

LIBRARY - AIR RESOURCES BOARD

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Final Report

AN ECONOMETRIC MODEL OF FINAL DEMAND  
COMPONENTS OF CALIFORNIA

by

Larry J. Kimbell  
Associate Professor of Business Economics  
and  
Director of Economic Models

and

Peter Jaquette  
Research Economist

UCLA Business Forecasting Project  
University of California, Los Angeles  
Los Angeles, California 90024  
(213) 825-1623

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## ABSTRACT

The purpose of this research project has been to build an econometric model of final demand components in California. This model of final demand components is needed in order to enable the use of macroeconomic forecasts and simulations of the California economy to drive an input-output model of the California economy. This model thus serves to bridge the gap between the currently available forecasts of major aggregative economic indicators in California and the detailed industry-specific analyses possible with the California input-output model. The final demand components estimated by the model are: Consumer Expenditures on Durable Goods, Nondurable Goods and Services, Investment in Nonresidential Structures, Producers' Durable Equipment, Residential Investment and Change in Business Inventories, Expenditures by Federal, State and Local Governments, and Gross Exports and Imports. This report presents the equations of the model with a brief discussion of each. The estimates of the model are presented and evaluated. The methods used to update the data for the model and to solve the model are explained. A glossary of variables used in the model, historical estimates of the final demand components in California, a forecast of final demand components in California through 1983 and a complete listing of the equations of the model are contained in Appendices.

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The statements and conclusions in this report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source or their use in connection with material reported herein is not to be construed as either an actual or implied endorsement of such products.

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## SUMMARY AND CONCLUSIONS

### STATEMENT OF THE PROBLEM

The California Air Resources Board is interested in assessing the economic impacts of air pollution control in California. Attainment of air quality standards necessarily takes place in the future. Impact analyses, therefore, must consider the likely future course of the California economy in order to evaluate the costs and benefits of alternative air pollution control policies.

The impacts of air pollution control policies vary considerably across different industries; consequently, any forecasting system that is to be used by the Air Resources Board, for the purpose of economic impact analysis, must provide detailed forecasts for the industries most likely to be affected.

Available forecasts for California, such as those provided by the UCLA Business Forecasting Project, routinely provide forecasts for major aggregative economic indicators; however, these forecasts do not provide forecasts for each of the specific industries that must be considered by the Air Resources Board. Members of the staff of the Air Resources Board are therefore adapting an input-output model for the purpose of performing detailed, industry-specific, impact analyses.

Input-output models must be driven by forecasts of expenditures for components of final demand. These components include expenditures for consumption, investment, government purchase of goods and services, exports and imports. None of these components is estimated routinely by official agencies for states or other regions. Neither do available forecasts provide such estimates. A missing link therefore exists between the available forecasts of the major aggregates and the data required to use input-output models. This missing link is data on components of final demand expenditures. The central purpose of this research project is to close this gap; that is, to build a Final Demand-I/O Bridge Model, which will take forecasts of major economic aggregates, such as those provided by the UCLA Business Forecasting Project, and convert these forecasts into the form required by the input-output model.

### IMPORTANT CONSTRAINTS ON THE SOLUTION

An efficient solution to the problem of bridging the gap must satisfy several important constraints. First, the historical data used to estimate the Final Demand-I/O Bridge Model must be available on a timely basis. This rules out data from censuses or other sources that are available only every few years with considerable lags. The chosen solution restricts the historical sources of data to those that are routinely provided every quarter without additional cost that would have to be born by the Air Resources Board. If the Model depended upon special

data collection, this constraint would not be satisfied. Second, the Final Demand-I/O Bridge Model must be capable of providing routine forecasts of future values without major costs in terms of time or money. The Model was designed to be updated every quarter, with no more than two days work, using forecasts routinely provided by the UCLA Business Forecasting Project. Third, the Model must be comprehensive enough to satisfy the requirements of the input-output model. The Final Demand-I/O Bridge Model meets, and indeed, exceeds the stipulations of the contract, since it provides all estimates required, but it also provides details that may be important for future extensions of the input-output model. Furthermore, the technique used is capable of being extended still further if the need arises.

#### METHODS OF PROCEDURE

Previous methods of estimating gross state product and components of final demand were reviewed. Special attention was paid to the data required to implement the alternative techniques, as discussed above. Analysis of the data routinely available in California was performed. The Final Demand-I/O Model was specified to meet these data restrictions.

The Model consists of two types of equations, accounting identities and behavioral equations. The former equations parallel the accounting rules used by the U.S. Department of Commerce in the construction of the National Income and Product Accounts. The latter equations used multiple regression analysis to find the best fitting historical relationships between final demand estimates at the national level and proxy variables available both in California and at the national level. For example, retail sales for consumer durables are available in both the U.S. and California. Consumer expenditures on durable goods for the U.S. as a whole are closely correlated with retail sales of durable goods. Therefore, the final demand estimate of consumer expenditures on durable goods in California is related to the estimates of retail sales of durable goods in California. The complete system of equations in the Final Demand-I/O Bridge Model has 70 equations.

Estimates of final demand components are available in current dollars and in constant dollars. The latter estimates adjust expenditures for inflation. Additionally, the Model provides estimates of the implicit price deflators that convert current dollar estimates into constant dollar equivalents.

The greatest problem in developing the Final Demand-I/O Model concerned the export-import sector. Final demand estimates require estimates of exports from California to the rest of the U.S. and the rest of the world. Final demand estimates also require estimates of imports from the rest of the U.S. and the rest of the world. Available data from the U.S. National Income and Product Accounts were of little use in this task since U.S. trade with foreign countries is not a valid guide to expected California trade with the rest of the U.S. Estimates of gross

product originating by industry were combined with estimates of the fraction of each California industry's output exported to the rest of the U.S. and the rest of the world to yield estimates of total exports. Net exports were estimated on the basis of U.S. net exports. Imports were then obtained as a residual.

Estimates of gross state product using the Final Demand-I/O Bridge Model correlated very closely with the method used by the UCLA Business Forecasting Project to estimate gross state product.

### SUMMARY

The UCLA Business Forecasting Project has developed a tool to bridge the gap between the available forecasts of major economic aggregates of the California economy and the detailed industry-specific analyses that the Air Resources Board needs for its work in analyzing the potential impacts of alternative air pollution control policies on individual industries. This tool, the Final Demand-I/O Bridge Model, is capable of routinely providing estimates of: consumer expenditures on durable goods, nondurable goods and services; investment in producers durable equipment, nonresidential construction and inventories; government expenditures by state and local governments as well as by the federal government; exports by industry and imports. These estimates are available in current dollars and in constant dollars. The data include historical estimates for the period from 1972 through the second quarter of 1981, as well as forecasts from 1981 through 1983. The Model can be used routinely to update the estimates in the future.

### REVIEW OF PREVIOUS METHODS FOR ESTIMATING COMPONENTS OF FINAL DEMAND

There are three methods for estimating the gross national (or state) product; (1) GNP is the sum of expenditures on final demand, the central purpose of this project; (2) GNP is the sum of factor incomes and other charges against GNP, such as capital consumption allowances and indirect factor taxes; and (3) GNP is the sum of value added by industry. According to a survey conducted by the Economic Planning Department of the State of Hawaii [ 2 ], the most widely used method for estimating gross state product is based on estimating value added by industry. This approach was developed by Kendrick and Jaycox [ 4 ] and has been used in 14 states, occasionally with modifications suggested by Niemi [ 7 ] or L'Esperance [ 5 ]. As interesting as this is in its own right, this method does not yield estimates of final demand, so it cannot be the primary basis for the Final Demand-I/O Model.

The State of Hawaii has occasionally prepared the most comprehensive set of regional accounts including estimates of the expenditures side as well as the income side of the accounts. Its methods, however, are peculiar to the special data available to a relatively small island economy where the flow of goods,

persons and money to and from the rest of the U.S. are better documented and highly concentrated. (Most traffic flows through Honolulu, which is overwhelmingly the largest city in the Islands.) Furthermore, this detailed and comprehensive approach is time consuming and expensive. One result is that long gaps appear in the historical estimates between one update and the next. Another consequence is that estimates, even when published, may be as much as a year out of date. This approach was therefore ruled infeasible.

The approach used to estimate the gross state product by the UCLA Business Forecasting Project is based on adjusting personal income estimates, which are routinely provided by the U.S. Department of Commerce, to approximate the income side of the accounts. Before 1974 the method had been to approximate each of the major adjustments between personal income and the gross national product. For example, estimates of corporate profits are added to personal income and dividend estimates are subtracted. This approach used ratios of U.S. data where no comparable California data existed. Historical estimates of the gross state product also tended to lag by a year or more, since several components, such as corporate profits, were only estimated annually. Finally, and very importantly, the estimates based on a simple ratio technique (gross state product in California equals California personal income times the ratio of U.S. GNP to U.S. personal income) were almost perfectly correlated with the more elaborate system. The correlation was higher than .999. This approach, however, in either form, does not yield estimates of final demand.

The approach used in the Final Demand-I/O Bridge Model is to find, where ever possible, indicators in California which can be shown in U.S. data to be well correlated and conceptually related to final demand components. For example, estimates of retail sales of durable goods are available in California as well as the U.S. U.S. retail sales were shown statistically to be a very good indicator of consumer expenditures in the U.S. There is a safe presumption, therefore, that California retail sales estimates afford a basis for estimating the (unknown) expenditures by consumers in California. A similar argument applies to residential building permits authorized in California--they provide a basis for estimating investment expenditures on residential construction.

In some instances there were no routinely available indicators in California data that parallel the U.S. components of final demand. An example is change in business inventories. In most of these cases ratios of California personal income to U.S. personal income were used to adjust U.S. estimates of the component of final demand.

DOCUMENTATION OF THE  
U.C.L.A. BUSINESS FORECASTING PROJECT  
ECONOMETRIC MODEL OF FINAL DEMAND  
COMPONENTS IN CALIFORNIA

DESCRIPTION OF THE DATA SET

The data set is divided into three parts covering two time periods. The three parts are: 1) data on U.S. final demands, 2) data on California final demands and 3) data which consist of the exogenous variables of the econometric model of final demand components in California and endogenous variables which are not final demand components in California. The two time periods are the historical time period from 1972 through the second quarter of 1981 and the forecast time period from the third quarter of 1981 through 1983. A complete glossary of the data set is contained in Appendix A.

For the historical period the source for the data on U.S. final demands is the Data Resources, Incorporated (DRI) U.S. Central Data Bank. For the forecast period the source for the data on U.S. final demands is the UCLA Business Forecast. For both the historical and the forecast period the data on California final demands are the output of the econometric model of final demand components in California. For the historical period these data are estimates based on the historical data of the U.S. final demands and U.S. and California variables which are the exogenous variables for the econometric model of final demands in California. For the forecast period the data are projections which are conditional on the forecast for U.S. and California exogenous data which are used to produce them. The exogenous data consist of data covering both the U.S. and California. For the historical period the source of the U.S. data is the DRI U.S. Central Data Bank, and the source for the California data is the Security Pacific National Bank California Data Bank. For the forecast period the source of this data is the UCLA Business Forecast for the U.S. and California. Tables consisting of quarterly estimates of the final demand components in California from 1981 through 1983 and annual estimates from 1972 through 1983 are contained in Appendix B.

DESCRIPTION OF THE MODEL

The purpose of this econometric model of final demand components in California is to produce forecasts of the components of final demand in California and to estimate the effect of different economic environments on the final demand components in California. The final demand components measure current production classified by end user. The end user categories are consumption, investment, exports, imports and government spending. The total of all final demand components in California is equal to the gross state product of California.

The concept of final demands can be contrasted with the concept of gross product originating by industry, which classifies current production by industry of production.

In order to develop estimates of the final demand components which can be updated in a timely and convenient manner, and which can be forecast, estimates of the final demand components must be based on various macroeconomic indicators such as income and employment. It is possible to develop historical estimates of the final demand components through a survey technique, but this method is often expensive and difficult to update. Survey based estimates of final demands intrinsically can not be forecast.

For many of the final demand components in California closely related California specific macroeconomic data are available. In these cases these macroeconomic variables are used to estimate the corresponding final demand component in California. In most other cases where there is no appropriate California specific macroeconomic data, the assumption is made that California is similar to the U.S. In this case an estimate of the final demand component in California is made as the final demand component in the U.S. multiplied by the ratio of personal income in California to personal income in the U.S.

We have direct macroeconomic indicators for the three categories of consumption, for residential investment and for government compensation expenditures. For consumption we have data on retail sales at durable and nondurable goods stores and on employment in services industries. For residential investment we have data on residential building permits. For government compensation expenditures we have data on wage and salary income of government employees.

For the other categories of investment we have no good macroeconomic indicators that are California specific. In the absence of any compelling reason to expect California to be systematically different from the U.S., we make the assumption that California differs from the U.S. only in scale, with that scale determined by the ratio of personal income in California to personal income in the U.S.

The greatest problem in constructing estimates of final demands for California is in the estimates for gross exports and gross imports. These final demand components are conceptually different for California as compared to the U.S. For California gross exports mean exports to the rest of the world, including the other 49 states, and gross imports mean imports from the rest of the world, again including the other 49 states. Since no data exist for gross exports from California on this basis and since it is inappropriate to use the ratio of personal incomes method to estimate gross exports, another method had to be devised.

Gross exports from California are equal to the sum of gross exports of all industries in California. Estimates of the proportion of employment in 9 industry groups devoted to gross

exports were obtained from the study Markets for California Products prepared for the State of California Economic Development Agency by W. Lee Hansen, R. Thayne Robson and Charles M. Tiebout [ 1 ]. Estimates of gross product originating in the various industry groups were developed using data on gross product originating in the industry groups in the U.S. as a whole and assuming that, with the exception of agriculture, gross product per worker was the same in California as in the U.S. In the case of agriculture we had historical data on cash receipts from farming in California, and the ratio of gross product to cash receipts from farming in the U.S. was used to estimate gross product from farming in California.

Thus the estimate of gross exports was constructed as the sum of estimates of gross exports of the different exporting industries in California. However no such approach was possible for gross imports. To estimate gross imports, the assumption was made that net exports in California could be estimated by the ratio of personal incomes method. Once an estimate for net exports was available, gross imports could be solved for by identity.

This section now describes the equations of the econometric model of final demand components in California. The UCLA Business Forecasting Project Econometric Model of Final Demand Components in California contains 70 equations. The equations of the model are listed in Appendix C. The model estimates the following components of final demand in California, both in current dollars and in constant (1972) dollars:

- A) Personal Consumption Expenditures
  - 1) Personal Consumption Expenditures - Durable Goods
  - 2) Personal Consumption Expenditures - Nondurable Goods
  - 3) Personal Consumption Expenditures - Services
- B) Gross Private Domestic Investment
  - 1) Investment in Private Nonresidential Structures
  - 2) Private Residential Investment
  - 3) Nonresidential Investment in Producers' Durable Equipment
  - 4) Change in Business Inventories
- C) Government Expenditures
  - 1) Federal Government Expenditures
  - 2) State and Local Government Expenditures
- D) Net Exports
  - 1) Gross Exports to the Rest of the World
  - 2) Gross Imports from the Rest of the World

The model contains 42 behavioral equations and 28 identities. The identities express relationships which are true by definition, and are usually one of two types, either additive or multiplicative. An example of an additive identity is

equation 52, which states that total government purchases of goods and services in California is the sum of Federal government purchases of goods and services in California and State and Local government purchases of goods and services in California. An example of a multiplicative identity is equation 51, which states that State and Local government purchases of goods and services in California in 1972 dollars is equal to State and Local government purchases of goods and services in California divided by the implicit price deflator for State and Local government purchases of goods and services in California.

Behavioral equations are substantive statements which yield new information not contained in the exogenous data. The behavioral equations describe economic behavior or express an economic relationship. The behavioral equations can also be divided into one of two general types. Estimates of the components of final demand in California can either be based directly on relevant data for California, or indirectly on data for the same component of final demand in the U.S. An example of a direct estimate is equation 39, which states that personal consumption expenditure on durable goods in California is a function of retail sales at durable goods stores in California. The functional form and coefficients of this equation come from a similar equation which was estimated relating personal consumption expenditure on durable goods in the U.S. to retail sales at durable goods stores in the U.S.

An example of an indirect estimate is equation 17. Because of data limitations a direct estimate of investment in private nonresidential structures in California was not possible. In the absence of better information, this equation states that investment in private nonresidential structures in California bears the same relationship to investment in private nonresidential structures in the U.S. as does personal income in California to personal income in the U.S.

#### THE EQUATIONS IN DETAIL

The following section contains an equation by equation description of the UCLA Business Forecasting Project model of the final demand components in California which accompanies the listing of the equations of the model in Appendix C.

Equation 1 estimates real personal consumption expenditures for services in California as a function of total employment in services industries in California. It is a direct behavioral equation.

Equation 2 estimates net exports of goods and services from California. It is an indirect behavioral equation.

Equation 3 estimates net exports of goods and services in 1972 dollars from California. It is an indirect behavioral equation.

Equation 4 estimates Federal government purchases except compensation in California. It is an indirect behavioral equation.

Equation 5 estimates Federal government compensation of employees in California as a function of Federal government wage and salary disbursements in California. It is a direct behavioral equation.

Equations 6 through 15 estimate real gross product originating in both the U.S. and California for the following industries: finance, insurance and real estate, manufacturing, mining, transportation, communication and utilities and services. The equations for the U.S. are direct behavioral equations, estimated on the annual data available from 1947 through 1978. The equations for California are direct behavioral equations also. For each industry gross product originating per worker in California is assumed to equal gross product originating per worker in the U.S. Thus gross product originating in one of these five industries in California is estimated to be a function of gross product originating in that industry in the U.S., employment in that industry in the U.S. and employment in that industry in California.

Equation 16 estimates State and Local government compensation in California as a function of wage and salary disbursements by State and Local governments in California. It is a direct behavioral equation.

Equation 17 estimates gross investment in private nonresidential structures in California. It is an indirect behavioral equation.

Equation 18 estimates gross private fixed residential investment in 1972 dollars in California as a function of total building permits for new residential dwelling units in California. It is a direct behavioral equation.

Equations 19 and 20 estimate change in business inventories in current and 1972 dollars in California. They are both indirect behavioral equations.

Equation 21 estimates nonresidential investment in producers' durable equipment in California. It is an indirect behavioral equation.

Equations 22 through 25 and 31 through 34 estimate implicit price deflators for California as a function of the implicit deflator in the U.S., the U.S. consumer price index (CPI) and the Los Angeles - Orange County consumer price index. The equations state that the implicit deflator in California bears the same relationship to the deflator in the U.S. as the California ( Los Angeles - Orange County ) CPI bears to the U.S. CPI. The

multiplicative constant in the equation is necessary to force the deflators to average 1.000 in the year 1972. These equations are indirect behavioral equations.

Equations 26 through 30 estimate gross product deflators as a function of various other price indices. These equations are direct behavioral equations.

Equation 35 estimates total cash receipts from farming in California as a function of agricultural employment in California. It is a direct behavioral equation.

Equation 36 is an identity which determines total cash receipts from farming in 1972 dollars in California as a function of the current dollar cash receipts from farming in California, the wholesale price index for farm products and a multiplicative constant to force the deflated series to equal the current dollar series for the year 1972.

Equation 37 estimates retail sales at durable goods stores in California as a function of total retail sales at all outlets in California and retail sales at durable goods stores in the U.S. It is a direct behavioral equation.

Equation 38 estimates retail sales at nondurable goods stores in California as a function of retail sales at nondurable goods stores in the U.S. and personal income in California. It is a direct behavioral equation.

Equation 39 estimates personal consumption expenditures for durable goods in California as a function of retail sales at durable goods stores in California. It is a direct behavioral equation.

Equation 40 is an identity for real personal consumption expenditures for durable goods in California.

Equation 41 estimates personal consumption expenditures for nondurable goods in California as a function of retail sales at nondurable goods stores in California. It is a direct behavioral equation.

Equation 42 is an identity for real personal consumption expenditures for nondurable goods in California.

Equation 43 is an identity for current dollar personal consumption expenditures for services in California.

Equation 44 is an identity for total real personal consumption expenditures in California.

Equation 45 is an identity for Federal government purchases of goods and services in California.

Equation 46 is an identity for Federal government purchases of goods and services in California in 1972 dollars.

Equation 47 estimates State and Local government purchases of goods and services other than compensation in California as a function of State and Local government compensation in California. It is a direct behavioral equation.

Equation 48 is an identity for investment in private nonresidential structures in 1972 dollars in California.

Equation 49 is an identity for nonresidential investment in producers' durable equipment in 1972 dollars in California.

Equation 50 is an identity for State and Local government purchases of goods and services in California.

Equation 51 is an identity for State and Local government purchases of goods and services in 1972 dollars in California.

Equation 52 is an identity for government purchases of goods and services in California.

Equation 53 is an identity for personal consumption expenditures in California.

Equation 54 is an identity for gross private domestic investment in 1972 dollars in California.

Equation 55 is an identity for gross private fixed residential investment in current dollars in California.

Equation 56 is an identity for gross private domestic investment in California.

Equation 57 is an identity for government purchases of goods and services in 1972 dollars in California.

Equation 58 is an identity for gross state product in 1972 dollars in California.

Equation 59 is an identity for gross state product in current dollars in California.

Equations 60 through 64 are identities for gross product originating in current dollars in California for the following industries: services, transportation, communication and utilities, mining, manufacturing and finance, insurance and real estate.

Equations 65 and 66 estimate gross exports from California to the rest of the world in 1972 dollars and current dollars. The coefficients in the equations are based on the coefficients in table IV-2d in Markets for California Products, a report prepared for the State of California Economic Development Agency

by W. Lee Hansen, R. Thayne Robson and Charles M. Tiebout [ 1 ]. The coefficients show that portion of employment in the particular industry devoted to exports. Since the measures of gross product originating in California are based on employment, this equation gives the total gross product of the various industries which is exported. This method was used because direct measures of gross exports from California are unavailable. These equations are direct behavioral equations.

Equation 67 is an identity for the implicit price deflator for gross state product in California.

Equation 68 is an identity for gross imports to California from the rest of the world in 1972 dollars.

Equation 69 is an identity for gross imports to California from the rest of the world in current dollars.

The model described above is the model used to generate the forecast data for final demands in California for the period from the third quarter of 1981 through 1983. It will be referred to as the forecasting model of final demand components in California. Since historical data for the period 1972 through 1980 are available for some of the endogenous variables of the forecasting model, the equations for these variables are eliminated in the historical model. The variables in question are the deflators for gross product originating, cash receipts from farming in California and retail sales in California. Therefore equations 26, 27, 28, 29, 30, 35, 37 and 38 were not used to generate the estimates of the final demand components for the historical period, and these equations do not appear in the historical model.

#### UPDATING PROCEDURES

There are two different updating procedures, one for updating the historical estimates of the final demand components in California and one for updating the forecast of final demand components in California. An example session is included at the end of this chapter which describes the method to update the forecasts.

When new historical data for the exogenous variables of the historical model become available it is possible to update the historical estimates of final demand components in California. To do this the new historical data must be acquired. Most of the data are usable in the form in which they are found in the DRI U.S. Central Data Bank or the Security Pacific National Bank California Data Bank. However some of the variables must be modified to be used by the historical model. Historical data for retail sales and cash receipts from farming in California must be seasonally adjusted. The seasonal adjustment of the historical data was performed with the Census X-11 method of multiplicate seasonal adjustment by the SEASONALADJUST command in EPS, the Data Resources interactive econometric computer program. The deflators for gross product originating are annual data and must be "distributed" to a quarterly frequency. This has been

accomplished by using the DISTRIBUTE command in EPS. When all the new historical exogenous variables are prepared the historical model can be solved for the new historical estimates of the final demand components in California.

When new forecast data for the exogenous variables of the forecasting model become available it is possible to update the forecast of final demand components in California. When all the forecast exogenous variables are obtained the forecasting model can be solved for the revised forecast of the final demand components.

In updating both the historical estimates of the model and the forecast estimates of the model, care should be taken to be sure that the units of measurement of the new data match the units of measurement of the old data. It is useful in this regard to print out all the exogenous variables of the model both before and after updating. While the updated data will differ in detail from the previous data, they should be approximately equal. Differences of orders of magnitude, for example millions of dollars instead of billions of dollars, can be readily detected and corrected with this simple precaution.

#### EVALUATION OF THE ESTIMATES OF THE MODEL

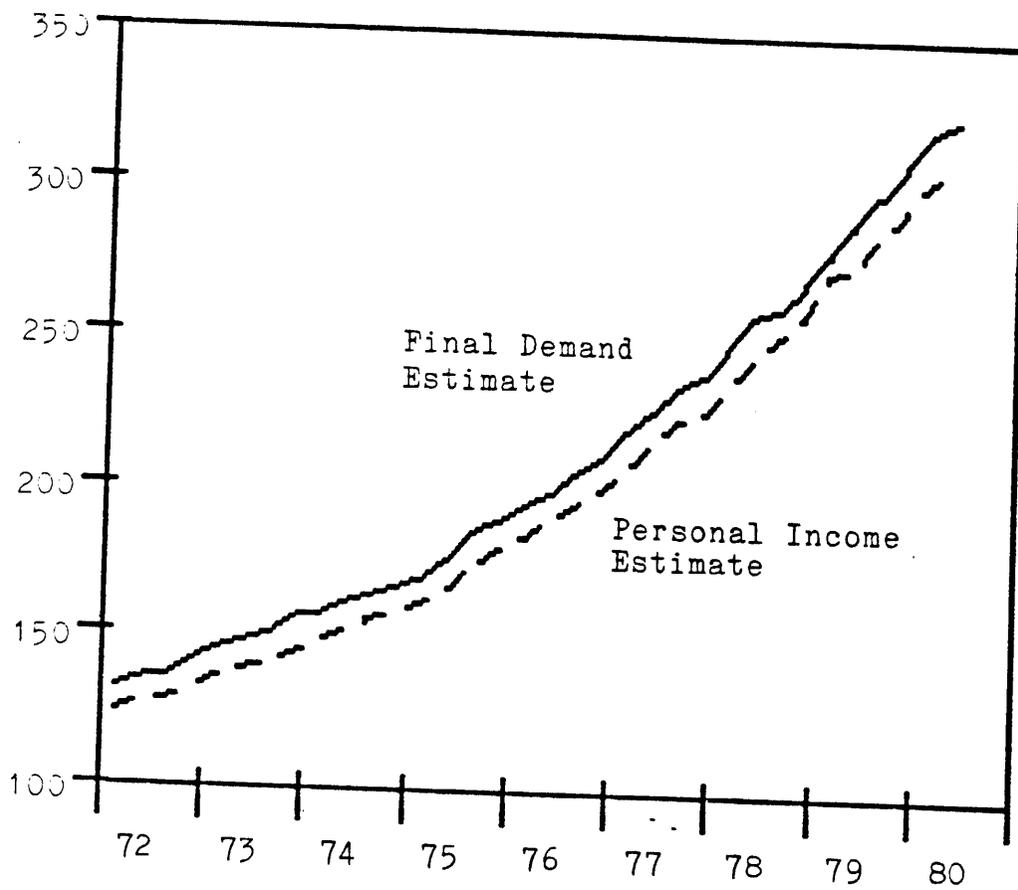
Because there are no official estimates of the final demand components in California it is not possible to compare the estimates produced by the model with any other estimates. The UCLA Business Forecasting Project, however, has produced estimates of gross state product and real gross state product in California for a number of years. These estimates are based on a simple one equation relationship which postulates that gross state product in California bears the same relationship to personal income in California that gross national product in the U.S. bears to U.S. personal income. These estimates can be compared to the estimates for gross state product produced by the econometric model of final demand components in California.

The following two charts show plots of the two different estimates of gross state product and real gross state product in California over the historical period. The solid line shows the estimates produced by the final demand model, and the dashed line shows the estimates produced by the simple personal income relationship. The estimates produced by the final demand model are higher than the estimates produced by the personal income relationship. The final demand based estimate of gross state product averages \$ 10.6 billion higher than the personal income based estimate. The final demand based estimate of real gross state product is 8.6 billion 1972 dollars higher than the personal income based estimate. The estimates are highly

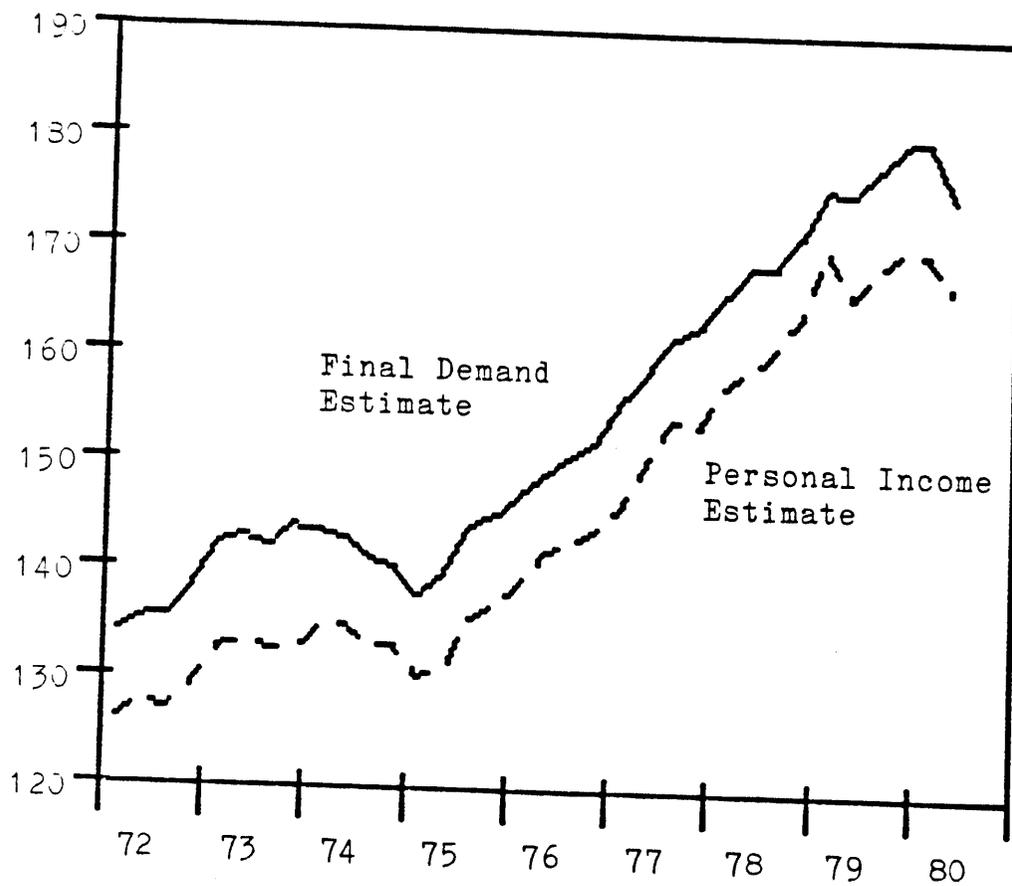
2  
correlated. The  $R^2$  of the final demand estimate of gross state product regressed on the personal income based estimate is 2  
0.9993, and the  $R^2$  of the final demand estimate of real gross state product regressed on the personal income based estimate is 0.9943.

Comparison of Two Estimates of  
Gross State Product in California

( Billions of Dollars )



Comparison of Two Estimates of  
Real Gross State Product in California  
( Billions of 1972 Dollars )



The advantage of the final demand estimates produced by the econometric model over the estimate for gross state product produced by the simple personal income relationship can be illustrated by examining the estimates for the second and third quarters of 1978. The estimate of real gross state product produced by the econometric model of final demands shows that the real gross state product in California in the third quarter of 1978 declined by 0.3 billion 1972 dollars or 0.18 percent. The estimate of real gross state product produced by the simple personal income relationship shows that real gross state product in the third quarter of 1978 increased by 2.2 billion 1972 dollars or 1.4 percent. The small decline in real gross state product estimated by the final demands model can be decomposed into the sum of the changes in real consumption, real investment, real Federal government expenditures, real State and Local government expenditures and real net exports. From the second to the third quarter of 1978 real consumption increased by 1.3 billion 1972 dollars, real federal government expenditures increased by 0.6 billion 1972 dollars and real net exports increased by 0.1 billion 1972 dollars. These increases were more than offset by a decline in real investment of 0.7 billion 1972 dollars and in real State and Local government expenditures of 1.6 billion 1972 dollars. The decline in State and Local government expenditures was the result of the passage of Proposition 13. The fall in real investment was caused mostly by a 0.5 billion 1972 dollar fall in real residential fixed investment. This fall in residential fixed investment is indicated by the fall in residential building permits from a 323 thousand unit annual rate in the second quarter to a 202 thousand unit rate in the third quarter, the result of more stringent energy and environmental regulations which took effect on July 1, 1978.

A close examination of the details of the estimates of final demand in California supports the conclusion that there was a pause in real economic activity in the third quarter of 1978. There was a contraction in real activity by State and Local government in anticipation of lower tax revenue, but no corresponding large increase in expenditures by consumers, perhaps because they had yet to receive any additional disposable income due to lower tax payments. Also the deadline of July 1, 1978 for building permits exempt from new more stringent energy and environmental regulations caused an artificial increase in building activity in the second quarter and a corresponding artificial decrease in the third quarter.

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5. John W. Kendrick, C. Milton Jaycox, W. L. L'Esperance, Gil Nestel and Daniel Fromm, "Gross State Product and an Econometric Model of a State", Journal of the American Statistical Association, September 1969.
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7. Albert W. Niemi, Jr., "A Re-Examination of the Kendrick-Jaycox Method of Estimating Gross State Product", Review of Regional Studies, Spring 1972.
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## CALIFORNIA FINAL DEMAND MODEL

### EXAMPLE SESSION

The following pages contain an actual example session of using the Final Demand Model workspace on Data Resources Inc.'s Econometric Programming System (EPS). All efforts have been made to simplify the procedures involved in using the workspace. Users are not required to have prior computer programming experience. Nevertheless, a brief understanding of EPS is helpful.

In the example session all commands are underlined and they are followed by a question mark (?). For those who are unfamiliar with DRI's system, EPS always prompts a question mark when it is ready to take a command. For example :

? INDEX VERSION

STEP 1 : After logging on to DRI's timesharing system, the user will be in the CANDE mode. From there he/she must go into EPS.

E\*EPS

#RUNNING 3456

#?

\*\*\*\*\*

\* EPS \* 8/4/81 14:46 VERSION 7/31/81 SC

\*\*\*\*\*

New financial functions, major enhancements to graphics, ARIMA, READ functio

STEP 2 : Load the California Final Demand Model workspace. The workspace's name may change from time to time but the procedure is always the same. At present the workspace is called CADEMAND81.

?LOAD CADEMAND81

LOADING CADEMAND81

WORKSPACE TITLE: CADEMAND81.

WS CREATED: 03/09/1981 18:11

WS LAST SAVED: 07/28/1981 15:16

WS LAST UPDATED: 08/04/1981 14:46

CURRENT INTERVAL: QUARTERLY(1972:1 TO 1983:4)

CURRENT VERSION: BASIC

208 ITEMS IN WORKSPACE

5 TEMPORARY (#) ITEMS

STEP 3 : If the user is unfamiliar with the workspace, he/she may find it helpful to index the available tools such as TEMPLATES, STUBLISTS, and NAMELISTS.

?INDEX STUBLIST

--- STUBLISTS ---  
RGSP            STUBLIST  
RGSP72         STUBLIST

INDEX TEMPLATES

--- TEMPLATES ---  
TCONVERT        TEMPLATE

?INDEX NAMELIST

--- NAMELISTS ---  
EXGSP@CA        NAMELIST  
EXGSP@US        NAMELIST  
MGSP@CA         NAMELIST  
MGSPHIST        NAMELIST

STEP 4 : Instruct EPS to verify all work performed by the computer.

?SET VERIFY=#TERMINAL

STEP 5 : If the user finds it necessary to update the recent historical endogenous variables of the model he/she must first bring the recent historical exogenous variables into the workspace. The exogenous variables are divided into two groups, those that come from the U.S. and those that come from California. The U.S. exogenous variables are contained in the namelist EXGSP@US while the California exogenous variables are contained in the namelist EXGSP@CA. The source of the U.S. exogenous variables is DRI's USMODEL. The source of the California exogenous variables is the most recent UCLA California forecast (in the example below, it is UCLA/BASE0681). Be certain the historical interval is set correctly while entering this command (in the example below, the interval is set from 1980:1 to 1981:2).

?GET<OVER, SRC=@USMODEL, Q, 80 TO 81:2>SEXGSP@US

SOURCE: @USMODEL. FREQ: Q

NAME	CLASS	CR/UP	RETRIEVED		AVAILABLE		LONG	DECS
			FIRST	LAST	FIRST	LAST		
C	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	1
CD	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
CN	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
CPIU	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	3
CS72	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	1
EEA	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	2
EFIR	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
EGF	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	3
EM	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
EMI	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
ER	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
ESV	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
EX6M	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
EX72@M72	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	1
GF	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
GNP72	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	1
ICNR	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
INVCH	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
INV72CH	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	1
IPDENR	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
PCD	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PCN	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PCS	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PCSO	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PGP	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PGNP	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PGSL	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PICNR	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	3
PIFIXR	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
PIPDENR	SERIES	UP	1980:1	1981:2	OC	1945:1	1981:2	3
SEASONQ4	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	0
WPIO1	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
WPIO5	SERIES	UP	1980:1	1981:2	OC	1947:1	1981:2	3
WSS	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1
YP	SERIES	UP	1980:1	1981:2	OC	1946:1	1981:2	1

?GET<OVER, SRC=@UCLA/BASE0681, Q, 80 TO 81:2>\$EXGSP@CA

SOURCE: @UCLA/BASE0681. FREQ: Q

NAME	CLASS	CR/UP	RETRIEVED		AVAILABLE		DECS
			FIRST	LAST	FIRST	LAST	
BRTU@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
CPIU@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
EA@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
EA@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
EFIR@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
EM@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
EMI@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
ER@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
ESV@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
SAF@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
ST@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
WSDGFCIVF@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
WSDGFMLF@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
WSDGSLF@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	
YFF@CA	SERIES	UP	1980:1	1981:2	1980:1	1983:4	

STEP 6 : Solve the conversion model to obtain the historical endogenous variables after the corresponding exogenous variables are brought into the workspace. Again, be sure the interval is set correctly and is identical to the historical interval set in the above step.

?SOLVE<80 TO 81:2>MGSPHIST  
RECURSIVE MODEL.

STEP 7 : This procedure is similar to STEP 5 except the variables are now forecast instead of history. The source of the U.S. exogenous variables can be any DRI U.S. forecast or UCLA's U.S. forecast on the DRI system. In this example it is DRI's latest Control forecast CONTROL072681. The source of California exogenous variables is the latest UCLA California forecast, currently it is UCLA/BASE0681. The quarterly interval should be set at the desirable forecast period. In this case it is 1981:3 to 1983:4.

?GET<OVER, SRC=SIM @CONTROL, Q, 81:3 TO 83>\$EXGSP@US

SOURCE: SIM @CONTROL072681 AVAIL: Q(1975:3 TO 1983:4)

NAME	CLASS	CR/UP	RETRIEVED		DECS
			FIRST	LAST	
C	SERIES	UP	1981:3	1983:4	OC 1
CD	SERIES	UP	1981:3	1983:4	OC 1
CN	SERIES	UP	1981:3	1983:4	OC 1
CPIU	SERIES	UP	1981:3	1983:4	OC 3
CS72	SERIES	UP	1981:3	1983:4	OC 1
EEA	SERIES	UP	1981:3	1983:4	OC 2
EFIR	SERIES	UP	1981:3	1983:4	OC 3
EGF	SERIES	UP	1981:3	1983:4	OC 3
EM	SERIES	UP	1981:3	1983:4	OC 3
EMI	SERIES	UP	1981:3	1983:4	OC 3
ER	SERIES	UP	1981:3	1983:4	OC 3
ESV	SERIES	UP	1981:3	1983:4	OC 3
EXEM	SERIES	UP	1981:3	1983:4	OC 1
EX72EM72	SERIES	UP	1981:3	1983:4	OC 1
GF	SERIES	UP	1981:3	1983:4	OC 1
GNP72	SERIES	UP	1981:3	1983:4	OC 1
ICNR	SERIES	UP	1981:3	1983:4	OC 1
INVCH	SERIES	UP	1981:3	1983:4	OC 1
INV72CH	SERIES	UP	1981:3	1983:4	OC 1
IPDENR	SERIES	UP	1981:3	1983:4	OC 1
PCD	SERIES	UP	1981:3	1983:4	OC 3
PCN	SERIES	UP	1981:3	1983:4	OC 3
PCS	SERIES	UP	1981:3	1983:4	OC 3
PCSO	SERIES	UP	1981:3	1983:4	OC 3
PGF	SERIES	UP	1981:3	1983:4	OC 3
PGNP	SERIES	UP	1981:3	1983:4	OC 3
PGSL	SERIES	UP	1981:3	1983:4	OC 3
PICNR	SERIES	UP	1981:3	1983:4	OC 3
PIFIXR	SERIES	UP	1981:3	1983:4	OC 3
PIPDENR	SERIES	UP	1981:3	1983:4	OC 3
SEASONQ4	SERIES	UP	1981:3	1983:4	OC 0
WPIO1	SERIES	UP	1981:3	1983:4	OC 3
WPIO5	SERIES	UP	1981:3	1983:4	OC 3
WSS	SERIES	UP	1981:3	1983:4	OC 1
YP	SERIES	UP	1981:3	1983:4	OC 1

?GET<OVER, SRC=@UCLA/BASE0681, Q, 81:3 TO 83>\$EXGSP@CA

SOURCE: @UCLA/BASE0681. FREQ: Q

NAME	CLASS	CR/UP	RETRIEVED		AVAILABLE		DECS
			FIRST	LAST	FIRST	LAST	
BRTU@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
CPIU@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
EAGCA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
EEA@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
EFIR@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
EM@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
EMIG@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
ER@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
ESV@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
SAF@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
ST@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
WSDGFCIVF@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
WSDGFMLF@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
WSDGSLF@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	
YPF@CA	SERIES	UP	1981:3	1983:4	1980:1	1983:4	

STEP 8 : Solve for the forecast solution of the California Final Demand Model. The name of the Model is MGSP@CA. It is important to note in EPS a model is a namelist. The names within the namelist represent the corresponding equations.

?SOLVE<81:3 TO 83>MGSP@CA  
RECURSIVE MODEL.

STEP 9 : Write out the tables. The table which reports current dollar values is RGSP while the table which reports real dollar values (1972 Dollars) is RGSP72.

?WRITE<81 TO 83>RGSP

8/4/81

TABLE 6. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF CURRENT DOLLARS)

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
PERSONAL CONSUMPTION												
EXPENDITURES	214.4	224.8	232.3	240.1	247.7	255.0	262.9	271.5	279.5	287.4	297.0	307.4
DURABLE GOODS	29.5	30.6	32.0	34.1	36.0	37.6	39.4	41.3	42.6	44.0	45.5	47.5
NONDURABLE GOODS	68.3	73.5	75.8	78.0	80.4	82.6	84.7	87.7	90.6	93.5	96.3	99.7
SERVICES	116.6	120.6	124.6	128.0	131.3	134.8	138.9	142.5	146.3	150.4	155.2	160.4
GROSS PRIVATE DOMESTIC INVESTMENT	49.3	51.7	51.0	53.4	56.1	59.2	62.1	65.7	68.5	70.9	73.6	76.3
RESIDENTIAL	10.2	9.8	9.9	10.4	11.0	11.8	12.7	13.7	14.6	15.3	15.7	16.3
NONRES. STRUCTURES	14.3	14.8	15.1	15.7	16.3	17.0	17.7	18.4	19.1	19.9	20.6	21.5
PRODUCERS DUR. EQUIP.	24.2	24.6	25.1	25.9	26.9	28.2	29.6	30.8	31.9	33.1	34.2	35.2
CHANGE IN INVENTORIES	0.5	2.5	0.8	1.5	1.8	2.2	2.1	2.8	2.9	2.0	3.1	3.3
NET EXPORTS	3.6	2.4	3.1	2.8	1.9	1.7	1.9	2.0	2.2	2.5	2.7	2.8
EXPORTS	30.8	31.0	31.8	33.7	34.0	34.8	36.4	38.8	38.9	39.8	41.3	43.4
IMPORTS	27.3	28.6	28.8	30.9	32.1	33.1	34.6	36.7	36.7	37.3	38.7	40.6
GOVERNMENT PURCHASES	64.0	66.6	68.1	70.5	72.5	74.4	76.5	79.4	81.3	83.5	85.7	88.9
FEDERAL	26.3	27.9	28.5	29.9	31.0	31.9	33.0	34.8	35.8	37.0	38.2	40.4
STATE AND LOCAL	37.7	38.7	39.6	40.6	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5
GROSS STATE PRODUCT	331.2	345.4	354.5	366.8	378.2	390.4	403.5	418.6	431.4	444.7	459.0	475.4
GSP IN 1972 \$	174.1	178.6	180.0	182.7	185.1	188.0	191.2	194.8	197.9	201.2	204.7	208.6
PRICE DEFLATOR (1972=1.0)	1.903	1.934	1.970	2.008	2.043	2.077	2.110	2.148	2.180	2.211	2.242	2.279
% CHANGE	9.9	6.7	7.6	7.9	7.2	6.9	6.6	7.4	6.1	5.7	5.7	6.8

?WRITE<75 TO 83>WITH TCONVERT, RGSP72

8/4/81

TABLE 7. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF 1972 DOLLARS)

	1975	1976	1977	1978	1979	1980	1981	1982	1983
PERSONAL CONSUMPTION EXPENDITURES	86.3	91.2	97.4	104.3	110.1	109.2	116.4	124.1	132.3
DURABLE GOODS	12.9	13.5	15.8	18.0	18.6	16.9	18.6	21.6	24.0
NONDURABLE GOODS	29.7	31.5	32.4	33.0	34.7	33.6	35.9	38.5	41.4
SERVICES	43.7	46.2	49.1	53.3	56.8	58.7	61.8	64.1	66.9
GROSS PRIVATE DOMESTIC INVESTMENT	16.4	20.3	23.6	25.1	25.7	22.6	24.1	26.5	29.6
RESIDENTIAL NONRES STRUCTURES	4.0	5.4	6.4	6.0	5.5	4.6	4.2	4.8	5.5
PRODUCERS DUR. EQUIP.	8.9	9.6	11.2	12.4	13.4	12.8	13.4	14.5	16.0
CHANGE IN INVENTORIES	-0.7	0.9	1.4	1.6	1.2	-0.4	0.5	0.9	1.1
NET EXPORTS	3.5	2.8	2.5	2.8	4.4	6.2	5.6	4.9	5.4
EXPORTS	11.9	12.7	13.7	14.9	15.9	16.0	16.7	17.7	18.8
IMPORTS	8.3	9.9	11.3	12.1	11.5	9.8	11.1	12.8	13.4
GOVERNMENT PURCHASES	29.2	29.5	30.2	30.2	30.5	30.5	32.7	34.2	35.8
FEDERAL	11.5	11.3	11.8	11.6	11.9	12.3	13.5	14.5	15.7
STATE AND LOCAL	17.7	18.2	18.4	18.5	18.6	18.2	19.2	19.7	20.2
GROSS STATE PRODUCT	135.5	143.8	153.6	162.4	170.7	168.6	178.8	189.8	203.1
PRICE DEFLATOR (1972=1.0)	1.250	1.322	1.408	1.512	1.632	1.809	1.954	2.095	2.228
% CHANGE	10.5	5.8	6.5	7.4	8.0	10.8	8.0	7.2	6.4
GSP IN CURRENT DOLLARS	169.4	190.3	216.3	245.7	278.7	304.9	349.5	397.7	452.6

STEP 10 : Save over the workspace for future uses.

? SAVE<OVER>

AN ECONOMETRIC MODEL OF FINAL DEMAND  
COMPONENTS OF CALIFORNIA

APPENDIX A.  
GLOSSARY OF VARIABLES

August 1981

LONG(BRTU@CA) = BLDG PERMITS: UNITS, TOTAL DWELLINGS - CALIFORNIA  
LONG(C@CA) = PERSONAL CONSUMPTION EXPENDITURES - CALIFORNIA  
LONG(CD) = PERSONAL CONSUMPTION EXPENDITURES - DURABLE GOODS  
LONG(CD@CA) = PERSONAL CONSUMPTION EXPENDITURES - DURABLE GOODS - CALIFORNIA  
LONG(CD72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - DURABLE GOODS - CALIFORNIA  
LONG(CN) = PERSONAL CONSUMPTION EXPENDITURES - NONDURABLE GOODS  
LONG(CN@CA) = PERSONAL CONSUMPTION EXPENDITURES - NONDURABLE GOODS - CALIFORNIA  
LONG(CN72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - NONDURABLE GOODS - CALIFORNIA  
LONG(CPIU) = CONSUMER PRICE INDEX (ALL URBAN) - ALL ITEMS  
LONG(CPIU@CA) = CONSUMER PRICE INDEX (ALL URBAN) - ALL ITEMS - CALIFORNIA  
LONG(CS@CA) = PERSONAL CONSUMPTION EXPENDITURES - SERVICES - CALIFORNIA  
LONG(CS72) = PERSONAL CONSUMPTION EXPENDITURES - SERVICES - 1972 DOLLARS  
LONG(CS72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - SERVICES - CALIFORNIA  
LONG(C72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - CALIFORNIA  
LONG(EEA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS  
LONG(EEA@CA) = TOTAL EMPL: NONAGRICULTURAL ESTABLISHMENTS - CALIFORNIA  
LONG(EFIR) = TOTAL EMPLOYMENT - FINANCE, INSURANCE AND REAL ESTATE  
LONG(EFIR@CA) = TOTAL EMPL: FINANCE, INSURANCE, & REAL ESTATE - CALIFORNIA  
LONG(EGF) = TOTAL EMPLOYMENT - FEDERAL GOVERNMENT  
LONG(EM) = TOTAL EMPLOYMENT - ALL MANUFACTURING  
LONG(EM@CA) = TOTAL EMPL: MANUFACTURING - CALIFORNIA  
LONG(EMI) = TOTAL EMPLOYMENT - MINING  
LONG(EMI@CA) = TOTAL EMPL: MINING - CALIFORNIA  
LONG(ER) = TOTAL EMPLOYMENT - TRANSPORTATION AND PUBLIC UTILITIES  
LONG(ER@CA) = TOTAL EMPL: TRANSPORTATION & PUBLIC UTILITIES - CALIFORNIA  
LONG(ESV) = TOTAL EMPLOYMENT - SERVICES  
LONG(ESV@CA) = TOTAL EMPL: SERVICES INDUSTRIES - CALIFORNIA  
LONG(EX@CA) = EXPORTS OF GOODS AND SERVICES - CALIFORNIA

LONG(EXCM@CA) = EXPORTS OF GOODS AND SERVICES (NET) - CALIFORNIA  
 LONG(EX72@CA) = EXPORTS OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
 LONG(EX72@M72) = NET EXPORTS OF GOODS AND SERVICES - 1972 DOLLARS  
 LONG(EX72@M72@CA) = EXPORTS OF GOODS AND SERVICES (NET) - 1972 DOLLARS - CALIFORNIA  
 LONG(G@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
 LONG(GP) = FEDERAL GOVERNMENT PURCHASES - ALL GOODS AND SERVICES  
 LONG(GF@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
 LONG(GPOTH) = FEDERAL GOVERNMENT PURCHASES - EXCEPT COMPENSATION OF EMPLOYEES  
 LONG(GPOTH@CA) = FEDERAL GOVERNMENT PURCHASES - EXCEPT COMPENSATION OF EMPLOYEES - CALIFORNIA  
 LONG(GPWSS) = FEDERAL GOVERNMENT PURCHASES - COMPENSATION OF EMPLOYEES  
 LONG(GPWSS@CA) = FEDERAL GOVERNMENT PURCHASES - COMPENSATION OF EMPLOYEES - CALIFORNIA  
 LONG(GP72@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
 LONG(GNP72) = GROSS NATIONAL PRODUCT - 1972 DOLLARS  
 LONG(GPOPIR@CA) = GROSS PRODUCT ORIGINATING - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA  
 LONG(GPOM@CA) = GROSS PRODUCT ORIGINATING - MANUFACTURING - CALIFORNIA  
 LONG(GPOMI@CA) = GROSS PRODUCT ORIGINATING - MINING - CALIFORNIA  
 LONG(GPOR@CA) = GROSS PRODUCT ORIGINATING - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA  
 LONG(GPOSVE@CA) = GROSS PRODUCT ORIGINATING - SERVICES - CALIFORNIA  
 LONG(GP072\$FIR) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE  
 LONG(GP072\$FIR@CA) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA  
 LONG(GP072\$M) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING  
 LONG(GP072\$M@CA) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING - CALIFORNIA  
 LONG(GP072\$MI) = GROSS PRODUCT ORIGINATING, REAL - MINING  
 LONG(GP072\$MI@CA) = GROSS PRODUCT ORIGINATING, REAL - MINING - CALIFORNIA  
 LONG(GP072\$R) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES  
 LONG(GP072\$R@CA) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFOR  
 LONG(GP072\$SV) = GROSS PRODUCT ORIGINATING, REAL - SERVICES  
 LONG(GP072\$SV@CA) = GROSS PRODUCT ORIGINATING, REAL - SERVICES - CALIFORNIA  
 LONG(GSL@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
 LONG(GSLO@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - OTHER - CALIFORNIA

LONG(GSLW33@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - COMPENSATION - CALIFORNIA  
LONG(GSL72@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
LONG(GSP@CA) = GROSS STATE PRODUCT - CALIFORNIA  
LONG(GSP72@CA) = GROSS STATE PRODUCT: IN 1972 DOLLARS - CALIFORNIA  
LONG(G72@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
LONG(I@CA) = PRIVATE DOMESTIC INVESTMENT, GROSS - CALIFORNIA  
LONG(ICNR) = GROSS INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES  
LONG(ICNR@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - CALIFORNIA  
LONG(ICNR72@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - 1972 DOLLARS - CALIFORNIA  
LONG(IPIXR@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - CALIFORNIA  
LONG(IPIXR72@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - 1972 DOLLARS - CALIFORNIA  
LONG(INVCH) = CHANGE IN BUSINESS INVENTORIES - TOTAL  
LONG(INVCH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - CALIFORNIA  
LONG(INV72CH) = CHANGE IN BUSINESS INVENTORIES - TOTAL - 1972 DOLLARS  
LONG(INV72CH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - 1972 DOLLARS - CALIFORNIA  
LONG(IPDENR) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT  
LONG(IPDENR@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA  
LONG(IPDENR72@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - 1972 DOLLARS - CALIFORNIA  
LONG(I72@CA) = GROSS PRIVATE DOMESTIC INVESTMENT - 1972 DOLLARS - CALIFORNIA  
LONG(M@CA) = IMPORTS OF GOODS AND SERVICES - CALIFORNIA  
LONG(M72@CA) = IMPORTS OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
LONG(PCD) = IMPLICIT PRICE DEFLATOR - CONSUMPTION OF DURABLE GOODS  
LONG(PCD@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER DURABLE GOODS EXPENDITURES - CALIFORNIA  
LONG(PCN) = IMPLICIT PRICE DEFLATOR - CONSUMPTION OF NONDURABLE GOODS  
LONG(PCN@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER NONDURABLE GOODS EXPENDITURES - CALIFORNIA

LONG(PCS) = IMPLICIT PRICE DEFLATOR - CONSUMPTION OF SERVICES  
 LONG(PCSeCA) = IMPLICIT PRICE DEFLATOR - CONSUMER SERVICES EXPENDITURES - CALIFORNIA  
 LONG(PCSO) = IMPLICIT PRICE DEFLATOR - CONSUMPTION OF OTHER SERVICES  
 LONG(PGF) = IMPLICIT PRICE DEFLATOR - FEDERAL GOVT PURCHASES OF GOODS & SERVICES  
 LONG(PGFeCA) = IMPLICIT PRICE DEFLATOR - FEDERAL GOVT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
 LONG(PGNP) = IMPLICIT PRICE DEFLATOR - GROSS NATIONAL PRODUCT  
 LONG(PGPOFIR) = GROSS PRODUCT DEFLATOR - FINANCE, INSURANCE AND REAL ESTATE  
 LONG(PGPOM) = GROSS PRODUCT DEFLATOR - MANUFACTURING  
 LONG(PGPCMI) = GROSS PRODUCT DEFLATOR - MINING  
 LONG(PGPOR) = GROSS PRODUCT DEFLATOR - TRANSPORTATION, COMMUNICATION & UTILITIES  
 LONG(PGPOSV) = GROSS PRODUCT DEFLATOR - SERVICES  
 LONG(PGSL) = IMPLICIT PRICE DEFLATOR - STATE & LOCAL GOVT PURCHASES GOODS & SERVICES  
 LONG(PGSLeCA) = IMPLICIT PRICE DEFLATOR - STATE & LOCAL GOVT PURCHASES GOODS & SERVICES - CALIFORNIA  
 LONG(PGSPeCA) = IMPLICIT PRICE DEFLATOR: GROSS STATE PRODUCT - CALIFORNIA  
 LONG(PICNR) = IMPLICIT PRICE DEFLATOR - PRIVATE NONRESIDENTIAL CONSTRUCTION  
 LONG(PICNReCA) = IMPLICIT PRICE DEFLATOR - INVESTMENT, PRIVATE NONRESIDENTIAL STRUCTURES - CALIFORNIA  
 LONG(PIFIXR) = IMPLICIT PRICE DEFLATOR - GROSS FIXED PRIVATE RESIDENTIAL INVESTMENT  
 LONG(PIFIXReCA) = IMPLICIT PRICE DEFLATOR - GROSS FIXED PRIVATE RESIDENTIAL INVESTMENT - CALIFORNIA  
 LONG(PIPDENR) = IMPLICIT PRICE DEFLATOR - NONRESIDENTIAL PRODUCERS' DURABLE EQUIPMENT  
 LONG(PIPDENReCA) = IMPLICIT PRICE DEFLATOR - NONRESIDENTIAL PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA  
 LONG(SAFeCA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA  
 LONG(SAF72eCA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA - 1972 DOLLARS  
 LONG(SEASONQ4) = SEASONAL DUMMY FOR FOURTH QUARTER (=1.0 THEREIN, 0.0 ELSEWHERE)  
 LONG(SRDeCA) = RETAIL SALES, DURABLE GOODS STORES - CALIFORNIA  
 LONG(SRNeCA) = RETAIL SALES, NONDURABLE GOODS - CALIFORNIA  
 LONG(STeCA) = RETAIL SALES: TOTAL ALL OUTLETS - CALIFORNIA  
 LONG(WPIO1) = WHOLESALE PRICE INDEX - FARM PRODUCTS  
 LONG(WPIO5) = WHOLESALE PRICE INDEX - FUELS AND RELATED PRODUCTS AND POWER  
 LONG(WSDGFCIVeCA) = WAGE & SALARY DISB: GOVT FED CIV, PLACE OF WORK - CALIFORNIA  
 LONG(WSDGFMLPeCA) = WAGE & SALARY DISB: GOVT FED MIL, PLACE OF WORK - CALIFORNIA  
 LONG(WSDGSLPeCA) = WAGE & SALARY DISB: GOVT S&L, PLACE OF WORK - CALIFORNIA  
 LONG(WSS) = COMPENSATION OF EMPLOYEES  
 LONG(YP) = PERSONAL INCOME  
 LONG(YPeCA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

AN ECONOMETRIC MODEL OF FINAL DEMAND  
COMPONENTS OF CALIFORNIA

APPENDIX B.  
ESTIMATES OF FINAL DEMAND  
COMPONENTS IN CALIFORNIA

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TABLE 6. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF CURRENT DOLLARS) - QUARTERLY, 1981 through 1983

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
<b>PERSONAL CONSUMPTION</b>												
EXPENDITURES	215.6	226.0	233.8	242.6	251.0	259.2	267.5	277.2	285.9	295.3	304.8	315.0
DURABLE GOODS	29.5	30.6	32.4	34.5	36.5	38.1	39.6	41.9	43.4	45.2	47.0	49.4
NONDURABLE GOODS	68.3	73.5	75.5	77.7	80.1	82.3	84.5	87.3	90.1	92.7	95.4	98.4
SERVICES	117.8	121.8	126.0	130.3	134.4	138.8	143.4	148.0	152.4	157.5	162.4	167.2
<b>GROSS PRIVATE DOMESTIC INVESTMENT</b>	49.1	50.6	52.7	55.4	58.1	62.1	64.9	67.4	72.1	74.9	77.5	81.1
RESIDENTIAL	10.3	9.9	10.1	10.6	11.3	12.2	13.1	14.2	15.2	16.0	16.5	17.1
NONRES STRUCTURES	14.2	14.5	15.0	15.9	16.9	17.8	18.8	19.7	20.7	21.7	22.5	23.5
PRODUCERS DUR. EQUIP.	24.3	25.0	25.4	26.1	27.2	28.3	29.5	30.8	32.0	33.1	34.2	35.3
CHANGE IN INVENTORIES	0.3	1.2	2.2	2.8	2.8	3.8	3.5	2.7	4.1	4.1	4.2	5.1
<b>NET EXPORTS</b>	4.5	5.2	5.3	5.4	4.9	4.5	4.9	4.7	4.8	4.7	4.5	4.2
EXPORTS	30.7	31.1	32.3	34.1	34.3	35.1	36.6	38.9	39.1	40.0	41.5	43.7
IMPORTS	26.2	25.9	27.0	28.7	29.5	30.7	31.7	34.1	34.2	35.3	36.9	39.5
<b>GOVERNMENT PURCHASES</b>	64.0	66.5	68.4	70.8	72.8	74.8	76.9	79.5	81.6	83.7	85.8	88.8
FEDERAL	26.3	27.8	28.8	30.2	31.3	32.3	33.4	35.0	36.1	37.2	38.3	40.2
STATE AND LOCAL	37.7	38.7	39.6	40.6	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5
<b>GROSS STATE PRODUCT</b>	333.3	348.3	360.2	374.2	386.9	400.5	414.2	428.9	444.3	458.6	472.6	489.0
GSP IN 1972 \$	175.0	179.1	181.5	185.2	188.3	191.4	194.1	197.3	201.0	204.1	206.9	210.4
PRICE DEFLATOR (1972=1.0)	1.904	1.945	1.984	2.020	2.055	2.093	2.134	2.173	2.211	2.247	2.284	2.324
% CHANGE	10.1	8.9	8.3	7.5	6.9	7.6	8.2	7.6	7.0	6.7	6.8	7.1

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TABLE 7. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF 1972 DOLLARS) - QUARTERLY, 1981 through 1983

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
<b>PERSONAL CONSUMPTION EXPENDITURES</b>	112.9	116.1	118.0	120.5	122.6	124.4	126.0	128.6	130.5	132.8	135.0	137.4
DURABLE GOODS	17.8	18.4	19.1	20.1	20.9	21.4	21.9	22.9	23.4	24.1	24.9	25.8
NONDURABLE GOODS	33.7	35.8	36.3	36.9	37.4	37.9	38.3	39.0	39.6	40.3	40.8	41.4
SERVICES	61.4	62.0	62.6	63.5	64.3	65.1	65.8	66.7	67.4	68.4	69.3	70.1
<b>GROSS PRIVATE DOMESTIC INVESTMENT</b>	23.5	24.0	24.6	25.6	26.3	27.5	28.1	28.7	30.0	30.7	31.2	32.1
RESIDENTIAL	4.4	4.2	4.1	4.3	4.4	4.6	4.9	5.1	5.4	5.5	5.6	5.7
NONRES STRUCTURES	5.9	5.9	6.0	6.2	6.4	6.5	6.7	6.9	7.0	7.2	7.3	7.5
PRODUCERS DUR. EQUIP.	13.5	13.7	13.6	13.9	14.3	14.7	15.1	15.6	16.0	16.4	16.7	17.1
CHANGE IN INVENTORIES	-0.3	0.3	0.9	1.2	1.2	1.6	1.4	1.1	1.6	1.6	1.6	1.9
<b>NET EXPORTS</b>	6.6	6.4	6.2	6.1	5.8	5.7	5.8	5.7	5.6	5.5	5.4	5.2
EXPORTS	16.5	16.4	16.8	17.5	17.3	17.4	17.8	18.6	18.5	18.6	19.0	19.6
IMPORTS	10.0	10.0	10.7	11.4	11.5	11.7	12.0	12.9	12.9	13.1	13.6	14.4
<b>GOVERNMENT PURCHASES</b>	32.0	32.5	32.7	33.0	33.6	33.8	34.1	34.4	34.9	35.2	35.4	35.7
FEDERAL	12.9	13.4	13.6	13.8	14.3	14.4	14.6	14.8	15.3	15.5	15.6	15.9
STATE AND LOCAL	19.1	19.1	19.1	19.2	19.3	19.4	19.5	19.6	19.6	19.7	19.8	19.9
<b>GROSS STATE PRODUCT</b>	175.0	179.1	181.5	185.2	188.3	191.4	194.1	197.3	201.0	204.1	206.9	210.4
<b>PRICE DEFLATOR (1972=1.0)</b>	1.904	1.945	1.984	2.020	2.055	2.093	2.134	2.173	2.211	2.247	2.284	2.324
% CHANGE	10.1	8.9	8.3	7.5	6.9	7.6	8.2	7.6	7.0	6.7	6.8	7.1
<b>GSP IN CURRENT DOLLARS</b>	333.3	348.3	360.2	374.2	386.9	400.5	414.2	428.9	444.3	458.6	472.6	489.0

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TABLE 6. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF CURRENT DOLLARS) - ANNUAL, 1972 through 1983

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>PERSONAL CONSUMPTION</b>												
EXPENDITURES	80.8	87.9	95.6	107.4	120.1	136.9	156.9	179.4	200.6	229.5	263.7	300.3
DURABLE GOODS	12.9	13.9	13.7	15.2	16.8	20.6	24.8	27.1	27.0	31.7	39.0	46.2
NONDURABLE GOODS	28.2	31.1	34.7	39.2	43.3	46.9	51.2	59.4	65.1	73.8	83.5	94.1
SERVICES	39.7	42.9	47.1	53.1	60.0	69.3	81.0	92.9	108.5	124.0	141.1	159.9
<b>GROSS PRIVATE DOMESTIC INVESTMENT</b>	20.7	23.5	23.5	21.9	28.4	35.9	41.3	46.0	44.9	52.0	63.1	76.4
RESIDENTIAL	6.5	6.4	5.1	5.2	7.6	10.2	10.9	11.2	10.2	10.2	12.7	16.2
NONRES STRUCTURES	4.8	5.4	6.0	6.1	6.6	7.3	9.1	11.3	13.0	14.9	18.3	22.1
PRODUCERS DUR. EQUIP.	8.3	9.8	10.8	11.3	12.9	16.0	18.8	21.5	22.4	25.2	28.9	33.7
CHANGE IN INVENTORIES	1.1	2.0	1.5	-0.8	1.3	2.4	2.6	2.0	-0.7	1.6	3.2	4.4
<b>NET EXPORTS</b>	0.1	1.5	1.4	3.0	1.5	-0.5	-0.1	1.6	2.8	5.1	4.7	4.6
EXPORTS	11.5	13.2	14.5	15.1	17.1	19.5	22.4	25.9	28.2	32.1	36.2	41.0
IMPORTS	11.4	11.7	13.1	12.1	15.5	19.9	22.5	24.3	25.4	26.9	31.5	36.5
<b>GOVERNMENT PURCHASES</b>	28.2	29.5	32.6	37.1	40.2	44.1	47.5	51.6	57.7	67.4	76.0	85.0
FEDERAL	11.8	11.7	13.0	14.4	15.1	16.9	18.1	19.8	23.3	28.3	33.0	37.9
STATE AND LOCAL	16.4	17.8	19.6	22.7	25.0	27.1	29.4	31.8	34.4	39.1	43.0	47.0
<b>GROSS STATE PRODUCT</b>	129.7	142.4	153.1	169.4	190.3	216.3	245.7	278.7	306.0	354.0	407.6	466.1
GSP IN 1972 \$	129.7	135.6	135.4	135.5	143.8	153.6	162.4	170.7	169.2	180.2	192.8	205.6
PRICE DEFLATOR (1972=1.0)	1.000	1.050	1.132	1.250	1.322	1.408	1.512	1.632	1.809	1.963	2.114	2.266
% CHANGE	4.0	5.0	7.8	10.5	5.8	6.5	7.4	8.0	10.8	8.6	7.6	7.2

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TABLE 7. CALIFORNIA GROSS STATE PRODUCT (BILLIONS OF 1972 DOLLARS) - ANNUAL, 1972 through 1983

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>PERSONAL CONSUMPTION</b>												
EXPENDITURES	80.8	83.8	83.6	86.3	91.2	97.4	104.3	110.1	109.8	116.9	125.4	133.9
DURABLE GOODS	12.9	13.7	12.8	12.9	13.5	15.8	18.0	18.6	16.9	18.8	21.8	24.6
NONDURABLE GOODS	28.2	28.9	28.6	29.7	31.5	32.4	33.0	34.7	33.6	35.7	38.1	40.5
SERVICES	39.7	41.2	42.2	43.7	46.2	49.1	53.3	56.8	59.3	62.4	65.5	68.8
<b>GROSS PRIVATE DOMESTIC INVESTMENT</b>												
RESIDENTIAL	20.7	22.4	20.3	16.4	20.3	23.6	25.1	25.7	22.6	24.4	27.7	31.0
NONRES STRUCTURES	6.5	5.9	4.3	4.0	5.4	6.4	6.0	5.5	4.6	4.2	4.8	5.5
PRODUCERS DUR. EQUIP.	4.8	5.0	4.7	4.2	4.4	4.6	5.1	5.6	5.6	6.0	6.6	7.2
CHANGE IN INVENTORIES	8.3	9.6	10.0	8.9	9.6	11.2	12.4	13.4	12.8	13.7	14.9	16.6
	1.1	1.8	1.2	-0.7	0.9	1.4	1.6	1.2	-0.4	0.5	1.3	1.7
<b>NET EXPORTS</b>												
EXPORTS	0.1	1.6	3.0	3.5	2.8	2.5	2.8	4.4	6.2	6.3	5.8	5.4
IMPORTS	11.5	12.5	12.4	11.9	12.7	13.7	14.9	15.9	16.0	16.8	17.8	18.9
	11.4	10.8	9.5	8.3	9.9	11.3	12.1	11.5	9.8	10.5	12.0	13.5
<b>GOVERNMENT PURCHASES</b>												
FEDERAL	28.2	27.8	28.4	29.2	29.5	30.2	30.2	30.5	30.5	32.6	34.0	35.3
STATE AND LOCAL	11.8	11.1	11.5	11.5	11.3	11.8	11.6	11.9	12.3	13.5	14.5	15.6
<b>GROSS STATE PRODUCT</b>												
PRICE DEFLATOR (1972=1.0)	129.7	135.6	135.4	135.5	143.8	153.6	162.4	170.7	169.2	180.2	192.8	205.6
% CHANGE	1.000	1.050	1.132	1.250	1.322	1.408	1.512	1.632	1.809	1.963	2.114	2.266
GSP IN CURRENT DOLLARS	4.0	5.0	7.8	10.5	5.8	6.5	7.4	8.0	10.8	8.6	7.6	7.2
	129.7	142.4	153.1	169.4	190.3	216.3	245.7	278.7	306.0	354.0	407.6	466.1

AN ECONOMETRIC MODEL OF FINAL DEMAND  
COMPONENTS OF CALIFORNIA

APPENDIX C.  
EQUATIONS OF THE MODEL

August 1981

EQUATION NUMBER = 1

QCS72@CA: EQUATION  
1>CS72@CA=EXP(3.57359+.876558\*LOG(ESV@CA/1990))

LONG(CS72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(ESV@CA) = TOTAL EMPL: SERVICES INDUSTRIES - CALIFORNIA

EQUATION NUMBER = 2

QEX@M@CA: EQUATION  
1>EX@M@CA=EX@M\*YPP@CA/YP

LONG(EX@M@CA) = EXPORTS OF GOODS AND SERVICES (NET) - CALIFORNIA  
= IS A FUNCTION OF

LONG(EX@M) = NET EXPORTS OF GOODS AND SERVICES

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

EQUATION NUMBER = 3

QEX72@M72@CA: EQUATION  
1>EX72@M72@CA=EX72@M72\*YPP@CA/YP

LONG(EX72@M72@CA) = EXPORTS OF GOODS AND SERVICES (NET) - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(EX72@M72) = NET EXPORTS OF GOODS AND SERVICES - 1972 DOLLARS

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

EQUATION NUMBER = 4

GFPO@CA: EQUATION  
1>GFPO@CA=GFPO\*YPP@CA/YP

LONG(GFPO@CA) = FEDERAL GOVERNMENT NONDEFENSE PURCHASES - CALIFORNIA  
= IS A FUNCTION OF

LONG(GFO) = FEDERAL GOVERNMENT NONDEFENSE PURCHASES

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

EQUATION NUMBER = 5

OGPWS\$A: EQUATION  
1>GPFSS\$A=EXP(-.0805874+1.04162\*LOG(WSDGPF\$A))

LONG(GPWS\$A) = FEDERAL GOVERNMENT PURCHASES - COMPENSATION OF EMPLOYEES - CALIFORNIA  
= IS A FUNCTION OF

LONG(WSDGPF\$A) = WAGE & SALARY DISB: GOVT FEDERAL, PLACE OF WORK - CALIFORNIA

\* = \*\*\*\*\*  
EQUATION NUMBER = 6

OGPO72\$FIR: EQUATION  
1>GPO72\$FIR=EXP(1.79844+.984967\*LOG(EFIR)+.783928\*LOG(GDPNF72/FEA))

LONG(GPO72\$FIR) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE  
= IS A FUNCTION OF

LONG(EEA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS

LONG(EFIR) = TOTAL EMPLOYMENT - FINANCE, INSURANCE AND REAL ESTATE

LONG(GDPNF72) = GROSS DOMESTIC PRODUCT - NONFARM BUSINESS - 1972 DOLLARS

\* = \*\*\*\*\*  
EQUATION NUMBER = 7

OGPO72\$FIR\$A: EQUATION  
1>GPO72\$FIR\$A=(EFIR\$A/1000)\*GPO72\$FIR/EFIR

LONG(GPO72\$FIR\$A) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA  
= IS A FUNCTION OF

LONG(EFIR) = TOTAL EMPLOYMENT - FINANCE, INSURANCE AND REAL ESTATE

LONG(EFIR\$A) = TOTAL EMPL: FINANCE, INSURANCE, & REAL ESTATE - CALIFORNIA

LONG(GPO72\$FIR) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE

\* = \*\*\*\*\*  
EQUATION NUMBER = 8

OGPO72\$M: EQUATION  
1>GPO72\$M=EXP(-2.01561+1.32187\*LOG(EM)+1.46552\*LOG(GDPNF72/FEA))

LONG(GPO72\$M) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING  
= IS A FUNCTION OF

LONG(EEA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS

LONG(EM) = TOTAL EMPLOYMENT - ALL MANUFACTURING

LONG(GDPNF72) = GROSS DOMESTIC PRODUCT - NONFARM BUSINESS - 1972 DOLLARS

EQUATION NUMBER = 9

OGP072SM@CA: EQUATION  
1>GPO72SM@CA=(EM@CA/1000)\*GPO72SM/EM

LONG(GPO72SM@CA) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING - CALIFORNIA

= IS A FUNCTION OF

LONG(EM) = TOTAL EMPLOYMENT - ALL MANUFACTURING

LONG(EM@CA) = TOTAL EMPL: MANUFACTURING - CALIFORNIA

LONG(GPO72SM) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING

\* = \*\*\*\*\*

EQUATION NUMBER = 10

OGP072SMI: EQUATION  
1>GPO72SMI=EXP(-.694884+.188638\*LOG(EMI)+1.44954\*LOG(GDPNF72/EAA))

LONG(GPO72SMI) = GROSS PRODUCT ORIGINATING, REAL - MINING

= IS A FUNCTION OF

LONG(EAA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS

LONG(EMI) = TOTAL EMPLOYMENT - MINING

LONG(GDPNF72) = GROSS DOMESTIC PRODUCT - NONFARM BUSINESS - 1972 DOLLARS

\* = \*\*\*\*\*

EQUATION NUMBER = 11

OGP072SMI@CA: EQUATION  
1>GPO72SMI@CA=(EMI@CA/1000)\*GPO72SMI/EMI

LONG(GPO72SMI@CA) = GROSS PRODUCT ORIGINATING, REAL - MINING - CALIFORNIA

= IS A FUNCTION OF

LONG(EMI) = TOTAL EMPLOYMENT - MINING

LONG(EMI@CA) = TOTAL EMPL: MINING - CALIFORNIA

LONG(GPO72SMI) = GROSS PRODUCT ORIGINATING, REAL - MINING

\* = \*\*\*\*\*

EQUATION NUMBER = 12

OGP072SR: EQUATION  
1>GPO72SR=EXP(-3.83212+1.71762\*LOG(ER) + 2.30673\*LOG(GDPNF72/EEA))

LONG(GPO72SR) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES  
= IS A FUNCTION OF

LONG(EEA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS

LONG(ER) = TOTAL EMPLOYMENT - TRANSPORTATION AND PUBLIC UTILITIES

LONG(GDPNF72) = GROSS DOMESTIC PRODUCT - NONFARM BUSINESS - 1972 DOLLARS

\* = \*\*\*\*\*

EQUATION NUMBER = 13

OGP072SR0CA: EQUATION  
1>GPO72SR0CA=(ER0CA/1000)\*GPO72SR/ER

LONG(GPO72SR0CA) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA  
= IS A FUNCTION OF

LONG(ER) = TOTAL EMPLOYMENT - TRANSPORTATION AND PUBLIC UTILITIES

LONG(ER0CA) = TOTAL EMPL: TRANSPORTATION - CALIFORNIA

LONG(GPO72SR) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES

\* = \*\*\*\*\*

EQUATION NUMBER = 14

OGP072SSV: EQUATION  
1>GPO72SSV=EXP(1.73784+.810267\*LOG(ESV) + .439133\*LOG(GDPNF72/EEA))

LONG(GPO72SSV) = GROSS PRODUCT ORIGINATING, REAL - SERVICES  
= IS A FUNCTION OF

LONG(EEA) = TOTAL EMPLOYMENT - NONAGRICULTURAL ESTABLISHMENTS

LONG(ESV) = TOTAL EMPLOYMENT - SERVICES

LONG(GDPNF72) = GROSS DOMESTIC PRODUCT - NONFARM BUSINESS - 1972 DOLLARS

\* = \*\*\*\*\*

OGP072SSV@CA: EQUATION  
1>GP072SSV@CA=(ESV@CA/1000)\*GP072SSV/ESV

LONG(GP072SSV@CA) = GROSS PRODUCT ORIGINATING, REAL - SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(ESV) = TOTAL EMPLOYMENT - SERVICES

LONG(ESV@CA) = TOTAL EMPL: SERVICES INDUSTRIES - CALIFORNIA

LONG(GP072SSV) = GROSS PRODUCT ORIGINATING, REAL - SERVICES

\* = \*\*\*\*\*

EQUATION NUMBER = 16

OGSLWSS@CA: EQUATION  
1>GSLWSS@CA=EXP(-.133819+1.04569\*LOG(WSDGSLF@CA))

LONG(GSLWSS@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - COMPENSATION - CALIFORNIA  
= IS A FUNCTION OF

LONG(WSDGSLF@CA) = WAGE & SALARY DISB: GOVT S&L, PLACE OF WORK - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 17

OICNR@CA: EQUATION  
1>ICNR@CA=ICNR\*YPF@CA/YP

LONG(ICNR@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - CALIFORNIA  
= IS A FUNCTION OF

LONG(ICNR) = GROSS INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES

LONG(YP) = PERSONAL INCOME

LONG(YPF@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 18

OIFXR72@CA: EQUATION  
1>FIFXR72@CA=EXP(1.17546+.289492\*LOG(BRTU@CA/83.3333)) &&  
2>+.192995\*LOG(BRTU@CA\1/83.3333)+.0964974\*LOG(BRTU@CA\2/83.3333))

LONG(IFIXR72@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(BRTU@CA) = BLDG PERMIT ACT: TOTAL NEW RES DWFL UNITS - CALIFORNIA

\* = \*\*\*\*\*

QINVCH@CA: EQUATION  
1>INVCH@CA=INVCH\*YPP@CA/YP

LONG(INVCH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - CALIFORNIA

= IS A FUNCTION OF

LONG(INVCH) = CHANGE IN BUSINESS INVENTORIES - TOTAL

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 20

QINV72CH@CA: EQUATION  
1>INV72CH@CA=INV72CH\*YPP@CA/YP

LONG(INV72CH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - 1972 DOLLARS - CALIFORNIA

= IS A FUNCTION OF

LONG(INV72CH) = CHANGE IN BUSINESS INVENTORIES - TOTAL - 1972 DOLLARS

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 21

QIPDENR@CA: EQUATION  
1>IPDENR@CA=IPDENR\*YPP@CA/YP

LONG(IPDENR@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA

= IS A FUNCTION OF

LONG(IPDENR) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT

LONG(YP) = PERSONAL INCOME

LONG(YPP@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 22

OPCD@CA: EQUATION  
1>PCD@CA=1.024451\*PCD\*CPIUN\$QLAO/CPIU

LONG(PCD@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER DURABLE GOODS EXPENDITURES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS  
LONG(CPIUN\$QLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES  
LONG(PCD) = IMPLICIT PRICE DEFLATOR - CONSUMER DURABLE GOODS EXPENDITURES

\* = \*\*\*\*\*  
EQUATION NUMBER = 23

OPCN@CA: EQUATION  
1>PCN@CA=1.024451\*PCN\*CPIUN\$QLAO/CPIU

LONG(PCN@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER NONDURABLE GOODS EXPENDITURES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS  
LONG(CPIUN\$QLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES  
LONG(PCN) = IMPLICIT PRICE DEFLATOR - CONSUMER NONDURABLE GOODS EXPENDITURES

\* = \*\*\*\*\*  
EQUATION NUMBER = 24

OPCS@CA: EQUATION  
1>PCS@CA=1.024451\*PCS\*CPIUN\$QLAO/CPIU

LONG(PC\$@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER SERVICES EXPENDITURES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS  
LONG(CPIUN\$QLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES  
LONG(PC\$) = IMPLICIT PRICE DEFLATOR - CONSUMER SERVICES EXPENDITURES

\* = \*\*\*\*\*

EQUATION NUMBER = 25

QPGFACA: EQUATION  
1>PGF@CA=1.024451\*PGF\*CPIUNSLAO/CPIU

LONG(PGF@CA) = IMPLICIT PRICE DEFLATOR - FEDERAL GOVT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS

LONG(CPIUNSLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES

LONG(PGF) = IMPLICIT PRICE DEFLATOR - FEDERAL GOVT PURCHASES OF GOODS AND SERVICES

\* = \*\*\*\*\*

EQUATION NUMBER = 26

QPGPOFIR: EQUATION  
1>PGPOFIR=-.039+EXP(-.0221643+.924978\*LOG(PCS))

LONG(PGPOFIR) = GROSS PRODUCT DEFLATOR - FINANCE, INSURANCE AND REAL ESTATE  
= IS A FUNCTION OF

LONG(PCS) = IMPLICIT PRICE DEFLATOR - CONSUMER SERVICES EXPENDITURES

\* = \*\*\*\*\*

EQUATION NUMBER = 27

QPGPOM: EQUATION  
1>PGPOM=.022+EXP(.0394887+.825032\*LOG(PGDPNF))

LONG(PGPOM) = GROSS PRODUCT DEFLATOR - MANUFACTURING  
= IS A FUNCTION OF

LONG(PGDPNF) = IMPLICIT PRICE DEFLATOR - GROSS DOMESTIC PRODUCT - NONFARM BUSINESS

\* = \*\*\*\*\*

EQUATION NUMBER = 28

QPGPOMI: EQUATION  
1>PGPOMI=.052+EXP(-.122468+.911092\*LOG(WPI05NS))

LONG(PGPOMI) = GROSS PRODUCT DEFLATOR - MINING  
= IS A FUNCTION OF

LONG(WPI05NS) = WHOLESALE PRICE INDEX - FUELS AND RELATED PRODUCTS AND POWER

\* = \*\*\*\*\*

EQUATION NUMBER = 29

OPGPR: EQUATION  
1>PGPOR=.026+EXP(-.0313293+.683087\*LOG(PGDPNF))+.0717393\*LOG(WPI05NS))

LONG(PGPR) = GROSS PRODUCT DEFLATOR - TRANSPORTATION, COMMUNICATION & UTILITIES  
= IS A FUNCTION OF

LONG(PGDPNF) = IMPLICIT PRICE DEFLATOR - GROSS DOMESTIC PRODUCT - NONFARM BUSINESS

LONG(WPI05NS) = WHOLESALE PRICE INDEX - FUELS AND RELATED PRODUCTS AND POWER

EQUATION NUMBER = 30

OPGPOSV: EQUATION  
1>PGPOSV=-.005+EXP(-.000573264+1.03284\*LOG(PCSO))

LONG(PGPOSV) = GROSS PRODUCT DEFLATOR - SERVICES  
= IS A FUNCTION OF

LONG(PCSO) = IMPLICIT PRICE DEFLATOR - CONSUMPTION OF OTHER SERVICES

EQUATION NUMBER = 31

OPGSL0CA: EQUATION  
1>PGSL0CA=1.024451\*PGSL\*CPIUNSL0LAO/CPIU

LONG(PGSL0CA) = IMPLICIT PRICE DEFLATOR - STATE & LOCAL GOVT PURCHASES GOODS & SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS

LONG(CPIUNSL0LAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES

LONG(PGSL) = IMPLICIT PRICE DEFLATOR - STATE & LOCAL GOVT PURCHASES GOODS & SERVICES

EQUATION NUMBER = 32

OPICNR0CA: EQUATION  
1>PICNR0CA=1.024451\*PICNR\*CPIUNSL0LAO/CPIU

LONG(PICNR0CA) = IMPLICIT PRICE DEFLATOR - INVESTMENT, PRIVATE NONRESIDENTIAL STRUCTURES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS

LONG(CPIUNSL0LAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES

LONG(PICNR) = IMPLICIT PRICE DEFLATOR - INVESTMENT, PRIVATE NONRESIDENTIAL STRUCTURES

EQUATION NUMBER = 33

OPFIXR@CA: EQUATION  
1>PIFIXR@CA=1.024451\*PIFIXR\*CPIUNSLAO/CPIU

LONG(PIFIXR@CA) = IMPLICIT PRICE DEFLATOR - GROSS FIXED PRIVATE RESIDENTIAL INVESTMENT - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS  
LONG(CPIUNSLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES

LONG(PIFIXR) = IMPLICIT PRICE DEFLATOR - GROSS FIXED PRIVATE RESIDENTIAL INVESTMENT

\* = \*\*\*\*\*

EQUATION NUMBER = 34

OPIDENR@CA: EQUATION  
1>PIDENR@CA=1.024451\*PIDENR\*CPIUNSLAO/CPIU

LONG(PIDENR@CA) = IMPLICIT PRICE DEFLATOR - NONRESIDENTIAL PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA  
= IS A FUNCTION OF

LONG(CPIU) = ALL URBAN CONSUMER PRICE INDEX - ALL ITEMS

LONG(CPIUNSLAO) = ALL URBAN CPI: ALL ITEMS - LOS ANGELES AND ORANGE COUNTIES

LONG(PIDENR) = IMPLICIT PRICE DEFLATOR - NONRESIDENTIAL PRODUCERS' DURABLE EQUIPMENT

\* = \*\*\*\*\*

EQUATION NUMBER = 35

OSAF@CA: EQUATION  
1>SAF@CA= - <2.73290> + <0.825181>\*SAF@CA\1 + <0.0144067>\*EA@CA

LONG(SAF@CA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA  
= IS A FUNCTION OF

LONG(EA@CA) = TOTAL EMPL: AGRICULTURAL - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 36

OSAF72@CA: EQUATION  
1>SAF72@CA=1.25\*SAF@CA/WPI@INS

LONG(SAF72@CA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA - 1972 DOLLARS  
= IS A FUNCTION OF

LONG(SAF@CA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA

LONG(WPI@INS) = WHOLESALE PRICE INDEX - FARM PRODUCTS

\* = \*\*\*\*\*

EQUATION NUMBER = 37

OSRD@CA: EQUATION  
1>SRD@CA=EXP(-.0875739+.817162\*LOG(STRD)+.320625\*LOG(STR@CA))

LONG(SRD@CA) = RETAIL SALES, DURABLE GOODS STORES - CALIFORNIA  
= IS A FUNCTION OF

LONG(STR@CA) = RETAIL SALES: TOTAL ALL OUTLETS - CALIFORNIA

LONG(STRD) = RETAIL SALES - DURABLE GOODS STORES (SEASONALLY ADJUSTED)

\* = \*\*\*\*\*

EQUATION NUMBER = 38

OSRN@CA: EQUATION

1>SRN@CA=EXP(2.27865+.224866\*LOG(YPF@CA)+.799654\*LOG(STRN))

LONG(SRN@CA) = RETAIL SALES, NONDURABLE GOODS - CALIFORNIA

= IS A FUNCTION OF

LONG(STRN) = RETAIL SALES - NONDURABLE GOODS STORES (SEASONALLY ADJUSTED)

LONG(YPF@CA) = PERSONAL INCOME TOTAL: PLACE OF RES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 39

OCDD@CA: EQUATION

1>CD@CA=EXP(2.34911+.932769\*LOG(SRD@CA/1000))

LONG(CD@CA) = PERSONAL CONSUMPTION EXPENDITURES - DURABLE GOODS - CALIFORNIA

= IS A FUNCTION OF

LONG(SRD@CA) = RETAIL SALES, DURABLE GOODS STORES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 40

OCDD72@CA: EQUATION

1>CD72@CA=CD@CA/PCD@CA

LONG(CD72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - DURABLE GOODS - CALIFORNIA

= IS A FUNCTION OF

LONG(CD@CA) = PERSONAL CONSUMPTION EXPENDITURES - DURABLE GOODS - CALIFORNIA

LONG(PCD@CA) = IMPLICIT PRICE DEFLATOR - CONSUMER DURABLE GOODS EXPENDITURES - CALIFORNIA

QCNA: EQUATION  
1>CNCA=EXP(2.30831+1.05345\*LOG(SRNA/1000))

LONG(CNCA) = PERSONAL CONSUMPTION EXPENDITURES - NONDURABLE GOODS - CALIFORNIA  
= IS A FUNCTION OF

LONG(SRNA) = RETAIL SALES, NONDURABLE GOODS - CALIFORNIA  
\* = \*\*\*\*\*

EQUATION NUMBER = 42

QC72CA: EQUATION  
1>CN72CA=CNCA/PCNCA

LONG(CN72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - NONDURABLE GOODS - CALIFORNIA  
= IS A FUNCTION OF

LONG(CNCA) = PERSONAL CONSUMPTION EXPENDITURES - NONDURABLE GOODS - CALIFORNIA  
LONG(PCNCA) = IMPLICIT PRICE DEFATOR - CONSUMER NONDURABLE GOODS EXPENDITURES - CALIFORNIA  
\* = \*\*\*\*\*

EQUATION NUMBER = 43

QCSA: EQUATION  
1>CSA=CS72CA\*PCSA

LONG(CSA) = PERSONAL CONSUMPTION EXPENDITURES - SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(CS72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - SERVICES - CALIFORNIA  
LONG(PCSA) = IMPLICIT PRICE DEFATOR - CONSUMER SERVICES EXPENDITURES - CALIFORNIA  
\* = \*\*\*\*\*

EQUATION NUMBER = 44

QC72CA: EQUATION  
1>C72CA=CD72CA+CN72CA+CS72CA

LONG(C72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - CALIFORNIA  
= IS A FUNCTION OF

LONG(CD72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - DURABLE GOODS - CALIFORNIA  
LONG(CN72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - NONDURABLE GOODS - CALIFORNIA  
LONG(CS72CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - SERVICES - CALIFORNIA

EQUATION NUMBER = 42

NGF@CA: EQUATION  
1>GF@CA=GFWS@CA+GFO@CA

LONG(GF@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(GFO@CA) = FEDERAL GOVERNMENT NONDEFENSE PURCHASES - CALIFORNIA

LONG(GFWS@CA) = FEDERAL GOVERNMENT PURCHASES - COMPENSATION OF EMPLOYEES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 46

NGF72@CA: EQUATION  
1>GF72@CA=GF@CA/PGF@CA

LONG(GF72@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(GF@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

LONG(PGF@CA) = IMPLICIT PRICE DEFLATOR - FEDERAL GOVT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 47

NGSLO@CA: EQUATION  
1>GSL@CA=EXP(-.83281+1.11869\*LOG(GSLWSS@CA))

LONG(GSLO@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - OTHER - CALIFORNIA  
= IS A FUNCTION OF

LONG(GSLWSS@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - COMPENSATION - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 48

OICNR72@CA: EQUATION  
1>ICNR72@CA=ICNR@CA/PICNR@CA

LONG(ICNR72@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(ICNR@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - CALIFORNIA

LONG(PICNR@CA) = IMPLICIT PRICE DEFLATOR - INVESTMENT, PRIVATE NONRESIDENTIAL STRUCTURES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER - 22

OIPDENR72@CA: EQUATION  
1>IPDENR72@CA=IPDENR@CA/PIPDENR@CA

LONG(IPDENR72@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - 1972 DOLLARS - CALIFORNIA

= IS A FUNCTION OF

LONG(IPDENR@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA

LONG(PIPDENR@CA) = IMPLICIT PRICE DEFLATOR - NONRESIDENTIAL PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 50

OGSL@CA: EQUATION

1>GSL@CA=GSL@CA+GSLMSS@CA

LONG(GSL@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

= IS A FUNCTION OF

LONG(GSLO@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - OTHER - CALIFORNIA

LONG(GSLMSS@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - COMPENSATION - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 51

OGSL72@CA: EQUATION

1>GSL72@CA=GSL@CA/PGSL@CA

LONG(GSL72@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA

= IS A FUNCTION OF

LONG(GSL@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

LONG(PGSL@CA) = IMPLICIT PRICE DEFLATOR - STATE & LOCAL GOVT PURCHASES GOODS & SERVICES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 52

OG@CA: EQUATION

1>G@CA=GF@CA+GSL@CA

LONG(G@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

= IS A FUNCTION OF

LONG(GF@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

LONG(GSL@CA) = STATE AND LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 53

OC@CA: EQUATION  
1>CC@CA=CD@CA+CN@CA+CS@CA

LONG(C@CA) = PERSONAL CONSUMPTION EXPENDITURES - CALIFORNIA

= IS A FUNCTION OF

LONG(CD@CA) = PERSONAL CONSUMPTION EXPENDITURES - DURABLE GOODS - CALIFORNIA

LONG(CN@CA) = PERSONAL CONSUMPTION EXPENDITURES - NONDURABLE GOODS - CALIFORNIA

LONG(CS@CA) = PERSONAL CONSUMPTION EXPENDITURES - SERVICES - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 54

O172@CA: EQUATION  
1>I72@CA=ICNR72@CA+IFIXR72@CA+IPDENR72@CA+INV72CH@CA

LONG(I72@CA) = GROSS PRIVATE DOMESTIC INVESTMENT - 1972 DOLLARS - CALIFORNIA

= IS A FUNCTION OF

LONG(ICNR72@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - 1972 DOLLARS - CALIFORNIA

LONG(IFIXR72@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - 1972 DOLLARS - CALIFORNIA

LONG(INV72CH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - 1972 DOLLARS - CALIFORNIA

LONG(IPDENR72@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - 1972 DOLLARS - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 55

OIFIXR@CA: EQUATION  
1>IFIXR@CA=IFIXR72@CA\*PIFIXR@CA

LONG(IFIXR@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - CALIFORNIA

= IS A FUNCTION OF

LONG(IFIXR72@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - 1972 DOLLARS - CALIFORNIA

LONG(PIFIXR@CA) = IMPLICIT PRICE DEFLATOR - GROSS FIXED PRIVATE RESIDENTIAL INVESTMENT - CALIFORNIA

\* = \*\*\*\*\*

01@CA: EQUATION  
1>I@CA=ICNR@CA+IFIXR@CA+IPDENR@CA+INVCH@CA

LONG(I@CA) = PRIVATE DOMESTIC INVESTMENT, GROSS - CALIFORNIA  
= IS A FUNCTION OF

LONG(ICNR@CA) = INVESTMENT IN PRIVATE NONRESIDENTIAL STRUCTURES, GROSS - CALIFORNIA

LONG(IFIXR@CA) = INVESTMENT, FIXED, GROSS PRIVATE RESIDENTIAL - CALIFORNIA

LONG(INVCH@CA) = CHANGE IN BUSINESS INVENTORIES - TOTAL - CALIFORNIA

LONG(IPDENR@CA) = NONRESIDENTIAL INVESTMENT IN PRODUCERS' DURABLE EQUIPMENT - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 57

0G72@CA: EQUATION

1>G72@CA=GF72@CA+GSL72@CA

LONG(G72@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(GF72@CA) = FEDERAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA

LONG(GSL72@CA) = STATE & LOCAL GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 58

0GSP72@CA: EQUATION

1>GSP72@CA=C72@CA+I72@CA+G72@CA+EX72@M72@CA

LONG(GSP72@CA) = GROSS STATE PRODUCT: IN 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(C72@CA) = PERSONAL CONSUMPTION EXPENDITURES, REAL - CALIFORNIA

LONG(EX72@M72@CA) = EXPORTS OF GOODS AND SERVICES (NET) - 1972 DOLLARS - CALIFORNIA

LONG(G72@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA

LONG(I72@CA) = GROSS PRIVATE DOMESTIC INVESTMENT - 1972 DOLLARS - CALIFORNIA

\* - \*\*\*\*\*

EQUATION NUMBER = 59

OGSP@CA: EQUATION  
1>GSP@CA=C@CA+I@CA+G@CA+EX@M@CA

LONG(GSP@CA) = GROSS STATE PRODUCT - CALIFORNIA

= IS A FUNCTION OF

LONG(C@CA) = PERSONAL CONSUMPTION EXPENDITURES - CALIFORNIA

LONG(EX@M@CA) = EXPORTS OF GOODS AND SERVICES (NET) - CALIFORNIA

LONG(G@CA) = GOVERNMENT PURCHASES OF GOODS AND SERVICES - CALIFORNIA

LONG(I@CA) = PRIVATE DOMESTIC INVESTMENT, GROSS - CALIFORNIA

\* = \*\*\*\*\*

EQUATION NUMBER = 60

OGPOSV@CA: EQUATION  
1>GPOSV@CA=GPO72SSV@CA\*PGPOSV

LONG(GPOSV@CA) = GROSS PRODUCT ORIGINATING - SERVICES - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72SSV@CA) = GROSS PRODUCT ORIGINATING, REAL - SERVICES - CALIFORNIA

LONG(PGPOSV) = GROSS PRODUCT DEFLATOR - SERVICES

\* = \*\*\*\*\*

EQUATION NUMBER = 61

OGPOR@CA: EQUATION  
1>GPOR@CA=GPO72SR@CA\*PGPOR

LONG(GPOR@CA) = GROSS PRODUCT ORIGINATING - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72SR@CA) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA

LONG(PGPOR) = GROSS PRODUCT DEFLATOR - TRANSPORTATION, COMMUNICATION & UTILITIES

\* = \*\*\*\*\*

EQUATION NUMBER = 62

OGPOMI@CA: EQUATION  
1>GPMI@CA=GPO72SMI@CA\*PGPOMI

LONG(GPOMI@CA) = GROSS PRODUCT ORIGINATING - MINING - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72SMI@CA) = GROSS PRODUCT ORIGINATING, REAL - MINING - CALIFORNIA

LONG(PGPOMI) = GROSS PRODUCT DEFLATOR - MINING

\* = \*\*\*\*\*

EQUATION NUMBR = 63

QGPOM@CA: EQUATION  
1>GPM@CA=GPO72\$M@CA\*PGPM

LONG(GPOM@CA) = GROSS PRODUCT ORIGINATING - MANUFACTURING - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72\$M@CA) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING - CALIFORNIA

LONG(PGPM) = GROSS PRODUCT DEFLECTOR - MANUFACTURING

\* = \*\*\*\*\*

EQUATION NUMBER = 64

QGPPIR@CA: EQUATION  
1>GPOPIR@CA=GPO72\$FIR@CA\*PGPIR

LONG(GPOPIR@CA) = GROSS PRODUCT ORIGINATING - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72\$FIR@CA) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA

LONG(PGPIR) = GROSS PRODUCT DEFLECTOR - FINANCE, INSURANCE AND REAL ESTATE

\* = \*\*\*\*\*

EQUATION NUMBER = 65

QEX72@CA: EQUATION  
1>EX72@CA=.226\*GPO72\$M@CA+.286\*SAF72@CA+.286\*GPO72\$MI@CA+.199\*GPO72\$SR@CA &&  
2>+.094\*GPO72\$FIR@CA+.066\*GPO72\$SV@CA

LONG(EX72@CA) = EXPORTS OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA

= IS A FUNCTION OF

LONG(GPO72\$FIR@CA) = GROSS PRODUCT ORIGINATING, REAL - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA

LONG(GPO72\$M@CA) = GROSS PRODUCT ORIGINATING, REAL - MANUFACTURING - CALIFORNIA

LONG(GPO72\$MI@CA) = GROSS PRODUCT ORIGINATING, REAL - MINING - CALIFORNIA

LONG(GPO72\$SR@CA) = GROSS PRODUCT ORIGINATING, REAL - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA

LONG(GPO72\$SV@CA) = GROSS PRODUCT ORIGINATING, REAL - SERVICES - CALIFORNIA

LONG(SAF72@CA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA - 1972 DOLLARS

.....

EQUATION NUMBER = 00

OPXRCA: EQUATION  
1>EX9CA=.226\*GPOY9CA+.286\*SAF9CA+.286\*GPOY19CA+.199\*GPOR9CA &&  
2>+.094\*GPOF19CA+.066\*GPOSV9CA

LONG(EX9CA) = EXPORTS OF GOODS AND SERVICES - CALIFORNIA  
= IS A FUNCTION OF

LONG(GPOF19CA) = GROSS PRODUCT ORIGINATING - FINANCE, INSURANCE AND REAL ESTATE - CALIFORNIA  
LONG(GPOY9CA) = GROSS PRODUCT ORIGINATING - MANUFACTURING - CALIFORNIA

LONG(GPOY19CA) = GROSS PRODUCT ORIGINATING - MINING - CALIFORNIA  
LONG(GPOR9CA) = GROSS PRODUCT ORIGINATING - TRANSPORTATION, COMMUNICATION AND UTILITIES - CALIFORNIA

LONG(GPOSV9CA) = GROSS PRODUCT ORIGINATING - SERVICES - CALIFORNIA  
LONG(SAF9CA) = CASH RECEIPTS FROM FARMING, TOTAL - CALIFORNIA

\* = \*\*\*\*\*  
EQUATION NUMBER = 67

OPGSP9CA: EQUATION  
1>PGSP9CA=GSP9CA/GSP729CA

LONG(PGSP9CA) = IMPLICIT PRICE DEFLATOR: GROSS STATE PRODUCT - CALIFORNIA  
= IS A FUNCTION OF

LONG(GSP9CA) = GROSS STATE PRODUCT - CALIFORNIA  
LONG(GSP729CA) = GROSS STATE PRODUCT: IN 1972 DOLLARS - CALIFORNIA

\* = \*\*\*\*\*  
EQUATION NUMBER = 68

OM729CA: EQUATION  
1>M729CA=EX729CA-EX729M729CA

LONG(M729CA) = IMPORTS OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
= IS A FUNCTION OF

LONG(EX729CA) = EXPORTS OF GOODS AND SERVICES - 1972 DOLLARS - CALIFORNIA  
LONG(FX729M729CA) = EXPORTS OF GOODS AND SERVICES (NET) - 1972 DOLLARS - CALIFORNIA  
\* = \*\*\*\*\*

EQUATION NUMBER = 69

OM@CA: EQUATION  
1>M@CA=EX@CA-EX@M@CA

LONG(M@CA) = IMPORTS OF GOODS AND SERVICES - CALIFORNIA

= IS A FUNCTION OF

LONG(EX@CA) = EXPORTS OF GOODS AND SERVICES - CALIFORNIA

LONG(EX@M@CA) = EXPORTS OF GOODS AND SERVICES (NET) - CALIFORNIA

#S = .....