AN ECONOMETRIC MODEL OF THE IRAQI ECONOMY, 1960-78

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CHAPTER I

INTRODUCTION

Construction of macroeconometric models has become an increasingly popular endeavor in recent decades.[1] Today, macroeconometric model-building is commonplace in mature economies where there is ample data and substantial agreement on the techniques appropriate for building such models. The state of the art in modeling developing economies is not so well defined and modeling of such economies is still in the pioneering stage. There are arguments in support of using basically the same models for mature and developing economies.[2] There may be some benefits from such an approach, but one must also be aware of the difference in behavioral characteristics and institutional elements of mature and developing economies.

In this study, a macroeconometric model is developed for the Iraqi economy. This model has its origin in and follows the basic framework of models developed for advanced economies. Efforts are made, however, to introduce modifications to accommodate the special features of the Iraqi economy.

The most recent and most sophisticated macroeconometric study of Iraq was done by A. Kader in 1974.[3] Kader's model is based on the Keynesian theory of effective demand and income determination with fifteen equations (eleven behavioral equations and four identities). The behavioral equations are estimated over the period 1953-1969 with merely

one independent variable in each equation. Kader's study has some shortcomings:

a. It takes into consideration only aggregate demand and its main components. Nothing is said about the economy's capacity to meet the desired level of aggregate demand.

b. It is estimated using data expressed in current prices. The use of current prices may introduce spurious correlation resulting from common price trends in the variables of the model. This generally leads to spuriously high R^2s and low standard errors of the estimates.[4] The presence of the common price trends also introduces multicollinearity which usually results in imprecise parameter estimates.[5]

c. Total imports are estimated as a function of GNP without any distinction between consumer, capital, and intermediate goods. For a developing economy like Iraq, there are advantages to disaggregating imports. In the first place, it facilitates an analysis of the trend and growth of these types of imports, and it also allows an investigation of their interaction with different domestic demand components. Secondly, it delineates between those goods imported to raise the level of material well-being and those imported to further industrial growth.

d. Finally, Kader's study ignores the important question of model stability and provides no discussion of system-wide dynamic multipliers.

Furthermore, because of the government's continuous revision to the official data, we might expect that the estimated coefficients of Kader's model are no longer valid. Therefore, a more complete and up-to-date macroeconometric model of Iraq is greatly needed.

Purpose and Nature of the Study

The main objective of this study is to develop a macroeconometric model for the Iraqi economy. Due to the vital importance of the oil sector in the Iraqi economy, the primary emphasis in this model will be given to the investigation of the effects of the oil sector on the structure and recent performance of the economy. In addition, simulation analysis will be utilized to derive policy implications and trace the effects of different shocks in oil variables on the Iraqi economy. The model will also be used to forecast the Iraqi economy for the years 1979 to 1985, using the Whatron Middle East Economic Service projections for the Iraqi oil variables as our assumptions for these variables during the forecast period.

This study is undertaken to satisfy the desperate need of the country for a well-formulated and empirically tested econometric model which could further assist the concerned planning authorities in evaluating the past, present, and future performance of the Iraqi economy.

The model to be developed in this research project is a non-linear simultaneous equation system. It contains fifty-three equations of which twenty-seven are behavioral and the remainder are non-behavioral or identities. The model is based on annual data from 1960 to 1978.

This study differs from Kader's model of Iraq in several ways. It is non-linear and employs simulation analysis to evaluate performance. It describes the economy in more detail. In particular, it includes equations for the price levels, the components of aggregate supply, the wage rate, and employment. It uses constant prices and covers a longer period of time. Finally, there is a sharp contrast between the

behavioral relationships formulated in the present study and those that appear in Kader's model.

Organization of the Study

The study is organized into five chapters. Chapter II describes the Iraqi economy. Sectoral performance and the role of oil sector are examined in this chapter. The specification and estimation of the model are discussed in Chapter III. Chapter IV is concerned with the model simulation analysis. Simulation error measures and dynamic properties of the model are examined in this chapter. Specifically, different simulation experiments are performed in this chapter to examine the effects on the economy of an increase in the volume of oil exports, a decrease in the total imports of oil by OECD countries, an increase in the export price of oil, and the effects of linking oil prices to currencies other than the U.S. dollar. In addition, the forecast of Iraqi economy for the years 1979 to 1985 is also included. The last chapter summarizes the study and also contains a discussion of the study's limitations and suggestions for further research.

FOOTNOTES

[1]For a review of the state of the art in macroeconometric model-building, see Paul A. Samuelson, "The Art and Science of Macro-models Over 50 Years," in Gary Fromm and Lawrence R. Klein (eds.), The Brookings Model: Perspective and Recent Developments (Amsterdam, 1975), pp. 3-10.

[2]Lawrence R. Klein, "What Kind of Macroeconometric Model for Developing Economies?" in Arnold Zellner (ed.), Readings in Economic Statistics and Econometrics (Boston, 1968), pp. 559-570.

[3]Ahmed A. Kader, "The Role of the Oil Export Sector in the Economic Development of Iraq" (unpub. Ph.D. Dissertation, West Virginia University, 1974), pp. 129-167.

[4]M. W. Khouja and P. G. Sadler, The Economy of Kuwait - Development and Role in International Finance (London, 1979), p. 94.

[5]Ibid.

CHAPTER II

THE IRAQI ECONOMY

Iraq is an Arab country in Western Asia with an area of 169,317 square miles (the equivalent of 438,317 square kilometers) and a population of approximately 12.7 million.[1] She is bounded by Turkey on the north, Iran on the east, Kuwait on the south, Saudi Arabia and Jordan on the southwest and by Syria on the northwest. Called Mesopotamia by the classical world, the country became known as Iraq in the 7th century. Baghdad is the national capital.

The summers in Iraq are overwhelmingly hot with shade temperatures of over 110° F. Winters, however, are severe in the north, but mild in the south. Rainfall is scanty, except for the northeast where enough rain occurs to grow crops without irrigation. Elsewhere, agriculture is mostly dependent upon irrigation from the two rivers (Tigris and the Euphrates).

Iraq gained her legal independence in 1932 when she ceased to be British mandate. Iraq was not fully independent from Britain, however, until the 1958 revolution which proclaimed Iraq a republic after twenty-six years as a monarchy.

Iraq is a major member of OPEC organization. In 1979, Iraq's oil production reached a level of 3.4 million barrels a day, making Iraq second only to Saudi Arabia as a major oil exporter.[2]

GNP and Price Level

Table I shows that during the 1960-1978 period real gross national product (GNP) increased at an average annual growth rate of 7.6 percent. Between 1960 and 1972 real GNP increased at an annual rate of 5.1 percent. But, from 1973 to 1978, it grew at a very rapid rate of 12.7 percent per year. Two important factors contributed to the rapid growth during the latter period. First, unlike the first period, the second was characterized by political stability which allowed more efforts to be devoted to economic development. Second, the successful nationalization in 1972 of foreign oil companies operating in Iraq and the subsequent increases in oil prices augmented government revenues thus increasing public development expenditures.

Over the period, the Iraqi population increased at a rate of 3.3 percent per annum. Because real GNP grew faster than population, real per capita income increased at an annual growth rate of 4.0 percent. Despite this increase, per capita income in Iraq is still lower than in many countries in the world. For example, in 1978, the per capita income in Iraq was $1,860 as compared to $6,910 in Libya, $2,910 in Venezuela, $3,470 in Spain, and $5,030 in Britain.[3]

Table I also shows the trend of price level (consumer price index) and its rates of change per annum for the 1960-1978 period. During phase one (1960-1972), the consumer price index increased at an annual rate of only 2.7 percent. During phase two (1973-1978), it increased at an annual rate of 8.18 percent. Several factors have contributed to this jump in the inflation rate. First, the government's injection of the rapidly increasing oil revenues into the economy exceeded the economy's absorptive capacity. Second, beginning in 1973, import prices

TABLE I

IRAQI REAL GROSS NATIONAL PRODUCT
AND THE CONSUMER PRICE INDEX
1960-1978

Year	Real GNP	Percentage Change	Consumer Price Index (1975 =100)	Percentage Change
1960	1439.7		58.7	
1961	1584.5	10.1	59.3	1.0
1962	1638.6	3.4	60.1	1.4
1963	1644.3	0.3	62.5	4.0
1964	1831.4	11.4	62.4	-0.2
1965	1973.6	7.8	62.1	-0.5
1966	2071.3	5.0	63.4	2.1
1967	1968.0	-5.0	65.4	3.2
1968	2262.2	14.9	66.9	2.3
1969	2359.8	4.3	70.7	5.7
1970	2431.2	3.0	73.8	4.4
1971	2529.3	4.0	76.4	3.5
1972	2577.1	1.9	80.4	5.2
1973	3194.7	24.0	84.7	5.3
1974	3116.5	-2.4	91.3	7.8
1975	3907.2	25.4	100.0	9.5
1976	4666.2	19.4	112.8	12.8
1977	4828.2	3.5	123.1	9.1
1978	5125.0	6.1	128.8	4.6

In Millions of Iraqi Dinars (ID) - One ID = $3.38

Sources:
1. United Nations, Office of Development Research and Policy Analysis, DRPA Computer Tape of National Accounts, Labour Force and Population, 1980 (New York, 1981).
2. IMF, International Financial Statistics (Washington, DC, 1980).

have risen sharply as a result of world-wide inflation. Third, infrastructural bottlenecks, such as deficient ports facilities and communication networks, were a deterrent to smooth inflow of imports.

Despite this, inflation in Iraq is still less than in other OPEC countries. For example, during the 1970-1978 period, the consumer price index in Iraq increased at an annual growth rate of 7.2 percent, as compared to a 12.0 percent growth in Iran, a 14.7 percent growth in Saudi Arabia, and a 16.9 percent growth in Nigeria.[4]

This low rate of inflation in Iraq is due to the extensive system of government price controls and subsidies which cover essential consumer goods. Total government subsidies averaged around ID 76 million (one Iraqi Dinar (ID) = $3.38) during the 1974-1978 period.

Composition of Gross Domestic Product

The major components of Iraq's gross domestic product are oil, agriculture, manufacturing, construction, transportation and communications, and services. These components (they can also be referred to as sectors) may be examined in terms of their importance and growth of the national economy.

Oil Sector

The oil sector dominates the Iraqi economy. It accounted for more than one third of the country's gross domestic product (GDP) during the 1960-1973 period (Table II). Following the rise in oil prices, the share of the oil sector in Iraq's GDP rose sharply, reaching 54.2 percent in 1978.

TABLE II

GROSS DOMESTIC PRODUCT BY SECTORS
AT CURRENT PRICES

Sector & Percent	1960	1963	1966	1969	1973	1975	1978
Agriculture	97.9	109.3	140.0	161.4	188.2	297.3	473.0
Percent	17.3	16.3	15.4	15.0	12.1	7.5	7.3
Oil Extraction	208.0	242.5	298.5	335.9	563.4	2279.0	3529.2
Percent	36.8	36.2	32.8	31.3	36.4	57.4	54.2
Manufacturing	56.1	66.1	80.4	110.3	168.5	247.2	493.9
Percent	9.9	9.9	8.8	10.3	10.9	6.2	7.6
Construction	23.1	20.3	34.5	38.5	57.6	91.3	317.6
Percent	4.1	3.0	3.8	3.6	3.7	2.3	4.9
Transportation & Communication	39.7	48.8	63.2	69.1	88.5	157.6	263.5
Percent	7.0	7.3	6.0	6.4	5.7	4.0	4.1
Services	136.9	178.4	285.4	348.1	467.6	880.4	1383.3
Percent	24.2	26.6	31.4	32.4	30.2	22.2	21.3
GDP at factor cost	565.2	670.6	909.7	1074.2	1549.8	3970.5	6506.0

Source: United Nations, Office of Development Research and Policy Analysis, DRPA Computer Tape of National Accounts, Labour Force and Population, 1980 (New York, 1981).

The Iraqi oil industry up to 1972 was dominated by private foreign firms with whom the government, in 1952, signed a concession agreement providing for equal sharing of profits on crude oil production. In 1960, negotiations to revise the concession agreement between the Iraqi government and the companies broke down. By decree, the Iraqi government then reduced the concession area to a fraction of its previous size. The resulting struggle between the government and the companies impeded the development of the Iraqi oil industry during the 1960s, and eventually ended with the nationalization of foreign oil companies in 1972.[5] The annual rate of growth of Iraqi crude production dropped from 21 percent during the 1950-1960 period to 4.8 percent during the 1960-1970 period.

Iraq exports most of its oil output. During the 1960-1978 period, oil exports accounted, on average, for about 95 percent of Iraqi oil output (Table III).

There is a general concensus among economists that a policy of industrialization normally lead to a drain of foreign exchange and balance of payments difficulties. However, Iraq's development experience, particularly during the post-nationalization era, has proved thus far to be an exception to this general rule. Revenues derived from oil exports provided foreign exchange for essential imports and strengthened Iraq's external account. The strengthening external position is indicated by the rise in gold and foreign exchange reserves held by the Central Bank of Iraq (CBI) from $781 million at the end of 1972 to $6990 million at the end of 1977.[6] Oil exports during the 1960-1978 period constituted, on the average, about 82 percent of the country's total merchandise exports. Its contribution grew markedly from 68

TABLE III

CRUDE PETROLEUM PRODUCTION
AND EXPORTS
1960-1978

Year	Production	Exports	Exports as Percent of Production
1960	0.355	0.331	93.2
1961	0.368	0.347	94.3
1962	0.368	0.346	94.0
1963	0.424	0.401	94.6
1964	0.458	0.438	95.6
1965	0.479	0.457	95.4
1966	0.508	0.482	94.9
1967	0.448	0.428	95.5
1968	0.549	0.522	95.1
1969	0.555	0.528	95.1
1970	0.565	0.546	96.6
1971	0.618	0.591	95.6
1972	0.535	0.524	97.9
1973	0.787	0.703	95.4
1974	0.719	0.675	93.9
1975	0.826	0.751	90.9
1976	0.882	0.818	92.7
1977	0.857	0.791	92.3
1978	0.935	0.870	93.0

In Billion Barrels

Source: OPEC, Annual Statistical Bulletin 1979 (Vienna, 1979).

percent in 1960 to 98.6 percent in 1978 (Table IV). There is no doubt that oil exports will dominate Iraq's foreign trade in the years to come.

Oil revenues are the major source of finance to the Ordinary Budget and Development Budget. The share of oil receipts in the combined revenues of the Ordinary and Development budgets amounted, on average, to about 74 percent during the 1960-1978 period. Its contribution grew markedly from 67.7 percent in 1960 to 92 percent in 1978 (Table V). Between 1951 and 1974, about 91 percent of Development Budget revenues came from oil revenues (Table VI).

The oil sector, in spite of its high share in GDP, is extremely capital intensive and employs only a small proportion of total employment in the country. In 1973, it employed less than 0.7 percent of the country's workforce (Table VII).

Agriculture

This sector includes farming, forestry, and fishing and, next to oil, it is the most important commodity-producing sector in the economy. Its importance stems from the following reasons: (a) it employs the highest percentage of the country's total labor force, (b) it is an important source of food and raw materials for domestic consumption, and (c) it accounts for the bulk of non-oil exports.

Employment in this sector, even though it has decreased in recent years, continued to be the highest. While the sector employed about 75 percent of total estimated labor in the 1960s, this percentage declined to about 54 percent in 1973. The sectoral distribution of gainfully employed labor in 1973 is shown in Table VII. The estimated number of

TABLE IV

PROPORTION OF OIL EXPORTS IN
TOTAL MERCHANDISE EXPORTS
1960-1978

Year	Total Merchandise Exports	Oil Exports	Oil Exports as Percent of Total Merchandise Exports
1960	233.6	158.9	68.0
1961	236.3	178.2	75.4
1962	247.2	178.6	72.2
1963	278.9	206.8	74.1
1964	299.9	226.4	75.5
1965	315.0	235.7	74.8
1966	333.5	249.3	74.8
1967	297.4	217.9	73.3
1968	371.7	269.6	72.5
1969	372.1	271.8	73.0
1970	392.8	280.0	71.3
1971	500.0	375.2	75.0
1972	371.3	317.3	85.5
1973	588.1	555.3	94.4
1974	1949.9	1921.0	98.5
1975	2450.2	2414.8	98.6
1976	2737.9	2691.5	98.3
1977	2850.0	2807.5	98.5
1978	3250.9	3204.4	98.6

In Million of Iraqi Dinars

Sources: 1. United Nation, Yearbook of International Trade Statistics 1979 (New York, 1979).
2. OPEC, Annual Statistical Bulletin 1979 (Vienna, 1979).

TABLE V

OIL REVENUES AS A PERCENTAGE OF
TOTAL GOVERNMENT REVENUES
1960-1978

Year	Total Revenues	Oil Revenues	Oil Revenues as Percent of Total Revenues
1960	140.5	95.1	67.7
1961	142.6	94.8	66.5
1962	145.6	95.1	65.3
1963	158.0	110.0	69.6
1964	182.3	126.1	69.2
1965	192.4	131.4	68.3
1966	212.0	140.8	66.4
1967	207.6	130.1	62.7
1968	265.5	174.3	65.6
1969	274.5	171.1	62.3
1970	301.8	183.1	60.7
1971	424.1	296.8	70.0
1972	320.8	191.4	60.0
1973	694.7	557.4	80.2
1974	1815.9	1683.3	92.7
1975	2383.5	2214.9	92.9
1976	2812.5	2510.2	89.3
1977	3128.8	2844.2	90.9
1978	3275.9	3012.2	92.0

In Millions of Iraqi Dinars

Sources:
1. OPEC, Annual Statistical Bulletin 1979 (Vienna, 1979).
2. Central Statistical Organization, Annual Abstracts of Statistics 1970 (Iraq, 1971).
3. Central Statistical Organization, Annual Abstracts of Statistics 1975 (Iraq, 1976).
4. Central Statistical Organization, Annual Abstracts of Statistics 1978 (Iraq, 1979).

TABLE VI

REVENUES OF ECONOMIC DEVELOPMENT
PROGRAMS AND PLANS
1951-1974

Program/Plan	Total Revenues	Oil Revenues	Oil Revenues as Percent of Total Revenues
Revised First General Program (1951-1954)	107.5	104.4	97.1
Revised Second General Program (1955-1959)	241.4	234.1	97.0
Provisional Economic Plan (1959-1961)	100.9	94.1	93.3
Detailed Economic Plan (1961-1964)	239.0	195.6	81.8
Five-Year Economic Plan (1965-1969)	407.0	372.3	91.5
National Development Plan (1970-1974)	1540.0	1389.7	90.2
Total	2635.8	2390.2	90.7

In Millions of Iraqi Dinars

Source: Kadhim A. Al-Eyed, Oil Revenues and Accelerated Growth: Absorptive Capacity in Iraq (New York, 1979), p. 34,

TABLE VII

SECTORAL DISTRIBUTION OF TOTAL GAINFUL EMPLOYMENT IN IRAQ IN 1973

Sector	Number (in thousands)	Percent of Total
Agriculture	1540.4	54.0
Mining (Oil)	18.5	0.65
Manufacturing	170.0	6.00
Electricity, Gas and Water	14.3	0.50
Construction	73.0	2.55
Commerce	164.0	5.74
Transport	162.0	5.67
Services	330.0	11.56
Other	380.4	13.33
Total	2852.6	100.00

Source: Europa Publications, The Middle East and North Africa 1978-1979 (London, 1978), p. 392.

gainful employment in all sectors in 1973 stood at 2,852 thousands. Of this number, agriculture alone used 1,540 thousands, representing 54.0 percent of the country's total employment.

Exports other than oil are mainly of agricultural origin; agricultural products constitute more than half of non-oil exports. Major agricultural exports are dates, barley, wheat, and rice.[7]

Iraq's agricultural resources consist of about 12 million hectars of potentially cultivable land, equivalent to about one-fourth of the total area of the country.[8] Less than two thirds of the cultivable land is cultivated, of which half is irrigated. Owing to the widespread practice of the fallow system, however, only about 50 percent of the cultivated land is under crops in any one year.

In contrast to the rising share of oil in GDP, agriculture's share has declined rather sharply since the early 1960s (Table II). Several factors have contributed to the poor performance of this sector. Chief among these is the decision of the Iraqi planners to neglect agriculture in the development plans of 1951-1974. During this period, less than 50 percent of planned allocations to agriculture was implemented.[9] Moreover, most of the allocations went to flood-control schemes and dams rather than to drainage canals, land reclamation, development of animal wealth, and other activities that directly contribute to increasing agricultural output. Estimates of the damage due to failure to undertake drainage indicates that 20-30 percent of the irrigation area has been deserted after its salination surpassed the limit.[10]

The growing awareness and concern with the problems of the agriculture sector was reflected in the country's latest development plan (1976-1980). In the first three years of the plan agriculture received

17 percent of the total development expenditures.[11] The aim is to increase agricultural output by reclaiming lands and solving the salinity problem which affects irrigated land.

Manufacturing

The manufacturing sector is the third largest commodity-producing sector after oil and agriculture. It accounted for approximately 11 percent of GDP and about 6 percent of the country's total employment in 1973 (Table II and Table VII). Its value added increased from ID 56.1 million in 1960 to ID 493.9 million in 1978, an annual growth rate of 12.8 percent.

All heavy industries are state-owned and the government has sizable shares in many private firms. The public sector concentrates on large scale and capital-intensive industries, leaving small-scale industries in the areas of consumer goods and services to the private sector.[12]

The major industries in Iraq are foodstuffs and beverages, textile and clothing, construction materials, and petroleum refining. Other important industrial projects completed in the past two years were a petro-chemical complex, an iron and steel complex, and a chemical fertilizer plant.

The manufacturing sector experienced a comparatively high rate of growth (almost 9 percent annually) during the 1960-1973. The rate accelerated during the 1973-1978 period to about 24 percent annually. The reason for the good performance of this sector is that during the last 18 years the Iraqi planners have given top priority to this sector. In the first three years of the development plan (1976-1980), manufacturing received 32.5 percent of the total development expenditures.[13]

Other Sectors

The services sector which includes domestic trade, banking, ownership of dwellings, and public administration and defense is the largest non-commodity producing sector of the economy. Its value added increased from ID 136.9 million in 1960 to ID 1383.3 million in 1978, an annual growth rate of 13.7 percent. In spite of the remarkably high growth rate of services, however, its share in GDP has decreased from 24.2 percent in 1960 to 21.3 percent in 1978 (Table II). This is largely due to an even greater growth of the contribution of the oil sector.

As for the construction sector, the trend continued to be upward during the period under study. Its value added increased from ID 23.1 million in 1960 to ID 317.6 million in 1978, an annual growth rate of 15.7 percent. Despite technical problems associated with scarcity of engineers, shortages in input materials and skilled labor, its share in GDP increased from about 4 percent to 5 percent (Table II).

The value added in transportation and communication sector increased from ID 39.7 million in 1960 to ID 263.5 million in 1978, an annual growth rate of 11.1 percent. In spite of this big increase, the transport system in Iraq is still inadequate for its ambitious development programs. The services provided by this sector are vital for the speedy execution of these programs and the proper operation of newly established projects.

Gross Domestic Expenditures

Table VIII combines the relevant information on aggregate consumption and investment expenditures and their respective shares in GNP for

TABLE VIII

IRAQ'S CONSUMPTION AND INVESTMENT EXPENDITURES
IN CONSTANT PRICES, 1960-1978

Year	Consumption Expenditures	Consumption as Percent of GNP	Investment Expenditures	Investment as Percent of GNP
1960	656.2	45.6	234.7	16.3
1961	749.6	47.3	262.6	16.6
1962	793.9	48.4	224.4	13.7
1963	710.9	43.2	211.9	12.9
1964	880.1	48.1	251.4	13.7
1965	1034.6	52.4	251.6	12.7
1966	1061.4	51.2	283.9	13.7
1967	961.2	48.8	269.9	13.7
1968	1161.8	51.4	272.4	12.0
1969	1149.9	48.7	289.1	12.3
1970	1131.9	46.6	317.9	13.1
1971	1246.9	49.3	326.5	12.9
1972	1300.2	50.5	338.8	13.1
1973	1270.4	39.8	428.1	13.4
1974	1695.9	54.4	617.1	19.8
1975	2059.9	52.7	971.1	31.2
1976	1968.9	42.2	1417.0	36.3
1977	2266.7	46.9	1621.8	34.8
1978	2434.3	47.5	1838.7	35.9

In Million of Iraqi Dinars

Source: United Nation, Office of Development Research and Policy Analysis, DRPA Computer Tape of National Accounts, Labour Force and Population, 1980 (New York, 1981).

the 1960-1978 period. Aggregate consumption expenditures measured in terms of millions of 1975 dinars increased at an annual growth rate of 7.5 percent, from 656.2 in 1960 to 2434.3 in 1978. Because the growth rates of GNP and consumption were almost identical, the proportion of consumption expenditures out of GNP remained almost stable at about 50 percent over the entire period except for 1973 and 1976. The above figures also suggest a two-fold increase in aggregate real per capita consumption expenditures from 1960 to 1978. Taking the latter as a crude yardstick for the standard of living, this indicates a substantial improvement in the overall well-being of the population over this period.

The same table shows that real domestic investment increased from ID 234.7 million in 1960 to ID 1838.7 million in 1978, an increase of 738 percent. Most of this increase, however, occurred during the 1973-1978 period. It grew at an annual rate of 3.1 percent during the 1960-1972 period, whereas its annual growth rate jumped to 32.6 percent during the 1973-1978 period. Political instability and fluctuations in foreign exchange receipts due to the strained relations between the Iraqi government and foreign oil companies were mainly responsible for the relative stagnation of investment in fixed capital formation during the 1960-1972 period.

Unlike aggregate consumption expenditures, there was an increase in the share of real domestic investment in GNP, rising from 16.3 percent in 1960 to about 36 percent in 1978. This reflects improvement in the country's ability to invest. As can be ascertained from Table VIII, real domestic investment amounted, on average, to 13.6 percent of real GNP during the 1960-1972 period; the ratio increased to 28.6 percent

during the following six-year period. This explains the high rates of economic growth during the 1973-1978 period and the relatively low rates of growth during the 1960-1972 period.

The figures for private and government consumption expenditures are given in Table IX. Real private consumption expenditures increased from ID 472.9 million in 1960 to ID 1635.5 million in 1978, an annual growth rate of 7.1 percent. At the same time, its government counterpart grew at an annual growth of 8.5 percent. The difference between these growth rates gradually narrowed the gap between government and private consumption expenditures from about 39 percent to around 49 percent over the span of 19 years 1960-1978 (Table IX).

The figures for private and government investment are also given in Table IX. Although real private investment expenditures increased in both magnitude and rate of change, they were outweighed on both accounts by their government counterpart. The former grew at about 4.5 percent per year, whereas the latter grew at about 16 percent annually. In 1960, the ratio of government to private investment expenditures was 75.9 percent. The same ratio was 111.9 percent in 1972 and by 1978 it increased to 524.9 percent in favor of the government (Table IX). The government's predominent role in investment expenditures, coupled with its increasingly larger share in aggregate consumption expenditures, could be interpreted as the prime force behind the rapid growth of the 1960-1978 period.

The Structure of Imports

Table X summarizes the import performance of the foreign trade sector during the 1960-1978 period. At that stage of Iraqi development,

TABLE IX

PRIVATE AND GOVERNMENT CONSUMPTION AND INVESTMENT EXPENDITURES, 1960-78

Year	Private Consumption Expenditures	Government Consumption Expenditures	Ratio of Government Consumption to Private Consumption (Percent)	Private Investment Expenditures	Government Investment Expenditures	Ratio of Government Investment to Private Investment (Percent)
1960	472.9	183.3	38.8	133.4	101.3	75.9
1961	546.4	203.3	37.2	148.5	114.1	76.8
1962	571.5	222.4	38.9	113.9	110.5	97.0
1963	486.6	224.3	46.1	99.8	112.0	112.2
1964	613.9	266.2	43.4	107.6	143.8	133.6
1965	739.1	295.5	40.0	113.6	137.9	121.4
1966	747.2	314.1	42.0	139.3	144.6	133.6
1967	648.8	312.4	48.2	120.2	149.7	124.5
1968	758.9	357.9	47.2	127.9	144.4	112.9
1969	766.3	383.6	50.1	121.0	168.1	138.9
1970	743.9	387.9	52.1	144.3	173.6	120.3
1971	838.2	408.7	48.8	150.4	176.1	117.1
1972	874.7	425.5	48.6	159.9	178.9	111.9
1973	854.4	415.9	48.8	103.4	324.7	314.0
1974	1140.5	555.2	48.7	99.7	517.4	520.5
1975	1384.6	675.4	48.8	181.1	790.0	436.2
1976	1323.6	645.3	48.8	237.6	1179.4	496.4
1977	1521.6	744.9	49.0	251.9	1369.9	543.8
1978	1635.5	798.8	48.8	294.2	1544.5	524.9

In Millions of 1975 Iraqi Dinars

Source: United Nations, Office of Development Research and Policy Analysis, DRPA Computer Tape of National Accounts, Labour Force and Population, 1980 (New York, 1981).

imports assumed a dual role in the economy. Imports of capital, intermediate and consumer goods were to provide the essential ingredient for industrial development and secure a balance between aggregate demand and aggregate supply, thus subduing inflationary pressures. As Table X shows, total merchandise imports increased from ID 138.9 million in 1960 to ID 1244.1 million in 1978, an annual growth rate of about 13 percent. This high rate of growth is due to a growing need for capital and intermediate goods, the need to meet shortages in consumer goods, and rising foreign exchange receipts.

TABLE X

THE COMPOSITION OF IMPORTS
IN SELECTED YEARS

Year	Consumer Goods (Percent)	Other Goods (Percent)	Capital and Intermediate Goods (Percent)	Total Merchandise Imports (in Mill. of Dinars)
1960	26.9	13.5	59.4	138.9
1965	26.1	16.5	57.3	162.6
1970	21.8	14.9	63.2	181.7
1975	20.6	8.4	70.7	1244.7
1978	14.3	9.3	76.6	1244.1

Sources:
1. United Nations, Yearbook of International Trade Statistics 1966 (New York, 1968).
2. United Nations, Yearbook of International Trade Statistics 1970 (New York, 1973).
3. United Nations, Yearbook of International Trade Statistics 1975 (New York, 1976).
4. United Nations, Yearbook of International Trade Statistics 1979 (New York, 1980).

The major components of Iraq's imports include consumer goods-food and live animals, beverages, crude materials excluding fuels, animal and vegetable oil, and fat; intermediate goods-basic manufactures such as iron, construction materials, and rubber; capital goods-machines and transport equipment; and other goods which includes chemicals and miscellaneous manufactured goods.

The figures in Table X reflect Iraqi import policy during the 1960-1978 period. Imports of consumer goods amounted to ID 37.4 million in 1960, whereas by 1978 they were in excess of ID 177 million. Despite this increase, their share in total merchandise imports steadily declined from 26.4 percent in 1960 to around 14 percent in 1978. The share of other goods in total merchandise imports also declined from 13.5 percent in 1960 to about 9 percent in 1978. These movements in imports of these two categories mirror the policy of protectionism and the working of import substitution mechanism.

The largest component of total merchandise imports, imports of capital and intermediate goods, were encouraged to foster the establishment of import substitution industries. The share of these imports in total imports rose from 59.4 percent in 1960 to about 77 percent in 1978 (Table X). Moreover, imports of capital and intermediate goods grew faster (almost 15 percent annually) than total imports, increasing from ID 82.6 million in 1960 to ID 952.7 million in 1978 (Table X).

Money and Banking

The banking system in Iraq comprises three categories: commercial banks, specialized banks, and the Central Bank. In 1964 commercial banks were amalgamated into one state-owned-the Rafidian Bank. Although

the activities of this bank have grown substantially with the planned development of the Iraqi economy, it remains essentially an urban institution. Its facilities are heavily concentrated in Baghdad and, to a lesser extent, in two other large cities, Basrah and Mousl; residents of smaller cities do not have access to its services.

The specialized banks are also state-owned, and include the Agricultural Bank (founded in 1936), the Industrial Bank (founded in 1947), and the Real State Bank (founded in 1948). These banks specialize in financing private investment in agriculture, industry, and housing, respectively. Their main source of lending power is their own capital, the Central Bank of Iraq, time and demand deposits, and the issue of bonds. These banks do not resort to issuing bonds due to the absence of an organized capital market in Iraq. The interest rate charged by these banks cannot exceed the legally fixed rate of 7 percent per annum.[14] This rate is lower than the rate charged in the unorganized money market.

The Central Bank of Iraq (CBI) was founded in 1947. It consists of two departments-the issue department and the banking department-and is managed by a nine-member board of directors. While the CBI possesses the three traditional tools of monetary control, (1) open market operations, (2) changes in the reserve requirements, (3) changes in the discount rate, their effectiveness is effectively hampered by the institutional setting on which it was superimposed.[15] In particular, commercial banks have a very high liquidity ratio, amounting to 30.7 in 1976.

Sources of monetary base in Iraq include the CBI's net holdings of foreign assets, the CBI's net credit to the banking system, and the CBI's net claims on the government. Among these, the last two represent

the domestic components of monetary base, over which the monetary authorities have direct control. The third source of the monetary base, net foreign assets holdings of the CBI, is directly related to the external trade balance. Therefore, the CBI has only limited direct control of the money supply.[16]

FOOTNOTES

[1]Iraqi Office Press, Iraq Monthly (September, 1981), p. 32.

[2]Basil al-Bustany, "Iraq: Economic Developments," AEI Foreign Policy and Defense Review, II (1980), pp. 38-40.

[3]The World Bank, World Development Report, 1980 (Washington, D.C., 1980), p. 111.

[4]These inflation rates were calculated from the International Monetary Fund, International Financial Statistics (Washington, D.C., 1980).

[5]Farid Abolfathi, et al., The OPEC Market to Nineteen Eighty-Five (Massachusetts, 1977), p. 136.

[6]Europa Publications, The Middle East and North Africa 1978-1979 (London, 1978), p. 391.

[7]United Nations, Studies on Selected Development Problems in Various Countries, 1972 (New York, 1973), p. 13.

[8]Taghi T. Kermani, Economic Development in Action: Theories, Problems, and Procedures as Applied in the Middle East (Ohio, 1967), p. 4.

[9]Abolfathi, p. 140.

[10]Yusif A. Sayigh, The Economies of the Arab World (New York, 1978), p. 31.

[11]Europa Publications, The Middle East and North Africa 1979-1980 (London, 1979), p. 409.

[12]Kadhim A. Al-Eyed, Oil Revenues and Accelerated Growth; Absorptive Capacity in Iraq (New York, 1979), p. 71.

13. Europa Publications, 1979, p. 409.

14 Abdul-Rasool F. Ali, "The Effect of the Pattern use of Oil Revenues on the Growth and Prices of Iraq" (unpub. Ph.D. dissertation, University of Massachusetts, 1970), p. 41.

[15]Abbas Alnasrawi Financing Economic Development in Iraq (New York, 1967), p. 147.

[16]Asim Salih, "The Role of the Central Bank of Iraq in Determining and Controlling the Money Supply," The Economist (November, 1978), pp. 31-56.

CHAPTER III

SPECIFICATION OF THE MODEL

The Iraqi macroeconometric model is formulated in terms of 53 equations of which 27 are stochastic and the remainder are non-behavioral equations or identities. These equations purport to simultaneously explain the 53 endogenous variables. The model also includes 36 predetermined variables. It is non-linear in variables but linear in parameters.

The equations and identities of the model can be categorized into six groups:

A. Domestic Demand

B. Imports

C. Non-Oil Output

D. Oil Sector

E. Wages and Employment

F. Prices

This particular way of grouping the model's equations singles out the more important sectors of the economy and facilitates the task of identifying the broad directions of causality among different components of the model. The model features demand functions for consumption, investment, and imports. The supply side is represented in the model by a set of equations for sectoral value added related to final demand components. The dominance of oil export revenues is evident in its strong

infiltration throughout the system; it influences aggregate income hence aggregate expenditures, which in turn, affect sectoral production and employment. The model also emphasizes the role of capital, intermediate and consumer goods in the import sector and the role of oil exports in the export sector.

The data used in the estimation process consists of 19 observations (1960-1978) and regression coefficients are estimated both by ordinary least square (OLS) and two-stage least square (TSLS) methods. As the number of the predetermined variables of the present model far exceeds the number of observations, there is insufficient degrees of freedom to estimate the first-stage reduced-form equations of the TSLS. To solve this problem, we estimated the reduced form equations using only those predetermined variables that are highly related to the endogenous variable in the equation, excluding from each reduced form equation those predetermined variables believed to be unimportant.[1] The estimates appearing in the specified model are the OLS estimates, whereas the TSLS estimates are given in Appendix A. The difference between OLS and TSLS estimates were very small, hence the reason for using the OLS estimates in the model.

Equations of the model are selected after many experiments with different variables and functional relationships both at (a) the estimation stage, and (b) the dynamic simulation of the overall model. The statistical results of the model are subject to those limitations imposed by a small sample and a relatively inaccurate data base.

To facilitate the subsequent discussion of the specification of the model, it is necessary to provide a glossary of variables (Table XI) and a statement of the model's equations. In all cases, the t-statistic,

TABLE XI

ALPHABETICAL LISTING OF THE VARIABLES[a]

Label	Description
CE	Private consumption
CET	Total consumption
DDA	Aggregate domestic demand
DDAN	Aggregate domestic demand, in millions of current dinars
GDP	Gross domestic product
GDPN	Gross domestic product, in millions of current dinars
GDPNP	Non-oil GDP
GDPNPN	Non-oil GDP, in millions of current dinars
GNPN	Gross national product, in millions of current dinars
GVCEN	Government consumption, in millions of current dinars
GVCEN/N	Per capita government consumption, in millions of current dinars
*GVRNPTN	Government non-oil revenues, in millions of current dinars
GVRPT$	Government oil revenues, in millions of current dollars
GVRPTBA$	Goverment oil revenues base, in millions of current dollars
GVRPTN	Government oil revenues, in millions of current dinars
GVRTN	Total government revenues, in millions of current dinars
GVRTN/N	Per capita government revenues, in millions of current dinars
*GVRTXINET	Indirect taxes net of subsidies
GXPCRB	Crude oil production, in billions of barrels
*GXPRFB	Production of petroleum refined products, in billions of barrels
IFGN	Government investment, in millions of current dinars

TABLX XI (Continued)

IFP	Private investment
IFT	Total investment
NEMP	Employment level, in millions
*NFPAN	Net factor payments abroad, in millions of current dinars
*NP	Total population, in millions
*OETMB	Total imports of oil of OECD countries, in billions of barrels
PDCE	Consumer price index (1975 = 100)
PDDA	Aggregate domestic demand deflator (1975 = 100)
PDGDP	GDP deflator (1975 = 100)
PDGDPNP	Non-oil GDP deflator (1975 = 100)
PDGVCE	Price deflator of government consumption (1975 = 100)
PDIFT	Price deflator of gross investment (1975 = 100)
PDXPCR	Deflator of crude oil mining (1975 = 100)
PR	Gross disposable non-wage income, in millions of current dinars
*PTE331	Export price index for crude petroleum (1975 = 100)
*PTE331$	Crude petroleum export price, $/Bbl.
PTE332	Export price index of petroleum refined products (1975 = 100)
PTE332$	Export price of petroleum refined products, $/Bbl.
*PTM0.4-3	Unit value index of imports of SITC 0, 1, 2, and 4 (1975 = 100)
*PTM5+8.9	Unit value index of imports of SITC 5, 8, and 9 (1975 = 100)
*PTM6	Unit value index of imports of SITC 6 (1975 = 100)
*PTM7	Unit value index of imports of SITC 7 (1975 = 100)
*Q72	Dummy variable

TABLE XI (Continued)

*Q73	Dummy variable
*Q74	Dummy variable
*REX	Exchange rate, $/ID
*SUBN	Government subsidies, in millions of current dinars
TBMN	Trade balance on merchandise, in millions of current dinars
TECMT	Total merchandise exports
TECMTN	Total merchandise exports, in millions of current dinars
*TECMNP	Non-petroleum exports
*TECMNPN	Non-petroleum exports, in millions of current dinars
*TESR	Exports of services
TET	Exports of goods and services
TE331B	Exports of crude oil, in billions of barrels
TE331N	Exports of crude oil, in millions of current dinars
*TE332B	Exports of petroleum refined products, in billions of barrels
*TIME	Time trend
TMCMT	Total merchandise imports
TMCMTN	Total merchandise imports, in millions of current dinars
TMCM0.4-3	Imports of SITC 0, 1, 2, and 4
*TMCM3	Imports of SITC 3
*TMCM3N	Imports of SITC 3, in millions of current dinars
TMCM5.8+9	Imports of SITC 5, 8, and 9
TMCM6	Imports of SITC 6
TMCM7	Imports of SITC 7
*TMSR	Imports of services
TMT	Total imports of goods and services

TABLE XI (Continued)

WRN	Average wage rate, in current dinars
WYN	Total wage bill, in millions of current dinars
XAG	Value added in agriculture
XC	Value added in construction
XMM	Value added in manufacturing
XPCR	Value added in crude oil mining
XPRF	Value added in petroleum refining
XS	Value added in services
XTC	Value added in transportation and communication
XUT	Value added in utilities
YPDN	Personal disposable income, in millions of current dinars

[a]Unless otherwise indicated, all variables are measured in millions of 1975 Iraqi dinars. Exogenous variables are marked with an asterisk.

the adjusted coefficient of determination ($\overline{R}^2$), DW statistic, and standard error of estimation (SEE) are provided below each estimated equation. The following are also listed below the relevant estimated equation: first-order autocorrelation coefficient (ρ) where a serial correlation correction is made and the h-statistic where a lagged dependent variable is present among the regressors in an equation. In addition, for testing whether or not an estimated coefficient is significant, a five percent significance level is used throughout the study.

The Model

Domestic Demand

Real Private Consumption

$$CE = -56.8787 + \underset{(5.48)}{0.4616}\left(\frac{YPDN * 100}{PDCE}\right) + \underset{(4.15)}{0.4890}\, CE(-1) \qquad (1)$$

$\overline{R}^2 = 0.965$ SEE = 65.28 h = 0.78

Nominal Per Capita Government Consumption

$$GVCEN/N = 3.0793 + \underset{(3.68)}{0.0927}\, GVRTN/N + \underset{(6.08)}{0.7948}\, GVCEN/N(-1) \qquad (2)$$

$\overline{R}^2 = 0.973$ SEE = 3.78 h = -0.08

Real Total Consumption

$$CET = CE + \left(\frac{GVCEN * 100}{PDGVCE}\right) \tag{3}$$

Real Private Investment

$$IFP = \underset{}{52.1612} + \underset{(1.91)}{0.0539}\left(\frac{PR(-1) * 100}{PDIFT}\right) + \underset{(9.83)}{0.1146}\ IFT(-1) - \underset{(-2.20)}{45.3124}\ Q73 \tag{4}$$

$\overline{R}^2 = 0.888$ SEE = 18.83 h = 0.65

Nominal Government Investment

$$IFGN = \underset{}{-2.8259} + \underset{(12.32)}{0.1856}\ GVRPTN + \underset{(5.14)}{0.1704}\ GVRPTN(-1) + \underset{(3.18)}{0.1131}\ GVRPTN(-2) + \underset{(5.83)}{0.1293}\ GVRPTN(-3) \tag{5}$$

$\overline{R}^2 = 0.999$ SEE = 16.11 $\rho = -0.59$ DW = 2.43

Real Total Investment

$$IFT = IFP + \left(\frac{IFGN * 100}{PDIFT}\right) \tag{6}$$

Real Aggregate Domestic Demand

$$DDA = CET + IFT \tag{7}$$

Imports

Real Imports of Consumer Goods (SITC 0, 1, 2, and 4)

$$\begin{aligned} TMCM0.4\text{-}3 = {} & 56.6050 + \underset{(10.44)}{0.1888}\ CE - \underset{(-2.44)}{0.3150}\ XAG \\ & + \underset{(4.33)}{80.1233}\ Q74 \end{aligned} \tag{8}$$

$\bar{R}^2 = 0.917$ SEE = 17.44 DW = 1.89

Real Imports of Other Goods (SITC 5, 8, and 9)

$$\begin{aligned} TMCM5.8\text{+}9 = {} & 26.0247 + \underset{(3.95)}{0.0635}\ CE \\ & - \underset{(2.12)}{0.2341}\ XMM + \underset{(2.24)}{0.0416}\ IFT \end{aligned} \tag{9}$$

$\bar{R}^2 = 0.887$ SEE = 7.66 DW = 1.86

Real Imports of Intermediate Goods (SITC 6)

$$\begin{aligned} TMCM6 = {} & 300.7712 + \underset{(6.74)}{0.5076}\ TMCM7 \\ & - \underset{(-1.63)}{292.8625}\left(\frac{PTM6(-1)}{PDIFT(-1)}\right) \\ & + \underset{(4.31)}{133.9945}\ Q74 \end{aligned} \tag{10}$$

$\bar{R}^2 = 0.889$ SEE = 29.72 DW = 1.75

Real Imports of Capital Goods (SITC 7)

$$\begin{aligned} TMCM7 = {} & 280.6101 + \underset{(20.82)}{0.4534}\ IFT \\ & - \underset{(-3.10)}{348.9075}\left(\frac{PTM7(-1)}{PDIFT(-1)}\right) \end{aligned} \tag{11}$$

$\bar{R}^2$ = 0.975 SEE = 28.17 DW = 2.35

Real Imports of Goods

TMCMT = TMCM0.4-3 + TMCM5.8+9 + TMCM6 + TMCM7 + TMCM3 (12)

Non-Oil Output

Real Value Added in Agriculture

XAG = 138.2695 - 0.1158 TMT + 0.1750 CET (13)
(-3.13) (4.30)

$\bar{R}^2$ = 0.613 SEE = 26.58 DW = 1.99

Real Value Added in Manufacturing

XMM = 0.1538 IFT + 0.1028 CET - 0.0648 TMT (14)
(9.07) (13.33) (-3.71)

$\bar{R}^2$ = 0.979 SEE = 13.88 DW = 1.17

Real Value Added in Construction

XC = 0.2435 IFT - 0.0781 TMT + 0.0064 TET (15)
(12.0) (-4.25) (1.52)

$\bar{R}^2$ = 0.966 SEE = 16.42 DW = 1.81

Real Value Added in Transportation and Communications

XTC = 19.6115 + 0.0555 CET + 0.0178 IFT (16)
(6.25) (1.91)

$\bar{R}^2$ = 0.964 SEE = 7.39 DW = 1.83

Real Value Added in Services

$$XS = -67.1068 + \underset{(22.04)}{0.4438}\ CET \qquad (17)$$

$\overline{R}^2 = 0.964$ SEE = 46.04 DW = 1.39

Real Value Added in Utilities

$$XUT = -9.0024 + \underset{(3.16)}{0.0084}\ CET + \underset{(7.67)}{0.0097}\ IFT + \underset{(3.04)}{0.0035}\ TET - \underset{(-2.69)}{0.0044}\ TMT \qquad (18)$$

$\overline{R}^2 = 0.989$ SEE = 0.92 DW = 2.17

Oil Sector

Crude Oil Exports (Bill. Bbl.)

$$TE331B = 0.2450 + \underset{(12.26)}{0.0472}\ OETMB - \underset{(-3.44)}{0.1048}\ Q72 + \underset{(5.76)}{0.0001}\ (IFGN + GVCEN - GVRNPTN) \qquad (19)$$

$\overline{R}^2 = 0.973$ SEE = 0.03 DW = 2.26

Real Value Added in Crude Oil Mining

$$XPCR = \underset{(25.85)}{2925.0095}\ GXPCRB \qquad (20)$$

$\overline{R}^2 = 0.987$ SEE = 72.46 DW = 1.24

Gross Output of Crude Oil (Bill. Bbl.)

$$GXPCRB = -0.0180 + \underset{(54.68)}{1.0943}\ TE331B \qquad (21)$$

$\bar{R}^2$ = 0.998 SEE = 0.01 ρ = 0.57 DW = 1.96

Real Value Added in Petroleum Refining

XPRF = 546.7097 GXPRFB (22)
(37.75)

$\bar{R}^2$ = 0.95 SEE = 2.16 DW = 1.09

Export Price of Refined Petroleum Products ($/Bbl.)

PTE332$ = 1.0125 + 0.9574 PTE331$ (23)
(69.91)

$\bar{R}^2$ = 0.999 SEE = 0.15 ρ = 0.57 DW = 1.52

Government Oil Revenues (Mill. US $)

GVRPT$ = -234.159 + 0.9547 GVRPTBA$ (24)
(75.31)

$\bar{R}^2$ = 0.997 SEE = 204.64 DW = 2.46

Government Oil Revenues (Mil. Dinars)

GVRPTN = GVRPT$ / REX (25)

Government Oil Revenues Base (Mill. US $)

GVRPTBA$ = (GXPCRB * PTE331$ + GXPRFB * PTE332$) * 1000 (26)

Wages and Employment

Average Wage Rate

WRN = -265.9077 + 1.6720 PDCE(-1) + 0.6223 (GDPNP/NEMP) (27)
(2.89) (4.36)

$\bar{R}^2 = 0.947$ SEE = 25.02 DW = 1.22

Employment (millions)

$$NEMP = \underset{}{1.5774} + \underset{(2.33)}{0.0001}\ GDPNP + \underset{(13.08)}{0.0586}\ TIME \qquad (28)$$

$\bar{R}^2 = 0.998$ SEE = 0.02 DW = 1.37

Prices

Consumer Price Index

$$PDCE = \underset{}{33.3540} + \underset{(16.51)}{0.0266}\ DDA - \underset{(-2.17)}{161.8185}\left(\frac{SUBN}{IFGN + GVCEN - SUBN}\right) \qquad (29)$$

$\bar{R}^2 = 0.957$ SEE = 5.46 $\rho = -0.46$ DW = 2.16

Deflator of Government Consumption

$$PDGVCE = \underset{}{32.5355} + \underset{(20.54)}{0.2383}\ WRN \qquad (30)$$

$\bar{R}^2 = 0.959$ SEE = 5.36 DW = 2.29

Deflator of Gross Investment

$$PDIFT = \underset{}{21.6385} + \underset{(15.43)}{0.7345}\ \frac{(PTM6 * TMCM6 + PTM7 * TMCM7)/100}{TMCM6 + TMCM7} * 100 \qquad (31)$$

$\bar{R}^2 = 0.98$ SEE = 2.91 $\rho = 0.57$ DW = 1.69

Deflator of Aggregate Domestic Demand

$$PDDA = (DDAN / DDA) * 100 \qquad (32)$$

Non-Oil GDP Deflator

$$PDGDPNP = 10.4457 + 0.9183\ PDDA \quad (19.65) \tag{33}$$

$\overline{R}^2 = 0.955$ SEE = 4.40 DW = 1.98

Deflator of Crude Oil Mining

$$PDXPCR = 7.2247 + 0.9394\ PTE331 \quad (32.06) \tag{34}$$

$\overline{R}^2 = 0.983$ SEE = 4.89 DW = 1.87

GDP Deflator

$$PDGDP = (GDPN / GDP) * 100 \tag{35}$$

Other Definitions and Identities

Real Non-Oil GDP

$$GDPNP = XAG + XMM + XTC + XC + XS + XUT + GVRTXINET \tag{36}$$

Real GDP

$$GDP = GDPNP + XPCR + XPRF \tag{37}$$

Nominal GDP

$$GDPN = (GDPNP * PDGDPNP + XPRF * PDGDPNP + XPCR * PDXPCR) / 100 \tag{38}$$

Nominal Gross National Product

$$GNPN = GDPN - NFPAN \tag{39}$$

Nominal Personal Disposable Income

$$YPDN = GNPN - GVRTN \tag{40}$$

Nominal Aggregate Domestic Demand

$$DDAN = GVCEN + IFGN + (CE * PDCE + IFP * PDIFT) / 100 \tag{41}$$

Total Wage Bill

$$WYN = WRN * NEMP \tag{42}$$

Gross Disposable Non-Wage Income

$$PR = GDPN - GVRTN - WYN \tag{43}$$

Total Government Revenues

$$GVRTN = GVRPTN + GVRNPTN \tag{44}$$

Nominal Government Consumption

$$GVCEN = GVCEN/N * NP \tag{45}$$

Crude Oil Exports (Mill. Dinars)

$$TE331N = \left(\frac{TE331B * PTE331\$}{REX}\right) * 1000 \tag{46}$$

Petroleum Refined Products Exports (Mill. Dinars)

$$TE332N = \left(\frac{TE333B * PTE332\$}{REX}\right) * 1000 \tag{47}$$

Nominal Merchandise Exports

$$TECMTN = TE331N + TE332N + TECMNPN \tag{48}$$

Real Merchandise Exports

$$TECMT = \left(\frac{TE331N}{PTE331} + \frac{TE332N}{PTE332}\right) * 100 + TECMNP \quad (49)$$

Real Exports of Goods and Services

$$TET = TECMTN + TESR \quad (50)$$

Real Imports of Goods and Services

$$TMT = TMCMT + TMSR \quad (51)$$

Nominal Total Merchandise Imports

$$TMCMTN = TMCM3N + (TMCM0.4\text{-}3 * PTM0.4\text{-}3 + TMCM5.8+9 * PTM5.8+9 + TMCM6 * PTM6 + TMCM7 * PTM7) / 100 \quad (52)$$

Trade Balance on Merchandise

$$TBMN = TECMTN - TMCMTN \quad (53)$$

Discussion of the Model

Domestic Demand

Real Private Consumption. A number of studies recognize the applicability of Friedman's permanent income hypothesis[2] in studying the behavior of consumption expenditures in developing countries.[3] The permanent income hypothesis maintains that consumption expenditures do not depend on the current level of income which might include positive or negative transitory elements but rather on the consumer's perception of his or her permanent income purged of all transitory elements.

Empirically, Friedman approximates permanent income by a weighted average of present and past incomes, with geometrically declining weights over time.

In equation (1) real private consumption expenditures are specified to be a function of real disposable income and private consumption expenditures in the previous year. Lagged private consumption expenditures enters as a transformed expression for the distributed lag in income since consumption expenditures depend on current and past levels of income. This form of consumption function allows both the short-run and the long-run marginal propensity to consume (mpc) to be estimated.[4] The estimated consumption function indicates a relatively low mpc (0.46) which is in large part due to the fact that per capita income in the oil producing countries is relatively high and thus the share of consumption in income is low. The marginal propensities to consume for Kuwait[5] and Saudi Arabia[6] were estimated at 0.42 and 0.25 respectively. The low mpc is also partly due to the increasing role that the government plays in providing free social services such as education, medical care, and other services.

The long-run mpc is estimated at 0.9033 which implies a long-run marginal propensity to save of 0.0977. If personal disposable income were to increase by ID 1.0 million, private consumption expenditures would increase by ID 460,000 in the same year. Eventually, consumers would adjust their consumption behavior to their higher income level, so that in the long-run consumption would increase by ID 903,300.

Nominal Government Consumption. In macroeconometric studies, government consumption expenditures, are either (a) taken as autonomous,[7] or (b) disaggregated according to the types of factors

purchased,[8] or (c) taken as a simple function of taxes collected.[9] Due to lack of data on the components of government consumption expenditures and the importance of government oil revenues in public expenditures, government consumption expenditures are specified in equation (2) to be a function of total government revenues, population, and government consumption in the previous year. The population variable is used to reflect the need for government services and is accounted for by estimating government consumption equation in per capita terms. The underlying theoretical justification for including government consumption in the previous year is the idea that its current level is subject to a previously established level of expenditures. One important distinction between government and private consumption equations is that the former is estimated in nominal terms. Government spending is usually planned and budgeted in nominal terms. In identity (3) real government consumption is calculated using government consumption deflator. The regression results of estimating equation (2) indicates that all the variables are significant and have the expected sign with $\overline{R}^2 = 0.97$.

Real Private Investment. The entrepreneur's decision on how much to invest may depend on a number of variables such as profit expectations, rate of interest, existing stock of capital, excess capacity, and the level of income. Theoretically, Keynes proposed that investment takes place so long as the marginal efficiency of investment is greater than the market rate of interest. This implies that, given the investor's expectations regarding the future, investment has an inverse relationship with the rate of interest.

It is doubtful, however, that investment theories designed for developed economies have much relevance for developing economies such as Iraq. In the words of Klein:

> Factors making investment behavior different from that suggested (for developed economies) are the lack of an organized Western-type capital market and the presence of large government supported investment . . . We might argue that there are so many worthwhile ventures, all economically sound, that close calculation by systematic pattern is unnecessary.[10]

Thus, the rate of interest appears to be a less important factor in explaining investment behavior in developing economies. This is particularly true in the case of Iraq in view of the absence of a freely determined interest rate that reflects the real scarcity of loanable funds.

In Iraq, private investment expenditures are largely financed through retained earnings. This is so because of the family orientation of business and the virtual nonexistence of a well-developed money and capital market. Thus, in equation (4), real private investment depends on gross disposable non-wage income, a dummy variable to account for political instability, and total investment in the previous year. This specification emphasizes the role of private profits as a source of financing. Lagged total investment is used as a proxy variable for changes in absorptive capacity. It measures the extent of new investment opportunities created by previous private and public investment. A number of attempts were made to include a financial variable in the private investment function to reflect the credit conditions provided by the commercial and specialized banks, but those attempts proved to be unsuccessful. All regression coefficients are significant at the five percent level, except for non-wage income, which is significant at the ten percent level. The estimated coefficient of the dummy variable

indicates that the uncertainties created by political instability in 1973 caused real private investment expenditures to decline by ID 45.3 million in the same year.

Nominal Government Investment. Due to lack of data it was not possible to disaggregate government investment, which consists of government expenditures on social overhead capital investment and disbursements through the Development Board, by sector. This is one of the many cases where the structure of the model has to be designed to conform to available data. It would have been useful to adopt such a breakdown to analyze the effects of different policies in allocating government investment expenditures into different sectors of the economy.

The task of estimating government investment proved to be much easier than estimating private investment. Government decisions to invest are not subject to the same type of behavioral considerations as private investment decisions. More specifically, the basic determinants of government investment expenditures are the product of a special mix of social, political, and economic factors.

As discussed in the last chapter, the primary source of government investment is the oil revenues. Therefore, in equation (5) government investment is specified to depend on the current and lagged government oil revenues. In this specification we did not impose geometrically declining weights on the coefficients of past oil revenues. It is likely that current government investment expenditures depend more on past years' revenues rather than on current revenues because of the lag involved in planning and allocating such expenditures; the argument can be made that, based on this year's revenues, the government plans next

year's expenditures. Of course, projections for next year's revenues will also enter the picture, but it is not clear, a priori, whether the contemporaneous revenues' effect should be larger or smaller than the effect of lagged revenues. Therefore it was felt that it would be a more proper procedure to estimate government investment as a function of past and present oil revenues and let the regression results determine the pattern of weights of the distributed lag. All the coefficients of equation (5) are highly significant and the distribution of weights of the impact of lagged values of oil revenues is quite different than the pattern that we would have obtained by imposing geometrically declining weights.

Imports

Ordinarily import demand functions include some measure of income and import price relative to domestic prices.[11] In the model, merchandise imports are disaggregated into (a) consumer goods (SITC 0, 1, 2, and 4), (b) intermediate goods (SITC 6), (c) capital goods (SITC 7), (d) imports of mineral fuels (SITC 3), and (e) all other imports (SITC 5, 8, and 9).

Imports of mineral fuels, mostly petroleum products, are small enough relative to total imports to be treated as an exogenous variable. The remaining four categories of imports are behavioral variables and estimated in real terms. Import prices are assumed to be determined only by conditions abroad, and hence, they are treated as exogenous variables.

Imports of consumer goods, mostly food and live animals, are considered to be a function of private consumption, value added in

agriculture, and a dummy variable to account for the sudden jump in the value of imports of this category in 1974 (equation 8). In the absence of disaggregated data on private consumption, total private consumption should serve as a reasonably good indicator of demand of consumer goods. Value added in agriculture is taken to serve as an import substitution variable. The estimated regression coefficients of all variables are statistically significant and have the expected sign. The negative coefficient of value added in agriculture indicates the import substitution effect of agricultural production on the imports of consumer goods. The estimated coefficients also implies an elasticity of demand of consumer goods imports of 1.2 with respect to private consumption and -0.7 with respect to value added in agriculture.

Relevant relative prices of foreign to domestic goods were tried for this category of imports. Their estimated coefficients were not significantly different from zero and were omitted. This result is expected given that a large proportion of imports of consumer goods are foodstuffs financed mainly by the government.

All other imports category constitutes mostly chemicals, miscellaneous manufactured goods, and fixed investment related items. In equation (9) it is considered to depend on two demand factors, private consumption and total investment, and an import substitution variable, the level of value added in manufacturing. The coefficient of all variables are statistically significant and have the expected sign. The negative coefficient of the value added in manufacturing indicates the import substitution effect of manufacturing on imports of this category.

Imports of capital goods constitute mostly of machines and transportation equipment. The demand for capital goods imports, therefore,

is considered to depend on both a demand factor, total investment, and relative prices, the ratio of import price index of capital goods to the investment expenditures deflator (equation 11). Needless to say, imports of capital goods hardly have any domestically produced equivalent to be subject to import substitution effects. The coefficients of both variables are highly significant and have the expected sign, implying an elasticity of demand of capital goods imports of 1.13 with respect to investment and -1.54 with respect to relative prices.

The largest items of imports of intermediate goods are heavy industrial intermediate goods. Thus, imports of this category go hand in hand with imports of capital goods. Since Iraq does not have any significant domestic production of either category, importing one would not be very meaningful without importing the other. Therefore in equation (10) the demand for intermediate goods imports are considered to be a function of a demand factor, imports of capital goods, relative prices (the ratio of import price index of intermediate goods to the investment expenditures deflator) and a dummy variable to account for the liberal import policy the government adopted in 1974. The coefficient of all three variables are of the correct signs but only two are statistically significant. Though the t-ratio of the relative prices term is not highly significant it points in the expected direction.

Real total imports of goods and services are determined in the model through identity (51) as the sum of real merchandise imports and services. Imports of services, mostly travel and expenditures of embassies and military missions, are taken to be exogenous.

Non-Oil Output

In equations (13) to (18) value added in each sector appears to be expressed as a function of aggregate final demand components; the explanatory variables are the expenditure side components of GNP. These equations can be interpreted as transformations of input-output relationships. Let us write the relationship which is the cornerstone of the input-output analysis.

$$(I - A)\, X^g = F \qquad (V.1)$$

where A is the matrix of technological coefficients, X^g is a vector of gross output and F is a vector of final demand. We can invert this expression to obtain

$$X^g = (I - A)^{-1} F \qquad (V.2)$$

The value added is defined as the value of gross output minus all the material cost. Therefore, we can assume that value added in each sector is proportional to gross output of the corresponding sector. Thus

$$x_i = k_i\, x_i^g \qquad i = 1, \ldots, n \qquad (V.3)$$

and we can write

$$X = K\, (I - A)^{-1} F \qquad (V.4)$$

where K is a diagonal matrix whose diagonal elements are k_i ($i = 1, \ldots, n$) and the off diagonals are zeros. We can rewrite (V.4) as:

$$X = DF \qquad (V.5)$$

where $D = K(I-A)^{-1}$. System (V.5) expresses each sector's value added as a linear function of final demand components.

In the model we distinguished among six non-oil productive sectors: agriculture, manufacturing, services, transportation and communication, construction, and utilities. The choice of these sectors was primarily based on the availability of the data. Thus X, according to the model, has six elements. On the final demand side the present model incorporates four components: total consumption, total investment, total exports, and total imports, hence, F has four elements. We can, therefore, write our six value added equations as:

$$\begin{bmatrix} XAG \\ XMM \\ XTC \\ XC \\ XS \\ XUT \end{bmatrix} = \begin{bmatrix} d_{11} & d_{12} & d_{13} & d_{14} \\ d_{21} & d_{22} & d_{23} & d_{24} \\ d_{31} & d_{32} & d_{33} & d_{34} \\ d_{41} & d_{42} & d_{43} & d_{44} \\ d_{51} & d_{52} & d_{53} & d_{54} \\ d_{61} & d_{62} & d_{63} & d_{64} \end{bmatrix} \times \begin{bmatrix} \\ GET \\ IFT \\ TET \\ TMT \\ \end{bmatrix} \qquad (V.6)$$

which implies,

$$XAG = d_{11}\,CET + d_{12}\,IFT + d_{13}\,TET + d_{14}\,TMT \qquad (V.7)$$

$$XMM = d_{21}\,CET + d_{22}\,IFT + d_{23}\,TET + d_{24}\,TMT \qquad (V.8)$$

$$XTC = d_{31}\,CET + d_{32}\,IFT + d_{33}\,TET + d_{34}\,TMT \qquad (V.9)$$

$$C = d_{41}\,CET + d_{42}\,IFT + d_{43}\,TET + d_{44}\,TMT \qquad (V.10)$$

$$XS = d_{51}\,CET + d_{52}\,IFT + d_{53}\,TET + d_{54}\,TMT \qquad (V.11)$$

$$XUT = d_{61}\,CET + d_{62}\,IFT + d_{63}\,TET + d_{64}\,TMT \qquad (V.12)$$

The coefficients in each row of system (V.6) represent the response of the sector's value added to changes in the various final demand

components. The coefficients in each column represent the relative impact (share) of changes in a specific final demand component on sectoral value added.

For Iraq, however, there is no input-output table, and hence, the coefficients (d_{ij}) of equations V.7 - 7.12 had to be estimated by regression method; in this case they had to be treated as stochastic rather than deterministic equations. In our search for good fit, we had to allow for a constant term in some of the equations and to delete some of the final demand components from some of the equations.

The use of this approach in specifying and estimating sectoral value added equations is not new, especially in models of developing countries, similar techniques have been used in studies of Brazil,[12] Mexico,[13] and Sudan.[14]

Equations (13) to (18) in the model shows the regression results of estimating value added equations V.7 - V.12. In these equations imports tend to have a negative coefficient. This is to conform to the national accounts identity GNP = C + I + X - M. This also, in a sense, is the reverse of import substitution effect: the more that is imported the less that has to be produced domestically to satisfy demand. As expected, the coefficient of total exports in each equation where it is included is close to zero reflecting the fact that most of the exports are from the oil sector. Total consumption is a prime determinant of value added in services (equation 17). Value added in construction and value added in manufacturing are highly responsive to investment (equations 15 and 14 respectively). In equation (13), it appears that total consumption is influential in determining value added in agriculture.

In terms of explanatory power, all of the estimation results of sectoral value added equations indicate that $\bar{R}^2$ ranges between 0.96 to 0.99 except for the equation (13) whose $\bar{R}^2$ is 0.61. All of the explanatory variables carry the expected signs, and all coefficients are significant at the five percent level, except for the total exports in equation (15) and the total investment in equation (16), which are significant at the 20 and 10 percent levels respectively.

Oil Sector

Crude oil exports is the most crucial variable in the model in general and in the oil sector in particular. As mentioned in the last chapter, crude oil exports have a far reaching effect on the economy as a whole. In macroeconometric studies of oil producing countries, oil exports are either (a) treated as an exogenous variable,[15] or (b) taken as a simple function of a supply variable,[16] or (c) explained by a demand variable.[17] It is realized here that treatment of oil exports as purely exogenous variables introduces not only too much arbitrariness in the model, but is also inappropriate for an oil based-economy like Iraq. It is also realized that oil exports have elements of and are influenced by, both demand-related and supply-related factors; more specifically, they can be viewed as the crude oil exports of the exporting country (the supply dimension) or, as part of the crude oil imports of the importing countries (the demand dimension).

The factors influencing these two dimensions of oil exports are different; if viewed as a demand function oil exports can be specified by international variables (industrial production index in OECD countries, imports of oil of OECD countries, and export price of crude

relative to OECD's average prices) which are exogenous to the Iraqi economy. Viewed as an export function, oil exports can be explained by revenue-need related factors. Thus, it would be unrealistic to specify a strictly supply or a strictly demand oriented equation. We should view oil exports as the market equilibrium quantities which are determined both by supply and demand conditions.

In view of the above, oil exports (in billions of barrels) are specified to be a function of total imports of oil of OECD countries, excess of government expenditures over non-oil government revenues, and a dummy variable to represent the impact of nationalization of foreign oil companies operating in Iraq (equation 19). The regression results of estimating this equation indicates that all variables are significant and have the expected sign. Export price of crude oil is taken as an exogenous (policy) variable since it is determined by OPEC organization of which Iraq is a major member.

The remaining equations of this sector are straightforward, so only a short note about each will be mentioned. Real value added in crude oil mining (equation 20) is made a function of volume of gross output of oil. This equation is estimated without a constant term, and as expected the coefficient of volume of oil output is very close to the price of a billion barrels of Iraqi oil in the base year of 1975.

In equation (21) volume of gross output of crude oil is specified to be a direct function of exports of oil. This specification assumes that Iraq produces what it can and/or is willing to export. This is a reasonable assumption given the fact that Iraq has been holding production below capacity and thought to have enormous undiscovered oil

reserves.[18] This equation is estimated in billions of barrels terms with $\overline{R}^2 = 0.998$.

In petroleum refining, real value added is made a function of the volume of gross output of refined products (equation 22). This equation is estimated without a constant term with satisfactory results. Due to lack of adequate data on such variables as investment in petroleum refining and refining capacity, we were not able to estimate a reasonable equation for gross output of refined products, and hence, it was decided to take it as exogenous, at least for now, in the hope that when future refinements are made, further investigation will be made of this variable. In the petroleum refining sector, exports of petroleum products have been playing a minor role, and hence, it is treated as an exogenous variable.

In equation (23) export price of a barrel of petroleum refined products is specified to be a direct function of the export price of a barrel of crude oil. This equation is estimated in dollar terms with $\overline{R}^2 = 0.999$.

In equation (24) government oil revenues is specified to be a function of government oil revenues base which is computed as the sum of the values of crude and refined petroleum produced (identity 26). This equation is estimated in dollar terms with $\overline{R}^2 = 0.997$.

Wages and Employment

The standard model of wage determination is based on the Phillips curve, which says that the tighter the labor markets, the more rapidly wages rise.[19] Recent studies have elaborated upon this formulation by allowing for, among other things, the impact of consumer prices, and

productivity.[20] In the model nominal average wage rate is considered to have a compensatory reaction to consumer prices and to average productivity in the non-oil sector (non-oil GDP divided by the level of employment). The oil-sector, in spite of its high share in GDP, is extremely capital intensive and employs a small proportion of the total labor force. We would thus get a misleading measure of average productivity if we measure it using total GDP (oil and non-oil).

Equation (27) shows the regression results of estimating the average wage rate equation. The coefficients of both variables are statistically significant, reflecting the dependence of the wage rate on both cost of living and productivity.

As far as employment is concerned, the present model includes only one simple employment level equation. Due to lack of data on foreign and local workers employed in different sectors, we were not able to develop a detailed employment sub-model. In equation (28) employment is assumed to depend on real non-oil GDP and time trend. The coefficients of both variables are statistically significant with $\overline{R}^2 = 0.998$.

Prices

The aggregate demand and supply functions examined thus far have been formulated largely in real terms. To obtain a complete picture of national income determination it is necessary to provide an endogenous explanation of the price level. In the model prices are explained by six equations; four behavioral and two identities.

In equation (29) the consumer price index is expressed as a function of real aggregate domestic demand (the sum of total consumption and total investment), and the ratio of government subsidies to total

government expenditures (government consumption excluding subsidies, plus government investment expenditures). Aggregate domestic demand measures the extent of domestic demand pressures on consumer prices.

The ratio of government subsidies to total government expenditures emphasizes the importance of subsidies as a policy tool at government's disposal to alleviate the inflationary pressures which result from the increasing government expenditures.

In equation (30) the government consumption deflator is specified as a direct function of the nominal average wage rate; government consumption expenditures are mostly wages and salaries of government employees.

Since most of the material cost incurred in fixed investment is imported, the investment deflator is expressed as a direct function of a weighted average of the deflators of imports of capital and intermediate goods (equation 31).

Identity (32) expresses the aggregate domestic demand deflator as a weighted average of the deflators of private consumption, government consumption, and total investment. In the solution of the model, the aggregate domestic demand deflator will be influenced by the explanatory variables in equations 29-31, and hence, will have elements of demand-pull, cost-push and "imported" inflation.

In equation (33) the non-oil GDP deflator is expressed as a direct function of the aggregate domestic demand deflator.

In equation (34) the deflator of the value added in crude oil mining is specified to be a direct function of the crude oil price index.

Identity (35) expresses the GDP deflator as a weighted average of the deflators of oil and non-oil GDP.[21]

In terms of explanatory power, all of the estimation results of price equations indicate that $\bar{R}^2$ ranges between 0.95 to 0.98. All of the explanatory variables carry the expected sign, and all coefficients are highly significant at the five percent level.

Other Definitions and Identities

These relationships require little explanation, since most of them simply redefine some given variable in a very straightforward manner. A few of the relationships, however, should be mentioned. Identity (36) defines non-oil GDP as the sum of value added in each sector. This variable is a more meaningful indicator of the state of the domestic economy han GDP, since the latter, which includes value-added in the petroleum sector, is highly and directly dependent on fluctuations in international oil markets, and thus gives a rather distorted picture of domestic economic activity.

In identity (37) real GDP is determined from the supply side (as the sum of oil and non-oil GDP) rather than from the expenditures (demand) side. It was realized that in Iraq economic activity is generally supply constrained and, therefore, GDP should be determined from the supply side. In an important paper on this subject Klein[22] concluded that while substantial parts of the models used for mature economies might be carried over, more emphasis should be given to the supply side in the models for developing economies. In developed economies, the productive capacity is fairly large, the emphasis is on the expenditure side of the national accounts, the problem being to create the necessary effective demand. In developing economies such as Iraq it is not effective demand that is lacking, but rather aggregate supply.

Furthermore, the supply-side GDP identity readily lends itself to disaggregating GDP into its oil and non-oil components.

Identity (42) defines wage income as the product of the wage rate and the level of employment. Identity (43) defines gross disposable non-wage income by substracting wage income and total government revenues from GDP.

FOOTNOTES

[1] Michael D. Intriligator, Econometric Models, Techniques and Applications (New Jersey, 1978), p. 391.

[2]Milton Friedman, Theory of Consumption Function (New Jersey, 1957), pp. 7-37.

[3]Donald W. Snyder, "Econometric Studies of Household Savings Behavior in Developing Countries: A Survey," The Journal of Development Studies, X (1974), pp. 139-153.

[4]A consumption function following the Koyck distributed lag model is

$$C_t = a + b\ y_t + c\ C_{t-1}$$

In the long run, we assume that $C_t = C_{t-1}$ and thus the long-run mpc is estimated by b/(1-c).

[5]M. W. Khouja and P. G. Sadler, The Economy of Kuwait-Development and Role in International Finance (London, 1979), p. 96.

[6]Faisal Al-Bashir, A Structural Econometric Model of the Saudi Arabian Economy 1960-1970 (New York, 1977), p. 62.

[7]Adeeb K. Haddad, "An Econometric Monetary Model of the Jordanian Economy" (unpub. Ph.D. Dissertation, Oklahoma State University, 1979), p. 40; and Peter T. Chang, "A Macroeconometric Forecasting Model of Taiwan" (unpub. Ph.D. Dissertation, Oklahoma State University, 1977), p. 55.

[8]A. Ando, E. C. Brown, and E. W. Adams, "Government Revenues and Expenditures," in J. S. Duesenberry et al. (eds.), The Brookings Quarterly Econometric Model of the United States (Chicago, 1965), pp. 533-585.

[9]Erik Thorbeck and Apostolos Condos, "Macroeconometric Growth and Development Models of the Peruvian Economy," in Irma Adelamn and Erik Thorbeck (eds.), The Theory and Design of Economic Development (Baltimore, 1966), pp. 181-209.

[10]Lawrence R. Klein, "What Kind of Macroeconometric Model for Developing Economies," in Arnold Zellner (ed.), Readings in Economic Statistics and Econometrics (Boston, 1968), p. 564.

[11]Michael K. Evans, Macroeconomic Activity: Theory, Forecasting, and Control (New York, 1969), p. 221.

[12]Jere Behrman and Lawrence R. Klein, "Econometric Grown Models for the Developing Economy," in W. A. Eltis et al. (eds.), Induction, Growth and Trade, Essays in Honour of Sir Ray Harrod (London, 1970), pp. 167-187.

[13]Abed B. Del Rio and Lawrence Klein, "Macroeconometric Model Building in Latin America: The Mexican Case," in N. D. Ruggles (ed.), The Role of the Computer in Economic and Social Research in Latin America (New York, 1974), pp. 161-190.

[14]M. S. Marzouk, "An Econometric Model of Sudan," Journal of Development Economics, I (1975), pp. 337-358.

[15]Ahmad Shahshahani and J. Malcolm Dowling, "An Econometric Model Forecast of Iran, 1975-1985," The Journal of Energy and Development, II (1976), pp. 148-162.

[16]UNCTAD Staff, "Models for Developing Countries," in R. J. Ball (eds.), The International Linkage of National Economic Models (Amsterdam, 1973), pp. 109-176.

[17]Al-Bashir, pp. 23-28.

[18]National Foreign Assessment Center, The World Oil Market in the Years Ahead: A Research Paper (August, 1979), p. 47.

[19]Richard G. Lipsey, "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957: A Further Analysis," Economica, XXVII (1960), 1-31.

[20]George L. Perry, Unemployment, Money Wage Rates, and Inflation (Cambridge, 1966), pp. 40-44; and E. Kuh, "A Productivity Theory of Wage Levels-An Alternative to the Phillips Curve," Review of Economic Studies, XXXIV (1967), pp. 333-360.

[21]A number of attempts were made to include in the model a simple monetary sector. These attempts, however, proved to be unsuccessful: the model turned out to be unstable.

[22]Klein. See also Behrman and Klein as well as Del Rio and Klein.

CHAPTER IV

MODEL SIMULATION ANALYSIS

In the previous chapter, the Iraqi macroeconometric model was specified and estimated. In this chapter, the model is evaluated using simulation analysis. Particular attention is given to the extent to which the model is able to replicate the actual data, the dynamic properties of the model, and finally the model's forecast of the Iraqi economy for the years 1979 to 1985.

Validation of the Model

The purpose of econometric model validation is "to increase one's confidence in the ability of the model to provide useful information."[1] A multiple-equation model cannot be evaluated by examining the statistical fit criteria of its individual equations only. It must also be evaluated in terms of its ability to reproduce the historical data. In a multiple-equation model, the individual relations may have a very good statistical fit, but the complete model may do a very bad job when it is simulated.[2]

Simulation analysis consists of solution of the model with actual historical or assumed values of the exogenous variables.[3] In the case of an econometric model which is linear in variables, solution is easily achieved by finding the reduced form of the model. This approach can not be used if the system is nonlinear in variables as in the case of

the model presented in this study.[4] Therefore the model was solved through the method of successive iterations (the Gauss Seidel method). To explain this procedure, we consider a model which consists of only two equations, two endogenous variables (the y's), and one exogenous variable (x).

$$y_{1t} = a_1 + a_2\, y_{2t} + a_3\, x_t \tag{1}$$

$$y_{2t} = b_1 + b_2\, y_{1t} + b_3\, y_{2,t-1} \tag{2}$$

To start the iterative process in period t, a starting value for y_{1t}, say $\hat{y}_{1t}^{(0)}$, has to be supplied (we shall denote the solution of y_{it} at the rth iteration by $\hat{y}_{it}^{(r)}$. Then, using (2), compute:

$$\hat{y}_{2t}^{(1)} = b_1 + b_2\, \hat{y}_{1t}^{(0)} + b_3\, y_{2,t-1} \tag{3}$$

Using (3) solve for y_{1t} in (1):

$$\hat{y}_{1t}^{(1)} = a_1 + a_2\, \hat{y}_{2t}^{(1)} + a_3\, x_t \tag{4}$$

It is worth mentioning that $y_{2,t-1}$ and x_t are fixed and known for each time period, and do not change from iteration to iteration. The second iteration begins by resolving y_{2t} using $\hat{y}_{1t}^{(1)}$ from (4) instead of $\hat{y}_{1t}^{(0)}$:

$$\hat{y}_{2t}^{(2)} = b_1 + b_2\, \hat{y}_{1t}^{(1)} + b_3\, y_{2,t-1} \tag{5}$$

and repeat (4) with $\hat{y}_{2t}^{(2)}$:

$$\hat{y}_{1t}^{(2)} = a_1 + a_2\, \hat{y}_{2t}^{(2)} + a_3\, x_t \tag{6}$$

The process iterates in this fashion until the values of $\hat{y}_{1t}$ and $\hat{y}_{2t}$ do not change significantly from iteration to iteration. A convergence criterion commonly used is to stop iterating when the values do not change by more than 0.1 percent, i.e.,

if

$$(\hat{y}_{1t}^{(r)} - \hat{y}_{1t}^{(r-1)}) / \hat{y}_{1t}^{(r-1)} \leq 0.001 \qquad (7)$$

and if

$$(\hat{y}_{2t}^{(r)} - \hat{y}_{2t}^{(r-1)}) / \hat{y}_{2t}^{(r-1)} \leq 0.001 \qquad (8)$$

stop iterating. Convergence in this algorithm is affected by the normalization procedure, i.e., the choice of the variable in each equation to be written on the left hand side with unit coefficient, and by the order in which the y_{it} are evaluated within each iteration.[5] For the solution of the model presented in this study, the average number of iteration necessary for convergence has been eleven for each period.

Using this method, the present model is dynamically simulated within the sample period. This kind of simulation is a stringent test of the model because simulated values of endogenous variables in one period are used as input into the equation to predict the values of the endogenous variables in the following periods, and hence, problems of error accumulation may arise.[6] A dynamic simulation is a "test that a model must pass before we would be willing to use it for forecasting purposes."[7] "Of course, no model is expected to fit the data exactly:

the question is whether the residual errors are sufficiently small to be tolerable and sufficiently unsystematic to be treated as random."[8]

There are many statistics which can be used to examine how closely each endogenous variable tracks its corresponding data series. The following statistics are often used:[9] mean absolute error (MAE), mean absolute percentage error (MAPE), root mean squared error (RMSE), and root mean squared percentage error (RMSPE). These measures are defined below.

1. The Mean Absolute Error (MAE): The MAE measures the absolute value of deviation of the simulated variable (Y_t^s) from its actual time time path (Y_t^a). It is defined as:

$$MAE = \frac{1}{N} \sum_{n=1}^{N} |Y_t^s - Y_t^a| \tag{9}$$

where N = the number of periods simulated. The MAE is not subject to the downward bias associated with the mean error - $ME = \frac{1}{N} \sum_{n=1}^{N} (Y_t^s - Y_t^a)$.

2. The Mean Absolute Percentage Error (MAPE): The MAPE expresses MAE in percentage terms, and hence, it can be defined as:

$$MAPE = \frac{1}{N} \sum_{n=1}^{N} \left| \frac{Y_t^s - Y_t^a}{Y_t^a} \right| \tag{10}$$

3. The Root Mean Squared Error (RMSE): The RMSE is a measure of the deviation of the simulated variable from its historical time path. The magnitude of this error must be evaluated relative to the mean value of the variable in question. This measure weights large errors more than the MAE. It can be defined as:

$$RMSE = \sqrt{\frac{1}{N}\sum_{n=1}^{N}(Y_t^s - Y_t^a)^2} \qquad (11)$$

4. The Root Mean Squared Percentage Error (RMSPE): This measure is the same as RMSE, but in percentage terms. It is defined as:

$$RMSPE = \sqrt{\frac{1}{N}\sum_{n=1}^{N}\left(\frac{Y_t^s - Y_t^a}{Y_t^a}\right)^2} \qquad (12)$$

Another important criterion for evaluating a model is how well actual turning points are simulated during the historical period. For a model to be superior to a simple time trend, it must simulate turning points.

The simulation error measures are presented in Table XII. In addition, the detailed results of dynamic simulation of the model are given in Appendix B. Before deriving some conclusions from the results of model simulation, the following analysis based on Table XII is in order.

A glance at the estimated and actual figures in Appendix B shows that aggregate domestic demand (DDA) and its components, total investment (IFT) and total consumption (CET) track their respective paths reasonably well. The RMSE for DDA is 3.35 which is approximately 2.42 percent of its value over the simulation period. A close analysis of the error statistics of the two components of DDA, i.e., CET and IFT, reveals that their errors tend to offset each other: while the sum of the RMSEs for CET and IFT is 72.34, the RMSE of their sum DDA is only 51.83.

The RMSE for private consumption (CE) is 33.02. This is approximately 3.3 percent of its mean value over the simulation period and is

quite small. Its simulated series, however, missed two turning points out of four. Error measures relating to government consumption (GVCEN) are also satisfactory with RMSPE of 4.06 percent. In 1971 GVCEN underestimated its actual value by almost 12 percent, resulting in an overall MAPE of 2.36 percent.

Table XII indicates that the MAPEs for private investment (IFP) and government investment (IFGN) are only 4.22 and 3.71 percent respectively. The simulated series of IFP, however, missed two turning points out of four.

A glance at the estimated and actual figures in Appendix B shows that import components of consumer goods (TMCMO.4-3), intermediate goods (TMCM6), capital goods (TMCM7), and imports of other goods (TMCM5.8+9) do not track their respective paths very well, and hence, their error measures are generally higher than those for other variables in the model. This is mainly due to the errors associated with the construction and estimation of import price deflators which were used in deflating the nominal values of import components. In addition, a close analysis of the error statistics of the four components of total merchandise imports (TMCMT) reveals that their errors tend to cancel out; while the sum of RMSEs of TMCMO.4-3, TMCM5.8+9, TMCM6, and TMCM7 is 38.94, the RMSE of their sum TMCMT is only 21.6. The simulated series of TMCMT missed one turning point out of four.

As regards oil exports (TE331B) and oil revenues (GVRPTN), the results appear encouraging in that RMSPEs, are 4.55 percent for TE331B and 5.06 percent for GVRPTN. Their simulated series predicts the turning point of 1972 very well.

TABLE XII

RESULTS OF DYNAMIC SIMULATION

Variable	MAE	MAPE (Percent)	RMSE	Ratio of RMSE to Variable's Mean Value (Percent)	RMSPE (Percent)
CE	24.39	3.07	33.02	3.30	4.48
CET	36.64	2.95	45.47	3.07	3.98
DDA	38.06	2.35	51.83	2.42	3.35
DDAN	36.60	2.06	48.65	2.48	2.64
GDP	130.00	3.91	150.12	4.5	4.43
GDPN	84.11	2.75	135.24	5.41	3.23
GDPNP	23.32	1.65	29.11	2.06	2.02
GNPN	84.11	3.01	135.24	5.75	3.51
GVCEN	8.44	2.36	13.50	3.02	4.06
GVRPT$	102.19	4.41	153.37	4.53	5.06
GVRPTBA$	150.93	4.18	244.41	5.70	4.91
GVRPTN	31.15	4.41	45.54	4.47	5.06
GVRTN	31.15	3.14	45.54	3.90	3.50
GXPCRB	0.03	4.42	0.03	4.54	5.19
IFGN	6.32	3.71	8.42	1.86	6.06
IFP	5.70	4.22	7.12	4.44	5.49
IFT	19.73	3.37	26.87	4.06	4.06
NEMP	0.02	1.06	0.03	1.23	1.12
PDCE	3.22	3.96	4.04	4.69	5.23
PDDA	2.17	2.91	2.41	2.96	3.45
PDGDP	2.88	4.29	4.18	6.23	5.49

TABLE XII (Continued)

PDGDPNP	2.67	2.98	3.83	4.46	4.01
PDGVCE	4.26	4.81	5.46	6.49	5.67
PDIFT	1.94	2.64	2.46	3.43	3.23
PDXPCR	3.43	5.68	5.34	10.09	7.38
PR	96.67	10.63	149.55	19.34	15.51
PTE332$	0.16	3.88	0.19	3.27	4.52
TBMN	38.22	5.39	61.83	9.21	6.44
TECMT	69.36	3.41	82.00	3.84	4.15
TECMTN	37.21	3.08	58.54	4.88	3.70
TET	69.36	3.47	82.00	3.81	4.25
TE331B	0.02	3.71	0.02	3.2	4.55
TE331N	37.25	3.71	58.57	5.18	4.55
TMCMT	17.65	3.99	21.60	3.24	5.45
TMCMTN	9.42	3.97	10.81	2.04	5.35
TMCM0.4-3	8.34	7.13	10.44	6.94	9.79
TMCM5.8+9	3.98	5.68	4.88	6.77	7.01
TMCM6	11.40	8.07	14.67	7.89	11.63
TMCM7	7.60	5.36	8.95	3.51	7.68
TMT	17.65	3.61	21.60	2.41	4.96
WRN	8.37	4.41	10.63	4.86	5.62
WYN	25.24	5.46	31.40	5.60	6.65
XAG	9.05	3.18	11.32	3.85	4.05
XC	3.89	5.87	4.93	4.71	8.78
XMM	6.61	4.35	7.98	4.11	5.66
XPCR	131.25	7.15	148.59	7.93	8.08

TABLE XII (Continued)

XPRF	1.68	8.25	2.22	11.6	10.38
XS	16.14	2.78	20.43	3.43	3.44
XTC	3.79	3.37	4.37	3.82	3.88
XUT	0.51	4.14	0.69	5.15	5.20
YPDN	95.92	6.12	152.39	12.50	7.80

The RMSPEs for the sectoral value added are all far below 10 percent, except for the value added in petroleum refining which is 10.38 percent. Fortunately, value added in petroleum refining constitute a very small fraction of Iraq's GDP (0.01 percent in 1978), and the error associated with this equation should not affect the outcome of the model.

The RMSE for non-oil GDP is 29.11 which is 2.06 percent of its mean value over the simulation period and is quite small. Its simulated series captures the turning point of 1973 which is the only one in its data series. Therefore, the simulated values of GDP are off by only 3.91 percent from the actual (historical) values. It is interesting to observe that it predicts the turning point of 1972 very well.

The error statistics of price deflators are more or less on par with those of the other variables discussed earlier. In terms of RMSPE, aggregate domestic demand deflator (PDDA), and investment deflator (PDIFT) standout. It is 0.45 percent for PDDA and 3.23 percent for PDIFT. As regards employment level (NEMP) and wage rate (WRN), the results also appear encouraging in that RMSPEs are 1.12 for NEMP and 5.62 for WRN.

The simulated values of gross disposable non-wage income (PR), which is an identity (non-behavioral) variable, are off by 10.93 percent from the actual values. PR is defined as GDP minus the sum of total government revenues and total wage bill, and hence, it is relatively small. Therefore, the MAPE and RMSPE would appear relatively large.

The above analysis supports the following general conclusions regarding simulation of the model:

1. The model replicates the time paths of most endogenous variables reasonably well and its overall performance in the sample period seems acceptable.

2. There is a tendency of errors to offset among components of some of the aggregates. This feature is common in econometric studies, including econometric models of U.S. economy.[10]

3. Finally, it should be pointed out that our statement in this section regarding the error statistics being "large", "small", or "acceptable" are mostly subjective and are based on the present state of the art in econometric modeling of developing countries. An informal comparison of the performance of the present model with that of some other models of developing countries might shed light on this subject. This is undertaken in Table XIII which exhibits the RMSPEs of some strategic variables of the present and three other models. Only the RMSPE is reported since this is more relevant, if any, for such a comparison. Apart from columns 1 through 4 which give the RMSPEs in percent, a ranking of the results is provided in column 5. The results, though quite encouraging for the present model, are not fully conclusive. The present model ranks first in 2 out of 5 cases. It ranks second in GDP and IFT and third in PDCE. These results, which should be interpreted cautiously, are intended to give only rough measures of some of the available range of errors in models of developing countries, and hence the relative performance of the present model.

Multiplier Analysis

The examination of a macroeconometric model is not complete until multiplier analysis is explored.[11] The purpose of multiplier analysis

TABLE XIII

ROOT MEAN SQUARE PERCENTAGE ERRORS (RMSPE) OF THE HISTORICAL SIMULATION OF SELECTED VARIABLES OF THE IRAQI MODEL, THE GREEK MODEL, THE LIBYAN MODEL, AND THE IRANIAN MODEL

Variables	(1) Iraq (1960-78) %	(2) Greece (1950-66) %	(3) Libya (1962-75) %	(4) Iran (1958-72) %	(5) Rank of Iraqi Model
GDP	4.43	0.9	5.24	n.a.	2
CE	4.48	n.a.	9.15	4.91	1
IFT	4.06	1.81	4.98	11.79	2
PDCE	5.23	1.04	8.59	2.81	3
XPCR	8.08	n.a.	11.39	25.88	1

Sources: Col. 2: Nikos Vernardakis, Econometric Models for the Developing Economies: A Case Study of Greece (New York, 1978).

Col. 3: Salem M. Moustafa, "An Econometric Model of the Libyan Economy, 1962-1975" (unpub. Ph.D. dissertation, Southern Methodist University, 1979).

Col. 4: Ali M. Parhizgari, "Mathematical and Econometric Models of Development Planning: The Case of Iran" (unpub. Ph.D. dissertation, University of Maryland, 1976).

is to examine the path that the system follows, when it is subjected to an exogenous shock, and see whether it corresponds to a priori information derived from economic theory.[12] Dynamic multipliers provide measures of both the magnitude and time response pattern of endogenous variables to changes in an exogenous variable. Dynamic multiplier analysis also provides a check on the stability of the model. The system is considered stable if the dynamic multipliers become smaller and smaller in absolute value and converge to zero over time, i.e., the sum of dynamic multipliers is finite.[13]

Multiplier simulations have been made for the following exogenous shocks:

- One-period shock in the volume of oil exports
- One-period shock in the price of oil
- One-period shock in the total imports of crude oil by OECD countries
- The impact of adopting the policy of denominating the price of a barrel of oil in terms of SDR (Special Drawing Rights) rather than in terms of dollar on the economy.

Each of the above changes in the exogenous variables is considered separately.

Since the exports of oil variable is endogenous in the system, we first exogenize it and then solve the model under this condition. This solution is considered to be the original solution. Then we assume an increase in the volume of oil exports in 1965 by 20 percent and solved the model to obtain the control solution. The choice of the year 1965 is arbitrary and has no significance. The increase in the volume of oil exports causes nearly every variable in the system to increase

(Table XIV). The 20 percent increase in oil exports resulted in about 14 percent increase in GDP in the first year. In the second year, the percentage increase in GDP declined sharply to about 0.7 percent and continued in this direction in the years after. These results are due to the fact that the 20 percent increase in the volume of oil exports in 1965 is a non-sustained one; it caused oil GDP to increase by about 22 percent in the same year and zero percent in the subsequent years. Consequently, the 14 percent increase in total GDP in the first year came mainly from the 22 percent increase in oil GDP; the small percentage increases in total GDP in the subsequent years came solely from non-oil GDP. The response of non-oil GDP to the increase in oil exports is very small; it increased by only 2.6 percent in the first year and by the third year the increase was only 1.16. Imports and prices increased because of the increase in domestic demand. These results indicate that the oil sector in general and oil exports in particular have little effect on domestic non-oil economic activities and the major part of the gain from these exports comes through their effect on domestic demand. The implication of this simulation experiment is that in order for Iraq to benefit from a sharp stimulus and enter an era of sustained growth, it must launch an attack on the limits that restrict its absorptive capacity and use its oil revenues more efficiently.

An increase of 20 percent in the price of oil in 1965 caused a minor decline in private consumption in the same year due to the fact that the resulting increase in the consumer price index outweighs the increase in personal disposable income (Table XV). Nevertheless, the increase in the export price of oil has an expansionary effect on the economy through its effect on government oil revenues.

TABLE XIV

PERCENTAGE CHANGES IN SELECTED VARIABLES FOR AN INCREASE IN THE VOLUME OF OIL EXPORTS BY 20 PERCENT

Variable	Year 1	2	3	4	5	6	7	8	9	10
CE	3.81	2.63	1.85	1.32	.99	.76	.61	.33	.25	.08
GVCEN	2.24	1.70	1.33	1.02	.78	.6	.45	.35	.25	.14
IFGN	12.85	9.05	6.47	6.45	0.0	0.0	0.0	0.0	0.0	0.0
IFP	0.0	3.84	1.94	1.19	1.21	.24	.15	.12	.14	.07
GDP	13.97	.69	.52	.22	.17	.13	.11	.07	.05	.03
GDPN	19.68	1.87	1.39	1.01	.62	.47	.34	.28	.18	.07
XPCR	22.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GDPNP	2.6	1.68	1.16	.89	.53	.42	.33	.25	.18	.12
YPDN	7.75	2.92	2.03	1.61	.97	.75	.62	.44	.33	.23
TMCMT	4.39	4.33	2.99	2.81	.86	.35	.24	.19	.13	.05
PDGDP	3.77	1.17	.87	.65	.4	.3	.2	.2	.11	.02
PDGDPNP	1.31	1.06	.77	.59	.36	.26	.2	.15	.12	.07
PDCE	1.67	1.47	.99	.85	.36	.26	.2	.15	.13	.08
PDGVCE	2.47	2.38	1.75	1.27	.86	.66	.26	.2	.15	.13
PDDA	1.55	1.25	.91	.70	.42	.30	.23	.18	.13	.08
WRN	5.75	4.69	3.39	2.39	1.58	1.02	.76	.58	.41	.30
NEMP	.12	.08	.05	.04	.03	.02	.02	.01	0.0	0.0

TABLE XV

PERCENTAGE CHANGES IN SELECTED VARIABLES FOR AN INCREASE IN THE PRICE OF OIL BY 20 PERCENT

Variable	Year 1	2	3	4	5	6	7	8	9	10
CE	-0.14	.17	.28	.31	.32	.32	.31	.26	.20	.06
GVCEN	2.14	1.66	1.29	1.0	.77	.59	.45	.35	.25	.14
IFGN	12.69	9.24	6.32	6.42	.15	.09	.05	.03	.02	0.0
IFP	0.0	1.24	1.4	.96	1.08	.17	.11	.09	.1	.07
GDP	.41	.37	.28	.27	.12	.11	.09	.08	.05	.02
GDPN	4.93	.78	.64	.60	.32	.28	.23	.20	.14	.04
XPCR	0.23	0.19	0.13	0.13	0.03	0.02	0.02	0.01	0.01	0.01
GDPNP	.66	.62	.49	.47	.26	.24	.21	.17	.12	.03
YPDN	.56	1.16	.91	.90	.50	.44	.4	.30	.26	.11
TMCMT	2.80	2.80	2.18	2.31	.60	.18	.13	.11	.08	.01
PDGDP	4.5	.41	.35	.33	.20	.16	.13	.11	.09	.02
PDGDPNP	.39	.43	.37	.34	.19	.15	.13	.10	.10	.06
PDCE	.79	.78	.59	.6	.2	.15	.13	.11	.09	.03
PDGVCE	.69	.95	.80	.70	.49	.32	.27	.22	.16	.07
PDDA	.46	.51	.43	.39	.23	.17	.15	.12	.12	.07
WRN	1.47	1.90	1.56	1.32	.91	.58	.48	.39	.28	.12
NEMP	0.03	.03	.02	.02	.01	.01	0.0	0.0	0.0	0.0

Comparing the effects of the 20 percent increase in the price of oil with the 20 percent increase in the volume of oil exports, we can say that both have expansionary and inflationary effects on the economy, but the effects are larger in the case of the increase in the volume of oil exports; even though the increases in both government consumption and government investment expenditures resulting from both shocks (the increase in oil exports and the increase in oil prices) are almost of the same magnitude, the increase in GDP which resulted from the former shock is much larger than that resulted from the latter shock. The reason is that oil exports affect GDP in two ways: first, through its effect on the oil revenues, which directly affect both government consumption and government investment; second, more exports of oil means more production of oil, which also means higher value added in the oil sector, and hence, higher GDP.

A 20 percent decrease in total imports of oil in 1965 by OECD countries causes nearly every variable in the system to decrease (Table XVI). It results in about seven percent decrease in oil exports in the first year. This leads to about eight percent decrease in oil GDP, and hence, almost five percent decrease in total GDP. This result supports our a priori conviction that economic activities in Iraq are extremely vulnerable to fluctuations in international oil markets.

These simulation experiments indicate that oil variables are a major source of fluctuation in GDP and other economic indicators. These findings have important implications for development planning policies which should emphasize the efforts to decrease the economy's dependence on the oil sector by diversifying investment and increasing production in the non-oil sectors.

TABLE XVI

PERCENTAGE CHANGES IN SELECTED VARIABLES FOR A TWENTY PERCENT DECREASE IN THE TOTAL IMPORTS OF OIL BY OECD COUNTRIES

Variable	Year 1	2	3	4	5	6	7	8	9	10
CE	-1.27	-.91	-.62	-.45	-.33	-.25	-.21	-.15	-.11	-.09
GVCEN	-0.73	-.56	-.44	-.34	-.26	-.20	-.15	-.12	-.09	-.05
IFGN	-4.31	-3.13	-2.15	-2.18	-.05	-.03	-.02	0.0	0.0	0.0
IFP	0.0	-1.25	-.65	-.39	-.41	-.09	-.06	-.04	-.05	-.02
GDP	-4.71	-0.28	-.19	-.15	-.08	-.06	-.05	-.04	-.03	-.02
GDPN	-3.22	-0.66	-.46	-.36	-.21	-.16	-.12	-.10	-.06	-.03
XPCR	-7.62	-0.07	-0.05	-0.04	-0.04	-0.01	-0.01	-0.01	0.0	0.0
GDPNP	-0.86	-0.57	-.39	-.30	-.18	-.14	-.11	-.08	-.07	-.04
YPDN	-2.56	-1.01	-.67	-.55	-.33	-.25	-.21	-.15	-.11	-.08
TE331B	-6.86	-0.06	-0.04	-0.04	-0.01	-0.01	-0.01	-0.01	0.0	0.0
TMCMT	-1.45	-1.46	-1.01	-0.95	-.31	-.13	-.10	-.07	-.06	-.01
PDGDP	-1.56	-0.39	-.27	0.21	-.13	-.10	-.07	-.06	-.03	-.01
PDGDPNP	-0.44	-0.37	-.26	-.20	-.12	-.09	-.07	-.05	-.02	-.03
PDCE	-1.28	-0.91	-.62	-.45	-.33	-.25	-.21	-.15	-.12	-.09
PDGVCE	-0.91	-0.80	-.58	-.43	-.29	-.19	-.14	-.11	-.09	-.06
PDDA	-0.52	-0.44	-.31	-.24	-.14	-.10	-.08	-.06	-.03	-.03
WRN	-1.92	-1.60	-1.13	-.81	-.54	-.34	-.26	-.20	-.16	-.11
NEMP	-0.04	-0.03	0.02	0.01	-.01	-.01	-.01	-.01	0.0	0.0

To examine the impact of adopting the policy of denominating the price of a barrel of crude oil in terms of SDR, rather than in terms of dollar, the model is run intact up to 1971. Then the dollar prices of oil for the period 1972-1978 are adjusted using the dollar-SDR exchange rate. The choice of the year 1972 is dictated by the fact that prior to 1972 the dollar-SDR exchange rate is one.[14] Table XVII indicates that if OPEC and hence Iraq had adopted SDR pricing of oil rather than dollar pricing of oil to safeguard the purchasing power of its oil revenues against inflation and dollar depreciation against other major currencies, oil revenues accruing to Iraq would have gone up substantially and the growth of economic activities in Iraq would have been faster. This result explains the reason behind of some OPEC countries' demand for linking oil prices to currencies other than the US dollar, e.g. to DMs or SDRs.

Forecast for 1979-1985

The complete system is dynamically simulated to forecast the Iraqi economy for the years 1979 to 1985. This forecast is predicated on the assumption that all the exogenous variables, other than oil variables, will continue to grow at their historical rates. It is further assumed that 1960-1978 estimates of the structural parameters will continue to be valid during the forecast period 1979-1985 which is a reasonable assumption since the forecast period is not long.

Before the war, oil production and exports in Iraq (like in Saudi Arabia, Kuwait, and the United Arab Emirates) were constrained by policy measures rather than resource considerations. Currently, however, oil production and exports is constrained neither by policy nor by resource

TABLE XVII

PERCENTAGE CHANGES IN SELECTED VARIABLES FOR ADOPTING THE POLICY OF DENOMINATING THE PRICE OF A BARREL OF OIL IN TERMS OF SDR

Variable	Year 1	2	3	4	5	6	7
CE	0.04	.12	.79	1.2	.8	1.2	1.69
GVCEN	0.85	3.59	10.91	13.11	14.12	16.69	21.13
IFGN	10.06	13.13	22.83	22.13	21.56	23.97	29.17
IFP	1.86	2.54	4.25	11.09	12.37	13.85	15.96
GDP	0.33	.79	3.08	3.94	4.37	5.66	7.50
GDPN	2.39	7.88	17.85	15.19	14.71	18.99	25.96
GDPNP	0.45	1.38	5.16	5.4	5.39	6.82	8.83
XPCR	0.25	0.44	1.88	2.93	3.58	4.79	6.50
YPDN	0.71	2.62	9.02	9.44	9.87	11.5	14.32
TMCMT	3.07	6.30	11.5	16.68	18.14	20.01	24.37
PDGDP	2.05	7.03	14.33	10.83	9.91	12.62	17.18
PDGDNPN	0.31	1.2	3.53	4.12	4.09	4.23	5.06
PDCE	0.77	2.36	7.62	7.97	9.33	9.93	12.11
PDGVCE	0.44	1.62	5.90	7.68	7.33	8.93	10.66
PDDA	0.35	1.39	4.03	4.61	4.53	4.64	5.52
WRN	0.79	2.84	10.47	11.79	10.17	12.07	14.05
NEMP	0.02	0.07	0.25	0.32	0.38	0.5	0.66

constraints, but rather by the war damage to oil facilities (the war between Iraq and Iran started in September 1980). Therefore, we had to exogenize the oil sector and simulate the model through 1985 using the Wharton Middle East Economic Service projections for the Iraqi oil variables (shown in Table XVIII) as our assumptions for these variables during the forecast period.

Wharton projections for the Iraqi oil variables are based on the following assumptions:[15] (a) Renovation, and in some cases reconstruction, of the damaged oil facilities is expected to progress slowly, given the continued hostility from Iran; (b) Iraq's re-capturing of its pre-war market share will be a slow process. Iran is expected to start increasing its output at the same time as Iraq, and the current oil glut is not expected to disappear very fast. All these are expected to make it difficult for Iraq to have a quick recovery in its oil sector.

As far as oil prices are concerned, Iraq is expected to adopt a rather moderate stand in the short run, in order to re-capture its pre-war market.

Results of the forecast are shown in Table XIX. Some of the implications of this forecast might be summarized as follows:

1. Government oil revenues are estimated at $11.7 billion in 1981. This represents a drastic decline compared with the revenues accrued to the government in 1980. This is mainly a consequence of the 60 percent drop in oil production. Based on our oil production and price assumptions described earlier, however, a very rapid recovery in oil revenues is projected over the forecast horizon.

2. Real non-oil GDP is projected to register a decline of around one percent in 1981. Combined with the close to 60 percent decline in

TABLE XVIII

VALUES OF OIL PRODUCTION, EXPORTS, AND PRICES USED DURING THE FORECAST PERIOD, 1979-85

	Oil Production (million bbl/d)	Oil Exports (million bbl/d)	Official Prices of Iraqi Oil (US $/bbl)
1979*	3.48	3.28	18.50
1980*	2.51	2.31	30.3
1981	1.00	0.82	36.5
1982	1.85	1.65	37.0
1983	2.40	2.18	39.0
1984	3.30	3.05	44.20
1985	3.40	3.14	51.40

Source: Wharton Middle East Economic Service, Gulf Economic Outlook, (October, 1981), p. 159.

*Figures for these two years are actual, source: National Foreign Assessment Center, International Energy Statistical Review (August 25, 1981).

TABLE XIX

FORECAST RESULTS FOR MAJOR ECONOMIC INDICATORS, 1979-85

Variable	1979	1980	1981	1982	1983	1984	1985
CE	1784.3	1905.6	1816.1	1914.1	2059.6	2238.8	2415.7
% Change	9.1	6.8	-4.7	5.4	7.8	8.7	7.9
GVCEN	1456.9	1851.9	2440.2	3057.5	3730.4	4459.1	5387.8
% Change	22.8	27.1	31.7	25.2	22.0	19.5	20.8
IFGN	1978.6	2299.5	2531.0	2870.1	3401.1	4129.9	5273.0
% Change	20.5	16.2	10.0	13.4	18.5	21.4	27.6
IFP	324.2	347.7	351.4	354.0	365.7	389.2	430.6
% Change	10.2	7.2	1.1	0.7	3.2	6.4	10.6
IFT	1972.7	2051.5	2018.0	2047.3	2180.2	2382.1	2729.0
% Change	7.3	4.0	-1.8	1.5	6.5	9.3	14.6
GDP	6436.3	5516.5	3845.1	4853.7	5608.1	6783.6	7160.7
% Change	22.4	-14.3	-30.3	26.2	15.5	21.0	5.6
GDPNP	2535.0	2682.0	2657.1	2776.6	2956.3	3180.4	3460.9
% Change	10.3	5.8	-0.9	4.5	6.5	7.6	8.8
XAG	340.7	355.0	361.4	369.7	386.7	409.1	436.1
% Change	6.8	4.2	1.8	2.3	4.6	5.8	6.6
XC	415.6	463.4	469.2	473.9	487.1	511.0	574.9
% Change	19.9	11.4	1.3	1.0	2.8	4.9	12.5
XTC	192.0	201.0	206.8	215.9	228.3	247.7	273.3
% Change	9.3	4.7	2.9	4.4	5.8	8.5	10.3
XMM	458.0	480.5	460.9	466.6	492.7	539.1	600.4
% Change	11.2	4.9	-4.1	1.3	5.6	9.4	11.4

TABLE XIX (Continued)

XS	988.7	1043.3	1022.5	1108.8	1213.2	1318.5	1415.6
% Change	7.2	5.5	-1.9	8.4	9.4	8.7	7.4
XUT	40.1	38.8	36.3	41.6	48.4	55.0	60.7
% Change	20.2	-3.2	-6.6	14.9	16.1	13.7	10.4
XPCR	3864.9	2897.1	1174.3	2063.5	2636.7	3586.8	3681.8
% Change	32.4	-27.4	-58.2	75.7	27.8	36.0	2.7
GVRPT$	20000.5	24000.3	11000.7	21000.5	29000.4	45000.6	54000.7
% Change	101.4	18.5	-51.9	83.7	38.4	55.4	20.0
TECMTN	6576.2	7422.2	2765.1	6040.8	8546.1	13754.8	18406.5
% Change	102.3	12.9	-62.7	118.5	41.5	60.9	19.3
TMCMTN	1686.4	2727.7	3664.5	4855.2	6108.9	7986.3	10514.9
% Change	35.6	61.7	34.3	32.5	25.8	30.7	31.7
TBMN	4889.7	4694.4	-899.4	1185.6	2437.3	5768.5	5981.6
PDGDP	156.6	212.9	217.0	246.4	269.0	308.4	345.4
% Change	22.5	36.0	2.0	13.5	9.2	14.7	12.0
PDGDPNP	141.1	154.7	170.6	186.9	202.5	218.1	233.5
% Change	3.1	9.6	10.3	9.6	8.3	7.7	7.1
PDDA	142.5	157.5	174.9	192.9	210.0	227.1	244.1
% Change	9.2	10.5	11.1	10.3	8.9	8.2	7.5
PDCE	157.9	171.0	186.7	202.6	217.2	230.9	243.3
% Change	6.1	8.3	9.2	8.5	7.2	6.3	5.4

the oil sector (resulting from the war damage to the oil facilities), this will lead to a total real GDP decline of over 30 percent in 1981. A slow but steady recovery is projected in the non-oil GDP for the next four years, with a much more rapid growth in the oil sector.

The most seriously affected sectors in the non-oil economy are expected to be manufacturing and services sectors. The former, which accounted for 17 percent of non-oil GDP in 1980, is projected to decline by over four percent in 1981, followed by a weak upturn of 1.3 percent in 1982. Services (including public utilities), which accounted for 40 percent of non-oil GDP in 1980, is projected to register a decline of around two percent in 1981.

The productive sectors, particularly agriculture, construction, and transportation and communication, while showing a significant slowdown, are not projected to undergo negative growth. It should perhaps be noted that despite the fact that the Gulf War did not start until mid-September of 1980, an overall deceleration is apparent in the 1980 annual average estimates. So that the trends of 1981 are the continuation of trends which started late 1980.

The fastest recovery is projected to occur in the services sector, with a significant upturn in utilities and other services to occur as early as 1982. This forecast is based on the assumption that the government, in its effort to minimize the effects of the war on the Iraqi people, will give top priority to basic public services. This trend will continue during 1983 and 1984, when an overall recovery is projected to be well underway.

3. Real private consumption expenditures and real fixed capital formation are projected to suffer a small negative growth rate in 1981.

The decline in the latter is partly due to the reluctance of foreign business in Iraq to undertake, or participate in, new investments, despite the government's assurances that there is no economic crisis resulting from the war and that Iraq has enough reserves to meet all foreign commitments in the long run. Fast recovery is projected for both of these variables, particularly for private consumption expenditures.

Unlike private consumption expenditures and capital formation, and mainly due to the new spending needs imposed by the war, government consumption expenditures were projected to increase significantly during 1979 and 1980. In fact our projection indicates that there was a marked acceleration in the growth rate of government consumption expenditures both in 1980 and in 1981. Compared with around 23 percent growth in 1979, nominal public consumption expenditures are projected to have grown by more than 27 percent in 1980, and by close to 32 percent in 1982. Although a steady deceleration is projected over the next three years, it is slow and gradual, and growth in nominal public consumption expenditures is projected to stabilize around the 20 percent per annum range toward the end of the forecast horizon.

4. Domestic inflation rates (excluding the effects of the oil sector) are not expected to be influenced significantly by the war. Most inflation rates are projected to be growing by eight to nine percent per year. This type of performance is partly due to the government's policies of controlling prices through subsidies.

5. Nominal merchandise imports are projected to grow by over 34 percent in 1981. Combined with the close to 63 percent decline in the export earnings, this will lead to Iraq's first negative merchandise

trade balance. After a more than ID 4600 million merchandise trade surplus in 1980, Iraq is projected to show a deficit of almost ID 900 million in 1981. As with other economic indicators, a rather quick improvement in merchandise trade balance is projected. Based on our oil production and price assumptions, a surplus of around ID 1180 million is projected for 1982 and this should grow very rapidly to more than ID 5890 million by 1985.

FOOTNOTES

[1]William E. Kost, "Model Validation and the Net Trade Model," Agricultural Economics Research, XXXII (1980), pp. 1-17.

[2]Robert S. Pindyck and Daniel L. Rubinfeld, Econometric Models and Economic Forecasts (New York, 1976), p. 315.

[3]Lawrence R. Klein and Richard M. Young, An Introduction to Econometric Forecasting and Forecasting Models (Lexington, 1980), p. 61.

[4]R. F. Wynn and K. Holden, An Introduction to Applied Econometric Analysis (New York, 1974), p. 179.

[5]Ibid. p. 184.

[6]Moshin S. Khan "Experiments with a Monetary Model for the Venezuelan Economy," IMF Staff Papers, XXI (1974), pp. 389-413.

[7]Klein and Young, p. 65.

[8]Charles C. Holt, "Validation and Application of Macroeconomic Models Using Computer Simulation," in J. S. Duesenberry, et al., eds., The Brookings Quarterly Econometric Model of the United States (Chicago, 1965), p. 639.

[9]Pindyck and Rubinfeld, pp. 316-317; Kost, pp. 3-6.

[10]Ta-Chung Liu and Erh-Cheng Hwa, "A Monthly Econometric Model of U.S. Economy," in Lawrence R. Klein and Edwin Burmeister, eds., Econometric Model Performance Comparative Simulation Studies of the U.S. Economy (Philadelphia, 1976), pp. 70-107.

[11]Nikos Vernardakis, Econometric Models for the Developing Economies: A Case Study of Greece (New York, 1978), p. 111.

[12]Klein and Young, p. 64.

[13]Jan Kmenta, Elements of Econometrics (New York, 1971), p. 593.

[14]International Monetary Fund, International Financial Statistics (Washington, D.C., 1979), p. 427.

[15]Wharton Middle East Economic Service, Gulf Economic Outlook (Philadelphia, 1981), p. 164.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

In the preceding chapters a macroeconometric model of Iraq was developed and evaluated. The model is based on annual data covering the period 1960-78. The basic behavioral and institutional characteristics of the economy, as well as the restrictions imposed by data were, in general, important considerations while designing and specifying the model. Availability of data have conditioned the level of disaggregation; behavioral and institutional characteristics of economic agents in Iraq have conditioned the specification of individual equations.

The model is a non-linear simultaneous equation system of fifty-three equations of which twenty-seven are stochastic and the remainder are non-behavioral or identities. It contains a private consumption function, a government consumption function, a private investment function, a government investment function, four import functions, an export function, eight value added functions, an output function, six price functions, a wage rate function, an employment level function, and a government income equation. It also contains some identities to close the system. The primary emphasis in this model was given to the investigation of the effects of the oil sector on the structure and recent performance of the Iraqi economy.

The model is examined with regard to its ability in reproducing the historical data. The results of the dynamic simulation indicates that the model replicates the time paths of most endogenous variables reasonably well and its overall performance in the sample period seems acceptable.

Dynamic multiplier analysis of the model showed the following:

1. The model is stable and exhibits damped oscillations in response to exogenous shocks.

2. The model's dynamic response to changes in exogenous variables are consistent with a priori information derived from economic theory.

3. An increase in oil exports is more expansionary and inflationary than a similar increase in the export price of oil.

4. Oil export earnings, and hence, economic activities in Iraq are extremely vulnerable to fluctuations in both international oil markets and developments in the international monetary system.

The model is also examined with regard to its ability of rendering reasonable ex ante forecasts of its endogenous variables. Considering our oil production and price assumptions during the forecast period (1979-85), the model seems capable of rendering a reasonable and meaningful short-run forecast of Iraqi economy.

Limitations and Suggestions for Further Research

The macroeconometric model developed, tested, and applied in this study is subject to some limitations and shortcomings. First, the model is incapable of evaluating different policies in allocating government investment expenditures into different sectors of the economy.

Considering the large size and importance of government investment projects in Iraq, this shortcoming is a serious one. Second, it does not include a detailed agricultural sector which reflects the structural characteristics of this section of the economy. Third, the model lacks a detailed manpower sector. These aforementioned channels for further improvement and expansion of the model are not explored here mainly because of data limitations. Hence, it would be fair to regard the present model as a prototype exercise, one that can be expanded and refined as more institutional information, more detailed and qualititatively better, longer time-series data, and more funds become available.

Conclusions

This study shows that data deficiencies while serious enough to prevent us from doing everything we would ideally want to do, are not serious enough to render meaningful and useful econometric modelling of Iraqi economy an impossibility. The model, in general, appears to be well specified considering the behavioral and institutional characteristics of the economy. Nevertheless, the fact that the present model deals with a dynamic economy, one which is experiencing a fairly rapid structural change, will limit the range of a meaningful forecast horizon for the model and will necessitate frequent re-estimation of the model parameters.

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APPENDIX A

TSLS ESTIMATES OF THE BEHAVIORAL EQUATIONS

$$CE = -57.7799 + \underset{(5.05)}{0.4684}\left(\frac{YPDN * 100}{PDCE}\right) + \underset{(3.76)}{0.4805}\ CE(-1) \qquad (1.1)$$

$\bar{R}^2 = 0.965$ SEE = 65.30 h = 0.83

$$GVCEN/N = 3.6549 + \underset{(4.56)}{0.0913}\ GVRTN/N + \underset{(7.17)}{0.7765}\ GVCEN/N(-1) \qquad (2.1)$$

$\bar{R}^2 = 0.975$ SEE = 3.80 h = -0.45

$$IFP = 58.1702 + \underset{(1.52)}{0.0462}\left(\frac{PR(-1) * 100}{PDIFT}\right) + \underset{(9.80)}{0.1158}\ IFT(-1) - \underset{(-2.08)}{43.4304}\ Q73 \qquad (4.1)$$

$\bar{R}^2 = 0.888$ SEE = 18.88 h = 0.55

$$IFGN = -2.8259 + \underset{(12.32)}{0.1856}\ GVRPTN + \underset{(5.14)}{0.1704}\ GVRPTN(-1) + \underset{(3.18)}{0.1131}\ GVRPTN(-2) + \underset{(5.83)}{0.1293}\ GVRPTN(-3) \qquad (5.1)$$

$\bar{R}^2 = 0.999$ SEE = 16.11 $\rho = -0.59$ DW = 2.43

$$TMCM0.4\text{-}3 = 98.4963 + \underset{(7.17)}{0.2039}\ CE - \underset{(-1.74)}{0.5121}\ XAG + \underset{(3.90)}{80.4827}\ Q74 \qquad (8.1)$$

$\bar{R}^2 = 0.900$ SEE = 19.41 DW = 1.67

$$TMCM5.8{+}9 = 27.7542 + \underset{(2.24)}{0.0646}\ CE - \underset{(-1.83)}{0.2690}\ XMM + \underset{(1.84)}{0.0477}\ IFT \qquad (9.1)$$

$\bar{R}^2 = 0.879$ SEE = 7.87 DW = 1.84

$$TMCM6 = 320.7549 + \underset{(6.57)}{0.5205}\ TMCM7 - \underset{(-1.71)}{319.4102}\left(\frac{PTM6(-1)}{PDIFT(-1)}\right) + \underset{(4.32)}{134.6452}\ Q74 \qquad (10.1)$$

$\bar{R}^2 = 0.889$ SEE = 29.75 DW = 1.77

$$TMCM7 = 294.7812 + \underset{(20.89)}{0.4590}\ IFT - \underset{(-3.26)}{368.2734}\left(\frac{PTM7(-1)}{PDIFT(-1)}\right) \qquad (11.1)$$

$\bar{R}^2 = 0.975$ SEE = 28.23 DW = 2.52

$$XAG = 153.2066 - \underset{(-2.16)}{0.0971}\ TMT + \underset{(3.01)}{0.1534}\ CET \qquad (13.1)$$

$\bar{R}^2 = 0.522$ SEE = 27.03 DW = 2.01

$$XMM = \underset{(8.18)}{0.1525}\ IFT + \underset{(12.88)}{0.1047}\ CET - \underset{(-3.45)}{0.0666}\ TMT \qquad (14.1)$$

$\bar{R}^2 = 0.978$ SEE = 14.29 DW = 1.18

$$XC = \underset{(11.35}{0.2563}\ IFT - \underset{(-4.35)}{0.0902}\ TMT + \underset{(1.65)}{0.0075}\ TET \qquad (15.1)$$

$\bar{R}^2 = 0.964$ SEE = 17.19 DW = 2.08

$$XTC = 19.3015 + \underset{(5.07)}{0.0564}\ CET + \underset{(1.49)}{0.0167}\ IFT \qquad (16.1)$$

$\bar{R}^2 = 0.962$ SEE = 7.58 DW = 1.86

$$XS = -68.4866 + \underset{(20.56)}{0.4458}\ CET \qquad (17.1)$$

$\bar{R}^2 = 0.961$ SEE = 47.15 DW = 1.42

$$XUT = -9.1838 + \underset{(2.19)}{0.0060}\ CET + \underset{(9.14)}{0.0096}\ IFT + \underset{(4.27)}{0.0048}\ TET - \underset{(-2.13)}{0.0032}\ TMT \qquad (18.1)$$

$\bar{R}^2 = 0.989$ SEE = 0.91 $\rho = -0.55$ DW = 2.17

$$TE331B = 0.2490 + \underset{(11.13)}{0.0468}\ OETMB - \underset{(-3.38)}{0.1053}\ Q72 + \underset{(5.48)}{0.0001}\ (IFGN + GVCEN - GVRNPTN) \qquad (19.1)$$

$\bar{R}^2 = 0.970$ SEE = 0.03 DW = 2.32

$$XPCR = \underset{(25.30)}{2932.6245}\ GXPCRB \qquad (20.1)$$

$\bar{R}^2 = 0.986$ SEE = 74.65 DW = 1.35

$$GXPCRB = -0.0240 + \underset{(53.28)}{1.1024}\ TE331B \qquad (21.1)$$

$\bar{R}^2 = 0.998$ SEE = 0.01 $\rho = 0.51$ DW = 1.92

$$XPRF = \underset{(37.75)}{546.7097}\ GXPRFB \qquad (22.1)$$

$\bar{R}^2 = 0.95$ SEE = 2.16 DW = 1.09

$$PTE332\$ = 1.0125 + \underset{(69.91)}{0.9574}\ PTE331\$ \qquad (23.1)$$

$\bar{R}^2 = 0.999$ SEE = 0.15 $\rho = 0.57$ DW = 1.52

$$GVRPT\$ = -230.1660 + \underset{(74.30)}{0.9444}\ GVRPTBA\$ \qquad (24.1)$$

$\bar{R}^2 = 0.997$ SEE = 208.71 DW = 2.45

$$WRN = -279.3418 + \underset{(2.17)}{1.1904}\ PDCE(-1) + \underset{(4.15)}{0.7130}\ (GDPNP/NEMP) \qquad (27.1)$$

$\bar{R}^2 = 0.947$ SEE = 25.09 DW = 1.33

$$NEMP = 1.5477 + \underset{(2.86)}{0.0001}\ GDPNP + \underset{(14.64)}{0.0587}\ TIME \qquad (28.1)$$

$\bar{R}^2 = 0.998$ SEE = 0.02 DW = 1.57

$$PDCE = 33.0621 + \underset{(15.76)}{0.0267}\ DDA - \underset{(-2.10)}{162.9375}\left(\frac{SUBN}{IFGN + GVCEN - SUBN}\right) \qquad (29.1)$$

$\bar{R}^2 = 0.955$ SEE = 5.66 $\rho = -0.45$ DW = 2.17

$$PDGVCE = 31.6904 + \underset{(20.00)}{0.2416}\ WRN \qquad (30.1)$$

$\bar{R}^2 = 0.959$ SEE = 5.43 DW = 2.33

$$PDIFT = 22.1139 + \underset{(14.87)}{0.7305}\ \frac{(PTM6 * TMCM6 + PTM7 * TMCM7)/100}{TMCM6 + TMCM7} * 100 \qquad (31.1)$$

$\bar{R}^2 = 0.979$ SEE = 3.0 = 0.57 DW = 1.69

$$PDGDPNP = 10.3358 + \underset{(18.77)}{0.9214}\ PDDA \qquad (33.1)$$

$\bar{R}^2 = 0.954$ SEE = 4.51 DW = 2.01

$$PDXPCR = 7.2247 + \underset{(32.06)}{0.9394}\ PTE331 \qquad (34.1)$$

$\bar{R}^2 = 0.983$ SEE = 4.89 DW = 1.87

APPENDIX B

DYNAMIC SIMULATION

(All variables are preceded by IQ which stands for Iraq.)

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGCE PRIVATE CONSUMPTION EXPENDITURES MILL. 1975 DINARUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 648.768 TO 1635.481
196501	739.086	657.105	81.980	11.092	.+ * .
196601	747.222	703.038	44.184	5.913	. + * .
196701	648.768	705.921	-57.153	-8.809	.* + .
196801	758.885	728.896	29.989	3.952	. + * .
196901	766.344	744.725	21.619	2.821	. + * .
197001	743.968	766.972	-23.005	-3.092	. + * .
197101	838.218	833.649	4.569	0.545	. X .
197201	874.698	898.353	-23.656	-2.704	. ** .
197301	854.356	854.370	-0.014	-0.002	. X .
197401	1140.498	1157.330	-16.833	-1.476	. ** .
197501	1384.599	1382.648	1.951	0.141	. X .
197601	1323.576	1307.224	16.352	1.235	. ** .
197701	1521.569	1524.855	-3.286	-0.216	. X .
197801	1635.481	1618.575	16.906	1.034	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	24.3926
MEAN ABSOLUTE % ERROR	3.0738
ROOT MEAN SQUARED ERROR	33.0227
ROOT MEAN SQUARED % ERROR	4.4816
MEAN OF ACTUALS	998.3750
MEAN OF PREDICTEDS	991.6890
MAXIMUM ABSOLUTE RESIDUAL	81.9805
MAXIMUM OF ACTUALS	1635.4812
MAXIMUM OF PREDICTEDS	1618.5752
MINIMUM OF ACTUALS	648.7678
MINIMUM OF PREDICTEDS	657.1055

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0037
FIRST INEQUALITY COEFFICIENT	(U)	0.4758
SECOND INEQUALITY COEFFICIENT	(U*)	0.5426
MEAN OF ACTUALS		0.0611
MEAN OF PREDICTEDS		0.0693
STANDARD DEVIATION OF ACTUALS		0.1114
STANDARD DEVIATION OF PREDICTEDS		0.0935
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8433
BIAS PROPORTION	(UM)	0.0186
VARIANCE PROPORTION	(US)	0.0880
COVARIANCE PROPORTION	(UC)	0.8934
REGRESSION PROPORTION	(UR)	0.0001
DISTURBANCE PROPORTION	(UD)	0.9813
INTERCEPT	(A)	0.0086
SLOPE ESTIMATE	(B)	1.0050
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9619

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQCET TOTAL CONSUMPTION EXPENDITURES MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (+)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	1034.553	946.732	87.821	8.489
196601	1061.354	996.900	64.451	6.072
196701	961.168	1018.839	-57.679	-6.001
196801	1116.831	1054.567	62.264	5.575
196901	1149.914	1088.858	61.055	5.310
197001	1131.967	1128.832	3.135	0.277
197101	1246.937	1217.924	29.014	2.327
197201	1300.184	1298.653	1.531	0.118
197301	1270.359	1253.398	16.962	1.335
197401	1695.686	1693.523	2.163	0.128
197501	2059.999	2053.650	6.349	0.308
197601	1968.923	2009.607	-40.685	-2.066
197701	2266.565	2218.981	47.584	2.099
197801	2434.256	2466.553	32.297	-1.327

GRAPH RANGE OF VALUES: 946.732 TO 2466.553

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	36.6428
MEAN ABSOLUTE % ERROR	2.9594
ROOT MEAN SQUARED ERROR	45.4714
ROOT MEAN SQUARED % ERROR	3.9826
MEAN OF ACTUALS	1478.4758
MEAN OF PREDICTEDS	1460.4993
MAXIMUM ABSOLUTE RESIDUAL	87.8215
MAXIMUM OF ACTUALS	2434.2561
MAXIMUM OF PREDICTEDS	2466.5539
MINIMUM OF ACTUALS	961.1682
MINIMUM OF PREDICTEDS	946.7324

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0028
FIRST INEQUALITY COEFFICIENT	(U)	0.4312
SECOND INEQUALITY COEFFICIENT	(U*)	0.5119
MEAN OF ACTUALS		0.0058
MEAN OF PREDICTEDS		0.0037
STANDARD DEVIATION OF ACTUALS		0.1029
STANDARD DEVIATION OF PREDICTEDS		0.0862
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8628
BIAS PROPORTION	(UM)	0.0221
VARIANCE PROPORTION	(US)	0.1612
COVARIANCE PROPORTION	(UC)	0.8767
REGRESSION PROPORTION	(UR)	0.0025
DISTURBANCE PROPORTION	(UD)	0.9754
INTERCEPT	(A)	-0.0101
SLOPE ESTIMATE	(B)	1.0306
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9727

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGDDA AGGREGATE DOMESTIC DEMAND MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 1182.022 TO 4272.934
9651	1286.11[illegible]	1182.022	104.087	8.093	.** .
9661	1345.33[illegible]	1266.756	78.574	5.843	. + * .
9671	1231.156	1287.792	-56.637	-4.600	.* + .
9681	1389.2[illegible]	1345.588	43.612	3.139	. X .
9691	1439.036	1385.696	53.341	3.707	. ** .
9701	1449.9[illegible]	1437.558	12.351	0.852	. ** .
9711	1573.394	1547.271	26.124	1.660	. ** .
9721	1638.98[illegible]	1661.348	-22.368	-1.365	. ** .
9731	1698.446	1699.215	-0.769	-0.045	. X .
9741	2312.778	2309.815	2.963	0.128	. X .
9751	3231.099	3233.887	-2.789	-0.092	. X .
9761	3385.964	3369.240	16.724	0.494	. ** .
9771	3888.394	3783.735	104.659	2.692	. + * .
9781	4272.934	4265.012	7.922	0.185	. ** .

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	38.0657
MEAN ABSOLUTE % ERROR	2.3495
ROOT MEAN SQUARED ERROR	51.8317
ROOT MEAN SQUARED % ERROR	3.3516
MEAN OF ACTUALS	2138.7646
MEAN OF PREDICTEDS	2112.4944
MAXIMUM ABSOLUTE RESIDUAL	104.6587
MAXIMUM OF ACTUALS	4272.9336
MAXIMUM OF PREDICTEDS	4265.[illegible]117
MINIMUM OF ACTUALS	1231.1555
MINIMUM OF PREDICTEDS	1182.[illegible]225

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.[illegible]016
FIRST INEQUALITY COEFFICIENT	(U)	0.2918
SECOND INEQUALITY COEFFICIENT	(U*)	0.3949
MEAN OF ACTUALS		0.0924
MEAN OF PREDICTEDS		0.0987
STANDARD DEVIATION OF ACTUALS		0.1[illegible]12
STANDARD DEVIATION OF PREDICTEDS		0.[illegible]881
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9223
BIAS PROPORTION	(UM)	0.0252
VARIANCE PROPORTION	(US)	0.1[illegible]81
COVARIANCE PROPORTION	(UC)	0.8667
REGRESSION PROPORTION	(UR)	0.0174
DISTURBANCE PROPORTION	(UD)	0.9573
INTERCEPT	(A)	0.[illegible]123
SLOPE ESTIMATE	(B)	1.[illegible]599
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9908

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGDDAN AGGREGATE DOMESTIC DEMAND MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (+)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 728.521 TO 5573.496
1965.1	735.699	728.521	7.178	0.976	.X.
1966.1	807.199	797.309	9.890	1.214	.X.
1967.1	812.899	820.862	-7.962	-0.979	. X.
1968.1	878.600	870.098	8.501	0.968	. X.
1969.1	934.800	918.641	16.159	1.729	. X.
1970.1	1932.599	972.113	60.486	5.858	. ++ .
1971.1	1136.799	1080.426	56.374	4.959	. X.
1972.1	1173.099	1219.141	-46.042	-3.925	. X.
1973.1	1217.999	1211.383	6.616	0.543	. X.
1974.1	1958.999	1943.213	15.796	0.806	. X.
1975.1	3031.099	3106.580	-75.480	-2.490	. X.
1976.1	3764.299	3677.719	86.599	2.301	. ++ .
1977.1	4351.551	4335.586	15.965	0.367	. ++ .
1978.1	5573.496	5474.047	99.449	1.784	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	36.6096
MEAN ABSOLUTE % ERROR	2.0642
ROOT MEAN SQUARED ERROR	48.6592
ROOT MEAN SQUARED % ERROR	2.6373
MEAN OF ACTUALS	1957.7942
MEAN OF PREDICTEDS	1939.6917
MAXIMUM ABSOLUTE RESIDUAL	99.4492
MAXIMUM OF ACTUALS	5573.4961
MAXIMUM OF PREDICTEDS	5474.0469
MINIMUM OF ACTUALS	735.6992
MINIMUM OF PREDICTEDS	728.5215

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

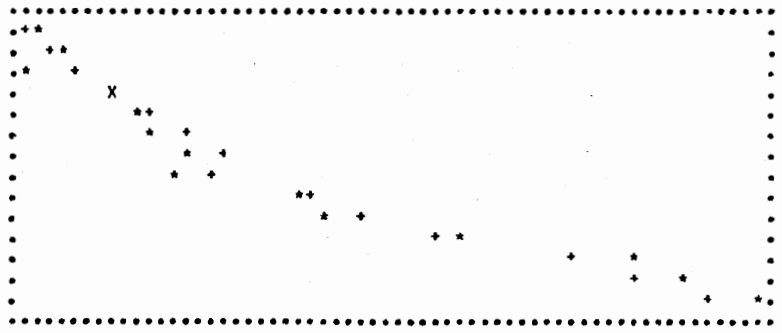
MEAN SQUARE ERROR	(D)	0.0013
FIRST INEQUALITY COEFFICIENT	(U)	0.1690
SECOND INEQUALITY COEFFICIENT	(U*)	0.2488
MEAN OF ACTUALS		0.1558
MEAN OF PREDICTEDS		0.1551
STANDARD DEVIATION OF ACTUALS		0.1442
STANDARD DEVIATION OF PREDICTEDS		0.1488
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9702
BIAS PROPORTION	(UM)	0.0003
VARIANCE PROPORTION	(US)	0.0115
COVARIANCE PROPORTION	(UC)	0.9881
REGRESSION PROPORTION	(UR)	0.9516
DISTURBANCE PROPORTION	(UD)	0.9481
INTERCEPT	(A)	0.0092
SLOPE ESTIMATE	(B)	0.9450
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9759

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQGDP GROSS DOMESTIC PRODUCT MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
96501	2239.546	2166.629	72.917	3.256
96601	2350.027	2306.288	43.739	1.861
96701	2212.597	2403.095	-190.499	-8.610
96801	2576.529	2566.738	9.792	0.381
96901	2658.653	2713.145	-54.492	-2.050
97001	2730.965	2870.641	-139.679	-5.115
97101	2837.319	2915.979	-118.660	-4.696
97201	2809.067	2958.639	-149.572	-5.325
97301	3324.197	3419.754	-95.557	-2.875
97401	3431.177	3626.429	-195.252	-5.691
97501	4122.194	3946.440	75.754	1.883
97601	4784.176	4484.562	299.613	6.263
97701	4954.203	4760.617	193.586	3.908
97801	5257.875	5076.949	180.926	3.441

GRAPH RANGE OF VALUES: 2166.629 TO 5257.875



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	130.9919
MEAN ABSOLUTE % ERROR	3.9108
ROOT MEAN SQUARED ERROR	150.1231
ROOT MEAN SQUARED % ERROR	4.4268
MEAN OF ACTUALS	3303.4575
MEAN OF PREDICTEDS	3308.2719
MAXIMUM ABSOLUTE RESIDUAL	299.6133
MAXIMUM OF ACTUALS	5257.8759
MAXIMUM OF PREDICTEDS	5076.9492
MINIMUM OF ACTUALS	2212.5966
MINIMUM OF PREDICTEDS	2166.6294

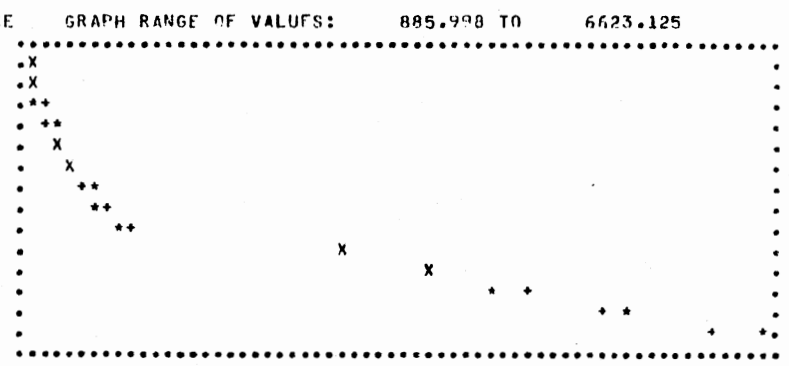
THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0022
FIRST INEQUALITY COEFFICIENT	(U)	0.4835
SECOND INEQUALITY COEFFICIENT	(U*)	0.6514
MEAN OF ACTUALS		0.0656
MEAN OF PREDICTEDS		0.0655
STANDARD DEVIATION OF ACTUALS		0.0727
STANDARD DEVIATION OF PREDICTEDS		0.0381
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8115
BIAS PROPORTION	(UM)	0.0100
VARIANCE PROPORTION	(US)	0.5749
COVARIANCE PROPORTION	(UC)	0.4650
REGRESSION PROPORTION	(UR)	0.1954
DISTURBANCE PROPORTION	(UD)	0.8045
INTERCEPT	(A)	0.0359
SLOPE ESTIMATE	(B)	1.5590
SLOPE ESTIMATE -WITHOUT INTERCEPT	(B*)	1.1496

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : I@GDPN GROSS DOMESTIC PRODUCT AT MARKET PRICES MILL.CURR.DINARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	885.998	898.832	-12.834	1.449
1966Q1	961.599	968.025	-6.426	-0.668
1967Q1	969.609	1004.849	-35.241	-3.634
1968Q1	1110.699	1078.989	21.710	1.972
1969Q1	1150.398	1143.221	7.177	0.624
1970Q1	1251.198	1212.925	38.273	3.059
1971Q1	1433.798	1360.130	73.668	5.138
1972Q1	1440.898	1474.205	-33.306	-2.311
1973Q1	1626.399	1670.893	-44.494	-2.736
1974Q1	3377.997	3325.255	52.742	1.561
1975Q1	4022.195	4047.726	-25.531	-0.635
1976Q1	4533.797	4780.617	-246.820	-5.444
1977Q1	5593.496	5380.836	212.660	3.802
1978Q1	6623.125	6256.320	366.805	5.538



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	84.1135
MEAN ABSOLUTE % ERROR	2.7544
ROOT MEAN SQUARED ERROR	135.2427
ROOT MEAN SQUARED % ERROR	3.2309
MEAN OF ACTUALS	2497.9487
MEAN OF PREDICTEDS	2471.6284
MAXIMUM ABSOLUTE RESIDUAL	366.8047
MAXIMUM OF ACTUALS	6623.1250
MAXIMUM OF PREDICTEDS	6256.3203
MINIMUM OF ACTUALS	885.9976
MINIMUM OF PREDICTEDS	898.8320

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

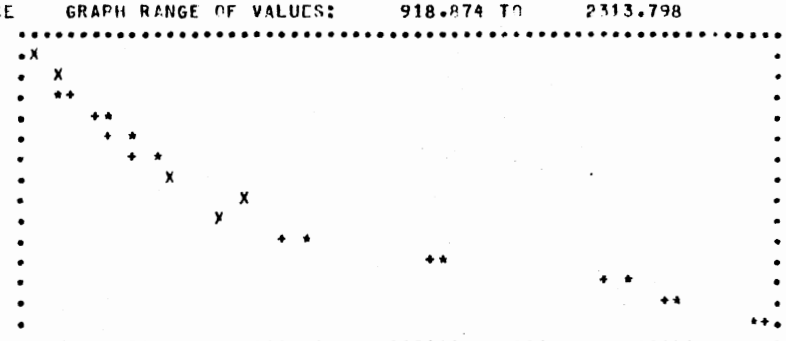
MEAN SQUARE ERROR	(D)	0.0019
FIRST INEQUALITY COEFFICIENT	(U)	0.1039
SECOND INEQUALITY COEFFICIENT	(U*)	0.2444
MEAN OF ACTUALS		0.1547
MEAN OF PREDICTEDS		0.1492
STANDARD DEVIATION OF ACTUALS		0.1766
STANDARD DEVIATION OF PREDICTEDS		0.1629
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9717
BIAS PROPORTION	(UM)	0.0162
VARIANCE PROPORTION	(US)	0.1146
COVARIANCE PROPORTION	(UC)	0.8692
REGRESSION PROPORTION	(UR)	0.0496
DISTURBANCE PROPORTION	(UD)	0.9342
INTERCEPT	(A)	0.0134
SLOPE ESTIMATE	(B)	1.0593
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0499

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQGDPNP NON OIL GDP MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIF = X)	% DIFFERENCE
1965Q1	922.877	918.874	4.003	0.434
1966Q1	969.599	974.483	-4.885	-0.504
1967Q1	989.612	998.003	-8.392	-0.848
1968Q1	1071.511	1049.526	21.985	2.052
1969Q1	1130.197	1083.960	46.237	4.091
1970Q1	1159.813	1123.637	36.176	3.119
1971Q1	1193.103	1178.992	14.111	1.183
1972Q1	1323.792	1335.907	-12.115	-0.915
1973Q1	1288.732	1278.777	9.955	0.772
1974Q1	1452.898	1414.765	38.133	2.625
1975Q1	1720.265	1677.368	42.897	2.494
1976Q1	2173.154	2012.128	61.026	2.944
1977Q1	2154.492	2143.364	11.128	0.516
1978Q1	2298.375	2313.798	-15.423	-0.671

GRAPH RANGE OF VALUES: 918.874 TO 2313.798



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	23.3189
MEAN ABSOLUTE % ERROR	1.6548
ROOT MEAN SQUARED ERROR	29.1122
ROOT MEAN SQUARED % ERROR	2.0206
MEAN OF ACTUALS	1410.5999
MEAN OF PREDICTEDS	1393.1118
MAXIMUM ABSOLUTE RESIDUAL	61.0261
MAXIMUM OF ACTUALS	2298.3755
MAXIMUM OF PREDICTEDS	2313.7981
MINIMUM OF ACTUALS	922.8770
MINIMUM OF PREDICTEDS	918.8740

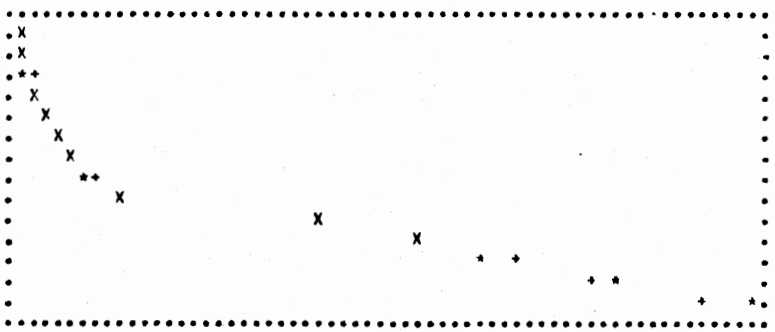
THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0083
FIRST INEQUALITY COEFFICIENT	(U)	0.1058
SECOND INEQUALITY COEFFICIENT	(U*)	0.2904
MEAN OF ACTUALS		0.0702
MEAN OF PREDICTEDS		0.0719
STANDARD DEVIATION OF ACTUALS		0.0584
STANDARD DEVIATION OF PREDICTEDS		0.0588
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9584
BIAS PROPORTION	(UM)	0.0025
VARIANCE PROPORTION	(US)	0.0013
COVARIANCE PROPORTION	(UC)	0.9963
REGRESSION PROPORTION	(UR)	0.0320
DISTURBANCE PROPORTION	(UD)	0.9655
INTERCEPT	(A)	0.0028
SLOPE ESTIMATE	(B)	0.9486
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9719

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGSNPN GROSS NATIONAL PRODUCT MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIC = X)	% DIFFERENCE
96501	756.597	769.441	-12.844	-1.698
96601	822.999	829.434	-6.435	-0.782
96701	847.099	882.231	-35.132	-4.147
96801	943.899	922.192	21.707	2.300
96901	995.698	988.513	7.185	0.722
97001	1085.198	1046.920	38.277	3.527
97101	1213.898	1145.234	73.664	6.044
97201	1304.398	1337.700	-33.302	-2.553
97301	1544.399	1588.890	-44.491	-2.881
97401	3135.997	3083.250	52.747	1.682
97501	3967.195	3932.732	-25.537	-0.654
97601	4413.797	4660.621	-246.824	-5.592
97701	5455.195	5242.531	212.664	3.898
97801	6454.125	6087.328	366.797	5.683



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	84.1147
MEAN ABSOLUTE % ERROR	3.9116
ROOT MEAN SQUARED ERROR	135.2421
ROOT MEAN SQUARED % ERROR	3.5082
MEAN OF ACTUALS	2348.9629
MEAN OF PREDICTEDS	2322.6431
MAXIMUM ABSOLUTE RESIDUAL	366.7969
MAXIMUM OF ACTUALS	6454.1250
MAXIMUM OF PREDICTEDS	6087.3281
MINIMUM OF ACTUALS	756.5974
MINIMUM OF PREDICTEDS	769.4414

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0022
FIRST INEQUALITY COEFFICIENT	(U)	0.2908
SECOND INEQUALITY COEFFICIENT	(U*)	0.2825
MEAN OF ACTUALS		0.1649
MEAN OF PREDICTEDS		0.1591
STANDARD DEVIATION OF ACTUALS		0.1667
STANDARD DEVIATION OF PREDICTEDS		0.1559
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9602
BIAS PROPORTION	(UM)	0.0152
VARIANCE PROPORTION	(US)	0.0522
COVARIANCE PROPORTION	(UC)	0.9327
REGRESSION PROPORTION	(UR)	0.0077
DISTURBANCE PROPORTION	(UD)	0.9772
INTERCEPT	(A)	0.0016
SLOPE ESTIMATE	(B)	1.0265
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0315

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGGVCEN GOVERNMENT CONSUMPTION EXPENDITURES MILL.CURR.DINARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 178.243 TO 1186.200
1965.1	178.600	178.243	0.357	0.200	.X .
1966.1	189.100	190.928	-1.828	-0.967	.X .
1967.1	201.800	203.243	-1.443	-0.715	. X .
1968.1	220.400	217.391	3.009	1.365	. X .
1969.1	242.500	232.435	10.065	4.151	. X .
1970.1	268.899	248.943	20.956	7.459	. ** .
1971.1	308.900	271.503	37.396	12.106	. + * .
1972.1	313.500	310.319	3.181	1.015	. X .
1973.1	304.700	305.862	-1.163	-0.382	. X .
1974.1	467.899	460.281	7.619	1.628	. X .
1975.1	675.400	672.462	2.938	0.435	. ** .
1976.1	794.800	799.729	-4.929	-0.620	. X .
1977.1	885.500	886.675	-1.176	-0.133	. X .
1978.1	1186.200	1163.108	23.092	1.947	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	8.4422
MEAN ABSOLUTE % ERROR	2.3644
ROOT MEAN SQUARED ERROR	13.5955
ROOT MEAN SQUARED % ERROR	4.0617
MEAN OF ACTUALS	445.5858
MEAN OF PREDICTEDS	438.6396
MAXIMUM ABSOLUTE RESIDUAL	37.3965
MAXIMUM OF ACTUALS	1186.1997
MAXIMUM OF PREDICTEDS	1163.1079
MINIMUM OF ACTUALS	178.6000
MINIMUM OF PREDICTEDS	178.2434

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0016
FIRST INEQUALITY COEFFICIENT	(U)	0.2041
SECOND INEQUALITY COEFFICIENT	(U*)	0.3056
MEAN OF ACTUALS		0.1456
MEAN OF PREDICTEDS		0.1443
STANDARD DEVIATION OF ACTUALS		0.1307
STANDARD DEVIATION OF PREDICTEDS		0.1248
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9522
BIAS PROPORTION	(UM)	0.0112
VARIANCE PROPORTION	(US)	0.0213
COVARIANCE PROPORTION	(UC)	0.9776
REGRESSION PROPORTION	(UR)	0.0001
DISTURBANCE PROPORTION	(UD)	0.9987
INTERCEPT	(A)	0.0018
SLOPE ESTIMATE	(B)	0.9967
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0041

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQGVRPT$ GOVERNMENT OIL REVENUES MILL.CURR.DOLLAROPEC ASB

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIC = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 351.943 TO 10281.664
196501	367.921	351.943	15.977	4.343	.X.
196601	394.243	385.773	8.467	2.148	.X.
196701	364.377	399.474	-35.104	-9.634	.X.
196801	487.923	456.752	31.167	6.388	.X.
196901	479.049	499.032	-19.992	-4.173	.X.
197001	512.643	550.172	-37.532	-7.321	.**
197101	840.010	783.346	56.654	6.745	. X
197201	575.800	605.179	-30.179	-5.249	. X
197301	1843.000	1836.664	6.336	0.344	. X
197401	5700.000	5986.531	-286.531	-5.027	. * *
197501	7500.000	7288.141	211.859	2.825	. **
197601	8500.000	8167.402	332.598	3.913	. * *
197701	9631.000	9354.328	276.672	2.873	. * *
197801	10200.000	1 281.664	-81.664	-0.801	.**.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	102.1953
MEAN ABSOLUTE % ERROR	4.4130
ROOT MEAN SQUARED ERROR	153.3728
ROOT MEAN SQUARED % ERROR	5.0619
MEAN OF ACTUALS	3385.3662
MEAN OF PREDICTEDS	3353.3149
MAXIMUM ABSOLUTE RESIDUAL	332.5977
MAXIMUM OF ACTUALS	10200.0000
MAXIMUM OF PREDICTEDS	10281.6641
MINIMUM OF ACTUALS	364.3701
MINIMUM OF PREDICTEDS	351.9426

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

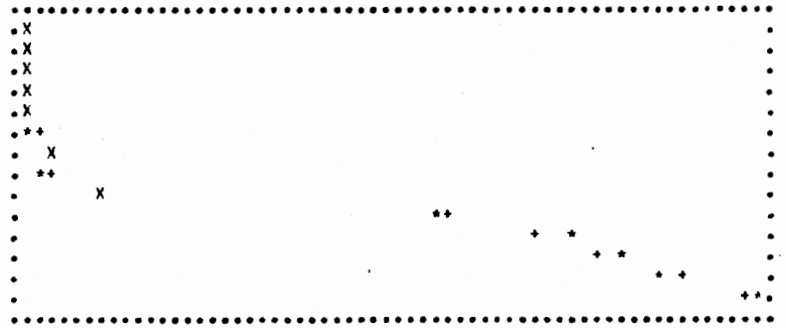
MEAN SQUARE ERROR	(D)	0.0076
FIRST INEQUALITY COEFFICIENT	(U)	0.1746
SECOND INEQUALITY COEFFICIENT	(U*)	0.2034
MEAN OF ACTUALS		0.2556
MEAN OF PREDICTEDS		0.2596
STANDARD DEVIATION OF ACTUALS		0.4280
STANDARD DEVIATION OF PREDICTEDS		0.3988
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9803
BIAS PROPORTION	(UM)	0.0021
VARIANCE PROPORTION	(US)	0.1120
COVARIANCE PROPORTION	(UC)	0.8859
REGRESSION PROPORTION	(UR)	0.0566
DISTURBANCE PROPORTION	(UD)	0.9412
INTERCEPT	(A)	0.0175
SLOPE ESTIMATE	(B)	1.0519
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0319

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IOGVRPT$BA GOVERNMENT OIL REVENUES BASE MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	737.607	697.622	39.986	5.421
196601	785.508	737.894	47.614	6.062
196701	685.052	754.205	-69.153	-10.095
196801	845.879	822.392	23.487	2.777
196901	852.966	872.723	-19.757	-2.316
197001	874.096	933.602	-59.506	-6.808
197101	1183.283	1211.182	-27.979	-2.365
197201	1466.166	1503.844	-37.676	-3.534
197301	2926.935	2919.393	7.542	0.372
197401	7317.809	7667.168	-349.359	-4.774
197501	9535.547	8954.758	580.789	6.091
197601	10498.699	10001.465	497.145	4.735
197701	11076.496	11414.430	-337.934	-3.051
197801	12533.594	12518.371	15.223	0.121

GRAPH RANGE OF VALUES: 685.052 TO 12533.594



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	150.9393
MEAN ABSOLUTE % ERROR	4.1801
ROOT MEAN SQUARED ERROR	244.4158
ROOT MEAN SQUARED % ERROR	4.9085
MEAN OF ACTUALS	4287.1016
MEAN OF PREDICTEDS	4264.9297
MAXIMUM ABSOLUTE RESIDUAL	580.7891
MAXIMUM OF ACTUALS	12533.5937
MAXIMUM OF PREDICTEDS	12518.3711
MINIMUM OF ACTUALS	685.0522
MINIMUM OF PREDICTEDS	697.6216

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0054
FIRST INEQUALITY COEFFICIENT	(U)	0.1739
SECOND INEQUALITY COEFFICIENT	(U*)	0.2629
MEAN OF ACTUALS		0.2179
MEAN OF PREDICTEDS		0.2221
STANDARD DEVIATION OF ACTUALS		0.3628
STANDARD DEVIATION OF PREDICTEDS		0.3575
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9793
BIAS PROPORTION	(UM)	0.0032
VARIANCE PROPORTION	(US)	0.0053
COVARIANCE PROPORTION	(UC)	0.9915
REGRESSION PROPORTION	(UR)	0.0089
DISTURBANCE PROPORTION	(UD)	0.9959
INTERCEPT	(A)	0.0028
SLOPE ESTIMATE	(B)	0.9939
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9904

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGOVRETN GOVERNMENT OIL REVENUES MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 125.694 TO 3136.316
196501	131.408	125.694	5.706	4.343	.X .
196601	140.809	137.776	3.024	2.148	.X .
196701	130.132	142.669	-12.537	-9.634	.X .
196801	174.257	163.126	11.131	6.388	.X .
196901	171.086	178.226	-7.140	-4.173	.** .
197001	183.086	196.490	-13.404	-7.321	. X .
197101	296.765	276.750	20.015	6.745	. X .
197201	191.418	201.465	-10.047	-5.249	. X .
197301	557.406	555.489	1.916	0.344	. X .
197401	1683.288	1767.905	-84.616	-5.027	. * + .
197501	2214.853	2152.288	62.565	2.825	. ** .
197601	2511.167	2411.946	98.221	3.913	. * * .
197701	2844.166	2762.461	81.705	2.873	. * * .
197801	3012.21[illegible]	3036.316	-24.116	-0.801	. **.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	31.1532
MEAN ABSOLUTE % ERROR	4.413[illegible]
ROOT MEAN SQUARED ERROR	45.5424
ROOT MEAN SQUARED % ERROR	5.0619
MEAN OF ACTUALS	1[illegible]17.2153
MEAN OF PREDICTEDS	1[illegible]67.7566
MAXIMUM ABSOLUTE RESIDUAL	98.2207
MAXIMUM OF ACTUALS	3[illegible]12.1997
MAXIMUM OF PREDICTEDS	3[illegible]36.3162
MINIMUM OF ACTUALS	130.1322
MINIMUM OF PREDICTEDS	125.6938

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0076
FIRST INEQUALITY COEFFICIENT	(U)	0.1812
SECOND INEQUALITY COEFFICIENT	(U*)	0.2094
MEAN OF ACTUALS		0.2409
MEAN OF PREDICTEDS		0.2450
STANDARD DEVIATION OF ACTUALS		0.4156
STANDARD DEVIATION OF PREDICTEDS		0.3854
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9793
BIAS PROPORTION	(UM)	0.0021
VARIANCE PROPORTION	(US)	0.1207
COVARIANCE PROPORTION	(UC)	0.8771
REGRESSION PROPORTION	(UR)	0.0617
DISTURBANCE PROPORTION	(UD)	0.9362
INTERCEPT	(A)	0.0178
SLOPE ESTIMATE	(B)	1.0561
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0352

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGGVRTN TOTAL GOVERNMENT REVENUES MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIF = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 186.694 TO 3299.969
196501	192.400	186.694	5.706	2.966	.X.
196601	212.400	208.976	3.424	1.426	.X.
196701	207.632	220.169	-12.537	-6.038	.X.
196801	265.457	254.326	11.131	4.193	. X.
196901	274.486	281.626	-7.140	-2.601	. X.
197001	301.786	315.190	-13.404	-4.442	. X.
197101	424.065	404.050	20.015	4.720	. X.
197201	329.818	339.965	-10.147	-3.132	. X.
197301	694.705	692.789	1.916	0.276	. X.
197401	1815.988	1900.604	-84.616	-4.660	. + + .
197501	2383.453	2320.888	62.565	2.625	. ** .
197601	2812.466	2714.246	98.221	3.492	. + * .
197701	3128.766	3047.061	81.705	2.611	. ** .
197801	3275.853	3299.969	-24.116	-0.736	. **.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	31.1532
MEAN ABSOLUTE % ERROR	3.1370
ROOT MEAN SQUARED ERROR	45.5424
ROOT MEAN SQUARED % ERROR	3.5019
MEAN OF ACTUALS	1164.9905
MEAN OF PREDICTEDS	1155.5315
MAXIMUM ABSOLUTE RESIDUAL	98.2207
MAXIMUM OF ACTUALS	3275.8525
MAXIMUM OF PREDICTEDS	3299.9690
MINIMUM OF ACTUALS	192.4000
MINIMUM OF PREDICTEDS	186.6938

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

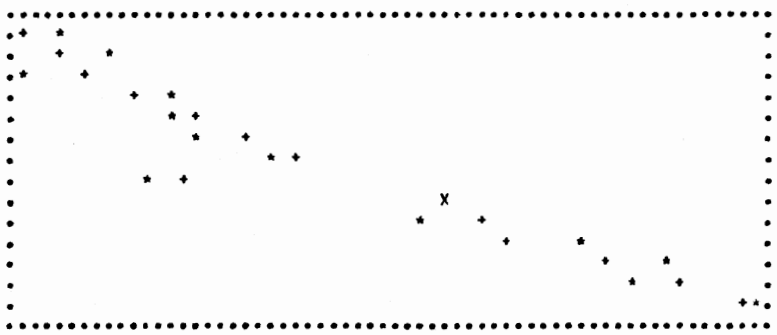
MEAN SQUARE ERROR	(D)	0.0035
FIRST INEQUALITY COEFFICIENT	(U)	0.1545
SECOND INEQUALITY COEFFICIENT	(U*)	0.1979
MEAN OF ACTUALS		0.2181
MEAN OF PREDICTEDS		0.2209
STANDARD DEVIATION OF ACTUALS		0.3151
STANDARD DEVIATION OF PREDICTEDS		0.3007
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9827
BIAS PROPORTION	(UM)	0.0024
VARIANCE PROPORTION	(US)	0.0596
COVARIANCE PROPORTION	(UC)	0.9380
REGRESSION PROPORTION	(UR)	0.0230
DISTURBANCE PROPORTION	(UD)	0.9746
INTERCEPT	(A)	0.0095
SLOPE ESTIMATE	(B)	1.0299
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0148

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQGXPCRB CRUDE OIL PRODUCTION BILL. BARRELS TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	0.479	0.450	0.029	6.071
196601	0.508	0.474	0.034	6.709
196701	0.448	0.496	-0.047	-10.553
196801	0.549	0.530	0.018	3.363
196901	0.555	0.566	-0.011	-1.990
197001	0.565	0.603	-0.038	-6.681
197101	0.618	0.632	-0.014	-2.226
197201	0.535	0.556	-0.021	-3.978
197301	0.737	0.733	0.004	0.520
197401	0.719	0.754	-0.035	-4.862
197501	0.826	0.771	0.055	6.606
197601	0.882	0.838	0.043	4.895
197701	0.857	0.887	-0.029	-3.438
197801	0.935	0.935	0.000	0.033

GRAPH RANGE OF VALUES: 0.448 TO 0.935



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	0.0273
MEAN ABSOLUTE % ERROR	4.4167
ROOT MEAN SQUARED ERROR	0.0313
ROOT MEAN SQUARED % ERROR	5.1884
MEAN OF ACTUALS	0.6581
MEAN OF PREDICTEDS	0.6589
MAXIMUM ABSOLUTE RESIDUAL	0.0545
MAXIMUM OF ACTUALS	0.9351
MAXIMUM OF PREDICTEDS	0.9348
MINIMUM OF ACTUALS	0.4483
MINIMUM OF PREDICTEDS	0.4500

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

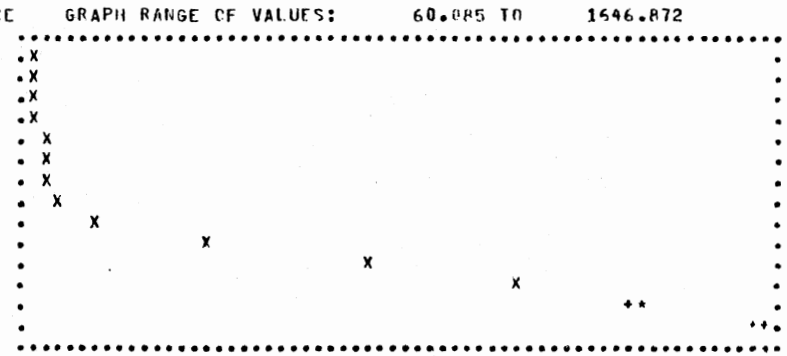
MEAN SQUARE ERROR	(U)	0.0062
FIRST INEQUALITY COEFFICIENT	(U)	0.5998
SECOND INEQUALITY COEFFICIENT	(U*)	0.6519
MEAN OF ACTUALS		0.0514
MEAN OF PREDICTEDS		0.0562
STANDARD DEVIATION OF ACTUALS		0.1208
STANDARD DEVIATION OF PREDICTEDS		0.0819
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7652
BIAS PROPORTION	(UM)	0.0137
VARIANCE PROPORTION	(US)	0.2557
COVARIANCE PROPORTION	(UC)	0.7406
REGRESSION PROPORTION	(UR)	0.6212
DISTURBANCE PROPORTION	(UD)	0.9751
INTERCEPT	(A)	0.0128
SLOPE ESTIMATE	(B)	1.1416
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0678

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQIFGN TOTAL GROSS FIXED PUBLIC INVESTMENT MILL.CURR.DINARSIRAQ AAS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIC = X)	% DIFFERENCE
19650 1	71.20[illegible]	60.085	11.115	15.611
19660 1	76.20[illegible]	76.592	-0.362	-0.501
19671 1	73.78[illegible]	75.301	4.399	5.519
19681	75.80[illegible]	84.977	-9.177	-12.107
19691	91.4[illegible]	91.163	0.237	0.259
19701	101.1[illegible]	101.388	-0.288	-0.285
19711	105.0[illegible]	106.964	-1.964	-1.871
19721	114.6[illegible]	124.657	-10.057	-8.776
19731	218.9[illegible]	214.662	4.238	1.936
1974 1	446.0[illegible]	441.576	4.424	0.992
19751	790.0[illegible]	808.620	-18.620	-2.357
19761	1112.4[illegible]	1110.240	2.159	0.194
19771	1392.053	1376.718	15.335	1.102
19781	1640.8[illegible]	1646.872	-6.072	-0.370

GRAPH RANGE OF VALUES: 60.085 TO 1646.872



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	6.3192
MEAN ABSOLUTE % ERROR	3.7057
ROOT MEAN SQUARED ERROR	8.4235
ROOT MEAN SQUARED % ERROR	6.8554
MEAN OF ACTUALS	451.0820
MEAN OF PREDICTEDS	451.4146
MAXIMUM ABSOLUTE RESIDUAL	18.6204
MAXIMUM OF ACTUALS	1640.8060
MAXIMUM OF PREDICTEDS	1646.8723
MINIMUM OF ACTUALS	71.2005
MINIMUM OF PREDICTEDS	60.0847

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

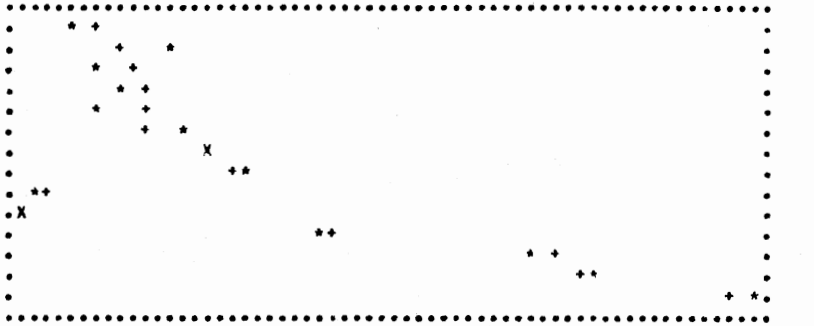
MEAN SQUARE ERROR	(U)	0.0073
FIRST INEQUALITY COEFFICIENT	(U)	0.2505
SECOND INEQUALITY COEFFICIENT	(U*)	0.3547
MEAN OF ACTUALS		0.2413
MEAN OF PREDICTEDS		0.2547
STANDARD DEVIATION OF ACTUALS		0.2497
STANDARD DEVIATION OF PREDICTEDS		0.2208
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9368
BIAS PROPORTION	(UM)	0.0244
VARIANCE PROPORTION	(US)	0.0543
COVARIANCE PROPORTION	(UC)	0.9213
REGRESSION PROPORTION	(UR)	0.0135
DISTURBANCE PROPORTION	(UD)	0.9726
INTERCEPT	(A)	0.0187
SLOPE ESTIMATE	(B)	1.0212
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9792

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGIFP GROSS FIXED PRIVATE INVESTMENT MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	113.569	122.378	-8.809	-7.757
196601	139.330	126.490	12.840	9.216
196701	120.248	130.506	-10.258	-8.531
196801	127.994	132.746	-4.752	-3.713
196901	121.020	134.486	-13.466	-11.127
197001	144.285	135.136	9.150	6.341
197101	150.401	149.861	0.541	0.360
197201	159.874	157.827	2.047	1.280
197301	103.389	106.320	-2.931	-2.835
197401	99.658	102.441	-2.783	-2.793
197501	181.100	182.775	-1.675	-0.925
197601	237.605	243.777	-6.172	-2.598
197701	251.927	250.835	1.092	0.433
197801	294.162	290.828	3.334	1.133

GRAPH RANGE OF VALUES: 99.658 TO 294.162



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	5.7836
MEAN ABSOLUTE % ERROR	4.2172
ROOT MEAN SQUARED ERROR	7.1182
ROOT MEAN SQUARED % ERROR	5.4926
MEAN OF ACTUALS	160.3259
MEAN OF PREDICTEDS	161.8860
MAXIMUM ABSOLUTE RESIDUAL	13.4664
MAXIMUM OF ACTUALS	294.1621
MAXIMUM OF PREDICTEDS	290.8284
MINIMUM OF ACTUALS	99.6582
MINIMUM OF PREDICTEDS	102.4414

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

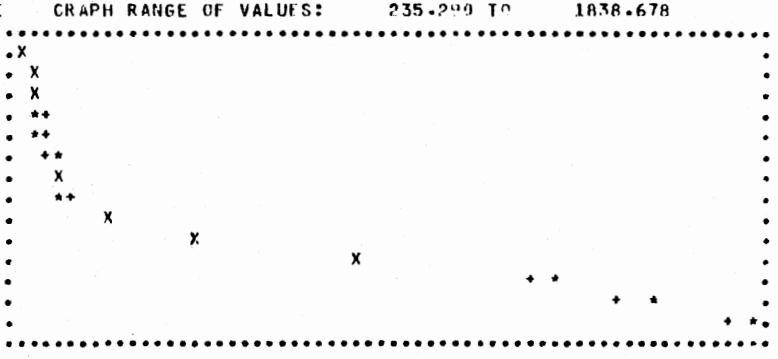
MEAN SQUARE ERROR	(U)	0.0080
FIRST INEQUALITY COEFFICIENT	(U)	0.3717
SECOND INEQUALITY COEFFICIENT	(U*)	0.3901
MEAN OF ACTUALS		0.0732
MEAN OF PREDICTEDS		0.0656
STANDARD DEVIATION OF ACTUALS		0.2298
STANDARD DEVIATION OF PREDICTEDS		0.2369
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9215
BIAS PROPORTION	(UM)	0.0055
VARIANCE PROPORTION	(US)	0.0052
COVARIANCE PROPORTION	(UC)	0.9893
REGRESSION PROPORTION	(UR)	0.0029
DISTURBANCE PROPORTION	(UD)	0.9916
INTERCEPT	(A)	0.0051
SLOPE ESTIMATE	(B)	1.0234
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0305

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQIFT IMPLICIT DEFLATOR OF GROSS FIXED INVESTMENT MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	251.556	235.290	16.266	6.466
196601	283.976	269.852	14.123	4.973
196701	269.995	268.953	1.042	0.386
196801	272.369	291.021	-18.652	-6.848
196901	289.123	296.838	-7.715	-2.668
197001	317.942	308.726	9.216	2.899
197101	326.457	329.347	-2.890	-0.885
197201	338.796	362.695	-23.899	-7.054
197301	428.094	445.825	-17.731	-4.142
197401	617.092	616.292	0.800	0.130
197501	971.100	980.237	-9.137	-0.941
197601	1417.741	1359.632	57.409	4.051
197701	1621.829	1564.754	57.075	3.519
197801	1838.678	1798.459	40.219	2.187

CRAPH RANGE OF VALUES: 235.290 TO 1838.678



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	19.7268
MEAN ABSOLUTE % ERROR	3.3679
ROOT MEAN SQUARED ERROR	26.8679
ROOT MEAN SQUARED % ERROR	4.8646
MEAN OF ACTUALS	660.2886
MEAN OF PREDICTEDS	651.9937
MAXIMUM ABSOLUTE RESIDUAL	57.4087
MAXIMUM OF ACTUALS	1838.6789
MAXIMUM OF PREDICTEDS	1798.4590
MINIMUM OF ACTUALS	251.5564
MINIMUM OF PREDICTEDS	235.2901

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

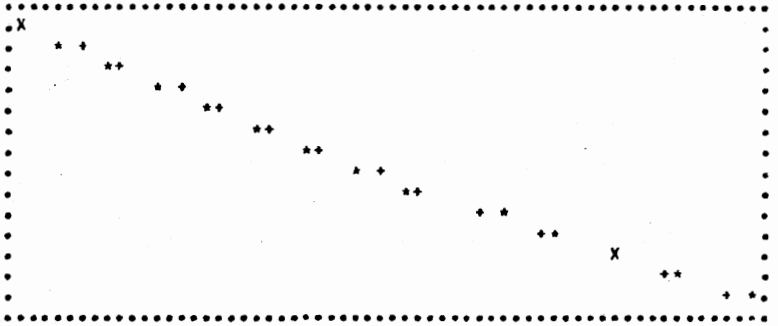
MEAN SQUARE ERROR	(D)	0.0017
FIRST INEQUALITY COEFFICIENT	(U)	0.1932
SECOND INEQUALITY COEFFICIENT	(U*)	0.2745
MEAN OF ACTUALS		0.1539
MEAN OF PREDICTEDS		0.1565
STANDARD DEVIATION OF ACTUALS		0.1515
STANDARD DEVIATION OF PREDICTEDS		0.1334
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9656
BIAS PROPORTION	(UM)	0.0068
VARIANCE PROPORTION	(US)	0.1906
COVARIANCE PROPORTION	(UC)	0.8026
REGRESSION PROPORTION	(UR)	0.0979
DISTURBANCE PROPORTION	(UD)	0.8962
INTERCEPT	(A)	-0.0186
SLOPE ESTIMATE	(B)	1.0971
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0281

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQNEMP EMPLOYMENT LEVEL MILLIONS TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	1.982	1.997	-0.015	-0.760
1966Q1	2.040	2.064	-0.024	-1.176
1967Q1	2.099	2.127	-0.028	-1.311
1968Q1	2.161	2.193	-0.032	-1.459
1969Q1	2.225	2.257	-0.032	-1.424
1970Q1	2.289	2.321	-0.031	-1.360
1971Q1	2.355	2.386	-0.031	-1.314
1972Q1	2.422	2.461	-0.038	-1.588
1973Q1	2.491	2.515	-0.024	-0.971
1974Q1	2.616	2.588	0.028	1.084
1975Q1	2.692	2.672	0.019	0.714
1976Q1	2.774	2.764	0.006	0.223
1977Q1	2.852	2.836	0.016	0.555
1978Q1	2.937	2.912	0.026	0.873

GRAPH RANGE OF VALUES: 1.982 TO 2.937



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	0.0250
MEAN ABSOLUTE % ERROR	1.0580
ROOT MEAN SQUARED ERROR	0.0263
ROOT MEAN SQUARED % ERROR	1.1238
MEAN OF ACTUALS	2.4237
MEAN OF PREDICTEDS	2.4351
MAXIMUM ABSOLUTE RESIDUAL	0.0385
MAXIMUM OF ACTUALS	2.9372
MAXIMUM OF PREDICTEDS	2.9116
MINIMUM OF ACTUALS	1.9817
MINIMUM OF PREDICTEDS	1.9968

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0009
FIRST INEQUALITY COEFFICIENT	(U)	0.2112
SECOND INEQUALITY COEFFICIENT	(U*)	1.1952
MEAN OF ACTUALS		0.0303
MEAN OF PREDICTEDS		0.0290
STANDARD DEVIATION OF ACTUALS		0.0154
STANDARD DEVIATION OF PREDICTEDS		0.0132
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.0330
BIAS PROPORTION	(UM)	0.0374
VARIANCE PROPORTION	(US)	0.1333
COVARIANCE PROPORTION	(UC)	0.8293
REGRESSION PROPORTION	(UR)	0.2634
DISTURBANCE PROPORTION	(UD)	0.6992
INTERCEPT	(A)	0.0319
SLOPE ESTIMATE	(B)	-0.0569
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0305

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDCE CONSUMER PRICE INDEX INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
96501	57.815	64.688	-6.874	11.889
196601	62.699	65.760	-3.062	-4.883
196701	72.044	66.769	5.275	7.322
196801	67.889	68.111	-0.222	-0.327
196901	69.825	69.761	0.064	0.092
197001	77.772	71.792	6.980	8.975
197101	75.541	73.490	2.051	2.715
197201	73.465	76.599	-3.134	-4.266
197301	73.119	73.001	0.119	0.162
197401	84.104	82.372	1.732	2.059
197501	100.000	104.160	-4.160	-4.160
197601	123.378	116.673	6.704	5.434
197701	119.482	118.659	0.823	0.689
197801	148.825	144.966	3.859	2.593

GRAPH RANGE OF VALUES: 57.815 TO 148.825

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	3.2185
MEAN ABSOLUTE % ERROR	3.9693
ROOT MEAN SQUARED ERROR	4.8363
ROOT MEAN SQUARED % ERROR	5.2328
MEAN OF ACTUALS	86.1397
MEAN OF PREDICTEDS	85.4143
MAXIMUM ABSOLUTE RESIDUAL	6.9801
MAXIMUM OF ACTUALS	148.8246
MAXIMUM OF PREDICTEDS	144.9659
MINIMUM OF ACTUALS	57.8146
MINIMUM OF PREDICTEDS	64.6884

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

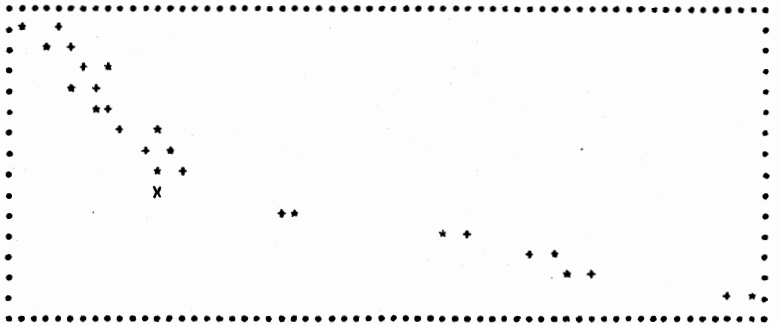
MEAN SQUARE ERROR	(D)	0.0048
FIRST INEQUALITY COEFFICIENT	(U)	0.0576
SECOND INEQUALITY COEFFICIENT	(U*)	0.0756
MEAN OF ACTUALS		0.0727
MEAN OF PREDICTEDS		0.0721
STANDARD DEVIATION OF ACTUALS		0.0951
STANDARD DEVIATION OF PREDICTEDS		0.0784
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7875
BIAS PROPORTION	(UM)	0.0239
VARIANCE PROPORTION	(US)	0.0587
COVARIANCE PROPORTION	(UC)	0.9174
REGRESSION PROPORTION	(UR)	0.0260
DISTURBANCE PROPORTION	(UD)	0.9501
INTERCEPT	(A)	0.0195
SLOPE ESTIMATE	(B)	0.8582
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9790

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDDA IMPLICIT DEFLATOR OF AGGREGATE DOMESTIC DEMAND INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965.1	57.203	61.633	-4.430	-7.744
1966Q1	60.000	62.948	-2.948	-4.913
1967Q1	66.027	63.742	2.286	3.462
1968Q1	63.245	64.663	-1.418	-2.242
1969Q1	64.960	66.295	-1.334	-2.054
1970Q1	71.218	67.623	3.596	5.049
1971Q1	72.251	69.828	2.424	3.354
1972Q1	71.575	73.383	-1.808	-2.526
1973Q1	71.713	71.291	0.422	0.588
1974Q1	84.703	84.128	0.575	0.679
1975Q1	100.000	102.396	-2.396	-2.396
1976Q1	111.174	109.155	2.018	1.816
1977Q1	111.911	114.585	-2.674	-2.389
1978Q1	130.437	128.348	2.090	1.602

GRAPH RANGE OF VALUES: 57.203 TO 130.437



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	2.1727
MEAN ABSOLUTE % ERROR	2.9153
ROOT MEAN SQUARED ERROR	2.4099
ROOT MEAN SQUARED % ERROR	3.4495
MEAN OF ACTUALS	81.1727
MEAN OF PREDICTEDS	81.4296
MAXIMUM ABSOLUTE RESIDUAL	4.4300
MAXIMUM OF ACTUALS	130.4372
MAXIMUM OF PREDICTEDS	128.3477
MINIMUM OF ACTUALS	57.2034
MINIMUM OF PREDICTEDS	61.6335

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

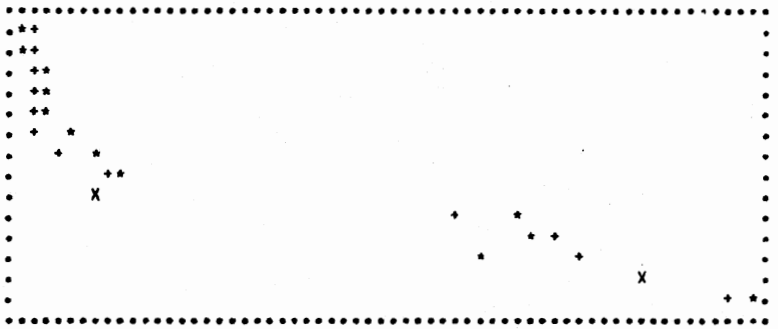
MEAN SQUARE ERROR	(U)	0.0021
FIRST INEQUALITY COEFFICIENT	(U)	0.4886
SECOND INEQUALITY COEFFICIENT	(U*)	0.6670
MEAN OF ACTUALS		0.0634
MEAN OF PREDICTEDS		0.0564
STANDARD DEVIATION OF ACTUALS		0.0682
STANDARD DEVIATION OF PREDICTEDS		0.0621
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7658
BIAS PROPORTION	(UM)	0.0235
VARIANCE PROPORTION	(US)	0.0182
COVARIANCE PROPORTION	(UC)	0.9582
REGRESSION PROPORTION	(UR)	0.0467
DISTURBANCE PROPORTION	(UD)	0.9298
INTERCEPT	(A)	0.0159
SLOPE ESTIMATE	(B)	0.8416
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9692

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQFDGDP IMPLICIT DEFLATOR OF GDP INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	39.561	41.485	-1.924	-4.863
1966Q1	40.919	41.973	-1.055	-2.577
1967Q1	43.828	41.816	2.012	4.591
1968Q1	42.721	42.037	0.683	1.599
1969Q1	43.270	42.136	1.134	2.620
1970Q1	45.815	42.253	3.563	7.776
1971Q1	49.487	45.097	4.390	8.870
1972Q1	51.295	49.827	1.467	2.861
1973Q1	48.926	48.860	0.066	0.135
1974Q1	98.456	91.695	6.755	6.861
1975Q1	100.000	102.566	-2.566	-2.566
1976Q1	94.767	106.612	-11.835	12.489
1977Q1	112.904	113.028	-0.124	-0.110
1978Q1	125.966	123.230	2.736	2.172

GRAPH RANGE OF VALUES: 39.561 TO 125.966



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	2.8792
MEAN ABSOLUTE % ERROR	4.2921
ROOT MEAN SQUARED ERROR	4.1792
ROOT MEAN SQUARED % ERROR	5.4935
MEAN OF ACTUALS	66.9933
MEAN OF PREDICTEDS	66.6147
MAXIMUM ABSOLUTE RESIDUAL	11.8351
MAXIMUM OF ACTUALS	125.9658
MAXIMUM OF PREDICTEDS	123.2299
MINIMUM OF ACTUALS	39.5615
MINIMUM OF PREDICTEDS	41.4853

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

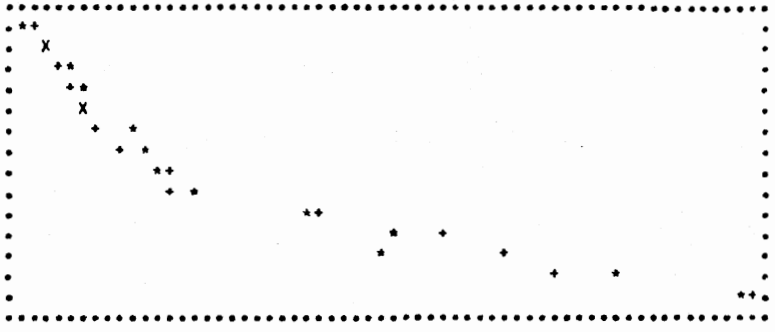
MEAN SQUARE ERROR	(D)	0.0040
FIRST INEQUALITY COEFFICIENT	(U)	0.3050
SECOND INEQUALITY COEFFICIENT	(U*)	0.3381
MEAN OF ACTUALS		0.0891
MEAN OF PREDICTEDS		0.0837
STANDARD DEVIATION OF ACTUALS		0.1862
STANDARD DEVIATION OF PREDICTEDS		0.1629
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9441
BIAS PROPORTION	(UM)	0.0072
VARIANCE PROPORTION	(US)	0.1379
COVARIANCE PROPORTION	(UC)	0.8549
REGRESSION PROPORTION	(UR)	0.0425
DISTURBANCE PROPORTION	(UD)	0.9503
INTERCEPT	(A)	0.0013
SLOPE ESTIMATE	(B)	1.0797
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0764

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDGDPNP IMPLICIT DEFLATOR OF NON-OIL GDP INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	64.769	67.046	-2.277	-3.515
1966Q1	67.594	68.253	-0.659	-0.975
1967Q1	70.394	68.992	1.412	2.006
1968Q1	70.674	69.828	0.842	1.192
1969Q1	71.229	71.326	-0.106	-0.149
1970Q1	75.686	72.546	3.140	4.149
1971Q1	76.694	74.571	2.119	2.763
1972Q1	77.647	79.316	-1.668	-2.149
1973Q1	81.348	79.214	2.134	2.623
1974Q1	92.996	93.744	-1.608	-1.746
1975Q1	100.000	104.489	-4.488	-4.489
1976Q1	99.463	110.687	-11.284	-11.352
1977Q1	120.708	115.673	5.035	4.171
1978Q1	132.673	133.312	-0.641	-0.483

GRAPH RANGE OF VALUES: 64.769 TO 133.312



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	2.6718
MEAN ABSOLUTE % ERROR	2.9824
ROOT MEAN SQUARED ERROR	3.8338
ROOT MEAN SQUARED % ERROR	4.0066
MEAN OF ACTUALS	85.7782
MEAN OF PREDICTEDS	86.3526
MAXIMUM APSOLUTE RESIDUAL	11.2843
MAXIMUM OF ACTUALS	132.6705
MAXIMUM OF PREDICTEDS	133.3119
MINIMUM OF ACTUALS	64.7690
MINIMUM OF PREDICTEDS	67.0459

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

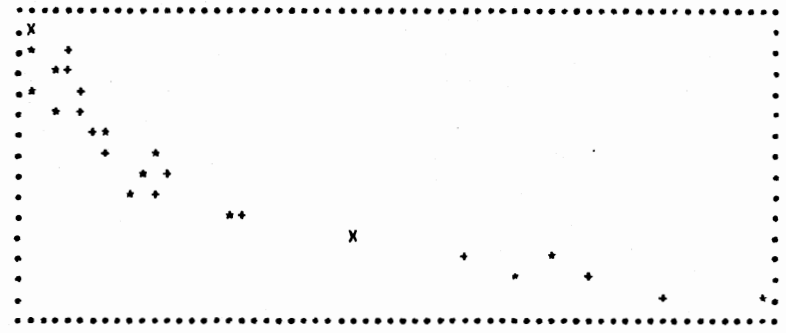
MEAN SQUARE ERROR	(U)	0.0031
FIRST INEQUALITY COEFFICIENT	(U)	0.7142
SECOND INEQUALITY COEFFICIENT	(U*)	1.0133
MEAN OF ACTUALS		0.0552
MEAN OF PREDICTEDS		0.0529
STANDARD DEVIATION OF ACTUALS		0.0548
STANDARD DEVIATION OF PREDICTEDS		0.0519
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.4604
BIAS PROPORTION	(UM)	0.0017
VARIANCE PROPORTION	(US)	0.0127
COVARIANCE PROPORTION	(UC)	0.9856
REGRESSION PROPORTION	(UR)	0.2307
DISTURBANCE PROPORTION	(UD)	0.7676
INTERCEPT	(A)	0.0295
SLOPE ESTIMATE	(B)	0.4861
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.7698

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDGVCE IMPLICIT DEFLATOR OF GOVERNMENT CONSUMPTION EXPENDITURES INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	60.447	61.542	-1.096	-1.813
1966Q1	64.198	64.971	-0.773	-1.930
1967Q1	64.598	64.951	-0.353	-0.546
1968Q1	61.574	66.751	-5.178	-8.409
1969Q1	63.222	67.542	-4.320	-6.833
1970Q1	69.304	68.768	0.536	0.773
1971Q1	75.577	70.653	4.924	6.515
1972Q1	73.680	77.522	-3.842	-5.214
1973Q1	73.246	76.639	-3.393	-4.632
1974Q1	84.278	85.842	-1.565	-1.856
1975Q1	100.000	100.218	-0.218	-0.218
1976Q1	123.158	113.859	9.299	7.550
1977Q1	118.861	127.739	-8.880	-7.471
1978Q1	148.502	137.162	11.340	7.636

GRAPH RANGE OF VALUES: 60.198 TO 148.502



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	4.1653
MEAN ABSOLUTE % ERROR	4.8140
ROOT MEAN SQUARED ERROR	5.4563
ROOT MEAN SQUARED % ERROR	5.6706
MEAN OF ACTUALS	84.0459
MEAN OF PREDICTEDS	84.5828
MAXIMUM ABSOLUTE RESIDUAL	11.3399
MAXIMUM OF ACTUALS	148.5023
MAXIMUM OF PREDICTEDS	137.1624
MINIMUM OF ACTUALS	60.1976
MINIMUM OF PREDICTEDS	61.5422

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0079
FIRST INEQUALITY COEFFICIENT	(U)	0.7341
SECOND INEQUALITY COEFFICIENT	(U*)	0.9252
MEAN OF ACTUALS		0.9691
MEAN OF PREDICTEDS		0.9616
STANDARD DEVIATION OF ACTUALS		0.0991
STANDARD DEVIATION OF PREDICTEDS		0.0524
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.4203
BIAS PROPORTION	(UM)	0.0081
VARIANCE PROPORTION	(US)	0.2053
COVARIANCE PROPORTION	(UC)	0.7866
REGRESSION PROPORTION	(UR)	0.0301
DISTURBANCE PROPORTION	(UD)	0.9619
INTERCEPT	(A)	0.0245
SLOPE ESTIMATE	(B)	0.7237
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9549

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDIFT IMPLICIT DEFLATOR OF GROSS FIXED INVESTMENT INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 51.599 TO 109.236
1965Q1	51.599	53.214	-1.615	-3.130	.*+ .
1966Q1	52.681	53.418	-0.738	-1.400	. X .
1967Q1	53.223	54.390	-1.167	-2.192	. *+ .
1968Q1	52.582	53.650	-1.187	-2.261	.* + .
1969Q1	54.371	56.152	-1.780	-3.275	. * + .
1970Q1	58.218	58.407	-0.189	-0.324	. X .
1971Q1	59.640	59.595	0.046	0.077	. X .
1972Q1	64.056	60.848	3.203	5.000	. + * .
1973Q1	67.415	63.228	4.187	6.211	. + * .
1974Q1	86.195	85.935	0.260	0.302	. X .
1975Q1	100.000	101.399	-1.399	-1.399	. ++ .
1976Q1	94.316	99.497	-5.181	-5.493	. * + .
1977Q1	101.617	104.779	-3.163	-3.112	. * + .
1978Q1	106.234	109.236	-3.002	-2.826	. * +.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	1.9368
MEAN ABSOLUTE % ERROR	2.6430
ROOT MEAN SQUARED ERROR	2.4611
ROOT MEAN SQUARED % ERROR	3.2291
MEAN OF ACTUALS	71.5757
MEAN OF PREDICTEDS	72.4131
MAXIMUM ABSOLUTE RESIDUAL	5.1805
MAXIMUM OF ACTUALS	106.2339
MAXIMUM OF PREDICTEDS	109.2358
MINIMUM OF ACTUALS	51.5988
MINIMUM OF PREDICTEDS	53.2136

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0008
FIRST INEQUALITY COEFFICIENT	(U)	0.3058
SECOND INEQUALITY COEFFICIENT	(U*)	0.3854
MEAN OF ACTUALS		0.0555
MEAN OF PREDICTEDS		0.0553
STANDARD DEVIATION OF ACTUALS		0.0724
STANDARD DEVIATION OF PREDICTEDS		0.0845
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9483
BIAS PROPORTION	(UM)	0.0001
VARIANCE PROPORTION	(US)	0.1877
COVARIANCE PROPORTION	(UC)	0.8122
REGRESSION PROPORTION	(UR)	0.3221
DISTURBANCE PROPORTION	(UD)	0.6778
INTERCEPT	(A)	0.0106
SLOPE ESTIMATE	(B)	0.8126
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.8788

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPDXPCR IMPLICIT DEFLATOR OF VALUE ADDED IN CRUDE PETROLEUM INDEX: 1975=100 TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 21.532 TO 120.922
1965Q1	21.532	22.293	-0.761	-3.534	.X .
1966Q1	21.806	22.356	-0.551	-2.525	.X .
1967Q1	21.875	22.111	-0.236	-1.079	.X .
1968Q1	22.397	22.336	0.061	0.274	.X .
1969Q1	22.158	22.285	-0.127	-0.574	.X .
1970Q1	23.268	22.217	1.051	4.515	.+* .
1971Q1	31.059	25.787	4.272	14.213	. + * .
1972Q1	27.226	24.918	2.308	8.478	. ** .
1973Q1	27.918	30.319	-2.400	-8.598	. * + .
1974Q1	103.272	90.437	12.835	12.428	. + * .
1975Q1	100.000	101.166	-1.166	-1.166	. ** .
1976Q1	91.208	103.414	-12.206	-13.383	. * + .
1977Q1	106.960	110.973	-4.013	-3.752	. * + .
1978Q1	120.922	114.863	6.059	5.011	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	3.4319
MEAN ABSOLUTE % ERROR	5.6806
ROOT MEAN SQUARED ERROR	5.3406
ROOT MEAN SQUARED % ERROR	7.3811
MEAN OF ACTUALS	52.9001
MEAN OF PREDICTEDS	52.5340
MAXIMUM ABSOLUTE RESIDUAL	12.8351
MAXIMUM OF ACTUALS	120.9223
MAXIMUM OF PREDICTEDS	114.8634
MINIMUM OF ACTUALS	21.5321
MINIMUM OF PREDICTEDS	22.1115

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0111
FIRST INEQUALITY COEFFICIENT	(U)	0.2797
SECOND INEQUALITY COEFFICIENT	(U*)	0.2989
MEAN OF ACTUALS		0.1327
MEAN OF PREDICTEDS		0.1261
STANDARD DEVIATION OF ACTUALS		0.3521
STANDARD DEVIATION OF PREDICTEDS		0.2868
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9665
BIAS PROPORTION	(UM)	0.0240
VARIANCE PROPORTION	(US)	0.3856
COVARIANCE PROPORTION	(UC)	0.6110
REGRESSION PROPORTION	(UR)	0.2584
DISTURBANCE PROPORTION	(UD)	0.7376
INTERCEPT	(A)	-0.0169
SLOPE ESTIMATE	(B)	1.1866
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.1648

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQPR PRIVATE NON-WAGE INCOME (INCLUDING DEPRE) MILL.CURR.DINARSTRANSFORMATIION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 459.097 TO 2033.073
1965 1	459.097	469.116	-10.019	-2.182	.X.
1966 1	487.999	478.198	9.801	2.008	.+*.
1967 1	491.266	495.371	-4.105	-0.836	. X .
1968 1	541.042	509.859	31.183	5.763	. + * .
1969 1	555.312	530.144	25.168	4.532	. +* .
1970 1	605.412	544.931	60.481	9.990	. + * .
1971 1	646.233	574.472	71.762	11.105	. + * .
1972 1	721.381	678.815	42.566	5.901	. +* .
1973 1	491.193	512.681	-21.487	-4.375	. +* .
1974 1	897.109	807.853	89.256	9.949	. + * .
1975 1	799.842	945.462	-145.620	-18.206	. * + .
1976 1	764.531	1123.189	-358.658	46.912	. * + .
1977 1	1329.230	1200.905	128.325	9.654	. + * .
1978 1	2033.073	1678.176	354.896	17.456	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	96.6662
MEAN ABSOLUTE % ERROR	10.6335
ROOT MEAN SQUARED ERROR	149.5532
ROOT MEAN SQUARED % ERROR	15.5137
MEAN OF ACTUALS	773.0503
MEAN OF PREDICTEDS	753.5112
MAXIMUM ABSOLUTE RESIDUAL	358.6582
MAXIMUM OF ACTUALS	2033.0725
MAXIMUM OF PREDICTEDS	1678.1763
MINIMUM OF ACTUALS	459.0974
MINIMUM OF PREDICTEDS	469.1165

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

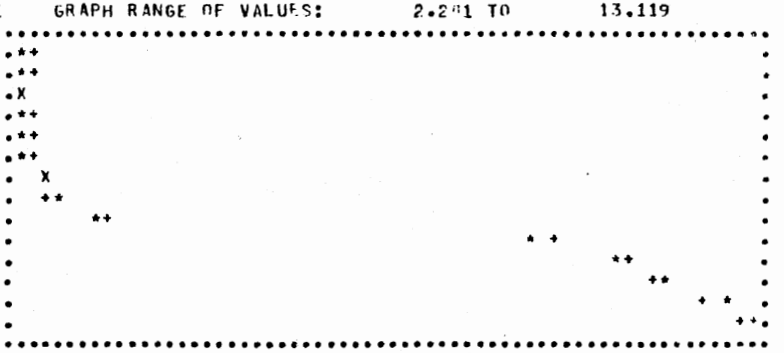
MEAN SQUARE ERROR	(U)	0.0317
FIRST INEQUALITY COEFFICIENT	(U)	0.6269
SECOND INEQUALITY COEFFICIENT	(U*)	0.6849
MEAN OF ACTUALS		0.1145
MEAN OF PREDICTEDS		0.0988
STANDARD DEVIATION OF ACTUALS		0.2601
STANDARD DEVIATION OF PREDICTEDS		0.1686
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7371
BIAS PROPORTION	(UM)	0.0085
VARIANCE PROPORTION	(US)	0.2674
COVARIANCE PROPORTION	(UC)	0.7241
REGRESSION PROPORTION	(UR)	0.0177
DISTURBANCE PROPORTION	(UD)	0.9738
INTERCEPT	(A)	0.0126
SLOPE ESTIMATE	(B)	1.1413
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.1479

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : I0PTE3321 REFINED PETROLEUM PRODUCTS EXPORT PRICE US $/BRL TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	2.291	2.390	-0.099	-4.311
196601	2.313	2.397	-0.084	-3.653
196701	2.291	2.376	-0.085	-3.717
196801	2.257	2.397	-0.140	-6.217
196901	2.261	2.393	-0.132	-5.725
197001	2.201	2.387	-0.186	-8.453
197101	2.615	2.733	-0.118	-4.514
197201	2.783	2.753	0.030	1.077
197301	3.431	3.513	-0.082	-2.394
197401	9.923	10.240	-0.317	-3.198
197501	11.175	11.430	-0.255	-2.284
197601	11.968	11.679	0.289	2.411
197701	12.784	12.518	0.266	2.083
197801	13.119	12.949	0.170	1.295

GRAPH RANGE OF VALUES: 2.201 TO 13.119



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	0.1653
MEAN ABSOLUTE % ERROR	3.0806
ROOT MEAN SQUARED ERROR	0.1863
ROOT MEAN SQUARED % ERROR	4.5237
MEAN OF ACTUALS	5.8109
MEAN OF PREDICTEDS	5.8683
MAXIMUM ABSOLUTE RESIDUAL	0.3174
MAXIMUM OF ACTUALS	13.1190
MAXIMUM OF PREDICTEDS	12.9492
MINIMUM OF ACTUALS	2.2010
MINIMUM OF PREDICTEDS	2.3762

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

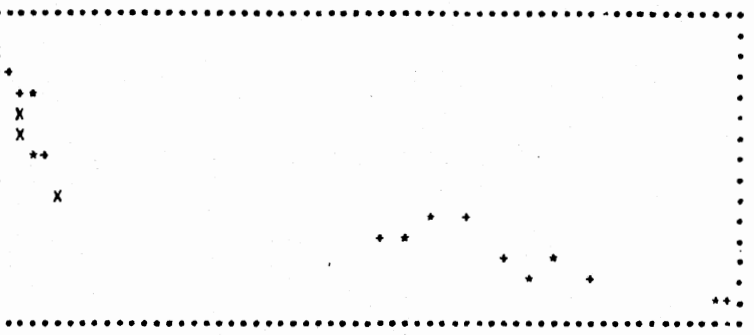
MEAN SQUARE ERROR	(U)	0.0007
FIRST INEQUALITY COEFFICIENT	(U)	0.0863
SECOND INEQUALITY COEFFICIENT	(U*)	0.0959
MEAN OF ACTUALS		0.1342
MEAN OF PREDICTEDS		0.1310
STANDARD DEVIATION OF ACTUALS		0.2768
STANDARD DEVIATION OF PREDICTEDS		0.2803
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9957
BIAS PROPORTION	(UM)	0.0256
VARIANCE PROPORTION	(US)	0.0176
COVARIANCE PROPORTION	(UC)	0.9565
REGRESSION PROPORTION	(UR)	0.0317
DISTURBANCE PROPORTION	(UD)	0.9425
INTERCEPT	(A)	0.0064
SLOPE ESTIMATE	(B)	0.9831
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9919

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTBNO TRADE BALANCE OF GOODS MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	152.349	152.729	-0.380	-0.249
1966Q1	157.420	156.673	0.747	0.474
1967Q1	146.169	162.293	-16.133	-11.038
1968Q1	227.553	206.586	20.974	9.217
1969Q1	214.950	208.056	14.894	6.929
1970Q1	211.159	215.659	-4.509	-2.136
1971Q1	252.169	263.961	-10.991	-4.323
1972Q1	136.630	128.269	8.361	6.119
1973Q1	317.781	307.569	10.211	3.213
1974Q1	1249.845	1340.525	-90.685	-7.256
1975Q1	1205.449	1118.536	86.914	7.219
1976Q1	1587.000	1452.711	134.289	8.462
1977Q1	1526.847	1662.789	-135.942	-8.903
1978Q1	2096.800	2096.931	-0.131	-0.007

GRAPH RANGE OF VALUES: 128.269 TO 2096.931



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	38.2185
MEAN ABSOLUTE % ERROR	5.3954
ROOT MEAN SQUARED ERROR	61.8327
ROOT MEAN SQUARED % ERROR	6.4454
MEAN OF ACTUALS	670.8618
MEAN OF PREDICTEDS	669.5979
MAXIMUM ABSOLUTE RESIDUAL	135.9424
MAXIMUM OF ACTUALS	2096.7998
MAXIMUM OF PREDICTEDS	2096.9307
MINIMUM OF ACTUALS	136.6301
MINIMUM OF PREDICTEDS	128.2693

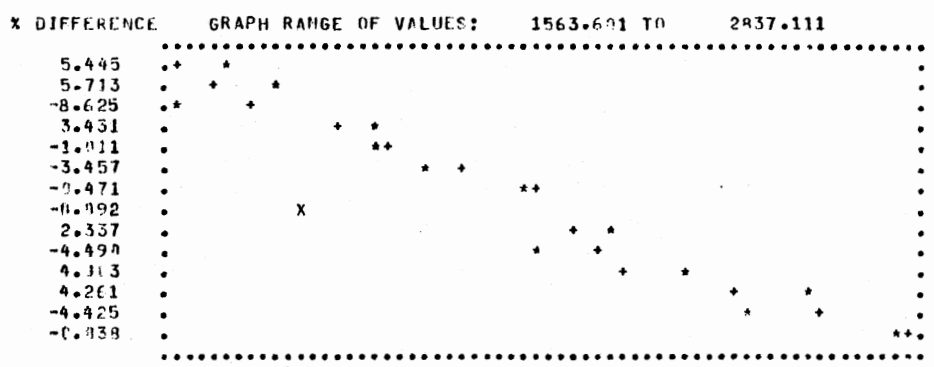
THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.011[illegible]
FIRST INEQUALITY COEFFICIENT	(U)	0.2069
SECOND INEQUALITY COEFFICIENT	(U*)	0.2247
MEAN OF ACTUALS		0.1983
MEAN OF PREDICTEDS		0.1981
STANDARD DEVIATION OF ACTUALS		0.4676
STANDARD DEVIATION OF PREDICTEDS		0.4960
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9779
BIAS PROPORTION	(UM)	0.0[illegible]00
VARIANCE PROPORTION	(US)	0.0731
COVARIANCE PROPORTION	(UC)	0.9269
REGRESSION PROPORTION	(UR)	0.1358
DISTURBANCE PROPORTION	(UD)	0.8642
INTERCEPT	(A)	0.0157
SLOPE ESTIMATE	(B)	0.9219
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9328

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTECMT TOTAL MERCHANDISE EXPORTS MILL.1975 DINARSUN YITS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	1657.645	1567.394	90.251	5.445
1966Q1	1748.525	1648.628	99.897	5.713
1967Q1	1563.601	1698.469	-134.867	-8.625
1968Q1	1909.906	1844.377	65.529	3.431
1969Q1	1918.646	1938.037	-19.391	-1.011
1970Q1	2005.211	2074.535	-69.325	-3.457
1971Q1	2180.906	2191.171	-10.265	-0.471
1972Q1	1796.526	1798.182	-1.654	-0.092
1973Q1	2320.491	2266.256	54.236	2.337
1974Q1	2201.448	2300.287	-98.839	-4.490
1975Q1	2450.199	2352.127	98.072	4.003
1976Q1	2670.148	2556.384	113.764	4.261
1977Q1	2574.217	2688.116	-113.899	-4.425
1978Q1	2836.028	2837.111	-1.083	-0.038



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	69.3622
MEAN ABSOLUTE % ERROR	3.4141
ROOT MEAN SQUARED ERROR	82.0634
ROOT MEAN SQUARED % ERROR	4.1493
MEAN OF ACTUALS	2130.9624
MEAN OF PREDICTEDS	2125.7891
MAXIMUM ABSOLUTE RESIDUAL	134.8672
MAXIMUM OF ACTUALS	2836.0281
MAXIMUM OF PREDICTEDS	2837.1111
MINIMUM OF ACTUALS	1563.6013
MINIMUM OF PREDICTEDS	1567.3938

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0045
FIRST INEQUALITY COEFFICIENT	(U)	0.5438
SECOND INEQUALITY COEFFICIENT	(U*)	0.5768
MEAN OF ACTUALS		0.0413
MEAN OF PREDICTEDS		0.0456
STANDARD DEVIATION OF ACTUALS		0.1169
STANDARD DEVIATION OF PREDICTEDS		0.0972
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8232
BIAS PROPORTION	(UM)	0.0041
VARIANCE PROPORTION	(US)	0.1936
COVARIANCE PROPORTION	(UC)	0.8022
REGRESSION PROPORTION	(UR)	0.0169
DISTURBANCE PROPORTION	(UD)	0.9791
INTERCEPT	(A)	0.0089
SLOPE ESTIMATE	(B)	1.1195
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0585

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTECNTN TOTAL MERCHANDISE EXPORTS MILL.CURR.DINARSUN YITS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 297.400 TO 3251.577
1965.1	314.954	300.485	14.465	4.593	.X .
196601	333.51	317.430	16.080	4.821	.X .
967.1	297.40	318.703	-21.293	-7.190	.X .
1968.1	371.72	361.183	10.537	2.835	. X .
1969.1	372.12	375.355	-3.235	-0.869	. X .
1970.1	392.899	403.943	-11.143	-2.837	. ++ .
1971.1	500.03	502.116	-2.086	-0.417	. X .
1972.1	371.31	371.624	-0.314	-0.085	. X .
1973.1	588.13	574.842	13.258	2.254	. X .
1974.1	1949.93	2038.235	-88.305	-4.529	. ++ .
1975.1	2450.20	2353.191	97.009	3.959	. ++ .
1976.1	2737.90	2620.227	117.673	4.298	. + * .
1977.1	2850.00	2974.804	-124.804	-4.379	. * + .
197801	3250.90	3251.577	-0.677	-0.021	. **.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	37.2120
MEAN ABSOLUTE % ERROR	3.9776
ROOT MEAN SQUARED ERROR	58.5436
ROOT MEAN SQUARED % ERROR	3.7039
MEAN OF ACTUALS	1198.6331
MEAN OF PREDICTEDS	1197.4131
MAXIMUM ABSOLUTE RESIDUAL	124.8040
MAXIMUM OF ACTUALS	3250.8999
MAXIMUM OF PREDICTEDS	3251.5767
MINIMUM OF ACTUALS	297.3999
MINIMUM OF PREDICTEDS	309.4854

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

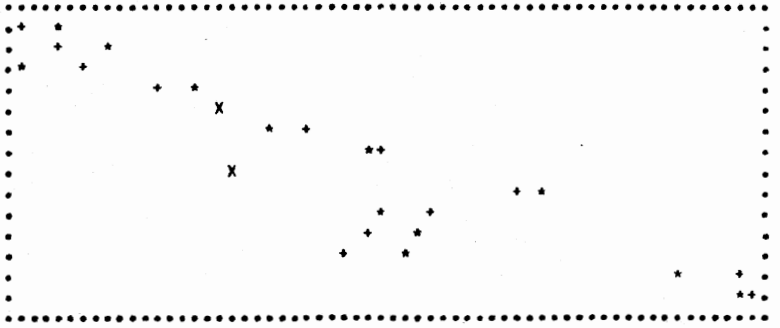
MEAN SQUARE ERROR	(U)	0.0037
FIRST INEQUALITY COEFFICIENT	(U)	0.1565
SECOND INEQUALITY COEFFICIENT	(U*)	0.1767
MEAN OF ACTUALS		0.1796
MEAN OF PREDICTEDS		0.1832
STANDARD DEVIATION OF ACTUALS		0.3429
STANDARD DEVIATION OF PREDICTEDS		0.3482
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9848
BIAS PROPORTION	(UM)	0.0036
VARIANCE PROPORTION	(US)	0.0075
COVARIANCE PROPORTION	(UC)	0.9888
REGRESSION PROPORTION	(UR)	0.0299
DISTURBANCE PROPORTION	(UD)	0.9664
INTERCEPT	(A)	0.0019
SLOPE ESTIMATE	(B)	0.9699
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9721

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTET EXPORTS OF GOODS AND SERVICES MILL.1975 DINARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	1597.995	1507.744	90.251	5.648
196601	1699.174	1599.277	99.897	5.879
196701	1513.524	1648.391	-134.867	-8.911
196801	1869.047	1803.519	65.529	3.506
196901	1913.603	1932.994	-19.391	-1.013
197001	2030.565	2099.890	-69.325	-3.414
197101	2231.068	2241.333	-10.265	-0.460
197201	1946.091	1947.745	-1.654	-0.085
197301	2560.560	2526.324	54.236	2.182
197401	2243.600	2342.439	-98.839	-4.405
197501	2328.999	2230.927	98.072	4.211
197601	2289.085	2175.322	113.764	4.979
197701	2853.929	2967.028	-113.099	-3.991
197801	2985.744	2986.827	-1.083	-0.036

GRAPH RANGE OF VALUES: 1507.744 TO 2986.827



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	69.3622
MEAN ABSOLUTE % ERROR	3.4737
ROOT MEAN SQUARED ERROR	82.8038
ROOT MEAN SQUARED % ERROR	4.2531
MEAN OF ACTUALS	2148.7827
MEAN OF PREDICTEDS	2143.6096
MAXIMUM ABSOLUTE RESIDUAL	134.8672
MAXIMUM OF ACTUALS	2985.7437
MAXIMUM OF PREDICTEDS	2986.8267
MINIMUM OF ACTUALS	1513.5239
MINIMUM OF PREDICTEDS	1507.7439

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

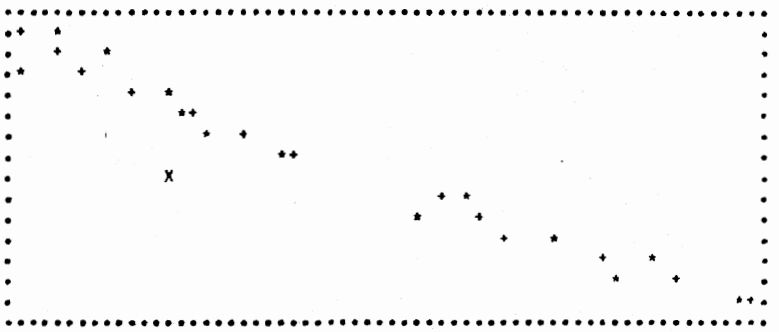
MEAN SQUARE ERROR	(D)	0.0047
FIRST INEQUALITY COEFFICIENT	(U)	0.4999
SECOND INEQUALITY COEFFICIENT	(U*)	0.5337
MEAN OF ACTUALS		0.0481
MEAN OF PREDICTEDS		0.0526
STANDARD DEVIATION OF ACTUALS		0.1285
STANDARD DEVIATION OF PREDICTEDS		0.1193
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8500
BIAS PROPORTION	(UM)	0.0043
VARIANCE PROPORTION	(US)	0.0181
COVARIANCE PROPORTION	(UC)	0.9776
REGRESSION PROPORTION	(UR)	0.0215
DISTURBANCE PROPORTION	(UD)	0.9742
INTERCEPT	(A)	-0.0001
SLOPE ESTIMATE	(B)	0.9157
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9155

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTL331B EXPORTS OF CRUDE PETROLEUM BILL. BARRELS TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	1.457	0.429	0.028	6.140
1966Q1	0.482	0.451	0.031	6.453
1967Q1	0.428	0.470	-0.042	-9.812
1968Q1	0.522	0.501	0.020	3.908
1969Q1	0.528	0.534	-0.006	-1.145
1970Q1	0.546	0.568	-0.022	-3.953
1971Q1	0.591	0.594	-0.003	-0.542
1972Q1	0.524	0.525	-0.001	-0.109
1973Q1	0.703	0.686	0.017	2.420
1974Q1	0.675	0.706	-0.031	-4.559
1975Q1	0.751	0.721	0.031	4.069
1976Q1	0.818	0.783	0.035	4.327
1977Q1	0.791	0.827	-0.035	-4.482
1978Q1	0.870	0.871	-0.000	-0.040

GRAPH RANGE OF VALUES: 0.428 TO 0.871



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	0.0216
MEAN ABSOLUTE % ERROR	3.7085
ROOT MEAN SQUARED ERROR	0.0255
ROOT MEAN SQUARED % ERROR	4.5519
MEAN OF ACTUALS	0.6204
MEAN OF PREDICTEDS	0.6188
MAXIMUM ABSOLUTE RESIDUAL	0.0420
MAXIMUM OF ACTUALS	0.8793
MAXIMUM OF PREDICTEDS	0.8707
MINIMUM OF ACTUALS	0.4278
MINIMUM OF PREDICTEDS	0.4292

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0054
FIRST INEQUALITY COEFFICIENT	(U)	0.5116
SECOND INEQUALITY COEFFICIENT	(U*)	0.6578
MEAN OF ACTUALS		0.0495
MEAN OF PREDICTEDS		0.0544
STANDARD DEVIATION OF ACTUALS		0.1119
STANDARD DEVIATION OF PREDICTEDS		0.0788
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7563
BIAS PROPORTION	(UM)	0.6144
VARIANCE PROPORTION	(US)	0.2029
COVARIANCE PROPORTION	(UC)	0.7927
REGRESSION PROPORTION	(UR)	0.0164
DISTURBANCE PROPORTION	(UD)	0.9852
INTERCEPT	(A)	0.0190
SLOPE ESTIMATE	(B)	1.0747
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.1214

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTE331N EXPORTS OF CRUDE PETROLEUM MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIF = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 217.857 TO 3205.732
1965-1	235.714	221.241	14.473	6.140	.X .
1966-1	249.286	233.198	16.088	6.454	.X .
1967-1	217.857	239.233	-21.375	-9.812	.X .
1968-1	269.643	259.106	10.537	3.908	.+* .
1969-1	271.786	274.898	-3.112	-1.145	. X .
1970-1	280.000	291.068	-11.068	-3.953	. X .
1971-1	375.196	377.229	-2.033	-0.542	. X .
1972-1	317.254	317.570	-0.316	-0.100	. X .
1973-1	555.268	541.963	13.325	2.400	. X .
1974-1	1921.016	2008.592	-87.577	-4.559	. + * .
1975-1	2414.781	2316.740	98.041	4.060	. + * .
1976-1	2691.489	2575.039	116.450	4.327	. + * .
1977-1	2807.547	2933.376	-125.829	-4.482	. + * .
1978-1	3204.449	3205.732	-1.283	-0.040	. **.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	37.2505
MEAN ABSOLUTE % ERROR	3.7085
ROOT MEAN SQUARED ERROR	58.5705
ROOT MEAN SQUARED % ERROR	4.5513
MEAN OF ACTUALS	1129.3782
MEAN OF PREDICTEDS	1128.2122
MAXIMUM ABSOLUTE RESIDUAL	125.8289
MAXIMUM OF ACTUALS	3204.4490
MAXIMUM OF PREDICTEDS	3205.7317
MINIMUM OF ACTUALS	217.8572
MINIMUM OF PREDICTEDS	221.2409

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

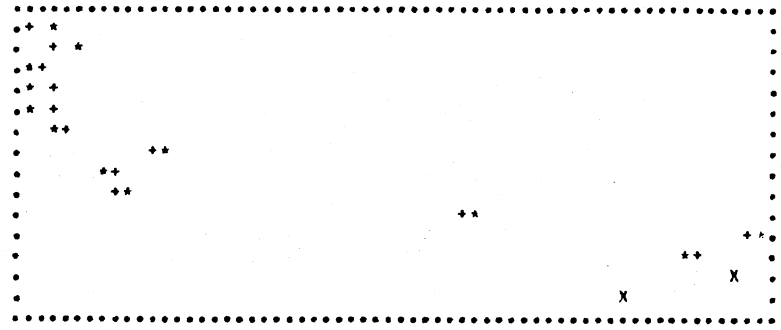
MEAN SQUARE ERROR	(U)	0.0154
FIRST INEQUALITY COEFFICIENT	(U)	0.1824
SECOND INEQUALITY COEFFICIENT	(U*)	0.2102
MEAN OF ACTUALS		0.2907
MEAN OF PREDICTEDS		0.2856
STANDARD DEVIATION OF ACTUALS		0.3502
STANDARD DEVIATION OF PREDICTEDS		0.3532
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9782
BIAS PROPORTION	(UM)	0.0044
VARIANCE PROPORTION	(US)	0.0016
COVARIANCE PROPORTION	(UC)	0.9939
REGRESSION PROPORTION	(UR)	0.0207
DISTURBANCE PROPORTION	(UD)	0.9748
INTERCEPT	(A)	0.0013
SLOPE ESTIMATE	(B)	0.9700
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9716

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTMCMT TOTAL MERCHANDISE IMPORTS MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965:1	390.592	352.950	37.641	9.637
1966:1	421.283	385.169	36.115	8.572
1967:1	359.009	373.739	-14.730	-4.103
1968:1	361.277	382.382	-21.104	-5.842
1969:1	347.951	391.250	-43.299	-12.444
1970:1	386.832	402.474	-15.671	-4.051
1971:1	517.574	501.654	15.920	3.076
1972:1	443.431	459.788	-16.357	-3.689
1973:1	472.847	468.335	4.511	0.954
1974:1	895.592	891.107	4.484	0.501
1975:1	1244.759	1234.655	10.104	0.812
1976:1	1154.851	1170.805	-15.954	-1.381
1977:1	1226.628	1216.042	10.587	0.863
1978:1	1084.609	1084.036	0.573	0.053

GRAPH RANGE OF VALUES: 347.951 TO 1244.759



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	17.6464
MEAN ABSOLUTE % ERROR	3.9984
ROOT MEAN SQUARED ERROR	21.6041
ROOT MEAN SQUARED % ERROR	5.4519
MEAN OF ACTUALS	664.7993
MEAN OF PREDICTEDS	665.3127
MAXIMUM ABSOLUTE RESIDUAL	43.2991
MAXIMUM OF ACTUALS	1244.7585
MAXIMUM OF PREDICTEDS	1234.6553
MINIMUM OF ACTUALS	347.9514
MINIMUM OF PREDICTEDS	352.9504

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0031
FIRST INEQUALITY COEFFICIENT	(U)	0.2386
SECOND INEQUALITY COEFFICIENT	(U*)	0.2536
MEAN OF ACTUALS		0.0786
MEAN OF PREDICTEDS		0.0863
STANDARD DEVIATION OF ACTUALS		0.2179
STANDARD DEVIATION OF PREDICTEDS		0.1976
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9700
BIAS PROPORTION	(UM)	0.0197
VARIANCE PROPORTION	(US)	0.1351
COVARIANCE PROPORTION	(UC)	0.8452
REGRESSION PROPORTION	(UR)	0.0622
DISTURBANCE PROPORTION	(UD)	0.9182
INTERCEPT	(A)	0.0138
SLOPE ESTIMATE	(B)	1.0697
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0442

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQIMCMTN TOTAL MERCHANDISE IMPORTS MILL.CURR.DINARSUN YITS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 144.160 TO 1323.153
1965Q1	162.614	147.766	14.844	9.129	.X
1966Q1	176.098	160.757	15.333	8.708	.**
1967Q1	151.243	156.493	-5.250	-3.471	.X
1968Q1	144.161	154.596	-10.436	-7.239	.X
1969Q1	157.170	175.299	-18.129	-11.535	.**
1970Q1	181.650	188.284	-6.634	-3.652	. **
1971Q1	247.871	239.055	8.815	3.556	. **
1972Q1	234.680	243.355	-8.675	-3.696	. X
1973Q1	270.320	267.273	3.047	1.127	. X
1974Q1	709.089	697.710	2.380	0.340	. X
1975Q1	1244.760	1234.654	10.106	0.812	. **
1976Q1	1150.982	1167.516	-16.616	-1.444	. **
1977Q1	1323.153	1312.015	11.138	0.842	. **
1978Q1	1244.190	1244.646	-0.546	-0.044	. X

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	9.4249
MEAN ABSOLUTE % ERROR	3.9718
ROOT MEAN SQUARED ERROR	10.8071
ROOT MEAN SQUARED % ERROR	5.3529
MEAN OF ACTUALS	527.7705
MEAN OF PREDICTEDS	527.8149
MAXIMUM ABSOLUTE RESIDUAL	18.1289
MAXIMUM OF ACTUALS	1323.1531
MAXIMUM OF PREDICTEDS	1312.0146
MINIMUM OF ACTUALS	144.1600
MINIMUM OF PREDICTEDS	147.7657

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0129
FIRST INEQUALITY COEFFICIENT	(U)	0.1617
SECOND INEQUALITY COEFFICIENT	(U*)	0.1831
MEAN OF ACTUALS		0.1565
MEAN OF PREDICTEDS		0.1639
STANDARD DEVIATION OF ACTUALS		0.2945
STANDARD DEVIATION OF PREDICTEDS		0.2798
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9841
BIAS PROPORTION	(UM)	0.0188
VARIANCE PROPORTION	(US)	0.0837
COVARIANCE PROPORTION	(UC)	0.8982
REGRESSION PROPORTION	(UR)	0.0495
DISTURBANCE PROPORTION	(UD)	0.9497
INTERCEPT	(A)	0.0138
SLOPE ESTIMATE	(B)	1.0389
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0173

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGTMCM[illegible].4-3 IMPORTS OF SITC 3, 1, 2, AND 4 MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIC = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 88.594 TO 261.874
1965Q1	120.534	99.116	21.418	17.769	
1966Q1	100.838	105.734	-4.904	-4.863	
1967Q1	97.207	104.042	-6.835	-7.031	
1968Q1	113.957	107.361	6.596	5.788	
1969Q1	88.594	109.693	-21.099	23.815	
1970Q1	97.359	111.797	-14.438	14.829	
1971Q1	145.285	157.368	-12.083	-8.317	
1972Q1	104.752	107.023	-2.272	-2.169	
1973Q1	125.881	132.208	-7.127	-5.698	
1974Q1	256.918	261.874	-4.955	-1.929	
1975Q1	256.898	260.929	-4.031	-1.569	
1976Q1	212.464	211.145	1.319	0.621	
1977Q1	217.312	214.591	2.721	1.252	
1978Q1	168.516	161.529	6.986	4.146	

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	8.3417
MEAN ABSOLUTE % ERROR	7.1283
ROOT MEAN SQUARED ERROR	10.4448
ROOT MEAN SQUARED % ERROR	9.7873
MEAN OF ACTUALS	150.4075
MEAN OF PREDICTEDS	153.1723
MAXIMUM ABSOLUTE RESIDUAL	21.4189
MAXIMUM OF ACTUALS	256.9185
MAXIMUM OF PREDICTEDS	261.8735
MINIMUM OF ACTUALS	88.5940
MINIMUM OF PREDICTEDS	99.1158

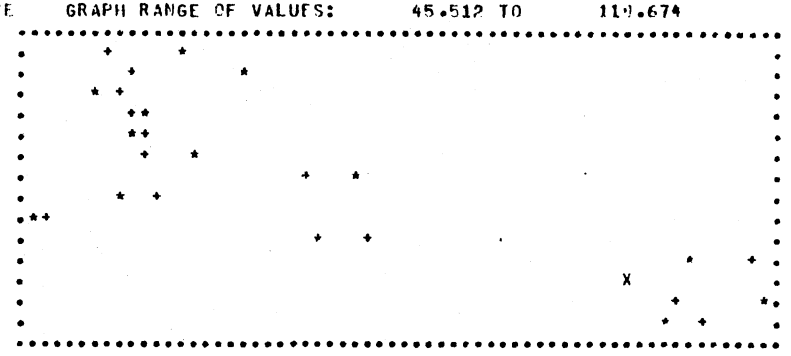
THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0128
FIRST INEQUALITY COEFFICIENT	(U)	0.3989
SECOND INEQUALITY COEFFICIENT	(U*)	0.4105
MEAN OF ACTUALS		0.0258
MEAN OF PREDICTEDS		0.0376
STANDARD DEVIATION OF ACTUALS		0.2829
STANDARD DEVIATION OF PREDICTEDS		0.2618
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9173
BIAS PROPORTION	(UM)	0.0108
VARIANCE PROPORTION	(US)	0.0346
COVARIANCE PROPORTION	(UC)	0.9546
REGRESSION PROPORTION	(UR)	0.0004
DISTURBANCE PROPORTION	(UD)	0.9887
INTERCEPT	(A)	0.0115
SLOPE ESTIMATE	(B)	0.9911
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9949

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQIMCM5+8,4 IMPORTS OF SITC 5,8,AND 9 MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	59.140	52.214	6.926	11.711
1966Q1	64.949	54.416	10.533	16.218
1967Q1	51.671	53.638	-1.967	-3.807
1968Q1	56.402	54.758	1.645	2.916
1969Q1	55.067	55.484	-0.417	-0.757
1970Q1	59.913	56.047	3.867	6.454
1971Q1	75.072	70.458	4.613	6.145
1972Q1	53.421	57.513	-4.092	-7.660
1973Q1	45.512	46.673	-1.161	-2.551
1974Q1	71.101	75.388	-4.287	-6.030
1975Q1	104.331	110.458	-6.127	-5.872
1976Q1	98.716	98.664	0.052	0.053
1977Q1	110.674	103.847	6.828	6.169
1978Q1	102.932	106.158	-3.226	-3.134



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	3.9815
MEAN ABSOLUTE % ERROR	5.6769
ROOT MEAN SQUARED ERROR	4.8766
ROOT MEAN SQUARED % ERROR	7.0054
MEAN OF ACTUALS	72.0644
MEAN OF PREDICTEDS	71.1225
MAXIMUM ABSOLUTE RESIDUAL	10.5333
MAXIMUM OF ACTUALS	110.6743
MAXIMUM OF PREDICTEDS	110.4581
MINIMUM OF ACTUALS	45.5123
MINIMUM OF PREDICTEDS	46.6731

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

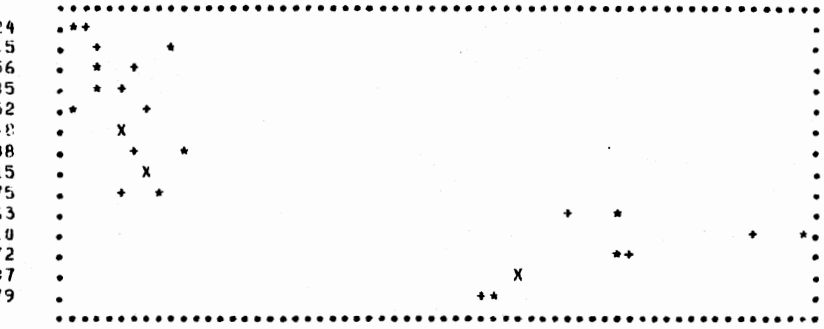
MEAN SQUARE ERROR	(U)	0.0076
FIRST INEQUALITY COEFFICIENT	(U)	0.3937
SECOND INEQUALITY COEFFICIENT	(U*)	0.4012
MEAN OF ACTUALS		0.0426
MEAN OF PREDICTEDS		0.0546
STANDARD DEVIATION OF ACTUALS		0.2171
STANDARD DEVIATION OF PREDICTEDS		0.1947
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9179
BIAS PROPORTION	(UM)	0.0188
VARIANCE PROPORTION	(US)	0.0661
COVARIANCE PROPORTION	(UC)	0.9151
REGRESSION PROPORTION	(UR)	0.0027
DISTURBANCE PROPORTION	(UD)	0.9784
INTERCEPT	(A)	-0.0132
SLOPE ESTIMATE	(B)	1.0234
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0058

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTMCM6 IMPORTS OF SITC 6 MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965 01	123.623	106.654	-3.030	-2.924
1966 01	137.958	113.670	24.288	17.605
1967 01	112.139	124.425	-12.285	10.956
1968 01	111.345	123.910	-12.565	11.285
1969 01	101.174	132.691	-31.517	-31.152
1970 01	122.226	120.823	1.403	1.148
1971 01	144.856	124.014	20.842	14.388
1972 01	129.463	131.037	-1.573	-1.215
1973 01	133.722	123.383	13.339	9.975
1974 01	383.069	286.814	16.255	5.363
1975 01	369.590	355.510	14.080	3.810
1976 01	305.795	306.616	-0.831	-0.272
1977 01	266.308	268.961	-2.654	-0.997
1978 01	259.725	254.844	4.881	1.879

GRAPH RANGE OF VALUES: 101.174 TO 369.590



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	11.3969
MEAN ABSOLUTE % ERROR	8.0692
ROOT MEAN SQUARED ERROR	14.6678
ROOT MEAN SQUARED % ERROR	11.6296
MEAN OF ACTUALS	185.7845
MEAN OF PREDICTEDS	183.5965
MAXIMUM ABSOLUTE RESIDUAL	31.5173
MAXIMUM OF ACTUALS	369.5898
MAXIMUM OF PREDICTEDS	355.5095
MINIMUM OF ACTUALS	101.1736
MINIMUM OF PREDICTEDS	106.6535

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

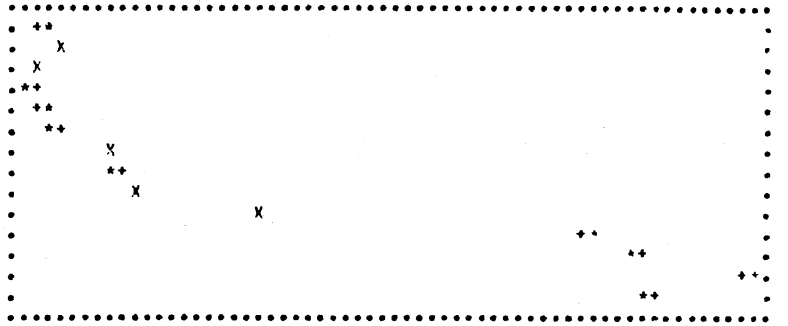
MEAN SQUARE ERROR	(U)	0.0241
FIRST INEQUALITY COEFFICIENT	(U)	0.5659
SECOND INEQUALITY COEFFICIENT	(U*)	0.5857
MEAN OF ACTUALS		0.0707
MEAN OF PREDICTEDS		0.0679
STANDARD DEVIATION OF ACTUALS		0.2648
STANDARD DEVIATION OF PREDICTEDS		0.2512
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8206
BIAS PROPORTION	(UM)	0.0006
VARIANCE PROPORTION	(US)	0.0078
COVARIANCE PROPORTION	(UC)	0.9916
REGRESSION PROPORTION	(UR)	0.0475
DISTURBANCE PROPORTION	(UD)	0.9519
INTERCEPT	(A)	0.0127
SLOPE ESTIMATE	(B)	0.8654
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.8786

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQTMCM7 IMPORTS OF SITC 7 MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
9651	106.271	93.943	12.328	11.6
9661	116.387	110.190	6.197	5.324
9671	97.991	91.634	6.357	6.488
9681	79.573	96.353	-16.780	-21.087
9691	102.000	92.266	9.734	9.543
9701	106.492	112.996	-6.504	-6.107
1971Q1	148.559	146.010	2.548	1.715
1972Q1	151.419	159.839	-8.420	-5.560
1973Q1	165.209	165.748	-0.539	-0.326
1974Q1	262.251	264.779	-2.528	-0.964
1975Q1	510.510	504.329	6.181	1.211
1976Q1	536.412	552.907	-16.494	-3.075
1977Q1	629.265	625.574	3.692	0.587
1978Q1	550.693	558.762	-8.069	-1.465

GRAPH RANGE OF VALUES: 79.573 TO 629.265



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	7.5978
MEAN ABSOLUTE % ERROR	5.3609
ROOT MEAN SQUARED ERROR	8.9541
ROOT MEAN SQUARED % ERROR	7.6827
MEAN OF ACTUALS	254.5922
MEAN OF PREDICTEDS	255.3806
MAXIMUM ABSOLUTE RESIDUAL	16.7796
MAXIMUM OF ACTUALS	629.2654
MAXIMUM OF PREDICTEDS	625.5737
MINIMUM OF ACTUALS	79.5733
MINIMUM OF PREDICTEDS	91.6342

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0154
FIRST INEQUALITY COEFFICIENT	(U)	0.4546
SECOND INEQUALITY COEFFICIENT	(U*)	0.5133
MEAN OF ACTUALS		0.1266
MEAN OF PREDICTEDS		0.1372
STANDARD DEVIATION OF ACTUALS		0.2415
STANDARD DEVIATION OF PREDICTEDS		0.2160
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8600
BIAS PROPORTION	(UM)	0.0073
VARIANCE PROPORTION	(US)	0.0423
COVARIANCE PROPORTION	(UC)	0.9504
REGRESSION PROPORTION	(UR)	0.0345
DISTURBANCE PROPORTION	(UD)	0.9882
INTERCEPT	(A)	0.0053
SLOPE ESTIMATE	(B)	0.9615
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9504

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IGTMT TOTAL IMPORTS OF GOODS AND SERVICES MILL.1975 DINARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	426.409	388.768	37.641	8.828
1966Q1	444.377	408.263	36.115	8.127
1967Q1	365.355	380.085	-14.730	-4.032
1968Q1	385.062	406.167	-21.104	-5.481
1969Q1	396.655	439.954	-43.299	-10.916
1970Q1	427.182	442.853	-15.671	-3.668
1971Q1	538.083	522.163	15.920	2.959
1972Q1	500.021	516.377	-16.357	-3.271
1973Q1	609.546	610.034	4.511	0.746
1974Q1	1396.118	1391.634	4.484	0.321
1975Q1	1792.009	1781.896	10.104	0.564
1976Q1	1465.286	1481.240	-15.954	-1.089
1977Q1	1954.874	1944.286	10.587	0.542
1978Q1	1847.256	1846.683	0.573	0.031

GRAPH RANGE OF VALUES: 365.355 TO 1954.874

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	17.6465
MEAN ABSOLUTE % ERROR	3.6124
ROOT MEAN SQUARED ERROR	21.6041
ROOT MEAN SQUARED % ERROR	4.9627
MEAN OF ACTUALS	895.9436
MEAN OF PREDICTEDS	896.4565
MAXIMUM ABSOLUTE RESIDUAL	43.2991
MAXIMUM OF ACTUALS	1954.8735
MAXIMUM OF PREDICTEDS	1944.2864
MINIMUM OF ACTUALS	365.3555
MINIMUM OF PREDICTEDS	380.7852

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

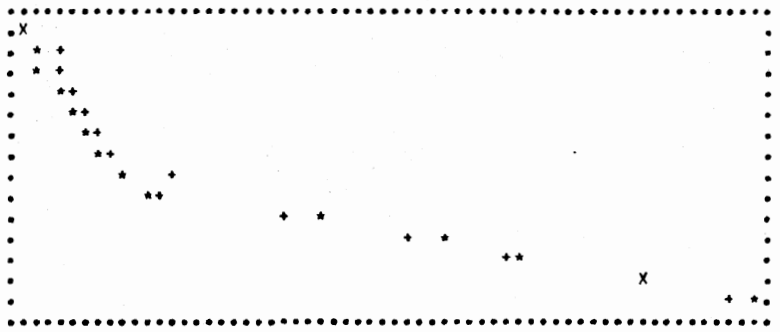
MEAN SQUARE ERROR	(U)	0.0026
FIRST INEQUALITY COEFFICIENT	(U)	0.1792
SECOND INEQUALITY COEFFICIENT	(U*)	0.1955
MEAN OF ACTUALS		0.1128
MEAN OF PREDICTEDS		0.1199
STANDARD DEVIATION OF ACTUALS		0.2584
STANDARD DEVIATION OF PREDICTEDS		0.2419
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9822
BIAS PROPORTION	(UM)	0.0197
VARIANCE PROPORTION	(US)	0.1164
COVARIANCE PROPORTION	(UC)	0.8739
REGRESSION PROPORTION	(UR)	0.0552
DISTURBANCE PROPORTION	(UD)	0.9251
INTERCEPT	(A)	-0.0139
SLOPE ESTIMATE	(B)	1.0491
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0277

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQWRN AVERAGE WAGE RATE DINARS TRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	118.333	121.708	-3.376	-2.853
196601	128.257	136.095	-7.838	-6.111
196701	128.983	136.011	-7.028	-5.449
196801	136.125	143.564	-7.439	-5.465
196901	144.097	146.882	-2.785	-1.933
197001	150.251	152.029	-1.777	-1.183
197101	154.349	159.937	-5.588	-3.620
197201	164.582	188.757	-24.175	-14.689
197301	176.844	185.052	-8.208	-4.641
197401	254.157	238.354	15.803	6.219
197501	311.662	292.377	19.284	6.188
197601	345.378	341.225	4.153	1.202
197701	398.169	399.464	-1.294	-0.325
197801	447.433	439.081	8.432	1.885

GRAPH RANGE OF VALUES: 118.333 TO 447.433



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	8.3700
MEAN ABSOLUTE % ERROR	4.4115
ROOT MEAN SQUARED ERROR	10.6340
ROOT MEAN SQUARED % ERROR	5.6229
MEAN OF ACTUALS	218.4727
MEAN OF PREDICTEDS	220.0324
MAXIMUM ABSOLUTE RESIDUAL	24.1754
MAXIMUM OF ACTUALS	447.4329
MAXIMUM OF PREDICTEDS	439.8910
MINIMUM OF ACTUALS	118.3328
MINIMUM OF PREDICTEDS	121.7084

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0028
FIRST INEQUALITY COEFFICIENT	(U)	0.3906
SECOND INEQUALITY COEFFICIENT	(U*)	0.5905
MEAN OF ACTUALS		0.1023
MEAN OF PREDICTEDS		0.0987
STANDARD DEVIATION OF ACTUALS		0.0902
STANDARD DEVIATION OF PREDICTEDS		0.0805
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8129
BIAS PROPORTION	(UM)	0.0146
VARIANCE PROPORTION	(US)	0.0331
COVARIANCE PROPORTION	(UC)	0.9622
REGRESSION PROPORTION	(UR)	0.0186
DISTURBANCE PROPORTION	(UD)	0.9768
INTERCEPT	(A)	0.0125
SLOPE ESTIMATE	(B)	0.9098
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9869

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQWYN TOTAL WAGE BILL MILL.CURR.DINARSIRAQ AAS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 234.500 TO 1314.200
96501	234.500	243.722	-8.522	-3.634	.X .
96601	261.600	280.851	-19.251	-7.359	. ** .
96701	270.600	289.299	-18.499	-6.831	. ** .
96801	294.200	314.804	-20.604	-7.003	. ** .
96901	328.600	331.451	-10.851	-3.384	. ** .
97001	344.000	352.804	-8.804	-2.559	. ** .
97101	363.500	381.609	-18.109	-4.982	. ** .
97201	398.700	464.525	-65.825	-16.513	. * + .
97301	440.500	465.423	-24.923	-5.658	. ** .
97401	664.900	616.798	48.102	7.235	. + * .
97501	838.900	781.376	57.523	6.857	. + * .
97601	956.800	943.183	13.617	1.423	. ** .
97701	1135.500	1132.870	2.630	0.232	. X .
97801	1314.200	1278.175	36.025	2.741	. + *.

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	25.2346
MEAN ABSOLUTE % ERROR	5.4577
ROOT MEAN SQUARED ERROR	31.3963
ROOT MEAN SQUARED % ERROR	6.6517
MEAN OF ACTUALS	559.9067
MEAN OF PREDICTEDS	562.5842
MAXIMUM ABSOLUTE RESIDUAL	65.8254
MAXIMUM OF ACTUALS	1314.2000
MAXIMUM OF PREDICTEDS	1278.1750
MINIMUM OF ACTUALS	234.5000
MINIMUM OF PREDICTEDS	243.4217

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0034
FIRST INEQUALITY COEFFICIENT	(U)	0.3587
SECOND INEQUALITY COEFFICIENT	(U*)	0.6165
MEAN OF ACTUALS		0.1326
MEAN OF PREDICTEDS		0.1277
STANDARD DEVIATION OF ACTUALS		0.0948
STANDARD DEVIATION OF PREDICTEDS		0.0819
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7922
BIAS PROPORTION	(UM)	0.0070
VARIANCE PROPORTION	(US)	0.0491
COVARIANCE PROPORTION	(UC)	0.9439
REGRESSION PROPORTION	(UR)	0.0133
DISTURBANCE PROPORTION	(UD)	0.9797
INTERCEPT	(A)	0.0154
SLOPE ESTIMATE	(B)	0.9176
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0031

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXAG VALUE ADDED IN AGRICULTURE MILL.1975 DINARSUN DRDA MAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE	GRAPH RANGE OF VALUES: 244.215 TO 365.651
196501	246.687	258.865	-12.177	-4.936	
196601	244.215	265.384	-21.169	-8.668	
196701	273.099	272.486	0.614	0.225	
196801	292.486	275.715	16.771	5.734	
196901	293.266	277.800	15.466	5.274	
197001	287.802	284.458	3.344	1.162	
197101	278.043	290.857	-12.813	-4.608	
197201	363.135	365.651	-2.516	-0.693	
197301	273.620	272.041	1.579	0.577	
197401	301.984	296.341	5.643	1.869	
197501	297.311	291.136	6.164	2.073	
197601	337.485	318.260	19.226	5.697	
197701	298.936	301.249	-2.313	-0.774	
197801	318.938	325.868	-6.930	-2.173	

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	9.0517
MEAN ABSOLUTE % ERROR	3.1759
ROOT MEAN SQUARED ERROR	11.3239
ROOT MEAN SQUARED % ERROR	4.0462
MEAN OF ACTUALS	293.3564
MEAN OF PREDICTEDS	292.5789
MAXIMUM ABSOLUTE RESIDUAL	21.1687
MAXIMUM OF ACTUALS	363.1348
MAXIMUM OF PREDICTEDS	365.6506
MINIMUM OF ACTUALS	244.2151
MINIMUM OF PREDICTEDS	258.8645

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(U)	0.0019
FIRST INEQUALITY COEFFICIENT	(U)	0.3381
SECOND INEQUALITY COEFFICIENT	(U*)	0.3421
MEAN OF ACTUALS		0.0198
MEAN OF PREDICTEDS		0.0177
STANDARD DEVIATION OF ACTUALS		0.1271
STANDARD DEVIATION OF PREDICTEDS		0.1128
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9418
BIAS PROPORTION	(UM)	0.0022
VARIANCE PROPORTION	(US)	0.1211
COVARIANCE PROPORTION	(UC)	0.8767
REGRESSION PROPORTION	(UR)	0.0316
DISTURBANCE PROPORTION	(UD)	0.9662
INTERCEPT	(A)	0.0008
SLOPE ESTIMATE	(B)	1.0699
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	1.0702

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : I9&C VALUE ADDED IN CONSTRUCTION MILL.1975 DINARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965 1	47.158	36.643	10.515	22.297
1966 1	51.181	44.126	7.054	13.782
1967 1	46.555	46.424	0.131	0.282
1968 1	59.577	59.759	-0.182	-0.361
1969 1	59.778	59.371	0.407	0.882
1970 1	51.784	54.114	-2.330	-4.500
1971 1	52.789	44.853	7.936	15.034
1972 1	55.896	58.535	-2.730	-4.891
1973 1	67.369	73.970	-6.601	-9.798
1974 1	69.480	71.485	-2.004	-2.885
1975 1	91.383	93.916	-2.616	-2.865
1976 1	196.871	201.417	-4.548	-2.310
1977 1	284.206	280.311	3.895	1.371
1978 1	346.570	342.962	3.608	1.041

GRAPH RANGE OF VALUES: 36.643 TO 346.570

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	3.8969
MEAN ABSOLUTE % ERROR	5.8727
ROOT MEAN SQUARED ERROR	4.9259
ROOT MEAN SQUARED % ERROR	8.7790
MEAN OF ACTUALS	104.4586
MEAN OF PREDICTEDS	103.5632
MAXIMUM ABSOLUTE RESIDUAL	10.5148
MAXIMUM OF ACTUALS	346.5698
MAXIMUM OF PREDICTEDS	342.9617
MINIMUM OF ACTUALS	46.5549
MINIMUM OF PREDICTEDS	36.6434

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0100
FIRST INEQUALITY COEFFICIENT	(U)	0.3793
SECOND INEQUALITY COEFFICIENT	(U*)	0.4666
MEAN OF ACTUALS		0.1534
MEAN OF PREDICTEDS		0.1720
STANDARD DEVIATION OF ACTUALS		0.2341
STANDARD DEVIATION OF PREDICTEDS		0.2209
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.8986
BIAS PROPORTION	(UM)	0.0347
VARIANCE PROPORTION	(US)	0.0046
COVARIANCE PROPORTION	(UC)	0.9608
REGRESSION PROPORTION	(UR)	0.0812
DISTURBANCE PROPORTION	(UD)	0.8841
INTERCEPT	(A)	0.0436
SLOPE ESTIMATE	(B)	0.8711
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.8789

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXMM VALUE ADDED IN NON-OIL MINING + MANUFACTURING MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	194.612	198.342	-3.730	-3.565
1966Q1	108.601	117.552	-8.951	-8.242
1967Q1	108.742	121.496	-12.754	11.729
1968Q1	114.926	126.873	-11.946	-10.395
1969Q1	131.688	129.104	2.584	1.962
1970Q1	134.694	134.855	-0.760	-0.567
1971Q1	152.227	142.047	10.180	6.687
1972Q1	166.388	173.852	-7.472	-4.491
1973Q1	183.264	184.556	-1.292	-0.705
1974Q1	198.412	178.720	11.692	6.140
1975Q1	224.279	227.419	-3.149	-1.404
1976Q1	311.978	307.713	4.265	1.367
1977Q1	372.331	359.770	12.561	3.373
1978Q1	411.756	410.491	1.265	0.307

GRAPH RANGE OF VALUES: 194.612 TO 411.756

SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	6.6144
MEAN ABSOLUTE % ERROR	4.3525
ROOT MEAN SQUARED ERROR	7.9824
ROOT MEAN SQUARED % ERROR	5.6621
MEAN OF ACTUALS	193.9486
MEAN OF PREDICTEDS	194.4849
MAXIMUM ABSOLUTE RESIDUAL	12.7542
MAXIMUM OF ACTUALS	411.7563
MAXIMUM OF PREDICTEDS	410.4912
MINIMUM OF ACTUALS	194.6122
MINIMUM OF PREDICTEDS	198.3418

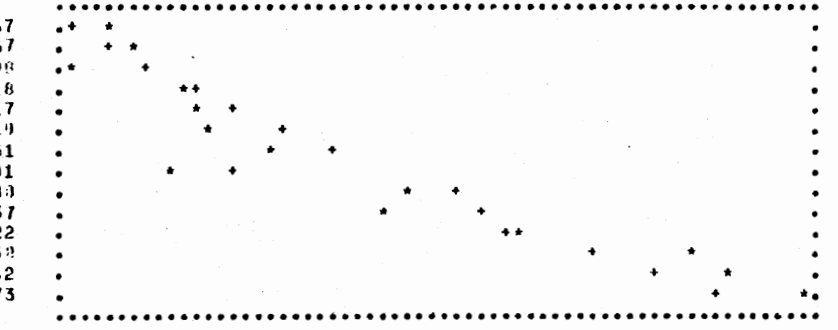
THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0639
FIRST INEQUALITY COEFFICIENT	(U)	0.4643
SECOND INEQUALITY COEFFICIENT	(U*)	0.7471
MEAN OF ACTUALS		0.1954
MEAN OF PREDICTEDS		0.1925
STANDARD DEVIATION OF ACTUALS		0.0836
STANDARD DEVIATION OF PREDICTEDS		0.0949
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7591
BIAS PROPORTION	(UM)	0.0022
VARIANCE PROPORTION	(US)	0.0275
COVARIANCE PROPORTION	(UC)	0.9702
REGRESSION PROPORTION	(UR)	0.2386
DISTURBANCE PROPORTION	(UD)	0.7592
INTERCEPT	(A)	0.0362
SLOPE ESTIMATE	(B)	0.6754
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.8672

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXPCR VALUE ADDED IN CRUDE PETROLEUM MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	1305.497	1236.740	68.756	5.267
196601	1360.909	1312.211	48.698	3.557
196701	1212.321	1394.047	-181.726	14.998
196801	1493.958	1504.681	-10.722	-0.718
196901	1505.945	1616.254	-100.310	-6.617
197001	1558.371	1731.499	-173.128	-11.110
197101	1689.329	1821.961	-132.631	-7.851
197201	1469.157	1604.334	-135.177	-9.201
197301	2018.027	2124.574	-106.547	-5.280
197401	1958.696	2190.451	-231.846	-11.837
197501	2279.009	2242.033	36.966	1.622
197601	2681.575	2441.568	240.007	8.950
197701	2763.179	2584.052	179.119	6.482
197801	2918.568	2726.717	191.852	6.573



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	131.2490
MEAN ABSOLUTE % ERROR	7.1468
ROOT MEAN SQUARED ERROR	148.5892
ROOT MEAN SQUARED % ERROR	8.0847
MEAN OF ACTUALS	1873.7437
MEAN OF PREDICTEDS	1895.6499
MAXIMUM ABSOLUTE RESIDUAL	240.0073
MAXIMUM OF ACTUALS	2918.5684
MAXIMUM OF PREDICTEDS	2726.7166
MINIMUM OF ACTUALS	1212.3206
MINIMUM OF PREDICTEDS	1236.7405

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

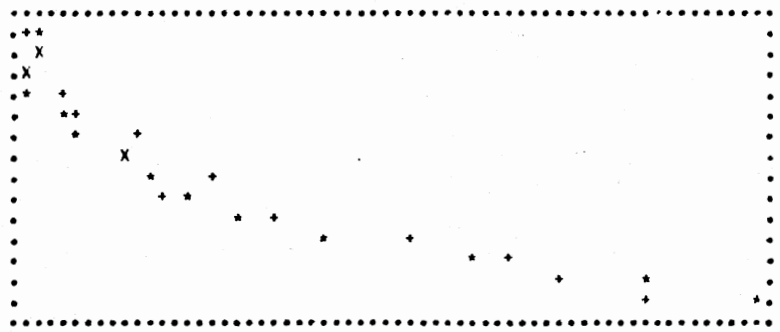
MEAN SQUARE ERROR	(U)	0.0064
FIRST INEQUALITY COEFFICIENT	(U)	0.5847
SECOND INEQUALITY COEFFICIENT	(U*)	0.6559
MEAN OF ACTUALS		0.4619
MEAN OF PREDICTEDS		0.4608
STANDARD DEVIATION OF ACTUALS		0.1218
STANDARD DEVIATION OF PREDICTEDS		0.0820
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7599
BIAS PROPORTION	(UM)	0.0002
VARIANCE PROPORTION	(US)	0.2485
COVARIANCE PROPORTION	(UC)	0.7514
REGRESSION PROPORTION	(UR)	0.0175
DISTURBANCE PROPORTION	(UD)	0.9823
INTERCEPT	(A)	-0.0068
SLOPE ESTIMATE	(B)	1.1290
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0894

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXPRF VALUE ADDED IN PETROLEUM REFINING MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	11.173	11.015	0.158	1.411
1966Q1	11.519	11.594	-0.075	-0.649
196701	13.575	13.955	-0.381	-3.688
196801	11.051	12.532	-1.481	-13.398
196901	12.511	12.931	-0.420	-3.354
197001	12.779	15.505	-2.726	-21.334
197101	14.886	15.026	-0.140	-0.941
197201	16.119	18.398	-2.280	-14.142
197301	17.438	16.403	1.035	5.935
197401	19.673	21.212	-1.539	-7.821
197501	22.930	27.049	-4.119	-17.919
197601	29.449	30.870	-1.421	-4.826
197701	36.543	33.205	3.338	9.135
197801	40.934	36.438	4.496	10.984

GRAPH RANGE OF VALUES: 10.575 TO 40.934



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	1.6855
MEAN ABSOLUTE % ERROR	8.2463
ROOT MEAN SQUARED ERROR	2.2183
ROOT MEAN SQUARED % ERROR	10.3751
MEAN OF ACTUALS	19.1128
MEAN OF PREDICTEDS	19.5087
MAXIMUM ABSOLUTE RESIDUAL	4.4961
MAXIMUM OF ACTUALS	40.9337
MAXIMUM OF PREDICTEDS	36.4376
MINIMUM OF ACTUALS	10.5746
MINIMUM OF PREDICTEDS	10.9552

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

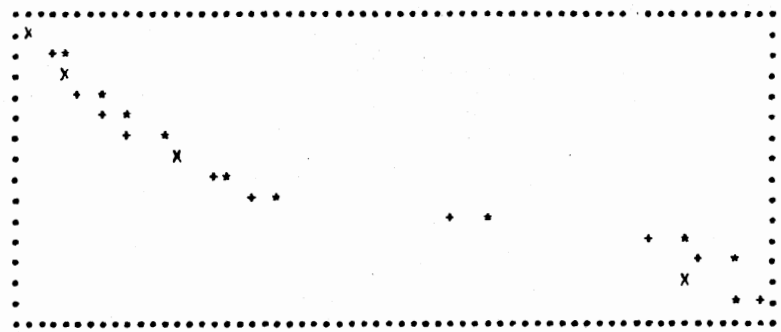
MEAN SQUARE ERROR	(D)	0.0147
FIRST INEQUALITY COEFFICIENT	(U)	0.9289
SECOND INEQUALITY COEFFICIENT	(U*)	1.4408
MEAN OF ACTUALS		0.0999
MEAN OF PREDICTEDS		0.0920
STANDARD DEVIATION OF ACTUALS		0.0842
STANDARD DEVIATION OF PREDICTEDS		0.1107
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.2514
BIAS PROPORTION	(UM)	0.0042
VARIANCE PROPORTION	(US)	0.0477
COVARIANCE PROPORTION	(UC)	0.9481
REGRESSION PROPORTION	(UR)	0.5446
DISTURBANCE PROPORTION	(UD)	0.4512
INTERCEPT	(A)	0.0823
SLOPE ESTIMATE	(B)	0.1913
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.5565

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXS VALUE ADDED IN SERVICES MILL.1975 DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
196501	356.342	353.081	3.269	0.915
196601	387.371	375.349	12.022	3.103
196701	389.503	385.084	4.418	1.134
196801	415.372	400.942	14.431	3.474
196901	440.380	416.161	24.219	5.500
197001	467.885	433.902	33.983	7.263
197101	479.137	473.444	5.693	1.188
197201	510.505	509.274	1.231	0.241
197301	550.392	532.185	18.207	3.308
197401	721.335	694.529	26.806	3.716
197501	880.399	844.365	36.034	4.093
197601	919.847	884.817	35.030	3.808
197701	882.549	882.743	-0.195	-0.022
197801	922.257	932.623	-10.366	-1.124

GRAPH RANGE OF VALUES: 353.081 TO 932.623



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	16.1354
MEAN ABSOLUTE % ERROR	2.7779
ROOT MEAN SQUARED ERROR	20.4264
ROOT MEAN SQUARED % ERROR	3.4389
MEAN OF ACTUALS	594.5186
MEAN OF PREDICTEDS	579.8921
MAXIMUM ABSOLUTE RESIDUAL	36.0342
MAXIMUM OF ACTUALS	922.2571
MAXIMUM OF PREDICTEDS	932.6233
MINIMUM OF ACTUALS	356.3418
MINIMUM OF PREDICTEDS	353.0813

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

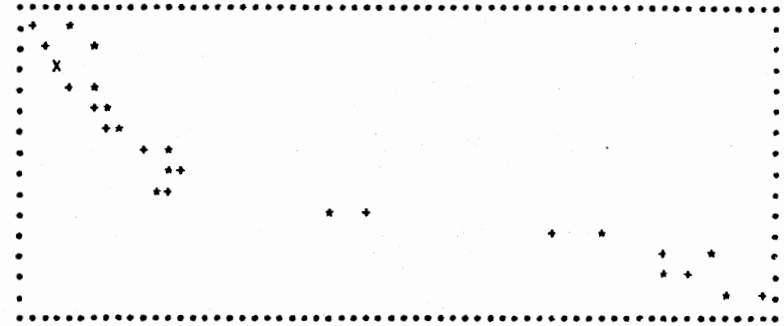
MEAN SQUARE ERROR	(U)	0.0607
FIRST INEQUALITY COEFFICIENT	(U)	0.2483
SECOND INEQUALITY COEFFICIENT	(U*)	0.3423
MEAN OF ACTUALS		0.0731
MEAN OF PREDICTEDS		0.0747
STANDARD DEVIATION OF ACTUALS		0.0771
STANDARD DEVIATION OF PREDICTEDS		0.0711
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9400
BIAS PROPORTION	(UM)	0.0035
VARIANCE PROPORTION	(US)	0.0523
COVARIANCE PROPORTION	(UC)	0.9442
REGRESSION PROPORTION	(UR)	0.0029
DISTURBANCE PROPORTION	(UD)	0.9936
INTERCEPT	(A)	0.0031
SLOPE ESTIMATE	(B)	1.0198
SLOPE ESTIMATE-WITHOUT INTERCEPT	(B*)	0.9984

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXTC VALUE ADDED IN TRANSPORTATION AND COMMUNICATION MILL.1975 DINARSIRAQ AAS

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIF = X)	% DIFFERENCE
1965Q1	82.200	76.359	5.841	7.106
1966Q1	85.900	79.759	6.141	7.149
1967Q1	80.000	80.961	-0.961	-1.201
1968Q1	85.600	83.337	2.263	2.644
1969Q1	88.600	85.344	3.256	3.675
1970Q1	89.200	87.775	1.225	1.376
1971Q1	97.200	93.088	4.112	4.230
1972Q1	97.200	98.163	-0.963	-0.991
1973Q1	95.200	97.128	-1.928	-2.025
1974Q1	119.900	124.595	-4.695	-3.916
1975Q1	157.600	151.058	6.542	4.151
1976Q1	175.200	167.355	7.845	4.478
1977Q1	168.100	170.625	-2.525	-1.502
1978Q1	175.700	180.525	-4.825	-2.746

GRAPH RANGE OF VALUES: 76.359 TO 180.525



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	3.7943
MEAN ABSOLUTE % ERROR	3.3706
ROOT MEAN SQUARED ERROR	4.3716
ROOT MEAN SQUARED % ERROR	3.8804
MEAN OF ACTUALS	114.0999
MEAN OF PREDICTEDS	112.5766
MAXIMUM ABSOLUTE RESIDUAL	7.8459
MAXIMUM OF ACTUALS	175.7000
MAXIMUM OF PREDICTEDS	180.5248
MINIMUM OF ACTUALS	80.0000
MINIMUM OF PREDICTEDS	76.3592

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

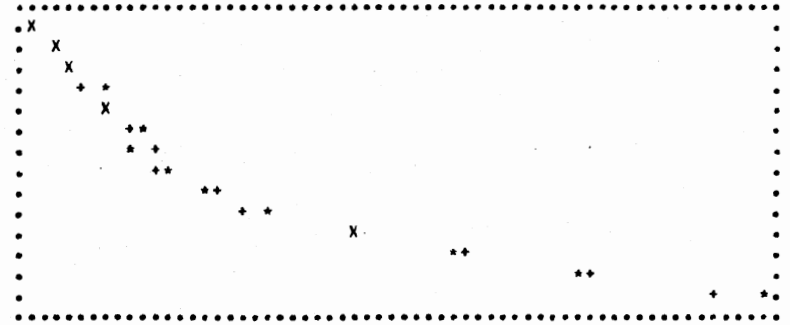
MEAN SQUARE ERROR	(D)	0.0019
FIRST INEQUALITY COEFFICIENT	(U)	0.3834
SECOND INEQUALITY COEFFICIENT	(U*)	0.4491
MEAN OF ACTUALS		0.0584
MEAN OF PREDICTEDS		0.0662
STANDARD DEVIATION OF ACTUALS		0.0959
STANDARD DEVIATION OF PREDICTEDS		0.0717
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.9119
BIAS PROPORTION	(UM)	0.0325
VARIANCE PROPORTION	(US)	0.3136
COVARIANCE PROPORTION	(UC)	0.6539
REGRESSION PROPORTION	(UR)	0.1324
DISTURBANCE PROPORTION	(UD)	0.8351
INTERCEPT	(A)	0.0222
SLOPE ESTIMATE	(B)	1.2183
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	1.0641

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQXUT VALUE ADDED IN UTILITIES MILL.1975 DIMARSUN DRPA NAT. ACT

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965Q1	5.116	4.822	0.294	5.741
1966Q1	5.832	5.814	0.018	0.308
1967Q1	6.446	6.285	0.160	2.489
1968Q1	7.878	7.229	0.649	8.242
1969Q1	8.185	7.879	0.306	3.735
1970Q1	9.617	8.903	0.715	7.430
1971Q1	9.093	10.090	-0.997	-11.072
1972Q1	10.334	9.999	0.334	3.237
1973Q1	12.073	12.083	-0.010	-0.085
1974Q1	14.017	13.326	0.691	4.930
1975Q1	17.708	17.778	-0.070	-0.439
1976Q1	21.496	22.199	-0.702	-3.702
1977Q1	26.399	26.694	-0.296	-1.120
1978Q1	33.358	31.533	1.825	5.471

GRAPH RANGE OF VALUES: 4.822 TO 33.358



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	0.5118
MEAN ABSOLUTE % ERROR	4.1429
ROOT MEAN SQUARED ERROR	0.6956
ROOT MEAN SQUARED % ERROR	5.2017
MEAN OF ACTUALS	13.3831
MEAN OF PREDICTEDS	13.1817
MAXIMUM ABSOLUTE RESIDUAL	1.8251
MAXIMUM OF ACTUALS	33.3577
MAXIMUM OF PREDICTEDS	31.5327
MINIMUM OF ACTUALS	5.1156
MINIMUM OF PREDICTEDS	4.8219

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

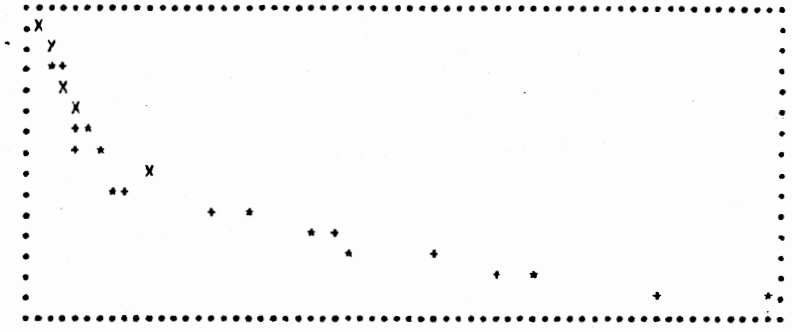
MEAN SQUARE ERROR	(D)	0.0959
FIRST INEQUALITY COEFFICIENT	(U)	0.4645
SECOND INEQUALITY COEFFICIENT	(U*)	0.9559
MEAN OF ACTUALS		0.1442
MEAN OF PREDICTEDS		0.1444
STANDARD DEVIATION OF ACTUALS		0.0802
STANDARD DEVIATION OF PREDICTEDS		0.0706
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.4893
BIAS PROPORTION	(UM)	0.0007
VARIANCE PROPORTION	(US)	0.0156
COVARIANCE PROPORTION	(UC)	0.9844
REGRESSION PROPORTION	(UR)	0.1676
DISTURBANCE PROPORTION	(UD)	0.8323
INTERCEPT	(A)	0.0640
SLOPE ESTIMATE	(B)	0.5555
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9139

ACTUAL COLUMN: ZERO SECTOR
PREDICTED COLUMN: DYNAMIC

VARIABLE GRAPHED : IQYPDN PERSONAL DISPOSABLE INCOME MILL.CURR.DINARSTRANSFORMATION

DATE	ACTUAL (*)	PREDICTED (+)	DIFFERENCE (TIE = X)	% DIFFERENCE
1965 1	565.598	584.148	-18.550	-3.280
1966 1	612.398	621.857	-9.459	-1.545
1967 1	641.166	663.761	-22.595	-3.524
1968 1	680.142	669.566	10.575	1.555
1969 1	722.113	707.788	14.325	1.984
1970 1	785.013	733.331	51.682	6.584
1971 1	797.133	743.484	53.649	6.730
1972 1	985.981	1009.236	-23.255	-2.359
1973 1	867.393	913.801	-46.407	-5.350
1974 1	1377.710	1240.347	137.364	9.970
1975 1	1594.445	1682.547	-88.102	-5.526
1976 1	1733.931	2078.875	-345.945	-19.910
1977 1	2423.629	2292.670	130.959	5.403
1978 1	3274.097	2883.184	390.913	11.940

GRAPH RANGE OF VALUES: 565.598 TO 3274.097



SUMMARY STATISTICS:

MEAN ABSOLUTE ERROR	95.9200
MEAN ABSOLUTE % ERROR	6.1185
ROOT MEAN SQUARED ERROR	152.3986
ROOT MEAN SQUARED % ERROR	7.8049
MEAN OF ACTUALS	1218.5593
MEAN OF PREDICTEDS	1281.6985
MAXIMUM ABSOLUTE RESIDUAL	396.9133
MAXIMUM OF ACTUALS	3274.0974
MAXIMUM OF PREDICTEDS	2883.1941
MINIMUM OF ACTUALS	565.5981
MINIMUM OF PREDICTEDS	584.1484

THEIL STATISTICS (BASED ON LOG-RELATIVE-CHANGES):

MEAN SQUARE ERROR	(D)	0.0110
FIRST INEQUALITY COEFFICIENT	(U)	0.5189
SECOND INEQUALITY COEFFICIENT	(U*)	0.6982
MEAN OF ACTUALS		0.1351
MEAN OF PREDICTEDS		0.1228
STANDARD DEVIATION OF ACTUALS		0.1500
STANDARD DEVIATION OF PREDICTEDS		0.1288
CORRELATION BETWEEN ACTUALS AND PREDICTEDS		0.7309
BIAS PROPORTION	(UM)	0.0137
VARIANCE PROPORTION	(US)	0.0440
COVARIANCE PROPORTION	(UC)	0.9423
REGRESSION PROPORTION	(UR)	0.9308
DISTURBANCE PROPORTION	(UD)	0.9555
INTERCEPT	(A)	0.0299
SLOPE ESTIMATE	(B)	0.8564
SLOPE ESTIMATE WITHOUT INTERCEPT	(B*)	0.9730

VITA

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Doctor of Philosophy

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