDS	state education operating expenditures net of debt service; million $	ADA, Executive Budget
EXEDS4	state education operating expenditure net of debt service before application of RATIO1; million $	-
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, Annual Financial Report
EXGF.AFR	state general fund expenditures; million $	ADA, Annual Financial Report
EXGFBM	state unrestricted general fund expenditures; million $	-

Variable	Definition; Units	Historical Data Source[a]
EXGFCAP	state general fund capital outlays—actual disbursements; million $	ADA, Annual Financial Report
EXGFCAP1	state general fund capital expenditures for traditional capital items; million $	ADA, Annual Financial Report
EXGFCAP6	initial value for EXGFCAP; million $	-
EXGFCHY	state general fund capital expenditures for highways; million $	ADA, Annual Financial Report
EXGFCNH	state general fund capital expenditures nonhighways; million $	ADA, Annual Financial Report
EXGFCOT	state general fund capital expenditures for non-traditional items; million $	ADA, Annual Financial Report
EXGFCOT6	initial value for EXGFCOT; million $	-
EXGFOPS	state unrestricted general fund operating expenditures; million $	-
EXGFOPSX	exogenous component of state unrestricted general fund operating expenditures; million $	-
EXGFOT.A	state general fund operating expenditures net of extraordinary items; million $	ADA, Annual Financial Report
EXGGS	state general government operating expenditures net of debt service; million $	ADA, Executive Budget
EXGGS4	initial model estimate of state general government operating expenditures net of debt service before application of RATIO1; million $	-
EXHES	state health operating expenditures net of debt service; million $	ADA, Executive Budget
EXHES4	state health operating expenditures net of debt service before application of RATIO1; million $	-
EXHYCAP	state capital expenditures for highways; million $	-
EXINREC	state government interagency receipts; million $	ADA, Annual Financial Report
EXINRECB	state government interagency receipts; million $	ADA, Executive Budget
EXJUS	state administration of justice operating expenditures net of debt service; million $	ADA, Executive Budget

Variable	Definition; Units	Historical Data Source[a]
EXJUS4	state administration of justice operating expenditures net of debt service before application of RATIO1; 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, Executive Budget
EXNRS4	state natural resource operating expenditures net of debt service before application of RATIO1; million $	-
EXOM84	annual operations and maintenance cost associated with incremental state capital stock put in place in 1984 and succeeding years; million $	-
EXOMba	operating expenditures on operations and maintenance of capital stock type a from funding source b; million $	-
EXOMCOST	annual operations and maintenance cost of incremental state capital stock (EXOM84) as a percentage of original cost; percent	-
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, Executive Budget
EXOPS6	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, Executive Budget

Variable	Definition; Units	Historical Data Source[a]
EXOPSIMP	per capita impact state operation expenditure used with fiscal rule EXRL4	Goldsmith and Mogford, The Relationship Between the Alaska Natural Gas Pipeline and State and Local Government Expenditures
EXPF1	percent contribution from available funds to Permanent Fund; percent	-
EXPF2	portion of Permanent Fund dividend income not entering purchasing power expression; percent	Knapp et al., The Permanent Fund Dividend Program: Economic Effects and Public Attitudes
EXPF3	portion of Permanent Fund dividend income not subject to personal income tax; percent	Knapp et al., The Permanent Fund Dividend Program: Economic Effects and Public Attitudes
EXPFTOGF	percent of Permanent Fund earnings transferred to the general fund (based on earnings net of dividends); percentage	-
EXPFCON	total additions to Permanent Fund, including special appropriations and earnings after transfers out; million $	-
EXPFCON1	contributions to the Permanent Fund, not including special appropriations or earnings transferred to general fund; million $	-
EXPFCONX	special Permanent Fund contributions appropriated from the general fund; million $	-
EXPFCON9	total gross additions to Permanent Fund, including special appropriations and earnings before transfers out; million $	-
EXPFDIST	percent of Permanent Fund earnings distributed to individuals; percent	-
EXPFDVX1	accounting adjustment to Permanent Fund retained earnings in early years; million $	ADR, The Alaska Permanent Fund: Overview and March 1984 Projections
EXPFDVX2	accounting adjustment to Permanent Fund dividend program in early years; million $	ADR, The Alaska Permanent Fund: Overview and March 1984 Projections

Variable	Definition; Units	Historical Data Source[a]
EXPPS	state public protection operating expenditures net of debt service; million $	ADA, Executive Budget
EXPPS4	state public protection operating expenditures net of debt service before application of RATIO1; million $	-
EXPR99	total state personnel expenditures; million $	ADA, Executive Budget
EXPRCDS	state personnel expenditures for development; million $	ADA, Executive Budget
EXPREDS1	state personnel expenditures for education net of University of Alaska; million $	ADA, Executive Budget
EXPRGGS	state personnel expenditures for general government; million $	ADA, Executive Budget
EXPRHES	state personnel expenditures for health; million $	ADA, Executive Budget
EXPRJUS	state personnel expenditures for administration of justice; million $	ADA, Executive Budget
EXPRNRS	state personnel expenditures for natural resources; million $	ADA, Executive Budget
EXPRPPS	state personnel expenditures for public protection; million $	ADA, Executive Budget
EXPRSSS	state personnel expenditures for social services; million $	ADA, Executive Budget
EXPRTRS	state personnel expenditures for transportation; million $	ADA, Executive Budget
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;	-
EXRL2	policy switch which, if set at 1, determines state operating expenditure growth based upon exogenous growth rate	-

Variable	Definition; Units	Historical Data Source[a]
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)	-
EXRL4OP	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 $	-
EXSPLIT	the allocation to operations when state spending falls below the authorized spending limit; percent	-

Variable	Definition; Units	Historical Data Source[a]
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, Executive Budget
EXSSS4	state social services operating expenditures net of debt service before application of RATIO1; million $	ADA, Executive Budget
EXSUB1	stimulative effect of state subsidies on construction industry; percent	-
EXSUB2	stimulative effect of state subsidies on consumer spending; percent	-
EXSUBS	state subsidy programs initiated after 1980; million $	-
EXSUBSX	state subsidy programs initiated after 1980, set exogenously; million $	-
EXTRNS	state Permanent Fund dividend distribution; million $	-
EXTRNSPI	state Permanent Fund dividends in 1982 and 1983 incorporated in state personal income; million $	-
EXTRNSX	state Permanent Fund dividend distribution funded through the general fund; million $	-
EXTRS	state transportation operating expenditures net of debt service; million $	ADA, Executive Budget
EXTRS4	state transportation operating expenditures net of debt service before application of RATIO1; million $	-
EXUA	University of Alaska operating budget; million $	ADA, Executive Budget
EXUA6	initial value for University of Alaska operating budget; million $	-
FAGI	federal adjusted gross income earned in Alaska; million $	Constructed from IRS, Statistics of Income and ADL Statistical Quarterly

Variable	Definition; Units	Historical Data Source[a]
FAGII	federal adjusted gross income reported on federal tax returns filed from Alaska; million $	IRS Statistics of Income
FERTj	non-Native fertility rate for female cohort j	Alaska Department of Health and Social Services and Alaska Native Medical Center
G.**	annual growth rate of variable **	-
GOBONDL	general obligation bonded indebtedness of local government; million $	ADCR, Alaska Taxable
GODT	general obligation bonded indebtedness of state; million $	ADA, Annual Financial Report
GODTX	general obligation bonded indebtedness of the state from debt incurred before start of simulation; million $	ADA, Annual Financial Report
GR	gross business receipts; million $	ADA, Annual Financial Report
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	-
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, Annual Financial Report and ADR unpublished data
Gj	shift factor for aging of cohorts	-

Variable	Definition; Units	Historical Data Source[a]
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	1980 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	-
HHSIZEM	average Alaska military household size	-
HHSIZEN	average Alaska Native household size	-
HHij	total Alaska households headed by persons in cohort ij; thousand	BOC, Census of Population
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. $	-

Variable	Definition; Units	Historical Data Source[a]
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 $	-
INX.DI	ratio of Alaskan to U.S. per capita real disposable personal income	-
INX.DINN	ratio of Alaska non-Native to U.S. per capita real disposable personal income	-
INX.DI8N	ratio of Alaska personal income produced to U.S. per capita real disposable personal income	-
INX.S1	ratio of trade/service/finance employment to Alaska real disposable personal income	-
INX.S2	ratio of transportation/communications/utilities employment to Alaska real disposable personal income	-
INX.WG	ratio of Alaskan to U.S. real average wage	-
LAFPART	pseudo labor force participation rate--employment by place of work divided by labor force by place of residence; percent	-
Lca	proportion of funding of state capital projects type a from initial funding source type c; percent	-
LF	labor force; thousand	-
LMUNCAP	proportion of state-funded municipal capital grants spent on capital projects; 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, Alaska Taxable
LPTB1	assessed value of real and personal property (A.S. 29.53) (not full value); million $	ADCR, Alaska Taxable
LPTB1FV	assessed value of real and personal property assessed at full value; million $	ADCR, Alaska Taxable

Variable	Definition; Units	Historical Data Source[a]
LPTRAT	percentage of pipeline property within local jurisdictions actually subject to local tax because of limitations imposed by state statutes; percent	Constructed from ADCR, Alaska Taxable
MDPij	military dependents in cohort ij; thousand	BOC, 1980 Census of Population
MDTOT	total military dependents in 1980; thousand	BOC, 1980 Census of Population
MHHij	1980 military households headed by individual in cohort ij; 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)	-
MILij	armed forces personnel and military dependents in cohort ij in 1980; thousand	BOC, 1980 Census of Population
Mij	fraction of total endogenous civilian (non-Native) migration assigned to cohort ij	Alaska Public Survey
NAPik	Native population in aggregated cohorts k (for use with income distribution model); thousand	-
NATINC	Alaska civilian non-Native (SIC) natural increase	-
NATPij	Alaska Native population in cohort ij; thousand	BOC, 1980 Census of Population
NATTOT	total Alaska Native population (civilian); thousand	BOC, 1980 Census of Population
NBTHTOT	total Alaska Native births; thousand	-
NCBP	bonus income to Natives from lease sales on Native lands; million $	-
NCBR	Alaska crude Native birth rate (per thousand)	-
NCCAP	accumulated capital of Native Corporations; million $	-

Variable	Definition; Units	Historical Data Source[a]
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	1980 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	-
NNPik	non-Native population in aggregated cohorts k for use with income distribution model; thousand	-
NPGQij	fraction of civilian Native population in cohort ij in group quarters	BOC, 1980 Census of Population

Variable	Definition; Units	Historical Data Source[a]
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
OMba	rate of operations and maintenance cost for state capital stock type a from funding source b; percent of value of stock	-
P.BAL99	combined fund balance per capita; $	-
P.BALGF9	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; $	-
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; $	-

Variable	Definition; Units	Historical Data Source[a]
P.EXOPS	per capita state operating expenditures; $	-
P.EXTRNS	per capita Permanent Fund dividend; $	-
P.GEXP	per capita state plus local government expenditures; $	-
P.GODT	per capita state government bonded indebtedness; $	-
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; $	-
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, Alaska Taxable
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	-

Variable	Definition; Units	Historical Data Source[a]
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, Revenues Sources
PC12N	proportion of ANCSA payments made to 12 regional Native corporations in Alaska; percent	Robert Nathan Associates, 2(c) Report: Federal Programs and Alaska Natives
PC12RN	proportion of members of 12 regional Native corporations residing in Alaska; percent	Robert Nathan Associates, 2(c) Report: Federal Programs and Alaska Natives
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	-
PCNCSV	proportion of Native Corporation income used for investment; percent	-
PCNCSV1	proportion of bonus income from lease sales on Native lands and retained by Native Corporations which is used for investment; percent	-

Variable	Definition; Units	Historical Data Source[a]
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, Statistical Quarterly and ADA, Executive Budget
PCWS2	ratio of local government wage and salary payments to local government personal services expenditures	ADL, Statistical Quarterly and BOC, Governmental Finances
PCYNA1	proportion by which the ratio of personal income to wages and salaries for Native exceeds that of the total population; percent	-
PDCON	construction price deflator; index	for construction methodology, see Brian Reeder, Gross State Product for Alaska: Technical Documentation, ISER
PDCONBAS	value of construction price deflator in base year	-
PDEXOPS	state government operating expenditures price deflator; index	constructed from ADL, Statistical Quarterly, BEA personal income and employment data
PDRATIO	ratio of Alaskan relative price index to U.S. consumer price index	-
PDRATIO6	initial values for 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
PDUSCPI6	initial value for US consumer price index; index	

Variable	Definition; Units	Historical Data Source[a]
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, Statistical Quarterly; BEA employment data; and G. Rogers, Measuring the Socioeconomic Impact of Alaska's Fisheries
PFN	Native females 14 and under; thousand	-
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	-

Variable	Definition; Units	Historical Data Source[a]
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
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 $	-
PIOLI	other labor income component of personal income; million $	BEA, personal income data
PIPADJ	ratio of "enclave" to regular construction wage rate; percent	ADL *Statistical Quarterly*

Variable	Definition; Units	Historical Data Source[a]
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 $	-
PITRAN6	initial values for transfers (excluding Permanent Fund) component of personal income; million $	-
PLFD9	total Alaska potential civilian labor force aged 15 to 64; thousand	-
PLFDOMC	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	-
PLFDOMN	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

Variable	Definition; Units	Historical Data Source[a]
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	-
POPAVAGE	average age of Alaskan population	-
POPC	total population net of armed forces personnel (includes military dependents); thousand	BOC and ADL
POPCGQ	Alaska civilian non-Native population in group quarters; thousand	BOC, Census of Population
POPGER	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	2(c) Report-Federal Program & Alaska Natives 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	-

Variable	Definition; Units	Historical Data Source[a]
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. $	-
PR.DPI	dispoable personal income real per capita; 1967 U.S. $	-
PR.DPI8N	real disposable personal income per capita before residence adjustment and net of enclave income; 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.DPIU6	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. $	-

Variable	Definition; Units	Historical Data Source[a]
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.EXccc	state expenditures in program category ccc real per capita; 1967 $	-
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.EXOPS	state operating expenditures real per capita; 1967 U.S. $	-
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.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. $	-

Variable	Definition; Units	Historical Data Source[a]
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. $	-
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, Alaska Taxable
PTOURB	intercept term on tourist industry employment equation	Improvements to Specification of the MAP Model
PTOURD	proportion of tourist industry employment in trade	Improvements to Specification of the MAP Model
PTOURE	elasticity of tourism employment to growth in number of tourists	Improvements to Specification of the MAP Model

Variable	Definition; Units	Historical Data Source[a]
PTOURS	proportion of tourist industry employment in services	Improvements to Specification of the MAP Model
PTOURT	proportion of tourist industry employment in transportation	Improvements to Specification of the MAP Model
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, Annual Financial Report
R.CAPa	real value of state capital stock type a; million 1982 $	-
R.DPI	real disposable personal income; million 1967 U.S. $	-
R.DPI8N	real purchasing power creating support sector demand; million 1967 U.S. $	-
R.DPI8X	real disposable personal income plus residence adjustment of "enclave" construction employees; million 1967 U.S. $	constructed using ADL, Statistical Quarterly
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, Annual Financial Report
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	-

Variable	Definition; Units	Historical Data Source[a]
RCij	targeted total change in civilian household formation rate for cohort ij	-
RCDEPa	rate of depreciation of state capital stock type a	-
REPba	rate of replacement of state capital stock type a from funding source b; percent of value of stock	-
RL99	total local government revenues; million $	constructed from BOC Governmental Finances and BOC State Government Finances
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 $	-
RLMC	local charges and miscellaneous revenue; million $	BOC, Governmental Finances
RLOT	local government taxes net of property tax; million $	BOC, Governmental Finances
RLPT	local property taxes; million $	BOC, Governmental Finances
RLPT1	local property tax revenues net of exogenous component; million $	BOC, Governmental Finances
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 RATIO1; million $	-
RLTE99	total state-local government transfers for education purposes; million $	-

Variable	Definition; Units	Historical Data Source[a]
RLTE994	initial estimate of transfers from state to local government for education purposes before application of RATIO1; million $	-
RLTEA	total transfers from state to local government for primary and secondary education; million $	ADA, Annual Financial Report
RLTEA4	initial estimate of transfers from state to local government for primary and secondary education before application of RATIO1; million $	-
RLTEB	state aid to local education net of aid to district schools and since their inception, the REAA schools; million $	constructed from BOC, State Governmental Finances and ADA Annual Financial Report
RLTEB4	initial model estimate of state aid to local government for education net of district and REAA aid before application of RATIO1	-
RLTEB6	initial values for state aid to local government for education net of district and REAA aid	-
RLTEC	cigarette tax education transfers from state to local government; million $	ADA, Annual Financial Report
RLTEC4	initial estimate of cigarette tax education transfers from state to local government before application of RATIO1; million $	-
RLTEF	school foundation program transfers from state to local government; million $	ADA, Annual Financial Report
RLTEF4	initial estimate of school foundation program transfers from state to local government before application of RATIO1; million $	-
RLTEO	miscellaneous state aids to district schools; million $	ADA, Annual Financial Report
RLTEO4	initial estimate of miscellaneous state aids to district schools before application of RATIO1; million $	-
RLTET	state aid to local district schools for transportation; million $	ADA, Annual Financial Report
RLTET4	initial estimate of state aid to district schools for transportation before application of RATIO1; million $	-

Variable	Definition; Units	Historical Data Source[a]
RLTF	federal-local government transfers; million $	BOC, Governmental Finances
RLTFPX	petroleum-related federal-local government transfers; million $	-
RLTMA	state local transfers under municipal assistance program; million $	ADA, Executive Budget
RLTMA4	initial model estimate of state-local transfers under municipal assistance program; million $	-
RLTMA6	initial values for state-local transfers under municipal assistance; million $	-
RLTMCAP	municipal capital grants from state to local government; million $	ADA, Annual Financial Report
RLTMS	state-local revenue transfers net of education, revenue sharing, and tax sharing; million $	constructed from BOC State Government Finances & ADA Executive Budget
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 RATIO1; million $	-
RLTRS	state-local revenue sharing; million $	ADA, Executive Budget
RLTRS4	initial model estimate of state-local revenue sharing before application of RATIO1; million $	-
RLTRS6	initial values for state-local revenue sharing; 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, Executive Budget
RLTVS4	initial estimate of state-local shared electric and telephone co-op taxes before application of RATIO1; million $	-

Variable	Definition; Units	Historical Data Source[a]
RLTX	exogenous state-local transfers; million $	-
RMIS	miscellaneous unrestricted general fund revenues; million $	ADR, Revenue Sources
RMISRES	miscellaneous restricted general fund revenues; million $	-
RMISRES6	initial values for miscellaneous restricted general fund revenues; million $	-
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, Annual Financial Report
ROFERS	general fund ferry receipts; million $	ADA, Annual Financial Report
ROFOS	nonauto-related business and nonbusiness licenses and fees to general fund; million $	constructed from ADA, Annual Financial Report
ROFTS	total general fund fees and licenses; million $	ADA, Annual Financial Report
ROR	real rate of return on general fund balance; percent	-
RORANGRO	under EXRLOP8, rate at which state operating expenditure annuity grows; percent	-
RORBOND	real state g.o. bond interest rate; 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	-

Variable	Definition; Units	Historical Data Source[a]
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 Revenue Sources
RP7SGF	total petroleum royalties and bonuses paid to general fund; million $	ADR, Revenue Sources
RP7SPF	constitutionally mandated Permanent Fund contributions from petroleum revenues; million $	ADR, Revenue Sources
RP9S	total petroleum revenues before Permanent Fund deductions; million $	ADR, Revenue Sources
RP9SGF	total petroleum revenues paid to general fund; million $	ADR, Revenue Sources
RP9X	miscellaneous exogenous petroleum revenues; million $	-
RPBS	state petroleum bonuses before Permanent Fund deduction; million $	ADR, Revenue Sources
RPBSGF	state petroleum bonuses paid to general fund; million $	ADR, Revenue Sources
RPEN	state petroleum rents before Permanent Fund deduction; million $	ADR, Revenue Sources
RPENGF	state petroleum rents paid to general fund; million $	ADR, Revenue Sources
RPPS	state petroleum property tax; million $	ADR, Revenue Sources
RPRY	state petroleum royalties before Permanent Fund deduction; million $	ADR, Revenue Sources
RPRYGF	state petroleum royalties paid to general fund; million $	ADR, Revenue Sources
RPTS	state petroleum production taxes; million $	ADR, Revenue Sources
RS.FED	ratio of federal transfers to total state revenues	-
RS.PET	ratio of "endowment" type revenues to total state revenues	-

Variable	Definition; Units	Historical Data Source[a]
RS.REC	ratio of endogenous and interest revenues 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	-
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	state endogenous unrestricted general fund revenues; million $	-
RSFDN	total federal grants-in-aid to state general fund; million $	ADA, Annual Financial Report
RSFDN6	initial values for total federal grants-in-aid to state general fund; million $	ADA, Annual Financial Report
RSFDNCAX	federal grants-in-aid to state general fund for capital expenditures; million $	ADA, Annual Financial Report

Variable	Definition; Units	Historical Data Source[a]
RSFDNPX	federal-state shared petroleum royalties; million $	ADR, Revenue Sources
RSFDNPXG	general fund portion of federal-state shared petroleum royalties; million $	ADR, Revenue Sources
RSFDNX	exogenous federal-state transfer payments; million $	-
RSFFS	fees and licenses receipts paid into the fish and game special revenue fund; million $	ADA, Annual Financial Report
RSFS	total revenues of the special funds except the Permanent Fund; million $	ADA, Annual Financial Report
RSFS1	miscellaneous receipts of state special revenue funds; million $	ADA, Annual Financial Report
RSGF	total state general fund revenues (unrestricted and restricted); million $	ADR, Revenue Sources
RSGFBM	total general fund unrestricted revenues; million $	ADR, Revenue Sources
RSGF.AFR	total general fund revenues (including inter-agency receipts)	ADA, Annual Financial Report
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, Annual Financial Report
RSID	state development fund earnings; million $	-
RSIDNET	state development fund earnings net of inflation; million $	-
RSIG	state general fund interest; million $	-
RSIG6	initial value for state general fund interest; million $	-
RSIGNET	state general fund interest net of inflation; million $	-
RSIN	state investment earnings deposited in the general fund; million $	ADR, Revenue Sources

Variable	Definition; Units	Historical Data Source[a]
RSIP	state Permanent Fund interest; million $	ADR, Revenue Sources
RSIP5	state Permanent Fund interest—initial adjustment; million $	ADR, Revenue Sources
RSIPGF	state Permanent Fund interest transferred into general fund; million $	-
RSIPPF	reinvested Permanent Fund earnings; million $	-
RSIPPF1	Permanent Fund earnings net of transfers to general fund; million $	-
RSIPNET	state Permanent Fund interest net of inflation; million $	-
RSI99	total earnings of state general fund, Permanent Fund, and development funds	ADR, Revenue Sources
RSI99NET	total earnings of state general fund, Permanent Fund, and development funds interest net of inflation; million $	-
RT99	total state tax revenues; million $	-
RTAS	alcoholic beverage tax; million $	ADA, Annual Financial Report and ADR, Revenue Sources
RTBS	gross receipts tax and business license tax; million $	ADA, Annual Financial Report
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, Annual Financial Report and ADL, unpublished data
RTCIS	cigarette tax receipts (sum of general fund and tobacco fund receipts); million $	ADA, Annual Financial Report and ADR, Revenue Sources
RTCS	state corporate tax receipts; million $	ADA, Annual Financial Report and ADR, Revenue Sources
RTCS1	corporate income tax net of petroleum sector; million $	-
RTCSPX	state corporate tax receipts from petroleum sector; million $	ADR, Revenue Sources

Variable	Definition; Units	Historical Data Source[a]
RTCSX	exogenous corporate income tax; million $	-
RTIS	personal income tax; million $	ADA, Annual Financial Report
RTISC	personal income tax on a calendar year basis; million $	ADR, Cumulative Summary of Revenue, 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, Annual Financial Report and ADR, Revenue Sources
RTOTS	other state taxes—consists of fiduciary, inheritance, estate, mining, conservation, prepaid, and fish taxes; million $	ADR, Revenue Sources
RTOTS6	initial values for other state taxes—consists of fiduciary, inheritance, estate, mining, conservation, prepaid, and fish taxes; million $	ADR, Revenue Sources
RTPIF	federal income taxes paid out of Alaskan resident personal income; million $	BEA - disposable personal income data
RTSS	school tax; million $	ADA, Annual Financial Report
RTVS	ad valorem taxes consisting of insurance premium tax and electric telephone company revenue tax; million $	ADA, Annual Financial Report and ADR, Revenue Sources

Variable	Definition; Units	Historical Data Source[a]
SANCSA	payments to Alaska Natives by state government under ANCSA; million $	-
SANCSAX	special state appropriation to pay off ANCSA debt	-
SEXDIV	non-Native sex division at birth; percent	Alaska Department of Health and Social Services
SLGEXP	total combined state and local government expenditures; million $	-
SURINFi	non-Native infant survival rates; percent	Alaska Department of Health and Social Services
Sij	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 withold 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	-

Variable	Definition; Units	Historical Data Source[a]
UNEMP	average annual Alaska unemployment; thousand	ADL
UNEMRATE	Alaska unemployment rate; percent	-
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, Statistics of Income
VAEX6	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
WEUS6	initial value for average weekly wage and salary earnings in United States; $	-
WR.AK.US	change in the 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; $	-
WRab	average annual wage rate for industry sector ab; $	ADL, Statistical Quarterly
WRCNNP	average annual wage rate for non- "enclave" construction wage rate; $	ADL, Statistical Quarterly
WRCNP	average annual wage rate for premium wage (pipeline or "enclave") construction; $	ADL, Statistical Quarterly
WRCU	average annual wage rate for communications and public utilities; $	ADL, Statistical Quarterly
WRGab	annual growth in real annual wage rate in industry ab (input to income distribution model)	-
WRGC	average annual wage rate for federal civilian; $	ADL, Statistical Quarterly
WRGMS	annual growth in income per proprietor (input to income distribution model)	-

Variable	Definition; Units	Historical Data Source[a]
WRM91	average annual wage rate for existing (low wage) manufacturing employment; $	ADL, Statistical Quarterly
WRMX1	average annual wage rate for large-project (high wage) manufacturing employment; $	-
WRSB	average annual wage rate for business services; $	ADL, Statistical Quarterly
WRSNB	average annual wage rate for nonbusiness services; $	ADL, Statistical Quarterly
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 $	-
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, Statistical Quarterly
WSCNP	wages and salary payments in high wage ("enclave") construction; million $	-
WSGC	federal civilian wages and salaries; million $	ADL, Statistical Quarterly
WSGL	local government wages and salaries; million $	ADL, Statistical Quarterly
WSGM	military personnel wages and salaries; million $	BEA, personal income data
WSGS	state government wages and salaries; million $	ADL, Statistical Quarterly
WSGSFY	state government wages and salaries on fiscal year basis; million $	ADL, Statistical Quarterly
WSMX1	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 $	-
X1-X6	variables used to facilitate printing of output of the income distribution model	-

Variable	Definition; Units	Historical Data Source[a]
XX98	total real gross state product in wage and salary industries and military; million 1972 U.S. $	-
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 Brian Reeder, Gross State Product for Alaska: Technical Documentation, ISER
XXA9	agriculture-forestry-fisheries real gross state product; million 1972 U.S. $	for construction methodology, see Brian Reeder, Gross State Product for Alaska: Technical Documentation, ISER
XXCN1	endogenous (residentiary plus state government) component of construction real gross state product; million 1972 U.S. $	-
XXCN8	residentiary construction real gross state product; million 1972 U.S. $	-
XXCNX	gross product associated with exogenous construction; 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. $	-
XXMO	endogenous manufacturing real gross state product; million 1972 U.S. $	-
XXMX1	exogenous large-project manufacturing real gross state product; million 1972 U.S. $	-
XXMX2	manufacturing real gross state product net of large projects; million	for construction methodologies, see Brian Reeder, Gross State Product for Alaska: Technical Documentation, ISER
XXS8NT	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. $	-

Variable	Definition; Units	Historical Data Source[a]
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
XXVNHY	value added in construction industry from private contracts for nonhighway construction let by state government; million $	constructed from ADPW worksheets
YR	year	-
Za.a	spacer variable to maintain locational consistency of equations	-

REGIONALIZATION MODEL

Institute of Social
and Economic Research
MAP Documentation
December 1984, Model A84.CD

ISER MAP ALASKA ECONOMIC MODEL:
REGIONALIZATION MODEL DOCUMENTATION
VERSION A84.CD, DECEMBER 1984

1. Model Description

Introduction

This report presents in general outline form the structure of the regionalization model which allocates population, households, and employment to the census division level (1970 definitions revised in 1975) 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:

- that the structure be simple and generalizable
- that the parameters be specified in terms with clear, intuitive meaning
- that the regions be disaggregated to census division levels
- 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 revised in 1975), the employment component of the model allocates support and total employment to each of the twenty regions. These estimates along with estimates of statewide population and households (from the statewide model) are then used 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:

$$S.aa = \sum^{bb} (A.aa.bb * M.bb) * BETA$$

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 (the state ratio of support to total employment) 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 Population Component

Population (P.aa) in each region is a function of residence-adjusted employment (MR.aa). This is calculated in two steps. First, residence-adjusted employment is calculated as follows,

$$MR.aa = \sum^{bb} (IM.aa.bb * M.bb)$$

where MR.aa is residence-adjusted employment and IM.aa.bb is the proportion of workers employed in region bb (M.bb) who live in region aa. Population is then determined as follows,

$$PRE.aa = PM.aa * MR.aa$$

where PRE.aa is a preliminary population estimate for 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 a final figure for population by census division (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:

$$PCEN.cc = \sum^{aa} (PC.cc.aa * P.aa)$$

where PC.cc.aa is the proportion of population in region aa (1970 census division) allocated to region cc (1980 census area). Population by labor market areas, which are aggregates of the 1980 census areas, is also calculated (PL.dd).

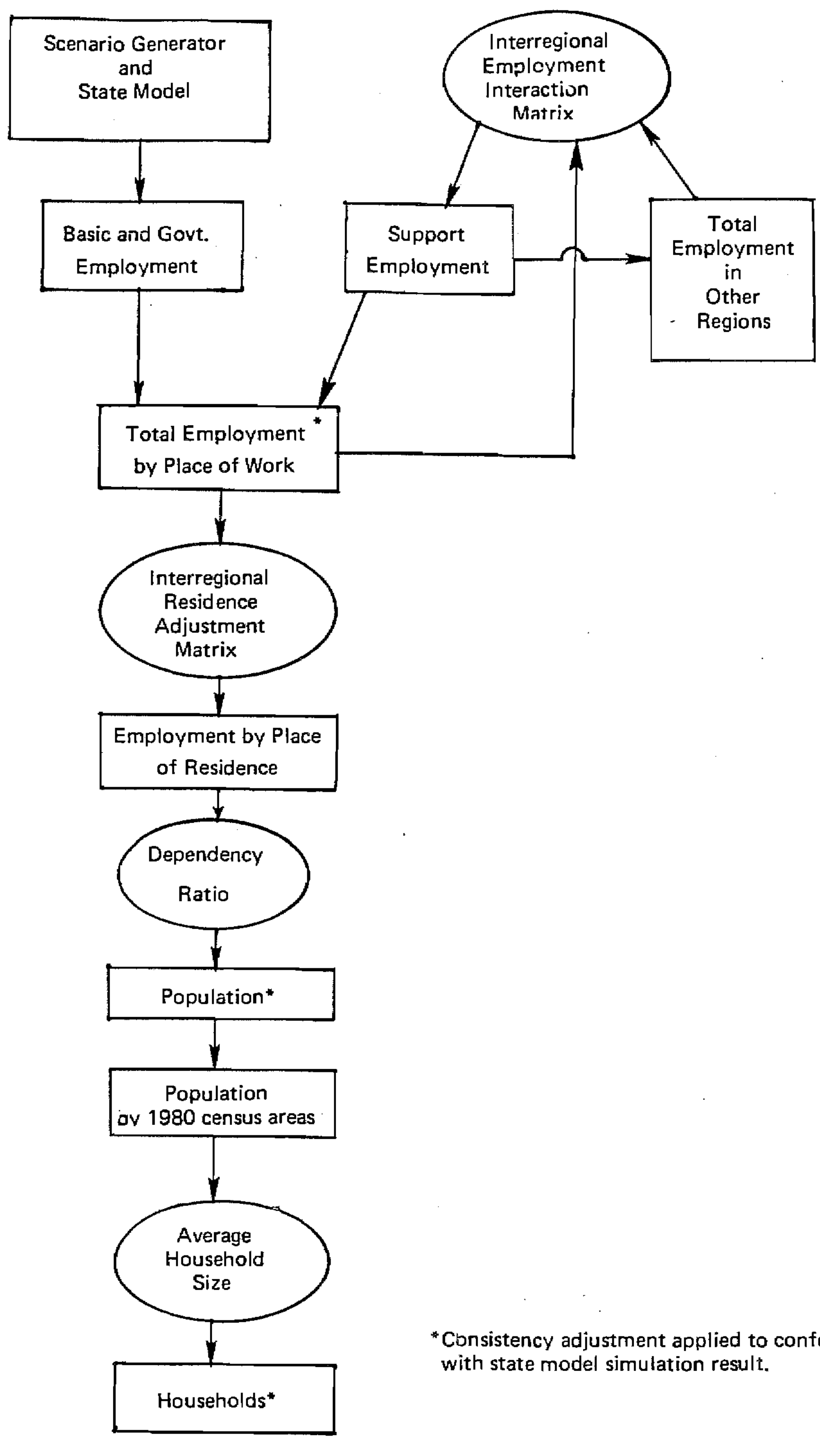
From the regional population figures, based upon the 1980 census areas, a preliminary value for the number of households (HPRE.cc) can be calculated as follows:

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

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 to yield final households by census areas (HHCEN.cc). In addition, the model produces a set of household estimates for the 1970 census divisions using the same allocation factors as employed in allocating population (HH.aa).

2. Flow Diagram

FIGURE 1. MAP REGIONALIZATION MODEL
FLOW DIAGRAM



*Consistency adjustment applied to conform with state model simulation result.

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

EMA9	agriculture-forestry-fisheries employment
EMAFISH	wage and salary component of fish harvesting employment
EMAGRI	wage and salary component of agriculture employment
EMCN	construction employment
EMCN1	construction employment net of exogenous construction employment
EM99	total wage and salary, nonwage and salary (proprietor), and military employment
EMGA	state and local government employment
EMGF	federal civilian and military employment
EMM9	manufacturing employment
EMMO	employment in endogenous manufacturing
EMP9	mining employment
EMPRO	total proprietor employment

EMPRO1	proprietor employment net of fish harvesting
EMT9X	exogenous (large pipeline project-related) transportation employment
EMTOUR	total tourism employment
HH	households
POP	population

4. Variable and Parameter Names

Variables

M.aa	Total employment, region aa (EM99)
MR.aa	Total employment by place of residence, region aa
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)
P.aa	Population[a], region aa
PCEN.cc	Population, region cc
PL.dd	Population, labor market area dd
HH.aa	Households, region aa
HHCEN.cc	Households[b], region cc
BETA	Ratio of support to basic employment
ADJ	Ratio of state model population (POP) to initial regionalization model population estimate (PRE.ST)
ADJHH	Ratio of state model households (HH) to initial regionalization model household estimate (HPRE.ST)
FRSTRY	Endogenous manufacturing and forestry employment (EMMO+EMAUN)
GR.M.aa	Annual percent change in employment, region aa
GR.P.aa	Annual percent change in population, region aa

Parameters

A.aa.bb	Proportion of the total support sector employment stimulated by increase in total employment in region bb which occurs in region aa
EA.aa.ee	Percent of basic employment category ee allocated to region aa

---

[a]A preliminary population, PRE.aa, is calculated for internal use.

[b]A preliminary household, HPRE.cc, is calculated for internal use.

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 area cc
PGQ.cc	Population in group quarters in 1980 in census area cc
PC.cc.aa	Proportion of population in region aa (1970 census division definiton) allocated to region cc (1980 census area definition)

Suffixes

aa Aggregated 1970 Census Divisions (Revised 1975)

01	Aleutian Islands
02	Anchorage
04	Barrow/North Slope
05	Bethel
06	Bristol Bay*
08	Cordova/McCarthy
09	Fairbanks
11	Southeast Alaska**
12	Kenai/Cook Inlet
14	Kobuk
15	Kodiak
16	Kuskokwim
17	Matanuska/Susitna
18	Nome
21	Seward

*Includes Bristol Bay Borough [07].

**Includes Angoon [03], Haines [10], Juneau [11], Ketchikan [13], Outer Ketchikan [19], Prince of Wales [20], Sitka [22], Skagway/Yakutat [23], and Wrangell/Petersburg [28].

24	Southeast Fairbanks
25	Upper Yukon
26	Valdez/Chitina/Whittier
27	Wade Hampton
29	Yukon/Koyukuk
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

cc Aggregated 1980 Census Areas

01	North Slope
02	Kobuk
03	Nome
04	Yukon/Koyukuk
05	Fairbanks
06	Southeast Fairbanks
07	Wade Hampton
08	Bethel
10	Bristol Bay Borough*
11	Aleutian Islands
12	Matanuska/Susitna
13	Anchorage
14	Kenai Peninsula
15	Kodiak
16	Valdez/Cordova
19	Southeast Alaska**

---

*Includes Dillingham [09].

**Includes Skagway/Yakutat/Angoon [17], Haines [18], Juneau [19], Sitka [20], Wrangell/Petersburg [21], Prince of Wales/Outer Ketchikan [22], and Ketchikan Borough [23].

dd 1980 Labor Market Areas

ANCMS	Anchorage-Matanuska/Susitna = 12, 13
SEAST	Southeast = 17, 18, 19, 20, 21, 22, 23
INTER	Interior = 5, 6 + Yukon Flats, Koyukuk net of Middle Yukon subareas of Yukon/Koyukuk
NORTH	North = 1, 2, 3
GULF	Gulf Coast = 14, 15, 16
SWEST	Southwest = 7, 8, 9, 10, 11 + McGrath-Holy Cross census subareas of Yukon/Koyukuk

ee Employment Categories

CN	endogenous construction (EMCN1)
FR	forestry (FRSTRY)
PR	nonfishing proprietors (EMPRO1)
TR	tourism (EMTOUR)
GA	state and local government (EMGA)

5. Parameter Values

A. Average Household Size (HHSZ.cc) and Population in Group Quarters (PGQ.cc)

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

TABLE 1. HOUSEHOLD SIZE AND POPULATION IN GROUP QUARTERS BY 1980 CENSUS AREAS

	1980 Census Areas (Aggregated)	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
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
19	Southeast Alaska**	2.89	1.418

*Includes Dillingham

**Includes Skagway/Yakutat/Angoon, Haines, Juneau, Sitka, Wrangell/Petersburg, Prince of Wales/Outer Ketchikan, and Ketchikan

SOURCE: 1980 Census of Population

B. Basic Employment Regional Allocation (EA.aa.ee)

Five industries are endogenous in the state model and are treated as basic and allocated regionally in the regional model based upon historical shares. Construction, forestry, and government (state and local) are allocated on the basis of observed employment shares in those industries from the Statistical Quarterly. Tourism is allocated on the basis of data from past state studies of the tourist industry. Proprietors is based upon historical data on the distribution of proprietors from the Bureau of Economic Analysis, net of fishermen.

TABLE 2. BASIC EMPLOYMENT REGIONAL ALLOCATION

[EA.aa.ee]

Region (Adjusted 1970 Census Divisions)	Construction (EMCN1) EA.aa.CN	Forestry (EMMO+EMAUN) EA.aa.FR	Proprietors (EMPRO1) EA.aa.PR	Tourism (EMTOUR) EA.aa.TR	Government (EMGA) EA.aa.GA
1 Aleutian Islands	.0098	0	.0212	0	.0106
2 Anchorage	.5733	.4547	.4646	.3336	.3386
4 Barrow/North Slope	.0325	0	.0011	0	.0341
5 Bethel	.0104	0	.0053	0	.0255
6 Bristol Bay*	.0053	0	.0114	0	.0174
8 Cordova/McCarthy	.0012	0	.0096	.005	.0069
9 Fairbanks	.1631	.2745	.1058	.1282	.1340
11 Southeast Alaska**	.0955	.04	.2324	.303	.2184
12 Kenai/Cook Inlet	.0418	.1677	.0490	.066	.0361
14 Kobuk	.0042	0	.0032	0	.0183
15 Kodiak	.0149	.0162	.0353	.039	.0239
16 Kuskokwim	0	0	.0008	0	.0083
17 Matanuska/Susitna	.0184	.0162	.0221	.0145	.0301
18 Nome	.0041	.0174	.007	.0013	.0208
21 Seward	.0047	0	.0118	.0044	.0084
24 Southeast Fairbanks	.0024	0	.0055	0	.0123
25 Upper Yukon	.0003	0	.0014	0	.0065
26 Valdez/Chitina/Whittier	.0086	0	.0077	.105	.0229
27 Wade Hampton	.0008	0	.0009	0	.0122
29 Yukon/Koyukuk	.0087	.0133	.0039	0	.0147

*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.

C. Interregional Employment Interaction Matrix (A.aa.bb)

The basic data source was regional employment for 1979 from the Alaska Department of Labor publications, specifically Statistical Quarterly and Alaska Economic Trends. The breakdown of employment by basic, government, and support sectors is shown in Table 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 the 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 3. EMPLOYMENT COMPOSITION, 1979

Region-Adjusted 1970 Census Divisions		Support	Basic[1]	Government[2]	Total[3]
1	Aleutian Islands	377	2,463	3,264	6,104
2	Anchorage	43,936	15,296	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	381	1,027	344	1,752
9	Fairbanks	10,627	4,148	12,801	27,576
11	Southeast Alaska**	8,142	10,617	11,081	29,840
12	Kenai/Cook Inlet	2,529	3,854	1,481	7,864
14	Kobuk	402	114	935	1,451
15	Kodiak	1,472	3,803	2,051	7,326
16	Kuskokwim	123	13	435	571
17	Matanuska/Susitna	1,441	624	1,345	3,410
18	Nome	1,077	304	980	2,361
21	Seward	414	728	390	1,532
24	Southeast Fairbanks	240	149	1,636	2,025
25	Upper Yukon	99	25	302	426
26	Valdez/Chitina/Whittier	253	1,140	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

[1]Mining, manufacturing, construction, agriculture-forestry-fisheries, proprietors, tourism, and exogenous transportation [EMP9+EMM9+EMCN+EMA9+EMPRO+EMTOUR+EMT9X].

[2]Federal, state, and local government [EMGF+EMGA].

[3]Total wage and salary, nonwage and salary (proprietor), and military [EM99].

*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: <u>Alaska Economic Projections for Electricity Requirements for the Railbelt</u>, ISER, 1981, adjusted. Based on regional data archive CDAA.

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. The matrix was recalibrated in 1984 using data for 1983 by iterative adjustment of individual elements while maintaining column sums. In addition, four of the matrix elements were converted from parameters to exogenous variables so that their values could trend over time. This allows the Matanuska/Susitna Borough to accrue an increasing portion of its own support activities over time.

The matrix, which we call the interregional employment interaction matrix, is presented in Table 4. 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 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 close to unity). Anchorage and Fairbanks are the most significant support centers, with Anchorage supplying most regions and Fairbanks supplying Kuskokwim, Upper Yukon, and Yukon/Koyukuk. Three local support centers emerge with Bethel supporting Wade Hampton, Nome supporting Kobuk, and Kenai supporting Kodiak. In addition, Matanuska/Susitna provides some support to Anchorage.

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 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	.25																			
02 Anchorage	.75	.97	.6		.44	.2	.05	.33	.05	0	.4		.2		.28	.7		.6		.15
04 Barrow			.4																	
05 Bethel				1.															.49	
06 Bristol Bay					.56															
08 Cordova/McCarthy						.8														
09 Fairbanks							.95					.2					.8			.15
11 Southeast Alaska								.67												
12 Kenai/Cook Inlet									.95		.1									
14 Kobuk										.8										
15 Kodiak											.5									
16 Kuskokwim												.8								
17 Matanuska/Susitna		.03											.8							
18 Nome										.2				1.						
21 Seward															.72					
24 S.E. Fairbanks																.3				
25 Upper Yukon																	.2			
26 Valdez/Chitina/Whittier																		.4		
27 Wade Hampton																			.51	
29 Yukon/Koyukuk																				.70

D. 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.

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 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 6 is a further indication of the amount of out-of-state job commuting which occurs in Alaska.

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.

TABLE 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

[a]U.S. Department of Commerce, Bureau of Economic Analysis.

[b]Alaska Department of Revenue, Federal Income Taxpayers Profile 1978, December 1981.

TABLE 6. NON-ALASKAN TAXPAYERS BY PLACE
IN RANK ORDER

State	Number of Taxpayers	State	Number of Taxpayers
1. Washington	18,259	27. Kansas	340
2. California	7,480	27. North Carolina	340
3. Oregon	4,588	29. Ohio	335
4. Texas	1,760	30. Massachusetts	326
5. Idaho	1,244	31. Alabama	310
6. Colorado	1,241	32. Wyoming	302
7. Arizona	1,216	33. Maryland	285
8. Montana	1,168	34. New Jersey	280
9. Florida	1,033	35. Mississippi	230
10. Minnesota	857	35. Tennessee	230
11. Oklahoma	795	37. Nebraska	223
12. New York	770	38. Indiana	216
13. Michigan	611	39. North Dakota	207
14. Utah	585	40. Iowa	199
15. Hawaii	557	41. South Carolina	186
16. New Mexico	542	42. Kentucky	174
17. Virginia	534	43. South Dakota	166
18. Other Country	513	44. Connecticut	146
19. Wisconsin	505	45. Maine	135
20. Illinois	469	46. New Hampshire	94
21. Missouri	450	47. West Virginia	88
22. Louisiana	448	48. Vermont	80
23. Nevada	417	49. District of Columbia	43
24. Georgia	405	50. Delaware	40
25. Pennsylvania	382	51. Rhode Island	39
26. Arkansas	373		

SOURCE: State of Alaska, Department of Revenue, Permanent Fund Dividends 1979 Community Profile, pp. 84-89.

The full matrix is shown in Table 7. Off-diagonal elements are best understood by considering a column where each element represents the percentage of employees who commute to the row 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.

TABLE 7. INTERREGIONAL RESIDENCE ADJUSTMENT MATRIX (IM.aa.bb)

Place of Residence \ Place of Work	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.

E. Ratio of Population to Residence-Adjusted Employment (PM.aa)

The relationship between residence-adjusted employment and population is difficult to accurately specify because of the lack of information about residence-adjusted employment and the difference between population estimates, which are point in time, and employment estimates, which are annual averages. Table 8, from the 1980 census, illustrates the variation in possible ratios both across regions and within regions using different definitions of employment. In regions with more seasonal employment, the ratio can vary by 100 percent, depending upon whether the employment definition is "currently working" or "worked during the year." Since most employment information is monthly or annual average, the proper ratio using average annual resident employment and July 1 census population should lie somewhere between the two extremes shown in Table 8.

This parameter is calculated in Table 9 as the ratio of population to employment. We use the most recent population estimate of the Department of Labor. The population data is "backward" 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 by running the interregional residence adjustment matrix, IM.aa.bb, applied to estimated 1983 employment by place of work.

TABLE 8. RELATIONSHIP BETWEEN EMPLOYMENT AND POPULATION

1980 Census Area	Employment: [1] Employed (16 Years +)	Employment: [2] Worked in 1979 (16 Years +)	[3] Population	Population/Employment Ratios: [3/1] Population/ Employed	Population/Employment Ratios: [3/2] Population/ Worked in 1979
Aleutian Islands	2,432	5,160	7,768	3.19	1.51
Anchorage	77,754	103,628	174,431	2.24	1.68
Bethel	3,013	4,767	10,999	3.65	2.31
Bristol Bay	282	798	1,094	3.88	1.37
Dillingham	1,308	2,207	4,616	3.53	2.09
Fairbanks N.S. Bor.	20,811	31,093	53,983	2.59	1.74
Haines	731	949	1,680	2.30	1.77
Juneau	10,360	12,151	19,528	1.88	1.61
Kenai Peninsula	9,622	13,318	25,282	2.63	1.90
Ketchikan	5,410	6,366	11,316	2.09	1.78
Kobuk	1,206	2,122	4,831	4.01	2.28
Kodiak	4,365	6,059	9,939	2.28	1.64
Matanuska/Susitna	6,477	8,536	17,816	2.75	2.09
Nome	1,831	2,991	6,537	3.57	2.19
North Slope Borough	1,734	2,336	4,199	2.42	1.80
Prince of Wales/ Outer Ketchikan	1,616	2,061	3,822	2.37	1.85
Sitka	3,626	4,577	7,803	2.15	1.70
Skagway/Yakutat/ Angoon	1,294	1,928	3,478	2.69	1.80
Southeast Fairbanks	1,519	2,961	5,676	3.74	1.92
Valdez/Cordova	3,701	4,710	8,348	2.26	1.77
Wade Hampton	964	1,844	4,665	4.84	2.53
Wrangell/Petersburg	2,800	3,596	6,167	2.20	1.71
Yukon/Koyukuk	2,018	4,170	7,873	3.90	1.89

SOURCE: U.S. Bureau of Census, General Social and Economic Characteristics, Alaska (Employment: Table 177, Worked in 1979: Table 180; Population: Table 171)

TABLE 9. POPULATION-TO-RESIDENT EMPLOYMENT RATIOS FOR 1982

(1970 MAP-Adjusted Census Divisions)

	Region	1983 Estimated Residence-Adjusted Employment[a]	July 1, 1983, Population[b]	July 1 Census Population per Average Annual Employed Resident (PM.aa)
01	Aleutian Islands	2.884	9.114	3.167
02	Anchorage	107.796	227.070	2.099
04	Barrow/North Slope	.817	5.168	6.326
05	Bethel	3.637	10.764	2.948
06	Bristol Bay*	2.057	6.279	3.026
08	Cordova/McCarthy	.893	2.722	3.055
09	Fairbanks	31.160	64.810	2.152
11	Southeast Alaska**	28.954	64.658	2.236
12	Kenai/Cook Inlet	11.668	31.052	2.660
14	Kobuk	1.912	5.759	2.999
15	Kodiak	5.610	12.896	2.334
16	Kuskokwim	.578	2.936	4.976
17	Matanuska/Susitna	9.397	29.849	3.168
18	Nome	2.139	7.661	3.568
21	Seward	1.263	3.838	3.041
24	Southeast Fairbanks	1.596	6.192	3.974
25	Upper Yukon	.494	1.793	3.558
26	Valdez/Chitina/Whittier	2.902	7.000	2.414
27	Wade Hampton	1.233	5.294	4.269
29	Yukon/Koyukuk	1.581	5.699	3.331
	Total		510.554	

[a]Based on estimated 1983 employment by place of work and residence-adjustment matrix IM.aa.bb.

[b]Alaska Population Overview 1983 adjusted to 1970 MAP-adjusted census divisions using matrix PC.cc.aa.

*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.

F. Allocation of Population from 1970 Census Divisions to 1980 Census Areas (PC.cc.aa)

Population is allocated in the regionalization model both by 1970 census divisions (adjusted in 1975) and by 1980 census areas. Conversion factors from the 1970 base to the 1980 base are based upon the 1980 population, for which regional allocations are available based upon both the 1970 and 1980 census boundaries. These allocations are shown in the left portion of Table 10. The right side of Table 10 shows how the population by 1970 census divisions must be reassigned to determine regional population by 1980 census areas. The reassignment affects 12,228 people who are added to census areas and subtracted from census areas. This process includes both the aggregation of some census divisions and the redrawing of some boundaries.

Based upon Table 10, the allocations used in the model were developed and are presented in Table 11.

TABLE 10. FACTORS FOR CONVERSION OF 1970 CENSUS DIVISIONS (UPDATED 1975) TO 1980 CENSUS AREAS

1980 Population						Conversion Factors (1970 to 1980)					
1970 Census Division			1980 Census Area			Add From			Subtract To		
(01)	Aleutian Islands	8,290	7,768	Aleutian Islands	[11]	-			[09]	Dillingham	522
(02)	Anchorage	174,431	174,431	Anchorage	[13]	-			-		
(03)	Angoon	712	0			-			[17]	Skagway-Yakutat-Angoon	712
(04)	Barrow North Slope	4,199	4,199	North Slope Borough	[01]	-			-		
(05)	Bethel	9,698	10,999	Bethel	[08]	(16)	Kuskokwim	1,301	-		
(06)	Bristol Bay Borough	1,094	1,094	Bristol Bay Borough	[10]	-			-		
(07)	Bristol Bay	4,094	4,616	Dillingham	[09]	(01)	Aleutians	522	-		
(08)	Cordova-McCarthy	2,330	0			-			[16]	Valdez-Cordova	2,330
(09)	Fairbanks	53,983	53,983	Fairbanks Borough	[05]	-			-		
(10)	Haines	1,815	1,680	Haines	[18]	-			[17]	Skagway-Yakutat-Angoon	135
(11)	Juneau	19,528	19,528	Juneau	[19]	-			-		
(12)	Kenai-Cook Inlet	22,473	25,282	Kenai Peninsula	[14]	(21)	Seward	2,809	-		
(13)	Ketchikan	11,316	11,316	Ketchikan	[23]	-			-		
(14)	Kobuk	4,831	4,831	Kobuk	[02]	-			-		
(15)	Kodiak	9,939	9,939	Kodiak Island	[15]	-			-		
(16)	Kuskokwim	2,644	0			-			[08] [04]	Bethel Yukon-Koyukuk	1,301 1,343
(17)	Matanuska-Susitna	17,816	17,816	Matanuska-Susitna	[12]	-			-		
(18)	Nome	6,537	6,537	Nome	[03]	-			-		
(19)	Outer Ketchikan	1,333	0			-			[22]	Prince of Wales	1,333
(20)	Prince of Wales	2,489	3,822	Pr/Wales-Outer Ketch.	[22]	(19)	Outer Ketchikan	1,333	-		
(21)	Seward	2,809	0			-			[14]	Kenai Peninsula Bor.	2,809
(22)	Sitka	7,889	7,803	Sitka	[20]	-			[21]	Wrangell-Petersburg	86
(23)	Skagway-Yakutat	2,631	3,478	Skagway-Yakutat-Angoon	[17]	(03) (10)	Angoon Haines	712 135	-		
(24)	Southeast Fairbanks	5,415	5,676	Southeast Fairbanks	[06]	(25)	Upper Yukon	303	[16]	Valdez-Cordova	42
(25)	Upper Yukon	1,516	0			-			[06] [04]	Southeast Fairbanks Yukon-Koyukuk	303 1,312
(26)	Valdez-Chitina-Whit.	5,976	8,348	Valdez-Cordova	[16]	(08) (24)	Cordova-McCarthy S.E. Fairbanks	2,330 42	-		
(27)	Wade Hampton	4,665	4,665	Wade Hampton	[07]	-			-		
(28)	Wrangell-Petersburg	6,081	6,167	Wrangell-Petersburg	[21]	(22)	Sitka	86	-		
(29)	Yukon-Koyukuk	5,218	7,873	Yukon-Koyukuk	[04]	(16) (25)	Kuskokwim Upper Yukon	1,343 1,312	-		
	TOTAL	401,851	401,851					12,228			12,228

TABLE 11. ALLOCATION OF 1970 CENSUS DIVISION POPULATION (aa) TO 1980 CENSUS AREA (cc) [PC.cc.aa]

Adjusted MAP Census Division (aa)		Variable	Proportion	1980 Census Area (cc)
1	Aleutian Islands	PC.11.01	.94	Aleutian Islands
		PC.10.01	.06	Bristol Bay
2	Anchorage	PC.13.02	1	-
4	Barrow	PC.01.04	1	-
5	Bethel	PC.08.05	1	-
6	Bristol Bay/Bor.	PC.10.06	1	-
8	Cordova/McCarthy	PC.16.08	1	-
9	Fairbanks	PC.05.09	1	-
11	Southeast (Juneau, etc.)	PC.19.11	1	-
12	Kenai/Cook Inlet	PC.14.12	1	-
14	Kobuk	PC.02.14	1	-
15	Kodiak	PC.15.15	1	-
16	Kuskokwim	PC.08.16	.49	Bethel
		PC.04.16	.51	Yukon/Koyukuk
17	Matanuska/Susitna	PC.12.17	1	-
18	Nome	PC.12.17	1	-
21	Seward	PC.14.21	1	-
24	S.E. Fairbanks	PC.16.24	.01	Valdez/Cordova
		PC.06.24	.99	S.E. Fairbanks
25	Upper Yukon	PC.04.25	.87	Yukon/Koyukuk
		PC.06.25	.13	S.E. Fairbanks
26	Valdez/Chitina/ Whittier	PC.16.26	1	-
27	Wade Hampton	PC.07.27	1	-
29	Yukon/Koyukuk	PC.04.29	1	-

6. Model Validation

The regionalization model has been initialized on 1983 population (Table 12) and a preliminary estimate of 1983 employment.

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.

Since 1970, the proportion of state employment occurring in the railbelt has remained remarkably constant (Table 13). The proportion has ranged between 66.9 and 69.8 percent. The concentration of population in the railbelt has been comparable during the 1970s, growing from 66 percent in 1970 to 68.9 percent in 1980 (Table 14). In the prior decade, there appears to have been a more significant shift of population toward the railbelt. The initial year simulation values for employment and population are consistent with the historical trends.

TABLE 12. CURRENT POPULATION DISTRIBUTION
(USING 1970 CENSUS DIVISIONS ADJUSTED IN 1975)

Region (Adjusted 1970 Census Divisions)	1980 By 1970 Census Divisions[1]	1980[2]	1982[3]	1983[4]
1 Aleutians	8,290	8,290	9,042	9,114
2 Anchorage	174,431	174,431	200,503	227,070
4 Barrow/North Slope	3,320	4,199	4,849	5,168
5 Bethel	9,698	9,698	9,964	10,764
6 Bristol Bay	5,188	5,188	5,451	6,279
8 Cordova/McCarthy	2,330	2,330	2,647	2,722
9 Fairbanks	53,983	53,983	59,222	64,810
11 Southeast Alaska	53,794	53,794	59,201	64,658
12 Kenai/Cook Inlet	22,473	22,473	28,912	31,052
14 Kobuk	5,295	4,831	5,090	5,759
15 Kodiak	9,939	9,939	12,714	12,896
16 Kuskokwim	2,644	2,644	2,709	2,936
17 Matanuska-Susitna	17,816	17,816	25,212	29,849
18 Nome	6,537	6,537	7,459	7,661
21 Seward	2,809	2,809	3,573	3,838
24 Southeast Fairbanks	5,415	5,415	5,755	6,192
25 Upper Yukon	2,030	1,516	1,653	1,793
26 Valdez/Chitina/Whittier	5,976	5,976	6,807	7,000
27 Wade Hampton	4,665	4,665	4,832	5,294
29 Yukon/Koyukuk	5,218	5,218	5,242	5,699
	401,851	401,851		
July 1 State Total		419,700	460,837	510,554

[1] Alaska Planning Information, Jan. 1984, p. 8.

[2] This is based on the formation of the North Slope Borough in 1975. Barrow/North Slope and Kobuk figures are equal to 1980 census area values and Upper Yukon is calculated as a residual.

[3] Alaska Population Overview, 1982, adjusted using matrix PC.cc.aa.

[4] Alaska Population Overview, 1983, adjusted using matrix PC.cc.aa.

TABLE 13. REGIONAL EMPLOYMENT DISTRIBUTION
(percentage of state)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983* (proj.)
Anchorage (M.02)	44.1	45.5	46.3	46.3	45.8	43.9	43.3	46.8	47.3	46.8	46.7	47.0	48.1	46.5
Matanuska/ Susitna (M.17)	1.2	1.4	1.3	1.4	1.4	1.3	1.4	1.7	2.0	2.0	2.0	2.1	2.3	2.3
Anchorage and Mat/Su	45.3	46.8	47.7	47.8	47.2	45.2	44.7	48.5	49.3	48.8	48.8	49.1	50.4	48.9
Kenai/Cook Inlet (M.12)	3.5	3.3	3.3	3.4	3.4	3.2	3.5	4.1	3.8	3.9	4.0	4.1	4.1	4.3
Seward (M.21)	0.7	0.7	0.7	0.7	0.7	1.7	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.6
Kenai and Seward	4.2	4.0	3.9	4.0	4.0	3.9	4.1	4.8	4.5	4.7	4.7	4.7	4.7	4.9
Southcentral	49.4	50.8	51.6	51.8	51.2	49.1	48.8	53.3	53.8	53.5	53.4	53.8	55.1	53.8
Fairbanks (M.9)	17.5	16.7	15.9	14.9	15.7	17.7	16.4	15.6	14.1	13.7	13.3	13.3	13.2	13.4
Southeast Fairbanks (M.24)	0.7	0.6	0.6	0.6	0.5	1.4	1.7	0.8	0.9	1.0	1.0	0.9	0.9	0.9
Fairbanks and S.E. Fairbanks	18.3	17.3	16.6	15.6	16.2	19.1	18.1	16.5	15.0	14.8	14.3	14.3	14.1	14.3
Railbelt	67.7	68.1	68.2	67.4	67.4	68.2	66.9	69.8	68.8	68.2	67.7	68.0	69.2	68.1
Balance of State	32.3	31.9	31.8	32.6	32.6	31.8	33.1	30.2	31.2	31.8	32.3	32.0	30.8	31.9
State Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Simulation UP85.16R

TABLE 14. REGIONAL POPULATION DISTRIBUTION
(thousand)

	Anchorage P.02	Matanuska-Susitna P.17	Kenai, Cook Inlet and Seward P.12 + P.21	Fairbanks P.09	Southeast Fairbanks P.24	Railbelt P.IR	State P.ST
Historical							
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	
1983 (projection)							
Number	225.747	29.7	34.799	66.904	6.328	363.478	510.484
% of State	44.2	5.8	6.8	13.1	1.2	71.2	

HISTORICAL DATA SOURCE: U.S. Census.

PROJECTION DATA SOURCE: Simulation UP8516.R

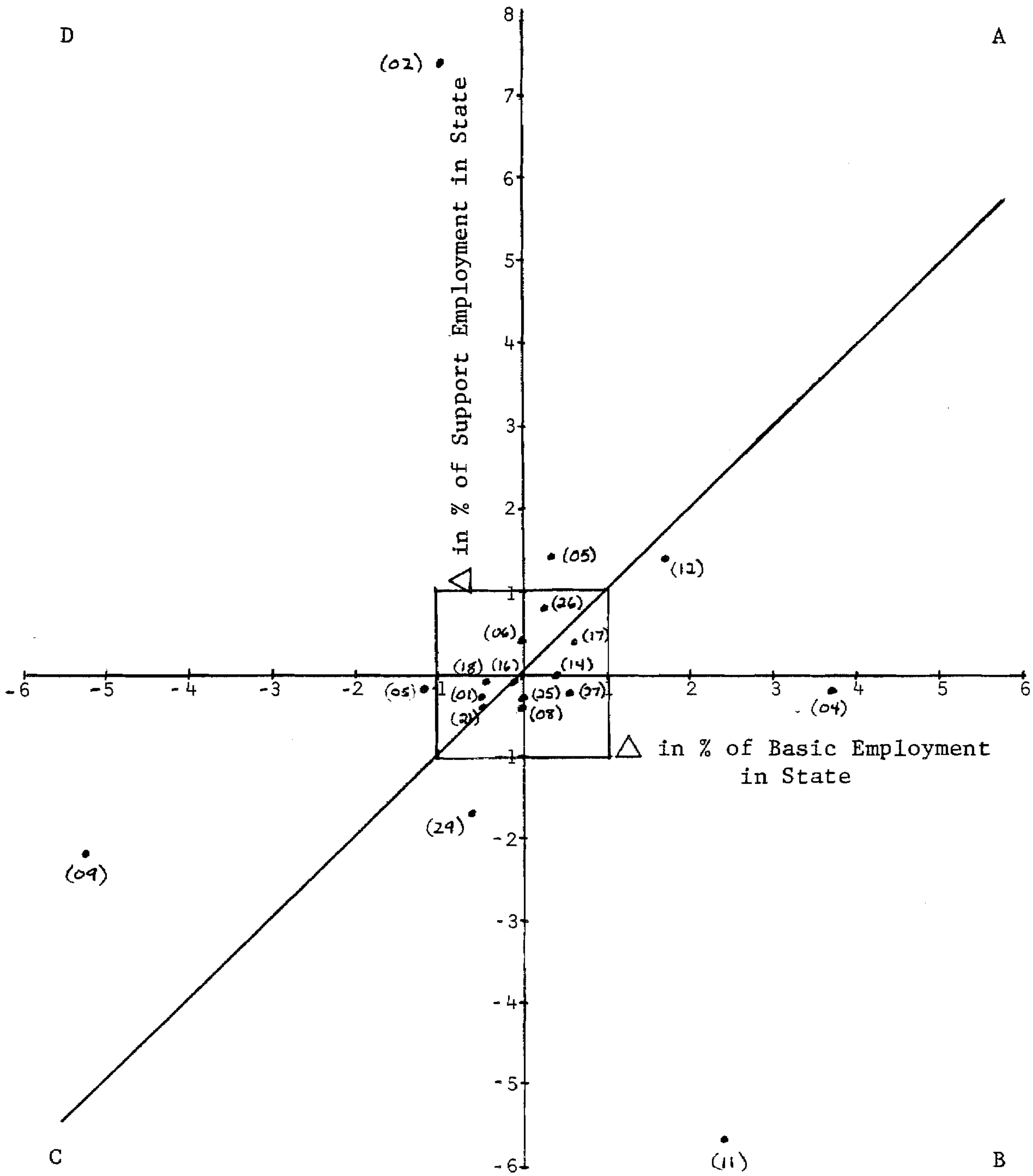
Model calibration has concentrated upon the structure of the interregional support sector demand matrix (A.aa.bb). Preliminary model runs for 1983 indicated that recalibration was necessary since the prior calibration had been done in 1979. Two analyses were done to gauge the degree of structural change across regions. They involved a comparison among regions of the change in percentage of statewide support to statewide basic employment over two periods: 1965 to 1979 and 1979 to 1983. The results are shown as Figures 2 and 3.

Figure 2 shows that between 1965 and 1979 the proportion of state total support sector growth in most regions was consistent with the proportion of state total basic sector growth (observations falling on the diagonal line). Four outliers show up. In two regions, the "multiplier" grew relative to the state. In Anchorage (02), the share of support employment increased while the share of basic fell. In Fairbanks (09), shares of both types of employment fell, but support by less. In two others, the multiplier fell relative to the state. Southeast (11) experienced an increase in basic and a decrease of support employment. Barrow/North Slope (04) experienced an increase in the share of basic and no change in the share of support.

Figure 3 shows that between 1979 and 1983 these trends have continued for Anchorage and Southeast. The "multiplier" for Bethel (05) has declined while for the Aleutians (01) it has grown.

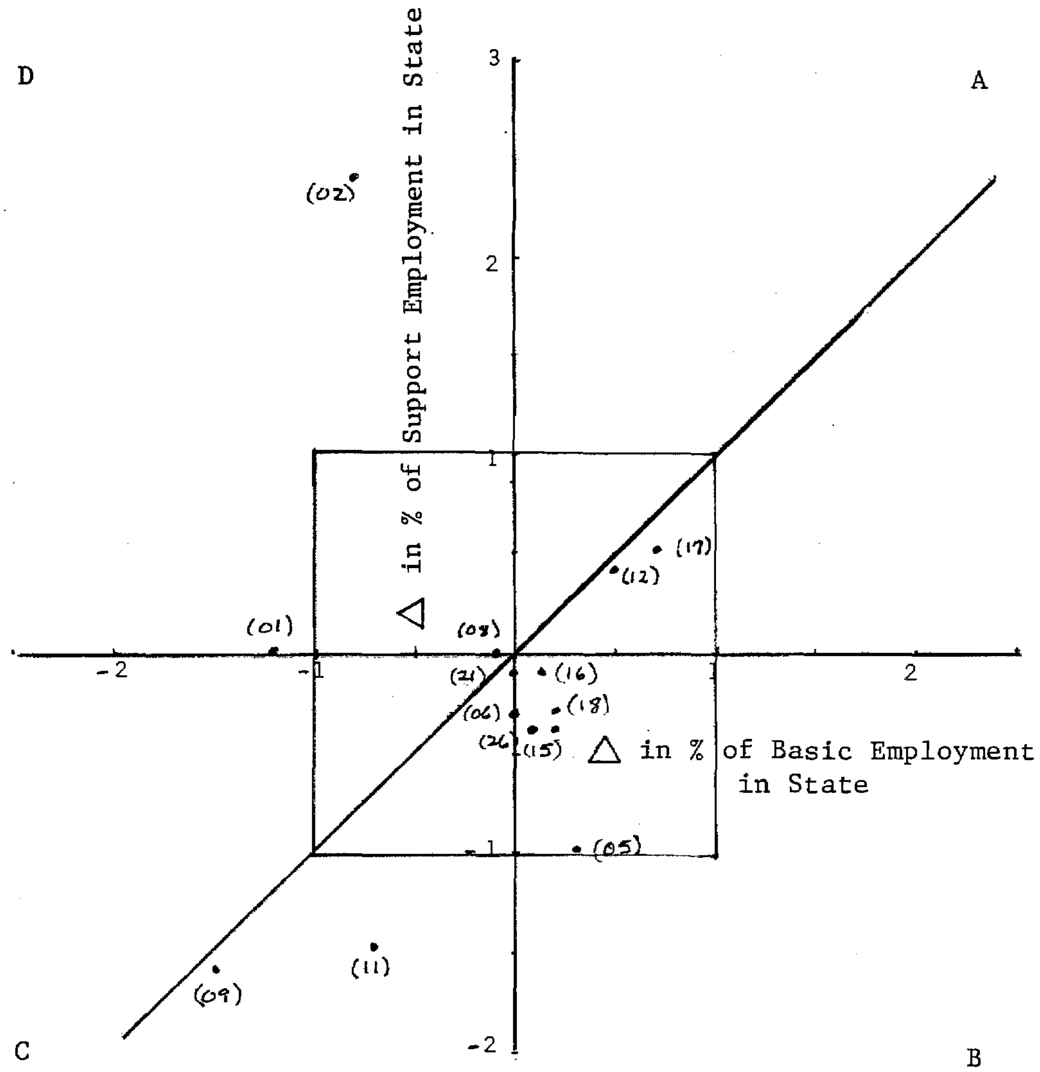
To account for these trends, four elements of the interregional support sector demand matrix have been trended. The purpose is to reflect the shift in support activities from Southeast to Anchorage (A.02.11 and A.11.11) and to reflect a shift from Anchorage to Matanuska/Susitna (A.02.02 and A.17.02).

Figure 2.: Proportion of Support to Basic Employment by Region:
Ratio of Change 1965-1979



Note: Numbers correspond to 1970 Census Divisions.

Figure 3.: Proportion of Support to Basic Employment by Region: Ratio of Change 1979-83



Note: Numbers correspond to 1970 Census Divisions.

7. Programs for Model Use

A84RUNCD	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.
A85PREG1	This MACRO prints initial values for population and employment for model calibration.
A85PREG2	This MACRO prints summary output for Anchorage and the Railbelt.
CDTAB7	This MACRO prints employment for each region.
CDTAB8	This MACRO prints population for each region.

8. Model Listing

MODEL: A84.CD

REVISION HISTORY: VERSION A83.CD IS PRECURSOR.
A84.CD REVISED 10/21 TO REMOVE UNNEEDED ZERO-VALUED ENTRIES IN A.AA.BB AND IM.AA.BB MATRICES. REVISED 10/31/84 TO ADD INTERMEDIATE OUTPUTS MR.NN AND AGGREGATE POPULATION FROM CENSUS LEVEL INTO LABOR MARKET REGIONS.

SYMBOL DECLARATIONS

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 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

CONSTRUCT:

ADJ ADJHH B.AG B.AM B.FG B.IR B.NIR B.NR B.RB B.ST
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 BAG
BAM BETA BFG BNR BRB BST FRSTRY G.AG G.AM G.FG G.IR
G.NIR G.NR G.RB G.ST 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 GAG GAM GFG GNR GRB GST M.AG
M.AM M.FG M.IR M.NIR M.NR M.RB M.ST MR.IR MR.ST P.AG
P.AM P.FG P.IR P.NIR P.NR P.RB P.ST PCEN.01 PCEN.02
PCEN.03 PCEN.04 PCEN.05 PCEN.06 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.IR S.NIR S.NR S.RB S.ST

DEFINITION:

GR.M.01 GR.M.02 GR.M.04 GR.M.05 GR.M.06 GR.M.08 GR.M.09
GR.M.11 GR.M.12 GR.M.14 GR.M.15 GR.M.16 GR.M.17 GR.M.18
GR.M.21 GR.M.24 GR.M.25 GR.M.26 GR.M.27 GR.M.29 GR.P.01
GR.P.02 GR.P.04 GR.P.05 GR.P.06 GR.P.08 GR.P.09 GR.P.11
GR.P.12 GR.P.14 GR.P.15 GR.P.16 GR.P.17 GR.P.18 GR.P.21
GR.P.24 GR.P.25 GR.P.26 GR.P.27 GR.P.29 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 MR.01 MR.02 MR.03 MR.04
MR.05 MR.06 MR.07 MR.08 MR.09 MR.10 MR.11 MR.12 MR.13
MR.14 MR.15 MR.16 MR.17 MR.18 MR.19 MR.20 MR.21 MR.22
MR.23 MR.24 MR.25 MR.26 MR.27 MR.28 MR.29 PL.ANCMS
PL.GULF PL.INTER PL.NORTH PL.SEAST PL.SWEST 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

EXOGENOUS:

B01 B02 B04 B05 B06 B08 B09 B11 B12 B14 B15 B16 B17
B18 B21 B24 B25 B26 B27 B29 EMAFISH EMAGRI EMA9 EMCN
EMCN1 EMGA EMGF EMMO EMM9 EMPRO EMPRO1 EMP9 EMTOUR
EMT9X EM99 G01 G02 G04 G05 G06 G08 G09 G11 G12 G14
G15 G16 G17 G18 G21 G24 G25 G26 G27 G29 HH POP

POLICY:

A.02.02 A.02.11 A.11.11 A.17.02

PARAMETER:

A.01.01 A.02.01 A.02.04 A.02.06 A.02.08 A.02.09 A.02.12
A.02.14 A.02.15 A.02.17 A.02.21 A.02.24 A.02.26 A.02.29
A.04.04 A.05.05 A.05.27 A.06.06 A.08.08 A.09.09 A.09.16
A.09.25 A.09.29 A.12.12 A.12.15 A.14.14 A.15.15 A.16.16
A.17.17 A.18.14 A.18.18 A.21.21 A.24.24 A.25.25 A.26.26
A.27.27 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
EA.01.CN EA.01.FR EA.01.GA EA.01.PR EA.01.TR EA.02.CN
EA.02.FR EA.02.GA EA.02.PR EA.02.TR EA.04.CN EA.04.FR
EA.04.GA EA.04.PR EA.04.TR EA.05.CN EA.05.FR EA.05.GA
EA.05.PR EA.05.TR EA.06.CN EA.06.FR EA.06.GA EA.06.PR
EA.06.TR EA.08.CN EA.08.FR EA.08.GA EA.08.PR EA.08.TR
EA.09.CN EA.09.FR EA.09.GA EA.09.PR EA.09.TR EA.11.CN
EA.11.FR EA.11.GA EA.11.PR EA.11.TR EA.12.CN EA.12.FR
EA.12.GA EA.12.PR EA.12.TR EA.14.CN EA.14.FR EA.14.GA
EA.14.PR EA.14.TR EA.15.CN EA.15.FR EA.15.GA EA.15.PR
EA.15.TR EA.16.CN EA.16.FR EA.16.GA EA.16.PR EA.16.TR
EA.17.CN EA.17.FR EA.17.GA EA.17.PR EA.17.TR EA.18.CN
EA.18.FR EA.18.GA EA.18.PR EA.18.TR EA.21.CN EA.21.FR
EA.21.GA EA.21.PR EA.21.TR EA.24.CN EA.24.FR EA.24.GA
EA.24.PR EA.24.TR EA.25.CN EA.25.FR EA.25.GA EA.25.PR
EA.25.TR EA.26.CN EA.26.FR EA.26.GA EA.26.PR EA.26.TR
EA.27.CN EA.27.FR EA.27.GA EA.27.PR EA.27.TR EA.29.CN
EA.29.FR EA.29.GA EA.29.PR EA.29.TR 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.10 HHSZ.11 HHSZ.12 HHSZ.13 HHSZ.14
HHSZ.15 HHSZ.16 HHSZ.19 IM.01.01 IM.02.01 IM.02.02
IM.02.04 IM.02.05 IM.02.06 IM.02.08 IM.02.12 IM.02.15
IM.02.16 IM.02.21 IM.04.04 IM.05.04 IM.05.05 IM.05.15
IM.06.06 IM.08.08 IM.09.04 IM.09.09 IM.09.24 IM.11.04
IM.11.11 IM.12.01 IM.12.04 IM.12.05 IM.12.06 IM.12.12
IM.12.16 IM.14.04 IM.14.14 IM.15.01 IM.15.06 IM.15.15
IM.15.16 IM.16.16 IM.17.01 IM.17.02 IM.17.04 IM.17.05
IM.17.06 IM.17.08 IM.17.12 IM.17.15 IM.17.16 IM.17.17
IM.17.21 IM.18.04 IM.18.18 IM.21.21 IM.24.04 IM.24.24
IM.25.04 IM.25.25 IM.26.04 IM.26.26 IM.27.27 IM.29.04
IM.29.29 PC.04.16 PC.04.25 PC.06.24 PC.06.25 PC.08.16
PC.10.01 PC.11.01 PC.16.24 PGQ.01 PGQ.02 PGQ.03 PGQ.04
PGQ.05 PGQ.06 PGQ.07 PGQ.08 PGQ.10 PGQ.11 PGQ.12 PGQ.13
PGQ.14 PGQ.15 PGQ.16 PGQ.19 PM.01 PM.02 PM.04 PM.05
PM.06 PM.08 PM.09 PM.11 PM.12 PM.14 PM.15 PM.16 PM.17
PM.18 PM.21 PM.24 PM.25 PM.26 PM.27 PM.29

EQUATIONS

```
 1:  BETA == (EM99-EMA9-EMM9-EMCN-EMP9-EMT9X-EMPRO-EMGA-EMGF-EMTOUR)/EM99

 2:  FRSTRY == EMMO+EMA9-EMAFISH-EMAGRI

 3:  B.01 == B01+EMCN1*EA.01.CN+FRSTRY*EA.01.FR+EMPRO1*EA.01.PR+EMTOUR*
             EA.01.TR

 4:  B.02 == B02+EMCN1*EA.02.CN+FRSTRY*EA.02.FR+EMPRO1*EA.02.PR+EMTOUR*
             EA.02.TR

 5:  B.04 == B04+EMCN1*EA.04.CN+FRSTRY*EA.04.FR+EMPRO1*EA.04.PR+EMTOUR*
             EA.04.TR

 6:  B.05 == B05+EMCN1*EA.05.CN+FRSTRY*EA.05.FR+EMPRO1*EA.05.PR+EMTOUR*
             EA.05.TR

 7:  B.06 == B06+EMCN1*EA.06.CN+FRSTRY*EA.06.FR+EMPRO1*EA.06.PR+EMTOUR*
             EA.06.TR

 8:  B.08 == B08+EMCN1*EA.08.CN+FRSTRY*EA.08.FR+EMPRO1*EA.08.PR+EMTOUR*
             EA.08.TR

 9:  B.09 == B09+EMCN1*EA.09.CN+FRSTRY*EA.09.FR+EMPRO1*EA.09.PR+EMTOUR*
             EA.09.TR

10:  B.11 == B11+EMCN1*EA.11.CN+FRSTRY*EA.11.FR+EMPRO1*EA.11.PR+EMTOUR*
             EA.11.TR

11:  B.12 == B12+EMCN1*EA.12.CN+FRSTRY*EA.12.FR+EMPRO1*EA.12.PR+EMTOUR*
             EA.12.TR

12:  B.14 == B14+EMCN1*EA.14.CN+FRSTRY*EA.14.FR+EMPRO1*EA.14.PR+EMTOUR*
             EA.14.TR

13:  B.15 == B15+EMCN1*EA.15.CN+FRSTRY*EA.15.FR+EMPRO1*EA.15.PR+EMTOUR*
             EA.15.TR

14:  B.16 == B16+EMCN1*EA.16.CN+FRSTRY*EA.16.FR+EMPRO1*EA.16.PR+EMTOUR*
             EA.16.TR

15:  B.17 == B17+EMCN1*EA.17.CN+FRSTRY*EA.17.FR+EMPRO1*EA.17.PR+EMTOUR*
             EA.17.TR

16:  B.18 == B18+EMCN1*EA.18.CN+FRSTRY*EA.18.FR+EMPRO1*EA.18.PR+EMTOUR*
             EA.18.TR

17:  B.21 == B21+EMCN1*EA.21.CN+FRSTRY*EA.21.FR+EMPRO1*EA.21.PR+EMTOUR*
             EA.21.TR

18:  B.24 == B24+EMCN1*EA.24.CN+FRSTRY*EA.24.FR+EMPRO1*EA.24.PR+EMTOUR*
             EA.24.TR
```

```
19:  B.25 == B25+EMCN1*EA.25.CN+FRSTRY*EA.25.FR+EMPRO1*EA.25.PR+EMTOUR*
             EA.25.TR

20:  B.26 == B26+EMCN1*EA.26.CN+FRSTRY*EA.26.FR+EMPRO1*EA.26.PR+EMTOUR*
             EA.26.TR

21:  B.27 == B27+EMCN1*EA.27.CN+FRSTRY*EA.27.FR+EMPRO1*EA.27.PR+EMTOUR*
             EA.27.TR

22:  B.29 == B29+EMCN1*EA.29.CN+FRSTRY*EA.29.FR+EMPRO1*EA.29.PR+EMTOUR*
             EA.29.TR

23:  G.01 == G01+EMGA*EA.01.GA

24:  G.02 == G02+EMGA*EA.02.GA

25:  G.04 == G04+EMGA*EA.04.GA

26:  G.05 == G05+EMGA*EA.05.GA

27:  G.06 == G06+EMGA*EA.06.GA

28:  G.08 == G08+EMGA*EA.08.GA

29:  G.09 == G09+EMGA*EA.09.GA

30:  G.11 == G11+EMGA*EA.11.GA

31:  G.12 == G12+EMGA*EA.12.GA

32:  G.14 == G14+EMGA*EA.14.GA

33:  G.15 == G15+EMGA*EA.15.GA

34:  G.16 == G16+EMGA*EA.16.GA

35:  G.17 == G17+EMGA*EA.17.GA

36:  G.18 == G18+EMGA*EA.18.GA

37:  G.21 == G21+EMGA*EA.21.GA

38:  G.24 == G24+EMGA*EA.24.GA

39:  G.25 == G25+EMGA*EA.25.GA

40:  G.26 == G26+EMGA*EA.26.GA

41:  G.27 == G27+EMGA*EA.27.GA

42:  G.29 == G29+EMGA*EA.29.GA
```

43: M.01 = A.01.01*M.01*BETA+B.01+G.01

44: M.02 = (A.02.01*M.01+A.02.02*M.02+A.02.04*M.04+A.02.06*M.06+
A.02.08*M.08+A.02.09*M.09+A.02.11*M.11+A.02.12*M.12+A.02.14*
M.14+A.02.15*M.15+A.02.17*M.17+A.02.21*M.21+A.02.24*M.24+
A.02.26*M.26+A.02.29*M.29)*BETA+B.02+G.02

45: M.03 = 0.

46: M.04 = A.04.04*M.04*BETA+B.04+G.04

47: M.05 = (A.05.05*M.05+A.05.27*M.27)*BETA+B.05+G.05

48: M.06 = A.06.06*M.06*BETA+B.06+G.06

49: M.07 = 0.

50: M.08 = A.08.08*M.08*BETA+B.08+G.08

51: M.09 = (A.09.09*M.09+A.09.16*M.16+A.09.25*M.25+A.09.29*M.29)*BETA+
B.09+G.09

52: M.10 = 0.

53: M.11 = A.11.11*M.11*BETA+B.11+G.11

54: M.12 = (A.12.12*M.12+A.12.15*M.15)*BETA+B.12+G.12

55: M.13 = 0.

56: M.14 = A.14.14*M.14*BETA+B.14+G.14

57: M.15 = A.15.15*M.15*BETA+B.15+G.15

58: M.16 = A.16.16*M.16*BETA+B.16+G.16

59: M.17 = (A.17.17*M.17+A.17.02*M.02)*BETA+B.17+G.17

60: M.18 = (A.18.14*M.14+A.18.18*M.18)*BETA+B.18+G.18

61: M.19 = 0.

62: M.20 = 0.

63: M.21 = A.21.21*M.21*BETA+B.21+G.21

64: M.22 = 0.

65: M.23 = 0.

66: M.24 = A.24.24*M.24*BETA+B.24+G.24

67: M.25 = A.25.25*M.25*BETA+B.25+G.25

68: M.26 = A.26.26*M.26*BETA+B.26+G.26

69: M.27 = A.27.27*M.27*BETA+B.27+G.27

70: M.28 = 0.

71: M.29 = A.29.29*M.29*BETA+B.29+G.29

72: S.01 == M.01-B.01-G.01

73: S.02 == M.02-B.02-G.02

74: S.03 == M.03-B.03-G.03

75: S.04 == M.04-B.04-G.04

76: S.05 == M.05-B.05-G.05

77: S.06 == M.06-B.06-G.06

78: S.07 == M.07-B.07-G.07

79: S.08 == M.08-B.08-G.08

80: S.09 == M.09-B.09-G.09

81: S.10 == M.10-B.10-G.10

82: S.11 == M.11-B.11-G.11

83: S.12 == M.12-B.12-G.12

84: S.13 == M.13-B.13-G.13

85: S.14 == M.14-B.14-G.14

86: S.15 == M.15-B.15-G.15

87: S.16 == M.16-B.16-G.16

88: S.17 == M.17-B.17-G.17

89: S.18 == M.18-B.18-G.18

90: S.19 == M.19-B.19-G.19

91: S.20 == M.20-B.20-G.20

92: S.21 == M.21-B.21-G.21

```
 93:  S.22 == M.22-B.22-G.22

 94:  S.23 == M.23-B.23-G.23

 95:  S.24 == M.24-B.24-G.24

 96:  S.25 == M.25-B.25-G.25

 97:  S.26 == M.26-B.26-G.26

 98:  S.27 == M.27-B.27-G.27

 99:  S.28 == M.28-B.28-G.28

100:  S.29 == M.29-B.29-G.29

101:  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

102:  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

103:  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

104:  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

105:  B.RB == B.02+B.09+B.12+B.17+B.21+B.24+B.26

106:  G.RB == G.02+G.09+G.12+G.17+G.21+G.24+G.26

107:  S.RB == S.02+S.09+S.12+S.17+S.21+S.24+S.26

108:  M.RB == M.02+M.09+M.12+M.17+M.21+M.24+M.26

109:  B.NR == B.ST-B.RB

110:  G.NR == G.ST-G.RB

111:  S.NR == S.ST-S.RB

112:  M.NR == M.ST-M.RB

113:  B.AM == B.02+B.17

114:  G.AM == G.02+G.17
```

```
115:  S.AM == S.02+S.17

116:  M.AM == M.02+M.17

117:  BAM == B02+B17

118:  GAM == G02+G17

119:  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

120:  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

121:  BRB == B02+B09+B12+B17+B21+B24+B26

122:  BNR == BST-BRB

123:  GRB == G02+G09+G12+G17+G21+G24+G26

124:  GNR == GST-GRB

125:  G.AG == G.AM+G.21+G.12

126:  B.AG == B.AM+B.21+B.12

127:  S.AG == S.AM+S.21+S.12

128:  M.AG == M.AM+M.21+M.12

129:  G.FG == G.09+G.24

130:  B.FG == B.09+B.24

131:  S.FG == S.09+S.24

132:  M.FG == M.09+M.24

133:  GAG == GAM+G21+G12

134:  BAG == BAM+B21+B12

135:  GFG == G09+G24

136:  BFG == B09+B24

137:  MR.01 == M.01*IM.01.01

138:  MR.02 == M.01*IM.02.01+M.02*IM.02.02+M.04*IM.02.04+M.05*IM.02.05+
               M.06*IM.02.06+M.08*IM.02.08+M.12*IM.02.12+M.15*IM.02.15+
               M.16*IM.02.16+M.21*IM.02.21
```

```
139:  MR.03 == 0.

140:  MR.04 == M.04*IM.04.04

141:  MR.05 == M.04*IM.05.04+M.05*IM.05.05+M.15*IM.05.15

142:  MR.06 == M.06*IM.06.06

143:  MR.07 == 0.

144:  MR.08 == M.08*IM.08.08

145:  MR.09 == M.04*IM.09.04+M.09*IM.09.09+M.24*IM.09.24

146:  MR.10 == 0.

147:  MR.11 == M.04*IM.11.04+M.11*IM.11.11

148:  MR.12 == M.01*IM.12.01+M.04*IM.12.04+M.05*IM.12.05+M.06*IM.12.06+
               M.12*IM.12.12+M.16*IM.12.16

149:  MR.13 == 0.

150:  MR.14 == M.04*IM.14.04+M.14*IM.14.14

151:  MR.15 == M.01*IM.15.01+M.06*IM.15.06+M.15*IM.15.15+M.16*IM.15.16

152:  MR.16 == M.16*IM.16.16

153:  MR.17 == M.01*IM.17.01+M.02*IM.17.02+M.04*IM.17.04+M.05*IM.17.05+
               M.06*IM.17.06+M.08*IM.17.08+M.12*IM.17.12+M.15*IM.17.15+
               M.16*IM.17.16+M.17*IM.17.17+M.21*IM.17.21

154:  MR.18 == M.04*IM.18.04+M.18*IM.18.18

155:  MR.19 == 0.

156:  MR.20 == 0.

157:  MR.21 == M.21*IM.21.21

158:  MR.22 == 0.

159:  MR.23 == 0.

160:  MR.24 == M.04*IM.24.04+M.24*IM.24.24

161:  MR.25 == M.04*IM.25.04+M.25*IM.25.25

162:  MR.26 == M.04*IM.26.04+M.26*IM.26.26

163:  MR.27 == M.27*IM.27.27
```

164: MR.28 == 0.

165: MR.29 == M.04*IM.29.04+M.29*IM.29.29

166: MR.ST == MR.01+MR.02+MR.04+MR.05+MR.06+MR.08+MR.09+MR.11+MR.12+
MR.14+MR.15+MR.16+MR.17+MR.18+MR.21+MR.24+MR.25+MR.26+
MR.27+MR.29

167: PRE.01 == PM.01*MR.01

168: PRE.02 == PM.02*MR.02

169: PRE.03 == 0.

170: PRE.04 == PM.04*MR.04

171: PRE.05 == PM.05*MR.05

172: PRE.06 == PM.06*MR.06

173: PRE.07 == 0.

174: PRE.08 == PM.08*MR.08

175: PRE.09 == PM.09*MR.09

176: PRE.10 == 0.

177: PRE.11 == PM.11*MR.11

178: PRE.12 == PM.12*MR.12

179: PRE.13 == 0.

180: PRE.14 == PM.14*MR.14

181: PRE.15 == PM.15*MR.15

182: PRE.16 == PM.16*MR.16

183: PRE.17 == PM.17*MR.17

184: PRE.18 == PM.18*MR.18

185: PRE.19 == 0.

186: PRE.20 == 0.

187: PRE.21 == PM.21*MR.21

188: PRE.22 == 0.

189: PRE.23 == 0.

190: PRE.24 == PM.24*MR.24

191: PRE.25 == PM.25*MR.25

192: PRE.26 == PM.26*MR.26

193: PRE.27 == PM.27*MR.27

194: PRE.28 == 0.

195: PRE.29 == PM.29*MR.29

196: 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

197: ADJ == POP/PRE.ST

198: P.29 == PRE.29*ADJ

199: P.28 == PRE.28*ADJ

200: P.27 == PRE.27*ADJ

201: P.26 == PRE.26*ADJ

202: P.25 == PRE.25*ADJ

203: P.24 == PRE.24*ADJ

204: P.23 == PRE.23*ADJ

205: P.22 == PRE.22*ADJ

206: P.21 == PRE.21*ADJ

207: P.20 == PRE.20*ADJ

208: P.19 == PRE.19*ADJ

209: P.18 == PRE.18*ADJ

210: P.17 == PRE.17*ADJ

211: P.16 == PRE.16*ADJ

212: P.15 == PRE.15*ADJ

213: P.14 == PRE.14*ADJ

```
214:  P.13 == PRE.13*ADJ

215:  P.12 == PRE.12*ADJ

216:  P.11 == PRE.11*ADJ

217:  P.10 == PRE.10*ADJ

218:  P.09 == PRE.09*ADJ

219:  P.08 == PRE.08*ADJ

220:  P.07 == PRE.07*ADJ

221:  P.06 == PRE.06*ADJ

222:  P.05 == PRE.05*ADJ

223:  P.04 == PRE.04*ADJ

224:  P.03 == PRE.03*ADJ

225:  P.02 == PRE.02*ADJ

226:  P.01 == PRE.01*ADJ

227:  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

228:  P.RB == P.02+P.09+P.12+P.17+P.21+P.24+P.26

229:  P.NR == P.ST-P.RB

230:  P.AM == P.02+P.17

231:  P.AG == P.AM+P.21+P.12

232:  P.FG == P.09+P.24

233:  PCEN.01 == P.04

234:  PCEN.02 == P.14

235:  PCEN.03 == P.18

236:  PCEN.04 == P.29+P.16*PC.04.16+P.25*PC.04.25

237:  PCEN.05 == P.09

238:  PCEN.06 == P.24*PC.06.24+P.25*PC.06.25
```

239: PCEN.07 == P.27

240: PCEN.08 == P.05+P.16*PC.08.16

241: PCEN.09 == P.07

242: PCEN.10 == P.06+P.01*PC.10.01

243: PCEN.11 == P.01*PC.11.01

244: PCEN.12 == P.17

245: PCEN.13 == P.02

246: PCEN.14 == P.12+P.21

247: PCEN.15 == P.15

248: PCEN.16 == P.24*PC.16.24+P.08+P.26

249: PCEN.17 == P.23+P.03

250: PCEN.18 == P.10

251: PCEN.19 == P.11

252: PCEN.20 == P.22

253: PCEN.21 == P.28

254: PCEN.22 == P.20+P.19

255: PCEN.23 == P.13

256: HPRE.01 == (PCEN.01-PGQ.01)/HHSZ.01

257: HPRE.02 == (PCEN.02-PGQ.02)/HHSZ.02

258: HPRE.03 == (PCEN.03-PGQ.03)/HHSZ.03

259: HPRE.04 == (PCEN.04-PGQ.04)/HHSZ.04

260: HPRE.05 == (PCEN.05-PGQ.05)/HHSZ.05

261: HPRE.06 == (PCEN.06-PGQ.06)/HHSZ.06

262: HPRE.07 == (PCEN.07-PGQ.07)/HHSZ.07

263: HPRE.08 == (PCEN.08-PGQ.08)/HHSZ.08

264: HPRE.09 == 0

265: HPRE.10 == (PCEN.10-PGQ.10)/HHSZ.10

266: HPRE.11 == (PCEN.11-PGQ.11)/HHSZ.11

267: HPRE.12 == (PCEN.12-PGQ.12)/HHSZ.12

268: HPRE.13 == (PCEN.13-PGQ.13)/HHSZ.13

269: HPRE.14 == (PCEN.14-PGQ.14)/HHSZ.14

270: HPRE.15 == (PCEN.15-PGQ.15)/HHSZ.15

271: HPRE.16 == (PCEN.16-PGQ.16)/HHSZ.16

272: HPRE.17 == 0

273: HPRE.18 == 0

274: HPRE.19 == (PCEN.19-PGQ.19)/HHSZ.19

275: HPRE.20 == 0

276: HPRE.21 == 0

277: HPRE.22 == 0

278: HPRE.23 == 0

279: 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

280: ADJHH == HH/HPRE.ST

281: HHCEN.01 == HPRE.01*ADJHH

282: HHCEN.02 == HPRE.02*ADJHH

283: HHCEN.03 == HPRE.03*ADJHH

284: HHCEN.04 == HPRE.04*ADJHH

285: HHCEN.05 == HPRE.05*ADJHH

286: HHCEN.06 == HPRE.06*ADJHH

287: HHCEN.07 == HPRE.07*ADJHH

288: HHCEN.08 == HPRE.08*ADJHH

289: HHCEN.09 == HPRE.09*ADJHH

```
290:  HHCEN.10 == HPRE.10*ADJHH

291:  HHCEN.11 == HPRE.11*ADJHH

292:  HHCEN.12 == HPRE.12*ADJHH

293:  HHCEN.13 == HPRE.13*ADJHH

294:  HHCEN.14 == HPRE.14*ADJHH

295:  HHCEN.15 == HPRE.15*ADJHH

296:  HHCEN.16 == HPRE.16*ADJHH

297:  HHCEN.17 == HPRE.17*ADJHH

298:  HHCEN.18 == HPRE.18*ADJHH

299:  HHCEN.19 == HPRE.19*ADJHH

300:  HHCEN.20 == HPRE.20*ADJHH

301:  HHCEN.21 == HPRE.21*ADJHH

302:  HHCEN.22 == HPRE.22*ADJHH

303:  HHCEN.23 == HPRE.23*ADJHH

304:  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

305:  B.IR == B.RB-B.26

306:  G.IR == G.RB-G.26

307:  S.IR == S.RB-S.26

308:  M.IR == M.RB-M.26

309:  MR.IR == MR.02+MR.09+MR.12+MR.17+MR.21+MR.24

310:  P.IR == P.RB-P.26

311:  B.NIR == B.ST-B.IR

312:  G.NIR == G.ST-G.IR

313:  S.NIR == S.ST-S.IR

314:  M.NIR == M.ST-M.IR
```

```
315:  P.NIR == P.ST-P.IR

316:  HH.AM == HHCEN.12+HHCEN.13

317:  HH.AG == HH.AM+HHCEN.14

318:  HH.FG == HHCEN.05+HHCEN.06*(P.24/PCEN.06)

319:  HH.IR == HH.AG+HH.FG

320:  PL.ANCMS == PCEN.12+PCEN.13

321:  PL.SEAST == PCEN.19

322:  PL.INTER == PCEN.05+PCEN.06+0.75*PCEN.04

323:  PL.NORTH == PCEN.01+PCEN.02+PCEN.03

324:  PL.GULF == PCEN.14+PCEN.15+PCEN.16

325:  PL.SWEST == PCEN.07+PCEN.08+PCEN.10+PCEN.11+0.25*PCEN.04

326:  GR.M.01 == (M.01/M.01(-1)-1)*100

327:  GR.M.02 == (M.02/M.02(-1)-1)*100

328:  GR.M.04 == (M.04/M.04(-1)-1)*100

329:  GR.M.05 == (M.05/M.05(-1)-1)*100

330:  GR.M.06 == (M.06/M.06(-1)-1)*100

331:  GR.M.08 == (M.08/M.08(-1)-1)*100

332:  GR.M.09 == (M.09/M.09(-1)-1)*100

333:  GR.M.11 == (M.11/M.11(-1)-1)*100

334:  GR.M.12 == (M.12/M.12(-1)-1)*100

335:  GR.M.14 == (M.14/M.14(-1)-1)*100

336:  GR.M.15 == (M.15/M.15(-1)-1)*100

337:  GR.M.16 == (M.16/M.16(-1)-1)*100

338:  GR.M.17 == (M.17/M.17(-1)-1)*100

339:  GR.M.18 == (M.18/M.18(-1)-1)*100

340:  GR.M.21 == (M.21/M.21(-1)-1)*100
```

341: GR.M.24 == (M.24/M.24(-1)-1)*100

342: GR.M.25 == (M.25/M.25(-1)-1)*100

343: GR.M.26 == (M.26/M.26(-1)-1)*100

344: GR.M.27 == (M.27/M.27(-1)-1)*100

345: GR.M.29 == (M.29/M.29(-1)-1)*100

346: GR.P.01 == (P.01/P.01(-1)-1)*100

347: GR.P.02 == (P.02/P.02(-1)-1)*100

348: GR.P.04 == (P.04/P.04(-1)-1)*100

349: GR.P.05 == (P.05/P.05(-1)-1)*100

350: GR.P.06 == (P.06/P.06(-1)-1)*100

351: GR.P.08 == (P.08/P.08(-1)-1)*100

352: GR.P.09 == (P.09/P.09(-1)-1)*100

353: GR.P.11 == (P.11/P.11(-1)-1)*100

354: GR.P.12 == (P.12/P.12(-1)-1)*100

355: GR.P.14 == (P.14/P.14(-1)-1)*100

356: GR.P.15 == (P.15/P.15(-1)-1)*100

357: GR.P.16 == (P.16/P.16(-1)-1)*100

358: GR.P.17 == (P.17/P.17(-1)-1)*100

359: GR.P.18 == (P.18/P.18(-1)-1)*100

360: GR.P.21 == (P.21/P.21(-1)-1)*100

361: GR.P.24 == (P.24/P.24(-1)-1)*100

362: GR.P.25 == (P.25/P.25(-1)-1)*100

363: GR.P.26 == (P.26/P.26(-1)-1)*100

364: GR.P.27 == (P.27/P.27(-1)-1)*100

365: GR.P.29 == (P.29/P.29(-1)-1)*100

9. Model Parameters

MODEL: A84.CD

COMMENT: THIS FILE CONTAINS THE PARAMETERS FOR VERSION A84.CD OF THE MAP REGIONALIZATION MODEL. VERSION A84.CD WAS 'CLEANED' OF UNNECESSARY ZERO-VALUED PARAMETERS AND THE CLEANED VERSION COMPLETED ON OCTOBER 21 1984. THE DELETIONS WERE ALL FROM THE A.NN.XX AND IM.NN.XX PARAMETER MATRICES.

A.01.01	0.25	A.02.01	0.75	A.02.02	0.965
A.02.04	0.6	A.02.06	0.44	A.02.08	0.2
A.02.09	0.05	A.02.11	0.33	A.02.12	0.05
A.02.14	0.	A.02.15	0.4	A.02.17	0.2
A.02.21	0.28	A.02.24	0.7	A.02.26	0.6
A.02.29	0.15	A.04.04	0.4	A.05.05	1.
A.05.27	0.49	A.06.06	0.56	A.08.08	0.8
A.09.09	0.95	A.09.16	0.2	A.09.25	0.8
A.09.29	0.15	A.11.11	0.67	A.12.12	0.95
A.12.15	0.1	A.14.14	0.8	A.15.15	0.5
A.16.16	0.8	A.17.02	0.035	A.17.17	0.8
A.18.14	0.2	A.18.18	1.	A.21.21	0.72
A.24.24	0.3	A.25.25	0.2	A.26.26	0.4
A.27.27	0.51	A.29.29	0.7	B.03	0.
B.07	0.	B.10	0.	B.13	0.
B.19	0.	B.20	0.	B.22	0.
B.23	0.	B.28	0.		
B03	0.	B07	0.	B10	0.
B13	0.	B19	0.	B20	0.
B22	0.	B23	0.	B28	0.
EA.01.CN	0.0098	EA.01.FR	0.	EA.01.GA	0.0106
EA.01.PR	0.0212	EA.01.TR	0.	EA.02.CN	0.5733
EA.02.FR	0.4547	EA.02.GA	0.3386	EA.02.PR	0.4646
EA.02.TR	0.3336	EA.04.CN	0.0325	EA.04.FR	0.
EA.04.GA	0.0341	EA.04.PR	0.0011	EA.04.TR	0.
EA.05.CN	0.0104	EA.05.FR	0.	EA.05.GA	0.0255
EA.05.PR	0.0053	EA.05.TR	0.	EA.06.CN	0.0053
EA.06.FR	0.	EA.06.GA	0.0174	EA.06.PR	0.0114
EA.06.TR	0.	EA.08.CN	0.0012	EA.08.FR	0.
EA.08.GA	0.0069	EA.08.PR	0.0096	EA.08.TR	0.005
EA.09.CN	0.1631	EA.09.FR	0.2745	EA.09.GA	0.134
EA.09.PR	0.1058	EA.09.TR	0.1282	EA.11.CN	0.0955
EA.11.FR	0.04	EA.11.GA	0.2184	EA.11.PR	0.2324
EA.11.TR	0.303	EA.12.CN	0.0418	EA.12.FR	0.1677
EA.12.GA	0.0361	EA.12.PR	0.049	EA.12.TR	0.066
EA.14.CN	0.0042	EA.14.FR	0.	EA.14.GA	0.0183
EA.14.PR	0.0032	EA.14.TR	0.	EA.15.CN	0.0149
EA.15.FR	0.0162	EA.15.GA	0.0239	EA.15.PR	0.0353

EA.15.TR	0.039	EA.16.CN	0.	EA.16.FR	0.
EA.16.GA	0.0083	EA.16.PR	0.0008	EA.16.TR	0.
EA.17.CN	0.0184	EA.17.FR	0.0162	EA.17.GA	0.0301
EA.17.PR	0.0221	EA.17.TR	0.0145	EA.18.CN	0.0041
EA.18.FR	0.0174	EA.18.GA	0.0208	EA.18.PR	0.007
EA.18.TR	0.0013	EA.21.CN	0.0047	EA.21.FR	0.
EA.21.GA	0.0084	EA.21.PR	0.0118	EA.21.TR	0.0044
EA.24.CN	0.0024	EA.24.FR	0.	EA.24.GA	0.0123
EA.24.PR	0.0055	EA.24.TR	0.	EA.25.CN	0.0003
EA.25.FR	0.	EA.25.GA	0.0065	EA.25.PR	0.0014
EA.25.TR	0.	EA.26.CN	0.0086	EA.26.FR	0.
EA.26.GA	0.0229	EA.26.PR	0.0077	EA.26.TR	0.105
EA.27.CN	0.0008	EA.27.FR	0.	EA.27.GA	0.0122
EA.27.PR	0.0009	EA.27.TR	0.	EA.29.CN	0.0087
EA.29.FR	0.0133	EA.29.GA	0.0147	EA.29.PR	0.0039
EA.29.TR	0.	G.03	0.	G.07	0.
G.10	0.	G.13	0.	G.19	0.
G.20	0.	G.22	0.	G.23	0.
G.28	0.	G03	0.	G07	0.
G10	0.	G13	0.	G19	0.
G20	0.	G22	0.	G23	0.
G28	0.	HHSZ.01	3.91	HHSZ.02	4.2
HHSZ.03	3.7	HHSZ.04	3.18	HHSZ.05	2.78
HHSZ.06	3.16	HHSZ.07	4.87	HHSZ.08	4.05
HHSZ.09	0.	HHSZ.10	3.68	HHSZ.11	3.27
HHSZ.12	3.06	HHSZ.13	2.8	HHSZ.14	2.92
HHSZ.15	3.06	HHSZ.16	2.84	HHSZ.17	0.
HHSZ.18	0.	HHSZ.19	2.89	HHSZ.20	0.
HHSZ.21	0.	HHSZ.22	0.	HHSZ.23	0.
IM.01.01	0.412	IM.02.01	0.09	IM.02.02	0.861
IM.02.04	0.376	IM.02.05	0.09	IM.02.06	0.09
IM.02.08	0.02	IM.02.12	0.02	IM.02.15	0.02
IM.02.16	0.09	IM.02.21	0.02	IM.04.04	0.078
IM.05.04	0.002	IM.05.05	0.861	IM.05.15	0.02
IM.06.06	0.5	IM.08.08	0.545	IM.09.04	0.163
IM.09.09	0.863	IM.09.24	0.05	IM.11.04	0.011
IM.11.11	0.84	IM.12.01	0.02	IM.12.04	0.064
IM.12.05	0.02	IM.12.06	0.02	IM.12.12	0.986
IM.12.16	0.02	IM.14.04	0.005	IM.14.14	1.
IM.15.01	0.02	IM.15.06	0.02	IM.15.15	0.69
IM.15.16	0.02	IM.16.16	0.778	IM.17.01	0.02
IM.17.02	0.02	IM.17.04	0.06	IM.17.05	0.02
IM.17.06	0.02	IM.17.08	0.01	IM.17.12	0.01
IM.17.15	0.01	IM.17.16	0.02	IM.17.17	1.
IM.17.21	0.01	IM.18.04	0.001	IM.18.18	0.788
IM.21.21	0.8	IM.24.04	0.006	IM.24.24	0.692
IM.25.04	0.005	IM.25.25	1.	IM.26.04	0.005
IM.26.26	1.	IM.27.27	1.	IM.29.04	0.005
IM.29.29	0.611	PC.04.16	0.51	PC.04.25	0.87
PC.06.24	0.99	PC.06.25	0.13	PC.08.16	0.49
PC.10.01	0.06	PC.11.01	0.94	PC.16.24	0.01

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	3.167
PM.02	2.099	PM.03	0.	PM.04	6.326
PM.05	2.948	PM.06	3.026	PM.07	0.
PM.08	3.055	PM.09	2.152	PM.10	0.
PM.11	2.236	PM.12	2.66	PM.13	0.
PM.14	2.999	PM.15	2.334	PM.16	4.976
PM.17	3.168	PM.18	3.568	PM.19	0.
PM.20	0.	PM.21	3.041	PM.22	0.
PM.23	0.	PM.24	3.974	PM.25	3.558
PM.26	2.414	PM.27	4.269	PM.28	0.
PM.29	3.331				

10. Exogenous and Startup Values

a. Exogenous Variables
(All exogenous variables come from the scenario generator [Baa and Gaa], or a state model simulation)

b. Policy Variables

	A.02.11	A.02.02	A.11.11	A.17.02
1983	0.33	0.965	0.67	0.035
1984	0.331	0.964	0.669	0.036
1985	0.332	0.963	0.668	0.037
1986	0.333	0.962	0.667	0.038
1987	0.334	0.961	0.666	0.039
1988	0.335	0.96	0.665	0.04
1989	0.336	0.959	0.664	0.041
1990	0.337	0.958	0.663	0.042
1991	0.338	0.957	0.662	0.043
1992	0.339	0.956	0.661	0.044
1993	0.34	0.955	0.66	0.045
1994	0.341	0.954	0.659	0.046
1995	0.342	0.953	0.658	0.047
1996	0.343	0.953	0.657	0.047
1997	0.344	0.952	0.656	0.048
1998	0.345	0.951	0.655	0.049
1999	0.346	0.95	0.654	0.05
2000	0.347	0.949	0.653	0.051
2001	0.348	0.948	0.652	0.052
2002	0.349	0.947	0.651	0.053
2003	0.35	0.946	0.65	0.054
2004	0.351	0.945	0.649	0.055
2005	0.352	0.944	0.648	0.056
2006	0.353	0.943	0.647	0.057
2007	0.354	0.942	0.646	0.058
2008	0.355	0.941	0.645	0.059
2009	0.356	0.94	0.644	0.06
2010	0.357	0.939	0.643	0.061

c. Startup Variables
(Startup values for endogenous variables do not affect simulation results)

SCENARIO GENERATOR

Institute of Social
and Economic Research
MAP Documentation
December 1984

ISER MAP ALASKA ECONOMIC MODEL:

SCENARIO GENERATOR MODEL

DOCUMENTATION

0. Introduction

The scenario generator model consists of a set of data files, macros, and programs designed to create and manipulate a library of some of the exogenous variables required for a run of each of the three major ISER models--the MAP statewide model, the regionalization model, and the Anchorage Municipality model--BIGMOD.

Part 1 documents the organization of data files in the archives related to the scenario generation tasks. Part 2 describes the use of the scenario generation macro in constructing a scenario. Part 3 then describes a set of macros which have been developed for conveniently manipulating, editing, and examining the files contained in the library archives. Part 4 displays a sample of the output of the model.

1. Organization of the Library Archives

Each of the three ISER economic models requires a set of data series corresponding to each of the variables treated as exogenous by that model. The scenario generator model provides the most important of those variables to each model.

Specifically, for use in a run of the MAP statewide model, the scenario generator provides a data series for each of the 16 exogenous variables listed in Table 1. The scenario generator provides for use in a run of the regionalization model a set of data series for each of the 40 exogenous variables shown in Table 2. Finally, the scenario generator provides for use in a run of the Anchorage Municipality model BIGMOD a set of data series for the 24 exogenous variables shown in Table 3.

Each model requires additional exogenous and policy variables to run. The scenario generator provides for each model only the subset of all exogenous variables equivalent to Table 1 for the state model. Consult individual model documentation for further details. Because not all exogenous and policy variables are set by the scenario generator, it is necessary to check that the assumptions implicit in the variables from the scenario generator are consistent with those variables input into the models not from the scenario generator. This is particularly true for the Anchorage Municipality model.

TABLE 1. EXOGENOUS VARIABLES PROVIDED FOR MAP STATEWIDE MODEL RUN

Variable Name	Description
EMAGRI	Agriculture Employment
EMCNX1	High Wage Exogenous Construction Employment
EMCNX2	Low Wage Exogenous Construction Employment
EMFISH	Fish Harvesting Employment
EMGC	Civilian Federal Employment
EMGM	Active Duty Military Employment
EMMX1	High Wage Exogenous Manufacturing Employment
EMMX2	Low Wage Exogenous Manufacturing Employment
EMP9	Mining Employment
EMT9X	Exogenous Transportation Employment
RPBS	State Bonus Payment Revenue
RPPS	State Property Tax Revenue
RPRY	State Royalty Income
RPTS	State Production Tax Revenue
RTCSPX	State Corporate Petroleum Tax Revenue
TOURIST	Tourists Entering Alaska

TABLE 2. EXOGENOUS VARIABLES PROVIDED FOR REGIONALIZATION MODEL RUN

Variable	Description
Bii	Basic Sector Employment, Region ii
Gii	Government Sector Employment, Region ii

Where ii:

01	for	Aleutian Islands CD
02	for	Anchorage CD
04	for	Barrow/N. Slope CD
05	for	Bethel CD
06	for	Bristol Bay*
08	for	Cordova/McCarthy CD
09	for	Fairbanks CD
11	for	Southeast**
12	for	Kenai/Cook Inlet CD
14	for	Kobuk CD
15	for	Kodiak CD
16	for	Kuskokwim CD
17	for	Matanuska/Susitna CD
18	for	Nome CD
21	for	Seward CD
24	for	S.E. Fairbanks CD
25	for	Upper Yukon CD
26	for	Valdez/Chitina/Whittier CD
27	for	Wade Hampton CD
29	for	Yukon Koyukuk

---

*Includes Bristol Bay CD and Bristol Bay Borough CD.

**Includes: Angoon CD
Haines CD
Juneau CD
Ketchikan CD
Outer Ketchikan CD
Prince of Wales CD
Sitka CD
Skagway-Yakatat CD
Wrangell-Petersburg CD

TABLE 3. EXOGENOUS VARIABLES PROVIDED FOR ANCHORAGE MUNICIPALITY MODEL RUN

Variable	Description
rMP.ss*	Employment by Place of Work, Region r, Sector ss

*Where r = B Matanuska/Susitna Region (Matanuska/Susitna CD)
C Southcentral Region (Kenai-Cook Inlet, Kodiak, Valdez/Chitina/Whittier, Cordova/McCarthy, and Seward CDs)
D Interior Region (Fairbanks, Yukon/Koyukuk, and Upper Yukon CDs)
E Southeast Region (Juneau, Ketchikan, Prince of Wales, Sitka, Wrangell, Petersburg, and Lynn Canal CDs)
F Northern Region (Barrow/North Slope, Kobuk, and Nome CDs)
G Southwest Region (Aleutian Islands, Bethel, Bristol Bay, Wade Hampton, and Kuskokwim CDs)

ss = B1 High Wage Basic Sector
B2 Low Wage Basic Sector
G9 Government Sector
PR Proprietor Sector

A scenario is defined as a set of values for each of these variables, and it is composed of sets of individual assumptions, or cases, each of which is itself an archive of individual component assumptions about an industry or activity. These individual components are filed in an archive called SCEN__, which can be considered to be the library from which scenarios may be constructed using the scenario generator. The scenario generator combines these cases according to user-specified instructions into scenarios, which are then filed in an archive called SCENARIO__. The scenarios archived in SCENARIO_ may be used directly as input into running the various ISER economic models.

a. Input File Archives--The Case Library (SCEN-) and Case Creation

The SCEN_ archives contain sets of data files which will be termed "cases." A "case" may be a particular exogenous development project, such as the gas pipeline or the Alpetco refinery, or a particular set of revenue estimates, such as those published by the Alaska Department of Revenue, or an assumption concerning the development of a component of an exogenous industry, such as commercial fishing or agriculture. Each "case" has implications for some subset of the exogenous variables in the ISER economic models.

A "case" consists of a set of data files, consisting of the effects of that case on the exogenous variables in one or more of the ISER economic models. In addition, each case contains an additional data file called COMMENT, containing no data but rather a comment which provides a short description and documentation of the case.

Each case is given a user-specified name which becomes the name of a sub-archive within the SCEN_ archive. The convention to be used in giving such names is as follows: the name will take the form ccc.nnn, where ccc is a three-digit code identifying the particular case, such as an OCS sale, which would be called OCS.nnn, or Prudhoe Bay field employment, which would be called PRB.nnn. The final three digits (nnn) are an identifier of the particular set of assumptions employed to describe this case. For example, there may be a series of PRB.nnn cases, each corresponding to a different set of assumptions regarding the future development of Prudhoe Bay.

It should be noted that not all cases will be usable with all models. For example, certain cases such as revenue assumptions may affect only variables in the MAP statewide model. On the other hand, any cases which involve exogenous employment will typically affect the exogenous variables in all three models, but information may be inadequate to provide sufficient regional disaggregation to use either the regionalization model or the municipality model. Alternatively, the user may have sufficient information to regionally disaggregate the statewide data to the level required by BIGMOD, but not to the level required by the regionalization model.

In order to deal with such possibilities without having to set up three special model-specific libraries in which there would be a great deal of duplication, the comment file in each case should include a list of the models with which the case may be appropriately utilized. Many cases initially entered into the library as "state" cases, usable only with the statewide model, may be gradually upgraded as more information and/or more effort is put into disaggregating the data to a regional level appropriate for use in one or both of the regional models.

A complete "case" includes both the on-line data files and a physical documentation file. While there is no single best approach in developing a "case," there are five basic steps required to complete a comprehensive "case" file: development of input numbers, data entry, data verification, written descriptions, and preparation of documentation file.

The input numbers required for a given "case" depend on the details of the specific project, industry, or revenue projections. The sources of data for these numbers are numerous and include historical data and feasiblity studies of proposed projects as well as "what if" assumptions regarding future levels of activity. For the regional and Anchorage models, regional breakdowns of the employment assumptions are required. Individual model documentations must be consulted to determine what model variables are affected by a particular project or "case."

In the data entry step, only that subset of the list of variables in Tables 1-3 which have nonzero values require entry. In the development of a new case archive, the macro &SETUP simplifies the data entry process. The data entry step includes the data files and a comment file. The comment should include the case's full name, a brief description, identity of the author of the case file and designation of the models for which data has been entered (statewide [S], Regional [C], Anchorage [A]).

Once the data entry is complete, the data should be verified for accuracy and compatibility among models. The macro &LKCASE produces a printout of all files created in an archive at the terminal. Data should be created for the Anchorage Municipality model using the macro &MUNICASE; and the macro &CASECHEK should be run to compare input values for the statewide, regional, and Anchorage models to make sure they are consistent.

The written descriptions of the case are important for documenting the on-line case file. The written descriptions include a short description and a medium description. The short description is usually two-to-three sentences long and provides an extended project title and information on the level of activity. These short descriptions are used in tables which summarize scenarios. The medium description is usually two-to-five paragraphs long and includes historical background, source of proposal, regional and/or industry breakdowns, and timing of activity.

The final step in preparing a "case" is to prepare the documentation. The documentation file should contain:

(1) a completed Case File Documentation Status checklist (see Table 4)

(2) written description(s) of the case

(3) printout of the input numbers

(4) copies of background information, tables, or cover page of documents used to develop the numbers in case

(5) worksheets, if any, used to develop numbers.

The physical files are centrally filed at ISER.

TABLE 4. EXAMPLE OF A SCEN_ CASE DESCRIPTION

	Comments
Case: AGR.PJD	
Title: Declining Agriculture Case	
Date Developed: June 1982	
Developed By: P.J. Hill	
Models: MAP Statewide Model MAP Regional Model	Shows for which models case is complete
Short Description: Agricultural employment falls to zero by the year 1992 due to declining state support, poor yields, and unfavorable market conditions.	Description to be stored in computer along with title, date, and author. Also for use in tables of assumptions.
Medium Description: In all regions, agricultural employment is assumed to decline steadily due to poor yields, unfavorable market conditions, declining state support and lower transportation costs for food imports. State subsidies of agricultural projects such as the Delta Barley project are eliminated. Agricultural employment falls to zero by 1992.	Description suitable for inclusion in Appendixes describing model assumptions used.

b. Output File Archives--The Scenario Library (SCENARIO-)

Output of the scenario generation macro is filed in the SCENARIO_ t.ddddd archive, where t is a one-digit code indicating the model to which the scenario is appropriate (S = statewide, C = regionalization, A = municipality--BIGMOD). A type S scenario archive contains the 16 data files listed in Table 1; a type C scenario archive contains the 40 data files listed in Table 2; a type A scenario archive contains the 24 data files listed in Table 3; and each contains an additional COMMENT file which documents the scenario.

2. Using the Scenario Generator

a. Capabilities and Organization

The scenario generator is simply an elaborate macro for combining the various cases contained in the SCEN_ library archives according to a variety of user-specified instructions and filing the resulting scenario in the SCENARIO_ library archives.

It expects input files in the format decribed above for the SCEN_ library and produces output in the form of data files in the format described above for the SCENARIO_ library.

It permits the user to alter the timing of events described in the individual case archives by moving the entire set of data series forward or backward in time.

In addition to the SCENARIO_ data files output which are automatically stored on disk following a run of the scenario generator, several online outputs are produced during and immediately following a run.

After receiving all instructions from the user, the scenario generator prints an acknowledgment that processing is beginning, of the form:

GENERATING SCENARIO t.dddd ...

and presents the total of the number of cases it is about to process:

CONSISTS OF n CASES, as follows:

After which it presents a description of each case as it is processed, consisting of the contents of the comment filed in the COMMENT file for that case and an acknowledgment of any moves in the timing of the case that have been made from that found in the SCEN_ library archives.

Upon completion of processing, it prints the message

SCENARIO t.dddd FILED IN SCENARIO ARCHIVE

Finally, following this message, it will request that the user provide a written description of the scenario, which will be filed as a comment in the COMMENT file corresponding to the newly generated scenario. This request will be indicated by the prompt:

NEW COMMENT:

at which point the user should type in a short description of the scenario. This description may be more than one line, but the prompt "NEW COMMENT:" will precede each line. Following completion of the description, the user should type a semicolon ";" followed by the command "FILE;".

b. <u>Instructions for Using &SCENGEN</u>

The command &SCENGEN will activate the scenario generator, which will proceed to ask the user a series of questions. First, the user will be asked to provide the type and name for the scenario, with the prompts:

SCENARIO TYPE (S, C, or A)
SCENARIO NAME:

Once this has been provided, the scenario generator will begin to ask questions about each of the cases to be included in the scenario. The first question,

CASE NAME:

it expects to be answered with one of the ccc.nnn names found in the SCEN_ library. It then prompts:

START:

and expects the user to provide an integer representing the number of years forward or backward in time that the case should be moved. For example, if the user wishes to leave the timing of the case as it is recorded in the library, he should respond with 0; if he wishes to delay the case by two years, -2; or move it forward five years, 5; and so on.

After providing this information for the first case, the computer will again give the prompt:

CASE NAME:

which it expects to be answered with the name of the second case, followed by prompts for the start and type of the second case, and so on. Currently, the user may specify as many as 97 cases to be included in a scenario. Once all of the case information has been entered, respond to the CASE NAME: prompt with a semicolon to indicate the end of the input list. No further information is required from the user until processing is completed, after which the user will receive the prompt:

NEW COMMENT:

and should type in a short description of the scenario contents, followed by a semicolon and the word "file", followed by a second semicolon.

All of these commands can be included in a user-written macro with the same name as the scenario being created. This macro then provides a permanent record of the case files composing the scenario.

c. An Example

Before beginning to generate a scenario, the user may want to scan the cases in the SCEN_ library available for use in the scenario. This can be done using the &LISTLIB command, which provides a complete listing of currently available cases, as follows:

```
&LISTLIB

DATA_     SCEN_     AGR.SCM
                    BCF.003
                    BCL.04T
                    DOR.381
                    FLP.SCM
                    GFC.EPM
                    GFM.EPM
                    NPR.MOD
                    NWG.MG1
                    OCS.BFM
                    OCS.55X
                    OCS.57X
                    OCS.60X
                    OCS.70L
                    OCS.71M
                    OCS.75H
                    OCS.75L
                    OCS.75M
                    OCS.751
                    OCS.754
                    OCS.755
                    OMN.EPH
                    PRB.081
                    TAP.XXX
                    TCF.001
                    TRS.MOD
                    UPC.011
```

If the user is unfamiliar with one or more of these cases, he may use the &DESCASE or &DESCLIB commands explained in the following section.

After deciding on the cases he wishes to include in the scenario, the user proceeds to invoke the scenario generator with the &SCENGEN command.

In this example, we generate a scenario for use with the statewide model called S.TEST1, consisting of 14 cases selected from the 27 available cases in the SCEN_ library. Note that we have changed the timing of two of those cases: OCS.60X has been moved forward 4 years, and NWG.MG1 has been moved back 1 year. After completing the questions for the desired cases, the user responds with a semicolon.

TROLL COMMAND: .&SCENGEN

TYPE OF SCENARIO (S, C, or A): S

NAME OF SCENARIO:
PROJECT CODE:.AGR.SCM
START:.0

CASE NAME:.BCF.003
START:.0

CASE NAME:.DOR.381
START:.0

CASE NAME:.FLP.SCM
START:.0

CASE NAME:.GFC.EPM
START:.0

CASE NAME:.GFM.EPM
START:.0

CASE NAME:.OCS.55X
START:.0

CASE NAME:.OCS.BFM
START:.0

CASE NAME:.OCS.60X
START:.4

CASE NAME:.OMN.EPH
START:.0

CASE NAME:.TAP.XXX
START:.0

CASE NAME:.TCF.001
START:.0

CASE NAME:.TRS.MOD
START:.0

CASE NAME:.NWG.MG1
START:.-1

CASE NAME:.;

The computer will now begin processing the required cases. As it completes each case, it provides a description of the case, as follows:

```
GENERATING SCENARIO TEST1 ...
CONSISTS OF 14 CASES AS FOLLOWS:
CASE AGR.SCM
MOVED 0 YEARS


SCEN_AGR.SCM_COMMENT -

    MODERATE CASE AGRICULTURAL DEVELOPMENT FROM :
    GOLDSMITH AND PORTER, ALASKA ECONOMIC PROJECTIONS
    FOR THE RAILBELT, ISER, 10/81, P. A-75


CASE BCF.003
MOVED 0 YEARS


SCEN_BCF.003_COMMENT -

    BOTTOMFISHING EMPLOYMENT ESTIMATES PREPARED BY
    GUNNAR KNAPP FOR OCS SALE 75 STUDY, FEB 1982
```

•

•

•

After processing all of the requested cases, the computer indicates that processing has terminated and requests a scenario description from the user.

The user types in a description, followed by a semicolon and a file command.

```
SCENARIO S.TEST1 FILED IN SCENARIO ARCHIVE
NEW COMMENT: .THIS IS A TEST CASE TO TRY OUT THE NEW SCENARIO GENERATOR
NEW COMMENT: .;FILE;
TROLL COMMAND: .
```

To generate scenarios for use with the regionalization model or the municipality model--BIGMOD, the user would follow the same procedure, except that the response to the prompt "TYPE OF SCENARIO:" would be C or A, as appropriate, and the user would have to take care that the list of cases used is appropriate for use with the C or A model. (Currently, all cases in the SCEN_ library are usable for constructing type S or C scenarios but need to be disaggregated for use in type A scenarios.)

3. Creating, Manipulating, Examining, and Printing Library Files

A variety of macros have been developed to perform several common operations on the library files. This section describes the functions and use of these macros.

The macros currently available are:

&SETUP
&MUNICASE
&DELCASE
&DELSCN
&LKCASE
&OLKCASE
&LKSCN
&OLKSCN
&ADCASE
&SUBCASE
&LISTLIB
&DESCLIB
&DESCASE
&COPYCASE
&CASECHEK
&SCENCHEK

a. &SETUP

In order to establish a "case," it would be possible to use a series of DEDIT commands in TROLL to input each of the affected data series. However, insofar as the scenario generator requires data files extending over the 1960-2030 range, this process would normally involve inputting a large number of zero values. Macro &SETUP is designed to make this input task simpler by setting up the affected series with zero values over the 1960-2030 range and permitting the user to replace the nonzero values of the series.

Example: [A 100,000 BPD refinery project in Valdez requires construction employment of 752 persons for three years beginning in 1983. Thereafter, it employs 386 persons for ten years.]

We will name this case ALP.100, indicating a 100,000 BPD version of the Alpetco proposal.

This project affects two variables in the statewide model, namely EMCNX2 and EMMX1. To prepare a case for use in constructing an "S" type scenario for use with the statewide model, the following commands would suffice.

```
TROLL COMMAND:  &SETUP
CASE NAME:  ALP.100
VARIABLE NAME:  EMCNX2
YEAR:  1983
1983  .752  .752  .752  ;FILE;
```

```
TROLL COMMAND:  &SETUP
CASE NAME:  ALP.100
VARIABLE NAME:  EMMX1
YEAR:  1986
1986  .386  .386  .386  .386  .386  .386  .386  .386  .386  .386  ;
FILE;
```

To upgrade the case for use with the regionalization model, notice that the project is located entirely in Valdez and, consequently, affects only the variable B26. The case may be upgraded by the following commands.

```
TROLL COMMAND:  &SETUP
CASE NAME:  ALP.100
VARIABLE NAME: B26
YEAR:  1983
1983  .752  .752  .752  .386  .386  .386  .386  .386
1991  .386  .386  .386  .386  .386  ;FILE;
```

To further upgrade the case for use with the municipality model, notice that the project affects only the variable C.MP.B1 in BIGMOD. Consequently, the case may be further upgraded by the following sequence:

TROLL COMMAND: &SETUP
CASE NAME: ALP.100
VARIABLE NAME: C.MP.B1
YEAR: 1983
1983 .752 .752 .752 .386 .386 .386 .386 .386
1991 .386 .386 .386 .386 .386 ;FILE;

Finally, the user should add a comment to archive SCEN_ALP.100 in the form of a file named COMMENT whose "comment" contains a description of the case just input. Enter this comment with a DEDIT command in the archive for the case.

b. &MUNICASE

The &MUNICASE macro takes a case which contains variables for type S and C scenarios and adds to it non-Anchorage data files for type A scenarios (any files containing data for Anchorage should be added using the &SETUP macro). This macro should be run any time a new case is created.

Example: The user wants to make case ABC.001, which is currently suited only for type S and C scenarios, suitable for type A scenarios.

&MUNICASE

SCEN CASE NAME: ABC.001
DATA_ SCEN_ ABC.001_ COMMENT
EMCNX1
BO4

FIRST BASIC, SECOND BASIC, OR COMBINED CASE (F, S, OR C)?[1] F

[1]A first basic case is generally one that contains any of the variables in column A (right), but none in column B. A second basic case is one that contains variables in column B, but none in column A. A combined case is one that contains variables from both columns. Each case should be placed in F, S, or C, depending upon an individual evaluation and review of the BIGMOD documentation.

A	B
EMCNX1	EMMX1
EMCNX2	EMMX2
EMP9	EMAGRI
EMT9X	EMFISH

c. <u>&DELCASE</u>

The &DELCASE macro deletes all files associated with the particular case specified by the user.

Example: Case ABC.001 is found to be in error or of no further value. To delete it, say:

<u>&DELCASE</u>

CASE TO BE DELETED: <u>ABC.001</u>

d. <u>&DELSCN</u>

The &DELSCN macro deletes all files associated with the particular SCENARIO_ archive specified by the user.

Example: Scenario S.TEST1 is found to be of no further value. To delete it, say:

<u>&DELSCN</u>

SCENARIO TO BE DELETED: <u>S.TEST1</u>

e. <u>&LKCASE and &OLKCASE</u>

In order to examine all of the variables in each case archive, two macros are available. Macro &LKCASE prints out all variables at the terminal. Macro &OLKCASE prints out the same tables offline at MIT.

Example: To print out case ABC.001 offline.

<u>&OLKCASE</u>

CASE NAME: <u>ABC.001</u>

f. <u>&LKSCN and &OLKSCN</u>

In order to examine all of the variables in a SCENARIO archive, two macros are available. Macro &LKSCN prints out all variables at the terminal. Macro &OLKSCN prints out all variables offline at MIT.

Example: To print out scenario S.TEST1 at the terminal,

<u>&LKSCN</u>

NAME OF SCENARIO: <u>S.TEST1</u>

g. <u>&ADCASE</u>

If the user wishes to add a single case to a scenario without rerunning the entire scenario generator, he or she may do so using macro &ADCASE.

It requests the name of the SCENARIO archive to which the case will be added, the name of the incrementing case, the number of years the case is to be moved, the type of scenario, and a name for the new scenario. Upon completing the processing, it will request a description of the new scenario from the user. The user types in the new description, followed by a semicolon and a file command.

Example: You want to add case ABC.001 to scenario S.TEST1 and call the new scenario TEST2.

<u>&ADCASE</u>

OLD SCENARIO ARCHIVE: <u>S.TEST1</u>
INCREMENTING SCEN ARCHIVE: <u>ABC.001</u>
START: <u>0</u>
TYPE OF SCENARIO (S, C, or A): <u>S</u>
NEW SCENARIO ARCHIVE: <u>S.TEST2</u>
SCENARIO S.TEST1 INCREMENTED BY
CASE ABC.001
MOVED 0 YEARS

SCEN_ABC.001_COMMENT

SAMPLE CASE TO TEST THE SCENARIO GENERATOR

SCENARIO S.TEST2 FILED IN SCENARIO ARCHIVE
NEW COMMENT: <u>SCENARIO S.TEST1 INCREMENTED</u>
NEW COMMENT: <u>BY CASE ABC.001</u>
NEW COMMENT: <u>;FILE;</u>

h. &SUBCASE

If the user wishes to subtract a single case from a scenario without rerunning the scenario generator, he or she may do so using macro &SUBCASE, which operates in a manner analogous to &ADCASE above.

Example: You want to take case ABC.001 out of scenario S.TEST2 and call the new scenario TEST1.

```
&SUBCASE

OLD SCENARIO ARCHIVE:  S.TEST2
DECREMENTING SCEN ARCHIVE:  ABC.001
START: 0
TYPE OF SCENARIO (S, C, or A):  S
NEW SCENARIO ARCHIVE:  S.TEST1
SCENARIO S.TEST2 DECREMENTED BY
CASE ABC.001
MOVED 0 YEARS

SCEN_ABC.001_COMMENT

     SAMPLE CASE TO TEST THE SCENARIO GENERATOR

SCENARIO S.TEST1 FILED IN SCENARIO ARCHIVE
NEW COMMENT:   SCENARIO S.TEST2 DECREMENTED
NEW COMMENT:   BY CASE ABC.001
NEW COMMENT:   ;FILE;
```

i. &LISTLIB

Lists the currently available cases for use by the scenario generator. Require no arguments.

j. &DESCLIB

Lists the comments associated with all available cases in the SCEN_ library. Requires no arguments.

k. <u>&DESCASE</u>

Lists the comments associated with a particular case in the SCEN_ library.

Example: The user is unfamiliar with case ABC.001 and wants a description of its contents.

<u>&DESCASE</u>

CASE NAME: <u>ABC.001</u>

l. <u>&COPYCASE</u>

Copies all or part of a user-specified case.

Example: The user wants to copy one of the three files in case ABC.001.

```
&COPYCASE

OLD CASE NAME:  ABC.001

THE VARIABLES IN CASE ABC.001 ARE:

DATA_  SCEN_  ABC.001_  COMMENT
                        EMCNX1
                        BO4

NEW CASE NAME:  ABC.002
VARIABLES TO BE COPIED, SEPARATED BY SPACES,
FOLLOWED BY SEMICOLON  EMCNX1;
```

m. <u>&CASECHEK</u>

The &CASECHEK macro verifies that the type S, C, and A components of a case are all consistent. The macro prints a table showing the total non-Anchorage employment assumptions for each type. This macro should be run each time a new case is created.

Example: The user wants to check that case ABC.001 is consistent for use in all three models.

<u>&CASECHEK</u>

CASE NAMES, SEPARATED BY SPACES, FOLLOWED BY SEMICOLON <u>ABC.001;</u>

n. <u>&SCENCHEK</u>

The &SCENCHEK macro verifies that a type C and a type A scenario which contain identical case files are consistent. The macro prints a table showing the total non-Anchorage employment assumptions for each type.

Example: The user wants to verify that C type scenario C.TEST1 and A type scenario A.TEST1, which contain the same cases, are consistent.

<u>&SCENCHEK</u>

REGIONAL MODEL SCENARIO ARCHIVE: <u>C.TEST1</u>
MUNI MODEL SCENARIO ARCHIVE: <u>A.TEST1</u>

TABLE 5. SUMMARY OF MAP MODEL BASE CASE ASSUMPTIONS FROM THE SCENARIO GENERATOR: DECEMBER 1984 SUSITNA STUDIES (S85.SUB4)

ASSUMPTIONS	DESCRIPTION(a)
National Variables Assumptions	
U.S. Inflation Rate	Consumer prices rise at 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.
Industry Assumptions	
Trans-Alaska Pipeline	Operating employment remains constant at 990 through 2010 (TAP.F84).
North Slope Petroleum Production	Petroleum employment increases through the early 1990s to a peak of 4.6 thousand and subsequently tapers off gradually. Construction employment is eliminated by the late 1990s. This case presumes no significant change in current oil price trends (NSO.84B).
Upper Cook Inlet Petroleum Production	Employment in exploration and development of oil and gas in the Upper Cook Inlet area declines gradually beginning in 1983 by approximately 2.5 percent per year (UPC.F84).
OCS Development	Exploration and development activity grows through the mid-1990s and direct employment continues through the following decade at a slightly reduced level of approximately 7,000 (OCS.CM3(-3)).

(a) Codes in parentheses indicate ISER names for MAP Model SCEN_ case files.

Oil Industry Headquarters	Oil company headquarters employment in Anchorage rises by 1,150 between 1983 and 1986 to remain at around 4,600 through 2010 (OHQ.F84).
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)).
Healy Coal Mining	Export of approximately 1 million tons of coal annually will add 25 new workers to current base of 100 by 1986 (HCL.84X).
U.S. Borax	The U.S. Borax mine near Ketchikan is brought into production with operating employment of 790 beginning in 1989 and eventually increasing to 1,020 (BXM.F84).
Greens Creek Mine	Production from the Greens Creek Mine on Admiralty Island results in employment of 150 people from 1988 through 2003 (GCM.F84).
Red Dog Mine	The Red Dog Mine in the Western Brooks Range reaches full production with operating employment of 428 by 1993 (RED.F84).
Other Mining Activity	Mining employment not included in special projects increases from current level at 1 percent annually (OMN.F84).
Agriculture	Moderate state support results in expansion of employment in agriculture by 4 percent per year (AGR.F83).
Logging and Sawmills	Employment expands to over 3,200 by 1990 before beginning to decline gradually to about 2,800 after 2000 (FLL.F84).
Pulp Mills	Employment declines at a rate of 1 percent per year after 1991 (FPU.F84).
Commercial Fishing-Nonbottomfish	Employment levels in traditional fisheries harvest remain constant at 7,500 through 2010 (TCF.F84).

Commercial Fish Processing - Nonbottomfish	Employment in processing traditional fisheries harvests remains at the level of the average figure for the period 1978-1982, or around 7,300 (TFP.F84).
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.F83).
Federal Military Employment	Employment declines at 1 percent per year, consistent with the long-term trend since 1960 (GFM.F84).
Light Army Division Deployment	A portion of a new Army division is deployed to Fairbanks and Anchorage beginning in 1986, augmenting active-duty personnel by 2,600 (GFM.JPR)
Federal Civilian Employment	Rises at 0.5 percent annual rate consistent with the long-term trend since 1960 (GFC.F84).
Tourism	Number of visitors to Alaska increases by 50,000 per year to over 2 million by 2010 (TRS.F83).
State Hydroelectric Projects	Construction employment from Alaska Power Authority projects peaks at over 700 in 1990 for construction of several projects in Southcentral and Southeast Alaska (SHP.F83).

<u>State Revenue Assumptions</u>

Severance Taxes	Based on 1984 Sherman Clark world oil price projection used to drive Alaska Department of Revenue MJSENSO petroleum revenue model. Post-2000 values extrapolated at average rate of change for period 1997 to 2000 (SHC.B84).

Royalties	Based on 1984 Sherman Clark world oil price projection used to drive Alaska Department of Revenue MJSENSO petroleum revenue model. Post-2000 values extrapolated at average rate of change for period 1997 to 2000 (SHC.B84).
Bonuses	Nominal average of past values not including major sales (SHC.B84).
Property Taxes	Aggregation of property taxes from specific petroleum activities based upon model CORPTX (SHC.B84) and (OCS.CM3(-3)).
Petroleum Corporate Income Tax	Aggregation of corporate taxes from specific petroleum activities based upon model CORPTX (SHC.B84).

TABLE 6. STATE VARIABLES: SCENARIO S85.SUB4

Part A: Economic Variables
(000)

	Agricultural Employment (EMAGRI)	Construction Employment		Fish Harvesting Employment (EMFISH)	Federal Government Employment	
		High Wage (EMCNX1)	Regular Wage (EMCNX2)		Civilian (EMGC)	Military (EMGM)
1983	0.37	2.991	0.672	7.558	17.729	22.261
1984	0.385	2.497	0.242	7.581	17.818	22.038
1985	0.4	2.891	0.218	7.608	17.907	21.818
1986	0.416	3.525	0.644	7.636	17.996	24.2
1987	0.435	2.361	1.63	7.664	18.086	23.984
1988	0.454	1.609	1.391	7.681	18.177	23.77
1989	0.475	2.393	0.89	7.716	18.268	23.558
1990	0.496	2.703	1.025	7.729	18.359	23.349
1991	0.52	2.102	1.13	7.745	18.451	23.141
1992	0.544	0.944	1.29	7.766	18.543	22.936
1993	0.573	1.529	0.571	7.792	18.636	22.732
1994	0.601	2.365	0.1	7.826	18.729	22.531
1995	0.633	1.461	0.	7.868	18.823	22.332
1996	0.668	2.217	0.	7.921	18.917	22.134
1997	0.704	0.717	0.	7.988	19.011	21.939
1998	0.744	1.655	0.	8.072	19.106	21.746
1999	0.788	0.783	0.	8.178	19.202	21.554
2000	0.834	1.821	0.	8.233	19.298	21.365
2001	0.866	0.783	0.	8.233	19.394	21.177
2002	0.899	0.336	0.	8.233	19.491	20.991
2003	0.935	0.336	0.	8.233	19.589	20.807
2004	0.971	0.336	0.	8.233	19.687	20.625
2005	1.008	0.336	0.	8.233	19.785	20.445
2006	1.047	0.336	0.	8.233	19.884	20.266
2007	1.089	0.336	0.	8.233	19.984	20.09
2008	1.132	0.336	0.	8.233	20.083	19.915
2009	1.176	0.336	0.	8.233	20.184	19.742
2010	1.223	0.336	0.	8.233	20.285	19.57

Table 6, Part A (continued)

	Manufacturing Employment		Petroleum and Mining Employment (EMP9)	Pipeline Employment (EMT9X)	Tourists (TOURIST)
	High Wage (EMMX1)	Regular Wage (EMMX2)			
1983	0.	8.938	8.179	1.1	730.
1984	0.	10.802	9.389	1.039	780.
1985	0.	11.129	10.391	1.116	830.
1986	0.	11.33	11.125	1.116	880.
1987	0.	11.536	12.379	1.136	930.
1988	0.	11.652	12.068	1.269	980.
1989	0.	11.724	13.841	1.588	1030.
1990	0.	11.785	14.157	1.657	1080.
1991	0.	11.805	13.736	1.538	1130.
1992	0.	11.817	13.627	1.393	1180.
1993	0.	11.837	15.412	2.114	1230.
1994	0.	11.868	17.82	3.096	1280.
1995	0.	11.914	18.965	3.461	1330.
1996	0.	11.979	18.168	2.981	1380.
1997	0.	12.072	18.78	3.01	1430.
1998	0.	12.203	20.142	3.62	1480.
1999	0.	12.386	19.992	3.498	1530.
2000	0.	12.618	20.083	3.517	1580.
2001	0.	12.564	19.468	3.187	1630.
2002	0.	12.533	17.837	2.706	1680.
2003	0.	12.502	17.062	2.326	1730.
2004	0.	12.471	16.693	2.335	1780.
2005	0.	12.44	16.742	2.335	1830.
2006	0.	12.313	16.782	2.335	1880.
2007	0.	12.126	16.187	2.335	1930.
2008	0.	12.118	16.218	2.335	1980.
2009	0.	12.111	16.231	2.335	2030.
2010	0.	12.104	16.243	2.335	2080.

TABLE 6. STATE VARIABLES: SCENARIO S85.SUB4

Part B: State Petroleum Revenues
(million $)

	Bonuses (RPBS)	Property Taxes (RPPS)	Royalties (RPRY)	Severance Taxes (RPTS)	Corporate Income Taxes (RTCSPX)
1983	48.3	152.6	1443.6	1493.	236.
1984	13.5	131.	1404.5	1392.	327.
1985	7.	145.	1484.61	1478.22	347.
1986	7.	159.	1620.81	1585.65	381.
1987	7.	183.	1775.68	1726.16	428.
1988	7.	187.323	1950.28	1901.39	441.
1989	7.	189.037	2211.31	1834.54	435.
1990	7.	184.249	2414.87	2001.94	432.
1991	7.	193.876	2365.16	1891.19	435.
1992	7.	197.125	2369.94	1840.35	442.
1993	7.	206.815	2580.39	1959.97	443.
1994	7.	231.002	2642.99	1961.6	445.
1995	7.	219.375	2684.84	1969.15	435.
1996	7.	254.837	2784.84	1982.17	435.
1997	7.	240.011	2900.09	2033.92	438.
1998	7.	270.521	3052.37	2086.43	463.
1999	7.	321.896	3155.62	2085.74	491.
2000	7.	411.148	3314.17	2133.67	501.
2001	7.	478.879	3466.06	2167.83	493.
2002	7.	508.757	3624.9	2202.53	474.
2003	7.	500.099	3791.03	2237.79	469.
2004	7.	491.67	3964.77	2273.62	461.
2005	7.	484.174	4146.47	2310.01	461.
2006	7.	476.435	4336.5	2347.	461.
2007	7.	467.379	4535.24	2384.57	450.
2008	7.	458.758	4743.09	2422.75	455.
2009	7.	450.472	4960.46	2461.53	464.
2010	7.	440.149	5187.79	2500.94	473.