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Appendix

V

Data Resources, Inc.

Regional Information Service

(DRIRIS)

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16. Abstract (Limit: 200 words)

Appendix V - Describes DRI's Regional Information System. This system provides California employment forecasts by 2 digit Manufacturing Standard Industrial Classification Code.

Appendix VI - Describes DRI's Interindustry (I-O) Model. The Interindustry Model provides national level output for 77 industries.

Appendix VII- Describes DRI's Regional Industry Forecasting System. This system links together the Regional Information System with the Interindustry Model to provide annual output and employment forecasts at the State level for 77 industries.

Appendix VIII-Provides county employment equations and regression statistics for all stochastic equations used to forecast employment for 58 California counties.

17. Document Analysis a. Descriptors

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Input/Output

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THE REGIONAL (RIS) MODEL

A. Model Overview

Introduction

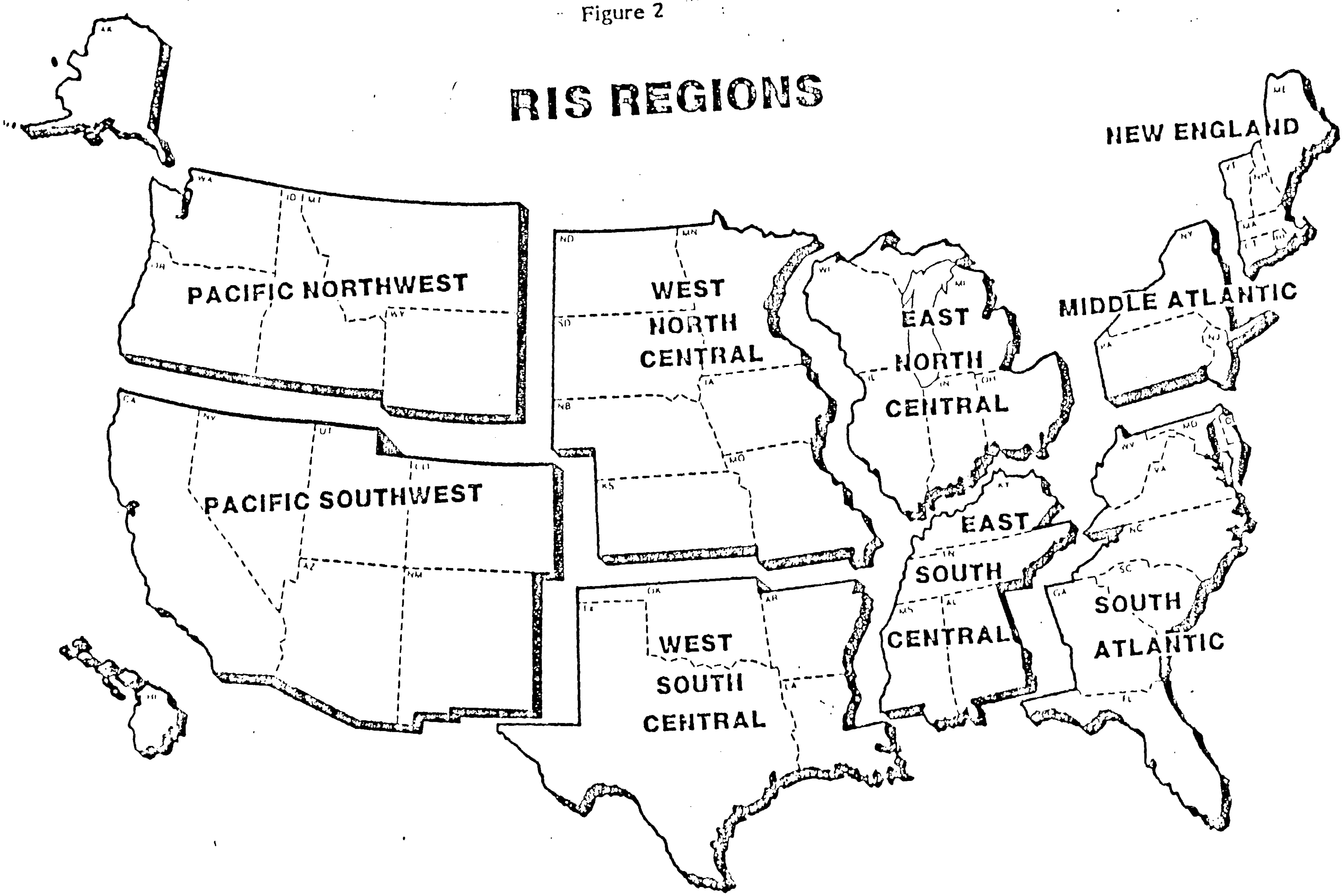
The Regional Model has taken advantage of several long established theories as well as recent advances in economic and statistical techniques to enhance DRI's ability to forecast regional economic activity. Among these is the use of export-base theory. This theory suggests that there is a set of industries within a region which sells its output in a national or international market. These industries provide the wages which, by a multiplier effect, drive a set of domestic or service industries. In most cases the manufacturing sectors of a region's economy are considered its export base. In some cases mining, finance and selected services may also be considered part of the export base.

The process of model development and enhancement is an ongoing process at DRI. Any model must be re-estimated on a regular basis to reflect recent developments and new data. In addition, model re-estimation and modification are important parts of sound model management. Thus, improvements of the RIS Model are made on an ongoing basis.

RIS Regional Definitions

The RIS regional definitions differ somewhat from the standard nine Census Divisions used previously in the State and Area Forecasting Service (see Figure 2). The Census Divisions divide the West from north to south, splitting it into the Mountain and the Pacific Divisions. The RIS definition, on the other hand, splits the West with an east to west line into the Pacific Northwest and the Pacific Southwest. This departure from the Census Divisions creates regions that are more homogeneous with respect to climate, resource base, and transportation linkages.

Figure 2



CENSUS REGIONS

NORTHEAST
New England (NENG)
Middle Atlantic (MATL)

SOUTH
South Atlantic (SATL)
East South Central (ESC)
West South Central (WSC)

NORTH CENTRAL
East North Central (ENC)
West North Central (WNC)

WEST
Pacific Northwest (PNW)
Pacific Southwest (PSW)

Brief History of Regional Models

In the past, regional models fell into three broad classes: top-down models, bottom-up models, and input-output models. Each class of models has a particular set of characteristics. Top-down or shift-share models are desirable from the perspective of consistency and short-run forecasting capability. A top-down model has simple sharing techniques and as such assures that the sum of the parts equals a predetermined national total. In addition, because shares do not change radically over the short-term horizon of a few quarters, such models forecast well in the short run. Top-down models, however, are not designed to explain why one region gains in share at the expense of another.

Bottom-up models are better suited to explain interregional shifts in national market share. They generally forecast well over the short and long run. Because bottom-up models represent structural models of a region's economy they generally simulate well. There are, however, two major limitations to bottom-up models. In a national system each model is estimated separately. As a consequence, the sum of the parts rarely equals a predetermined national total. The second disadvantage is more subtle. Because of the unconstrained nature of the models, the elasticities of regional employment or value added with respect to national employment or production may be significantly different from one. This does not pose a problem in the short term. In the long run, however, these models will tend to over- or under-forecast economic activity.

Input-Output (I/O) models are frequently discussed in regional economics literature. I/O tables contain a wealth of information about interindustry flows and simulate well in the historic period for which they are constructed. In order to construct a regional input-output model, a consistent set of regional input-output tables, whose coefficients can be updated and forecast, is required. Unfortunately, current regional input-output tables are simply not available and gathering data to construct such tables involves enormous expense, time, and effort.

DRI's Regional Group has adopted an eclectic approach in the new Regional Information Service (RIS) Model. This approach is an attempt to combine and enhance the strengths from each of the major classes of models to produce a fourth class which represents the state-of-the-art in regional econometric modeling.

The Two-Step Approach

Generating a complete solution of the RIS Model is a two-step process. The Core Model is first solved for levels of economic activity in the nine RIS regions (New England, Middle Atlantic, South Atlantic, East North Central, East South Central, West North Central, West South Central, Pacific Southwest, and Pacific Northwest). In the second step, the model is solved again to obtain forecasts of economic activity for the states within each region.

The decision to model regional activity in a two-step process is the result of both theoretical and pragmatic considerations. On the theoretical side, the elements influencing a business decision to move from one region to another are different from those affecting a firm's choice of a specific site within a region. For example, the factors leading a business to decide that it needs a West Coast distribution facility or a plant in the South are very different from those influencing the choice of San Francisco over Phoenix.

The factors a firm considers in the decision to move between regions are:

- proximity to markets,
- cost considerations such as wages, energy prices, and taxes,
- degree of unionization,
- housing prices,
- climate, and
- overall desirability or attractiveness of the region.

Within a given region, elements affecting industrial location are more limited. States within the region are essentially competing for a share of the business that is moving into that particular region. In the process of constructing the RIS state models, DRI has found that the single most important factor determining a state's ability to compete with its neighbors is its business tax burden. This finding is consistent with a prior belief concerning the role of business tax burdens in determining industrial location decisions, and is supported by academic literature on the subject.

An added benefit of the two-step approach in the RIS model is that the cost of solving the model and of simulations are greatly reduced. For some purposes state detail is not essential.

B. Model Structure

General Outline of Model

At the RIS Core Model level, exogenous variables are selected from the Macro, Interindustry, Agriculture, Energy, Steel, Drilling, Coal, and Cost Forecasting Services. In addition, RIS Model levers are exogenous to the model. Levers incorporated into the current version of the model are distance, transportation costs, tax burdens, unionization, education, climate, attractiveness, and marginal tax rates.

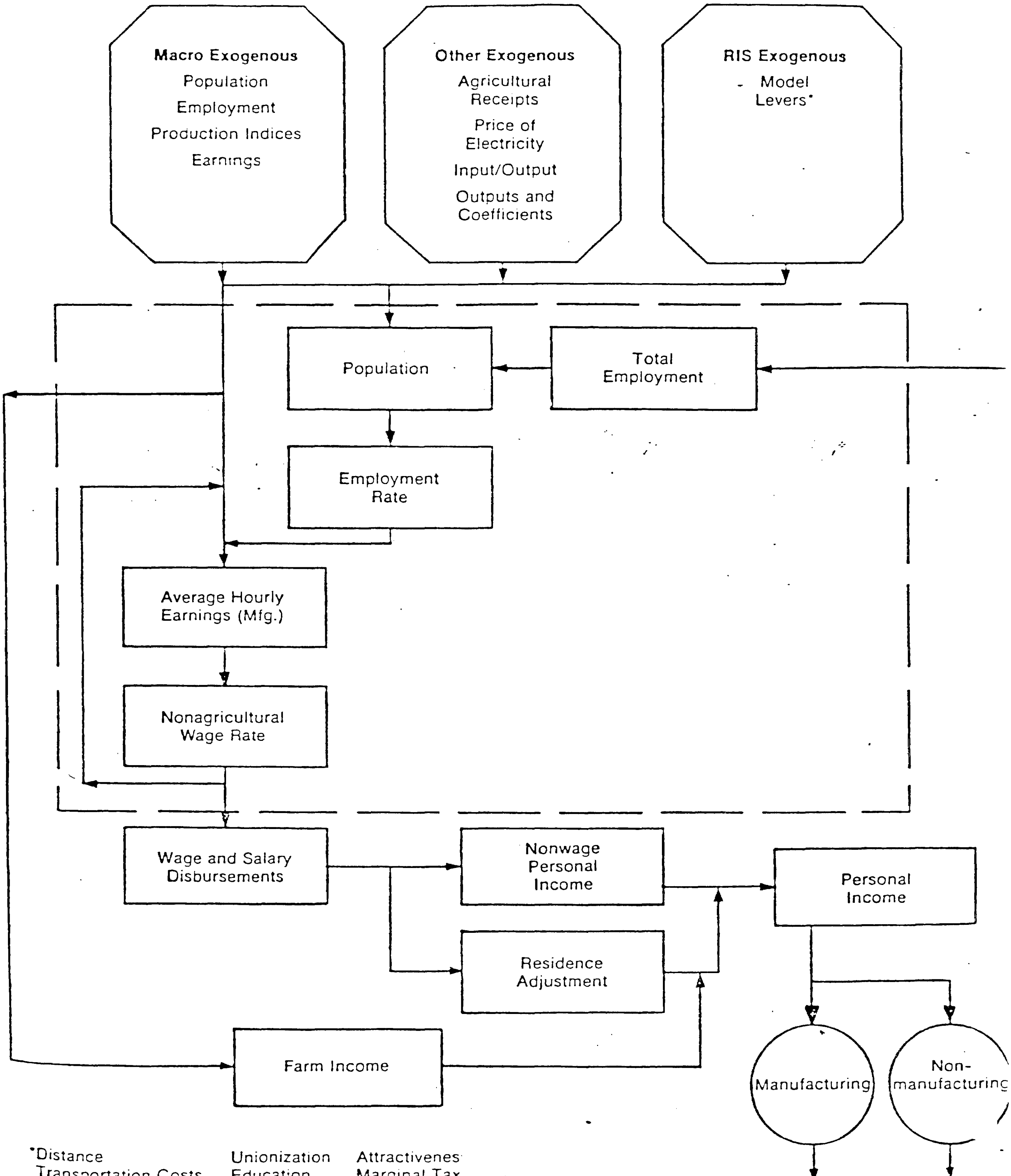
The manufacturing block is completely structural, incorporating the advantages of bottom-up and top-down techniques. Its pooled cross-sectional structure ensures that region concepts sum to national figures without sacrificing the behavioral structure of bottom-up models.

In addition, manufacturing employment relies on domestic sector employment and on activity in the area's export-base industries (see Figure 3). The relative impact of these factors depend upon the manufacturing sector in question. Concrete manufacturing, for example, is relatively unaffected by export-base activity. Auto production, on the other hand, is primarily a function of demand outside the state and is therefore largely independent of domestic sector fluctuations.

The nonmanufacturing block also distinguishes between state, regional and national endmarket demand. Because state and regional boundaries are abstractions, state's economic activity is a function of economic health in neighboring states as well as within its borders. A sharp decline in New Jersey's consumer spending will affect retail sales employment in New Jersey, New York and Pennsylvania. Similarly, Florida's tourism-related employment can be expected to change in

Figure 3

RIS Structure



*Distance
Transportation Costs
Tax Burdens
Unionization
Education
Climate
Attractivenes
Marginal Tax Rate

times of national economic malaise. Most nonmanufacturing activity is a function of state, regional, and national income.

Three nonmanufacturing sectors are exceptions to this rule. Construction employment is primarily a function of housing and nonresidential building activity, while mining and federal government employment are fundamentally dependent upon the national economic climate.

The housing block examines housing activity in light of affordability and need. The driving forces behind the housing block are the discrepancies between actual and desired housing stocks (stock gap) and consumers' ability to purchase housing. The latter term explicitly addresses the barrier to entry of home purchasing, incorporating mortgage rates and income into a "first payment" concept.

The population block is endogenous to the RIS Model, facilitating realistic, longterm forecasts and simulations. The structure is particularly realistic as employment rates and wages interact with population to pull workers from glutted areas.

Personal income similarly corresponds to observable phenomemon as forecast components are summed into a personal income concept.

The Manufacturing Sector

The manufacturing employment equations lie at the heart of the Regional Information Service (RIS) Model. As an export-based model, RIS assumes that the primary determinant of a region's level of economic activity is the region's ability to sell goods and services outside of its borders. It is the manufacturing sector which procedes the vast majority of a region's export-based employment.

One of the most important and certainly the most complex variable used in the manufacturing sector of the RIS model is the Market Pull variable. The development of the Market Pull concept was based on suggestions in regional economics literature that regional interaction can best be modeled by incorporating industry interaction explicitly into the model. Including a link between the steel and auto industries, for example, helps explain the relationship between the Middle Atlantic and East North Central regions. The Market Pull variable measures how important proximity to market is to a particular industry and assures that where important, a selling industry will develop near buying industries. For example, the Market Pull variables assure that an increase in construction activity in a region will create an increase in employment in that region's stone, clay, and glass industry.

The estimation of the manufacturing sector in the RIS Model employment was accomplished by using the technique of pooled cross-sectional time series simulation (PLS). The fundamental assumption involved in the PLS technique is that the dependent variable reacts to a unit changed in an independent variable by a fixed amount across time as well as across sectors. A unit change in an independent variable will alter the dependent variable by a fixed amount and in a fixed direction (i.e., the amount and direction of the regression coefficient). All other assumptions of the ordinary least squares estimation (Guass-Markov Theorem) are met in PLS estimations, allowing the use of standard hypothesis tests including the T-Statistic, the F-statistic, and the R-squared, and so on.

The Nonmanufacturing Sector

The nonmanufacturing sector of the RIS Model covers employment in the mining, government, and domestic sectors. For the purposes of the RIS Model, construction is considered to be a portion of the housing (construction) block. The nonmanufacturing sectors of the model are treated as "domestic" industries for the most part. In export-based theory "domestic" industries are those industries which serve primarily local needs. Barber shops, fast food outlets, real estate brokers, retail establishments, hospitals, local government, and utilities, for example, all derive the majority of their revenues from within the region. Business activity in each of the nonmanufacturing sectors is essentially driven by personal income in the region.

The following discussion describes the individual components of the nonmanufacturing block of the RIS Model.

Government

The government employment portion of the model is broken into state and local government and federal government. State and local government jobs are forecast on the basis of tax collections for state and local governments and on federal transfers to state and local governments. The level of state and local tax collections is a policy lever in the RIS Model. It is manipulated by changing the business or non-business tax burdens in the state or region. Federal transfers to state and local governments are determined in identity equations which allocate federal transfers to state and local governments based on the portion of people not working in the state or region, relative to the same ratio for the nation. This term is designed to capture the counter-cyclicality of federal transfers.

Federal government employment covers all nonmilitary federal employees. It is forecast by sharing out total federal government employment on the basis of a longterm moving average of a state's or region's share of total employment.

Mining

The mining industry is one portion of the nonmanufacturing sector which is clearly in the export base of a region's economy. That is, a substantial portion of mined materials are not consumed in the region where they are produced. The most obvious examples are oil and natural gas.

The RIS mining equations rely on several terms.

- The first is a state- or region-specific, fixed weight production index that captures the specific mix of mining industries in the area. The weights are derived from the Census of Mining.
- The ratio of the price of labor to the price of energy captures the labor/energy substitution which occurs in the mining industry.
- A time trend is included as a proxy for productivity trends.
- Dummy variables are used to capture the effects of strikes. These can also be used as policy variables to test the impact of possible future strikes.
- The final term, the ratio of energy prices to all prices, is used to capture the portion of energy development that is not well-reflected in a fixed index.

Domestic Employment

Domestic employment is composed of employment in services, trade, transportation, communication and public utilities, and finance, insurance and real estate. This is typically the largest employment sector in the model in terms of number of people employed. The domestic sector is part export-based and part domestic. The banking industry in New York is a good example of an industry in the domestic sector which has a substantial export component.

Regional employment in the domestic sector is determined by the mix of personal income sources in the region and the nation. At the state level, it is determined by the mix of state, regional, and national personal income sources. At both the state and regional level the various types of income are combined into a weighted index of demand for domestic services. The index is deflated by wage rates to reflect the purchasing power of a dollar of personal income of a domestic sector employee.

To capture the cyclicality of the domestic sector, the weighted index of demand for domestic services is specified in the employment equations using a variation of Friedman's permanent and transitory income hypotheses. Friedman observed that consumers make consumption decisions on the basis of long run expectations of income and that transitory changes in income are either saved or dissaved (i.e., the marginal propensity to consume a dollar of permanent income).

Permanent income in the model is represented as a long run moving average of the weighted index of demand for domestic services. Transitory income is defined as the difference between last period's value of the index and a long run moving average of the index. Consistent with theoretical expectations, the coefficient on the transitory component is substantially smaller than the coefficient of the permanent component. The result of this specification is a short run income multiplier which is smaller than the long run income multiplier.

The final term which is included in the domestic sector equations is the ratio of labor costs to capital costs. This term is used to capture the labor/capital substitution effect. Because this substitution is dynamic, a long run moving average of the ratio is used.

Wages and Income

Personal income provides the link between the export and domestic sectors of the export-based RIS Model. The wage bill generated in a given region's export sector drives its domestic sector by a multiplier effect. In the RIS model, domestic economic activity is determined by total real personal income in a given region. The ratio of personal income to export wages yields the export wage multiplier. The linkage occurs via the wage and salary disbursements term.

This relationship between the export and domestic sectors is essentially simultaneous. The simultaneity works as follows:

- Wage and salary disbursements, as a major component of personal income, is a determinant of domestic sector employment.
- Domestic sector employment is a major component of total employment.
- Total employment is a major determinant of wage and salary disbursements.

Total personal income in each region is defined as the sum of its parts - wage and salary disbursements, farm proprietors' income, nonwage personal income - and a residence adjustment factor. Wage and salary disbursements, the largest single component of personal income, is a function of total nonagricultural employment and implied average wage of all nonagricultural employees in a given region.

Wages

Implied average wages are modeled stochastically using the following set of factors:

- o average hourly earnings for manufacturing workers in the state or region,
- o national total person hours paid in the private sector per nonagricultural and nongovernment workers (as a proxy for the average work week), and
- o the percentage of state or regional employees in high-paying industries.

Average hourly earnings in manufacturing is the driving variable in these equations. This term sets the basic wage level in the state. Unfortunately, only manufacturing wages are available consistently across all states and regions. However, the growth in the manufacturing wage rate is an effective indicator of growth in the overall wage rate within a state or region. The final term, the ratio of high paying jobs to total employment, captures the wage mix not reflected in the manufacturing wage rate.

The regional manufacturing wage rate is modeled as a function of the following variables:

- o National wages:
  This is the driving variable in the equations. National wage trends are modified by regional labor market conditions and the regional cycle.
- o Ratio of the region's share of national employment to the region's share of national population:
  This variable is designed to capture regional labor market tightness. To the extent that the percent of the national workforce in a region exceeds the percent of the population living in the region, wage rates will be squeezed upward by a tighter-than-average labor market.
- o Current national industrial production relative to its long-run value:
  This variable is cyclical and may appear in the wage equation with either a positive or negative sign. A positive coefficient implies that the marginal employee is paid at a higher wage than the average and a negative coefficient implies the reverse.

Farm Income

Farm income is determined primarily by cash receipts for crops and livestock at the state or region level. Regional farm income is disaggregated from national farm income and state farm income is similarly derived from regional farm income.

Nonwage Income

The balance of personal income is accounted for in the nonwage income term. Nonwage income is defined as the sum of nonfarm proprietors' income, transfer payments, residence adjustment, dividends, interest, and rent, and other labor income, minus contributions for social insurance.

Nonwage income is modeled using various sharing algorithms that take the national income components and disaggregate them to the regional or state level. The algorithms assure appropriate cyclical and countercyclical behavior.

Residence Adjustment

The residence adjustment accounts for income earned in one state or region and taken home to another. For example, Connecticut has a positive residence adjustment because portions of southwest Connecticut are bedroom communities of New York City. New York has an offsetting negative residence adjustment to account for money earned in New York but providing income for residents of other states - Connecticut and New Jersey, primarily.

The residence adjustment is forecast using the wage and salary disbursements of neighboring states when there is a positive residence adjustment in a given state (as in Connecticut). When the residence adjustment is negative (as in New York), it is forecast using the state's own wage and salary disbursement level. This implies that a certain portion of a state's wages are being removed from the state's economy.

The Housing Sector

Single Family Housing

The foundation of the RIS housing starts model is a modified form of the stock adjustment model. In a stock adjustment model, it is assumed that there is some underlying desired stock of housing which is function of population and propensity to form households. Housing starts are then a function of this stock gap and financial supply and demand terms which reflect the affordability of consuming housing and the profitability of constructing housing.

The RIS single family housing starts equation contains five terms.

o Demand vs. Supply of Housing Stock

The desired stock of housing is obviously the lynchpin of the specification. The literature reflects many attempts to model this concept, using two divergent approaches. One successful approach has used micro data to predict each household's consumption of housing. Such an approach produces strong cross section results, but has yet to be adapted for forecasting. The other common approach defines the desired stock per capital as a function of long-term affordability of housing and a time trend to reflect non-price taste changes. DRI has adopted this specification, utilizing state housing price, income, and population data to create state-specific desired stock series.

o Anticipated New Demand

The stock adjustment term reflects existing pressures resulting from excess supply and demand, since there is a one to three quarter lag between the start of contruction and the addition of the unit to the housing stock. To measure this anticipated demand, the past year's growth in desired stock is used.

o Real After-tax Mortgage Rate

This variable reflects the equity effect of purchasing a home. The monthly payment on a mortgage is not equivalent to monthly expenditures for consumption of housing, since the underlying asset is appreciating in value. If appreciation exceeds the mortgage rate, the real interest lost is negative, as was the case from 1976 through 1979. In periods of high interest rates and slow price appreciation the real interest rates become strongly positive, eliminating the investment motivation for buying housing.

o Long-term Affordability

This reflects both buyer's consumption decisions and the lender's rule that housing payments not exceed 25% to 30% of gross income. Past attempts have deflated per capita income with either national consumption deflators or national home prices. Neither captures differential price escalations and the perverse impact of high mortgage rates. The RIS Model uses permanent income divided by the desired stock of housing, deflated by the monthly payment on a median priced home at national mortgage rates.

- Transitory Affordability

  This captures short run changes in affordability, which are crucial to consumer confidence. It is specified as current-quarter affordability minus the eight-quarter average affordability.

Home Prices

Home prices have been derived from the 1970 and 1980 Census data on value and number of permits, and home price data at the four Census Regional level. They have proven an importnat determinant of manufacturing location decisions(see discussion of Manufacturing Sector) and have been crucial in the development of all terms in the housing starts equations. They are modeled as a function of national home prices, relative per capita income, and relative housing market tightness. Market tightness is defined as the ratio of actual to desired housing stock.

Construction Employment

Construction employment is driven by DRI-derived proxies for residential and nonresidential investment in construction. The residential construction term uses area housing starts and stock to allocate national investment. The sharing factors are derived from the national input-output table. National nonresidential construction is shared to areas using growth in employment and area share of national employment, with weights derived from an historical analysis of the replacement share of national construction investment. Both sharing algorithms force summation to national totals and ensure that replacement construction (that part shared out by housing stock and level of employment) will be more important in times of slow growth and less important when growth is high.

Appendix VI

Data Resources, Inc.

Interindustry Service

(DRI10)

THE INTERINDUSTRY MODEL

A. Model Structure

The Interindustry Model is really a set of interrelated models that are directly linked to the DRI Macro Model of the U.S. economy (see Figure 1).

- The Macro-Linkage Model translates macroeconomic projections of consumption, investment, government expenditures, exports and imports into 160 disaggregate final demand components that are used as inputs into the Interindustry Model.

- The Final Demand (Bridge) Model disaggregates each of the 160 final demand components into final demand for each of the 400 sectors. For example, total investment by the chemicals industry is translated into specific demands for plant, non-electrical machinery, computing equipment, etc. Total military spending is translated into demands for planes, ships, guided missiles, equipment, military facilities, etc.

- The Output Model, a set of 400 simultaneous equations, uses these projections of sectoral final demands to calculate the levels of real (1972$) output required from each of the 400 sectors.

- The Price Model is an econometric model that forecasts price indices for each of the 400 sectors. Nominal outputs can then be calculated by multiplying these prices by the real output levels generated by the Output Model.

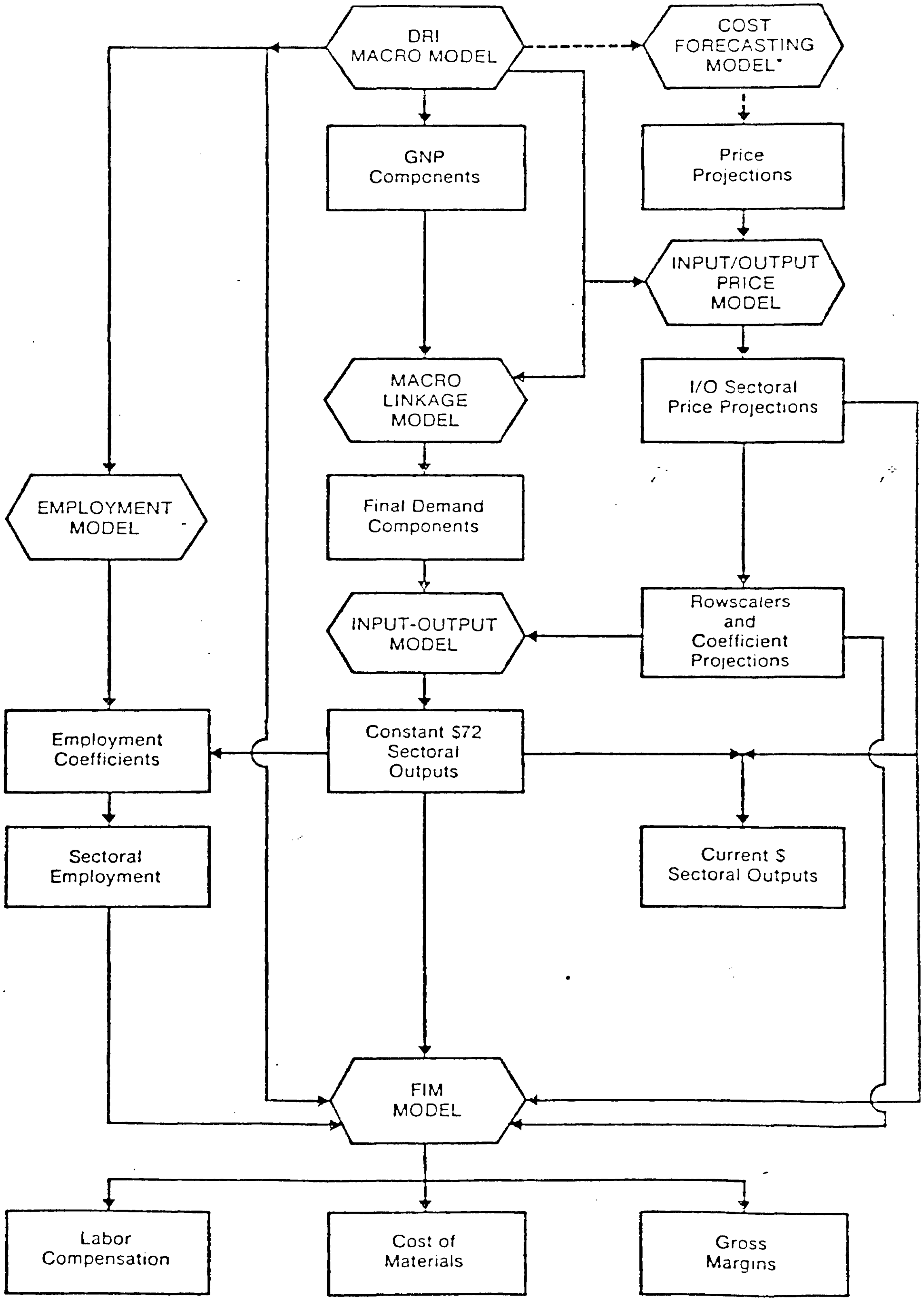
- The Employment Model is an econometric model that forecasts employment levels (millions of persons) for each of the 400 sectors. Sectoral labor productivity can be calculated by dividing real output projections by the employment projections.

B. Updating the Input-Output Structure to 1978

a. Interindustry Technical Coefficients

The Output Model has at its core a 400-sector input-output structure. The structure, a 400x400 matrix, shows in real terms how much of a specific input is

Figure 1
Structure of the
Interindustry Model System



required to produce a unit of a given sector's output (i.e., each column of the matrix represents the "technology" of a give sector). The most recent year for which such a structure exists is 1972[1]. Obviously, the technology of 1972, as represented by the input-output coefficients, is no longer representative of the current economy. Trends such as reduced energy consumption, downsizing of cars, import penetration in key sectors, the "high-tech" explosion, the fast growth of the service sectors, etc., have all contributed to a changing economic structure. As a result, the 1972 technical coefficients were updated by DRI to 1978, the latest year for which comprehensive sectoral data were available.

Clearly, it was impossible to update each of the non-zero entries in the 160,000-cell matrix individually, primarily because data for such a comprehensive undertaking are simply not available. However, key sectors such as computing equipment, electronic components, the 4 energy sectors, and the steel sector, where obvious trends have been developing, were updated individually. Some data on individual cells or groups of cells were available for other sectors, and were directly incorporated into the updating procedure.

For example, data were available for consumption of electricity, natural gas, coal, and refined petroleum, by major categories of users -- commercial, industrial, households, and electric utilities. Not only had the mix of energy sources by user changed over time, but the rates of energy conservation by user differed. The technical coefficients were updated to reflect these changes. Similarly, data were available on changes in the consumption of steel by various users. These data were used to update the steel coefficients in the interindustry structure.

In some cases, zero entries in the 1972 matrix were changed to non-zero entries. For example, in 1972, electronic components were not widely used. By 1978, however, their use had become extremely widespread, so that many sectors of the

[1] The Input-Output Structure of the U.S. Economy, 1972. U.S. Department of Commerce, Bureau of Economic Analaysis, April 1979

economy, from automobiles to toys, now purchased them as inputs. All available data on the increasing penetration of "high-tech" commodities were utilized for the updating of the coefficients.

b. Updating the Bridge to 1978

The bridge in the Interindustry Model is a 400X160 matrix that represents the sectoral composition of final demand. It is used to disaggregate the 160 final demand components into final demand by sector. The coefficients in each of the 160 columns of the bridge matrix represent the proportions of a given final demand expenditure category purchased from each of the 400 sectors in the economy.

The core structure for the bridge matrix in the Interindustry Model was developed from detailed information available in the 1972 BEA Input-Output Study. This data source provided the composition of purchases for the 14 personal consumption categories in the bridge, the 5 residential investment categories, one nonresidential fixed investment category and an inventory change column, one export and one import column, and detail for each of the 10 government columns.

Several sets of bridge coefficients received special treatment in the updating procedure. First, the 1972 capital flows matrix[2], which the BEA published as a supplement to the 1972 Input-Output table, was incorporated into the bridge structure. That is, the single non-residential fixed investment column was disaggregated into 71 columns. Note that the investment columns of the bridge represent purchases on capital account only, whereas the columns of the interindustry matrix represent purchases on current account.

[2] New Structures and Equipment by Using Industries, 1972: Detailed Estimates and Methodology, U.S. Dept. of Commerce, Bureau of Economic Analysis, September, 1980.

The 1972 capital flow matrix was used as the starting point for determining bridge coefficients for the nonresidential investment sectors, with the row and column balancing technique outlined in the next section then applied to update them to 1978. Special information on the distribution of computing equipment sales was introduced to improve the updating of this sector's endmarkets. The 1977 Census of Manufacturers provided a split of the new investment total for each industry between plant, business equipment, and other equipment, which was used to evaluate relative industry purchases. These data and information from other sources, including special data from Gnostic Concepts, Inc., were used in the updating process.

The second group of bridge categories that received special treatment in the updating procedure was the set of foreign trade categories. Detailed information on exports and imports by sector, available from the Department of Commerce, was used to estimate export and import flows by industry for 1978. These were then brought into balance with the 30 export and 27 import final demand components. Because the bridge coefficients for these categories were determined for 1978, they were omitted from the balancing procedure outlined below.

One other category in the bridge received special treatment. The column for military expenditures was updated to 1978 by utilizing the new data on the composition of these purchases now available from the Department of Defense.

c. Balancing the Structure

As explained above, coefficients in both the interindustry matrix and in the bridge matrix were updated to 1978 individually wherever possible. The rest of the coefficients were updated by balancing the rows and columns of the tables to conform with data on total sectoral output levels and sectoral prices in 1978. The balancing procedure involves the scaling of each row in the interindustry and bridge tables by a factor (rowscalar), such that the sum of interindustry sales plus sales to final demand in each sector is equal to its known output level in 1978. This procedure is explained in more detail below. Similarly, the columns of the interindustry matrix are scaled by a factor (columnscalar) that ensures that the sum of material inputs and value-added per unit of output in each sector is equal to its price in 1978. The process is iterative. First the rows are scaled, then the columns, then the rows again, and so on, until the process converges, and the rows and columns are fully balanced.

It should be noted that whenever specific data were available for particular cells within the matrix for 1978, these cells were removed from the balancing process. Thus, the output balancing across the rows was always done by using output less net exports and defense entries within the bridge. Further, for most of the construction categories, the split between public and private output was known, so that the public portion could be taken out. Some of the special case updating also involved removing entries or blocks of entries from the balancing process, as outlined above.

The result of the updating procedure is an input-output structure (interindustry and bridge matrices) that approximates as closely as possible the technology of the U.S. economy in 1978. Note that the balancing procedure employed does operate on whole blocks of entries across a row or a column, and thus does not update individual cell coefficients. This was the necessary result of the lack of available data and the sheer magnitude of the number of entries within the matrix. However, the process does result in producing rising coefficients in sectors that have shown output growth outpacing the growth of their historical endmarkets, and similarly shows reduced input requirements in sectors whose price performance indicates that labor and material productivity gains have been made.

Appendix VII

Data Resources, Inc.

Industry Forercasting System

(DRIFS)

THE REGIONAL-INTERINDUSTRY LINK

THE Regional Industry Forecasting System links together the Interindustry and Regional Models to provide annual output and employment forecasts at the state and regional level for 77 industries. The models are "linked" in the sense that national output and employment forecasts generated by the Interindustry Model are shared down to the region and state level with employment forecasts generated by the Regional (RIS) model. This is defined elsewhere as Regional Information Service (see p. VII - 4).

It is important to stress here, however, that the Regional Industry Forecasting System in NOT a regional input-output model. A regional input-output model consists of a set of regional input-output tables linked together by trade flows. The lack of current regional input-output tables precludes the construction of such a model at this time.

A. Methodolgy

Benchmarking the Data

In order to determine a benchmark level of employment by industry for each of the 9 RIS regions and the 51 states, 4-digit County Business Pattern (CBP) data for 1979 were used to share down the national industry totals. The CBP data set contains data on employment by 4-digit SIC code by county. Due to disclosure problems and the inconsistent reporting practices among states, a joint effort, undertaken by DRI and the National Planning Data Corporation (NPDC) was made to construct a complete and consistent database covering the entire economy. The data were aggregated to the state level and to 400 industries (approximately 4-digit SIC level).

National industry employment levels are available for 400 industries from the Interindustry Service for 1979. These employment levels were distributed to the state level as follows in 1979:

$$EMP@IND_i@STATE_j = EMP@IND_i * \frac{CBP@IND_i@STATE_j}{CBP@IND_i}$$

where

$EMP@IND_i@STATE_j$ = employment in industry i in state j in 1979,

$EMP@IND_i$ = national employment in industry i (from Interindustry Service) in 1979,

$\frac{CBP@IND_i@STATE_j}{CBP@IND_i}$ = share of CBP employment of industry i in state j in total CBP employment in 1979,

i = 1, 400
j = 1, 51

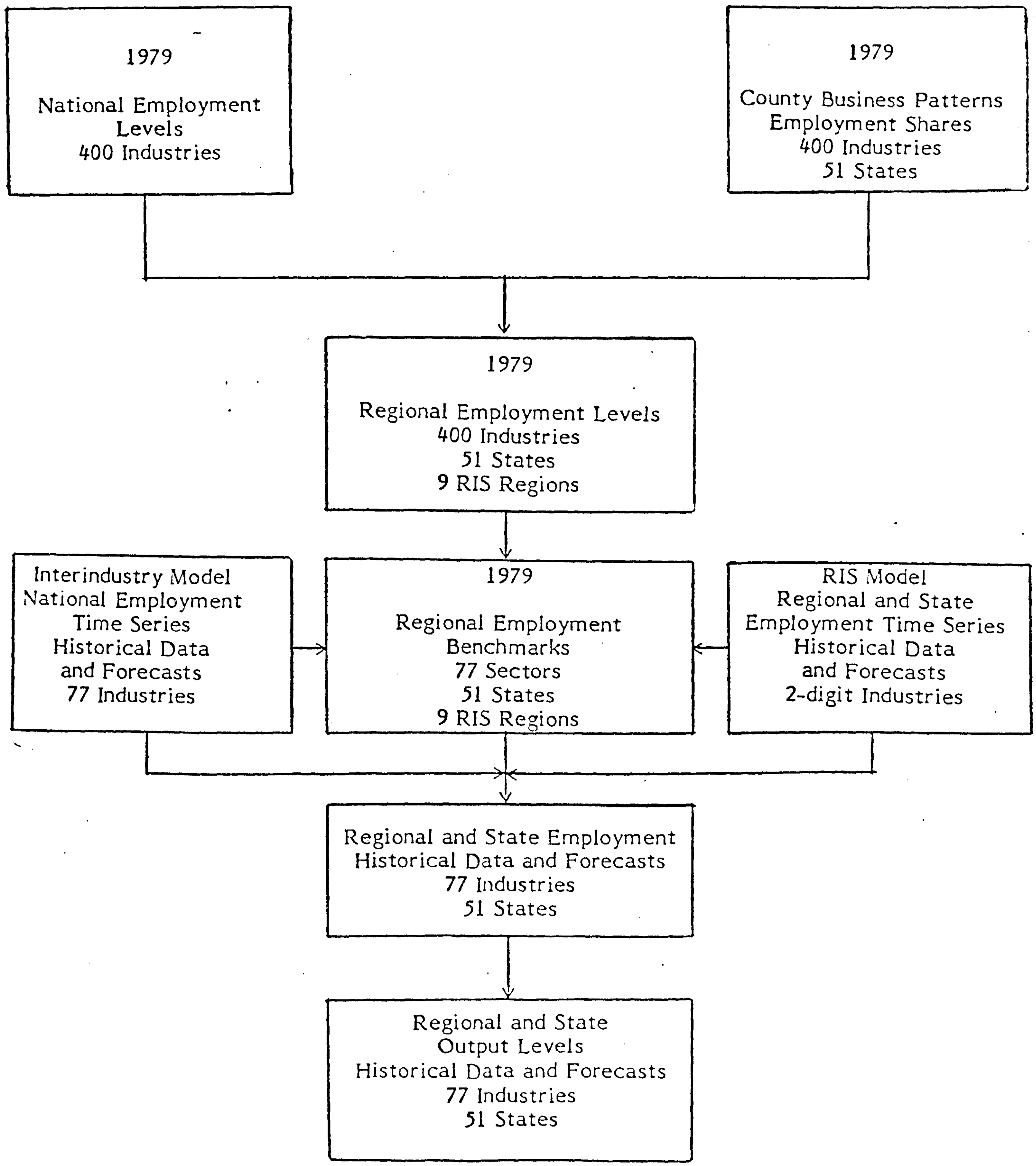
That is, in order to derive 1979 benchmarks of state employment levels consistent with the national employment totals, as provided by the Interindustry Service, the CBP data were used as the sharing device. As a result of this sharing process, a set of 4-digit (400 sector) benchmark employment levels were created for each state and region for 1979.

The state and regional employment levels for 4-digit industries were then aggregated to 77 sectors (2-3 digit levels for 1979). These were then considered as the benchmark state and regional employment levels by industry for the Regional Industry Forecasting System. (See Figure 4).

Time Series Data

The improved CBP data are available for 1979 only. Consistent and comprehensive disaggregate time series data of state employment by industry are not available.

Figure 4
The Regional Industry Forecasting System



The Regional Information Service (RIS) has developed a consistent database on employment by state at the 2-digit level. Lacking more disaggregate data, time series of state employment for each of the 77 sectors were constructed by indexing each sector's benchmark (1979) employment level with the appropriate 2-digit series from RIS, as follows:

$$EMP@IND_i@STATE_j^t = EMP@IND_i@STATE_j^{79} * EMP@2\text{-}DIG@STATE_j^t$$

where

$EMP@IND_i@STATE_j^t$ = employment in industry i in state j at time t,

$EMP@IND_i@STATE_j^{79}$ = employment in industry i in state j in 1979 (benchmark),

$EMP@2\text{-}DIG@STATE_j^t$ = index of employment in the relevant 2-digit industry in state j at time t (from RIS).

Because of the methodology employed to calculate state employment levels by industry (i.e., by indexing the benchmark levels), total employment in a given industry across all states need not necessarily sum to the national total for that industry. As a result, an algorithm was developed which ensured that employment in an industry summed across states was constrained to the pre-determined national total. This constraint holds both for the historical and forecast intervals.

Output Data

The Interindustry Service provides data and forecasts on output (i.e., production levels) as well as employment. This means that labor productivity (output per employee) levels can be calculated for each industry at the national level. If the assumption is made that labor productivity in an industry does not vary across regions and states, then output levels by industry by state and region can be derived as follows:

$$OUT@IND_i@STATE_j^t = EMP@IND_i@STATE_j^t * \frac{OUT@IND_i^t}{EMP@IND_i^t}$$

where

$OUT@IND_i@STATE_j^t$ = output of industry i in state j at time t,

$EMP@IND_i@STATE_j^t$ = employment in industry i in state j at time t,

$\frac{OUT@IND_i^t}{EMP@IND_i^t}$ = national (average productivity level of industry i at time t (output/employee).

Output levels (measured in constant 1972 dollars) were calculated for 77 industries for 51 states and 9 RIS regions. These are available historically beginning in 1973, as well as over the forecast interval.

Industry vs. Commodity Based Data

The Interindustry Service provides historical data and forecasts on output and employment on a commodity rather than an industry base. The Regional Industry Forecasting System is therefore also on a commodity base.

Output defined on an industry base is the total production of an industry, which is a collection of establishments. An industry or establishment, however, may produce more than one commodity. For example, petroleum refiners often produce some chemicals, lumber mills may produce some furniture, etc. These are considered to be secondary outputs of the industry. Thus, output defined on a commodity base includes only refined petroleum and excludes the output of chemicals, while the commodity output of chemicals includes the chemicals produced by petroleum refiners.

In most sectors of the economy, the proportion of secondary output in an industry does not exceed 5-10% on average, so that the levels of industry and commodity outputs are generally not very different. However, in a few sectors, the difference can be significant. The most striking example of such a sector is Radio and TV Broadcasting.

The output of this sector defined on an industry basis includes all revenues earned by radio and TV stations. However, most of these revenues accrue as a result of the sale of airtime for advertising purposes. Thus, the "secondary" output of the Radio and TV Broadcasting sector -- which is advertising -- is considered part of the Advertising sector's output, defined on a commodity basis. In the case of Radio and TV Broadcasting, output defined on an industry base is very large ($4.5b. in 1972) whereas output defined on a commodity base is extremely small ($.004b in 1972).

Users of the RIS Model are accustomed to dealing with variables defined on an industry base. Users of the Interindustry Model are accustomed to dealing with variables defined on a Commodity basis. Because data do not exist for transforming industry data to commodity data (and vice versa) over time, all variables in the Regional Industry Forecasting System are defined on a commodity basis.

Appendix VIII

County Employment Equations and Summary Statistics

```
EE@CA001: EQUATION
1>E@CA001=<#COEF1:281.739>+<#COEF2:0.160123>*GENE@CA001+ &&
2>    <#COEF3:13.4897>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.151961>*(<#COEF1:281.739>+ &&
3>       <#COEF2:0.160123>*GENE@CA001\1+<#COEF3:13.4897>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA001\1)

EE@CA003: EQUATION
1>E@CA003=<#COEF1:-0.326988>+<#COEF2:0.000436512>*GENE@CA003+ &&
2>    <#COEF3:0.0151534>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:-0.181888>*(<#COEF1:-0.326988>+ &&
3>       <#COEF2:0.000436512>*GENE@CA003\1+<#COEF3:0.0151534>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA003\1)

EE@CA005: EQUATION
1>E@CA005=<#COEF1:0.540310>+<#COEF2:0.00381805>*GENE@CA005+ &&
2>    <#COEF3:0.0225164>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.615621>*(<#COEF1:0.540310>+ &&
3>       <#COEF2:0.00381805>*GENE@CA005\1+<#COEF3:0.0225164>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA005\1)

EE@CA007: EQUATION
1>E@CA007=<#COEF1:3.24575>+<#COEF2:0.0252892>*GENE@CA007- &&
2>    <#COEF3:0.162700>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.735442>*(<#COEF1:3.24575>+ &&
3>       <#COEF2:0.0252892>*GENE@CA007\1-<#COEF3:0.162700>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA007\1)

EE@CA009: EQUATION
1>E@CA009=<#COEF1:0.206803>+<#COEF2:0.00329510>*GENE@CA009+ &&
2>    <#COEF3:0.156542>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.700772>*(<#COEF1:0.206803>+ &&
3>       <#COEF2:0.00329510>*GENE@CA009\1+<#COEF3:0.156542>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA009\1)

EE@CA011: EQUATION
1>E@CA011=<#COEF1:3.28768>+<#COEF2:0.00164004>*GENE@CA011- &&
2>    <#COEF3:5.55176>*1/TIME**2-<#RHO1:0.779052>*(<#COEF1:3.28768>+ &&
3>       <#COEF2:0.00164004>*GENE@CA011\1-<#COEF3:5.55176>*1/TIME\1** &&
4>       2-E@CA011\1)-<#RHO2:-0.530156>*(<#COEF1:3.28768>+ &&
5>       <#COEF2:0.00164004>*GENE@CA011\2-<#COEF3:5.55176>*1/TIME\2** &&
6>       2-E@CA011\2)

EE@CA013: EQUATION
1>E@CA013=<#COEF1:13.4035>+<#COEF2:0.133430>*GENE@CA013+ &&
2>    <#COEF3:2.39627>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.442878>*(<#COEF1:13.4035>+ &&
3>       <#COEF2:0.133430>*GENE@CA013\1+<#COEF3:2.39627>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA013\1)

EE@CA015: EQUATION
1>E@CA015=<#COEF1:4.13622>+<#COEF2:0.00132202>*GENE@CA015+ &&
2>    <#COEF3:0.224304>*D77T095-<#RHO1:1.41970>*(<#COEF1:4.13622>+ &&
3>       <#COEF2:0.00132202>*GENE@CA015\1+<#COEF3:0.224304>*D77T095\ &&
4>       1-E@CA015\1)-<#RHO2:-0.796388>*(<#COEF1:4.13622>+ &&
5>       <#COEF2:0.00132202>*GENE@CA015\2+<#COEF3:0.224304>*D77T095\ &&
6>       2-E@CA015\2)

EE@CA017: EQUATION
1>E@CA017=<#COEF1:-1.82798>+<#COEF2:0.0129877>*GENE@CA017- &&
2>    <#COEF3:0.364115>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.829988>*(<#COEF1:-1.82798>+ &&
3>       <#COEF2:0.0129877>*GENE@CA017\1-<#COEF3:0.364115>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA017\1)

EE@CA019: EQUATION
1>E@CA019= <47.1256> + <0.112176>*GENE@CA019 - <12.3056>*(IF TIME LEQ 7 THEN 1 ELSE 0)
```

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EE@CA021: EQUATION
1>E@CA021=<#COEF1:2.93487>+<#COEF2:0.00382307>*GENE@CA021- &&
2>    <#COEF3:0.428436>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.760991>*(<#COEF1:2.93487>+ &&
3>        <#COEF2:0.00382307>*GENE@CA021\1-<#COEF3:0.428436>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA021\1)

EE@CA023: EQUATION
1>E@CA023=<#COEF1:20.3458>+<#COEF2:0.0134938>*GENE@CA023- &&
2>    <#COEF3:0.114179>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.807189>*(<#COEF1:20.3458>+ &&
3>        <#COEF2:0.0134938>*GENE@CA023\1-<#COEF3:0.114179>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA023\1)

EE@CA025: EQUATION
1>E@CA025=<#COEF1:15.9465>+<#COEF2:0.0132438>*GENE@CA025- &&
2>    <#COEF3:0.891071>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.737904>*(<#COEF1:15.9465>+ &&
3>        <#COEF2:0.0132438>*GENE@CA025\1-<#COEF3:0.891071>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA025\1)

EE@CA027: EQUATION
1>E@CA027=<#COEF1:2.02282>+<#COEF2:0.00315369>*GENE@CA027- &&
2>    <#COEF3:0.0468896>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.330039>*(<#COEF1:2.02282>+ &&
3>        <#COEF2:0.00315369>*GENE@CA027\1-<#COEF3:0.0468896>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA027\1)

EE@CA029: EQUATION
1>E@CA029=<#COEF1:33.5440>+<#COEF2:0.0913113>*GENE@CA029- &&
2>    <#COEF3:0.228640>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.600748>*(<#COEF1:33.5440>+ &&
3>        <#COEF2:0.0913113>*GENE@CA029\1-<#COEF3:0.228640>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA029\1)

EE@CA031: EQUATION
1>E@CA031=<#COEF1:22.1267>+<#COEF2:0.00582713>*GENE@CA031- &&
2>    <#COEF3:9.17189>*1/TIME*2-<#RHO1:-0.159524>*(<#COEF1:22.1267>+ &&
3>        <#COEF2:0.00582713>*GENE@CA031\1-<#COEF3:9.17189>*1/TIME\1* &&
4>        2-E@CA031\1)

EE@CA033: EQUATION
1>E@CA033=<#COEF1:-1.04122>+<#COEF2:0.00511417>*GENE@CA033- &&
2>    <#COEF3:0.0529399>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:-0.322561>*(<#COEF1:-1.04122>+ &&
3>        <#COEF2:0.00511417>*GENE@CA033\1-<#COEF3:0.0529399>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA033\1)

EE@CA035: EQUATION
1>E@CA035=<#COEF1:2.40852>+<#COEF2:0.00312645>*GENE@CA035+ &&
2>    <#COEF3:0.429082>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.302699>*(<#COEF1:2.40852>+ &&
3>        <#COEF2:0.00312645>*GENE@CA035\1+<#COEF3:0.429082>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA035\1)

EE@CA037: EQUATION
1>E@CA037=<#COEF1:1643.19>+<#COEF2:1.55704>*GENE@CA037+ &&
2>    <#COEF3:65.3369>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.323348>*(<#COEF1:1643.19>+ &&
3>        <#COEF2:1.55704>*GENE@CA037\1+<#COEF3:65.3369>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA037\1)

EE@CA039: EQUATION
1>E@CA039=<#COEF1:-1.64735>+<#COEF2:0.0183600>*GENE@CA039- &&
2>    <#COEF3:0.922876>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.101743>*(<#COEF1:-1.64735>+ &&
3>        <#COEF2:0.0183600>*GENE@CA039\1-<#COEF3:0.922876>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA039\1)
```

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EE@CA041: EQUATION
1>E@CA041=<#COEF1:10.7686>+<#COEF2:0.0384211>*GENE@CA041+ &&
2>    <#COEF3:0.717712>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.489584>*(<#COEF1:10.7686>+ &&
3>        <#COEF2:0.0384211>*GENE@CA041\1+<#COEF3:0.717712>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA041\1)

EE@CA043: EQUATION
1>E@CA043=<#COEF1:0.720013>+<#COEF2:0.00141569>*GENE@CA043+ &&
2>    <#COEF3:0.0162593>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.378934>*(<#COEF1:0.720013>+ &&
3>        <#COEF2:0.00141569>*GENE@CA043\1+<#COEF3:0.0162593>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA043\1)

EE@CA045: EQUATION
1>E@CA045=<#COEF1:4.72455>+<#COEF2:0.0136133>*GENE@CA045- &&
2>    <#COEF3:0.728987>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.733807>*(<#COEF1:4.72455>+ &&
3>        <#COEF2:0.0136133>*GENE@CA045\1-<#COEF3:0.728987>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA045\1)

EE@CA047: EQUATION
1>E@CA047=<#COEF1:7.66373>+<#COEF2:0.0309535>*GENE@CA047- &&
2>    <#COEF3:1.48777>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.690356>*(<#COEF1:7.66373>+ &&
3>        <#COEF2:0.0309535>*GENE@CA047\1-<#COEF3:1.48777>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA047\1)

EE@CA049: EQUATION
1>E@CA049=<#COEF1:2.14289>+<#COEF2:0.000422718>*GENE@CA049- &&
2>    <#COEF3:0.247905>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.267903>*(<#COEF1:2.14289>+ &&
3>        <#COEF2:0.000422718>*GENE@CA049\1-<#COEF3:0.247905>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA049\1)-<#RHO2:-0.543503>*(<#COEF1:2.14289>+ &&
5>        <#COEF2:0.000422718>*GENE@CA049\2-<#COEF3:0.247905>*(IF TIME LEQ 5 THEN 1 ELSE 0)- &&
6>        E@CA049\2)

EE@CA051: EQUATION
1>E@CA051=<#COEF1:-2.58362>+<#COEF2:0.00382618>*GENE@CA051- &&
2>    <#COEF3:0.181794>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.587777>*(<#COEF1:-2.58362>+ &&
3>        <#COEF2:0.00382618>*GENE@CA051\1-<#COEF3:0.181794>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA051\1)

EE@CA053: EQUATION
1>E@CA053=<#COEF1:56.8578>+<#COEF2:0.0479712>*GENE@CA053+ &&
2>    <#COEF3:4.16723>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.729200>*(<#COEF1:56.8578>+ &&
3>        <#COEF2:0.0479712>*GENE@CA053\1+<#COEF3:4.16723>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA053\1)

EE@CA055: EQUATION
1>E@CA055=<#COEF1:6.24471>+<#COEF2:0.0324400>*GENE@CA055+ &&
2>    <#COEF3:0.0300440>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.457526>*(<#COEF1:6.24471>+ &&
3>        <#COEF2:0.0324400>*GENE@CA055\1+<#COEF3:0.0300440>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA055\1)

EE@CA057: EQUATION
1>E@CA057=<#COEF1:-5.13604>+<#COEF2:0.0126219>*GENE@CA057+ &&
2>    <#COEF3:0.135144>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.662600>*(<#COEF1:-5.13604>+ &&
3>        <#COEF2:0.0126219>*GENE@CA057\1+<#COEF3:0.135144>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA057\1)

EE@CA059: EQUATION
1>E@CA059=<#COEF1:-266.432>+<#COEF2:0.867244>*GENE@CA059+ &&
2>    <#COEF3:1.37305>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:-0.248826>*(<#COEF1:-266.432>+ &&
3>        <#COEF2:0.867244>*GENE@CA059\1+<#COEF3:1.37305>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA059\1)
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EE@CA061: EQUATION
1>E@CA061=<#COEF1:-3.58409>+<#COEF2:0.0236699>*GENE@CA061+ &&
2>    <#COEF3:0.436145>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.710063>*(<#COEF1:-3.58409>+ &&
3>        <#COEF2:0.0236699>*GENE@CA061\1+<#COEF3:0.436145>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA061\1)

EE@CA063: EQUATION
1>E@CA063=<#COEF1:1.72369>+<#COEF2:0.00297677>*GENE@CA063+ &&
2>    <#COEF3:0.111448>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.703689>*(<#COEF1:1.72369>+ &&
3>        <#COEF2:0.00297677>*GENE@CA063\1+<#COEF3:0.111448>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA063\1)

EE@CA065: EQUATION
1>E@CA065=<#COEF1:16.7458>+<#COEF2:0.124995>*GENE@CA065+ &&
2>    <#COEF3:1.77604>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.410453>*(<#COEF1:16.7458>+ &&
3>        <#COEF2:0.124995>*GENE@CA065\1+<#COEF3:1.77604>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA065\1)

EE@CA067: EQUATION
1>E@CA067=<#COEF1:76.5450>+<#COEF2:0.161849>*GENE@CA067+ &&
2>    <#COEF3:1.90372>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.613317>*(<#COEF1:76.5450>+ &&
3>        <#COEF2:0.161849>*GENE@CA067\1+<#COEF3:1.90372>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA067\1)

EE@CA069: EQUATION
1>E@CA069=<#COEF1:3.59557>+<#COEF2:0.00362556>*GENE@CA069- &&
2>    <#COEF3:0.271200>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.314292>*(<#COEF1:3.59557>+ &&
3>        <#COEF2:0.00362556>*GENE@CA069\1-<#COEF3:0.271200>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA069\1)

EE@CA071: EQUATION
1>E@CA071=<#COEF1:74.4035>+<#COEF2:0.138627>*GENE@CA071- &&
2>    <#COEF3:0.145563>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.183324>*(<#COEF1:74.4035>+ &&
3>        <#COEF2:0.138627>*GENE@CA071\1-<#COEF3:0.145563>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA071\1)

EE@CA073: EQUATION
1>E@CA073=<#COEF1:19.6277>+<#COEF2:0.536640>*GENE@CA073+ &&
2>    <#COEF3:28.8255>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.244977>*(<#COEF1:19.6277>+ &&
3>        <#COEF2:0.536640>*GENE@CA073\1+<#COEF3:28.8255>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA073\1)

EE@CA075: EQUATION
1>E@CA075=<#COEF1:409.466>+<#COEF2:0.108945>*GENE@CA075- &&
2>    <#RHO1:1.25484>*(<#COEF1:409.466>+<#COEF2:0.108945>*GENE@CA075\ &&
3>        1-E@CA075\1)-<#RHO2:-0.640028>*(<#COEF1:409.466>+ &&
4>        <#COEF2:0.108945>*GENE@CA075\2-E@CA075\2)

EE@CA077: EQUATION
1>E@CA077=<#COEF1:59.1389>+<#COEF2:0.0525414>*GENE@CA077- &&
2>    <#COEF3:3.27537>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:-0.0381776>*(<#COEF1:59.1389>+ &&
3>        <#COEF2:0.0525414>*GENE@CA077\1-<#COEF3:3.27537>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA077\1)

EE@CA079: EQUATION
1>E@CA079=<#COEF1:-2.37503>+<#COEF2:0.0317408>*GENE@CA079- &&
2>    <#COEF3:0.950378>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.306558>*(<#COEF1:-2.37503>+ &&
3>        <#COEF2:0.0317408>*GENE@CA079\1-<#COEF3:0.950378>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>        E@CA079\1)
```

```
EE@CA081: EQUATION
1>E@CA081=<#COEF1:75.5108>+<#COEF2:0.120851>*GENE@CA081+ &&
2>    <#COEF3:3.31237>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.396063>*(<#COEF1:75.5108>+ &&
3>       <#COEF2:0.120851>*GENE@CA081\1+<#COEF3:3.31237>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA081\1)

EE@CA083: EQUATION
1>E@CA083=<#COEF1:26.5529>+<#COEF2:0.0715489>*GENE@CA083+ &&
2>    <#COEF3:0.600997>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.174944>*(<#COEF1:26.5529>+ &&
3>       <#COEF2:0.0715489>*GENE@CA083\1+<#COEF3:0.600997>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA083\1)

EE@CA085: EQUATION
1>E@CA085=<#COEF1:-82.3311>+<#COEF2:1.01895>*GENE@CA085+ &&
2>    <#COEF3:2.63912>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.276123>*(<#COEF1:-82.3311>+ &&
3>       <#COEF2:1.01895>*GENE@CA085\1+<#COEF3:2.63912>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA085\1)

EE@CA087: EQUATION
1>E@CA087=<#COEF1:-6.68426>+<#COEF2:0.0472520>*GENE@CA087- &&
2>    <#COEF3:0.786615>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.513118>*(<#COEF1:-6.68426>+ &&
3>       <#COEF2:0.0472520>*GENE@CA087\1-<#COEF3:0.786615>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA087\1)

EE@CA089: EQUATION
1>E@CA089=<#COEF1:1.75774>+<#COEF2:0.0228555>*GENE@CA089+ &&
2>    <#COEF3:0.115511>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.701961>*(<#COEF1:1.75774>+ &&
3>       <#COEF2:0.0228555>*GENE@CA089\1+<#COEF3:0.115511>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA089\1)

EE@CA091: EQUATION
1>E@CA091=<#COEF1:0.638495>+<#COEF2:0.000262964>*GENE@CA091+ &&
2>    <#COEF3:0.184462>*(IF TIME EQ 7 THEN 1 ELSE 0)-<#RHO1:0.449242>*(<#COEF1:0.638495>+ &&
3>       <#COEF2:0.000262964>*GENE@CA091\1+<#COEF3:0.184462>*(IF TIME EQ 6 THEN 1 ELSE 0)- &&
4>       E@CA091\1)-<#RHO2:-0.678224>*(<#COEF1:0.638495>+ &&
5>       <#COEF2:0.000262964>*GENE@CA091\2+<#COEF3:0.184462>*(IF TIME EQ 5 THEN 1 ELSE 0)- &&
6>       E@CA091\2)

EE@CA093: EQUATION
1>E@CA093=<#COEF1:8.61794>+<#COEF2:0.00322671>*GENE@CA093- &&
2>    <#RHO1:0.680281>*(<#COEF1:8.61794>+<#COEF2:0.00322671>* &&
3>       GENE@CA093\1-E@CA093\1)-<#RHO2:-0.202735>*(<#COEF1:8.61794>+ &&
4>       <#COEF2:0.00322671>*GENE@CA093\2-E@CA093\2)

EE@CA095: EQUATION
1>E@CA095=<#COEF1:39.0886>+<#COEF2:0.0271979>*GENE@CA095+ &&
2>    <#COEF3:2.33464>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.816355>*(<#COEF1:39.0886>+ &&
3>       <#COEF2:0.0271979>*GENE@CA095\1+<#COEF3:2.33464>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA095\1)

EE@CA097: EQUATION
1>E@CA097=<#COEF1:-17.0616>+<#COEF2:0.0776625>*GENE@CA097+ &&
2>    <#COEF3:0.0550137>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.179387>*(<#COEF1:-17.0616>+ &&
3>       <#COEF2:0.0776625>*GENE@CA097\1+<#COEF3:0.0550137>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA097\1)

EE@CA099: EQUATION
1>E@CA099=<#COEF1:13.2429>+<#COEF2:0.0634651>*GENE@CA099- &&
2>    <#COEF3:1.14801>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<#RHO1:0.753129>*(<#COEF1:13.2429>+ &&
3>       <#COEF2:0.0634651>*GENE@CA099\1-<#COEF3:1.14801>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
4>       E@CA099\1)
```

```
EE@CA101: EQUATION
E@CA101=<//COEF1:3.79435>+<//COEF2:0.00944192>*GENE@CA101- &&
    <//COEF3:0.377616>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.772658>*(<//COEF1:3.79435>+ &&
       <//COEF2:0.00944192>*GENE@CA101\1-<//COEF3:0.377616>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA101\1)

EE@CA103: EQUATION
E@CA103=<//COEF1:4.43914>+<//COEF2:0.00489719>*GENE@CA103+ &&
    <//COEF3:0.651470>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.0765733>*(<//COEF1:4.43914>+ &&
       <//COEF2:0.00489719>*GENE@CA103\1+<//COEF3:0.651470>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA103\1)

EE@CA105: EQUATION
E@CA105=<//COEF1:0.717160>+<//COEF2:0.00184679>*GENE@CA105- &&
    <//COEF3:0.0376661>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.671450>*(<//COEF1:0.717160>+ &&
       <//COEF2:0.00184679>*GENE@CA105\1-<//COEF3:0.0376661>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA105\1)

EE@CA107: EQUATION
E@CA107=<//COEF1:15.3106>+<//COEF2:0.0510296>*GENE@CA107- &&
    <//COEF3:3.49725>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.364112>*(<//COEF1:15.3106>+ &&
       <//COEF2:0.0510296>*GENE@CA107\1-<//COEF3:3.49725>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA107\1)

EE@CA109: EQUATION
E@CA109=<//COEF1:-1.16583>+<//COEF2:0.00682862>*GENE@CA109+ &&
    <//COEF3:0.354448>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.737284>*(<//COEF1:-1.16583>+ &&
       <//COEF2:0.00682862>*GENE@CA109\1+<//COEF3:0.354448>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA109\1)

EE@CA111: EQUATION
E@CA111=<//COEF1:-2.44434>+<//COEF2:0.120669>*GENE@CA111- &&
    <//COEF3:1.27010>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:-0.144151>*(<//COEF1:-2.44434>+ &&
       <//COEF2:0.120669>*GENE@CA111\1-<//COEF3:1.27010>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA111\1)

EE@CA113: EQUATION
E@CA113=<//COEF1:0.197182>+<//COEF2:0.0332036>*GENE@CA113- &&
    <//COEF3:1.36610>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.809050>*(<//COEF1:0.197182>+ &&
       <//COEF2:0.0332036>*GENE@CA113\1-<//COEF3:1.36610>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA113\1)

EE@CA115: EQUATION
E@CA115=<//COEF1:15.9587>+<//COEF2:0.00213689>*GENE@CA115+ &&
    <//COEF3:1.00418>*(IF TIME LEQ 7 THEN 1 ELSE 0)-<//RHO1:0.131917>*(<//COEF1:15.9587>+ &&
       <//COEF2:0.00213689>*GENE@CA115\1+<//COEF3:1.00418>*(IF TIME LEQ 6 THEN 1 ELSE 0)- &&
       E@CA115\1)

EGENE@CA001: EQUATION
GENE@CA001=0.001*EMI@CA+0.087*EC@CA+0.037*E20@CA+0.001*E22@CA+0.007*E23@CA+ &&
  0.003*E24@CA+0.005*E25@CA+0.009*E26@CA+0.017*E27@CA+0.016*E28@CA+0.000*E29@CA+ &&
0.005*E30@CA+0.001*E31@CA+0.013*E32@CA+0.010*E33@CA+0.030*E34@CA+0.030*E35@CA+&&
0.015*E36@CA+0.026*E37@CA+0.008*E38@CA+0.003*E39@CA+0.313*ET@CA+0.073*EFIR@CA+0.290*ESV@CA

EGENE@CA003: EQUATION
GENE@CA003=0.000*EMI@CA+0.029*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
  0.000*E24@CA+0.000*E25@CA+0.000*E26@CA+0.000*E27@CA+0.109*E28@CA+0.000*E29@CA+ &&
0.000*E30@CA+0.000*E31@CA+0.000*E32@CA+0.000*E33@CA+0.000*E34@CA+0.000*E35@CA+&&
0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.152*ET@CA+0.011*EFIR@CA+0.699*ESV@CA
```

```
EGENE@CA005: EQUATION
1>GENE@CA005=0.033*EMI@CA+0.074*EC@CA+0.001*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.193*E24@CA+0.002*E25@CA+0.000*E26@CA+0.011*E27@CA+0.000*E28@CA+0.004*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.047*E32@CA+0.005*E33@CA+0.008*E34@CA+0.008*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.353*ET@CA+0.090*EFIR@CA+0.169*ESV@CA

EGENE@CA007: EQUATION
1>GENE@CA007=0.001*EMI@CA+0.069*EC@CA+0.041*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.048*E24@CA+0.001*E25@CA+0.000*E26@CA+0.014*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.004*E30@CA+0.000*E31@CA+0.006*E32@CA+0.000*E33@CA+0.006*E34@CA+0.029*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.002*E38@CA+0.005*E39@CA+0.397*ET@CA+0.074*EFIR@CA+0.300*ESV@CA

EGENE@CA009: EQUATION
1>GENE@CA009=0.104*EMI@CA+0.083*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.035*E24@CA+0.000*E25@CA+0.000*E26@CA+0.013*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.106*E32@CA+0.006*E33@CA+0.000*E34@CA+0.010*E35@CA+&&
4>0.009*E36@CA+0.002*E37@CA+0.000*E38@CA+0.000*E39@CA+0.325*ET@CA+0.051*EFIR@CA+0.255*ESV@CA

EGENE@CA011: EQUATION
1>GENE@CA011=0.045*EMI@CA+0.027*EC@CA+0.009*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.003*E24@CA+0.000*E25@CA+0.000*E26@CA+0.000*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.004*E32@CA+0.082*E33@CA+0.000*E34@CA+0.012*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.488*ET@CA+0.073*EFIR@CA+0.256*ESV@CA

EGENE@CA013: EQUATION
1>GENE@CA013=0.001*EMI@CA+0.112*EC@CA+0.015*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.001*E24@CA+0.003*E25@CA+0.008*E26@CA+0.016*E27@CA+0.021*E28@CA+0.036*E29@CA+ &&
3>0.001*E30@CA+0.000*E31@CA+0.009*E32@CA+0.011*E33@CA+0.014*E34@CA+0.008*E35@CA+&&
4>0.010*E36@CA+0.003*E37@CA+0.020*E38@CA+0.005*E39@CA+0.345*ET@CA+0.091*EFIR@CA+0.267*ESV@CA

EGENE@CA015: EQUATION
1>GENE@CA015=0.001*EMI@CA+0.025*EC@CA+0.019*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.449*E24@CA+0.000*E25@CA+0.000*E26@CA+0.001*E27@CA+0.000*E28@CA+0.001*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.001*E32@CA+0.000*E33@CA+0.000*E34@CA+0.001*E35@CA+&&
4>0.000*E36@CA+0.008*E37@CA+0.000*E38@CA+0.000*E39@CA+0.320*ET@CA+0.044*EFIR@CA+0.131*ESV@CA

EGENE@CA017: EQUATION
1>GENE@CA017=0.003*EMI@CA+0.099*EC@CA+0.000*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.036*E24@CA+0.001*E25@CA+0.000*E26@CA+0.021*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.006*E30@CA+0.000*E31@CA+0.006*E32@CA+0.000*E33@CA+0.001*E34@CA+0.005*E35@CA+&&
4>0.013*E36@CA+0.001*E37@CA+0.000*E38@CA+0.001*E39@CA+0.386*ET@CA+0.092*EFIR@CA+0.328*ESV@CA

EGENE@CA019: EQUATION
1>GENE@CA019=0.008*EMI@CA+0.077*EC@CA+0.055*E20@CA+0.004*E22@CA+0.004*E23@CA+ &&
2>  0.008*E24@CA+0.004*E25@CA+0.002*E26@CA+0.010*E27@CA+0.007*E28@CA+0.000*E29@CA+ &&
3>0.004*E30@CA+0.000*E31@CA+0.011*E32@CA+0.003*E33@CA+0.011*E34@CA+0.032*E35@CA+&&
4>0.002*E36@CA+0.006*E37@CA+0.002*E38@CA+0.003*E39@CA+0.373*ET@CA+0.093*EFIR@CA+0.279*ESV@CA

EGENE@CA021: EQUATION
1>GENE@CA021=0.001*EMI@CA+0.057*EC@CA+0.085*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.019*E24@CA+0.000*E25@CA+0.000*E26@CA+0.012*E27@CA+0.006*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.115*E32@CA+0.000*E33@CA+0.000*E34@CA+0.037*E35@CA+&&
4>0.000*E36@CA+0.038*E37@CA+0.000*E38@CA+0.000*E39@CA+0.456*ET@CA+0.055*EFIR@CA+0.119*ESV@CA

EGENE@CA023: EQUATION
1>GENE@CA023=0.000*EMI@CA+0.042*EC@CA+0.030*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.196*E24@CA+0.001*E25@CA+0.021*E26@CA+0.011*E27@CA+0.004*E28@CA+0.000*E29@CA+ &&
3>0.001*E30@CA+0.001*E31@CA+0.003*E32@CA+0.000*E33@CA+0.001*E34@CA+0.002*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.343*ET@CA+0.058*EFIR@CA+0.285*ESV@CA

EGENE@CA025: EQUATION
```

```
1>GENE@CA025=0.001*EMI@CA+0.064*EC@CA+0.029*E20@CA+0.002*E22@CA+0.016*E23@CA+ &&
2>  0.000*E24@CA+0.000*E25@CA+0.000*E26@CA+0.014*E27@CA+0.012*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.005*E31@CA+0.041*E32@CA+0.000*E33@CA+0.000*E34@CA+0.006*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.001*E39@CA+0.538*ET@CA+0.068*EFIR@CA+0.201*ESV@CA

EGENE@CA027: EQUATION
1>GENE@CA027=0.178*EMI@CA+0.036*EC@CA+0.023*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.000*E24@CA+0.000*E25@CA+0.000*E26@CA+0.013*E27@CA+0.000*E28@CA+0.003*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.002*E32@CA+0.000*E33@CA+0.000*E34@CA+0.006*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.439*ET@CA+0.054*EFIR@CA+0.246*ESV@CA

EGENE@CA029: EQUATION
1>GENE@CA029=0.135*EMI@CA+0.076*EC@CA+0.014*E20@CA+0.000*E22@CA+0.003*E23@CA+ &&
2>  0.002*E24@CA+0.001*E25@CA+0.000*E26@CA+0.008*E27@CA+0.004*E28@CA+0.012*E29@CA+ &&
3>0.007*E30@CA+0.000*E31@CA+0.010*E32@CA+0.004*E33@CA+0.008*E34@CA+0.011*E35@CA+&&
4>0.002*E36@CA+0.004*E37@CA+0.001*E38@CA+0.002*E39@CA+0.387*ET@CA+0.059*EFIR@CA+0.250*ESV@CA

EGENE@CA031: EQUATION
1>GENE@CA031=0.002*EMI@CA+0.064*EC@CA+0.051*E20@CA+0.042*E22@CA+0.014*E23@CA+ &&
2>  0.001*E24@CA+0.000*E25@CA+0.007*E26@CA+0.024*E27@CA+0.004*E28@CA+0.021*E29@CA+ &&
3>0.065*E30@CA+0.000*E31@CA+0.004*E32@CA+0.000*E33@CA+0.001*E34@CA+0.009*E35@CA+&&
4>0.000*E36@CA+0.006*E37@CA+0.000*E38@CA+0.002*E39@CA+0.414*ET@CA+0.051*EFIR@CA+0.218*ESV@CA

EGENE@CA033: EQUATION
1>GENE@CA033=0.015*EMI@CA+0.081*EC@CA+0.004*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.020*E24@CA+0.001*E25@CA+0.000*E26@CA+0.009*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.004*E30@CA+0.000*E31@CA+0.005*E32@CA+0.000*E33@CA+0.005*E34@CA+0.002*E35@CA+&&
4>0.000*E36@CA+0.002*E37@CA+0.000*E38@CA+0.001*E39@CA+0.430*ET@CA+0.093*EFIR@CA+0.327*ESV@CA

EGENE@CA035: EQUATION
1>GENE@CA035=0.014*EMI@CA+0.044*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.177*E24@CA+0.000*E25@CA+0.000*E26@CA+0.025*E27@CA+0.012*E28@CA+0.000*E29@CA+ &&
3>0.001*E30@CA+0.000*E31@CA+0.001*E32@CA+0.000*E33@CA+0.006*E34@CA+0.000*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.006*E39@CA+0.369*ET@CA+0.098*EFIR@CA+0.247*ESV@CA

EGENE@CA037: EQUATION
1>GENE@CA037=0.003*EMI@CA+0.050*EC@CA+0.017*E20@CA+0.003*E22@CA+0.028*E23@CA+ &&
2>  0.004*E24@CA+0.014*E25@CA+0.005*E26@CA+0.018*E27@CA+0.010*E28@CA+0.003*E29@CA+ &&
3>0.012*E30@CA+0.003*E31@CA+0.009*E32@CA+0.009*E33@CA+0.030*E34@CA+0.030*E35@CA+&&
4>0.038*E36@CA+0.062*E37@CA+0.011*E38@CA+0.008*E39@CA+0.257*ET@CA+0.087*EFIR@CA+0.287*ESV@CA

EGENE@CA039: EQUATION
1>GENE@CA039=0.000*EMI@CA+0.065*EC@CA+0.162*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.029*E24@CA+0.022*E25@CA+0.009*E26@CA+0.011*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.005*E30@CA+0.000*E31@CA+0.069*E32@CA+0.000*E33@CA+0.002*E34@CA+0.052*E35@CA+&&
4>0.000*E36@CA+0.005*E37@CA+0.000*E38@CA+0.000*E39@CA+0.342*ET@CA+0.050*EFIR@CA+0.176*ESV@CA

EGENE@CA041: EQUATION
1>GENE@CA041=0.002*EMI@CA+0.071*EC@CA+0.002*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.002*E24@CA+0.001*E25@CA+0.001*E26@CA+0.014*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.008*E30@CA+0.000*E31@CA+0.006*E32@CA+0.000*E33@CA+0.004*E34@CA+0.004*E35@CA+&&
4>0.027*E36@CA+0.003*E37@CA+0.003*E38@CA+0.009*E39@CA+0.356*ET@CA+0.144*EFIR@CA+0.340*ESV@CA

EGENE@CA043: EQUATION
1>GENE@CA043=0.002*EMI@CA+0.049*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.001*E24@CA+0.000*E25@CA+0.000*E26@CA+0.005*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.000*E32@CA+0.000*E33@CA+0.001*E34@CA+0.003*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.017*E38@CA+0.000*E39@CA+0.261*ET@CA+0.068*EFIR@CA+0.592*ESV@CA

EGENE@CA045: EQUATION
1>GENE@CA045=0.001*EMI@CA+0.046*EC@CA+0.019*E20@CA+0.005*E22@CA+0.000*E[illegible]@CA+ &&
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2>   0.198*E24@CA+0.014*E25@CA+0.000*E26@CA+0.011*E27@CA+0.003*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.004*E32@CA+0.000*E33@CA+0.015*E34@CA+0.025*E35@CA+&&
4>0.001*E36@CA+0.001*E37@CA+0.003*E38@CA+0.000*E39@CA+0.336*ET@CA+0.056*EFIR@CA+0.262*ESV@CA

EGENE@CA047: EQUATION
1>GENE@CA047=0.001*EMI@CA+0.057*EC@CA+0.081*E20@CA+0.007*E22@CA+0.003*E23@CA+ &&
2>   0.011*E24@CA+0.000*E25@CA+0.003*E26@CA+0.025*E27@CA+0.000*E28@CA+0.001*E29@CA+ &&
3>0.003*E30@CA+0.000*E31@CA+0.004*E32@CA+0.002*E33@CA+0.025*E34@CA+0.011*E35@CA+&&
4>0.001*E36@CA+0.013*E37@CA+0.000*E38@CA+0.000*E39@CA+0.413*ET@CA+0.131*EFIR@CA+0.206*ESV@CA

EGENE@CA049: EQUATION
1>GENE@CA049=0.017*EMI@CA+0.040*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>   0.100*E24@CA+0.000*E25@CA+0.000*E26@CA+0.006*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.009*E32@CA+0.000*E33@CA+0.000*E34@CA+0.000*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.429*ET@CA+0.080*EFIR@CA+0.320*ESV@CA

EGENE@CA051: EQUATION
1>GENE@CA051=0.009*EMI@CA+0.081*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>   0.000*E24@CA+0.000*E25@CA+0.000*E26@CA+0.001*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.000*E32@CA+0.000*E33@CA+0.000*E34@CA+0.000*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.349*ET@CA+0.091*EFIR@CA+0.467*ESV@CA

EGENE@CA053: EQUATION
1>GENE@CA053=0.013*EMI@CA+0.058*EC@CA+0.065*E20@CA+0.000*E22@CA+0.005*E23@CA+ &&
2>   0.002*E24@CA+0.000*E25@CA+0.004*E26@CA+0.018*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.012*E32@CA+0.006*E33@CA+0.003*E34@CA+0.009*E35@CA+&&
4>0.002*E36@CA+0.001*E37@CA+0.004*E38@CA+0.002*E39@CA+0.399*ET@CA+0.076*EFIR@CA+0.318*ESV@CA

EGENE@CA055: EQUATION
1>GENE@CA055=0.000*EMI@CA+0.086*EC@CA+0.094*E20@CA+0.000*E22@CA+0.015*E23@CA+ &&
2>   0.004*E24@CA+0.003*E25@CA+0.001*E26@CA+0.013*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.017*E31@CA+0.015*E32@CA+0.087*E33@CA+0.004*E34@CA+0.009*E35@CA+&&
4>0.006*E36@CA+0.000*E37@CA+0.006*E38@CA+0.001*E39@CA+0.051*ET@CA+0.398*EFIR@CA+0.189*ESV@CA

EGENE@CA057: EQUATION
1>GENE@CA057=0.003*EMI@CA+0.074*EC@CA+0.000*E20@CA+0.002*E22@CA+0.000*E23@CA+ &&
2>   0.066*E24@CA+0.000*E25@CA+0.001*E26@CA+0.012*E27@CA+0.000*E28@CA+0.001*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.004*E32@CA+0.001*E33@CA+0.008*E34@CA+0.007*E35@CA+&&
4>0.102*E36@CA+0.000*E37@CA+0.000*E38@CA+0.002*E39@CA+0.305*ET@CA+0.116*EFIR@CA+0.295*ESV@CA

EGENE@CA059: EQUATION
1>GENE@CA059=0.003*EMI@CA+0.070*EC@CA+0.012*E20@CA+0.003*E22@CA+0.006*E23@CA+ &&
2>   0.005*E24@CA+0.010*E25@CA+0.005*E26@CA+0.016*E27@CA+0.011*E28@CA+0.000*E29@CA+ &&
3>0.018*E30@CA+0.000*E31@CA+0.005*E32@CA+0.004*E33@CA+0.028*E34@CA+0.052*E35@CA+&&
4>0.076*E36@CA+0.026*E37@CA+0.020*E38@CA+0.006*E39@CA+0.282*ET@CA+0.094*EFIR@CA+0.248*ESV@CA

EGENE@CA061: EQUATION
1>GENE@CA061=0.005*EMI@CA+0.121*EC@CA+0.000*E20@CA+0.001*E22@CA+0.001*E23@CA+ &&
2>   0.028*E24@CA+0.000*E25@CA+0.001*E26@CA+0.010*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.016*E30@CA+0.000*E31@CA+0.019*E32@CA+0.000*E33@CA+0.008*E34@CA+0.013*E35@CA+&&
4>0.002*E36@CA+0.000*E37@CA+0.001*E38@CA+0.002*E39@CA+0.392*ET@CA+0.069*EFIR@CA+0.310*ESV@CA

EGENE@CA063: EQUATION
1>GENE@CA063=0.013*EMI@CA+0.065*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>   0.305*E24@CA+0.000*E25@CA+0.000*E26@CA+0.013*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.001*E32@CA+0.000*E33@CA+0.001*E34@CA+0.002*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.369*ET@CA+0.067*EFIR@CA+0.165*ESV@CA

EGENE@CA065: EQUATION
1>GENE@CA065=0.009*EMI@CA+0.089*EC@CA+0.010*E20@CA+0.000*E22@CA+0.006*E23@CA+ &&
2>   0.014*E24@CA+0.003*E25@CA+0.005*E26@CA+0.017*E27@CA+0.004*E28@CA+0.000*E29@CA+ &&
```

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3>0.013*E30@CA+0.003*E31@CA+0.018*E32@CA+0.011*E33@CA+0.010*E34@CA+0.011*E35@CA+&&
4>0.036*E36@CA+0.029*E37@CA+0.002*E38@CA+0.002*E39@CA+0.355*ET@CA+0.077*EFIR@CA+0.275*ESV@CA

EGENE@CA067: EQUATION
1>GENE@CA067=0.002*EMI@CA+0.078*EC@CA+0.031*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.008*E24@CA+0.004*E25@CA+0.002*E26@CA+0.015*E27@CA+0.004*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.003*E32@CA+0.001*E33@CA+0.009*E34@CA+0.005*E35@CA+&&
4>0.005*E36@CA+0.018*E37@CA+0.003*E38@CA+0.001*E39@CA+0.379*ET@CA+0.101*EFIR@CA+0.326*ESV@CA

EGENE@CA069: EQUATION
1>GENE@CA069=0.006*EMI@CA+0.070*EC@CA+0.100*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.000*E24@CA+0.001*E25@CA+0.000*E26@CA+0.013*E27@CA+0.099*E28@CA+0.024*E29@CA+ &&
3>0.001*E30@CA+0.000*E31@CA+0.012*E32@CA+0.000*E33@CA+0.006*E34@CA+0.019*E35@CA+&&
4>0.051*E36@CA+0.008*E37@CA+0.000*E38@CA+0.000*E39@CA+0.401*ET@CA+0.079*EFIR@CA+0.108*ESV@CA

EGENE@CA071: EQUATION
1>GENE@CA071=0.014*EMI@CA+0.078*EC@CA+0.015*E20@CA+0.000*E22@CA+0.008*E23@CA+ &&
2>  0.010*E24@CA+0.004*E25@CA+0.003*E26@CA+0.011*E27@CA+0.005*E28@CA+0.002*E29@CA+ &&
3>0.010*E30@CA+0.000*E31@CA+0.019*E32@CA+0.039*E33@CA+0.021*E34@CA+0.013*E35@CA+&&
4>0.012*E36@CA+0.025*E37@CA+0.006*E38@CA+0.002*E39@CA+0.340*ET@CA+0.059*EFIR@CA+0.303*ESV@CA

EGENE@CA073: EQUATION
1>GENE@CA073=0.001*EMI@CA+0.070*EC@CA+0.014*E20@CA+0.001*E22@CA+0.007*E23@CA+ &&
2>  0.002*E24@CA+0.003*E25@CA+0.001*E26@CA+0.015*E27@CA+0.004*E28@CA+0.000*E29@CA+ &&
3>0.004*E30@CA+0.001*E31@CA+0.003*E32@CA+0.001*E33@CA+0.008*E34@CA+0.031*E35@CA+&&
4>0.041*E36@CA+0.059*E37@CA+0.018*E38@CA+0.007*E39@CA+0.307*ET@CA+0.090*EFIR@CA+0.313*ESV@CA

EGENE@CA075: EQUATION
1>GENE@CA075=0.001*EMI@CA+0.100*EC@CA+0.012*E20@CA+0.001*E22@CA+0.026*E23@CA+ &&
2>  0.001*E24@CA+0.002*E25@CA+0.001*E26@CA+0.023*E27@CA+0.004*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.001*E32@CA+0.000*E33@CA+0.006*E34@CA+0.005*E35@CA+&&
4>0.004*E36@CA+0.009*E37@CA+0.002*E38@CA+0.003*E39@CA+0.229*ET@CA+0.196*EFIR@CA+0.371*ESV@CA

EGENE@CA077: EQUATION
1>GENE@CA077=0.002*EMI@CA+0.074*EC@CA+0.088*E20@CA+0.000*E22@CA+0.006*E23@CA+ &&
2>  0.026*E24@CA+0.007*E25@CA+0.011*E26@CA+0.010*E27@CA+0.008*E28@CA+0.000*E29@CA+ &&
3>0.007*E30@CA+0.000*E31@CA+0.025*E32@CA+0.004*E33@CA+0.023*E34@CA+0.016*E35@CA+&&
4>0.012*E36@CA+0.004*E37@CA+0.000*E38@CA+0.003*E39@CA+0.336*ET@CA+0.065*EFIR@CA+0.272*ESV@CA

EGENE@CA079: EQUATION
1>GENE@CA079=0.006*EMI@CA+0.087*EC@CA+0.011*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.003*E24@CA+0.005*E25@CA+0.000*E26@CA+0.025*E27@CA+0.001*E28@CA+0.003*E29@CA+ &&
3>0.001*E30@CA+0.001*E31@CA+0.003*E32@CA+0.001*E33@CA+0.006*E34@CA+0.005*E35@CA+&&
4>0.059*E36@CA+0.002*E37@CA+0.002*E38@CA+0.006*E39@CA+0.410*ET@CA+0.072*EFIR@CA+0.291*ESV@CA

EGENE@CA081: EQUATION
1>GENE@CA081=0.001*EMI@CA+0.081*EC@CA+0.017*E20@CA+0.000*E22@CA+0.002*E23@CA+ &&
2>  0.002*E24@CA+0.003*E25@CA+0.005*E26@CA+0.020*E27@CA+0.009*E28@CA+0.000*E29@CA+ &&
3>0.025*E30@CA+0.001*E31@CA+0.004*E32@CA+0.004*E33@CA+0.014*E34@CA+0.014*E35@CA+&&
4>0.059*E36@CA+0.002*E37@CA+0.009*E38@CA+0.003*E39@CA+0.341*ET@CA+0.098*EFIR@CA+0.285*ESV@CA

EGENE@CA083: EQUATION
1>GENE@CA083=0.022*EMI@CA+0.060*EC@CA+0.016*E20@CA+0.000*E22@CA+0.003*E23@CA+ &&
2>  0.001*E24@CA+0.000*E25@CA+0.000*E26@CA+0.016*E27@CA+0.001*E28@CA+0.001*E29@CA+ &&
3>0.005*E30@CA+0.000*E31@CA+0.005*E32@CA+0.001*E33@CA+0.003*E34@CA+0.025*E35@CA+&&
4>0.064*E36@CA+0.019*E37@CA+0.020*E38@CA+0.007*E39@CA+0.344*ET@CA+0.078*EFIR@CA+0.308*ESV@CA

EGENE@CA085: EQUATION
1>GENE@CA085=0.000*EMI@CA+0.054*EC@CA+0.016*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.003*E24@CA+0.001*E25@CA+0.004*E26@CA+0.014*E27@CA+0.006*E28@CA+0.000*E29@CA+ &&
3>0.006*E30@C[illegible]0.000*E31@CA+0.006*E32@CA+0.002*E33@CA+0.015*E34@CA+0.1[illegible]35@CA+&&
```

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4>0.163*E36@CA+0.056*E37@CA+0.049*E38@CA+0.003*E39@CA+0.037*ET@CA+0.250*EFIR@CA+0.182*ESV@CA

EGENE@CA087: EQUATION
1>GENE@CA087=0.002*EMI@CA+0.086*EC@CA+0.096*E20@CA+0.000*E22@CA+0.003*E23@CA+ &&
2>  0.009*E24@CA+0.002*E25@CA+0.000*E26@CA+0.014*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.010*E30@CA+0.010*E31@CA+0.009*E32@CA+0.005*E33@CA+0.004*E34@CA+0.008*E35@CA+&&
4>0.042*E36@CA+0.003*E37@CA+0.004*E38@CA+0.004*E39@CA+0.368*ET@CA+0.068*EFIR@CA+0.255*ESV@CA

EGENE@CA089: EQUATION
1>GENE@CA089=0.004*EMI@CA+0.086*EC@CA+0.008*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.088*E24@CA+0.001*E25@CA+0.031*E26@CA+0.011*E27@CA+0.003*E28@CA+0.000*E29@CA+ &&
3>0.001*E30@CA+0.000*E31@CA+0.009*E32@CA+0.002*E33@CA+0.005*E34@CA+0.008*E35@CA+&&
4>0.003*E36@CA+0.005*E37@CA+0.009*E38@CA+0.000*E39@CA+0.383*ET@CA+0.063*EFIR@CA+0.281*ESV@CA

EGENE@CA091: EQUATION
1>GENE@CA091=0.123*EMI@CA+0.022*EC@CA+0.000*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.462*E24@CA+0.000*E25@CA+0.000*E26@CA+0.011*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.000*E32@CA+0.000*E33@CA+0.000*E34@CA+0.014*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.221*ET@CA+0.056*EFIR@CA+0.090*ESV@CA

EGENE@CA093: EQUATION
1>GENE@CA093=0.004*EMI@CA+0.056*EC@CA+0.005*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.248*E24@CA+0.004*E25@CA+0.000*E26@CA+0.013*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.005*E32@CA+0.000*E33@CA+0.005*E34@CA+0.001*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.353*ET@CA+0.071*EFIR@CA+0.233*ESV@CA

EGENE@CA095: EQUATION
1>GENE@CA095=0.004*EMI@CA+0.083*EC@CA+0.053*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.011*E24@CA+0.001*E25@CA+0.001*E26@CA+0.019*E27@CA+0.001*E28@CA+0.011*E29@CA+ &&
3>0.003*E30@CA+0.000*E31@CA+0.004*E32@CA+0.000*E33@CA+0.021*E34@CA+0.008*E35@CA+&&
4>0.003*E36@CA+0.006*E37@CA+0.000*E38@CA+0.004*E39@CA+0.401*ET@CA+0.064*EFIR@CA+0.301*ESV@CA

EGENE@CA097: EQUATION
1>GENE@CA097=0.003*EMI@CA+0.072*EC@CA+0.033*E20@CA+0.001*E22@CA+0.003*E23@CA+ &&
2>  0.023*E24@CA+0.010*E25@CA+0.000*E26@CA+0.012*E27@CA+0.001*E28@CA+0.000*E29@CA+ &&
3>0.005*E30@CA+0.001*E31@CA+0.008*E32@CA+0.003*E33@CA+0.008*E34@CA+0.025*E35@CA+&&
4>0.009*E36@CA+0.005*E37@CA+0.056*E38@CA+0.004*E39@CA+0.361*ET@CA+0.093*EFIR@CA+0.264*ESV@CA

EGENE@CA099: EQUATION
1>GENE@CA099=0.001*EMI@CA+0.088*EC@CA+0.167*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.010*E24@CA+0.003*E25@CA+0.019*E26@CA+0.013*E27@CA+0.002*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.019*E32@CA+0.003*E33@CA+0.027*E34@CA+0.016*E35@CA+&&
4>0.001*E36@CA+0.002*E37@CA+0.000*E38@CA+0.002*E39@CA+0.321*ET@CA+0.055*EFIR@CA+0.249*ESV@CA

EGENE@CA101: EQUATION
1>GENE@CA101=0.005*EMI@CA+0.101*EC@CA+0.084*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.041*E24@CA+0.002*E25@CA+0.000*E26@CA+0.002*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.004*E32@CA+0.000*E33@CA+0.012*E34@CA+0.034*E35@CA+&&
4>0.000*E36@CA+0.002*E37@CA+0.005*E38@CA+0.000*E39@CA+0.380*ET@CA+0.088*EFIR@CA+0.238*ESV@CA

EGENE@CA103: EQUATION
1>GENE@CA103=0.001*EMI@CA+0.046*EC@CA+0.015*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.208*E24@CA+0.003*E25@CA+0.059*E26@CA+0.009*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.004*E32@CA+0.000*E33@CA+0.000*E34@CA+0.002*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.331*ET@CA+0.064*EFIR@CA+0.255*ESV@CA

EGENE@CA105: EQUATION
1>GENE@CA105=0.018*EMI@CA+0.070*EC@CA+0.002*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.358*E24@CA+0.003*E25@CA+0.000*E26@CA+0.013*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.000*E30@CA+0.000*E31@CA+0.014*E32@CA+0.000*E33@CA+0.002*E34@CA+0.004*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.000*E39@CA+0.390*ET@CA+0.034*EFIR@CA+0.092*ESV@CA
```

```
EGENE@CA107: EQUATION
1>GENE@CA107=0.001*EMI@CA+0.071*EC@CA+0.054*E20@CA+0.010*E22@CA+0.009*E23@CA+ &&
2>  0.023*E24@CA+0.002*E25@CA+0.004*E26@CA+0.042*E27@CA+0.002*E28@CA+0.000*E29@CA+ &&
3>0.006*E30@CA+0.000*E31@CA+0.007*E32@CA+0.012*E33@CA+0.020*E34@CA+0.015*E35@CA+&&
4>0.035*E36@CA+0.006*E37@CA+0.001*E38@CA+0.004*E39@CA+0.404*ET@CA+0.054*EFIR@CA+0.215*ESV@CA

EGENE@CA109: EQUATION
1>GENE@CA109=0.003*EMI@CA+0.110*EC@CA+0.002*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.094*E24@CA+0.003*E25@CA+0.000*E26@CA+0.015*E27@CA+0.000*E28@CA+0.000*E29@CA+ &&
3>0.002*E30@CA+0.000*E31@CA+0.007*E32@CA+0.000*E33@CA+0.000*E34@CA+0.003*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.008*E38@CA+0.000*E39@CA+0.354*ET@CA+0.084*EFIR@CA+0.313*ESV@CA

EGENE@CA111: EQUATION
1>GENE@CA111=0.013*EMI@CA+0.078*EC@CA+0.014*E20@CA+0.000*E22@CA+0.009*E23@CA+ &&
2>  0.003*E24@CA+0.002*E25@CA+0.011*E26@CA+0.012*E27@CA+0.005*E28@CA+0.000*E29@CA+ &&
3>0.012*E30@CA+0.000*E31@CA+0.004*E32@CA+0.006*E33@CA+0.007*E34@CA+0.037*E35@CA+&&
4>0.039*E36@CA+0.036*E37@CA+0.008*E38@CA+0.002*E39@CA+0.347*ET@CA+0.075*EFIR@CA+0.281*ESV@CA

EGENE@CA113: EQUATION
1>GENE@CA113=0.020*EMI@CA+0.056*EC@CA+0.075*E20@CA+0.000*E22@CA+0.001*E23@CA+ &&
2>  0.034*E24@CA+0.000*E25@CA+0.016*E26@CA+0.009*E27@CA+0.003*E28@CA+0.000*E29@CA+ &&
3>0.012*E30@CA+0.000*E31@CA+0.011*E32@CA+0.000*E33@CA+0.014*E34@CA+0.013*E35@CA+&&
4>0.000*E36@CA+0.009*E37@CA+0.001*E38@CA+0.001*E39@CA+0.440*ET@CA+0.065*EFIR@CA+0.218*ESV@CA

EGENE@CA115: EQUATION
1>GENE@CA115=0.020*EMI@CA+0.063*EC@CA+0.026*E20@CA+0.000*E22@CA+0.000*E23@CA+ &&
2>  0.102*E24@CA+0.000*E25@CA+0.000*E26@CA+0.013*E27@CA+0.000*E28@CA+0.001*E29@CA+ &&
3>0.008*E30@CA+0.000*E31@CA+0.000*E32@CA+0.000*E33@CA+0.000*E34@CA+0.005*E35@CA+&&
4>0.000*E36@CA+0.000*E37@CA+0.000*E38@CA+0.001*E39@CA+0.424*ET@CA+0.065*EFIR@CA+0.271*ESV@CA
```

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA001

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	281.739	15.42	18.27	CONSTANT
1)	0.160123	0.01213	13.20	GENE@CA001
2)	13.4897	6.113	2.207	DSIC
	0.151961	0.3464	0.4386	RHO

R-BAR SQUARED: 0.9686
DURBIN-WATSON STATISTIC: 1.8158
STANDARD ERROR OF THE REGRESSION: 5.988 NORMALIZED: 0.01278

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA003

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-0.326988	0.05242	-6.238	CONSTANT
1)	0.000436512	3.240E-05	13.47	GENE@CA003
2)	0.0151534	0.02286	0.6629	DSIC
	-0.181888	0.2852	-0.6376	RHO

R-BAR SQUARED: 0.9499
DURBIN-WATSON STATISTIC: 2.0268
STANDARD ERROR OF THE REGRESSION: 0.03229 NORMALIZED: 0.1060

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA005

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.540310	0.3045	1.775	CONSTANT
1)	0.00381805	0.0002838	13.46	GENE@CA005
2)	0.0225164	0.09340	0.2411	DSIC
	0.615621	0.2711	2.271	RHO

R-BAR SQUARED: 0.9882
DURBIN-WATSON STATISTIC: 1.4476
STANDARD ERROR OF THE REGRESSION: 0.08353 NORMALIZED: 0.01894

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA007

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	3.24575	3.501	0.9271	CONSTANT
1)	0.0252892	0.002523	10.02	GENE@CA007
2)	-0.162700	0.8708	-0.1869	DSIC
	0.735442	0.2160	3.404	RHO

R-BAR SQUARED: 0.9895
DURBIN-WATSON STATISTIC: 1.1625
STANDARD ERROR OF THE REGRESSION: 0.7567 NORMALIZED: 0.02114

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA009

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.206803	0.6846	0.3021	CONSTANT
1)	0.00329510	0.0005873	5.611	GENE@CA009
2)	0.156542	0.1926	0.8128	DSIC
	0.700772	0.1960	3.576	RHO

R-BAR SQUARED: 0.9331
DURBIN-WATSON STATISTIC: 1.2056
STANDARD ERROR OF THE REGRESSION: 0.1734 NORMALIZED: 0.04554

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA013

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	13.4035	4.932	2.717	CONSTANT
1)	0.133430	0.003814	34.99	GENE@CA013
2)	2.39627	1.772	1.352	DSIC
	0.442878	0.2804	1.579	RHO

R-BAR SQUARED: 0.9976
DURBIN-WATSON STATISTIC: 1.5541
STANDARD ERROR OF THE REGRESSION: 1.538 NORMALIZED: 0.009086

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA017

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-1.82798	2.040	-0.8961	CONSTANT
1)	0.0129877	0.001533	8.473	GENE@CA017
2)	-0.364115	0.4217	-0.8634	DSIC
	0.829988	0.1927	4.308	RHO

R-BAR SQUARED: 0.9907
DURBIN-WATSON STATISTIC: 1.1687
STANDARD ERROR OF THE REGRESSION: 0.3817 NORMALIZED: 0.02456

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA021

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	2.93487	1.132	2.592	CONSTANT
1)	0.00382307	0.0009876	3.871	GENE@CA021
2)	-0.428436	0.2604	-1.645	DSIC
	0.760991	0.2120	3.589	RHO

R-BAR SQUARED: 0.9550
DURBIN-WATSON STATISTIC: 1.5012
STANDARD ERROR OF THE REGRESSION: 0.2348 NORMALIZED: 0.03285

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA023

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	20.3458	4.876	4.172	CONSTANT
1)	0.0134938	0.004365	3.091	GENE@CA023
2)	-0.114179	1.040	-0.1097	DSIC
	0.807189	0.2528	3.193	RHO

R-BAR SQUARED: 0.9325
DURBIN-WATSON STATISTIC: 1.1850
STANDARD ERROR OF THE REGRESSION: 0.9454 NORMALIZED: 0.02586

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA025

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	15.9465	6.153	2.592	CONSTANT
1)	0.0132438	0.004264	3.106	GENE@CA025
2)	-0.891071	1.590	-0.5606	DSIC
	0.737904	0.2078	3.552	RHO

R-BAR SQUARED: 0.9040
DURBIN-WATSON STATISTIC: 1.4112
STANDARD ERROR OF THE REGRESSION: 1.436 NORMALIZED: 0.04169

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA027

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	2.02282	0.4401	4.596	CONSTANT
1)	0.00315369	0.0003182	9.910	GENE@CA027
2)	-0.0468896	0.1632	-0.2873	DSIC
	0.330039	0.3300	1.000	RHO

R-BAR SQUARED: 0.9633
DURBIN-WATSON STATISTIC: 1.2769
STANDARD ERROR OF THE REGRESSION: 0.1609 NORMALIZED: 0.02696

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA029

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	33.5440	9.176	3.656	CONSTANT
1)	0.0913113	0.007101	12.86	GENE@CA029
2)	-0.228640	2.952	-0.07744	DSIC
	0.600748	0.2236	2.687	RHO

R-BAR SQUARED: 0.9859
DURBIN-WATSON STATISTIC: 1.2177
STANDARD ERROR OF THE REGRESSION: 2.686 NORMALIZED: 0.01902

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA031

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	22.1267	1.965	11.26	CONSTANT
1)	0.00582713	0.001297	4.493	GENE@CA031
2)	-9.17189	1.994	-4.599	1/TIME*2
	-0.159524	0.2861	-0.5576	RHO

R-BAR SQUARED: 0.9302
DURBIN-WATSON STATISTIC: 1.8302
STANDARD ERROR OF THE REGRESSION: 0.7401   NORMALIZED: 0.02772

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA033

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-1.04122	0.2123	-4.905	CONSTANT
1)	0.00511417	0.0001372	37.28	GENE@CA033
2)	-0.0529399	0.08295	-0.6382	DSIC
	-0.322561	0.3097	-1.041	RHO

R-BAR SQUARED: 0.9930
DURBIN-WATSON STATISTIC: 2.0989
STANDARD ERROR OF THE REGRESSION: 0.1256   NORMALIZED: 0.02067

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA035

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	2.40852	0.5826	4.134	CONSTANT
1)	0.00312645	0.0004545	6.880	GENE@CA035
2)	0.429082	0.2173	1.974	DSIC
	0.302699	0.3046	0.9939	RHO

R-BAR SQUARED: 0.9035
DURBIN-WATSON STATISTIC: 1.6444
STANDARD ERROR OF THE REGRESSION: 0.2010 NORMALIZED: 0.03272

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA037

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	1643.19	169.7	9.685	CONSTANT
1)	1.55704	0.1466	10.62	GENE@CA037
2)	65.3369	66.94	0.9760	DSIC
	0.323348	0.3710	0.8715	RHO

R-BAR SQUARED: 0.9711
DURBIN-WATSON STATISTIC: 1.4210
STANDARD ERROR OF THE REGRESSION: 54.75 NORMALIZED: 0.01666

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA039

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-1.64735	0.9817	-1.678	CONSTANT
1)	0.0183600	0.0008837	20.78	GENE@CA039
2)	-0.922876	0.3636	-2.538	DSIC
	0.101743	0.3105	0.3277	RHO

R-BAR SQUARED: 0.9891
DURBIN-WATSON STATISTIC: 1.8033
STANDARD ERROR OF THE REGRESSION: 0.4136 NORMALIZED: 0.02505

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA041

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	10.7686	3.827	2.813	CONSTANT
1)	0.0384211	0.002660	14.44	GENE@CA041
2)	0.717712	1.427	0.5031	DSIC
	0.489584	0.2990	1.637	RHO

R-BAR SQUARED: 0.9845
DURBIN-WATSON STATISTIC: 1.7187
STANDARD ERROR OF THE REGRESSION: 1.283 NORMALIZED: 0.02099

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA043

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.720013	0.2701	2.666	CONSTANT
1)	0.00141569	0.0001616	8.759	GENE@CA043
2)	0.0162593	0.1070	0.1519	DSIC
	0.378934	0.2737	1.384	RHO

R-BAR SQUARED: 0.9535
DURBIN-WATSON STATISTIC: 1.7156
STANDARD ERROR OF THE REGRESSION: 0.1049 NORMALIZED: 0.03710

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA045

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	4.72455	2.981	1.585	CONSTANT
1)	0.0136133	0.002534	5.373	GENE@CA045
2)	-0.728987	0.7890	-0.9239	DSIC
	0.733807	0.2388	3.073	RHO

R-BAR SQUARED: 0.9706
DURBIN-WATSON STATISTIC: 1.0053
STANDARD ERROR OF THE REGRESSION: 0.6209 NORMALIZED: 0.03159

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA047

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	7.66373	5.240	1.462	CONSTANT
1)	0.0309535	0.004083	7.580	GENE@CA047
2)	-1.48777	1.503	-0.9897	DSIC
	0.690356	0.2085	3.312	RHO

R-BAR SQUARED: 0.9757
DURBIN-WATSON STATISTIC: 1.4633
STANDARD ERROR OF THE REGRESSION: 1.338   NORMALIZED: 0.03010

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA051

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-2.58362	0.7319	-3.530	CONSTANT
1)	0.00382618	0.0004638	8.249	GENE@CA051
2)	-0.181794	0.2434	-0.7470	DSIC
	0.587777	0.2823	2.082	RHO

R-BAR SQUARED: 0.9710
DURBIN-WATSON STATISTIC: 1.5369
STANDARD ERROR OF THE REGRESSION: 0.2220   NORMALIZED: 0.07602

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA053

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	56.8578	16.49	3.448	CONSTANT
1)	0.0479712	0.01127	4.256	GENE@CA053
2)	4.16723	4.904	0.8498	DSIC
	0.729200	0.2164	3.369	RHO

R-BAR SQUARED: 0.8576
DURBIN-WATSON STATISTIC: 2.0767
STANDARD ERROR OF THE REGRESSION: 4.107 NORMALIZED: 0.03331

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA055

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	6.24471	2.030	3.077	CONSTANT
1)	0.0324400	0.002817	11.51	GENE@CA055
2)	0.0300440	0.7700	0.03902	DSIC
	0.457526	0.2539	1.802	RHO

R-BAR SQUARED: 0.9761
DURBIN-WATSON STATISTIC: 1.5190
STANDARD ERROR OF THE REGRESSION: 0.7279 NORMALIZED: 0.02670

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA057

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-5.13604	1.060	-4.847	CONSTANT
1)	0.0126219	0.0008408	15.01	GENE@CA057
2)	0.135144	0.3051	0.4429	DSIC
	0.662600	0.2491	2.660	RHO

R-BAR SQUARED: 0.9935
DURBIN-WATSON STATISTIC: 1.3515
STANDARD ERROR OF THE REGRESSION: 0.2530 NORMALIZED: 0.02684

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA059

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-266.432	8.815	-30.23	CONSTANT
1)	0.867244	0.007672	113.0	GENE@CA059
2)	1.37305	3.449	0.3981	DSIC
	-0.248826	0.2999	-0.8297	RHO

R-BAR SQUARED: 0.9993
DURBIN-WATSON STATISTIC: 1.8049
STANDARD ERROR OF THE REGRESSION: 5.009 NORMALIZED: 0.007924

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA061

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-3.58409	1.086	-3.301	CONSTANT
1)	0.0236699	0.0007886	30.01	GENE@CA061
2)	0.436145	0.3042	1.434	DSIC
	0.710063	0.2222	3.195	RHO

R-BAR SQUARED: 0.9980
DURBIN-WATSON STATISTIC: 1.7032
STANDARD ERROR OF THE REGRESSION: 0.2748 NORMALIZED: 0.01006

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA063

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	1.72369	0.9032	1.908	CONSTANT
1)	0.00297677	0.0008263	3.603	GENE@CA063
2)	0.111448	0.2452	0.4545	DSIC
	0.703689	0.2592	2.715	RHO

R-BAR SQUARED: 0.9198
DURBIN-WATSON STATISTIC: 1.1638
STANDARD ERROR OF THE REGRESSION: 0.1863 NORMALIZED: 0.03888

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA065

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	16.7458	8.099	2.068	CONSTANT
1)	0.124995	0.006153	20.32	GENE@CA065
2)	1.77604	2.977	0.5966	DSIC
	0.410453	0.3017	1.360	RHO

R-BAR SQUARED: 0.9911
DURBIN-WATSON STATISTIC: 1.6317
STANDARD ERROR OF THE REGRESSION: 2.817 NORMALIZED: 0.01691

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA067

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	76.5450	13.43	5.699	CONSTANT
1)	0.161849	0.009324	17.36	GENE@CA067
2)	1.90372	4.455	0.4274	DSIC
	0.613317	0.2785	2.202	RHO

R-BAR SQUARED: 0.9920
DURBIN-WATSON STATISTIC: 1.5818
STANDARD ERROR OF THE REGRESSION: 3.949 NORMALIZED: 0.01369

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA069

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	3.59557	0.6626	5.427	CONSTANT
1)	0.00362556	0.0005957	6.086	GENE@CA069
2)	-0.271200	0.2272	-1.194	DSIC
	0.314292	0.2994	1.050	RHO

R-BAR SQUARED: 0.9282
DURBIN-WATSON STATISTIC: 1.6976
STANDARD ERROR OF THE REGRESSION: 0.2188 NORMALIZED: 0.03035

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA071

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	74.4035	5.223	14.24	CONSTANT
1)	0.138627	0.003940	35.18	GENE@CA071
2)	-0.145563	1.992	-0.07307	DSIC
	0.183324	0.2979	0.6154	RHO

R-BAR SQUARED: 0.9959
DURBIN-WATSON STATISTIC: 1.8322
STANDARD ERROR OF THE REGRESSION: 2.192 NORMALIZED: 0.009137

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA073

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	19.6277	28.21	0.6957	CONSTANT
1)	0.536640	0.02158	24.87	GENE@CA073
2)	28.8255	10.90	2.644	DSIC
	0.244977	0.3186	0.7689	RHO

R-BAR SQUARED: 0.9926
DURBIN-WATSON STATISTIC: 1.7600
STANDARD ERROR OF THE REGRESSION: 10.47 NORMALIZED: 0.01587

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA077

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	59.1389	2.631	22.48	CONSTANT
1)	0.0525414	0.002067	25.42	GENE@CA077
2)	-3.27537	1.018	-3.219	DSIC
	-0.0381776	0.2945	-0.1296	RHO

R-BAR SQUARED: 0.9911
DURBIN-WATSON STATISTIC: 2,0118
STANDARD ERROR OF THE REGRESSION: 1.275 NORMALIZED: 0.01078

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA079

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-2.37503	1.996	-1.190	CONSTANT
1)	0.0317408	0.001336	23.75	GENE@CA079
2)	-0.950378	0.8472	-1.122	DSIC
	0.306558	0.3689	0.8309	RHO

R-BAR SQUARED: 0.9946
DURBIN-WATSON STATISTIC: 1.6098
STANDARD ERROR OF THE REGRESSION: 0.6552 NORMALIZED: 0.01682

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA081

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	75.5108	8.071	9.356	CONSTANT
1)	0.120851	0.006187	19.53	GENE@CA081
2)	3.31237	2.919	1.135	DSIC
	0.396063	0.3338	1.186	RHO

R-BAR SQUARED: 0.9900
DURBIN-WATSON STATISTIC: 1.2049
STANDARD ERROR OF THE REGRESSION: 2.862 NORMALIZED: 0.01296

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA083

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	26.5529	3.760	7.062	CONSTANT
1)	0.0715489	0.002767	25.86	GENE@CA083
2)	0.600997	1.447	0.4153	DSIC
	0.174944	0.2888	0.6059	RHO

R-BAR SQUARED: 0.9923
DURBIN-WATSON STATISTIC: 1.8234
STANDARD ERROR OF THE REGRESSION: 1.579 NORMALIZED: 0.01384

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA085

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-82.3311	12.17	-6.763	CONSTANT
1)	1.01895	0.01870	54.50	GENE@CA085
2)	2.63912	4.730	0.5579	DSIC
	0.276123	0.3444	0.8018	RHO

R-BAR SQUARED: 0.9985
DURBIN-WATSON STATISTIC: 1.6114
STANDARD ERROR OF THE REGRESSION: 5.088 NORMALIZED: 0.009767

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA087

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-6.68426	3.054	-2.189	CONSTANT
1)	0.0472520	0.002388	19.79	GENE@CA087
2)	-0.786615	0.9675	-0.8131	DSIC
	0.513118	0.2791	1.839	RHO

R-BAR SQUARED: 0.9943
DURBIN-WATSON STATISTIC: 1.5928
STANDARD ERROR OF THE REGRESSION: 0.8875 NORMALIZED: 0.01809

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA089

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	1.75774	3.118	0.5637	CONSTANT
1)	0.0228555	0.002417	9.456	GENE@CA089
2)	0.115511	0.7741	0.1492	DSIC
	0.701961	0.2603	2.697	RHO

R-BAR SQUARED: 0.9874
DURBIN-WATSON STATISTIC: 1.4734
STANDARD ERROR OF THE REGRESSION: 0.6855 NORMALIZED: 0.02284

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA093

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	8.74237	1.134	7.712	CONSTANT
1)	0.00311024	0.001052	2.955	GENE@CA093
	0.554964	0.3289	1.687	RHO

R-BAR SQUARED: 0.7891
DURBIN-WATSON STATISTIC: 1.3925
STANDARD ERROR OF THE REGRESSION: 0.4061 NORMALIZED: 0.03326

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA095

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	39.0886	7.622	5.128	CONSTANT
1)	0.0271979	0.005393	5.043	GENE@CA095
2)	2.33464	2.010	1.162	DSIC
	0.816355	0.1808	4.516	RHO

R-BAR SQUARED: 0.9493
DURBIN-WATSON STATISTIC: 1.1514
STANDARD ERROR OF THE REGRESSION: 1.707 NORMALIZED: 0.02308

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA097

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-17.0616	1.335	-12.78	CONSTANT
1)	0.0776625	0.001018	76.27	GENE@CA097
2)	0.0550137	0.5087	0.1081	DSIC
	0.179387	0.2857	0.6280	RHO

R-BAR SQUARED: 0.9991
DURBIN-WATSON STATISTIC: 1.7022
STANDARD ERROR OF THE REGRESSION: 0.5577 NORMALIZED: 0.007471

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA099

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	13.2429	6.791	1.950	CONSTANT
1)	0.0634651	0.006200	10.24	GENE@CA099
2)	-1.14801	1.591	-0.7214	DSIC
	0.753129	0.2578	2.922	RHO

R-BAR SQUARED: 0.9907
DURBIN-WATSON STATISTIC: 1.6869
STANDARD ERROR OF THE REGRESSION: 1.440 NORMALIZED: 0.01742

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA101

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	3.79435	1.665	2.278	CONSTANT
1)	0.00944192	0.001336	7.066	GENE@CA101
2)	-0.377616	0.3806	-0.9923	DSIC
	0.772658	0.1910	4.046	RHO

R-BAR SQUARED: 0.9838
DURBIN-WATSON STATISTIC: 1.0740
STANDARD ERROR OF THE REGRESSION: 0.3395 NORMALIZED: 0.02275

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA103

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	4.43914	0.4509	9.844	CONSTANT
1)	0.00489719	0.0003740	13.09	GENE@CA103
2)	0.651470	0.1741	3.742	DSIC
	0.0765733	0.2981	0.2569	RHO

R-BAR SQUARED: 0.9511
DURBIN-WATSON STATISTIC: 1.8615
STANDARD ERROR OF THE REGRESSION: 0.1985 NORMALIZED: 0.01994

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA105

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.717160	0.5930	1.209	CONSTANT
1)	0.00184679	0.0006139	3.008	GENE@CA105
2)	-0.0376661	0.1439	-0.2617	DSIC
	0.671450	0.2883	2.329	RHO

R-BAR SQUARED: 0.9047
DURBIN-WATSON STATISTIC: 1.4220
STANDARD ERROR OF THE REGRESSION: 0.1246   NORMALIZED: 0.05113

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA107

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	15.3106	4.685	3.268	CONSTANT
1)	0.0510296	0.003615	14.12	GENE@CA107
2)	-3.49725	1.749	-2.000	DSIC
	0.364112	0.3188	1.142	RHO

R-BAR SQUARED: 0.9850
DURBIN-WATSON STATISTIC: 1.7113
STANDARD ERROR OF THE REGRESSION: 1.638   NORMALIZED: 0.02208

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA109

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-1.16583	1.567	-0.7438	CONSTANT
1)	0.00682862	0.001204	5.674	GENE@CA109
2)	0.354448	0.3971	0.8927	DSIC
	0.737284	0.2517	2.929	RHO

R-BAR SQUARED: 0.9701
DURBIN-WATSON STATISTIC: 0.8308
STANDARD ERROR OF THE REGRESSION: 0.3124 NORMALIZED: 0.04159

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA111

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	-2.44434	3.220	-0.7591	CONSTANT
1)	0.120669	0.002447	49.30	GENE@CA111
2)	-1.27010	1.244	-1.021	DSIC
	-0.144151	0.3347	-0.4307	RHO

R-BAR SQUARED: 0.9970
DURBIN-WATSON STATISTIC: 1.8738
STANDARD ERROR OF THE REGRESSION: 1.640 NORMALIZED: 0.01167

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA113

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.197182	6.887	0.02863	CONSTANT
1)	0.0332036	0.005400	6.148	GENE@CA113
2)	-1.36610	1.581	-0.8641	DSIC
	0.809050	0.1769	4.575	RHO

R-BAR SQUARED: 0.9772
DURBIN-WATSON STATISTIC: 1.5146
STANDARD ERROR OF THE REGRESSION: 1.431 NORMALIZED: 0.03450

LEAST SQUARES WITH FIRST-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA115

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	15.9587	1.137	14.04	CONSTANT
1)	0.00213689	0.0008009	2.668	GENE@CA115
2)	1.00418	0.4261	2.357	DSIC
	0.131917	0.2973	0.4437	RHO

R-BAR SQUARED: 0.3215
DURBIN-WATSON STATISTIC: 1.8807
STANDARD ERROR OF THE REGRESSION: 0.4802 NORMALIZED: 0.02526

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CAO11

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	3.28768	0.4303	7.641	CONSTANT
1)	0.00164004	0.0002848	5.759	GENE@CAO11
2)	-5.55176	2.510	-2.212	1/TIME**2
	0.779052	0.2440	3.193	RHO1
	-0.530156	0.2418	-2.193	RHO2

R-BAR SQUARED: 0.9387
DURBIN-WATSON STATISTIC: 1.9487
STANDARD ERROR OF THE REGRESSION: 0.1450 NORMALIZED: 0.02681

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CAO15

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	4.13622	0.8176	5.059	CONSTANT
1)	0.00132202	0.0009623	1.374	GENE@CAO15
2)	0.224304	0.1052	2.131	D77TO95
	1.41970	0.2655	5.348	RHO1
	-0.796388	0.2140	-3.721	RHO2

R-BAR SQUARED: 0.9099
DURBIN-WATSON STATISTIC: 1.9373
STANDARD ERROR OF THE REGRESSION: 0.1358 NORMALIZED: 0.02497

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA049

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	2.14289	0.1331	16.10	CONSTANT
1)	0.000422718	8.791E-05	4.808	GENE@CA049
2)	-0.247905	0.05296	-4.681	DSIC
	0.267903	0.2545	1.053	RHO1
	-0.543503	0.2367	-2.296	RHO2

R-BAR SQUARED: 0.9147
DURBIN-WATSON STATISTIC: 2.3550
STANDARD ERROR OF THE REGRESSION: 0.06777 NORMALIZED: 0.02565

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA075

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	409.466	33.51	12.22	CONSTANT
1)	0.108945	0.02863	3.805	GENE@CA075
	1.25484	0.2268	5.533	RHO1
	-0.640028	0.2560	-2.500	RHO2

R-BAR SQUARED: 0.9252
DURBIN-WATSON STATISTIC: 1.8928
STANDARD ERROR OF THE REGRESSION: 9.235 NORMALIZED: 0.01716

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CAO11

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	3.28768	0.4303	7.641	CONSTANT
1)	0.00164004	0.0002848	5.759	GENE@CAO11
2)	-5.55176	2.510	-2.212	1/TIME**2
	0.779052	0.2440	3.193	RHO1
	-0.530156	0.2418	-2.193	RHO2

R-BAR SQUARED: 0.9387
DURBIN-WATSON STATISTIC: 1.9487
STANDARD ERROR OF THE REGRESSION: 0.1450   NORMALIZED: 0.02681

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982)   16 OBSERVATIONS
DEPENDENT VARIABLE: E@CAO15

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	4.13622	0.8176	5.059	CONSTANT
1)	0.00132202	0.0009623	1.374	GENE@CAO15
2)	0.224304	0.1052	2.131	D77TO95
	1.41970	0.2655	5.348	RHO1
	-0.796388	0.2140	-3.721	RHO2

R-BAR SQUARED: 0.9099
DURBIN-WATSON STATISTIC: 1.9373
STANDARD ERROR OF THE REGRESSION: 0.1358   NORMALIZED: 0.02497

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA049

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	2.14289	0.1331	16.10	CONSTANT
1)	0.000422718	8.791E-05	4.808	GENE@CA049
2)	-0.247905	0.05296	-4.681	DSIC
	0.267903	0.2545	1.053	RHO1
	-0.543503	0.2367	-2.296	RHO2

R-BAR SQUARED: 0.9147
DURBIN-WATSON STATISTIC: 2.3550
STANDARD ERROR OF THE REGRESSION: 0.06777 NORMALIZED: 0.02565

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA075

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	409.466	33.51	12.22	CONSTANT
1)	0.108945	0.02863	3.805	GENE@CA075
	1.25484	0.2268	5.533	RHO1
	-0.640028	0.2560	-2.500	RHO2

R-BAR SQUARED: 0.9252
DURBIN-WATSON STATISTIC: 1.8928
STANDARD ERROR OF THE REGRESSION: 9.235 NORMALIZED: 0.01716

LEAST SQUARES WITH SECOND-ORDER AUTOCORRELATION CORRECTION

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA091

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	0.638495	0.04772	13.38	CONSTANT
1)	0.000262964	7.617E-05	3.452	GENE@CA091
2)	0.184462	0.03022	6.103	D71
	0.449242	0.2950	1.523	RHO1
	-0.678224	0.2601	-2.608	RHO2

R-BAR SQUARED: 0.5848
DURBIN-WATSON STATISTIC: 1.2892
STANDARD ERROR OF THE REGRESSION: 0.03559 NORMALIZED: 0.04379

ORDINARY LEAST SQUARES

ANNUAL(1967 TO 1982) 16 OBSERVATIONS
DEPENDENT VARIABLE: E@CA019

	COEFFICIENT	STD. ERROR	T-STAT	INDEPENDENT VARIABLE
	47.1256	7.501	6.283	CONSTANT
1)	0.112176	0.005493	20.42	GENE@CA019
2)	-12.3056	2.891	-4.257	DSIC

R-BAR SQUARED: 0.9883
DURBIN-WATSON STATISTIC: 1.1749
STANDARD ERROR OF THE REGRESSION: 3.574 NORMALIZED: 0.01973

Appendix IX

I/O Sector Definitions

Table 1
Regional Industry Forecasting System:
Industry Classification

Sector	Description	SIC Code
1	Livestock and livestock products	pt.01, pt.02
2	Other agricultural products	pt.01, pt.02
3	Forestry and fishery products	081-4, 091, 097
4	Agricultural, forestry, and fishery services	0254, 07 (excl. 074),
5	Iron and ferroalloy ores mining	101, 106
6	Nonferrous metal ores mining	102-5, pt.108,109
7	Coal mining	1111, pt.1112, 1211, pt.1212
8	Crude petroleum and natural gas	131, 132, pt.138
9	Stone and clay mining and quarrying	141-5, pt.148, 149
10	Chemical and fertilizer mineral mining	147
11	New construction	pt. 15-17, pt. 108 pt. 1112, pt. 1212, pt. 148
12	Maintenance and repair construction	pt. 15-17, pt. 138
13	Ordnance and accessories	3482-4, 3489, 3761, 3795
14	Food and kindred products	20
15	Tobacco manufactures	21
16	Broad and narrow fabrics, yarn and thread mills	221-4, 226, 228
17	Miscellaneous textile goods and floor coverings	227, 229
18	Apparel	225
19	Miscellaneous fabricated textile products	239
20	Lumber and wood products, except containers	241-3, 2448, 249
21	Wood containers	2441, 2449
22	Household furniture	251
23	Other furniture and fixtures	252-4, 259
24	Paper and allied products, except containers and boxes	261-4, 266
25	Paperboard containers and boxes	265
26	Printing and publishing	27
27	Chemicals and selected chemical products	281, 286-7, 289
28	Plastics and synthetic materials	282
29	Drugs, cleaning and toilet preparations	283-4
30	Paints and allied products	285
31	Petroleum refining and related industries	29
32	Rubber and miscellaneous plastics products	30
33	Leather tanning and finishing	311
34	Footwear and other leather products	313-7, 319
35	Glass and glass products	321-3
36	Stone and clay products	324-9
37	Primary iron and steel manufacturing	331-2, 339, 3462
38	Primary nonferrous metals manufacturing	333-6, 3463
39	Metal containers	341

Sector	Description	SIC Code
40	Heating, plumbing, and fabricated structural metal products	343-4
41	Screw machine products and stampings	345, 3465-6, 3469
42	Other fabricated metal products	342, 347, 349
43	Engines and turbines	351
44	Farm and garden machinery	352
45	Construction and mining machinery	3531-3
46	Materials handling machinery and equipment	3534-7
47	Metalworking machinery and equipment	354
48	Special industry machinery and equipment	355
49	General industrial machinery and equipment	356
50	Miscellaneous machinery, except electrical	359
51	Office, computing, and accounting machines	357
52	Service industry machines	358
53	Electrical transmission and distribution equipment and industrial apparatus	361-2, 3825
54	Household appliances	363
55	Electric lighting and wiring equipment	364
56	Radio, TV, and communication equipment	365-6
57	Electronic components and accessories	367
58	Miscellaneous electrical machinery, equipment, and supplies	369
59	Motor vehicles and equipment	371
60	Aircraft and parts	372
61	Other transportation equipment	373-5, 3792, 3799, 2451
62	Professional, scientific, and controlling instruments and supplies	381, 3822-4,3829, 384, 387
63	Optical, ophthalmic, and photographic equipment and supplies	383, 385-6
64	Miscellaneous manufacturing	39
65	Transportation and warehousing	40-2, 44-7
66	Communications, except radio and TV	481-2, 489
67	Radio and TV broadcasting	483
68	Electric, gas, water, and sanitary services	49
69	Wholesale and retail trade	50-57, 59, 7396, 8042
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