SHORT-RUN STRUCTURAL RIGIDITIES AND SUPPLY PERFORMANCE IN A FINANCIALLY REPRESSED ECONOMY: THE CASE OF TURKEY

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ABSTRACT

In the beginning of the 1980, a stabilization programme was introduced under the auspices of the IMF as a remedy to high rate of inflation and excessive balance of payment deficits experienced in Turkey. After five-year implementation, however, the success of the programme is ambiguous. The purpose of the study is to evaluate the short-run rigidities as an obstacle to stabilization efforts experienced last years from the "Structuralist" perspective. The emphasis given solely on the supply side. But, due to their direct effects on the supply side, the external balance and the adjustment mechanisms in the financial sector are also included. Simple macroeconomic models are presented in the study and used for explaining some of the stylized facts of the Turkish economy. A macroeconometric model for the Turkish economy is estimated and used for analyzing some of the structural characteristics of the economy the study concerns.

ÖZET

1980 başında Türkiye'de yaşanan yüksek oranlı enflasyon ve büyük ödemeler dengesi açıklarını gidermek için IMF'nin yönetiminde bir istikrar programı yürürlüğe kondu. Ancak, beş yıllık uygulamanın sonucunda elde edilen başarı belirgin değildir. Bu çalışmanın amacı son yıllarda yaşanan istikrar çabalarını engelleyen bir etmen olarak kısa dönemde ekonomideki katılıkları "Yapısalcı" açıdan değerlendirmektir. Ekonominin arz yanına ağırlık verilmektedir. Ancak, dış dengeler ile parasal kesimdeki intibak mekanizmalarının doğrudan etkileri nedeniyle bu kesimler de çalışmaya dahil edildi. Türkiye ekonomisinin bazı tipik özellikleri çalışmada sunulan basit makro ekonomik modeller ile açıklanmaktadır. Ekonominin çalışmanın kapsamına giren yapısal özellikleri Türkiye ekonomisi için tahmin edilen bir makro ekonometrik model yardımı ile incelenmektedir.

CONTENTS

CHAPTER 1: INTRODUCTION

1.1 The Purpose and the Approach

In the late 1970's, high rate of inflation and excessive balance of payment deficits were experienced in Turkey. As a remedy to these difficulties, a stabilization programme was introduced under the auspice of the IMF in the beginning of the 1980 which consists of significant policy shifts in several key areas. Main objectives of this programme is to eliminate the obstacles to market efficiency through reducing the direct or indirect interventions of the state and reestablish the stability. After five-year implementation, however, the success of the programme is ambiguous.

Most of the developing countries were also experienced similar procedure in the 1970's and 1980's. The implementations of similar stabilization programmes rise the interests on the impacts and appropriateness of the IMF-type stabilization policies. Various studies come to same conclusion which indicate that these programmes are not able to capture their targets (1).

The structuralist school of thougth stresses the role of the institutional and the behavioral factors as the determinants of the structure of the less developed economies. From the

structuralist point of view, it is concluded that the failure of the IMF-type stabilization programmes is the result of the inapplicability of their assumptions to the structures of these countries where stabilization attempts are built on. Neo-classic assumptions on capital-labor substitution, full employment, market clearing prices, etc., argued that, do not reflect the existing structure of the less developed countries which are characterized by market segmentation, resource immobility and disequilibrium between sectoral demand and supply. Under this circumstance, short-term issues become center of interest. A stabilization effort may attain success in some segments of the economy while aggravating the disequilibrium in the other segments as a result of the rigidities which prevent the adjustment in the short period of time.

The study does not attempt to propose or simulate alternative policies to the endemic diseases of the turkish economy. The purpose of the study is to evaluate the short-run rigidities as an obstacle to stabilization efforts experienced during the few years. The term short-term structural rigidities is used for the factors which prevent or slow down the adjustment processes in the short-run. The structuralist perspective seems that applicaple for this purpose. The emphasis is given on the supply side of the economy. It is assumed that the external balance and the adjustment mechanisms in the financial sector have direct effects on the supply side of the economy, in the short-run. One of the usual consequences of the import substituting

industrialization strategy is that the imported intermediate goods play crucial role in the output performance as a complementary input. So, external balance has to be included into the analyses as a determinant of the supply performance. On the other hand, in the financially repressed economies money serves as a factor of production. The availability and the cost of money to finance the working capital are another determinant of the supply performance. So, financial sector also included into the analysis in this sence.

1.2 The Outline of the Study and Summary of the Major Findings

Chapter-2 outlines some of the institutional and structural characteristics of the Turkish economy from historical perspective. The purpose of this introductory chapter is to stress some of the well-known aspects of the Turkish development efforts in order to construct the foundation stone for the analysis presented in the study. The role of "etatism" in Turkish development efforts, the determinants of the market structure, and the basic results of the import substituting industrialization strategy are the subjects of this chapter. Within this framework, the chapter is concluded with brief discussion on the recession experienced in the late 1970's.

In the chapter-3, an analytical framework is developed for the Turkish economy with the help of the structuralist approach. Using the structuralist assumptions which are considered as

relevant for the turkish economy a three-sector model presented for the real side of the economy. This model consists of manufacturing, agricultural and basic intermediate sectors. Dividing the economy into agriculture and manufacturing is the usual way of the structuralist perspective. Third sector is introduced to the model in order to show the effects of the direct intervention of the state as the producer of the basic intermediate goods for the manufacturing sector. This model stresses the intersectoral relations to understand the performance of the economy in the short-run. In the chapter-3, another model stressing the relations between real and financial sides of the economy is developed. Recent studies stress the role of the unorganized money market on the contractionary effect of the monetary policy. The model presented, shows that the monetary policy may also be contractionary when this kind of market does not exist.

In the chapter-4, a macroeconometric model for the Turkish economy is presented. The specification of the equations and the estimation results are discussed in this chapter. The model is constructed with the emphasis of the relations analyzed in the chapter-3 and rests on the characteristics of the Turkish economy discussed in the chapter-2. Satisfactionary statistical resuls and economic meanings of the estimated coefficients show the relevance of the basic structuralist assumptions for the Turkish economy.

Chapter-5 deals with the structural analyses of the turkish economy using the model presented in the chapter-4. Empirical results indicate that the structural rigidities are important factors determinin the supply performance of the economy, and the turkish stabilization programme is far being eliminating these rigidities. Given these structural rigidities, the programme has generated some improvement with balance of payment difficulties, but at the costs of the output decrease and price rise. Another interesting finding from the empirical analysis is that the economy turns to be more sensitive position against the external shocks in the period of the implementation of the stabilization programme.

Chapter-6 is devoted to the conclusion of the study. Supplementary materials are given in the appendices. Appendix-1 gives data base for the estimation of the macroeconometric model. The estimation procedure appears in the appendix-2. The reduced forms of the model computed for the period 1977-1979 and 1981-1984 is in appendix-3. The model does not constructed for simulation. But, in order to give an idea about the performance of the model, static simulation results are given in the appendix-4.

CHAPTER 2: DETERMINANTS OF THE INDUSTRIALIZATION PROCESS IN TURKEY

2.1 Introduction

In this chapter, some of the well-known institutional and structural characteristics of the Turkish economy are summarized, and 1977-79 crisis and the efforts to stabilize economy are outlined. The topics covered in this chapter are presumed that essencial aspects to understand the working of the Turkish economy, and require large space for surveying the existing studies. The purpose of the chapter, however, is simply to stress the basic concepts and the facts which underline the study. The role of the state in the industrialization process, the private enterprises as an engine of the import substituting industrialization, the structure of the factor and the commodity markets in Turkey are outlined in the section-2.2. In the section-2.3, high rate of inflation and balance of payment difficulties experienced in the late 1970's and the stabilization programme are discussed briefly.

2.2 The Structure of the Industry and the Markets in Turkey

One of the important characteristics of the Turkish economy is the role of the state in the industrialization process in Turkey. State owned enterprises have great share in the Turkish manufacturing sector in Turkey. However, this is not typical to

Table - 2.1

SHARE OF THE PUBLIC SECTOR IN TOTAL MANUFACTURING VALUE-ADDED (PERCENT)

Low-income countries:	
Bangladesh	70.6 (1977/78)
Pakistan	84.0 (1975)
Senegal	21.1 (1974)
Sri Lanka	64.3 (1976)
Middle-income countries:	
Algeria	74.9 (1978)
Egypt	66.7 (1981/82)
Iraq	41.5 (1975)
Mexico	29.8 (1975)
Panama	3.7 (1977)
Syria	57.6 (1977)
Thailand	6.5 (1979)
Turkey	47.3 (1972)
Industrialized countries	9.6 (1975)

Source: Dervis and Page:1984.

Turkey: In most of the less developed countries publicly owned enterprises account for a much greater percentage of value added than the advanced market economies (table-2.1). Direct intervention of the state as a producer emerged in the 1930's in Turkey. This period was entirely different as far as the role assigned to the government was concerned. Main reason for the government to undertake the pioneering role in the industrialization of Turkey was the insufficiency of the private enterprises and capital (1). This industrialization and modernization policy, named as "etatism", started with the investment in the activities of producing basic consumer goods and intermediate goods inputs to the traditional industrial activities. First five year industrialization plan stressed the priority of the basic consumption goods production which were imported. In addition to this, activities which use domestically produced inputs were also of interest (2). The state economic enterprises (SEE's) keep their share in the manufacturing sector untill 1980's (table-2.2). After 1950, producing basic intermediates and raw materials are major industrial activities which state concerns. Basic characteristics of the SEE's are large scale and capital intensive. The SEE's are used as an effective tool to motivate industrialization through feedback effects, and to allocate the resources through pricing policy (3).

The role of the private enterprises in the industrialization of Turkey rose after the year 1950 as a result of the economic programme implemented by new government. Share of the private

Table - 2.2

SHARE OF THE SEE'S IN THE MANUFACTURING SECTOR (PERCENT)

	Employment	Output	Value-added
1950	45.9	46.4	58.3
1955	39.7	40.7	50.1
1965	43.6	47.1	57.1
1975	35.0	37.5	48.0
1983	35.0	40.8	42.5

Source: DIE:1973, DIE: Statistical Yearbooks of Turkey.

enterprises in the manufacturing sector increased gradually after this years (table-2.2). As a results of the balance of payment dificulties in the mid 1950's, liberalization attempt on the foreign trade was interrupted. This policy change induce the consumer goods importers to invests in the manufacturing sector. This sort of transformation from trading activities to manufacturing is one of the characteristics of the Turkish import substituting industrialization process. Protecting the domestic production through trade restrictions and incentives to promote the private enterprises are effectively used tools for import substituting industrialization in Turkey (4).

The structure of the banking system in Turkey is one of the important determinant of the performance of the industrial activities. In spite of the gradual increase in intermediation

in the financial sector, commercial banking is still only sort of institution. In addition to the monopolistic market structure in the banking system, before the year 1980 short-term bank credits are rationed with the official interest rates. Increase in the cost of using bank credits as a result of the positive real time deposit rate policy after the year 1980, reduced the control of the commercial banks on rationing. Since equity market does not exist, private investments are financed by either retained earnings of the firms or centrally rationed long and medium term bank credits. So, price and economic efficiency of capital are ineffective on the investment decisions.

Para-economic factors are also effective in the labor market from supply side. Migration from rural areas to cities depends on the social and cultural factors, and economic dependence of emigrants to rural areas persists. So, large marginal sectors in the cities disguise the unemployment and wage contracts are free from labor supply.

Consentration ratios for most of the manufacturing good markets are very high (table-2.4). Monopolistic and oligopolistic market structures in the domestic production is one of the basic characteristics of the turkish economy. Large efficient scale comparing to the domestic market size and limited capital and entrepreneurship supply are the major sources for the market consentration in the protectted domestic industrial activities of Turkey.

Table - 2.3

COMPONENT OF MONEY STOCK (M1) (PERCENT)

	Currency in circulation / Money supply	Total deposit / Money supply
1950	58.1	41.9
1955	42.8	57.2
1960	41.4	58.6
1965	38.5	61.5
1970	33.6	66.4
1975	28.0	72.0
1980	30.9	69.1
1984	32.7	67.3

Source: The Central Bank of The Republic Turkey, Quarterly Bulletins.

Table - 2.4

NUMBER OF INDUSTRIES BY CONSENTRATION RATIO (PERCENT)

Consentration ratio (CR_4)	1982(x)	1976(xx)
Greater the 91 percent	39.5	21
Greater the 71 percent	55.3	44
Greater the 61 percent	63.6	56

(x) 514 industries base (source: Doğruel:1983)

(xx) 115 industries base (source: Tekeli et al: Undated, pp.42).

2.3 The Turkish Stabilization Programme

By the end of 1977, Turkey was faced with high rate of inflation and excessive balance of payment deficits. Acute shortage of foreign exchange resulted in sharp decline in capacity use in the manufacturing sector. As a result of high oil price and decline in real exports due to economic slowdown in the industrial countries, external account of Turkey deteriorated. In addition to the external factors some of the domestic policies are also lead the Turkish economy into crisis. Large public deficits, preferential treatment for enterprises geared towards domestic markets, lack of incentives for the export sectors are the factors aggravating the effects of the external factors.

In 1978 and 1979 gradual stabilization programmes were initiated. Both these programmes failed due to political unstabilities at that years. By January 1980, a comprehensive and far-reaching stabilization programme initiated under the auspices of the IMF. The objectives of the programme are restoration of balance of payments equilibrium, orderly servicing of the foreign depts, appeasing and eliminating the inflation, and creating of a structure of relative prices conducive to an efficient allocation of resources. Basic tools for these purposes are "reduction (...) credit expansion claimed by the public sector, adjustment (...) in the prices which had lagged behind inflation, especially the price of foreign exchange and interest rates, the removal of distortions, such as import controls and excessive tarifs, and (...) tough limits on wage increases" (5). The Turkish stabilization programme can be divided into four subprogremmes:

Rationalization of the state economic enterprises, liberalization of the foreign trade, liberalization of the financial sector, and increase the efficiency of the tax system (Durdağ:1981). Excluding the last one, these subprogrammes will be discussed in the context of the structural rigidities in the chapter-5.

Some macroeconomic indicators are presented in table-2.5. Average values for the years 1971-1976, 1977-1979 and 1980-1984 are given in order to compare the relatively stable, the recession and the implementation of stabilization periods of the turkish economy. 1980 is taken as a transition year between the recession and the stabilizing the economy. The evaluation of the indicators indicates that there is a remarkable progress in the foreign trade performance of the turkish economy. Continuous detoriation in the ratios of the exports to the imports and the exports to the national product has been reversed and the average values for these ratios for the years 1981-1984 exceed the values for the relatively stable years. On the other hand, the rate of inflation which is one of main target of the stabilization programme is still high in the years 1981-1984 comparing to the stable period. At the same time, growth rate achieved with the stabilization programme is less than the average growth rate in the years 1971-1976. Due to continuous decrease in the ratio of the private investments to national product, one can expect that the rate of growth will not exceed the average level for the period of 1971-1976 in next years. It seems that the remedies to reduce domestic demand have been more effective on the private investments than other components of the aggregate demand.

Table - 2.5

SELECTED MACROECONOMIC INDICATORS: 1971 - 1984

	1971-76	1977-79	1980	1981-84
Percentage change in GNP	7.710	2.116	- 0.960	4.397
Percentage change in GNP deflator	19.677	46.443	103.815	35.155
Percentage change in exchange rate	7.847	30.113	120.980	48.588
Exports/Imports	0.491	0.409	0.380	0.615
Exports/GNP	0.048	0.038	0.050	0.113
Private investments/GNP	0.143	0.152	0.113	0.101
Money supply(M2)/GNP	0.281	0.259	0.199	0.281

Source: Appendix-1

CHAPTER 3: THEORETICAL FRAMEWORK APPLICAPLE FOR THE TURKISH ECONOMY

3.1 Introduction

Performance of the turkish economy in last decade and the implementation of the stabilization policy was outlined in the last section of the chapter-2. It is shown that, remedies to prevent the inflation and the balance of payment difficulties do not effective for restoring the internal equilibriums. This outcome rises the questions about the assumptions of the stabilization policies underlying the policy implementations. Doubts about IMF-type stabilization policies rises the interests of the economists to the less developed economies in recent years. Extensive efforts devoted to the Latin American countries to analyze their economic structure. In the following section, stylized facts as an abstraction of the findings of these studies are discussed in the context of the study. The description of the LDE's from structuralist point of view seem also relevant for the turkish economy. With the help of the structuralist approach, in section-3.3, a three-sector model is developed to represent the turkish economy. This model emphasizes the stylized facts of the supply side of the economy. In the section-3.4, a model with financial sector is introduced to discuss the interaction between the real and the financial sides of the economy.

3.2 The Structuralist Perspective and the Stylized Facts for the Less Developed Countries

The structuralist approach is based on a set of assumptions where each of them are applicable for most of the less developed countries (LDC's). Any combination of these assumptions relevant to an economy may differ from another combination. Each combination of assumptions reflects an economic structure. So, structuralist approach does not need to have universal solution.

Structuralist economic analysis centered their interest on two fundamental aspects that act as constraints on growth: external disequilibrium and the narrow domestic market. External disequilibrium is outcome of import substitution: During the easy phase of import substituting industrialization, intermediate and investment goods imports increases. Since the sources are devoted to the import substituting industries, they grow faster than export goods producing sector. As long as external conditions permit, increasing trade deficite stimulate the economic growth by compensating low level of domestic savings financing investments. Nonexistence of domestic substitutes of imported intermediate and investment goods, on the other hand, creates an interdependency between industrial sector's performance and inflow of funds for financing imports. This situation renders the domestic production structure highly sensitive to external shocks (1).

Import substitution policy results construction of plants less than efficient minimum size and oligopolistic and monopolistic market structure (Krueger:1980). Under this market structure

price level is assumed to be determined by a fixed producers' markup over prime cost. Markup pricing behaviour of producers will be discussed in the next section. Incentive policies implemented under import substitution strategy encourage the firms to produce for domestic market. Small size of domestic market comparing to the scale requirement of the existing technology leads the firm to operate below the efficient capacity, which in turn results high fixed cost of production. Potancielly high price of import substituting sectors reduces the pover of competition of domestic firms in the international market on one hand, also reduces size of the domestic market of which only high income groups are capable to purchase these goods on the other (2). Thus, income distribution plays crucial role determining the composition of domestic production. On the other hand, assuming that saving propencity differs among social groups, income distribution is one of the important determinants of the saving-investment balance of the economy.

As a result of dichotomy between traditional sector and modern sector (import substituting sector) structuralists examine the economic structure with disaggregation. Disaggregating the supply side of the economy according to the production conditions gives opportunity for a closer examination of the economic performance. This is not only sort of disaggregation. The level of the price flexibility may correspond to a particular technology and patterns of consumer demand. So, distinction between sectors may be required according to their supply and demand structures. One-sector model solutions could reflect the realities of the

countries behave uniformly. Structuralist argues that the evaluations of the less developed economies require disaggregated framework which has more explanatory power to understand the dualistic structure of the less developed economies (Taylor:1979, p.2).

Financial sector structure and portfolio preference behaviours of the asset holders are stressed by the structuralist studies which focus on the linkage between financial and real sectors. Absence of primary security markets and controlling the funds by commercial banks as a main source of financing industrial sector are common characteristics of the underdeveloped nature of financial sector of the LDC's (3).

Without going into detail, stylized facts mentioned above give general description for the less developed economies. One can define an economy with restating these common characteristics precisely, or for some cases, with modifications. "Economic policy issues cannot be discussed fruitfully without reference to particular economic structure and institutions. Models constructed for one set-up may be of little relevance in another. This is no less true for problems of short-term stabilization and macro-policies."(4)

3.3 The Real Side of the Economy with the Active State Intervention

The real side of the economy can be disaggregated into three sectors by their distinctive supply responses to macro adjustment mechanisms. The manufacturing sector (M-sector) resembles import substituting economic activities. The agricultural sector (A-sector) resembles traditional sectors. The economic activities carried by the government constitute Q-sector which supply basic intermediaries to M-sector.

Manufacturing sector which is characterized by chronic excess capacity and markup pricing behavior of the producers. For this sector with three variable inputs - labor, imported and domestic intermediate goods - unit price under markup pricing rule is:

$$(3.1) \qquad PM = (1 + z)(wa + eP^{x}_{in}b + PQc)$$

where z is the markup rate, a, b and c are input coefficients for labor and intermediate goods respectively. Exchange rate e is domestic price of the foreign currency. Being w wage rate, eP^{x}_{in} domestic price of the imported intermediates and PQ price of Q-sector's output $(wa + eP^{x}_{in}b + PQc)$ is the unit variable cost. Assuming that a, b and c are constant, changes in wages and intermediate goods prices are the only source for unit variable cost variations in the short-run. Constant intermediate goods coefficients b and c assumption is directly related with the physical transformation of the intermediaries into final product. Full substitutability assumption between capital and labor is widely

used in the production theory. But, for a model with special emphasis on short-run mechanisms, it may be more realistic to assume that produced and installed fixed capital equipments require a particular quantity of labor(5). So, substitution between capital and labor exists only at the stage of planning the fixed capital investment (6). In addition to the fixed input coefficient, markup pricing rule is inconsistent with neoclassical assumptions. If consumers spend a very high proportion of their incomes on consumption than the price elasticity of demand on average must be near unity (McFarland:1982). So price changes do not effect the consumer expenditures. For an economy where perfect competition is not valid and the consumers are more patient about their expenditures rather than prices, it is very hard to assume that prices are the sum of the factor payments. Assuming that manufacturing sector products are used as final consumption good and fixed capital, profit rate can be expressed as:

$$(3.2) \qquad r = \frac{PM \cdot YM - waYM - eP^{x}_{in}bYM - PQcYM}{PM \cdot K_m}$$

where K_m is the fixed capital stock of the manufacturing sector. The value of the total output less the total wage and intermediate goods payments gives the total profit as numerator. Solving eq-3.2 for price gives:

$$(3.3) \qquad PY = wa + eP^{x}_{in}b + PQc + r(PM \cdot K_m/YM)$$

Eq-3.3 shows that the firms are not subject to any pressure on the cost side to rise their prices increas solely as a result of the demand increase. For a given price set, profit rate and total profit are increasing functions of the demand of total output (Eichner and Kregel:1975). This can be shown by substituting eq-3.1 into 3.2:

$$(3.4) \qquad r = \frac{z}{(1+z)} \frac{YM}{K_m} = \frac{z}{(1+z)} u$$

where $u = YM/K_m$ measures the capacity utilization. When capacity is not fully utilized, increase in production will reduce fixed costs. Since wages and intermediate goods prices are constant in the short-run, increase in production reduces total costs where prime costs staying constant (Eichner and Kregel:1975). Eq-3.4 also shows that the profit rate and the markup rate varies in same directions. With price fixing suppliers by a markup over prime costs and consumers sensitive to their total expenditures, quantity clears the manufacturing sector market.

Excess demand function for the manufacturing sector production can be expressed as:

$$(3.5) \qquad ED_m = C_m + IP + IG + EM - YM$$

where C_m is manufacturing goods consumption, IP is private investments, IG is public investments, and EM is exports of manufacturing sector.

The agricultural sector (A-sector) supply is assumed constant in the short-run. Available land for cultivation limits the production and yield per unit of land could be increased only by the investments in the physical and the institutional infrastructure where their effects on productivity are not received in the short-run. Land and past investment activities on land can be converted into capital stock of agricultural sector. Labor supply is not less than the available employment opportunities created by the existing capital stock as a result of the assumption of which there exists large reservoir of labor in the economy either in the form of unemployment in the urban areas or as employed in the rural areas with very low average productivity. So, agricultural production is a linear function of the capital stock:

$$(3.6) \qquad YA = k_a K_a$$

where YA is agricultural production, K_a is capital stock in this sector and k_a is output-capital ratio which is a function of the natural forces effecting the production.

A ratio, ϕ, of the agricultural production is exported and the rest is consumed. If economy does not have any monopoly power on the agricultural goods in the international markets and its exports are highly dependent upon the institutional factors, export demand can be held constant in the short-run. So, excess demand function for the agricultural goods can be written as:

$$(3.7) \qquad ED_a = C_a + \phi YA - YA = C_a - (1 - \phi)YA$$

where C_a is domestic consumption on agricultural goods. If there exists weak coordination between the organizations orientated to the domestic and the international markets, and/or ϕ is very close to zero, price variations in the international markets will have negligible effect on the domestic prices. So, the domestic price of the agricultural goods will clear the market. Assuming that the agricultural private investment is zero for the sake of simplicity, also reflects the fact that average propencity to save of the peasants is very low and the infrastructural investments financed by the government have a great share in the total agricultural investments (7).

Activities such as mining, energy production, transportation and other intermediate goods production which are not carried by the private sector constitute Q-sector which resembles government activities in the economy. These activities are taken as a seperate sector due to the fact that the quantity supplied and and the price of these goods are determined by the central authority. For the economies where bureaucratic elites (or economic nationalism) have dominancy in the political structure, government policies charged with the guiding economic development and the modernization problems have distributive effects as well as allocative effects on the supply side of the economy via non-market mechanisms (8). So, government has to be taken into the analysis not only by its financial role, but also with its own decision processes, as a seperate sector in the real side of the economy. The financial balance of the Q-sector simply can be given as:

(3.8) $PQ \cdot YQ + D = wqYQ + PM \cdot IG$

where YQ is the intermediate goods and services produced by the state owned enterprises, w is wage rate for the non-agricultural sectors, q is labor-output coefficient for this sector, PQ is the administrated price for YQ, IG is investments financed by the government and D is the financial deficit of the government. Other financial flows of funds related with this sector (e.g. taxes, subsidies) are not included for simplicity.

Q-sector production is used as input for the manufacturing sector with no substitution (9). So, level of YQ limits the manufacturing good sector production. Excess demand function for this sector can be expressed as:

(3.9) $ED_q = cYM - YQ$

If derived demand for YQ exceeds the productive capacity of the Q-sector, market price for these goods (PQ_m) clears the market. If not, administrated price, PQ, is also real input price for the manufacturing good producers. In order to keep clearness, it is convenient to assume that there is no resource diversion formulated by Krueger (1974) for the case of $PQ_m > PQ$ by setting ED_q equals to zero.

Assuming that wage earners do not save, with consumption share on profits beign $(1 - s_m)$ and on agricultural income $(1 - s_a)$, total consumption expenditures for three-sector economy can be

given as:

$$(3.10) \qquad C = waYM + wqYQ + (1 - s_a)YA \cdot PA + (1 - s_m)rPM \cdot K_m$$

Substituting eq-3.9 and 3.4 into 3.10 total consumption function becomes:

$$(3.11) \qquad C = YM(wa + wcq) + (1 - s_a)YA \cdot PA + \left[(1 - s_m)z/(1+z)\right]PM \cdot YM$$

Following Taylor's formulation for the income elasticity differences in consumptions on the agricultural and the manufacturing goods, sectoral consumption equations can be given as (Taylor: 1983, pp.39-40):

$$(3.12) \qquad PA \cdot C_a = vC + \theta PA$$

and,

$$(3.13) \qquad PM \cdot C_m = (1 - v)C - \theta PA$$

Positive value for θ gives income-inelastic demand for the agricultural goods and income-elastic demand for the manufacturing goods. C_a and C_m are food and nonfood consumptions, respectively. Substituting eq-3.12 into 3.7 and 3.13 into 3.5, summing excess demand equations gives saving-investment balance for the economy:

$$(3.14) \qquad IP \cdot PM + D - (eP^x_{in}bYM - \emptyset PA \cdot YA - PM \cdot EM)$$

$$- (s_m rPM \cdot K_m + s_a PA \cdot YA) = 0$$

Eq-14 shows that, total private investments are financed by the trade deficit and the domestic savings from agricultural and profit incomes. Part of the savings are absorbed by the public deficit D.

With fixed output in the agricultural sector and fixed price in the manufacturing sector, manufacturing output YM and food price PA clear the markets (10). Excess demand functions can be rewritten as follows after some manipulations:

$$(3.15) \qquad ED_m = -(\underline{AA})YM + (\underline{BB})\frac{PA}{PM} + (1 - v)\frac{D}{PM} + vIG + IP + EM$$

$$(3.16) \qquad ED_a = (\underline{CC})\frac{PM \cdot YM}{PA} - YA\left[1 - v(1 - s_a)\right] + \emptyset YA + \theta$$

where

$$(3.17) \qquad \underline{AA} = 1 - (1 - v)\left[1 - s_m\left(\frac{z}{1 + z}\right)\right] - (1 - v)\frac{eP^x_{in}}{PM}b$$

$$(3.18) \qquad \underline{BB} = (1 - v)(1 - s_a)YA - \theta$$

$$(3.19) \qquad \underline{CC} = vw(a + cq)/PM + v(1 - s_m)\frac{z}{1 + z}$$

$\underline{AA}$ and $\underline{CC}$ are both positive (11). Following the stability analysis applied by Taylor, Jacobian matrix of the excess demand functions can be constructed as (Taylor:1983, p.41):

$$\begin{vmatrix} -\underline{AA} & \frac{1}{PM}(\underline{BB}) \\ \frac{PM}{PA}(\underline{CC}) & \frac{PM \cdot YM}{PA^2}(\underline{CC}) \end{vmatrix}$$

The determinant of the Jacobian is:

$$(3.20) \qquad \Delta = \frac{PM}{PA}\left[(\underline{AA})(\underline{CC})\frac{YM}{PA} - (\underline{CC})(\underline{BB})\frac{1}{PM}\right]$$

Since $\underline{AA}$ and $\underline{CC}$ are positive, eq-3.20 can be restated as:

$$(3.21) \qquad YM - \frac{(\underline{BB})}{(\underline{AA})}\frac{PA}{PM} > 0$$

Eq-3.21 gives the stability condition for the model. Setting the excess demand for the manufacturing sector to zero, quantity produced is given by:

$$(3.22) \qquad YM = \frac{(\underline{BB})}{(\underline{AA})}\frac{PA}{PM} + \frac{(1 - v)D/PM + vIG + IP + EM}{(\underline{AA})}$$

If, as an extreme case, large public surplus does not exists, with positive value of the second term stability condition given by eq-3.21 is satisfied. Second equation for the two-unknown model is obtained from the agricultural sector excess demand function setting to zero:

$$(3.23) \qquad YM = \frac{YA\left[1 - v(1 - s_a)\right] - \emptyset YA - \theta}{(\underline{CC})} \frac{PA}{PM}$$

Eq-3.23 gives positive relation between the manufacturing sector output and the agricultural sector price (figure-1).

The slope of the manufacturing sector balance curve depends on the value of the term (BB). Given upward sloping agricultural sector balance curve, necessary condition for (BB) to be negative is:

$$(3.24) \qquad v > \frac{1}{2} + \frac{1 - \emptyset}{2(1 - s_a)}$$

Setting s_a equals to zero as an extreme case of our low level of saving propencity in agriculture assumption, (BB) can be negative when food consumption share in consumers' basket is very high or very big proportion of agricultural production is exported. When s_a is greater than zero, these requirements become stronger. So, downward sloping manufacturing sector balance curve can be considered as a special case of relatively very high income-inelasticity for food demand (figure-1A). For positively sloping manufacturing sector balance curve, as income elasticity of food demand increase both curves become steeper.

From eq-3.22 and 3.23, it is easy to determine the effects of the changes in exogenous variables YA and PM. Decrease in agricultural production (or supplied in the domestic market) results clockwise rotations of both curve curves (figure-1B). When food demand is income-elastic, price increase for the

Figure - 1

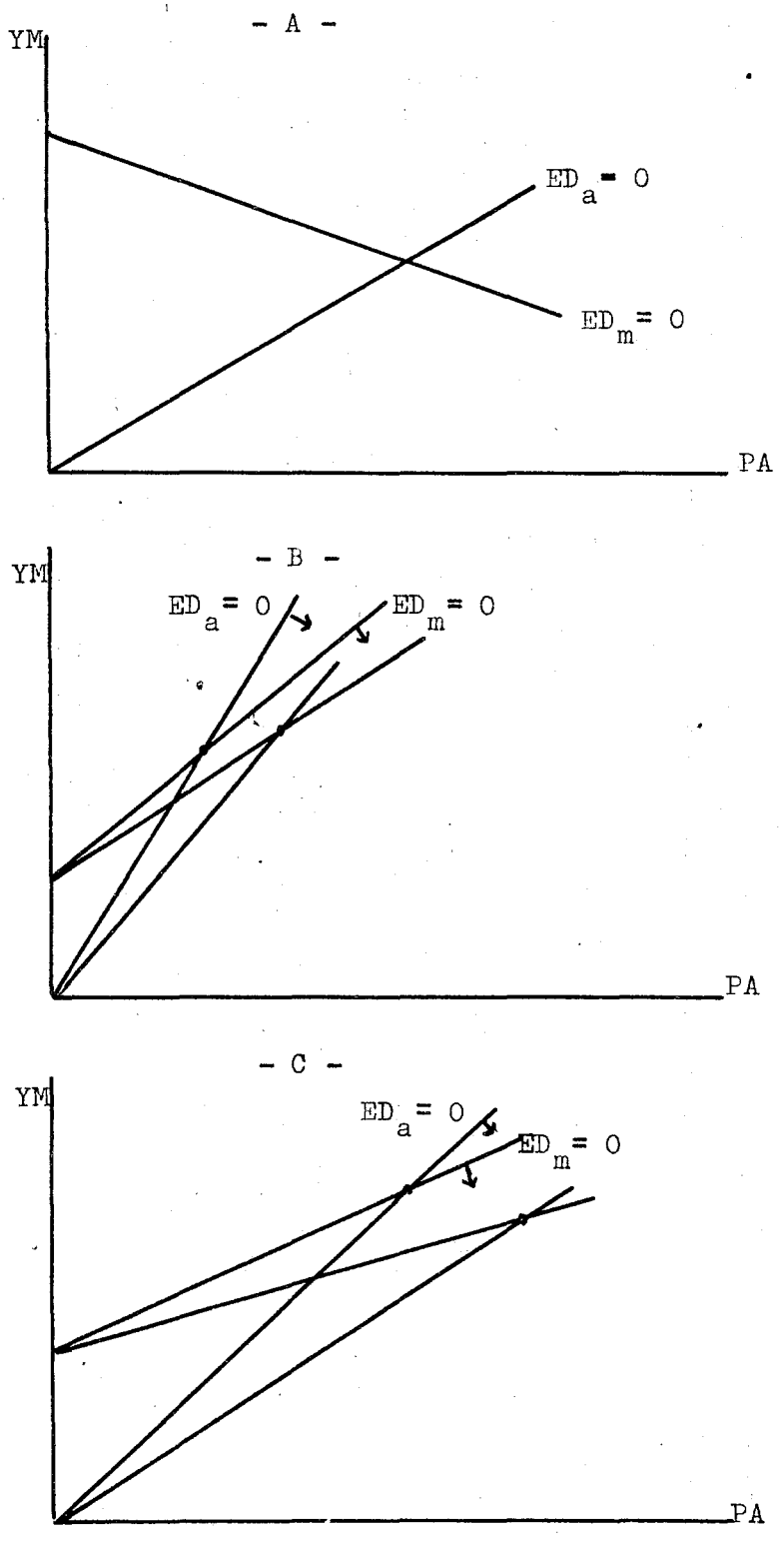
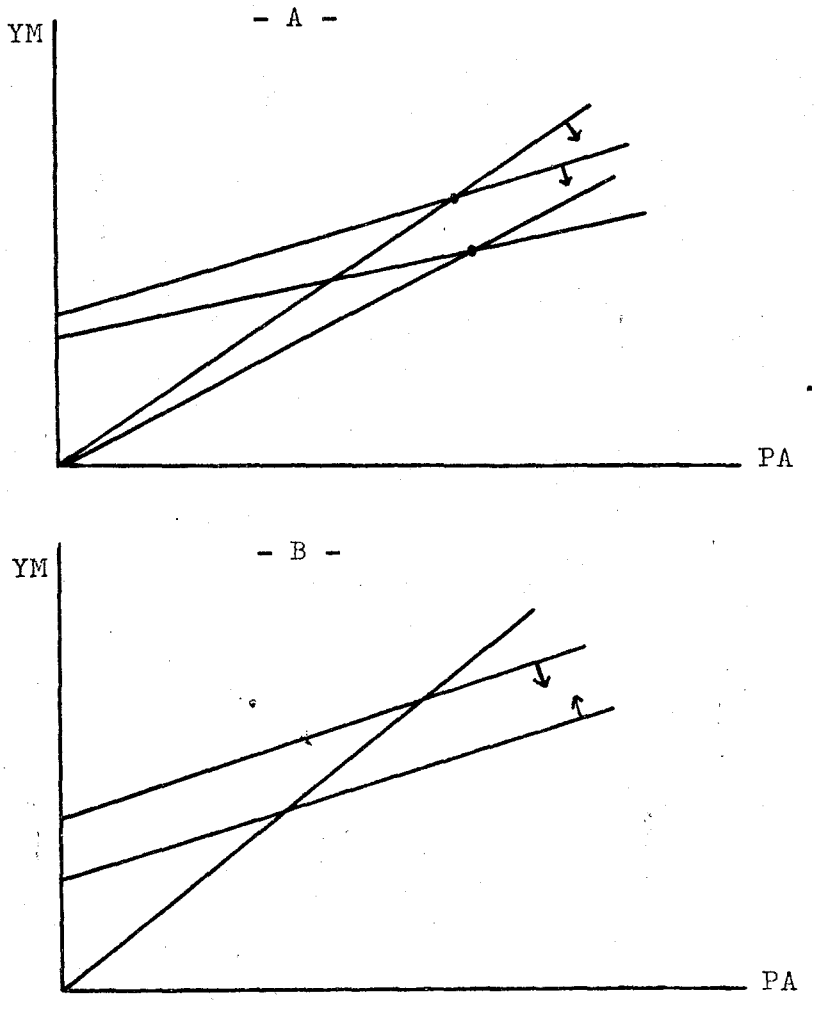


Figure - 2



agricultural goods as a result of the reduction in supply, causes increase in the manufacturing sector production. When income elasticity for food demand is low, same movement in the agricultural sector reduces the manufacturing sector production (figure-1C). For this case, manufacturing goods production can be motivated by reducing agricultural export (or higher food imports). One of the traditional growth stories stresses the role of the agricultural savings as the source for financing fixed capital formation. Higher saving propencity for the

agricultural income correspons a manufacturing sector market sensitive to the food prices (figure-1C), in the short-run. Food supply variation due to natural factors effecting the agricultural output strongly effecs the manufacturing sector output when the transmission mechanisms for trasferring the agricultural savings into the investments have lower speed than the adjustment mechanisms in the real side of the economy. Reduction in food supply will rise agricultural income and saving results YM to decrease. On the other hand investment expenditure increase shifts up manufacturing sector balance curve. Time lag between these two effects leads the manufacturing good producers to face unsteady demand for their products in the short-run which may be inconsistent with the growth targets.

Public deficits are considered as one of the main source for the inflationary pressures in the economy. Conventional stabilization policy requires to reduce public deficits. Increase in costs of production of manufacturing goods (hence rice PM) results clockwise rotation for each curves Intercept term also diminishes as YM increases (figure-2A). The level of public investments and deficits shifts the manufacturing sector balance curve in same direction (figure-2B). From Q-sector balance (eq-3.8) public deficit can be reduced by cutting the investments (IG) or/and rising the price of Q-product (PQ), where all of these movements give same result on the manufacturing sector output. The intercept term of the manufacturing sector balance curve shows that output reducing effect of the public deficit management can be balanced by the increase of PM. On the other hand, if derived demand

elasticity for the domestic intermediaries is less than unity, it is possible to increase the public investments by rising PQ for a given level of the deficit. So, an anti-inflationary deficit management without reducing the public investments may not be contractionary, or at least less severe than the overall curtailment of the public injections.

3.4 Regulated Money Market and the Adjustment mechanisms for the Financial Sector

In this section, financial sector of the economy is under examination. Recent studies stress the financing working capital of the firms incorporating the financial sector into the short-run macro models. Following this framework, it is necessary, at first, to decribe the real side of the economy, or simply industry. Since emphasis is given on the financial sector, for simplicity intersectoral complications are omitted her. Following the basic properties described for the manufacturing sector in the previous section an one-sector model is employed.

Using markup pricing rule price for real side can be given as:

$$(3.25) \qquad P = (1 + i)(1 + z)(wa + eP^{X}_{in}b)$$

or,

$$(3.26) \qquad P = (1 + i)(wa + eP^{X}_{in}b) + rPK/Y$$

These equations are similar to the manufacturing goods price equations 3.1 and 3.3 of the three-sector model presented last section with one new element i. One of the characteristics of the production structure of the LDC's is that firms have very weak financial structure. So, firms are dependent on borrowing to finance their wage and intermediate goods bills and cost of financing these working capital requirements is an important component of the total production costs (12). Interest rate for financing working capital, i, is included into the price equation.

The equilibrium of the commodity market is given as:

$$(3.27) \qquad ED_y = C + I + E - Y = 0$$

where C is total consumption, I is investments, E is exports and Y is total output. As previously assumed, wage earners consume all their income. In addition to three kinds of income presented in the previous section as wage, agricultural income and profit income, fourth one introduced here; interest income. It is widely accepted that the propencity to consumtion on rental income is high. So, the interest income earners can be ranked as, they save more than wage earners but less than profit earners. Assuming that the interest income earners also do not save as wage earners simplifies the mathematical manipulations below without any alteration in the results. The value of the private consumption becomes:

$$(3.28) \qquad PC = waY + i(waY + eP^{X}_{1n}bY) + (1 - s)rPK$$

Substituting eq-3.28 into 3.27, with manipulations gives commodity market balance as:

$$(3.29) \qquad ED_y = eP^x_{in}bY - PE + srPK - PI = 0$$

The export share in domestic production E/Y can be defined as a function of the price of the domestic commodities abroad (P/e) relative to the price of the foreign commodities (P^x):

$$(3.30) \qquad E = E(eP^x/P)X \qquad : \quad dE > 0$$

Investment demand function, following Taylor (Taylor: 1981), is given as a function of the real rate of return on capital stock r and the borrowing cost i faced by the firms. Real investments increase with r and decrease with i. As previously noted, r is an increasing function of Y. So, investment demand is given as:

$$(3.31) \qquad IP = I(Y,i)PK \qquad : \quad \partial I/\partial Y > 0, \quad \partial I/\partial i < 0$$

Substituting eq-3.30 and 3.31 into 3.29 gives:

$$(3.32) \qquad ED_y = q(Y/K) + sr(Y) - I(Y,i) = 0$$

where q is $\left[(eP^x_{in}/P)b - E(eP^x/P)\right]$ (13). Output variation response of the excess demand is:

$$(3.33) \qquad \partial ED_y/\partial Y = \left[q\left(\frac{1}{K}\right) + s\frac{\partial r}{\partial Y}\right] - \frac{\partial I}{\partial Y}$$

The term in square brackets gives the saving effect of the output change being positive. $\partial I/\partial Y$, on the other hand, gives the investment effect of the output change which is also positive. Relative values of these two effects give the magnitute of the total effect on the commodity market balance. Assuming that the saving effect is stronger than investment effect, $\partial ED_y/\partial Y$ is positive. Usual AD curve in the (P,Y) plane is downward sloping (14). So, the effect of price changes on the excess demand must be positive. Derivative of the excess demand function with respect to price gives:

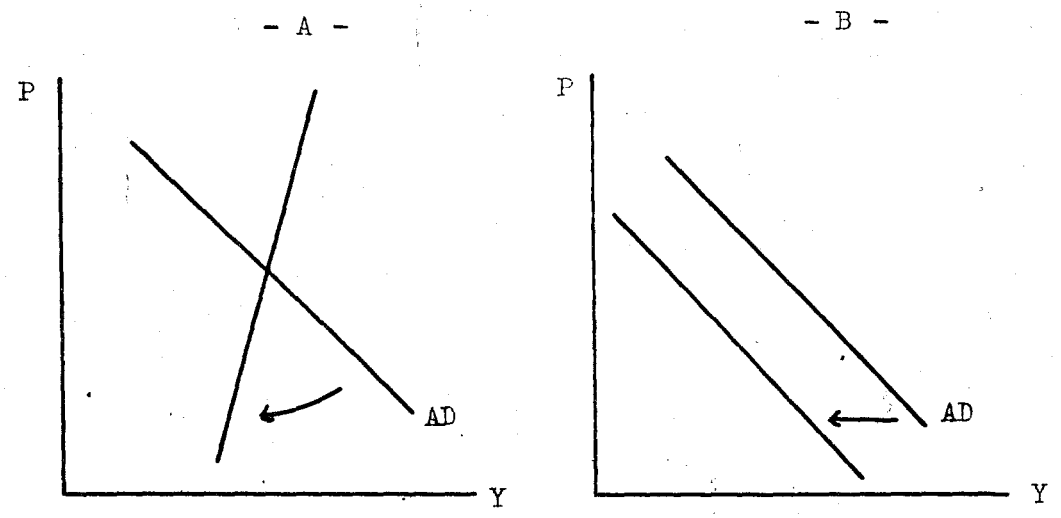
$$(3.34) \qquad \partial ED_y/\partial P = (\partial q/\partial P)(Y/K) > 0$$

The sign of the term $(\partial q/\partial P)$ determines the effect of the price changes on the trade balance in domestic currency. If intermediate good imports is not sensitive to the relative price change (eP^x_{in}/P) and price increase in the domestic market reduces the exports, $(\partial q/\partial P)$ takes positive value, and vica verca. Writing AD curve as:

$$(3.35) \qquad \left.\frac{dP}{dY}\right|_{AD} = - \frac{\partial ED_y/\partial Y}{\partial ED_y/\partial P} < 0$$

As the relative sensitivities of the intermediate imports and the domestic good exports to the price change differ, magnitute of the denominator of the AD function increases, the function rotates counterclockwise. Contractionary devaluation case results clockwise rotation as a result of decreasing the denominator (figure-3A). If the effect of the price change on the imports is

Figure - 3



stronger than on the exports, $\overline{AD}$ curve positively sloped. Change in the interest rate i is given by:

$$(3.36) \qquad \left.\frac{di}{dY}\right|_{P:\text{constant}} = -\frac{\overset{(+)}{\partial ED_Y/\partial Y}}{\underset{(-)}{-(\partial I/\partial i)}} < 0$$

which corresponds to the shift of the AD curve to the left (figure-3B). Reverse result is obtained for the change in exchange rate for the negatively sloped AD curve:

$$(3.37) \qquad \left.\frac{de}{dY}\right|_{P:\text{constant}} = -\frac{\overset{(+)}{\partial ED_Y/\partial Y}}{\underset{(-)}{(\partial q/\partial e)}} > 0$$

One of the standart part of the IMF type stabilization package is that establishing high time deposit rate leads to an

influx of deposits into commercial banks. Basic argument for this policy rests on the analysis presented by McKinnon (McKinnon:1973). The argument is quite simple: Higher real interest rate for the deposits will rice the real size of the banking system and hence the net flow of real bank credit to finance investment (15). So, this policy helps long-run growth of the economy. Starting from this point, Kapur argues that this process is also helpfull for financing working capital requirements of the firms as a result of the increased net flow of bank credit (Kapur: 1976). So, higher time deposit rate policy is not only helpfull for the growth prospect of the economy, also motivate the firms to increase their levels of production by reducing financial deficiencies for an economy working under full capacity, in the short-run. Output increase as a result of this process eliminates inflationary pressure from supply side of the economy. This argument rests on the assumption of which portfolio shifts into time deposit with high deposit rate come out of the unproductive assets like gold, real estate, commodity stock, etc.

Recently published empirical studies, Cavallo:1977 and Van Wijnbergen:1982 show that the implications of the high deposit rate policies are contractionary. This results rise the doubts on the arguments presented by Kapur and McKinnon and the characteristics of the financial market structure of the LDE's turn to be the center of the interests for evaluating the implications of these kinds of policies. This approach is expressed in formal terms by Bruno:1979, Van Wijnbergen:1983a and 1983b stating medium- and long-run repercussions of the high deposit rate policy. Van Wijnbergen:1985 supports the longer term

argument emprically by using South Korean data. These studies stress the role of the institutions in the financial sector of the LDC's and the degree of substitutability between available assets held by the wealthowners.

The financial sector of the LDC's is defined by these authors as:

- Short-term bank credit is mainly used for busineness loans which are needed to finance working capital.
- Limited supply of the short-term bank credit is rationed with officially determined interest rate. On the other hand, banks do not have control over deposit rate.
- Efficient stock market does not exist. Firms finance their fixed capital investments by retained earnings.
- Security and consumer credits are absent. Working capital of firms is partly financed by the short-term bank loans, and the unorganized financial "curb" market plays an important role for financing working capital.

Given this financial market structure, it is argued that time deposit is closer substitute to unorganized money market loans, rather than unproductive assets. So, time deposit rate increase results a shifts of funds mainly from unorganized money market to the banks. This substitution effect has two results: First, increase in the rate of time deposit rise also interest rate in the curb market which results an upward pressure on the prices via high cost for financing working capital under markup pricing rule. Second, as a result of the fact that banks have to hold reserves at central bank where the loans directly transferred to

the firms in curbe market, shifts of funds to banking system reduce available total loan supply to firm for financing working capital. So, there exists a pressure for firms to reduce their production. Overall effect of high time deposit rate policy as a remedy for eliminating the inflationary pressures results as higher price level with lower production.

For the economy where efficient curb market does not exist, high time deposit rate may also be contractionary. In order to see this possibility, a closer examination for the "unproductive assets" (tangible assets) is required. Gold, cash, real estate are the examples for this group of assets. It is not realistic to assume that persons hold cash as an asset in the inflationary period. Part of the gold stock held by the persons is not subject to substitution to another forms of asset due to the traditional factors effecting the demand for gold or hoarding the gold for future where social insurence system include only part of the society.

Rapid urbanization is one of the natural outcome of the industrialization process. This process increases the urban land price and creates fairly stable demand for dwelling which is not subject to short-term market flactuations, in contrast to the gold market. So, real estate is a riskless form of asset with high real rate of return for the wealthowners. Substitution between time deposit and real estate, therefore, require very high real rate for time deposit comparing to the rate of return on real estate.

For an economy described above, time deposit rate increases generate weak substitution from tangible assets to time deposit. On the other hand, deposit rate increase effects only a segment of total demand - demand for dwelling. Since real estate is in non-tradable character, substitution from real estate to time deposit reduce the price for the existing stock of the real estate which stimulate the dwelling demand. So, high time deposit rate policy results reduction in the demand for construction sector only due to the substitution effect asset holder faced. But, on the other hand, volume of cash, time deposit and gold held by the new owners of the dwelling reduce without any alteration in their consumption demand. Since consumption credit absent, only way for this group to reestablish their consumption pattern is to force the firm to change sale conditions.

Given these characteristics for the tangible assets, if the commercial banks are only sort of intermediary institution effective in the financial sector, persons can hold their wealth in the form of money, time deposit and tangible asset. Assuming money is demanded only for transaction, it can be either in the form of cash or demand deposit. Cash - demand deposit ratio is determined by the institutional and behavioral factors and shows no appearant change in the short-run. So, simply considering the money as in form of demand deposit for simplifying the presentation will not change the discussion below. A series of balance sheets for the financial sector outlined is given in table-3.1. Defining money supply as:

Table - 3.1

FINANCIAL BALANCE SHEETS

Assets		Liabilities	
Central Bank:			
Net foreign assets	NFA	Bank reserves	REV
Net domestic assets	NDA		
Commercial Banks:			
Bank reserves	REV	Demand deposets from firms	DDCOM
Loans to firms	CR	Demand deposits from public	DDPR
		Time deposits	DT
Firms:			
Physical capital	PK	Loans from banks	CR
Loans to banks	DDCOM		
Public:			
Demand deposits with banks	DDPR	Wealth	PW
Time deposits with banks	DT		
Tangible assets	PZ		

(3.38) MS = DDCOM + DDPR + DT

and money base as:

(3.39) MB = NFA + NDA = REV

and using bank balance

(3.40) REV + CR = DDCOM + DDPR + DT

wealth identity

(3.41) PW = DDPR + DT + PZ

can be rewritten as:

(3.42) PW = MB + PK + PZ

Assuming that firms hold their working capital requirements in the form of demand deposit in the banks, DDCOM gives us ex-post working capital demand (WCD) of the firms as as a result of their economic activities already exist. From firms balance

(3.43) WCD = DDCOM = CR + PK

can be given as:

(3.44) WCD = CR - PW + MB + PZ = MS - DDPR - DT

Before going into detail with this equation, it is necessary to discuss two points; portfolio preference of wealth holders and the determinance of the ex-post working capital demand function of the firms.

Following the Tobin-type portfolio model, demand for three assets can be given as (Tobin: 1969):

$$(3.45) \qquad DDPR = DDPR(i_m, i_d, i_z, Y)PW$$

$$(3.46) \qquad DT = DT(i_m, i_d, i_z, Y)PW$$

$$(3.47) \qquad Z = Z(i_m, i_d, i_z, Y)PW$$

where i_m, i_d and i_z are real rates of returns on private demand deposit, time deposit and tangible assets, respectively. With substitution assumption, demand functions have positive derivatives with respect to their own rate of return and negative with respect to the rate of return on the alternative assets. In most of the LDC's, interest rate for time and demand deposits is determined by the central authorities. Than, third asset's return, i_z, clears the asset market. Rate of return on tangible assets depends on the nominal value (or market price). As previously noted, demand for these goods as a determinant of their price is not homogenous: A segment of the demand is not in portfolio preference character. As long as rest of the world feeds the excess demand for, or absorbs the excess supply of gold, nominal value of gold is not effected by substitution. On the other hand,

price of real estate is directly effected by demand variations due to substitution. If the tangible assets are widely in the form of the real estate, i_z is no longer purely monetary character.

Studies which construct the link between financial sector and real sector through working capital needs of the firms define the working capital demand function as (Van Wijnbergen: 1983a and 1983b, Bruno: 1979):

(3.48) $$WCD = \mathbf{WCD}(\mathbf{w},Y)$$

where **w** and Y are input price vector and real output, respectively. Working capital demand of the firms increase with the input prices and the output. In other words, working capital requirement of the firms is effected only from real side of the economy. As previously assumed that firms hold their cash for financing their working capital needs as deposits in the banks, DDCOM, cash - payments ratio of the firms for purchasing the inputs may be given as:

(3.49) $$hl = \frac{DDCOM}{waY + eP^{x}_{in}bY}$$

hl is determined by the regulations for wage payments and purchasing the imported intermediate goods. Institutionally determined ratio, hl, can be taken as constant in the short-run. So, any pressure rising the denominator increase the firms' demand for bank loan

to reestablish the value of h1. Then working capital demand function defined as WCD = WCD(h1) has similar first order conditions to eq-3.48. But this formulation represents part of the pressure on the working capital demand of the firms: Cash flow - volume of selling ratio is another determinant of the firms' demands for bank loans to finance working capital. This ratio can be expressed as:

$$(3.50) \qquad h2 = \frac{DDPR}{P \cdot C}$$

where C is the real consumption, and DDPR shows cash position of consumers. h2 is highly dependent upon the sales conditions when economy faced with permanent and fairly high inflation. As h2 decrease, demand of firms for bank loans to finance working capital increases. Assuming that firms have no stock, realized demand of firms for bank loan to finance their working capital can be given as:

$$(3.51) \qquad WCD = WCD(h1,h2) \qquad : \quad WCD_{h1},\ WCD_{h2} < 0$$

where

$$(3.52) \qquad h1 = h1(w, eP^{x}_{in}, Y) \qquad : \quad h1_{w},\ h1_{eP^{x}_{in}},\ h1_{Y} < 0$$

$$(3.53) \qquad h2 = h2(DDPR, P, C) \qquad : \quad h2_{DDPR} > 0 \quad h2_{P},\ h2_{C} < 0$$

Rewriting eq-3.44 in excess demand form in money market gives:

$$(3.54) \qquad ED_m = MS - DDPR - DT - WCD = 0$$

Eq-3.54 gives upward sloping AS curve in (P,Y) plane after differenciation:

$$(3.55) \qquad \left.\frac{dP}{dY}\right|_{AS} = \frac{\left[\underset{(+)}{\frac{\partial DDPR}{\partial Y}} + \underset{(+)}{\frac{\partial DT}{\partial Y}} + \underset{(+)}{\frac{\partial WCD}{\partial Y}}\right]}{\left[-\underset{(-)}{\frac{\partial DDPR}{\partial P}} - \underset{(-)}{\frac{\partial DT}{\partial P}} - \underset{(-)}{\frac{\partial WCD}{\partial DDPR}}\,\underset{(-)}{\frac{\partial DDPR}{\partial P}}\right]} > 0$$

if $\partial WCD/\partial DDPR > -1$. This condition is obtained from:

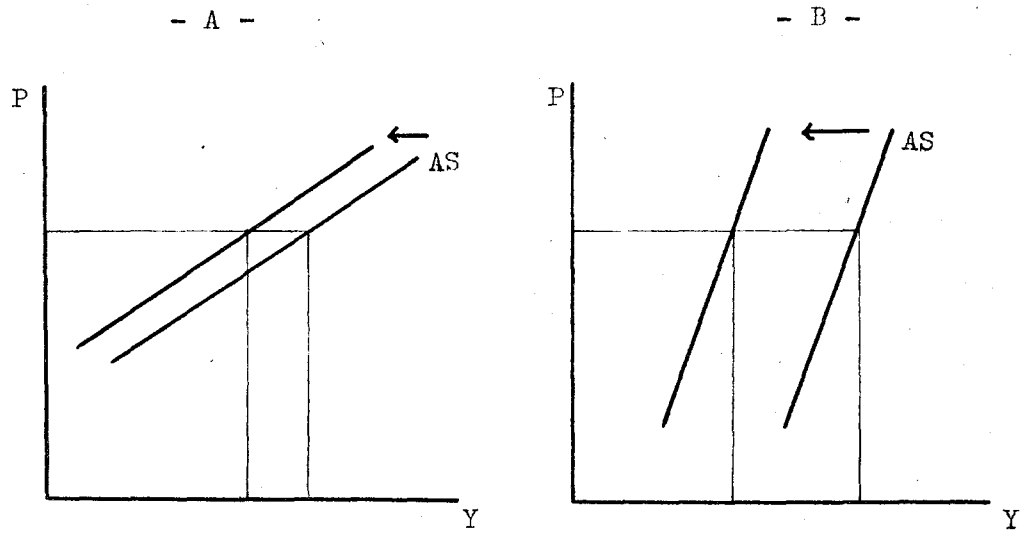
$$(3.56) \qquad \frac{\partial ED_m}{\partial P} = -\frac{\partial DDPR}{\partial P}\left[1 + \frac{\partial WCD}{\partial DDPR}\right] - \frac{\partial DT}{\partial P}$$

which also shows that AS curve becomes steeper as the sales conditions on the demand of the firms for bank loans is effective (figure-4B). As $\partial WCD/\partial DDPR$ reduces, $\partial ED_m/\partial P$ also reduce where final result is counterclockwise rotation of AS curve.

The effect of the change of the time deposit rate, i_d, can be determined by differentiating eq-3.54 holding P constant:

$$(3.57) \qquad \left.\frac{di}{dY}\right|_{P:\text{constant}} = \frac{\left[\frac{\partial DDPR}{\partial Y} + \frac{\partial DT}{\partial Y} + \frac{\partial WCD}{\partial Y}\right]}{\left[-\left(\underset{(-)}{\frac{\partial DDPR}{\partial i_d}} + \underset{(+)}{\frac{\partial DT}{\partial i_d}}\right) - \underset{(-)}{\frac{\partial WCD}{\partial DDPR}}\,\underset{(-)}{\frac{\partial DDPR}{\partial i_d}}\right]} < 0$$

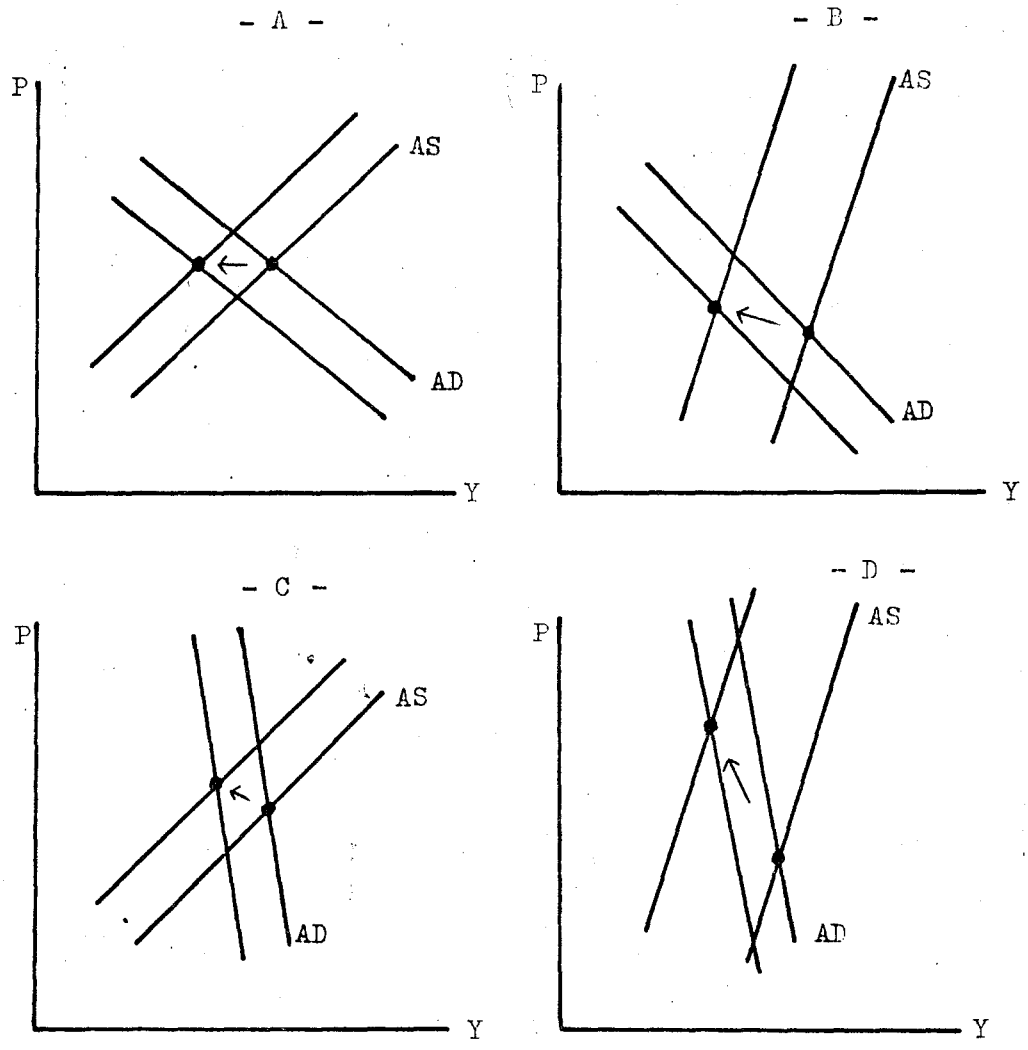
Figure - 4



As it is seen from eq-3.55, numerator is positive. Sign of the denominator is negative. So, increase in the officially determined time deposit rate, i_d, shifts the AS curve to the left (figure-4). Smallest shift exists when deposit rate increase is uneffective on the level of intermediation in the financial sector. Stronger effect of sales condition on demand for bank loans (steeper AS curve) corresponds with larger shift (figure-4A and B).

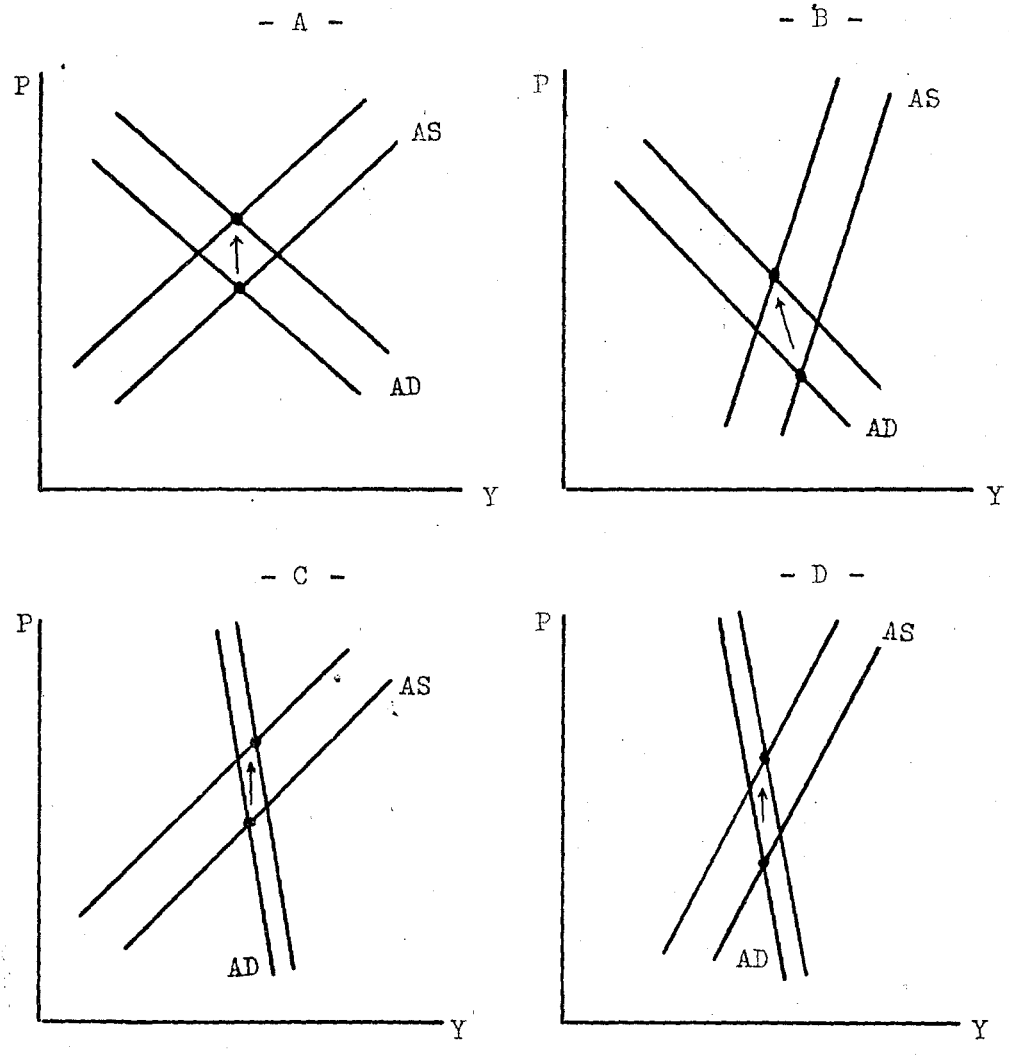
Short-term comparative statics results of the high time deposit rate policy is illustrated in figure-5, for various combination of AD and AS curves. In order to avoid the stability analysis, unusual slopped AD and AS curves are not used.
It is assumed that, time deposit rate and interest rate payed on borrowing are moving in same direction, so that it is possible to combine two results in figure-3 and 4. Since both curves shift to the left final impact of the high time deposit rate on output level is decrease for all case. Change on the price level

Figure - 5



on the other hand, depends on the factors effecting the slopse of the curves. As both AD and AS curves became steeper, inflationary pressure of the high deposit rate on the economy rises. Note that, shifs of AD curve come from investment reducing effect of interest rate increase (eq-3.36). For an economy where stock market does not exist and investments are financed by retained earnings or selective regulated credit, one can plausibly assume that this effect is small. So, for the case of which weak

Figure - 6



sensitivity of investment to interest rate, inflationary effect of high deposit rate policy will be amplified. Similar unusual result obtained from devaluation (figure-6). From eq-3.52 it can be shown that as e rises (devaluation) AS curve shifts to the left. Final impact of devaluation is price increase for all case. The effect of devaluation on output level depends on either slope of AS curve or degree of contractionary effect of devaluation. If sales condition is effective on demand of firms for bank loans,

domestic price increase as a result of cost pressure from imported intermediate goods rises working capital requirement of firms. For a given level of bank loans supply, output decreases (figure-6B). From eq-3.37, one can see that contractionary effect of devaluation lessens the shift of the AD curve, and from a point this shift reverses as to right which results as reduction in output (figure-6C and D).

CHAPTER 4: A MACROECONOMETRIC MODEL FOR THE TURKISH ECONOMY

4.1 Introduction

In this chapter, a short-term macroeconometric model for the Turkish economy is formulated and estimated. The basic concepts underlying the model specification were discussed in the section 3.2. Descriptive analysis of the Turkish economy, from the longer term perspective presented in the chapter-2 is also used for constructing the relations between principal components of the economy. The purpose of constructing an econometric model is to quantify the Turkish economy for evaluating the performance of the economy in the short-run. In other word, descriptive use of the econometric model is of interest (1). Next chapter is devoted to structural analysis of the economy.

Section 4.2 describes the general features of the model. Econometric problems faced in constructing and estimating the model are discussed in the section 4.3. The structure of the equations and the estimation results are presented in the section 4.4. Estimated equations and identities of the model, and list of the variables are given in the appendix at the end of this chapter.

4.2 Basic Assumptions and the Description of the Model

The purpose of constructing a macroeconometric model for Turkey is to test the validities of the possible outcomes of the discussion presented in the chapter-3. One of the usual ways of quantifying the structure of the economy for this purpose is to construct an econometric model consists of equation(s) identifying the basic behavioral relation(s), and to estimate using elaborated econometric techniques. In addition to the intensive care required for identifying the model, it is presumed that the efficiency gained from sophisticated econometric techniques is exhausted by the unreliable data which is common characteristics of most of the series for the Turkish economy (2). So, this approach is not prefered for the structural analysis concerned. Rather, a macro model is employed with the emphasises on the sectoral distinction and the financial market.

Modelling the Turkish economy is a quite new course of study for the researches on Turkish economy. Excluding early examples (Bulutay: 1967 and Korum: 1969), Özmucur:1980, and 1984, Yağcı:1982 and 1983 are the macroeconometric studies for analyzing the Turkish economy. Özmucur:1984 is a large-size where the other are medium size. All models presented by these studies are employed for the predictive use. The model presented in this chapter is closer to Yağcı's works with its theoretical base and modelling technique.

The model presented is charged to clerify the short-term mechanisms and rigidities of the Turkish economy. Data base of

short-term model must be quarterly, or if it is possible, monthly in order to detect the changes of the variables within very short period of time. Unfortunately, for most of the macro variables of the Turkish economy, quarterly series do not exist. So, short-term character of the model is supported by the specification of the behavioral equations, annual data are used for estimation.

Special emphasis in the model is given on the determinants of the supply. So, real side of the economy is disaggregated into five sector according to their relative sensitivities to the demand and the factor endowment. Total output is determined as the sum of the sectoral value added and effect of demand in the short-run is assumed that stronger on the price level. Cost of production is also considered as the major determinant of the prices of some sectors (5).

Adjustment in the financial sector is assumed that has direct impact on the supply side of the economy through its effect on the working capital demand of the firms. Level of working capital requirement of the firms is defined in the light of the discussion presented in the section-3.4. It is derived as to sum up the effects of the monetary restaint/expansion on the working capital demand of the firms. So, this variable is used as one of the key policy variables effecting the supply performance of the real side of the economy. Another important link between financial and real sectors appears in the construction sector value-added function. The substitution between tangible assets and time deposit is used as an indicator for identifying the demand for

the construction sector. Current account balance is another key variable as an indicator for the effect of the supply performance on the financial sector.

The economy is divided into three sectors: Real sector, public sector and financial sector. Since size of the real sector part of the model is too big comparing the other sectors, it is into submodels which determine sectoral productions, expenditures, prices and foreign trade.

4.3 The Estimation Method and the Data

20 endogenous variables out of 33 are determined by the behavioural equations, and rest of them are defined as identity. 25 exogenous variables, 14 lagged endogenous variables and 3 lagged exogenous variables are used as explanatory variable in the model. 15 behavioral equations have endogenous variables as explanatory variable, as a result of the intersectoral dependence. So, two-stage least squares estimation (2SLS) technique is preferred for estimating the model (4). The equations of the model are non-linear in variables, but linear in parameters. This kind of non-linearity problem can be handled with simple manipulations. Full estimation procedure is given in appendix-2 in the form of the computer output.

One of the problem faced with 2SLS estimation is that the number of predetermined variables exceeds the number of observation. One of the ways to overcome this problem is to divide the model into submodels (Intrigilator: 1978, p.391). The model

presented her is divided into six submodels: four submodels for the real sector, one for public and one for financial sector. In this method, predetermined variables which appear in the submodel are used as instrument for the dependant variables for the first stage estimates.

The sample period for estimation is taken to be 1964-84 with 1963 used for lagged values as required. In most of the equations lagged value of dependent variables used as explanatory variable in order to reduce longer term effects in the short-term relations. One of the problem faced with the data is absence of series for some variables within the sample period. For example, series for imported goods price index in TL is published by the State Institute of Statistics starts with 1968. The values for previous years of this variable is calculated from the series in same nature given by Özmucur:1980. The methods for classifications of monetary data is changed in recent years, and it is used for generating the series starting from 1970. The values for the money base (MB) is calculated by using the percentage change of the some component of the money base which is seen as subject to yearly variations. Data generation for special purpose is not applied for constructing the data base of the model except one: Working capital demand indicator (WCD) is generated as a summary variable of the monetary regulations which is defined in the section-4.4.1. For the sake of the degree of freedom, some of the exogenous variables are employed as the indicators of more than one macro changes. PMTL, PETL and D1 are the examples for this kind of use of variables.

4.4 The Estimation Results of the Model

4.4.1 Real Sector: Production

The supply side of the economy is disaggregated into five sectors: Construction, services, manufacturing, mining and energy production, and agriculture. First three sectors are endogenously determined. The agricultural sector is taken as exogenous due to the effectiveness of the non-economic factors on the agricultural output. A-sector described in the section-3.3 is represented by the agricultural sector. The mining and energy production sector resembles the role of the government as an intermatiary supplier. So, this sector is considered as an policy tool for the state to influence type supply performance of the economy.

The construction sector value added is defined as:

$$(4.1') \qquad YC = \mathcal{F}^{YC}(Y,(DT/PY),(PY_{-1}/PYC),YC_{-1})$$

The level of this sector is assumed that determined by demand. First variable, Y, represents the effects of the income on the construction sector production. Second and third terms in the equation serve as the indicators of the substitution effect as described in the section-3.4 in between real estate and time deposit. Lagged value of the dependent variable absorbs long-term growth effect in order to emphasize short-term issues. The estimation results (in the appendix at the end of this chapter) show that the level of the income increases the demand for this sector and the real demand for time deposit (DT/PY) reduces.

Since the demand for construction for storing the wealth is only a part of the total demand for this sector, one can expect that the estimated coefficient for this variable must be statistically weak. But, fairly strong relation estimated between demand for construction and time deposit in opposite directions. It seems that the source of the serial correlation is due to this overestimation where demand for time deposit is determined strongly by the time trend (lagged variable in eq-4.28). As expected, return on real estate has positive but weak effect on the demand for the construction sector. The return on the real estate is defined as the ratio of the price level to the price of the construction. It is assumed that return on real estate varies with the price level and the expectation for the price level (PY_{-1}) is determines the return.

The services sector value added is determined simply by the demand:

$$(4.2') \qquad YS = \mathcal{F}^{YS}(Y, YS_{-1})$$

which gives that the real demand (Y) is main determinant of the services sector output. Lagged variable is represent the time trend effect on the services sector production.

Most of the important mechanism stressed in section-3.3 and 3.4 are used to construct the equation for the manufacturing sector value added. Short-run production function for the manufacturing sector is defined as a function of the real imported

intermediate goods (MIN·EXRM/PMTL), the domestically produced intermediate goods - Q products in section-3.3 - (YQ), the working capital demand (WCD) and the labor (L) (5):

$$(4.3') \qquad YM = \mathcal{F}^{YM}((MIN \cdot EXRM/PMTL), YQ, WCD, L)$$

Estimation results show that (eq-4.3) the levels of the imported and domestically produced intermediate goods have strong effects on the level of manufacturing good production, as expected. On the other hand, working capital demand indicator gives negative coefficient estimation. WCD is generated by using eq-3.49, 3.50 and 3.51. As pressure on working capital demand h1 is calculated as:

$$h1 = \frac{(CYM/(CYM+CYT))DDCOM}{CYM(w/o)}$$

where CYM and CYT are the nominal manufacturing and the trade sectors value addeds. It is assumed that the commercial deposit is uniformly divided between the trade and the manufacturing sectors. The numerator gives the total deposit of the manufacturing good producers. The term (w/o) gives the ratio of the nominal input payments to the nominal output. So, denominator gives total payments for the variable costs of the firms. On the other hand, h2 is calculated as:

$$h2 = \frac{DDPR}{CP}$$

where DDPR and CP are the nominal private demand deposit and

the consumption, respectively. Than, WCD is defined as:

$$WCD = H1 - H2$$

where H1 and H2 are deflated values of h1 and h2 by their 1968 values:

$$H1 = h1/h1_{68} \quad , \qquad H2 = h2/h2_{68}$$

in order to reduce both ratios to unity to establish a base for WCD. So, WCD serves as the working capital demand indicator for the manufacturing sector relative to the magnitute for the year 1968. Relative increase of H1 rices the demand for bank loans to finance working capital and relative decrease of H2 reduces. If we assume that supply of bank loans is always less than the required, and bank loans are the only source for financing working capital, increase of WCD corresponds to rice of financial constraint on production. The negative coefficient for WCD verifies the relevance of the financial restraint on production. Labor demand function is defined as a function of the level of the manufacturing sector value added and the investment with lag:

$$(4.4') \qquad L = \overline{f}^{L}(YM, IM_{-1}, L_{-1})$$

Lagged value for employment absorbs the time trend factors effecting labor demand.

Gross national product is defined as the sum of the sectoral

value addeds (eq-4.5). So, all determinants of the sectoral productions are counted for national product determination. The variable DIF represents the difference between the gross domestic product and the gross national product.

4.4.2 Real Sector: Prices

The prices of four sectors out of five are determined endogenously by the model. The price of the mining and the energy production sector is taken as exogenous policy variable. The price of the manufacturing sector is defined as:

$$(4.6') \quad PYM = f^{PYM}(W, WCD, (WCD \cdot D1), PMTL, PYQ, PYM_{-1})$$

All variables in the short-run price equation are exogenous as a result of the fixed-price assumption for the manufacturing sector discussed in the section-3.3. Eq-4.6' is in form of unit variable cost consisting with the unit price of the variable inputs. The explanatory variable W is taken to be exogenous. So, the model does not have wage determination equation under the assumption that the wages are determined mainly by non-economic factors due to the organization of the labor force and the social factors effecting the labors as discussed in the chapter-2 (6). Positive and statistically strong coefficient for wage is estimated.
The cost of using bank loans determination is not straightforward: Limited supply of short-term bank credits is rationed with negative real and officially determined interest rate, in the period before the year 1981. So, as the level of the bank credit use increase, rice of WCD, the cost pressure of the financing working capital

reduces, as estimated (eq-4.6). On the other hand, for the period after the year 1981 real cost of bank credit use turns to be positive. Dummy D1 is used for representing the positive real interest rate. For this period, as expected, it is estimated that the rise of the interest rate has effect on the price level. The coefficient for (WCD·D1) is positive. TL price of imported goods is used for explaning the imported intermediate good price effect on the final good price. PMTL is a linear combination of the foreign prices and the exchange rate. So, positive and statistically strong coefficient for PMTL stresses the importance of the devaluation and the foreign inflation on the domestic price level of the manufacturing goods. On the other hand, price of domestic intermediaries has weak effect on the manufacturing good price. Lagged value of PYM serves for explaning the demand expectations of the producers: Following the discussion on the markup pricing rule, output increase reduce the fixed cost of production, and prices. High price for the previous period encourages the producer to rise their production level, and this effect reduces the fixed costs and prices. So, lagged value for PYM effect the current value of PYM as estimated.

The agricultural price equation is defined as a combination of the usual excess demand and cost determined function form:

$$(4.7') \qquad PYA = \mathcal{F}^{PYA}((YD/PY), YA, PYA_{-1}, PYM)$$

First three variables gives the effects of the dynamic excess demand on the price. Real disposible private income (YD/PY) has

positive effect on the agricultural price, as expected. But, the level of the agricultural production also effects the prices in same direction. This result may be explained by the agricultural input demand of the non-agricultural sector. If we assume that the peasants have information for the input demand of the non-agricultural sector, and reactions are pessimistic, reverse sign for this coefficient may be partly explaned. But, at this moment, it is not possible to verify the relevance of this sort of mechanism. Lagged value for agricultural price is use for expaining the effect of demand on the resource allocation in the agriculture: Cobweb-type market mechanisms are one of the characteristics of the Turkish agriculture. Lagged adjustment of the farmers to the excess demand leads to the price variation year to year almost all commodity markets. If we assume that the agricultural good prices are more elastic for the case of positive excess demand than the case of negative excess demand, the price variations in the good markets can be observed as variation in the general price level of the agriculture. Negative valued coefficient for the lagged PYA reflects the resource allocative effect of the food demand with time lag. PYM puts the input price as a cost factor effecting the agricultural prices. High t statistics for this coefficient shows that the input prices are directly transmitted to the output price.

The price of the services sector is directly related to the price level of the economy:

(4.8') $\quad PYS = f^{PYS}(PY)$

The price of the construction sector is defined by the costs and demand variables:

$$(4.9') \quad PYC = \mathcal{F}^{PYC}(PYM, PYM_{-1}, PY_{-1})$$

The estimation results for the construction sector price show that input costs (manufactured good prices) are the major determinants of the prices (eq-4.9). At the same time, inflationary expectations (PY_{-1}) also effects the construction prices as a pressure from demand side. Lagged manufacturing good price serves as an indicator for the profits of the construction sector's firms. Assuming that the firms in the construction sector have very poor asset stock, as their profits increase they could impose a monopoly power. On the other hand, as their profits tend to fall they behave as price receiver due to their inability to rise the stock as a result of their financial weakness. Negative coefficient for lagged manufacturing good price reflects this mechanism relevant to the construction sector. So, any substitution from real estate to time deposit leads significant price reduction at the expense of the construction investment reduction.

The price change equation is defined as:

$$(4.10') \quad PY/PY_{-1} = \mathcal{F}^{PY/PY_{-1}}((YD/YD_{-1}),(Y/Y_{-1}),(MS2/MS2_{-1}))$$

One of the important characteristics of this equation is that the change of the disposible private income (YD/YD_{-1}) defined in nominal value where the change of the output (Y/Y_{-1}) is in real

term. So, price change determined implicitly. Another characteristics of the price change function is that the expenditures, production equations and the money stock are combined with this equation to determine the price changes. The signs of the estimated coefficients are all as expected and except one for the change of money stock significant. With this results one can conclude that the inflation in Turkey is not purely either Keynesian or Neo-classic.

4.4.3 Real Sector: Expenditures

The total nominal expenditures are given as the sum of the private and public consumptions and private and public investments. The total nominal resources are the sum of the nominal gross national product and the foreign resources:

$$Y \cdot PY + RG = CP + (IP \cdot PIP) + CG + IG + TSC$$

The private consumption and the investment determined endogenously in the model. The reason for using the nominal values for the expenditures is to combine the supply and the demand sides of the economy by implicitly determined price.

The private consumption function is in simple Keynesian form, but not with real terms. Nominal private consumption is determined by the nominal disposible private income:

(4.11') $\quad CP = f^{CP}(YD)$

The argument behind constructing the consumption function in nominal term is that the consumers are more patient about their expenditures rather than prices (7). Estimation result shows that there is very low propensity to save as expected.

The investment demand equations consist lagged gross national output, price level and the imported investment goods. Lagged values for the investments reflect the continuation of the investment expenditure. In addition to the total private investment, the private investment in manufacturing sector is also determined in the model in order to explane labor demand function:

$$(4.12') \qquad IP = f^{IP}(Y_{-1}, (MI \cdot EXRM/PMTL), IP_{-1}, PY_{-1})$$

$$(4.13') \qquad IM = f^{IM}(Y_{-1}, (MI \cdot EXRM/PMTL), IM_{-1}, PY_{-1})$$

The estimation results for these two equations are very similar. The level of national product, as an indicator for the sources of investment either in the forms of saving or profits, effects the investment positively. But, price expectations effect the investment demand negatively. This result does not verify the inflation led growth hypothesis especially for the manufacturing sector investments. For both demand equation the level of the imported investment goods is restrictive factor on the realization of the investments. The private investment in the non-manifacturing sectors and the disposible private income are defined by identities (eq-4.14 and 4.15).

4.4.4 Real Sector: Foreign Trade

The foreign trade structure of the Turkish economy is defined as to reflect the import substituting industrialization strategy which is implemented in the estimation period with the exception of the last years. In order to include the effects of the changes in the trade policy implemented after the year 1981, dummy D1 is employed. It is assumed that this policy change does not yield the structural transformation of the supply side of the economy within the estimation period.

The exports are divided into three: The manufacturing goods exports, the agricultural goods exports and the mining production exports. Agricultural and mining exports are assumed to be determined exogenously as a result of the fact that these sectors as the source for financing the imports are neglected under import substitution policy.

The exports of the manufacturing goods defined as:

$$(4.17') \qquad EM = f^{EM}\left((PYM/EXRE)-(PYM_{-1}/EXRE_{-1}) \;,(YM/Y),D1,EM_{-1}\right)$$

First term represent the change of the price advantage of domestic products abroad which gives that if the foreign currency price change is negative the exports of the manufacturing goods increase, and vice versa. But, this coefficient is insignificant. Since the firms in the manufacturing sector are orientated for the domestic market they tend to export if the domestic market is squeezed. The ratio of the manufacturing sector production to

total output (YM/Y) is used to explane this relation. That is as this ratio increases the size of the domestic market relative to the manufacturing output decreases. But, increase of this ratio also reftlect the shifts of the demand for the manufacturing output. On the other hand, decrease in the size of the domestic market may force the producers to reduce their output, hence ratio YM/Y may not change. So, this ratio is weak indicator for the present purpose. Low t statistics indicates the weakness. D1 is used for the export promotions implemented after the years 1981. The coefficient for dummy is positive which shows that this policy induces the manufacturing exports. Lagged value for the manufacturing exports absorbs the long-term determinants of the export performance of the manufacturing sector.

The imports are also divided into three: The intermediate goods imports, the investment goods imports and the consumption goods imports. The investment goods and the consumption goods imports are exogenous. The consumption goods imports have small share in total imports and subject to the public regulations. The imports of the investment goods, on the other hand, could be partly expained by the trade performance of the economy in the short-run. Investment goods imports are mainly financed by the loans from international financial organizations where availability of foreign loans are determined by the longer-term performance of the economy.

Real demand for the intermediate goods imports is simply stated as a function of the domestic economic activities:

(4.18') $MIN \cdot EXRM/PMTL = \mathcal{F}^{MIN \cdot EXRM/PMTL}((YM+YQ+YA),D2)$

where manufacturing, mining and energy production, and agriculture are the sectors which use imported goods as input. Dummy D2 is employed to count the effects of the balance of payment bottleneck in the years 1978-80 where negative coefficient shows low level of importation than demanded.

The current account deficite is defined as the sum of trade deficite and balance of invisible (eq-4.21. Negative values for the balance variables denote surplus). Current account balance is the key variable to transform the trade performance into financial sector of the economy.

4.4.5 Public Sector

The public revenues are defined as the sum of the direct taxes (TD), indirect taxes (TI) and non-tax revenues (RG) (eq-4.24). Direct and indirect taxes are determined endogenously as the functions of Y and PY:

(4.22') $TI = \mathcal{F}^{TI}(Y,PY)$

(4.23') $TD/PY = \mathcal{F}^{TD/PY}(PY_{-1})$

The estimation result for the indirect taxes gives that they are more sensitive to the level of prices then the overall economic activity. The direct tax revenue of the public, on the other

hand, is determined by the total economic activity in real terms but with lag. These results reflect the characteristics of the tax collecting processes in Turkey. With these behavioral equations public revenues are related to the macro balances of the economy. It is not intended to generate mechanisms for the use of the fiscal policy tools with the tax equations. Rather, with endogenously determined public revenues, the disposible private income is determined completely within the system as one of the determinant of the price changes (eq-4.15).

4.4.6 Financial Sector

Identifications for the short-run adjustment mechanisms of the financial sector are based on the linkages between the real and the financial sectors which run both ways. So, mutually dependence exists between the real and the financial macro balances in the short-run. Basic structure postulated for the financial sector can be explained as follows: Money base and money stock are the kay variables to identify the balances of the financial sector where both are determined endogenously. Money base (MB) is defined as the sum of the net domestic and foreign assets. Former is related with the economic actions of the government and latter reflects the external equilibrium. On the other hand money stock gives total debts of the banking system. The difference between money stock and money base, therefore, simply stating gives loans supply generated by the financial sector (8):

$$MB = NDA + NFA = CS + REV$$

$$MS2 = DT + DD + CS$$

(4.32') $$CR = MS2 - MB = DT + DD - REV$$

where REV is bank reserves hold by the Central Bank. Eq-4.32 summarizes the role of the financial sector in the economy as a whole.

The change of the level of net domestic assets of the Central Bank is defined by the factors forces the government to use the loans of the Central Bank:

(4.26') $$NDA-NDA_{-1} = f^{NDA-NDA_{-1}}(SUB,(PYQ/PY)/(PYQ_{-1}/PY_{-1}),(YQ\cdot PYQ)-(YQ_{-1}\cdot PYQ_{-1}),D1,D2)$$

The sources of the needs of the government for using the Central Bank's loans are divided into two groups. First one is related with the current expenditures. It is assumed that cash position of government determines the level of the borrowing to the Central Bank, rather than the fiscal balance at the end of the year. So, subsidies are used for explaining the cash position of the government within the year due to the discreate character of the cash outflow for the subsidiary payments. Estimation result gives a strong relation between the subsidies and the change of the net domestic assets. Second one is related with the losses of the state economic enterprises (SEE's). Second and third terms are used for explaining this relation. Estimation results show that relative price changes of the mining and the energy productions

have negative effect, and the change of the output level of this sector has positive effect on the domestic assets. Price and output level of mining and energy production sector are used as instrument for the products of the SEE's. Negative coefficient for D1 shows that the budget management has great importance on reducing the demand for the loans of the Central Bank, implemented in the years 1981-84. Dummy D2 is included for the resession in the years 1978-80.

Net foreign assets are simply explaned by the current account balance. So, the effects of the external equilibrium on the financial sector are determined:

$$(4.27') \qquad NFA = f^{NFA}(BC \cdot EXRM, D1)$$

Estimation results show that the current account deficits in TL reduce the money base. Dummy D1 is used for the role of the policy change where the commercial banks are also charged with the foreign transactions.

The commercial deposit demand function is defined as:

$$(4.28') \qquad DDCOM = f^{DDCOM}(WCD, DDCOM_{-1}, D1)$$

As expected, working capital demand has positive effect on the cash demand of the firms. But, high t statistics for the lagged dependent variable shows that the structural factors are also effective on the cash demand. D1 is employed to explaine the

effect of tight money policy on the cash demand of the firms which gives weak but positive coefficient.

The demand for time deposit is identified with the portfolio preference behavior of the wealthowners discussed in the section-3.4:

(4.29') $$DT = \mathcal{F}^{DT}(PY,(Y\cdot PY),D1)$$

Dummy D1 is included for the effect of positive real time deposit rate relevant for the years 1981-84. The estimated demand equation fits the conditions given in the eq-3.46.

4.A Appendix: Equations and List of Variables of the Macro Model for the Turkish Economy (9)

Real Sector: Production

(4.1) $$YC = \underset{(0.138)}{0.09847145} + \underset{(3.517)}{0.02162244}\ Y - \underset{(-3.066)}{0.02605507}\ (DT/PY) + \underset{(0.495)}{0.2809742}\ (PY_{-1}/PYC) + \underset{(5.560)}{0.6528225}\ YC_{-1}$$

R^2: 0.9947 D-W: 2.8471

(4.2) $$YS = \underset{(-5.065)}{-7.733747} + \underset{(7.512)}{0.3340449}\ Y + \underset{(3.448)}{0.3201819}\ YS_{-1}$$

R^2: 0.9986 D-W: 1.7208

(4.3) $$YM = \underset{(-2.183)}{-3.813876} + \underset{(4.371)}{0.07810436}\ (MIN \cdot \underline{EXRM}/\underline{PMTL}) + \underset{(2.265)}{0.9570454}\ \underline{YQ} - \underset{(-2.107)}{4.6687776}\ \underline{WCD} + \underset{(5.523)}{0.01286666}\ L$$

R^2: 0.9915 D-W: 1.4430

(4.4) $$L = \underset{(4.728)}{220.2153} + \underset{(2.735)}{17.12433}\ YM + \underset{(1.708)}{7.978137}\ IM_{-1} + \underset{(4.479)}{0.5801447}\ L_{-1}$$

R^2: 0.9922 D-W: 2.3700

(4.5) $$Y = YM + YS + YC + \underline{YQ} + \underline{YA} + \underline{DIF}$$

Real Sector: Prices

(4.6) $$PYM = -0.08866596 + 0.04083896\ \underline{W} - 3.670084\ \underline{WCD}$$
$$(-0.454) \qquad (7.597) \qquad (-3.837)$$
$$+ 2.888229\ (\underline{WCD} \cdot \underline{D1}) + 0.002676175\ \underline{PMTL}$$
$$(1.751) \qquad (6.039)$$
$$+ 0.06395775\ \underline{PYQ} - 0.3024658\ PYM_{-1}$$
$$(0.407) \qquad (-1.974)$$

R^2: 0.9996 D-W: 2.1127

(4.7) $$PYA = -3.922206 + 0.0106262\ (YD/PY) + 0.1128844\ \underline{YA}$$
$$(-1.876) \quad (0.612) \qquad (1.075)$$
$$- 0.2760666\ PYA_{-1} + 0.8165605\ PYM$$
$$(-1.924) \qquad (11.660)$$

R^2: 0.9975 D-W: 2.4278

(4.8) $$PYS = -0.04293151 + 1.017513\ PY$$
$$(-0.807) \qquad (431.346)$$

R^2: 0.9998 D-W: 2.0656

(4.9) $$PYC = 0.4681510 + 0.6970558\ PYM - 0.6152581\ PYM_{-1}$$
$$(2.939) \qquad (18.022) \qquad (-3.722)$$
$$+ 0.5282765\ PY_{-1}$$
$$(2.540)$$

R^2: 0.9991 D-W: 2.2472

(4.10) $PY/PY_{-1} = 2.762711 + 0.587188\ (YD/YD_{-1})$
$(3.010) \quad (5.254)$
$- 2.450973\ (Y/Y_{-1}) + 0.2216587\ (MS2/MS2_{-1})$
$(-3.152) \quad (1.328)$

R^2: 0.8742 D-W: 1.6309

Real Sector: Expenditures

(4.11) $CP = - 15.69008 + 0.9088006\ YD$
$(-0.636) \quad (157.202)$

R^2: 0.9992 D-W: 2.2847

(4.12) $IP = - 8.420465 + 0.08210119\ Y_{-1}$
$(-3.413) \quad (2.637)$
$+ 0.1858054\ (\underline{MI} \cdot \underline{EXRM}/\underline{PMTL}) + 0.4131002\ IP_{-1}$
$(9.658) \quad (3.336)$
$- 0.09612433\ PY_{-1}$
(-1.685)

R^2: 0.9853 D-W: 2.4502

(4.13) $IM = - 8.142265 + 0.09039785\ Y_{-1}$
$(-4.208) \quad (3.899)$
$+ 0.09028974\ (\underline{MI} \cdot \underline{EXRM}/\underline{PMTL}) + 0.1481719\ IM_{-1}$
$(6.719) \quad (0.882)$
$- 0.150088\ PY_{-1}$
(-3.743)

R^2: 0.9777 D-W: 1.8896

(4.14) $IR = IP - IM$

(4.15) $YD = (Y \cdot PY) - YG$

(4.16) $FR = CP + (IP \cdot \underline{PIP}) + \underline{IG} + \underline{CG} + \underline{TSC} - (Y \cdot PY)$

Real Sector: Foreign Trade

(4.17) $$EM = \underset{(-0.951)}{-\ 741.4624} \underset{(-0.384)}{-\ 988.9226} \left[(PYM/\underline{EXRE}) - (PYM_{-1}/EXRE_{-1})\right]$$
$$\underset{(1.053)}{+\ 5473.03\ (YM/Y)} \underset{(3.689)}{+\ 1136.746\ \underline{D1}}$$
$$\underset{(7.162)}{+\ 0.8649517\ EM_{-1}}$$

R^2: 0.9764 D-W: 2.5286

(4.18) $$MIN \cdot \underline{EXRM}/\underline{PMTL} = \underset{(-6.116)}{-\ 56.35935} \underset{(14.174)}{+\ 1.851385\ (YM+\underline{YQ}+\underline{YA})}$$
$$\underset{(-3.129)}{-\ 22.56181\ \underline{D2}}$$

R^2: 0.9195 D-W: 1.1424

(4.19) $E = EM + \underline{EA} + \underline{EQ}$

(4.20) $M = MIN + \underline{MI} + \underline{MC}$

(4.21) $BC = M - E + \underline{BINV}$

Public Sector:

(4.22)
$$TI = -\,22.27817 + 0.1680237\ Y + 13.74796\ PY$$
$$(-0.848) \quad (0.950) \quad (29.810)$$

R^2: 0.9906 D-W: 2.8728

(4.23)
$$TD/PY = -\,9.472555 + 0.1468511\ Y_{-1}$$
$$(-6.799) \quad (17.412)$$

R^2: 0.9410 D-W: 1.1945

(4.24)
$$YG = TI + TD + \underline{RG}$$

(4.25)
$$GD = \underline{CG} + \underline{IG} + \underline{SUB} - YG$$

Financial Sector:

(4.26)
$$NDA-NDA_{-1} = 405.1909 + 5.540957\ \underline{SUB}$$
$$(3.180) \quad (5.995)$$
$$-\,415.0582\ \left[(\underline{PYQ}/PY)/(\underline{PYQ}_{-1}/PY_{-1})\right]$$
$$(-3.279)$$
$$+\,6.230907\ \left[(\underline{YQ}\cdot\underline{PYQ})-(\underline{YQ}_{-1}\cdot\underline{PYQ}_{-1})\right]$$
$$(7.458)$$
$$-\,888.1491\ \underline{D1} - 166.137\ \underline{D2}$$
$$(-14.347) \quad (-5.260)$$

R^2: 0.9939 D-W: 2.4694

(4.27) $$NFA = 30.47812 - 0.002599734\ (BC \cdot \underline{EXRM}) + 99.54271\ \underline{D1}$$
$$\quad\quad\quad (0.853) \quad\quad (-7.047) \quad\quad\quad\quad\quad\quad (0.727)$$

R^2: 0.8756 D-W: 2.2644

(4.28) $$DDCOM = -6.062741 + 64.02502\ \underline{WCD} + 1.158717\ DDCOM_{-1}$$
$$\quad\quad\quad\quad\quad\quad (-0.792) \quad\quad (3.512) \quad\quad\quad\quad (21.018)$$
$$\quad\quad\quad\quad\quad\quad + 56.07725\ \underline{D1}$$
$$\quad\quad\quad\quad\quad\quad\quad\quad (1.775)$$

R^2: 0.9950 D-W: 1.2584

(4.29) $$DT = 76.82616 - 171.0316\ PY + 0.8398361\ (Y \cdot PY)$$
$$\quad\quad\quad (2.729) \quad\quad (-8.190) \quad\quad\quad (10.125)$$
$$\quad\quad\quad + 314.5510\ \underline{D1}$$
$$\quad\quad\quad\quad\quad (2.719)$$

R^2: 0.9896 D-W: 2.9347

(4.30) $$DD = DDCOM + \underline{DDPR}$$

(4.31) $$MS2 = DD + DT + \underline{CS} + \underline{DCB}$$

(4.32) $$CR = MS2 - MB$$

(4.33) $$MB = NDA + NFA$$

ENDOGENOUS VARIABLES:

YC	Construction sector value added
YS	Service sector value added
YM	Manufacturing sector value added
Y	Gross national product
L	Labor
PYM	Implicit price deflator for the manufacturing sector
PYA	Implicit price deflator for the agricultural sector
PYS	Implicit price deflator for the service sector
PYC	Implicit price deflator for the construction sector
PY	Implicit price deflator for the gross national product
CP	Private consumption (current)
IP	Total private investment
IM	Private investment in manufacturing sector
IR	Private investment in non-manufacturing sectors
YD	Disposable private income (current)
FR	Foreign resources (current)
EM	Exports of manufacturing goods (current $)
MIN	Imports of the intermediary goods (current $)
E	Total exports (current $)
M	Total imports (current $)
BC	Current account balance (current $)
TI	Indirect taxes (current)
TD	Direct taxes (current)
YG	Public revenue (current)
GD	Public deficit (current)
NDA	Net domestic assets of the central bank (nominal)
NFA	Net foreign assets of the central bank (nominal)

DDCOM Commercial demand deposits (nominal)

DT Time deposits (nominal)

DD Total time deposits (nominal)

MS2 Money stock (nominal)

CR Credit supply of the banking system (nominal)

MB Money base (nominal)

EXOGENOUS VARIABLES:

PYQ Implicit price deflator for the mining and energy sector

PIP Implicit price deflator for the private investments

YQ Mining and energy sector value added

YA Agricultural sector value added

IG Public investment (current)

CG Public consumption expenditures (current)

TSC Total stock changes (current)

W Wages (nominal)

CS Currency in sirculation (nominal)

DCB Deposits with central banks (nominal)

DDPR Private demand deposits (nominal)

MI Imports of investment goods (current $)

MC Imports of consumption goods (current $)

EA Exports of agricultural goods (current $)

EQ Exports of mining sector

EXRM Exchange rate for imports (TL/$)

EXRE Exchange rate for exports (TL/$)

PMTL Price index for imports in TL

BINV Balance of invisible (current $)

RG	Public non-tax revenues (current)
SUB	Subsidies (current)
D1	Dummy for 1981, 82, 83, 84 : 1
D2	Dummy for 1978, 79, 80 : 1
WCD	Working capital demand indicator
DIF	Gross national product minus total domestic value added

CHAPTER 5: SHORT-RUN ADJUSTMENTS IN THE TURKISH ECONOMY

5.1 Introduction

In the chapter-4, we have attempted to formulate a macro model of how the Turkish economy works in the short-run. The purpose of this chapter is to analyse how the Turkish economy adjusts to the policy variables in the short-run using the macro-econometric model estimated. The method applied for evaluating the effects of the exogenous changes on the macro balances is fairly different than the method applied to the existing ones for the Turkish economy. This method is presented in the section-5.2.

The stabilization policy package implemented after the year 1980 consists of four main targets: Rationalization of the state economic enterprises, liberalization of the foreign trade, liberalization of the finalcial sector and increase the efficiency of the tax system (Durdağ: 1981). The effects of basic policy tools used for attaining the targets on the selected macro variables are evaluated by the impact multipliers in the section-5.3. It is shown that some of the attempts to maintain these targets give pervers results in the short-run.

5.2 Linearization of the Model and the Impact multipliers

15 equations of the model out of 33 are nonlinear. So, it is not possible to solve the model for reduced form directly. One of the ways to obtain the multipliers is to simulate the model (1). Alternatively, multipliers are computed directly reduced form of the model after linear transformation.

Linear approximation for a non-linear function $y=f(x_1,x_2,...)$ is given as:

$$y = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + ...$$

where

$$\alpha_i = \partial y/\partial x_i \qquad i: 1, 2, ...$$

The coefficient α_0 is sum of the value of the terms which are subject to transformation and the constant term in the non-linear equation (2). Application of this technique can be shown on a simple example: The non-linear for of the time deposit demand function is given as (eq-4.29):

$$DT = 76.82616 - 171.0316\ PY + 0.8398361\ (Y \cdot PY) + 314.551\ D1$$

Linear approximation for this equation is:

$$DT = \alpha_0 + \alpha_1\ PY + \alpha_2\ Y + \alpha_3\ D1$$

where α_1, α_2 and α_3 are partial derivatives of the non-linear

equation subject to PY, Y and D1:

$$\lambda_1 = -171.0316 + 0.8398361\ Y$$

$$\lambda_2 = 0.8398361\ PY$$

$$\lambda_3 = 314.551$$

λ_0 is the sum of the constant term and the value of the non-linear term:

$$\lambda_0 = 76.82616 + 0.8398361\ (PY \cdot Y)$$

The coefficients of the linearized equation except λ_3, consist the variables. So, values for linearized coefficients change for each years. In other words, linearized equation is defined for every years in the estimation period. So, after linear transformation, the model as a whole can be defined for a particular point of time where the coefficients reftlect the structure for the point concern.

For the sample period the model may be defined by the mean values of the coefficients. If sample period is divided into subperiods, with this method for each subperiod we can obtain a model. Significant differences between the coefficients of the subperiods reflect the distinct economic conditions for the subperiods. For the present purpose of the study, two subperiods are defined:

Period-I: recession (1977-79)

Period-II: implementation of stabilization policy (1981-84)

Linearized form of the non-linear equations of the model and the values for the linearized coefficients are given in the appendix-5A at the end of this chapter. The linear equation of the model, of course, remain unchange which are not reported in the appendix. Differences between values of the linearized coefficients show that the distinction made for these two subperiod is meaningfull.

Once the model linearized, derivation of the model's reduced form is straightforward. After some manipulation one can get the impact multipliers. Selected multipliers are given in table- 5.1 - 5.4 for period-I and period-II (3)

5.3 The Effects of the Exogenous Changes in the Short-Run

In this section, the effects of the exogenous policy tools in the short-run will be evaluated for each of two periods. Period-I can be taken as the initial conditions for stabilizing the economy. The stabilization policy practice can be examined in the period-II. Basic analitical tools are the explicite impact multipliers derived by the method presented in the last section.

5.3.1 The Rationalization of the State Economic Enterprises

Basic assumption underlining the short-run production function for the manufacturing sector (eq-4.5) is that there is no substitutablity between inputs. So, prices and quantities of these inputs directly determine the performance of the sector. Increasing the price of the mining and the energy producing

Table - 5.1

SELECTED REDUCED FORM COEFFICIENTS OF PYQ AND YQ

	Period-I		Period-II	
	PYQ	YQ	PYQ	YQ
YM	-	1.6503	-	1.7625
Y	-0.0033	3.9581	-0.0006	4.1434
PYM	0.0640	-	0.0640	-
PY	0.0000	0.0220	0.0000	-0.00043
EM	-2.6356	25.5631	-0.2758	24.1644
MIN	-	142.9402	-	285.1821
BC	2.6356	117.3771	0.2758	261.0177
DDCOM	-	-	-	-
DT	0.0194	23.3522	-0.0268	185.3068
DD	-	-	-	-
MS_2	0.0194	23.3522	-0.0268	185.3068
CR	30.8360	-1.2706	-44.9201	17.4759
MB	-30.8166	24.6228	44.8933	167.8309
NDA	-30.6390	32.5340	45.0775	342.1646
NFA	- 0.1776	-7.9112	-0.1842	-174.3337

sector, as an indicator for the price of the intermediaries produced by the SEE's, is used for the evaluation of the effects of the rationalization. The impact multipliers for the price and the output of this sector is given in the table-5.1. The coefficients for the manufacturing sector show that the assumption on the supply of this sector is relevant for both periods. Slight changes of the coefficients of YQ may show that the excess demand for these goods is, at least, reduced with this policy. The sign change for the multiplier of YQ on PY also can be considered as an indicator for this result.

For both period, PYQ has no effect on PY. In the section-3.3 it is shown that financing the public investments through rising PYQ may increase output. From eq-5.9, it is possible to calculate the elasticity of the public investments on Y and PY (4):

Period-I:

$$E_{IG}^{Y} = 0.1102$$

$$E_{IG}^{PY} = 0.1101$$

Period-II:

$$E_{IG}^{Y} = 0.1119$$

$$E_{IG}^{PY} = 0.1121$$

The values for these elasticities are very low. That is, it possible to increase public investment without inflationary pressure. But, output effect is not important in the short-run

Positive coefficients of YQ on MIN for both period stress the fact that imported and domestically produced inputs are complimentary. Positive coefficients of YQ on EM, MIN and BC for both period show that import substituting character of the

Table - 5.2

SELECTED REDUCED FORM COEFFICIENTS OF EXRE AND PMTL

	Period-I		Period-II	
	EXRM	PMTL	EXRM	PMTL
YM	-0.2998	-10.9095	-0.0437	-15.0696
Y	-0.4477	-16.2931	-0.0655	-22.6024
PYM	-	0.0027	-	0.0027
PY	-0.02490	-0.0906	0.0000068	0.00235
EM	10.8230(x)	-214.2086	1.2195(x)	-259.7386
MIN	-226.8464	-582.2110	-242.9371	-1173.1173
BC	-220.9631	-368.0024	-242.1837	-913.3797
DDCOM	-	-	-	-
DT	-2.7037	-96.1271	-2.9293	-1010.8556
DD	-	-	-	-
MS_2	-2.7037	-96.1271	-2.9293	-1010.8556
CR	-13.2414(xx)	-120.5471	-161.9712(xx)	-1620.9019
MB	10.5377(xx)	24.4200	159.0419(xx)	610.0463
NDA	0.1053	-0.3833	0.0000	0.0000
NFA	10.4324(xx)	24.8033	159.0419(xx)	610.0463

x) Impact multiplier of EXRE

xx) Sum of the multipliers of EXRM and EXRE

Table - 5.3

SELECTED REDUCED FORM COEFFICIENTS OF D_1 AND WCD

	Period-I		Period-II	
	D1	WCD	D1	WCD
YM	-	-7.1274	-	-7.4291
Y	-2.1233	-10.4577	-0.2560	-11.1355
PYM	2.0786	-3.6701	2.2553	-0.7819
PY	0.0015	-0.0447	0.0007	0.0012
EM	-1060.3576	11.2781	1128.0000	-124.6715
MIN	-	-7.1274	-	-7.1274
BC	1060.3576	-18.4055	-1128.0000	117.5441
DDCOM	56.0773	64.0250	56.0773	64.0250
DT	616.6118	-61.6615	617.6714	-498.0140
DD	56.0773	64.0250	56.0773	64.0250
MS_2	672.6891	2.3635	673.7487	-433.9890
CR	1532.7572	1.3121	708.9639	-355.4813
MB	-860.0681	1.0514	-35.2152	-78.5077
NDA	-888.1426	-0.1891	-888.1491	-0.0000
NFA	28.0745	1.2405	852.9339	-78.5077
YC	-3.3584	0.3885	-0.4453	0.2968

manufacturing sector does not changed in the period-II. That is, export promotion does not lead to transformation of the manufacturing sector's structure.

5.3.2 Liberalization of the Foreign Trade

Exchange rate as one of the effective policy tool is used for evaluating the liberalization attempts. The multipliers of exchange rate do not alter between two periods. The price index for the imported goods is a linear combination of the exchange rate and the prices abroad. One can follow from table-5.2 that ratios of coefficients of EXRM to PMTL show significant changes. This result indicate that the internal balances become more sensitive to the price abroad in the stabilization period. The trade regime has been converted fully for liberalizing the trade structure. Dummy D1 was used as an indicator of this change in some of the equations of the macroeconometric model. Reduced form coefficients of D1 show sign changes between two period for the foreign trade variables. This indicate that change in trade regime - export promotion, relaxing the restriction - is more effective than the exchange rate adjustments on the performance of the foreign trade (5).

Changes in the overall performance of the trade structure can be seen in the elasticities of trade balance (M-E) and balance of payment (BC):

Period-I: Period-II:

$E^{BC}_{EXRM} = -2.870$ $E^{BC}_{EXRM} = -45.882$

$E^{(M-E)}_{EXRM} = -1.786$ $E^{(M-E)}_{EXRM} = -18.213$

These values show that either trade balance and balance of payment become more elastic in the stabilization period. This is usual result of the IMF type stabilization policies: "Stabilization plans achieve their clearest and quickest success in the balance of payments" (6).

5.3.3 Liberalization of the Financial Sector

Dummy D1 and working capital demand indicator WCD were used for liberalizating the financial sector and tight money policy. Not surprisingly, coefficients of WCD for MS2, MB and CR are negative for the period-II which represent tight money policy. That is reduction in MS2 and MB increase the demand for bank loans for financing the working capital of the firms. As WCD rises, on the other hand, the manufacturing sector output YM and gross national product Y reduce, and price of manufacturing sector output increases (table-5.3) (7). This result indicates that the case depicted in figure-5B represents the Turkish economy in the period-II.

Coefficients of WCD for real sector's variables do not differ between two periods. This shows that monetary policy in 1980's does not give any structural change. That is, structural rigities could not be eliminated. But, squeeze in money stock

worsens the trade and current account balance via rise of the demand for bank loans.

Coefficient of D1 for YC is negative (table-5.3). Remembering that dummy D1 was used for the positive real time deposit rate, negative value for this coefficient verifies the assumption on the substitutability between time deposit and real estate. But, positive coefficient of WCD for YC indicates that this substitution effect is not only source for the connexion between monetary variables and working capital requirement of firms if WCD is specified correctly.

5.3.4 Final Remarks for the Stabilization Programme

Dummy D2 was used for balance of payment difficulties in the macroeconometric model. It may be interesting to compare reduced form coefficients of D2 for two period (table-5.4). Almost all coefficients' absolute values increase in the period-II and are in negative sign. This indicates that the economy becomes more sensitive to external shock in the stabilization period.

In table-5.5A, 5.5B, 5.5C and 5.5D total effects of the stabilization programme are summarized. PYC, EXRM and D1 as the basic tools of the programme are used and (+) denotes increase and (-) decrease. Table-5.5A shows that the output effects of basic policy tools are contractionary. On the other hand, prices rise with stabilization in general, especially in the period-II. Previously noted that the structure of the real side remains unchanged between two periods. So, as long as the structural

Table - 5.4

SELECTED REDUCED FORM COEFFICIENTS OF D2

	Period-I D2	Period-II D2
YM	-2.8181	-2.9212
Y	-4.2087	-4.3881
PYM	-	-
PY	-0.0234	0.0004
EM	-55.3050	-50.3196
MIN	-954.5944	-1614.5446
BC	-899.2894	-1564.2250
DDCOM	-	-
DT	-24.8306	-196.2505
DD	-	-
MS_2	-24.8306	-196.2505
CR	80.7933	-1074.8593
MB	-105.6239	878.6088
NDA	-166.2360	-166.1370
NFA	60.6121	1044.7458

Table - 5.5 A

IMPACTS OF STABILIZATION ON OUTPUT

	Period-I		Period-II	
	YM	Y	YM	Y
PYQ	0	-	0	-
EXRM	-	-	-	-
D1	0	-	0	-

Table - 5.5 B

IMPACTS OF STABILIZATION ON PRICES

	Period-I		Period-II	
	PYM	PY	PYM	PY
PYQ	+	-	+	+
EXRM	0	-	0	+
D1	+	+	+	+

Table - 5.5 C

IMPACTS OF STABILIZATION ON FOREIGN TRADE

	Period-I			Period-II		
	EM	MIN	BC	EM	MIN	BC
PYQ	-	0	+	-	0	+
EXRM	+	-	-	+	-	-
D1	-	0	+	+	0	-

Table - 5.5 D

IMPACT OF STABILIZATION ON FINANCIAL SECTOR

	Period-I			Period-II		
	MS2	MB	CR	MS2	MB	CR
PYQ	+	-	+	-	+	-
EXRM	-	+	-	-	+	-
D1	+	-	+	+	-	+

rigities persist in the short-run, this stabilization programme gives pervers results for the real side of the economy. On the other hand, impacts on the balance of payment are consistent with the targets of the stabilization programme (table-5.5C). Bank credit supply (CR) can be taken as the overall performance of the financial sector from real sector of the economy point of view. While impacts of EXRM and D1 remain unchange, the effect of increase in PYQ on credit supply turns to negative in the stabilization period (table-5.5D).

5.A Appendix: The Linearized Forms of the Non-Linear Equations of the Model

The linearized form of the non-linear equations with the definitions of the linearized coefficients are given as fallows. The values for the linearized coefficients are listed in the table-5.A.

(5.1) $$YC = \alpha_0 + \alpha_1 Y + \alpha_2 DT + \alpha_3 PY + \alpha_4 PY_{-1} + \alpha_5 PYC + \alpha_6 YC_{-1}$$

$$\alpha_0 = 0.0985 - 0.0261\ (DT/PY) + 0.281\ (PY_{-1}/PYC)$$

$$\alpha_1 = 0.0216$$

$$\alpha_2 = -0.0261\ \frac{1}{PY}$$

$$\alpha_3 = 0.0261\ (DT/PY^2)$$

$$\alpha_4 = 0.281\ \frac{1}{PYC}$$

$$\alpha_5 = -0.281\ (PY_{-1}/PYC^2)$$

$$\alpha_6 = 0.6528$$

(5.2) $$YM = \alpha_0 + \alpha_1 MIN + \alpha_2 \underline{EXRM} + \alpha_3 \underline{PMTL} + \alpha_4 \underline{YQ} + \alpha_5 \underline{WCD} + \alpha_6 L$$

$$\alpha_0 = -3.8139 + 0.0781 \left[(MIN \cdot EXRM)/PMTL\right]$$

$$\alpha_1 = 0.0781 \ (EXRM/PMTL)$$

$$\alpha_2 = 0.0781 \ (MIN/PMTL)$$

$$\alpha_3 = -0.0781 \left[(MIN \cdot EXRM)/PMTL^2\right]$$

$$\alpha_4 = 0.957$$

$$\alpha_5 = -4.6688$$

$$\alpha_6 = 0.0129$$

(5.3) $$PYM = \alpha_0 + \alpha_1 \underline{W} + \alpha_2 \underline{WCD} + \alpha_3 \underline{D1} + \alpha_4 \underline{PMTL} + \alpha_5 \underline{PYQ} + \alpha_6 PYM_{-1}$$

$$\alpha_0 = -0.0887 + 2.8882 \ (WCD \cdot D1)$$

$$\alpha_1 = 0.0408$$

$$\alpha_2 = -3.6701 + 2.8882 \ D1$$

$\alpha_3 = 2.8882 \cdot WCD$

$\alpha_4 = 0.0027$

$\alpha_5 = 0.064$

$\alpha_6 = -0.3025$

(5.4) $PYA = \alpha_0 + \alpha_1 YD + \alpha_2 PY + \alpha_3 \underline{YA} + \alpha_4 PYA_{-1} + \alpha_5 PYM$

$\alpha_0 = -3.9222 + 0.0106 (YD/PY)$

$\alpha_1 = 0.0106 \frac{1}{PY}$

$\alpha_2 = -0.0106 (YD/PY^2)$

$\alpha_3 = 0.1129$

$\alpha_4 = -0.2761$

$\alpha_5 = 0.8166$

(5.5) $$PY = \alpha_0 + \alpha_1 PY_{-1} + \alpha_2 YD + \alpha_3 YD_{-1} + \alpha_4 Y + \alpha_5 Y_{-1} + \alpha_6 MS2 + \alpha_7 MS2_{-1}$$

$$\alpha_0 = 2.7627 \frac{1}{PY_{-1}} + 0.5872 \frac{(YD/YD_{-1})}{PY_{-1}} - 2.451 \frac{(Y/Y_{-1})}{PY_{-1}} + 0.2217 \frac{(MS2/MS2_{-1})}{PY_{-1}}$$

$$\alpha_1 = -2.7627 \frac{1}{PY_{-1}^2} - 0.5872 \frac{YD}{(YD_{-1} \cdot PY_{-1}^2)} + 2.451 \frac{Y}{(Y_{-1} \cdot PY_{-1}^2)} - 0.2217 \frac{MS2}{(MS2_{-1} \cdot PY_{-1}^2)}$$

$$\alpha_2 = 0.5872 \frac{1}{(YD_{-1} \cdot PY_{-1})}$$

$$\alpha_3 = -0.5872 \frac{YD}{(YD_{-1}^2 \cdot PY_{-1})}$$

$$\alpha_4 = -2.451 \frac{1}{(Y_{-1} \cdot PY_{-1})}$$

$$\alpha_5 = 2.451 \frac{Y}{(Y_{-1}^2 \cdot PY_{-1})}$$

$$\alpha_6 = 0.2217 \frac{1}{(MS2_{-1} \cdot PY_{-1})}$$

$$\alpha_7 = -0.2217 \frac{MS2}{(MS^2_{-1} \cdot PY_{-1})}$$

(5.6) $$IP = \alpha_0 + \alpha_1 Y_{-1} + \alpha_2 \underline{MI} + \alpha_3 \underline{EXRM} + \alpha_4 \underline{PMTL} + \alpha_5 IP_{-1} + \alpha_6 PY_{-1}$$

$$\alpha_0 = -8.4205 + 0.1858 \left[(MI \cdot EXRM)/PMTL\right]$$

$$\alpha_1 = 0.0821$$

$$\alpha_2 = 0.1858 \ (EXRM/PMTL)$$

$$\alpha_3 = 0.1858 \ (MI/PMTL)$$

$$\alpha_4 = -0.1858 \left[(MI \cdot EXRM)/PMTL\right]$$

$$\alpha_5 = 0.4131$$

$$\alpha_6 = -0.0961$$

(5.7) $$IM = \alpha_0 + \alpha_1 Y_{-1} + \alpha_2 \underline{MI} + \alpha_3 \underline{EXRM} + \alpha_4 \underline{PMTL} + \alpha_5 IM_{-1} + \alpha_6 PY_{-1}$$

$$\alpha_0 = -8.1423 + 0.0904 \left[(MI \cdot EXRM)/PMTL\right]$$

$$\alpha_1 = 0.0904$$

α_2 = 0.0903 (EXRM/PMTL)

α_3 = 0.0903 (MI/PMTL)

α_4 = 0.0903 [(MI·EXRM)/PMTL]

α_5 = 0.1482

α_6 = -0.1501

(5.8) $YD = \alpha_0 + \alpha_1 Y + \alpha_2 PY + \alpha_3 YG$

$\alpha_0 = Y \cdot PY$

$\alpha_1 = PY$

$\alpha_2 = Y$

$\alpha_3 = -1$

(5.9) $FR = \alpha_0 + \alpha_1 CP + \alpha_2 IP + \alpha_3 \underline{PIP} + \alpha_4 \underline{IG} + \alpha_5 \underline{CG} + \alpha_6 \underline{TSC} + \alpha_7 Y + \alpha_8 PY$

$\alpha_0 = (IP \cdot PIP) - (Y \cdot PY)$

$\alpha_1 = 1$

$\angle_2$ = PIP

$\angle_3$ = IP

$\angle_4$ = 1

$\angle_5$ = 1

$\angle_6$ = 1

$\angle_7$ = -PY

$\angle_8$ = -Y.

(5.10) $$EM = \angle_0 + \angle_1 PYM + \angle_2 \underline{EXRE} + \angle_3 PYM_{-1} + \angle_4 EXRE_{-1} + \angle_5 YM + \angle_6 Y + \angle_7 \underline{D1} + \angle_8 EM_{-1}$$

$$\angle_0 = -741.4624 - 988.9226 \left[\frac{PYM}{EXRE} - \frac{PYM_{-1}}{EXRE_{-1}}\right] + 5474.03 \frac{YM}{Y}$$

$$\angle_1 = -988.9226 \frac{1}{EXRE}$$

$$\angle_2 = 988.9226 \frac{PYM}{EXRE^2}$$

$$\angle_3 = 988.9226 \frac{1}{EXRE_{-1}}$$

$$\angle_4 = -988.9226 \frac{PYM_{-1}}{EXRE^2_{-1}}$$

$$\angle_5 = 5474.03 \frac{1}{Y}$$

$$\angle_6 = -5474.03 \frac{YM}{Y^2}$$

$$\angle_7 = 1136.746$$

$$\angle_8 = 0.865$$

(5.11) $$MIN = \angle_0 + \angle_1 \underline{EXRM} + \angle_2 \underline{PMTL} + \angle_3 YM + \angle_4 \underline{YQ} + \angle_5 \underline{YA} + \angle_6 \underline{D2}$$

$$\angle_0 = -56.3594 (EXRM/PMTL) + 1.8514 \frac{(YM + YQ + YA)}{(EXRM/PMTL)} - 22.5618 \frac{D2}{(EXRM/PMTL)}$$

$$\angle_1 = -56.3594 \frac{1}{PMTL} - 1.8514 \frac{(YM + YQ + YA) \cdot PMTL}{EXRM^2} + 22.5618 \frac{(D2 \cdot PMTL)}{EXRM^2}$$

$$\angle_2 = 56.3594 \frac{EXRM}{PMTL^2} + 1.8514 \frac{(YM + YQ + YA)}{EXRM} - 22.5618 (D2/EXRM)$$

$$\angle_3 = 1.8514 (PMTL/EXRM)$$

$$\angle_4 = 1.8514 (PMTL/EXRM)$$

$$\angle_5 = 1.8514\ (PMTL/EXRM)$$

$$\angle_6 = -22.5618\ (PMTL/EXRM)$$

(5.12) $$TD = \angle_0 + \angle_1\ PY + \angle_2\ Y_{-1}$$

$$\angle_0 = -9.4726\ \frac{1}{PY} + 0.1469\ (Y_{-1}/PY)$$

$$\angle_1 = 9.4726\ \frac{1}{PY^2} - 0.1469\ (Y_{-1}/PY^2)$$

$$\angle_2 = 0.1469\ \frac{1}{PY}$$

(5.13) $$NDA = \angle_0 + \angle_1\ \underline{SUB} + \angle_2\ \underline{PYQ} + \angle_3\ PY + \angle_4\ PYQ_{-1} + \angle_5\ PY_{-1}$$
$$+ \angle_6\ \underline{YQ} + \angle_7\ YQ_{-1} + \angle_8\ \underline{D1} + \angle_9\ \underline{D2}$$

$$\angle_0 = 405.1909 - 415.0582\ (PYQ/PY)/(PYQ_{-1}/PY_{-1})$$
$$+ 6.230907\ ((YQ \cdot PYQ)-(YQ_{-1} \cdot PYQ_{-1}))$$

$$\angle_1 = 5.540952$$

$$\angle_2 = -415.0582\ PY_{-1}/(PY \cdot PYQ_{-1}) + 6.230907\ YQ$$

$$\angle_3 = 415.0582\ \frac{PYQ \cdot PY_{-1}}{(PY)^2 PYQ_{-1}}$$

$$\angle_4 = 415.0582 \frac{PYQ \cdot PY_{-1}}{PY\ (PYQ_{-1})^2} - 6.230907\ YQ_{-1}$$

$$\angle_5 = -\ 415.0582\ PYQ/(PY \cdot PYQ_{-1})$$

$$\angle_6 = 6.230907\ PYQ$$

$$\angle_7 = -\ 6.230907\ PYQ_{-1}$$

$$\angle_8 = -\ 888.1491$$

$$\angle_9 = -\ 166.137$$

(5.14) $$NFA = \angle_0 + \angle_1\ BC + \angle_2\ \underline{EXRM} + \angle_3\ \underline{D1}$$

$$\angle_0 = 30.47812 - 0.002599734\ (BC \cdot EXRM)$$

$$\angle_1 = -\ 0.002599734\ EXRM$$

$$\angle_2 = -\ 0.002599734\ BC$$

$$\angle_3 = 99.54271$$

(5.15) $$DT = \alpha_0 + \alpha_1 PY + \alpha_2 Y + \alpha_3 \underline{D1}$$

$$\alpha_0 = 76.82616 + 0.8398361 (Y \cdot PY)$$

$$\alpha_1 = - 171.0316 + 0.8398361 Y$$

$$\alpha_2 = 0.8398361 PY$$

$$\alpha_3 = 314.5510$$

Table - 5.A

VALUES FOR COEFFICIENTS OF LINEARIZED EQUATIONS

	Period-I	Period-II
Equation (5.1):		
α_0	0.1365	-0.4625
α_1	0.0216	0.0216
α_2	-0.0043	-0.0005
α_3	0.0328	0.3681
α_4	0.0557	0.0080
α_5	-0.0488	-0.0087
α_6	0.6528	0.6528
Equation (5.2):		
α_0	3.3466	5.6577
α_1	0.0023	0.0014
α_2	0.2882	0.0386
α_3	-7.3546	-9.4716
α_4	0.9570	0.9570
α_5	-4.6688	-4.6688
α_6	0.0129	0.0129
Equation (5.3):		
α_0	-0.0887	2.1667
α_1	0.0408	0.0408
α_2	-3.6701	-0.7819
α_3	2.0786	2.2553

Table - 5.A (Contd.)

$\angle_4$	0.0027	0.0027
$\angle_5$	0.0640	0.0640
$\angle_6$	-0.3025	-0.3025
Equation (5.4):		
$\angle_0$	-2.2220	-1.8987
$\angle_1$	0.0017	0.0002
$\angle_2$	-1.7002	-2.0235
$\angle_3$	0.1129	0.1129
$\angle_4$	-0.2761	-0.2761
$\angle_5$	0.8166	0.8166
Equation (5.5):		
$\angle_0$	0.3210	0.0354
$\angle_1$	-0.0754	-0.0082
$\angle_2$	0.0020	0.000002
$\angle_3$	-0.0003	-0.000003
$\angle_4$	-0.0028	-0.0003
$\angle_5$	0.0029	0.0003
$\angle_6$	0.0002	0.000002
$\angle_7$	-0.0003	-0.000004
Equation (5.6):		
$\angle_0$	1.4081	-0.4109
$\angle_1$	0.0821	0.0821
$\angle_2$	0.0053	0.0032

Table - 5.A (Contd.)

$\angle_3$	0.4384	0.0326
$\angle_4$	-9.8286	-7.9511
$\angle_5$	0.4131	0.4131
$\angle_6$	-0.0961	-0.0961
Equation (5.7):		
$\angle_0$	-3.3662	-4.2785
$\angle_1$	0.0904	0.0904
$\angle_2$	0.0026	0.0016
$\angle_3$	0.2108	0.0159
$\angle_4$	-4.7761	-3.8637
$\angle_5$	0.1482	0.1482
$\angle_6$	-0.1501	-0.1501
Equation (5.8):		
$\angle_0$	1454.5187	12559.5529
$\angle_1$	7.0066	53.2557
$\angle_2$	206.9610	233.7130
$\angle_3$	-1.0000	-1.0000
Equation (5.9):		
$\angle_0$	-1301.0107	-11619.9189
$\angle_1$	1.0000	1.0000
$\angle_2$	5.0254	39.3270
$\angle_3$	31.4197	23.6487
$\angle_4$	1.0000	1.0000

Table - 5.A (Contd.)

λ_5	1.0000	1.0000
λ_6	1.0000	1.0000
λ_7	-7.0066	-53.2557
λ_8	-206.9610	-233.7130
Equation (5.10):		
λ_0	148.4781	253.3956
λ_1	-41.9049	-4.3759
λ_2	10.8230	1.2195
λ_3	53.0564	6.3954
λ_4	11.2664	1.9488
λ_5	26.4488	23.4476
λ_6	-4.5692	-4.1420
λ_7	1136.7460	1136.7460
λ_8	0.8650	0.8650
Equation (5.11):		
λ_0	5194.6522	10555.3114
λ_1	-210.6775	-47.1670
λ_2	6.1776	0.7843
λ_3	53.9336	107.6037
λ_4	53.9336	107.6037
λ_5	53.9336	107.6037
λ_6	-802.6041	-1311.3066

Table - 5.A (Contd.)

Equation (5.12):		
λ_0	3.2691	0.4619
λ_1	-0.5908	-0.0097
λ_2	0.0240	0.0029
Equation (5.13):		
λ_0	260.5995	3615.8489
λ_1	5.5410	5.5410
λ_2	-30.6390	45.0775
λ_3	4.2314	0.0069
λ_4	-40.5487	-51.3803
λ_5	-91.2071	-11.5557
λ_6	32.4410	342.1646
λ_7	-22.9451	-287.2382
λ_8	-888.1491	-888.1491
λ_9	-166.1370	-166.1370
Equation (5.14):		
λ_0	-88.8990	-911.3226
λ_1	-0.0674	-0.6679
λ_2	-5.1899	-3.5270
λ_3	99.5427	99.5427
Equation (5.15):		
λ_0	1298.2649	10624.7921

Table - 5.A (Contd.)

Δ_1	2.7820	25.2490
Δ_2	5.8844	44.7260
Δ_3	314.5510	314.5510

CHAPTER 6: CONCLUSIONS

The technique for computing the reduced form coefficients (impact multipliers) presented in the chapter-5 enables us to divide the estimation period into sub-periods and to compare these sub-periods. In the study, this technique is applied to the sub-periods 1977-1979 and 1981-1984. Each set of coefficients describes a particular economic condition of these sub-periods. The macro econometric model which is employed for the structural analysis in this sence is constructed on the basis of the theoretical framework developed in the chapter-3.

Simple macro models presented in the chapter-3 include some of the stylized characteristics of the turkish economy. Three-sector model consists of agricultural, industrial and public sectors focuses on the food price, food exports and public deficits. It is shown that the policies which yeald increases in the agricultural good prices reduce the domestic demand for the manufacturing goods via income effect. Public deficits as an inflationary pressure in the financial markets can be reduced without squeezing the manufacturing output. In the chapter-3, another model is employed to analyze the interaction between the financial and the real sectors of the economy. The concept developed for the working capital requirements of the firms is the center of the analysis. This model shows that high time

deposit rate policy may be contractionary by rising the firms' demands for the bank loans for financing their working capital requirements.

The theoretical specifications of these models underlie the macroeconometric model estimated for the turkish economy. Considering the statistical results of the estimation, one can conclude that the description of the economy presented in the chapter-3 is an applicable framework for the turkish economy. The macroeconometric model is employed for the structural analyses of the turkish economy. The evaluation on the basis of the reduced forms of the model for the recession period (1977 -1979) and the stabilization period (1981-1984) shows there is no difference between two periods in terms of short-term rigidities except the progress in the foreign trade. Flexible adjustment mechanisms for the trade balance and the balance of payments of the turkish economy exist in the years 1981-1984. But, the tools used for reducing the inflationary pressures and balance of payment difficulties do not transform the import substituting industry into the outward orientated production structure.

NOTES

CHAPTER 1:

1) Among others, see particularly Diaz-Alejandro:1981, Foxley:1982 and 1981, Taylor:1984.

CHAPTER 2:

1) For initial conditions of "etatism", see Tekeli and İlkin: 1982, pp.5-77.

2) First and second industrialization plans are in the form of feasibility reports. For evaluation of these plans see Tekeli and İlkin:1982, pp.184-201. Second industrialization plan did not implemented due to II. World War (Günçe:1981)

3) Akad:1983, pp.7-40.

4) Import substitutihg industrialization strategy is criticized last years from various aspects. Akad:1980 argued that as a result of this strategy Turkey becomes one of the typical country with her closed foreign trade structure. Çiller:1981 estimates that the protectionist trade policy is not effective tool for import substituting industrialization and growth of Turkey. Chenery:1980 also argues that effectiveness of the import substitution as a source for industrial growth uniformly reduces as GNP increase in Turkey.

5) Diaz-Alejandro:1981, p.123. This passage is used for defining the basic tools of the Turkish stabilization programme in order to stress the uniformness of the IMF type stabilization package recommended for the countries faced with similar difficulties.

CHAPTER 3:

1) Among other particular examples of the studies on the external disequilibrium in this sence are given by Lusting:1982, Kirkpatrick and Önis:1985 and Diaz-Alejandro:1981.

2) Any attempts to transform the industrialization strategy from import substitution to export promotion within very short period of time has high cost due to this structural rigidities. Structuralists recommend gradual process for stabilizing economy as a result of these structural rigidities. Structuralist policies are discussed in Foxley:1981 and Taylor:1983 chapter 10 and 11. Import substituting modern sector and traditional sector dichotomy is one of the point of interest for the structural studies. A variant of this kind of sectoral distinction is between traded and home-good production sectors where both are highly dependant on intermediate imports not produced within country. Krugman and Taylor:1978, Cooper:1971, Hanson:1983 and 1985 discuss interactions between external and internal balances with special emphasis to this dichotomy.

3) Studies which take cost and availability of working capital as a central linkage between financial and real sides of the economy are Bruno:1979, Van Wijnbergen:1983a, 1983b and 1982. Their framework with some alteration is discussed in the section-3.4.

4) Bruno:1979, p.270.

5) It is widely accepted that excess supply of labor is one of the characteristics of the LDC's. Most of the industrial activities require skilled labor where production may be constrainted when this kind of labor scarce. For the sake of simplicity, it is assumed that the amount of skilled labor is not less than the existing physical capital requirement.

6) For further discussions on the fixed production coefficients in this sence, see Johansen:1974 pp.26-27, and 1959. On the other hand, efficient technology currently available for most of the industrial activities is of one kind which limits the substitutability even at the planning stage (Sutcliffe:1971 pp. 146-59).

7) Defining the agricultural sector in this kind is largely based on Taylor's presentation for food sector (Taylor:1983 pp.38-48).

8) Lucid presentation for the bureaucratic elites/economic nationalism and its distributive and allocative role in Turkey is given by Akad:1983 pp.7-40.

9) This assumption reflects the facts that Q-sector productions are either non-traded goods or require high transportation costs which reduce substitutability with imported similars.

10) Note that excess demand for the Q-sector (eq-3.9) can be rewritten as:

$$ED_q = \left[(1 - z/(1 + z) - wa - eP^X_{in}b\right] YM - PQ \cdot YC = 0$$

As previously assumed, administrated price for the Q-sector is also market price, YM clears the Q-sector market also. So, equilibrium in the A and M sectors guarantee the equilibrium in the Q-sector.

11) One can get that necessary condition for $\underline{AA}$ to be positive is:

$$v/(1 - v) > -\left[s_m z/(1 + z) + eP^X_{in}b/PM\right]$$

This condition is satisfied for all economically meaningfull values of the parameters.

12) Emprical studies show that the share of the cost of financing working capital is very high for LDC's comparing to the developed ones. See, for example, for Latin American countries, Taylor:1981, for South Korea Van Wijnbergen:1982. Akyüz:1984 show that dept-equity ratio is highest for the private firms comparing to the other units in the Turkish economy.

13) Proceeding IS curve analysis is a simplified and revised presentation of Taylor's study (Taylor:1981).

14) Public regulations in the money market and distortions are main characteristics of the financial sector structure presented here. For a regulated financial market where efficiently usable tools for effecting the macro equilibrium are official bank rate and reserve requirement ratio, working on the (P,Y) plane is more convenient than on the (i,Y) plane.

15) Emprical support is given by Galbis:1979.

CHAPTER 4:

1) The use of econometric models can be classified as descriptive, predictive and prescriptive. These correspon to structural analysis, forecasting and policy evaluation (Intrigilator:1978 p.490).

2) Sims:1982 and comments by Sachs are good example for various implications of the model construction in the context of the quantifying rational expectation approach. Data realibility and model construction are discussed by Watanabe:1975.

3) Insufficiency of demand determined models for less developed countries is discussed by Klein:1965.

4) The purpose of prefering the 2SLS over ordinary least squares (OLS) is to gain consistency. OLS estimation gives more pessimistic result which is preferable for prediction (Kennedy:1979 p.113). However, if R^2 values are very close to unity, which is the case for this model, 2SLS estimates are negligibly different from OLS (Intriligator:1978 p.392). Comparing with the OLS estimates of the model it is seen that bigger values for the coefficients estimated by OLS are reduced by 2SLS and smaller ones increase. Similar results are obtained for the values of t statistics. As a result of this, 2SLS estimation technique prefered for structural analysis in order to avoid over and underestimation. Formal discussions on the estimation techniques for the simultaneous equation system are given by Intriligator:1978 chap.11 and Kmenta:1971 chap.13.

5) For the sake of the degree of freedom limited number of exogenous variables are used. So, only PMTL, EXRM and EXRE are used for transformations in order to maintaine the required qualities for the data.

6) The effects of the wage determination process on the macro balance of the economy in the short-run are widely discussed in the literature. These studies stress the effects of the labor market equilibrium not only on the cost side, but also on the income distribution and the total demand for evaluating the success of the short-term policies. See, particularly, deMelo and Robinson:1980, Lal:1979, and Lopes and Bacha:1983.

7) Since the difference between initial and final values for the nominal variables are too big, linear form for regression does not give good fit (see appendix-4). But, in order to avoid complexity in deriving procedure of the multipliers, exponencial or logaritmic forms are not used. This does not create any problem as long as the model do not used for prediction or

policy simulation.

8) Since this derivation is based on broad definition of the banking system Central Bank deposit (DCB) is not included for simplicity. Therefore, CR simply states the loans generating performance of the banking system.

9) D-W statistics reported here is not good indicator for the serial correlation if dependent variable appears at righ side of the equation with lag. For alternative techniques for this case see Intriligator:1978, pp.163-165.

CHAPTER 5:

1) For non-linearity problem see, Wallis:1973 chap.4.

2) For the proof of the linear transformation see, Apostol:1969 p.258, and for simple step by step presentation, Friedman:1975 pp.37-39. For full process of linearization and multiplier derivation see, Friedman:1975 chap.3, 4 and 5.

3) Reduced forms for the period-I and period-II are given in appendix-3. Linearization also gives opportunity to derive interim and total multipliers. Since short-run changes are concerned here, it is not intented to derive these multipliers.

4) Elasticities given in this section are calculated as:

$$E_y^x = \frac{\partial x}{\partial y} \frac{\bar{x}}{\bar{y}}$$

where $\bar{y}$ and $\bar{x}$ are mean values for y and x for each subperiods

5) Similar result is obtained by Ersel and Temel:1984. But, on the other hand, this result is partly compatible with Dervis et. al. which proposes flexible exchange rate regime for the balance of payment difficulties of Turkey (Dervis, deMelo and Robinson: 1982 pp.350-58).

6) Diaz-Alejandro:1981 p.124.

7) In contrast with this result, in order to eliminate the inflationary pressure in the economy Fry proposes stabilization policy consists of money supply reduction and deposit rate increase (Fry:1978).

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APPENDIX - 1

DATA

NOTES:

1) The following sources are use for data:

State Planning Organisation: Annual Program

Data for sectoral and total outputs, prices, expenditures series

State Institute of Statistics: Statistical Yearbook of Turkey

Data for foreign trade, wages, labor

The Central Bank of the Republic of Turkey: Quarterly Bulletin

Data for financial sector

The Central Bank of the Republic of Turkey: Annual Report

Date for public revenues

2) The units for the series are as follows:

- Series for foreign trade are million $
- Series for prices are indexed as 1968 = 1.00
- Wages are daily TL
- Labor is 1000 persons
- Series for sectoral and total outputs, expenditures, public revenues and financial sector are billion TL

3) List of variable names is given in pages 79-81

ENDOGENOUS VARIABLES :

		YC	YS	YM	Y
63-	1	4.89100	30.1560	9.98600	84.1880
64-	1	5.43600	31.6270	10.8090	87.6190
65-	1	5.62900	33.2260	11.8330	90.3680
66-	1	6.40900	36.8860	13.6360	101.204
67-	1	6.59200	38.8700	15.0290	105.461
68-	1	7.32100	42.3970	17.2860	112.493
69-	1	7.52800	45.4420	18.9740	118.595
70-	1	8.15500	49.4120	19.3920	125.425
71-	1	7.78400	53.6500	21.0220	138.185
72-	1	8.34800	58.1520	23.2920	148.477
73-	1	8.95600	63.4890	26.1120	156.458
74-	1	9.50400	68.9160	27.9120	168.013
75-	1	10.3100	74.3380	30.1650	181.383
76-	1	11.1640	81.0690	33.1150	195.751
77-	1	11.7830	85.6080	35.5470	203.358
78-	1	12.2710	89.0750	36.8180	209.183
79-	1	12.7860	88.7770	34.8810	208.343
80-	1	12.8850	88.5090	32.9910	206.121
81-	1	12.9390	94.1230	35.8530	214.672
82-	1	13.0000	97.5530	37.6690	224.543
83-	1	13.0790	101.849	41.2310	231.793
84-	1	13.1190	107.756	45.3010	244.803

		L	PYM	PYA	PYS
63-	1	710.800	.845984	.830763	.799058
64-	1	765.300	.855593	.832866	.830344
65-	1	921.500	.910826	.851287	.862559
66-	1	991.500	.957649	.929630	.911750
67-	1	1069.40	.984151	.971874	.958871
68-	1	1206.20	1.00002	.999997	1.00000
69-	1	1261.90	1.01137	1.06220	1.03522
70-	1	1313.50	1.10250	1.19899	1.17789
71-	1	1404.80	1.34371	1.36976	1.39950
72-	1	1525.00	1.48920	1.64268	1.62166
73-	1	1649.10	1.76775	2.25714	1.95864
74-	1	1800.00	2.36707	2.95039	2.44823
75-	1	1823.30	2.64696	3.43072	2.88032
76-	1	2017.90	2.95711	4.15026	3.40802
77-	1	2191.30	3.64889	5.21036	4.39495
78-	1	2206.10	6.30319	6.95836	6.19005
79-	1	2152.40	11.9462	10.4630	10.8788
80-	1	2204.80	26.3964	20.4348	21.6441
81-	1	2228.40	36.6731	29.2607	30.5111
82-	1	2264.80	48.1237	34.8307	39.7712
83-	1	2327.20	62.9376	42.8034	50.8904
84-	1	2439.00	89.2058	66.0190	72.2971

		PVC	PV	DP	IP
63-	1	.641627	.793479	51.0000	6.49800
64-	1	.684952	.813897	52.1000	5.97200
65-	1	.736170	.849043	55.4000	6.41700
66-	1	.786519	.903314	65.1000	7.65900
67-	1	.933192	.962261	71.8000	8.13500
68-	1	.999986	1.00000	79.0000	9.10000
69-	1	1.08027	1.05311	86.9000	10.3340
70-	1	1.16090	1.17820	102.800	11.2370
71-	1	1.28936	1.39380	133.400	11.3430
72-	1	1.47229	1.62186	164.400	21.2820
73-	1	1.65063	1.98027	210.000	24.0300
74-	1	1.98114	2.54205	301.500	24.4210
75-	1	2.38803	2.95361	378.500	28.3070
76-	1	2.77921	3.44819	460.000	34.5400
77-	1	3.57260	4.29240	599.200	34.0350
78-	1	5.21490	6.17029	913.200	31.9730
79-	1	8.12076	10.5572	1550.00	28.2510
80-	1	16.5335	21.5172	3187.30	23.3720
81-	1	22.0584	30.5284	4675.50	21.3440
82-	1	27.4664	38.9015	6208.80	22.5070
83-	1	34.2220	49.5494	8428.10	23.5830
84-	1	50.6618	71.3161	12987.8	24.8560

		IM	IR	YD	FR
63-	1	3.11474	3.38326	55.0714	2.90000
64-	1	2.54892	3.42308	58.5928	1.00000
65-	1	2.37372	4.04328	63.5363	.700000
66-	1	3.03115	4.62785	75.5590	1.40000
67-	1	3.79601	4.33899	81.5910	1.00000
68-	1	4.67711	4.42289	92.3630	2.00000
69-	1	5.64650	4.68750	101.933	1.90000
70-	1	6.06653	5.17047	115.256	2.00000
71-	1	6.10622	5.23678	152.772	1.60000
72-	1	11.3012	9.98075	193.859	.100000
73-	1	11.3635	12.6665	251.279	-6.60000
74-	1	12.2226	12.1984	357.178	9.90000
75-	1	16.5740	11.7330	430.371	29.9000
76-	1	18.1010	16.4390	534.236	36.5000
77-	1	18.6150	15.4200	689.134	60.4000
78-	1	16.2353	15.7377	986.850	34.1000
79-	1	14.3757	13.8753	1684.07	46.5000
80-	1	14.0499	9.32215	3509.91	244.100
81-	1	13.0962	8.24778	5140.70	230.600
82-	1	11.9542	10.5528	7283.75	187.700
83-	1	11.8235	11.7595	9180.20	475.600
84-	1	11.3742	13.4818	14175.6	611.400

		EM	MIN	E	M
63-	1	73.3000	336.000	368.100	687.600
64-	1	84.3000	266.000	410.600	537.200
65-	1	91.0000	306.000	463.700	572.000
66-	1	88.3000	341.000	490.500	718.300
67-	1	81.2000	328.000	522.300	684.700
68-	1	63.8000	361.000	496.400	763.700
69-	1	97.0000	396.000	536.800	747.300
70-	1	100.500	455.000	588.500	885.800
71-	1	136.400	601.000	676.600	1088.20
72-	1	227.300	707.000	885.000	1508.00
73-	1	428.700	944.000	1317.10	2036.70
74-	1	592.000	2274.00	1532.20	3719.70
75-	1	502.900	2574.00	1401.10	4738.60
76-	1	595.800	2733.00	1960.20	5128.60
77-	1	585.800	3363.00	1753.00	5796.30
78-	1	621.300	2876.00	2288.20	4599.00
79-	1	785.100	3377.00	2261.20	5311.40
80-	1	1047.40	5916.00	2910.10	7667.40
81-	1	2290.10	6547.00	4702.90	8933.40
82-	1	3429.40	6338.00	5746.00	8842.70
83-	1	3658.30	6675.00	5727.80	9235.00
84-	1	5144.60	7624.00	7133.60	10756.9

		BC	TI	TD	YB
63-	1	327.000	5.68000	2.75000	11.7300
64-	1	109.000	6.25000	3.04000	12.7200
65-	1	76.0000	6.89000	3.41000	13.1900
66-	1	158.000	8.27000	4.20000	15.8600
67-	1	114.000	9.81000	5.07000	19.8900
68-	1	222.000	10.5400	5.70000	20.1300
69-	1	214.000	12.3400	6.78000	22.9600
70-	1	171.000	14.3700	8.64000	32.5200
71-	1	109.000	19.6300	11.7900	39.8300
72-	1	8.00000	23.9400	15.0800	46.9500
73-	1	-484.000	29.9200	22.0400	58.5500
74-	1	719.000	35.0300	30.1300	69.9200
75-	1	1880.00	50.6200	44.3900	105.400
76-	1	2301.00	66.7100	60.3500	140.750
77-	1	3385.00	78.7800	89.4700	183.760
78-	1	1418.00	104.800	141.620	303.870
79-	1	1186.00	169.620	235.870	515.450
80-	1	3210.00	279.080	470.770	925.240
81-	1	2084.00	422.530	767.670	1412.90
82-	1	835.000	479.000	826.000	1451.30
83-	1	1828.00	785.000	1149.00	2305.00
84-	1	1407.00	988.000	1381.00	3282.80

		GD	NDA	NFA	DDCOM
63-	1	.840400	7.37300	.337000	1.80500
64-	1	1.35930	8.07000	.470000	2.20700
65-	1	2.57280	9.43000	.760000	2.55500
66-	1	3.25400	11.3200	.400000	3.18100
67-	1	1.53970	13.5300	.550000	3.56200
68-	1	4.97310	15.9500	.640000	4.92600
69-	1	4.79290	17.1800	1.11000	6.01400
70-	1	1.13750	22.0600	1.25000	6.56100
71-	1	2.97810	23.6400	6.67000	8.67300
72-	1	2.77840	33.5500	6.82000	11.8380
73-	1	5.26100	35.3600	13.2900	15.9980
74-	1	14.2520	56.7300	3.86000	22.6090
75-	1	14.8008	97.2600	-16.3400	32.0770
76-	1	25.3925	150.290	-47.7300	44.9310
77-	1	52.9510	216.760	-65.1800	62.9530
78-	1	22.5410	304.220	-88.1300	86.0330
79-	1	38.7410	460.530	-136.910	154.480
80-	1	135.853	846.970	-368.470	286.019
81-	1	164.842	1142.15	-327.300	458.468
82-	1	589.884	1510.87	-321.720	651.235
83-	1	327.352	2179.94	-609.750	806.060
84-	1	422.709	4379.62	-1660.70	1042.64

		DT	DD	MS2	CR
63-	1	1.57000	7.04700	13.7400	6.03000
64-	1	1.80000	8.14100	15.8000	7.26000
65-	1	2.65000	10.0830	19.0800	8.89000
66-	1	2.66000	12.5910	22.4400	10.7200
67-	1	4.42000	13.9520	27.1000	13.0200
68-	1	5.43000	17.7260	31.4000	14.8100
69-	1	6.44000	21.0320	36.5700	18.2800
70-	1	8.89000	23.3440	44.1500	20.8400
71-	1	13.0200	29.5500	56.6400	26.3300
72-	1	18.0100	36.7030	70.9000	30.5300
73-	1	20.5400	48.9360	90.3400	41.6900
74-	1	24.5800	62.2630	113.280	52.6900
75-	1	29.0000	84.3260	146.640	65.7200
76-	1	30.7800	107.640	181.160	78.6000
77-	1	34.4000	145.352	243.520	91.9400
78-	1	44.4100	189.301	328.010	111.920
79-	1	83.3100	298.161	527.800	204.180
80-	1	177.940	483.451	881.950	403.450
81-	1	665.150	686.939	1637.19	822.340
82-	1	1212.23	926.705	2554.14	1364.99
83-	1	1347.47	1373.96	3288.45	1718.26
84-	1	2926.33	1485.36	5179.00	2460.08

		MB
63-	1	7.71000
64-	1	8.54000
65-	1	10.1900
66-	1	11.7200
67-	1	14.0800
68-	1	16.5900
69-	1	18.2900
70-	1	23.3100
71-	1	30.3100
72-	1	40.3700
73-	1	48.6500
74-	1	60.5900
75-	1	80.9200
76-	1	102.560
77-	1	151.580
78-	1	216.090
79-	1	323.620
80-	1	478.500
81-	1	814.850
82-	1	1189.15
83-	1	1570.19
84-	1	2718.92

EXOGENOUS VARIABLES :

		PYG	PIP	YG	YA
63-	1	.710102	.754078	1.86100	28.8270
64-	1	.753588	.820496	2.32700	28.6980
65-	1	.740991	.841515	2.54200	27.5510
66-	1	.743431	.900901	2.91500	30.5060
67-	1	.936100	.971112	2.83100	30.5060
68-	1	1.00000	1.00000	2.95500	30.9430
69-	1	1.03547	1.04509	3.39400	31.2880
70-	1	1.12347	1.14799	3.27700	32.0170
71-	1	1.37138	1.41056	3.62700	36.2290
72-	1	1.56725	1.26398	3.82600	36.0650
73-	1	1.76703	1.42322	4.08200	32.4100
74-	1	2.22791	1.68298	4.77600	35.7620
75-	1	2.69451	1.91119	5.45000	39.6750
76-	1	2.81863	2.28720	6.05000	42.7320
77-	1	3.72419	3.02630	7.59900	42.1800
78-	1	4.50457	4.48191	9.17300	43.3020
79-	1	7.38973	7.56787	8.54700	44.5180
80-	1	19.7404	16.2031	7.89600	45.2680
81-	1	32.3236	22.2311	8.12800	45.2980
82-	1	45.3789	28.4978	8.34500	48.2020
83-	1	60.5943	36.6790	8.26900	48.0810
84-	1	88.5286	52.8042	8.62300	50.0300

		IG	CG	TSC	W
63-	1	4.80000	7.40000	1.70000	17.9100
64-	1	5.40000	8.30000	1.60000	19.5000
65-	1	6.10000	9.30000	1.20000	21.6400
66-	1	7.90000	10.5000	2.50000	23.2800
67-	1	9.00000	12.0000	1.90000	28.8400
68-	1	11.2000	13.1000	2.20000	28.2200
69-	1	12.8000	14.8000	1.60000	32.1300
70-	1	14.4000	17.7000	1.90000	35.3200
71-	1	16.2000	24.9000	3.70000	39.3200
72-	1	20.0000	28.0000	1.60000	43.8800
73-	1	25.1000	36.8000	-3.10000	54.4100
74-	1	35.0000	47.0000	12.4000	68.2600
75-	1	53.8000	63.9000	12.4000	85.5500
76-	1	74.7000	86.4000	13.2000	115.300
77-	1	107.800	116.300	7.00000	146.530
78-	1	136.300	172.600	-40.6000	207.930
79-	1	235.500	294.000	-47.3000	294.310
80-	1	484.900	544.100	84.3000	426.960
81-	1	766.900	700.100	167.200	543.840
82-	1	1005.50	939.400	127.700	691.030
83-	1	1314.40	1157.00	196.300	944.370
84-	1	1877.90	1569.00	322.600	1307.00

		CS	DCB	DDPR	MI
63-	1	4.93000	.193000	5.24200	315.000
64-	1	5.84000	.190000E-01	5.93400	245.000
65-	1	6.33000	.170000E-01	7.52800	241.000
66-	1	7.16000	.290000E-01	9.41000	341.000
67-	1	8.71000	.180000E-01	10.3900	323.000
68-	1	8.24000	.400000E-02	12.8000	367.000
69-	1	9.08000	.180000E-01	15.0180	351.000
70-	1	11.8500	.660000E-01	16.7830	446.000
71-	1	13.9200	.150000	20.8770	511.000
72-	1	15.9800	.207000	24.8650	783.000
73-	1	20.7000	.164000	32.9380	1003.00
74-	1	26.1500	.287000	39.6540	1289.00
75-	1	32.9100	.404000	52.2490	1961.00
76-	1	42.4700	.270000	62.7090	2239.00
77-	1	62.9600	.808000	82.3990	2255.00
78-	1	93.8300	.469000	103.268	1590.00
79-	1	143.680	2.64900	143.681	1596.00
80-	1	217.510	3.04900	197.432	1581.00
81-	1	280.640	4.46100	228.471	2207.00
82-	1	411.870	3.33500	275.470	2324.00
83-	1	547.540	19.4800	567.900	2317.00
84-	1	735.520	31.7900	442.720	2659.00

		MC	EA	EQ	EXRM
63-	1	36.6000	284.200	10.6000	9.04596
64-	1	26.2000	311.500	15.0000	9.08414
65-	1	25.0000	352.000	20.7000	9.07343
66-	1	36.3000	379.100	23.1000	9.07699
67-	1	33.7000	420.400	20.7000	9.08427
68-	1	35.7000	406.600	26.0000	9.07424
69-	1	.300000	405.000	34.8000	9.08604
70-	1	-15.2000	442.600	45.4000	10.8377
71-	1	-23.8000	491.300	48.9000	15.1351
72-	1	18.0000	607.400	50.3000	14.2971
73-	1	89.7000	832.000	56.4000	14.2780
74-	1	156.700	851.900	88.3000	14.0630
75-	1	203.600	792.600	105.600	14.5592
76-	1	156.600	1254.40	110.000	16.1721
77-	1	178.300	1041.40	125.800	18.0943
78-	1	133.000	1542.80	124.100	24.6336
79-	1	338.400	1343.60	132.500	35.0567
80-	1	170.400	1671.70	191.000	77.4682
81-	1	179.400	2219.40	193.400	112.204
82-	1	180.700	2141.20	175.400	165.270
83-	1	243.000	1880.60	188.900	230.328
84-	1	473.900	1749.20	239.800	375.099

		EXRE	PWTL	BINV	RG
63-	1	8.99212	99.2000	7.50000	3.30000
64-	1	9.00682	94.0000	-17.4000	3.43000
65-	1	8.99288	101.200	-32.3000	2.89000
66-	1	8.99083	105.800	-69.8000	3.39000
67-	1	8.99866	106.900	-48.4000	5.01000
68-	1	9.00483	100.000	-45.3000	3.89000
69-	1	8.99776	101.400	3.50000	3.84000
70-	1	10.8921	122.800	-126.300	9.51000
71-	1	13.4348	182.200	-302.600	8.41000
72-	1	13.4237	177.200	-615.000	7.93000
73-	1	13.6968	214.800	-1203.60	6.59000
74-	1	13.8363	350.800	-1468.50	4.76000
75-	1	14.3316	405.200	-1457.50	10.3900
76-	1	15.7025	431.800	-867.400	13.6900
77-	1	17.8779	547.200	-658.300	15.5100
78-	1	24.1937	848.700	-892.800	57.4500
79-	1	33.4955	1473.30	-1864.20	109.960
80-	1	76.1142	5204.00	-1547.30	175.390
81-	1	112.850	7625.50	-2146.50	222.700
82-	1	163.124	11124.1	-2261.70	146.300
83-	1	226.780	13179.0	-1679.20	371.000
84-	1	365.640	18693.0	-2216.30	913.800

		SUB	WCD	DIF
63-	1	.370400	.688218E-01	8.46700
64-	1	.379300	.866838E-01	8.72200
65-	1	.362800	.726293E-03	9.58700
66-	1	.714000	-.206625E-01	10.8520
67-	1	.429700	-.601421E-01	11.6330
68-	1	.803100	-.585392E-07	11.5910
69-	1	.152900	-.163587E-01	11.9690
70-	1	1.55750	.616479E-01	13.1720
71-	1	1.70810	.906740E-01	15.8730
72-	1	1.72840	.241373	18.7940
73-	1	1.91100	.201161	21.4090
74-	1	2.17200	.301233	21.1430
75-	1	2.50080	.404435	21.4450
76-	1	5.04250	.628847	21.6210
77-	1	12.6110	.745946	20.6410
78-	1	17.5110	.644691	18.5440
79-	1	24.6910	.768410	18.8340
80-	1	32.0930	.804109	18.5720
81-	1	110.742	.892117	18.3310
82-	1	96.2840	.981300	19.7740
83-	1	160.952	.667273	39.2840
84-	1	258.609	.694023	19.9740

APPENDIX - 2

ESTIMATION PROCEDURES

MACRO MODEL FOR TURKISH ECONOMY

ENDOGENOUS VARIABLES	: 33
EXOGENOUS VARIABLES	: 25
LAGGED ENDOGENOUS VARIABLES	: 14
LAGGED EXOGENOUS VARIABLES	: 3

2SLS ESTIMATION RESULTS

ENDOGENOUS VARIABLES :

YC
YS
YM
Y
L
PYM
PYA
PYS
PYC
PY
CP
IP
IM
IR
YD
FR
EM
MIN
E
M
BC
TI
TD
YG
GD
NDA
NFA
DDCOM
DT
DD
MS2
CR
MB

EXOGENOUS VARIABLES :

PYQ
PIP
YQ
YA
IG
CG
TSC
W
CS
DCB
DDPR
MI
MC
EA
EQ
EXRM
EXRE
PMTL
BINV
RG
SUB
D1
D2
WCD
DIF

RESULTS OF FIRST STAGE

REAL SECTOR : PRODUCTION

ENDOGENOUS VARIABLES :

YC
YS
YM
L
Y

EXOGENOUS VARIABLES :

EXRM
PMTL
YD
WCD
YA
DIF

LAGGED VARIABLES :

PY
YC
YS
IM
L

DEPENDENT VARIABLE 23 YC
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99568210 RBAR**2 .99040466
SSR .65476803 SEE .26972579
DURBIN-WATSON 2.28163300
Q(10)= 5.26880 SIGNIFICANCE LEVEL .872514

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	2.279692	1.719707	.1196004
2	EXRM	45	0	.4596487E-02	.3719217	.7185571
3	PMTL	49	0	.2398464E-04	.9322146E-01	.9277699
4	YQ	7	0	.5732159E-01	.3336332	.7462982
5	WCD	58	0	1.732271	.9263365	.3784419
6	YA	11	0	-.9570902E-02	-.1681275	.8702005
7	DIF	1	0	.2094520E-01	.5653101	.5856772
8	PY	4	1	-.3144371E-01	-.4086671	.6923368
9	YC	23	1	.4033669	1.395619	.1963018
10	YS	15	1	-.4874277E-01	-.5381221	.6035439
11	IM	20	1	.1530970E-01	.2339887	.8202296
12	L	6	1	.3484518E-02	1.662825	.1307098

DEPENDENT VARIABLE 15 YS
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99950340 RBAR**2 .99889645
SSR 6.0992125 SEE .82321946
DURBIN-WATSON 2.61987780
Q(10)= 8.00963 SIGNIFICANCE LEVEL .627896

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	2.116851	.5232093	.6134648
2	EXRM	45	0	.4474271E-01	1.186191	.2659162
3	PMTL	49	0	-.2978515E-03	-.3793056	.7132554
4	YQ	7	0	-1.367051	-2.607010	.2840972E-01
5	WCD	58	0	8.704645	1.525144	.1615629
6	YA	11	0	.3850829	2.216394	.5388022E-01
7	DIF	1	0	.1704526	1.507345	.1659918
8	PY	4	1	.1910342	.8134929	.4369273
9	YC	23	1	-.6313229	-.7156899	.4923320
10	YS	15	1	-.6310303E-01	-.2282589	.8245467
11	IM	20	1	.9229789	4.621967	.1250857E-02
12	L	6	1	.3081567E-01	4.818172	.9493931E-03

DEPENDENT VARIABLE 19 YM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99792685 RBAR**2 .99539300
SSR 4.4079244 SEE .69983525
DURBIN-WATSON 2.42039042
Q(10)= 4.56051 SIGNIFICANCE LEVEL .918541

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-1.995924	-.5802952	.5759541
2	EXRM	45	0	.4830360E-01	1.506370	.1662376
3	PMTL	49	0	-.9966960E-03	-1.493042	.1696284
4	YB	7	0	-.6988683	-1.567736	.1513866
5	WCD	58	0	-.1865791E-01	-.3845409E-02	.9970157
6	YA	11	0	.2439132	1.651383	.1330549
7	DIF	1	0	.6353931E-01	.6609543	.5251977
8	PY	4	1	.2953336	1.479365	.1731708
9	YC	23	1	-.6806138	-.9075988	.3877459
10	YS	15	1	-.1843446	-.7843823	.4529656
11	IM	20	1	.7041933	4.148076	.2491508E-02
12	L	6	1	.1935919E-01	3.560555	.6113969E-02

DEPENDENT VARIABLE 6 L
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99501167 RBAR**2 .98891482
SSR 28461.652 SEE 56.235271
DURBIN-WATSON 2.47249937
Q(10)= 6.55347 SIGNIFICANCE LEVEL .766820

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	233.5194	.8449188	.4200493
2	EXRM	45	0	2.540717	.9860419	.3498775
3	PMTL	49	0	.4373483E-02	.8153119E-01	.9368039
4	YB	7	0	-32.60186	-.9101376	.3864758
5	WCD	58	0	280.3146	.7189726	.4904028
6	YA	11	0	1.548049	.1304321	.8990934
7	DIF	1	0	8.343820	1.080142	.3081727
8	PY	4	1	-12.46829	-.7772423	.4569583
9	YC	23	1	43.42664	.7206699	.4894071
10	YS	15	1	-15.38394	-.8146143	.4363172
11	IM	20	1	24.62663	1.805290	.1045117
12	L	6	1	1.002976	2.295662	.4733417E-01

DEPENDENT VARIABLE 3 Y
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99930543 RBAR**2 .99845650
SSR 35.958344 SEE 1.9988426
DURBIN-WATSON 2.22043413
Q(10)= 6.21925 SIGNIFICANCE LEVEL .796519

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	7.077126	.7204089	.4895601
2	EXRM	45	0	.6969945E-01	.7610246	.4661132
3	PMTL	49	0	-.5348832E-03	-.2805340	.7854098
4	YQ	7	0	-4.200831	-3.299363	.9239299E-02
5	WCD	58	0	8.972581	.6474618	.5334983
6	YA	11	0	1.775254	4.208140	.2279074E-02
7	DIF	1	0	.2564922	.9341578	.3746063
8	PY	4	1	.3254725	.5708133	.5820961
9	YC	23	1	-4.008423	-1.871475	.9407713E-01
10	YS	15	1	.6978528E-01	.1039629	.9194787
11	IM	20	1	2.048638	4.225103	.2222633E-02
12	L	6	1	.6977255E-01	4.492958	.150410BE-02

REAL SECTOR : PRICES

ENDOGENOUS VARIABLES:

PYM
PYA
PYS
PYC
PY

EXOGENOUS VARIABLES :

PYQ
W
WCD
D1
PMTL
YA

LAGGED VARIABLES :

PYM
PYA
PY
YD
MS2
Y

DEPENDENT VARIABLE 24 PYM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 8
R**2 .99997861 RBAR**2 .99994651
SSR .25862197 SEE .17979918
DURBIN-WATSON 1.92517985
Q(10)= 7.64420 SIGNIFICANCE LEVEL .663546

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	.5471803	.6547045	.5310267
2	W	25	0	.4634957E-01	7.870331	.4910992E-04
3	WCD	58	0	.5365592	.5149020	.6205423
4	D1	56	0	7.013639	.8770547	.4060231
5	PMTL	49	0	.6013349E-02	4.264415	.2744894E-02
6	YA	11	0	-.5847497E-01	-1.727314	.1223799
7	PYQ	12	0	-.9287144	-4.923518	.1158863E-02
8	PYM	24	1	4.936025	2.628280	.3025890E-01
9	PYA	9	1	1.441709	.8619990	.4137787
10	PY	4	1	-8.761839	-1.694631	.1285933
11	YD	22	1	.8439496E-04	.3104876E-01	.9759913
12	MS2	31	1	.1453790E-01	1.038717	.3293090
13	Y	3	1	.2858271E-01	2.265329	.5327745E-01

DEPENDENT VARIABLE 9 PYA
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 8
R**2 .99996406 RBAR**2 .99991016
SSR .22298601 SEE .16695284
DURBIN-WATSON 2.13029740
Q(10)= 7.24576 SIGNIFICANCE LEVEL .702058

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	.3310842	.4266259	.6809003
2	W	25	0	.2452891E-01	4.485589	.2040632E-02
3	WCD	58	0	.5167794	.5340796	.6078037
4	D1	56	0	-1.783663	-.2402094	.8162088
5	PMTL	49	0	-.1101680E-02	-.8413805	.4245691
6	YA	11	0	-.3625062E-01	-1.153216	.2821112
7	PYQ	12	0	1.006269	5.745152	.4313882E-03
8	PYM	24	1	-.3005108	-.1723250	.8674618
9	PYA	9	1	.1332785	.8581894E-01	.9337193
10	PY	4	1	.6883445	.1433770	.8895381
11	YD	22	1	-.1355872E-02	-.5372054	.6057407
12	MS2	31	1	-.1234759E-01	-.9501055	.3698747
13	Y	3	1	.2227116E-02	.1900923	.8539717

DEPENDENT VARIABLE 21 PYS
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 8
R**2 .99998679 RBAR**2 .99996698
SSR .10392077 SEE .11397410
DURBIN-WATSON 2.61406202
Q(10)= 8.52573 SIGNIFICANCE LEVEL .577625

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	.3840402	.7248917	.4891752
2	W	25	0	.3422475E-01	9.167883	.1617361E-04
3	WCD	58	0	.9780377	1.480621	.1769797
4	D1	56	0	2.698212	.5322809	.6089926
5	PMTL	49	0	.3232150E-02	3.615898	.6823056E-02
6	YA	11	0	-.4752279E-01	-2.214546	.5767064E-01
7	PYQ	12	0	-.4287640	-3.585860	.7127264E-02
8	PYM	24	1	2.995832	2.516479	.3600572E-01
9	PYA	9	1	.8062370	.7604546	.4688004
10	PY	4	1	-4.630624	-1.412866	.1953978
11	YD	22	1	-.1821900E-02	-1.057386	.3212163
12	MS2	31	1	.6893970E-02	.7770459	.4594894
13	Y	3	1	.1798841E-01	2.249066	.5464692E-01

DEPENDENT VARIABLE 16 PYC
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 8
R**2 .99999214 RBAR**2 .99998036
SSR .29419698E-01 SEE .60642083E-01
DURBIN-WATSON 2.60679308
Q(10)= 4.36805 SIGNIFICANCE LEVEL .929220

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-.2542479	-.9019571	.3934244
2	W	25	0	.2589041E-01	13.03466	.1138821E-05
3	WCD	58	0	-.3884563	-1.105255	.3011774
4	D1	56	0	.1445220	.5358349E-01	.9585809
5	PMTL	49	0	.1157742E-02	2.434269	.4092875E-01
6	YA	11	0	-.3616520E-02	-.3167420	.7595469
7	PYQ	12	0	.1183977	1.861016	.9977474E-01
8	PYM	24	1	.2278821	.3597643	.7283355
9	PYA	9	1	-.3466983	-.6146026	.5558897
10	PY	4	1	.2283422	.1309422	.8990540
11	YD	22	1	-.1630743E-02	-1.778799	.1131577
12	MS2	31	1	-.3542783E-02	-.7505056	.4744432
13	Y	3	1	.4601263E-02	1.081231	.3111073

DEPENDENT VARIABLE 4 PY
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 8
R**2 .99998920 RBAR**2 .99997299
SSR .82083562E-01 SEE .10129386
DURBIN-WATSON 1.92609464
Q(10)= 5.76524 SIGNIFICANCE LEVEL .834586

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	.1664916	.3535997	.7327765
2	W	25	0	.3231217E-01	9.739083	.1033680E-04
3	WCD	58	0	.7218639	1.229608	.2537772
4	Di	56	0	2.773750	.6156803	.5552127
5	PMTL	49	0	.2841881E-02	3.577285	.7216730E-02
6	YA	11	0	-.4192549E-01	-2.198285	.5915189E-01
7	PYQ	12	0	-.2148828	-2.022086	.7780650E-01
8	PYM	24	1	2.662633	2.516577	.3600023E-01
9	PYA	9	1	.8054971	.8548652	.4174900
10	PY	4	1	-4.397567	-1.509722	.1695541
11	YD	22	1	-.7399981E-03	-.4832401	.6418732
12	MS2	31	1	.3650404E-02	.4629576	.6557277
13	Y	3	1	.1842266E-01	2.591701	.3202832E-01

REAL SECTOR : EXPENDITURES

ENDOGENOUS VARIABLES :

CP
IP
IM
IR
YD
FR

EXOGENOUS VARIABLES :

EXRM
PMTL
IG
CG
PIP
TSC
MI

LAGGED VARIABLES :

Y
IP
PY
IM

DEPENDENT VARIABLE 13 CP
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99997599 RBAR**2 .99994665
SSR 5654.7552 SEE 25.066035
DURBIN-WATSON 2.76843045
Q(10)= 10.9110 SIGNIFICANCE LEVEL .364493

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-133.7405	-1.822249	.1017396
2	EXRM	45	0	8.481712	3.797460	.4233854E-02
3	PMTL	49	0	-.6380986E-01	-1.477309	.1737088
4	IG	14	0	1.686222	.9932053	.3465607
5	CG	17	0	-4.501244	-2.692821	.2468220E-01
6	PIP	5	0	313.0084	3.368289	.8279443E-02
7	TSC	18	0	-3.184609	-2.995944	.1505508E-01
8	MI	38	0	.1839300	2.931778	.1670863E-01
9	Y	3	1	-1.980669	-1.813008	.1032415
10	IP	8	1	9.943917	1.902405	.8954303E-01
11	PY	4	1	-11.32960	-.6338380	.5419581
12	IM	20	1	-14.95816	-1.462367	.1776584

```
DEPENDENT VARIABLE    8     IP
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM      9
R**2           .98271154     RBAR**2         .96158120
SSR         31.429354        SEE          1.8687296
DURBIN-WATSON  2.01943583
Q(  10)=   4.88589       SIGNIFICANCE LEVEL  .898669
```

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-9.441410	-1.725523	.1185146
2	EXRM	45	0	.3536011	2.123550	.6267508E-01
3	PMTL	49	0	-.1543759E-02	-.4794048	.6430852
4	IG	14	0	-.3755389E-01	-.2967006	.7734283
5	CG	17	0	.1125042	.9027819	.3901640
6	PIP	5	0	-5.150521	-.7434362	.4761760
7	TSC	18	0	.7483874E-01	.9443722	.3696398
8	MI	38	0	.2853821E-02	.6101609	.5568459
9	Y	3	1	.1621444	1.990806	.7769561E-01
10	IP	8	1	-.1075286	-.2759362	.7888284
11	PY	4	1	.4802667	.3604004	.7268611
12	IM	20	1	.4995144	.6550450	.5288235

```
DEPENDENT VARIABLE   20     IM
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM      9
R**2           .99022071     RBAR**2         .97826824
SSR          5.4949890        SEE          .78137976
DURBIN-WATSON  2.55649450
Q(  10)=   11.9343       SIGNIFICANCE LEVEL  .289474
```

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-8.521766	-3.724757	.4735682E-02
2	EXRM	45	0	.1148209	1.649128	.1335217
3	PMTL	49	0	-.1934186E-04	-.1436499E-01	.9888522
4	IG	14	0	.6281485E-02	.1186889	.9081288
5	CG	17	0	.4020687E-01	.7716115	.4601234
6	PIP	5	0	-2.546107	-.8789283	.4022965
7	TSC	18	0	.4052313E-01	1.222937	.2524094
8	MI	38	0	.2669041E-02	1.364763	.2054714
9	Y	3	1	.1353566	3.974576	.3232198E-02
10	IP	8	1	-.1090913	-.6695130	.5199728
11	PY	4	1	-.2396991	-.4301831	.6771796
12	IM	20	1	-.2329140E-01	-.7304711E-01	.9433663

DEPENDENT VARIABLE 10 IR
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .95946927 RBAR**2 .90993170
SSR 15.813454 SEE 1.3255378
DURBIN-WATSON 1.85606320
Q(10)= 8.30055 SIGNIFICANCE LEVEL .599505

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-.9196433	-.2369505	.8180006
2	EXRM	45	0	.2387801	2.021629	.7392735E-01
3	PMTL	49	0	-.1524417E-02	-.6673921	.5212646
4	IG	14	0	-.4383538E-01	-.4882503	.6370476
5	CG	17	0	.7229732E-01	.8178821	.4345427
6	PIP	5	0	-2.604415	-.5299770	.6089520
7	TSC	18	0	.3431561E-01	.6104679	.5566513
8	MI	38	0	.1847802E-03	.5569643E-01	.9568005
9	Y	3	1	.2678779E-01	.4636800	.6538868
10	IP	8	1	.1562674E-02	.5653371E-02	.9956126
11	PY	4	1	.7199658	.7616737	.4657445
12	IM	20	1	.5228058	.9665357	.3590289

DEPENDENT VARIABLE 22 YD
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99994421 RBAR**2 .99987602
SSR 15899.444 SEE 42.031000
DURBIN-WATSON 2.94245940
Q(10)= 16.1170 SIGNIFICANCE LEVEL .963329E-01

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-119.5573	-.9714867	.3566896
2	EXRM	45	0	1.585697	.4233952	.6819453
3	PMTL	49	0	.3769802	5.204969	.5603283E-03
4	IG	14	0	5.458161	1.917284	.8743598E-01
5	CG	17	0	-8.738664	-3.117712	.1236416E-01
6	PIP	5	0	308.4780	1.979673	.7910119E-01
7	TSC	18	0	-8.019506	-4.499260	.1490538E-02
8	MI	38	0	.3118774	2.964684	.1583857E-01
9	Y	3	1	-.8578578	-.4682945	.6507080
10	IP	8	1	4.666089	.5323711	.6073597
11	PY	4	1	-84.09501	-2.805755	.2051884E-01
12	IM	20	1	-14.37701	-.8382403	.4235981

DEPENDENT VARIABLE 2 FR
FROM 64- 1 UNTIL 84- 1

OBSERVATIONS 21 DEGREES OF FREEDOM 9
R**2 .99105327 RBAR**2 .98011838
SSR 5119.4514 SEE 23.850114
DURBIN-WATSON 2.72561204
Q(10)= 19.1028 SIGNIFICANCE LEVEL .389760E-01

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	********	***	***	************	************	************
1	CONSTANT	0	0	50.78970	.7273034	.4855281
2	EXRM	45	0	7.367470	3.466756	.7084917E-02
3	PMTL	49	0	-.1452407	-3.534006	.6373753E-02
4	IG	14	0	-.3731609	-.2310019	.8224792
5	CG	17	0	5.460889	3.433472	.7467150E-02
6	PIP	5	0	-172.9494	-1.955994	.8217168E-01
7	TSC	18	0	4.190868	4.143590	.2508201E-02
8	MI	38	0	-.1232285	-2.064357	.6899175E-01
9	Y	3	1	-.9021358E-01	-.8678706E-01	.9327410
10	IP	8	1	5.002214	1.005780	.3407953
11	PY	4	1	14.25735	.8382960	.4235684
12	IM	20	1	-3.851879	-.3957782	.7014870

REAL SECTOR : FOREIGN TRADE

ENDOGENOUS VARIABLES :

EM
MIN
E
M
BC

EXOGENOUS VARIABLES :

EXRE
D1
EXRM
PMTL
YQ
YA
D2
EA
EQ
MI
MC
BINV

LAGGED VARIABLES :

PYM
EXRE
EM

DEPENDENT VARIABLE 41 EM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99932235 RBAR**2 .99728940
SSR 27279.189 SEE 73.863643
DURBIN-WATSON 2.31264303
Q(10)= 7.29825 SIGNIFICANCE LEVEL .697020

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-328.7811	-.4415544	.6772536
2	EXRE	42	0	-23.06816	-.2260857	.8300862
3	D1	56	0	1173.393	1.166114	.2961611
4	EXRM	45	0	39.33508	.4390015	.6789828
5	PMTL	49	0	.1880937	.5734846	.5911457
6	YQ	7	0	127.6704	1.533709	.1856826
7	YA	11	0	1.370810	.5427981E-01	.9588143
8	D2	57	0	-525.0513	-1.256515	.2644368
9	EA	39	0	.3869237	1.325717	.2422710
10	EQ	44	0	-6.644477	-1.385174	.2246147
11	MI	38	0	-.1028355	-.3594665	.7339290
12	MC	40	0	.9168913	.8711882	.4234998
13	BINV	46	0	-.1531898	-.8753229	.4214492
14	PYM	24	1	-94.10860	-.5920847	.5795513
15	EXRE	42	1	-11.58982	-.2281795	.8285447
16	EM	41	1	.6162802	1.315006	.2455859

DEPENDENT VARIABLE 48 MIN
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99951352 RBAR**2 .99805409
SSR 63018.800 SEE 112.26647
DURBIN-WATSON 2.55273575
Q(10)= 3.89015 SIGNIFICANCE LEVEL .952166

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	208.7532	.1844553	.8609043
2	EXRE	42	0	-192.2363	-1.239584	.2701345
3	D1	56	0	3492.735	2.283724	.7120576E-01
4	EXRM	45	0	89.68363	.6585364	.5393045
5	PMTL	49	0	1.858713	3.728555	.1359129E-01
6	YQ	7	0	-340.8062	-2.693648	.4311017E-01
7	YA	11	0	-21.48506	-.5597297	.5998101
8	D2	57	0	396.7657	.6247132	.5595572
9	EA	39	0	.6401110	1.442983	.2086147
10	EQ	44	0	48.83887	6.698687	.1121694E-02
11	MI	38	0	-.4026551	-.9260391	.3969234

12	MC	40	0	7.714926	4.822881	.4786307E-02
13	BINV	46	0	1.111731	4.179445	.8659597E-02
14	PYM	24	1	-739.0044	-3.059019	.2813345E-01
15	EXRE	42	1	190.0054	2.461197	.5714454E-01
16	EM	41	1	.8748581E-01	.1228196	.9070340

DEPENDENT VARIABLE 37 E
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99966836 RBAR**2 .99867345
SSR 27279.189 SEE 73.863643
DURBIN-WATSON 2.31264303
Q(10)= 7.29825 SIGNIFICANCE LEVEL .697020

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-328.7811	-.4415544	.6772536
2	EXRE	42	0	-23.06816	-.2260857	.8300862
3	D1	56	0	1173.393	1.166114	.2961611
4	EXRM	45	0	39.33508	.4390015	.6789828
5	PMTL	49	0	.1880937	.5734846	.5911457
6	YQ	7	0	127.6704	1.533709	.1856826
7	YA	11	0	1.370810	.5427981E-01	.9588143
8	D2	57	0	-525.0513	-1.256515	.2644368
9	EA	39	0	1.386924	4.752017	.5095394E-02
10	EQ	44	0	-5.644477	-1.176704	.2922770
11	MI	38	0	-.1028355	-.3594665	.7339290
12	MC	40	0	.9168913	.8711882	.4234998
13	BINV	46	0	-.1531898	-.8753229	.4214492
14	PYM	24	1	-94.10860	-.5920847	.5795513
15	EXRE	42	1	-11.58982	-.2281795	.8285447
16	EM	41	1	.6162802	1.315006	.2455859

DEPENDENT VARIABLE 47 M
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99973331 RBAR**2 .99893323
SSR 63018.800 SEE 112.26647
DURBIN-WATSON 2.55273575
Q(10)= 3.89015 SIGNIFICANCE LEVEL .952166

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	208.7532	.1844553	.8609043
2	EXRE	42	0	-192.2363	-1.239584	.2701345
3	D1	56	0	3492.735	2.283724	.7120576E-01
4	EXRM	45	0	89.68363	.6585364	.5393045
5	PMTL	49	0	1.858713	3.728555	.1359129E-01
6	YQ	7	0	-340.8062	-2.693648	.4311017E-01
7	YA	11	0	-21.48506	-.5597297	.5998101

8	D2	57	0	396.7657	.6247132	.5595572
9	EA	39	0	.6401110	1.442983	.2086147
10	EQ	44	0	48.83887	6.698687	.1121694E-02
11	MI	38	0	.5973449	1.373793	.2278982
12	MC	40	0	8.714926	5.448018	.2830510E-02
13	BINV	46	0	1.111731	4.179445	.8659597E-02
14	PYM	24	1	-739.0044	-3.059019	.2813345E-01
15	EXRE	42	1	190.0054	2.461197	.5714454E-01
16	EM	41	1	.8748581E-01	.1228196	.9070340

DEPENDENT VARIABLE 43 BC
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99395884 RBAR**2 .97583536
SSR 147483.70 SEE 171.74615
DURBIN-WATSON 2.52510257
Q(10)= 5.35047 SIGNIFICANCE LEVEL .866572

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	537.5342	.3104754	.7687245
2	EXRE	42	0	-169.1682	-.7130539	.5076996
3	D1	56	0	2319.341	.9913012	.3670560
4	EXRM	45	0	50.34855	.2416666	.8186370
5	PMTL	49	0	1.670620	2.190628	.8003327E-01
6	YQ	7	0	-468.4766	-2.420384	.6008892E-01
7	YA	11	0	-22.85587	-.3892267	.7131334
8	D2	57	0	921.8170	.9487554	.3863122
9	EA	39	0	-.7468127	-1.100477	.3212620
10	EQ	44	0	54.48335	4.884847	.4533825E-02
11	MI	38	0	.7001804	1.052614	.3407054
12	MC	40	0	7.798035	3.186567	.2435841E-01
13	BINV	46	0	2.264920	5.565896	.2576616E-02
14	PYM	24	1	-644.8958	-1.744969	.1414363
15	EXRE	42	1	201.5952	1.706961	.1485378
16	EM	41	1	-.5287944	-.4852662	.6480022

PUBLIC SECTOR :

ENDOGENOUS VARIABLES :

TI
TD
YG
GD

EXOGENOUS VARIABLES :

IG
CG
SUB
RG

LAGGED VARIABLE :

Y

DEPENDENT VARIABLE 50 TI
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 15
R**2 .99356370 RBAR**2 .99141827
SSR 9766.8965 SEE 25.517179
DURBIN-WATSON 2.83511752
Q(10)= 5.41384 SIGNIFICANCE LEVEL .861876

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-17.97907	-.6339652	.5356523
2	IG	14	0	.1902550	.5332101	.6016998
3	CG	17	0	.2076314	.6494227	.5258855
4	SUB	51	0	1.212901	1.244436	.2324333
5	RG	53	0	-.2531960E-01	-.2534900	.8033311
6	Y	3	1	.2238823	.9717902	.3465659

DEPENDENT VARIABLE 52 TD
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 15
R**2 .99769376 RBAR**2 .99692501
SSR 8033.3364 SEE 23.142078
DURBIN-WATSON 2.68749501
Q(10)= 5.70176 SIGNIFICANCE LEVEL .839667

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL

***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	33.12546	1.287924	.2172874
2	IG	14	0	-1.113748	-3.441752	.3632815E-02
3	CG	17	0	1.750921	6.038532	.2269702E-04
4	SUB	51	0	4.896183	5.539047	.5675516E-04
5	RG	53	0	-.5143603	-5.678082	.4382587E-04
6	Y	3	1	-.3821003	-1.828776	.8738460E-01

DEPENDENT VARIABLE 54 YG
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 15
R**2 .99812032 RBAR**2 .99749376
SSR 29597.973 SEE 44.420695
DURBIN-WATSON 2.98169283
Q(10)= 7.52557 SIGNIFICANCE LEVEL .675069

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	15.14639	.3067994	.7632138
2	IG	14	0	-.9234933	-1.486768	.1577923
3	CG	17	0	1.958552	3.518981	.3100397E-02
4	SUB	51	0	6.109084	3.600564	.2622629E-02
5	RG	53	0	.4603201	2.647348	.1828800E-01
6	Y	3	1	-.1582181	-.3945083	.6987582

DEPENDENT VARIABLE 55 GD
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 15
R**2 .94353857 RBAR**2 .92471809
SSR 29597.973 SEE 44.420695
DURBIN-WATSON 2.98169283
Q(10)= 7.52557 SIGNIFICANCE LEVEL .675069

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-15.14639	-.3067994	.7632138
2	IG	14	0	1.923493	3.096708	.7366606E-02
3	CG	17	0	-.9585524	-1.722256	.1055720
4	SUB	51	0	-5.109084	-3.011185	.8770650E-02
5	RG	53	0	-.4603201	-2.647348	.1828800E-01
6	Y	3	1	.1582181	.3945083	.6987582

FINANCIAL SECTOR :

ENDOGENOUS VARIABLES :

NDA
NFA
DDCOM
DT
DD
MS2
CR
MB

EXOGENOUS VARIABLES :

SUB
D1
D2
EXRM
DDPR
CS
WCD
YQ
DCB
PYQ

LAGGED VARIABLES :

PYQ
PY
YQ
NDA
DDCOM

DEPENDENT VARIABLE 29 NDA
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 \ DEGREES OF FREEDOM 5
R**2 .99999689 RBAR**2 .99998757
SSR 69.294137 SEE 3.7227446
DURBIN-WATSON 2.43595726
Q(10)= 7.36109 SIGNIFICANCE LEVEL .690972

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-66.11269	-4.609213	.5791723E-02
2	SUB	51	0	4.882178	1.694110	.1510192
3	D1	56	0	-1277.646	-4.685588	.5406429E-02

4	D2	57	0	73.72063	3.741295	.1341360E-01
5	EXRM	45	0	-.9113482	-.7907252	.4649396
6	DDPR	35	0	-2.229280	-5.514092	.2684757E-02
7	CS	26	0	-4.765823	-5.237935	.3359585E-02
8	WCD	58	0	26.13891	.9470328	.3871088
9	YQ	7	0	1.667781	.3191243	.7625337
10	DCB	36	0	26.69276	1.925397	.1121500
11	PYQ	12	0	16.12098	1.643558	.1611887
12	PYQ	12	1	-41.73869	-2.462201	.5707413E-01
13	YQ	7	1	11.94492	2.048204	.9586188E-01
14	NDA	29	1	1.503535	4.178068	.8671127E-02
15	DDCOM	28	1	-.1131303	-.7838239E-01	.9405641
16	PY	4	1	125.7453	3.929760	.1107298E-01

DEPENDENT VARIABLE 27 NFA
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99996151 RBAR**2 .99984603
SSR 111.26064 SEE 4.7172160
DURBIN-WATSON 2.50116713
Q(10)= 6.47903 SIGNIFICANCE LEVEL .773541

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	27.98973	1.539991	.1841885
2	SUB	51	0	-3.164332	-.8665377	.4258153
3	DI	56	0	1077.963	3.119859	.2625642E-01
4	D2	57	0	-82.48550	-3.303604	.2139045E-01
5	EXRM	45	0	.5682797	.3891176	.7132091
6	DDPR	35	0	1.289968	2.518059	.5330082E-01
7	CS	26	0	7.091843	6.151185	.1651113E-02
8	WCD	58	0	-23.70290	-.6777299	.5280300
9	YQ	7	0	5.480697	.8276261	.4455725
10	DCB	36	0	-19.99304	-1.138107	.3066536
11	PYQ	12	0	-13.56006	-1.091020	.3250264
12	PYQ	12	1	70.40622	3.277729	.2200967E-01
13	YQ	7	1	-13.44800	-1.819806	.1284413
14	NDA	29	1	-1.336637	-2.931251	.3258542E-01
15	DDCOM	28	1	-1.999050	-1.093052	.3242145
16	PY	4	1	-116.5180	-2.873722	.3484268E-01

DEPENDENT VARIABLE 28 DDCOM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999607 RBAR**2 .99998428
SSR 7.2161157 SEE 1.2013422
DURBIN-WATSON 3.07210883
Q(10)= 12.4330 SIGNIFICANCE LEVEL .257119

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL

***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	2.130874	.4603586	.6645867
2	SUB	51	0	-1.858524	-1.998447	.1021419
3	D1	56	0	148.2586	1.684885	.1528260
4	D2	57	0	-.4863221	-.7648098E-01	.9420025
5	EXRM	45	0	-.2224697	-.5981478	.5758025
6	DDPR	35	0	.2693123E-01	.2064249	.8446016
7	CS	26	0	.5939338	2.022818	.9901382E-01
8	WCD	58	0	7.222424	.8108808	.4542850
9	YQ	7	0	-2.356117	-1.397057	.2212336
10	DCB	36	0	4.306365	.9625740	.3799699
11	PYQ	12	0	5.708227	1.803397	.1311826
12	PYQ	12	1	-5.414898	-.9898545	.3676976
13	YQ	7	1	.4900795	.2604073	.8049337
14	NDA	29	1	.3019595	2.600203	.4823764E-01
15	DDCOM	28	1	-.3295378E-01	-.7075242E-01	.9463375
16	PY	4	1	1.473136	.1426638	.8921265

DEPENDENT VARIABLE 34 DT
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999875 RBAR**2 .99999499
SSR 12.808390 SEE 1.6005243
DURBIN-WATSON 3.04211553
Q(10)= 15.1647 SIGNIFICANCE LEVEL .126170

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-64.77850	-10.50446	.1349507E-03
2	SUB	51	0	2.272689	1.834294	.1260694
3	D1	56	0	-282.5133	-2.409869	.6087389E-01
4	D2	57	0	-52.31737	-6.175609	.1621933E-02
5	EXRM	45	0	.2463170	.4970918	.6402077
6	DDPR	35	0	-2.377019	-13.67549	.3750321E-04
7	CS	26	0	2.913344	7.447576	.6883315E-03
8	WCD	58	0	-26.96263	-2.272170	.7224233E-01
9	YQ	7	0	8.703513	3.873615	.1171733E-01
10	DCB	36	0	1.407753	.2361860	.8226586
11	PYQ	12	0	-.5113249	-.1212527	.9082130
12	PYQ	12	1	62.86420	8.625593	.3457572E-03
13	YQ	7	1	-2.677998	-1.068074	.3343182
14	NDA	29	1	-.2006993	-1.297206	.2511878
15	DDCOM	28	1	-3.099783	-4.995417	.4120864E-02
16	PY	4	1	12.03338	.8747073	.4217540

DEPENDENT VARIABLE 33 DD
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999823 RBAR**2 .99999273

SSR 7.2161157 SEE 1.2013422
DURBIN-WATSON 3.07210883
Q(10)= 12.4330 SIGNIFICANCE LEVEL .257119

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	2.130874	.4603586	.6645867
2	SUB	51	0	-1.858524	-1.998447	.1021419
3	D1	56	0	148.2586	1.684885	.1528260
4	D2	57	0	-.4863221	-.7648098E-01	.9420025
5	EXRM	45	0	-.2224697	-.5981478	.5758025
6	DDPR	35	0	1.026931	7.871313	.5318093E-03
7	CS	26	0	.5939338	2.022818	.9901382E-01
8	WCD	58	0	7.222424	.8108808	.4542850
9	YQ	7	0	-2.356117	-1.397057	.2212336
10	DCB	36	0	4.306365	.9625740	.3799699
11	PYQ	12	0	5.708227	1.803397	.1311826
12	PYQ	12	1	-5.414898	-.9898545	.3676977
13	YQ	7	1	.4900795	.2604073	.8049337
14	NDA	29	1	.3019595	2.600203	.4823764E-01
15	DDCOM	28	1	-.3295378E-01	-.7075242E-01	.9463375
16	PY	4	1	1.473136	.1426638	.8921265

DEPENDENT VARIABLE 31 MS2
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999991 RBAR**2 .99999965
SSR 3.2413395 SEE .80515085
DURBIN-WATSON 2.52214510
Q(10)= 16.3849 SIGNIFICANCE LEVEL .891324E-01

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-62.64763	-20.19448	.5509235E-05
2	SUB	51	0	.4141651	.6644885	.5357911
3	D1	56	0	-134.2547	-2.276507	.7185132E-01
4	D2	57	0	-52.80370	-12.39034	.6068379E-04
5	EXRM	45	0	.2384736E-01	.9566819E-01	.9275001
6	DDPR	35	0	-1.350087	-15.44035	.2069062E-04
7	CS	26	0	4.507278	22.90459	.2953993E-05
8	WCD	58	0	-19.74021	-3.306856	.2131403E-01
9	YQ	7	0	6.347396	5.615681	.2477476E-02
10	DCB	36	0	6.714118	2.239246	.7528590E-01
11	PYQ	12	0	5.196902	2.449764	.5795325E-01
12	PYQ	12	1	57.44930	15.66951	.1924617E-04
13	YQ	7	1	-2.187919	-1.734632	.1433333
14	NDA	29	1	.1012602	1.301028	.2499749
15	DDCOM	28	1	-3.132737	-10.03574	.1680510E-03
16	PY	4	1	13.50651	1.951657	.1084399

DEPENDENT VARIABLE 30 CR
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999922 RBAR**2 .99999688
SSR 7.0753825 SEE 1.1895699
DURBIN-WATSON 2.88811353
Q(10)= 9.59854 SIGNIFICANCE LEVEL .476392

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-24.52467	-5.350798	.3062194E-02
2	SUB	51	0	-1.303681	-1.415704	.2160252
3	D1	56	0	65.42825	.7509175	.4865186
4	D2	57	0	-44.03884	-6.994264	.9202161E-03
5	EXRM	45	0	.3669159	.9962791	.3648553
6	DDPR	35	0	-.4107756	-3.179708	.2454626E-01
7	CS	26	0	2.181258	7.502440	.6652500E-03
8	MCD	58	0	-22.17621	-2.514422	.5353800E-01
9	YQ	7	0	-.8010821	-.4797016	.6516878
10	DCB	36	0	.1439948E-01	.3250475E-02	.9975322
11	PYQ	12	0	2.635984	.8410265	.4386913
12	PYQ	12	1	28.78177	5.313436	.3157093E-02
13	YQ	7	1	-.6848389	-.3674953	.7282922
14	NDA	29	1	-.6563750E-01	-.5708044	.5928281
15	DDCDM	28	1	-1.020557	-2.212839	.7782597E-01
16	PY	4	1	4.279233	.4185174	.6929378

DEPENDENT VARIABLE 32 MB
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 5
R**2 .99999909 RBAR**2 .99999635
SSR 8.5497445 SEE 1.3076501
DURBIN-WATSON 2.78827724
Q(10)= 10.9099 SIGNIFICANCE LEVEL .364577

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-38.12296	-7.566591	.6394150E-03
2	SUB	51	0	1.717846	1.697008	.1504560
3	D1	56	0	-199.6829	-2.084809	.9150117E-01
4	D2	57	0	-8.764861	-1.266338	.2611812
5	EXRM	45	0	-.3430685	-.8474103	.4354417
6	DDPR	35	0	-.9393119	-6.614405	.1188423E-02
7	CS	26	0	2.326020	7.277920	.7659546E-03
8	MCD	58	0	2.436005	.2512624	.8116110
9	YQ	7	0	7.148478	3.894091	.1147746E-01
10	DCB	36	0	6.699718	1.375799	.2273161
11	PYQ	12	0	2.560918	.7432947	.4907315
12	PYQ	12	1	28.66753	4.814448	.4821921E-02
13	YQ	7	1	-1.503080	-.7337427	.4960473
14	NDA	29	1	.1668977	1.320335	.2439315
15	DDCDM	28	1	-2.112180	-4.166220	.8771084E-02
16	PY	4	1	9.227281	.8209556	.4490280

RESULTS OF SECOND STAGE

NOTE : VARIABLE NAME E****** IS FITTED VALUE OF
****** OBTAINED FROM FIRST STAGE

REAL SECTOR : PRODUCTION

NOTE : R1 ; MIN * EXRM / PMTL
NOTE : R2 ; DT / PY
NOTE : R3 ; PY(-1) / PYC

DEPENDENT VARIABLE 23 YC
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 16
R**2 .99476909 RBAR**2 .99346137
SSR .79321593 SEE .22265668
DURBIN-WATSON 2.8471798I
Q(10)= 10.6822 SIGNIFICANCE LEVEL .382809

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	.9847145E-01	.1382621	.8917429
2	EY	63	0	.2162244E-01	3.517797	.2854218E-02
3	R2	93	0	-.2605507E-01	-3.066465	.7380200E-02
4	R3	94	0	.2809742	.4957737	.6267947
5	YC	23	1	.6628225	5.560919	.4302186E-04

```
DEPENDENT VARIABLE   15     YS
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     18
R**2           .99861005     RBAR**2         .99845561
SSR         17.071431        SEE          .97386490
DURBIN-WATSON  1.72086455
Q(  10)=   3.41257       SIGNIFICANCE LEVEL  .969984
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************   ************
  1     CONSTANT   0    0  -7.733747       -5.065626       .8056576E-04
  2     EV        63    0   .3340449        7.512244       .5932202E-06
  3     YS        15    1   .3201819        3.448606       .2865589E-02
```

```
DEPENDENT VARIABLE   19     YM
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     16
R**2           .99156345     RBAR**2         .98945432
SSR         17.937751        SEE          1.0588246
DURBIN-WATSON  1.44301523
Q(  10)=   10.0885       SIGNIFICANCE LEVEL  .432765
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************   ************
  1     CONSTANT   0    0  -3.813876       -2.183676       .4422279E-01
  2     R1        92    0   .7810436E-01    4.371460       .4745595E-03
  3     YQ         7    0   .9570454        2.265475       .3771509E-01
  4     WCD       58    0  -4.668776       -2.107863       .5116591E-01
  5     EL        62    0   .1286666E-01    5.523642       .4626680E-04
```

```
DEPENDENT VARIABLE    6     L
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     17
R**2           .99229644     RBAR**2         .99093699
SSR         43953.801        SEE          50.847986
DURBIN-WATSON  2.37009389
Q(  10)=   7.51342       SIGNIFICANCE LEVEL  .676247
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************   ************
  1     CONSTANT   0    0   220.2153        4.728993       .1939142E-03
  2     EYM       61    0   17.12433        2.735267       .1409645E-01
  3     IM        20    1   7.978137        1.708660       .1057059
  4     L          6    1   .5801447        4.479101       .3301919E-03
```

REAL SECTOR : PRICES

NOTE : R4 ; WCD * D1
R5 ; YD / PY
R6 ; PY / PY(-1)
R7 ; YD / YD(-1)
R8 ; Y / Y(-1)
R9 ; MS2 / MS2(-1)

DEPENDENT VARIABLE 24 PYM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 14
R**2 .99966365 RBAR**2 .99951950
SSR 4.0658941 SEE .53890723
DURBIN-WATSON 2.11272524
Q(10)= 6.54642 SIGNIFICANCE LEVEL .767459

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-.8866596E-01	-.4547208	.6562811
2	W	25	0	.4083896E-01	7.597052	.2486143E-05
3	WCD	58	0	-3.670084	-3.837234	.1812605E-02
4	R4	99	0	2.888229	1.751546	.1017185
5	PMTL	49	0	.2676175E-02	6.039137	.3043297E-04
6	PYQ	12	0	.6395775E-01	.4073952	.6898787
7	PYM	24	1	-.3024658	-1.974615	.6837386E-01

DEPENDENT VARIABLE 9 PYA
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 16
R**2 .99755719 RBAR**2 .99694649
SSR 15.158091 SEE .97333484
DURBIN-WATSON 2.42788519
Q(10)= 8.86595 SIGNIFICANCE LEVEL .544871

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-3.922206	-1.876355	.7896904E-01
2	R5	100	0	.1062620E-01	.6120109	.5491295
3	YA	11	0	.1128844	1.075196	.2982341
4	PYA	9	1	-.2760666	-1.924673	.7223993E-01
5	EPYM	44	0	.8165605	11.66031	.3115420E-08

```
DEPENDENT VARIABLE   21     PYS
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     19
R**2           .99989789     RBAR**2         .99989252
SSR         .80336871        SEE          .20562724
DURBIN-WATSON  2.06566981
Q(  10)=   7.60047       SIGNIFICANCE LEVEL  .667798
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************  ************
  1     CONSTANT   0   0  -.4293151E-01  -.8077999       .4292039
  2     EPY       68   0   1.017513       431.3464       .3718988E-08
```

```
DEPENDENT VARIABLE   16     PYC
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     17
R**2           .99911172     RBAR**2         .99895497
SSR         3.3258419        SEE          .44230957
DURBIN-WATSON  2.24723832
Q(  10)=   6.69812       SIGNIFICANCE LEVEL  .753604
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************  ************
  1     CONSTANT   0   0   .4681510       2.939615       .9159360E-02
  2     EPYM      64   0   .6970558       18.02267       .3720617E-08
  3     PYM       24   1  -.6152581      -3.722720       .1692259E-02
  4     PY         4   1   .5282765       2.540889       .2110161E-01
```

```
DEPENDENT VARIABLE  101     R6
FROM   64- 1 UNTIL   84- 1
OBSERVATIONS          21     DEGREES OF FREEDOM     17
R**2           .87422914     RBAR**2         .85203429
SSR         .15389093        SEE          .95144140E-01
DURBIN-WATSON  1.63094010
Q(  10)=   8.63106       SIGNIFICANCE LEVEL  .567438
NO.     LABEL    VAR  LAG    COEFFICIENT    T-STATISTIC   SIGNIF LEVEL
***    *******   ***  ***   ************   ************  ************
  1     CONSTANT   0   0   2.762711       3.010285       .7879947E-02
  2     R7       102   0   .5871880       5.254196       .6460982E-04
  3     R8       103   0  -2.450973      -3.152422       .5812683E-02
  4     R9       104   0   .2216587       1.328359       .2016178
```

REAL SECTOR : EXPENDITURES

NOTE : R10 ; MI * EXRM / PMTL

DEPENDENT VARIABLE 13 CP
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 19
R**2 .99923175 RBAR**2 .99919132
SSR 180946.81 SEE 97.588504
DURBIN-WATSON 2.28479901
Q(10)= 3.45127 SIGNIFICANCE LEVEL .968727

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-15.69008	-.6362911	.5321778
2	EYD	73	0	.9088006	157.2023	.3718988E-08

DEPENDENT VARIABLE 8 IP
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 16
R**2 .98530549 RBAR**2 .98163186
SSR 26.713716 SEE 1.2921328
DURBIN-WATSON 2.45020995
Q(10)= 6.66123 SIGNIFICANCE LEVEL .756993

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-8.420465	-3.413930	.3554137E-02
2	Y	3	1	.8210119E-01	2.637421	.1792303E-01
3	R10	110	0	.1858054	9.658302	.4445950E-07
4	IP	8	1	.4131002	3.336772	.4182315E-02
5	PY	4	1	-.9612433E-01	-1.685457	.1113008

DEPENDENT VARIABLE 20 IM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 16
R**2 .97779509 RBAR**2 .97224387
SSR 12.476949 SEE .88306812
DURBIN-WATSON 1.88965939
Q(10)= 7.67080 SIGNIFICANCE LEVEL .660957

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-8.142265	-4.208597	.6664086E-03
2	Y	3	1	.9039785E-01	3.899306	.1275637E-02
3	R10	110	0	.9028974E-01	6.719264	.4927612E-05
4	IM	20	1	.1481719	.8823729	.3906395
5	PY	4	1	-.1500880	-3.743529	.1771799E-02

REAL SECTOR : FOREIGN TRADE

NOTE : R11 ; (PYM / EXRE) - (PYM(-1) / EXRE(-1))
R12 ; YM / Y
R13 ; MIN * EXRM / PMTL
R14 ; YM + YD + YA

DEPENDENT VARIABLE 41 EM
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 16
R**2 .97645073 RBAR**2 .97056341
SSR 947989.64 SEE 243.41190
DURBIN-WATSON 2.52866083
Q(10)= 5.70105 SIGNIFICANCE LEVEL .839723

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-741.4624	-.9515665	.3554714
2	R11	114	0	-988.9226	-.3844201	.7057284
3	R12	115	0	5473.030	1.053205	.3078931
4	D1	56	0	1136.746	3.689748	.1984878E-02
5	EM	41	1	.8649517	7.162125	.2258596E-05

DEPENDENT VARIABLE 116 R13
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 18
R**2 .91954917 RBAR**2 .91061019
SSR 2085.2042 SEE 10.763117
DURBIN-WATSON 1.14249735
Q(10)= 12.6005 SIGNIFICANCE LEVEL .246875

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-56.35935	-6.116049	.8893711E-05
2	R14	117	0	1.851385	14.17407	.3312410E-10
3	D2	57	0	-22.56181	-3.129259	.5795940E-02

PUBLIC SECTOR :

NOTE : R15 ; TD /PY

DEPENDENT VARIABLE 50 TI
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 18
R**2 .99069281 RBAR**2 .98965868
SSR 14123.399 SEE 28.011307
DURBIN-WATSON 2.87284829
Q(10)= 5.78332 SIGNIFICANCE LEVEL .833127

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
1	CONSTANT	0	0	-22.27817	-.8487466	.4071686
2	EY	63	0	.1680237	.9506606	.3543680
3	EPY	68	0	13.74796	29.81059	.1562008E-15

DEPENDENT VARIABLE 120 R15
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 19
R**2 .94102945 RBAR**2 .93792573
SSR 68.671543 SEE 1.9011291
DURBIN-WATSON 1.19457966
Q(10)= 8.02799 SIGNIFICANCE LEVEL .626103

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
1	CONSTANT	0	0	-9.472555	-6.799306	.1718990E-05
2	Y	3	1	.1468511	17.41249	.3719377E-08

FINANCIAL SECTOR :

NOTE : R16 ; NDA - NDA(-1)
R17 ; (PYQ / PY) / (PYQ(-1) / PY(-1))
R18 ; (YQ * PYQ) - (YQ(-1) * PYQ(-1))
R19 ; BC * EXRM
R20 ; Y * PY

DEPENDENT VARIABLE 123 R16
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 15
R**2 .99396112 RBAR**2 .99194816
SSR 28925.730 SEE 43.913347
DURBIN-WATSON 2.46940515
Q(10)= 14.7710 SIGNIFICANCE LEVEL .140636

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	405.1909	3.180688	.6204329E-02
2	SUB	51	0	5.540957	5.995623	.2452341E-04
3	R17	124	0	-415.0582	-3.279113	.5071494E-02
4	R18	125	0	6.230907	7.458921	.2021370E-05
5	D1	56	0	-888.1491	-14.34730	.4082164E-08
6	D2	57	0	-166.1370	-5.260999	.9591219E-04

DEPENDENT VARIABLE 27 NFA
FROM 64- 1 UNTIL 84- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 18
R**2 .87564078 RBAR**2 .86192309
SSR 359443.92 SEE 141.31209
DURBIN-WATSON 2.26448538
Q(10)= 5.28479 SIGNIFICANCE LEVEL .871360

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	30.47812	.8532779	.4047173
2	R19	126	0	-.2599734E-02	-7.047044	.1419971E-05
3	D1	56	0	99.54271	.7278808	.4760492

DEPENDENT VARIABLE 28 DDCOM
FROM 64- 1 UNTIL 64- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 17
R**2 .99505688 RBAR**2 .99418456
SSR 9074.7471 SEE 23.104299
DURBIN-WATSON 1.25841360
Q(10)= 8.08635 SIGNIFICANCE LEVEL .620403

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	-6.062741	-.7921215	.4392042
2	WCD	58	0	64.02502	3.512557	.2670344E-02
3	DDCOM	28	1	1.158717	21.01871	.3719121E-08
4	D1	56	0	56.07725	1.775001	.9380391E-01

DEPENDENT VARIABLE 34 DT
FROM 64- 1 UNTIL 64- 1
OBSERVATIONS 21 DEGREES OF FREEDOM 17
R**2 .98967178 RBAR**2 .98784916
SSR 105600.16 SEE 78.814808
DURBIN-WATSON 2.93471991
Q(10)= 6.65477 SIGNIFICANCE LEVEL .757585

NO.	LABEL	VAR	LAG	COEFFICIENT	T-STATISTIC	SIGNIF LEVEL
***	*******	***	***	**********	**********	**********
1	CONSTANT	0	0	76.82616	2.729850	.1425721E-01
2	EPY	68	0	-171.0316	-8.190229	.2683781E-06
3	R20	127	0	.8398361	10.12562	.1660872E-07
4	D1	56	0	314.5510	2.719509	.1456896E-01

APPENDIX - 3

REDUCED FORMS OF MODEL

Reduced forms of the model are presented in matrix notation as:

$$y = B_i x + T_i y_{-1} \qquad i: \text{I for period-I, II for period-II}$$

$$y = \begin{vmatrix} YC \\ YS \\ YM \\ Y \\ L \\ PYM \\ PYA \\ PYS \\ PYC \\ PY \\ CP \\ IP \\ IM \\ IR \\ YD \\ FR \\ EM \\ MIN \\ E \\ M \\ BC \\ TI \\ TD \\ YG \\ GD \\ NDA \\ NFA \\ DDCOM \\ DT \\ DD \\ MS2 \\ CR \\ MB \end{vmatrix} \qquad x = \begin{vmatrix} \text{Constant} \\ PYQ \\ PIP \\ YQ \\ YA \\ IG \\ CG \\ TSC \\ W \\ CS \\ DCB \\ DDPR \\ MI \\ MC \\ EA \\ EQ \\ EXRM \\ EXRE \\ PMTL \\ BINV \\ RG \\ SUB \\ D1 \\ D2 \\ WCD \\ DIF \\ EXRE_{-1} \\ YQ_{-1} \\ PYQ_{-1} \end{vmatrix}$$

$$y_{-1} = \begin{vmatrix} YC_{-1} \\ YS_{-1} \\ Y_{-1} \\ L_{-1} \\ PYM_{-1} \\ PYA_{-1} \\ PY_{-1} \\ IP_{-1} \\ IM_{-1} \\ YD_{-1} \\ EM_{-1} \\ NDA_{-1} \\ DDCOM_{-1} \\ MS2_{-1} \end{vmatrix}$$

Matrix B_I

Number of columns:

1	2	3	4	5
5.4179	- 0.0022	0.0000	- 0.0131	- 0.0059
- 0.4451	- 0.0011	0.0000	1.3226	0.5936
27.6851	0.0000	0.0000	1.6503	0.1894
21.8221	- 0.0033	0.0000	3.9598	1.7773
694.3041	0.0000	0.0000	28.2603	3.2433
- 0.0887	0.0640	0.0000	0.0000	0.0000
8.0291	0.0524	0.0000	- 0.0614	- 0.0276
6.2617	0.0001	0.0000	0.0798	0.0358
0.4064	0.0446	0.0000	0.0000	0.0000
6.1962	- 0.0001	0.0000	0.0784	0.0352
2581.8459	- 0.0381	0.0000	38.4183	17.2443
1.4081	0.0000	0.0000	0.0000	0.0000
- 3.3662	0.0000	0.0000	0.0000	0.0000
4.7743	0.0000	0.0000	0.0000	0.0000
2823.6075	-0.0419	0.0000	42.2737	18.9748
- 147.3590	0.0057	31.4197	- 5.5522	- 2.4922
784.7232	- 2.6668	0.0000	25.5553	- 3.1105
6687.8093	0.0000	0.0000	142.9402	64.1486
784.7232	- 2.6668	0.0000	25.5553	- 3.1105
6687.8093	0.0000	0.0000	142.9402	64.1486
5903.0861	2.6668	0.0000	117.3849	67.2591
66.5733	- 0.0019	0.0000	1.7431	0.7825
- 0.3916	0.0001	0.0000	- 0.0463	- 0.0208
66.1817	- 0.0018	0.0000	1.6968	0.7617
- 66.1817	0.0018	0.0000	- 1.6968	- 0.7617
286.8181	- 30.6390	0.0000	32.7727	0.1489
- 486.7670	- 0.1797	0.0000	- 7.9117	- 4.5333
- 6.0627	0.0000	0.0000	0.0000	0.0000
1443.9127	- 0.0197	0.0000	23.5192	10.5551
- 6.0627	0.0000	0.0000	0.0000	0.0000
1437.8500	- 0.0197	0.0000	23.5192	10.5551
1636.9489	30.7990	0.0000	- 1.3418	14.9395
- 199.9489	- 30.8187	0.0000	24.8610	- 4.3844

Matrix B_I (continued)

Number of columns:

6	7	8	9	10
0.0000	0.0000	0.0000	- 0.0014	0.1E-4
0.0000	0.0000	0.0000	- 0.0007	0.3E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	-0.0021	0.1E-4
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0408	0.0000
0.0000	0.0000	0.0000	0.0334	- 0.0004
0.0000	0.0000	0.0000	- 0.4E-4	0.0003
0.0000	0.0000	0.0000	0.0284	0.0000
0.0000	0.0000	0.0000	- 0.4E-4	0.0003
0.0000	0.0000	0.0000	0.0201	0.0529
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0221	0.0582
1.0000	1.0000	1.0000	0.0431	- 0.0093
0.0000	0.0000	0.0000	- 1.7001	- 0.0001
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 1.7010	- 0.0001
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	1.7001	0.0001
0.0000	0.0000	0.0000	- 0.0009	0.0041
0.0000	0.0000	0.0000	0.2E-4	- 0.0002
0.0000	0.0000	0.0000	- 0.0009	0.0039
1.0000	1.0000	0.0000	0.0009	- 0.0039
0.0000	0.0000	0.0000	- 0.0002	0.0013
0.0000	0.0000	0.0000	- 0.1146	- 0.3E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0125	0.0009
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0125	1.0009
0.0000	0.0000	0.0000	0.1273	0.9996
0.0000	0.0000	0.0000	- 0.1148	0.0013

Matrix B_I (continued)

Number of columns:

11	12	13	14	15
0.1E-4	0.1E-4	0.0000	0.0000	0.0000
0.3E-5	0.3E-5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.1E-4	0.1E-4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.0004	- 0.0004	0.0000	0.0000	0.0000
0.0003	0.0003	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0003	0.0003	0.0000	0.0000	0.0000
0.0529	0.0529	0.0000	0.0000	0.0000
0.0000	0.0000	0.0053	0.0000	0.0000
0.0000	0.0000	0.0026	0.0000	0.0000
0.0000	0.0000	0.0027	0.0000	0.0000
0.0582	0.0582	0.0000	0.0000	0.0000
- 0.0093	- 0.0093	0.0053	0.0000	0.0000
- 0.0001	- 0.0001	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.0001	- 0.0001	0.0000	0.0000	1.0000
0.0000	0.0000	0.0000	1.0000	1.0000
0.0001	0.0001	1.0000	1.0000	- 1.0000
0.0041	0.0041	0.0000	0.0000	0.0000
- 0.0002	- 0.0002	0.0000	0.0000	0.0000
0.0039	0.0039	0.0000	0.0000	0.0000
- 0.0039	- 0.0039	0.0000	0.0000	0.0000
0.0013	0.0013	0.0000	0.0000	0.0000
- 0.3E-5	- 0.3E-5	- 0.0674	- 0.0674	0.0674
0.0000	0.0000	0.0000	0.0000	0.0000
0.0009	0.0009	0.0000	0.0000	0.0000
0.0000	1.0000	0.0000	0.0000	0.0000
1.0009	1.0009	0.0000	0.0000	0.0000
0.9996	0.9996	0.0674	0.0674	- 0.0674
0.0013	0.0013	- 0.0674	- 0.0674	0.0674

Matrix B_I (continued)

Number of columns:

16	17	18	19	20
0.0000	0.0015	0.0000	0.0552	0.0000
0.0000	- 0.1496	0.0000	- 0.5921	0.0000
0.0000	- 0.2998	0.0000	-11.2059	0.0000
0.0000	- 0.4479	0.0000	- 16.7429	0.0000
0.0000	- 5.1339	0.0000	- 191.8935	0.0000
0.0000	0.0000	0.0000	0.0027	0.0000
0.0000	0.0070	0.0000	0.2587	0.0000
0.0000	- 0.0091	0.0000	- 0.3373	0.0000
0.0000	0.0000	0.0000	0.0019	0.0000
0.0000	- 0.0089	0.0000	- 0.3315	0.0000
0.0000	- 4.3512	0.0000	- 162.4425	0.0000
0.0000	0.4384	0.0000	- 9.8286	0.0000
0.0000	0.2108	0.0000	- 4.7761	0.0000
0.0000	0.2276	0.0000	- 5.0525	0.0000
0.0000	- 4.7879	0.0000	- 178.7440	0.0000
0.0000	2.8321	0.0000	- 25.9168	0.0000
0.0000	- 5.8828	10.8230	- 219.9940	0.0000
0.0000	-226.8468	0.0000	- 598.1969	0.0000
1.0000	- 5.8828	10.8230	-219.9940	0.0000
0.0000	- 226.8468	0.0000	- 598.1969	0.0000
- 1.0000	-220.9640	- 10.8230	- 378.2029	1.0000
0.0000	- 0.1976	0.0000	- 7.3703	0.0000
0.0000	0.0053	0.0000	0.1959	0.0000
0.0000	- 0.1923	0.0000	7.1744	0.0000
0.0000	0.1923	0.0000	- 7.1744	0.0000
0.0000	- 0.0377	0.0000	- 1.4027	0.0000
0.0674	9.7031	0.7295	25.4909	- 0.0674
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 2.6604	0.0000	- 99.4442	0.0000
0.00000	0.0000	0.0000	0.0000	0.0000
0.0000	- 2.6604	0.0000	- 99.4442	0.0000
- 0.0674	- 12.3258	- 0.7295	-123.5324	0.0674
0.0674	9.6654	0.7295	24.0882	- 0.0674

Matrix B_I (continued)

Number of columns:

21	22	23	24	25
-0.0001	0.0000	- 1.4138	0.0139	0.1597
- 0.3E-4	0.0000	- 0.7090	- 1.4063	- 3.4943
0.0000	0.0000	0.0000	- 2.8181	- 7.1274
- 0.0001	0.0000	- 2.1228	- 4.2105	- 10.4620
0.0000	0.0000	0.0000	-48.2581	- 122.0519
0.0000	0.0000	2.0786	0.0000	- 3.6701
0.0028	0.0000	1.5643	0.0654	- 2.8634
- 0.0034	0.0000	0.0805	- 0.0849	- 0.1895
0.0000	0.0000	1.4490	0.0000	- 2.5584
- 0.0033	0.0000	0.0791	- 0.0834	- 0.1862
- 1.4906	0.0000	0.7388	- 40.8571	- 97.8157
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 1.6402	0.0000	0.8129	- 44.9572	- 107.6317
- 0.8069	0.0000	- 0.7582	5.9047	14.0235
0.0005	0.0000	1059.3420	- 55.2967	13.0870
0.0000	0.0000	0.0000	- 954.5944	- 384.4063
0.0005	0.0000	1059.5420	- 55.2967	13.0870
0.0000	0.0000	0.0000	- 954.5944	- 384.4063
- 0.0005	0.0000	- 1059.3420	899.2977	- 397.4933
- 0.0454	0.0000	0.7308	- 1.8539	- 4.3175
0.0019	0.0000	- 0.0467	0.0493	0.1100
0.9565	0.0000	0.6841	- 1.8046	- 4.2075
- 0.9565	1.0000	- 0.6841	1.8046	4.2075
- 0.0140	5.5410	- 887.8144	- 166.4899	- 0.7879
0.3E-4	0.0000	170.9424	- 60.0127	26.7910
0.0000	0.0000	56.0773	0.0000	64.0250
- 0.0098	0.0000	302.2797	- 25.0083	- 62.0806
0.0000	0.0000	56.0773	0.0000	64.0250
- 0.0098	0.0000	358.3570	- 25.0083	1.9444
0.0042	- 5.5410	1075.2290	201.4943	- 24.0587
- 0.0140	5.5410	- 716.8720	- 226.5026	26.0031

Matrix B_I (continued)

Number of columns:

26	27	28	29
- 0.0049	0.0000	0.0000	0.0000
0.4990	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
1.4941	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
- 0.0232	0.0000	0.0000	0.0000
0.0301	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0296	0.0000	0.0000	0.0000
14.4991	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
15.9541	0.0000	0.0000	0.0000
- 2.0955	0.0000	0.0000	0.0000
- 6.8268	11.2664	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
- 6.8268	11.2664	0.0000	0.0000
0.00000	0.0000	0.0000	0.0000
6.8268	- 11.2664	0.0000	0.0000
0.6579	0.0000	0.0000	0.0000
- 0.0175	0.0000	0.0000	0.0000
0.6404	0.0000	0.0000	0.0000
- 0.6404	0.0000	0.0000	0.0000
0.1252	0.0000	- 22.9451	- 40.5487
- 0.4601	0.7594	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
8.8742	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
8.8742	0.0000	0.0000	0.0000
9.2091	- 0.7594	22.9451	40.5487
- 0.3349	0.7594	- 22.9451	- 40.5487

Matrix T_I

Number of columns:

1	2	3	4	5
0.6496	- 0.0016	0.0001	- 0.0001	0.0401
0.3258	0.4800	0.3E-4	0.0057	0.0201
0.0000	0.0000	0.0000	0.0114	0.0000
0.9753	0.4784	0.0001	0.0170	0.0602
0.0000	0.0000	0.0000	0.7754	0.0000
0.0000	0.0000	0.0000	0.0000	- 0.3025
- 0.0151	- 0.0075	- 0.0065	- 0.0002	- 0.2480
0.0196	0.0097	0.0048	0.0003	0.0012
0.0000	0.0000	0.0000	0.0000	- 0.8262
0.0193	0.0095	0.0047	0.0003	0.0012
9.4607	4.6464	0.8067	0.1585	0.5854
0.0000	0.0000	0.0821	0.0000	0.0000
0.0000	0.0000	0.0904	0.0000	0.0000
0.0000	0.0000	- 0.0083	0.0000	0.0000
10.4101	5.1127	0.8876	0.1744	0.6442
- 1.3672	- 0.6717	0.2459	0.5576	- 0.0848
4.4563	- 2.1859	- 0.0005	0.2238	65.4576
0.0000	0.0000	0.0000	0.6148	0.0000
4.4563	- 2.1859	- 0.0005	0.2238	65.4576
0.0000	0.0000	0.0000	0.6148	0.0000
- 4.4563	2.1859	0.0005	0.3910	- 65.4576
0.4292	0.2110	0.0646	0.0070	0.0266
- 0.0114	- 0.0056	0.0212	- 0.0002	- 0.0007
0.4178	0.2054	0.0858	0.0068	0.0259
- 0.4178	- 0.2054	- 0.0858	- 0.0068	- 0.0259
0.0817	0.0402	0.0199	0.0013	0.0051
0.3004	- 0.1473	- 0.3E-4	- 0.0264	4.4118
0.0000	0.0000	0.0000	0.0000	0.0000
5.7927	2.8415	0.0137	0.1009	0.3576
0.0000	0.0000	0.0000	0.0000	0.0000
5.7927	2.8415	0.0137	0.1009	0.3576
5.4106	2.9486	- 0.0062	0.1260	- 4.0593
0.3821	- 0.1071	0.0199	0.0251	4.4169

Matrix T_I (continued)

Number of columns:

6	7	8	9	10
0.0000	0.0272	0.0000	- 0.0008	- 0.4E-7
0.0000	0.0136	0.0000	0.0784	- 0.3E-7
0.0000	0.0000	0.0000	0.1571	0.0000
0.0000	0.0408	0.0000	0.2347	- 0.1E-6
0.0000	0.0000	0.0000	10.6684	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.2761	0.1693	0.0000	- 0.0036	0.3E-5
0.0000	- 0.1254	0.0000	0.0047	- 0.2E-5
0.0000	0.5283	0.0000	0.0000	0.0000
0.0000	- 0.1232	0.0000	0.0046	- 0.2E-5
0.0000	- 21.4455	0.0000	2.2688	- 0.0004
0.0000	- 0.0961	0.4131	0.0000	0.0000
0.0000	- 0.1501	0.0000	0.1482	0.0000
0.0000	0.0540	0.4131	- 0.1482	0.0000
0.0000	- 23.5976	0.0000	2.4965	- 0.0004
0.0000	3.2833	0.4131	- 0.3277	- 0.1E-4
0.0000	- 0.1864	0.0000	3.0827	0.1E-5
0.0000	0.0000	0.0000	8.4730	0.0000
0.0000	- 0.1864	0.0000	3.0827	0.1E-5
0.0000	0.0000	0.0000	8.4730	0.0000
0.0000	0.1864	0.0000	5.3903	- 0.1E-5
0.0000	- 1.6869	0.0000	0.1027	- 0.3E-4
0.0000	0.0728	0.0000	- 0.0027	0.1E-5
0.0000	- 1.6141	0.0000	0.1000	- 0.3E-4
0.0000	1.6141	0.0000	- 0.1000	0.3E-4
0.0000	- 90.6858	0.0000	0.0195	- 0.1E-4
0.0000	- 0.0126	0.0000	- 0.3633	0.3E-7
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 0.1027	0.0000	1.3939	- 0.1E-4
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 0.1027	0.0000	1.3939	- 0.1E-4
0.0000	90.5957	0.0000	1.7377	- 0.4E-5
0.0000	- 90.6984	0.0000	- 0.3438	- 0.1E-4

Matrix T_I (continued)

Number of columns:

11	12	13	14
0.0000	0.0000	0.1E-4	- 0.1E-4
0.0000	0.0000	0.3E-5	- 0.3E-5
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.1E-4	- 0.1E-4
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	- 0.0004	0.0007
0.0000	0.0000	0.0003	- 0.0005
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0003	- 0.0005
0.0000	0.0000	0.0529	- 0.0882
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0582	- 0.0970
0.0000	0.0000	- 0.0093	0.0154
0.8650	0.0000	- 0.0001	0.0001
0.0000	0.0000	0.0000	0.0000
0.8650	0.0000	- 0.0001	0.0001
0.0000	0.0000	0.0000	0.0000
- 0.8650	0.0000	0.0001	- 0.0001
0.0000	0.0000	0.0041	- 0.0069
0.0000	0.0000	- 0.0002	0.0003
0.0000	0.0000	0.0039	- 0.0066
0.0000	0.0000	- 0.0039	0.0066
0.0000	0.0000	0.0013	- 0.0021
0.0583	0.0000	- 0.3E-5	0.3E-5
0.0000	0.0000	1.1587	0.0000
0.0000	0.0000	0.0009	- 0.0014
0.0000	0.0000	1.1587	0.0000
0.0000	0.0000	1.1596	- 0.0014
- 0.0583	0.0000	1.1583	0.0007
0.0583	0.0000	0.0013	- 0.0021

Matrix B_{II}

Number of columns:

1	2	3	4	5
- 5.7913	- 0.0004	0.0000	- 0.0033	- 0.0015
4.0561	- 0.0002	0.0000	1.3837	0.6210
37.0341	0.0000	0.0000	1.7624	0.2397
35.2989	0.0006	0.0000	4.1428	1.8592
854.3994	0.0000	0.0000	30.1799	4.1047
2.1667	0.0640	0.0000	0.0000	0.0000
2.5982	0.0523	0.0000	0.0448	0.1330
0.0367	0.1E-6	0.0000	- 0.0004	- 0.0002
1.9786	0.0446	0.0000	0.0000	0.0000
0.0782	0.1E-6	0.0000	- 0.0004	- 0.0002
13097.2724	- 0.0289	0.0000	199.7940	89.6592
- 0.4109	0.0000	0.0000	0.0000	0.0000
- 4.2785	0.0000	0.0000	0.0000	0.0000
3.8676	0.0000	0.0000	0.0000	0.0000
14428.8760	- 0.0318	0.0000	219.8437	98.6567
- 436.9508	0.0030	23.6487	- 20.7402	- 9.3071
966.0671	- 0.2776	0.0000	24.1646	- 2.0804
14540.3176	0.0000	0.0000	297.2445	133.3963
966.0671	- 0.2776	0.0000	24.1646	- 2.0804
14540.3176	0.0000	0.0000	297.2445	133.3963
13574.2505	0.2776	0.0000	273.0799	135.4767
- 15.2729	- 0.0001	0.0000	0.6905	0.3096
0.4611	- 0.1E-8	0.0000	0.4E-5	0.2E-5
- 14.8181	- 0.0001	0.0000	0.6995	0.3096
- 14.8181	0.0001	0.0000	- 0.6995	- 0.3096
3615.8494	45.0775	0.0000	342.1646	0.1E-5
- 9977.5645	- 0.1854	0.0000	- 182.3901	- 90.4849
- 6.0627	0.0000	0.0000	0.0000	0.0000
12205.5452	- 0.0268	0.0000	185.2808	83.1495
- 6.0627	0.0000	0.0000	0.0000	0.0000
12199.4825	- 0.0268	0.0000	185.2808	83.1495
18561.1976	- 44.9189	0.0000	25.5063	173.6344
- 6361.7115	44.8921	0.0000	159.7745	- 90.4849

Matrix B_{II} (continued)

Number of columns:

6	7	8	9	10
0.0000	0.0000	0.0000	- 0.0002	0.1E-5
0.0000	0.0000	0.0000	- 0.0001	0.3E-6
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0003	0.1E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0408	0.0000
0.0000	0.0000	0.0000	0.0333	- 0.4E-5
0.0000	0.0000	0.0000	0.3E-7	0.2E-5
0.0000	0.0000	0.0000	0.0284	0.0000
0.0000	0.0000	0.0000	0.3E-7	0.2E-5
0.0000	0.0000	0.0000	- 0.0144	0.0005
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0159	0.0005
1.0000	1.0000	1.0000	0.0016	- 0.2E-4
0.0000	0.0000	0.0000	- 0.1773	- 0.4E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.1773	- 0.4E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.1773	0.4E-5
0.0000	0.0000	0.0000	- 0.0001	0.3E-4
0.0000	0.0000	0.0000	- 0.3E-9	- 0.2E-7
0.0000	0.0000	0.0000	- 0.0001	0.3E-4
1.0000	1.0000	0.0000	0.0001	- 0.3E-4
0.0000	0.0000	0.0000	0.2E-9	0.1E-7
0.0000	0.0000	0.0000	- 0.1184	- 0.3E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0134	0.0001
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	- 0.0134	1.0001
0.0000	0.0000	0.0000	0.1050	1.0001
0.0000	0.0000	0.0000	- 0.1184	- 0.3E-5

Matrix B_{II} (continued)

Number of columns:

11	12	13	14	15
0.1E-5	0.1E,5	0.0000	0.0000	0.0000
0.3E-6	0.3E-6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.1E-5	0.1E-5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.4E-5	- 0.4E-5	0.0000	0.0000	0.0000
0.2E-5	0.2E-5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.2E-5	0.2E-5	0.0000	0.0000	0.0000
0.0005	0.0005	0.0000	0.0000	0.0000
0.0000	0.0000	0.0032	0.0000	0.0000
0.0000	0.0000	0.0016	0.0000	0.0000
0.0000	0.0000	0.0016	0.0000	0.0000
0.0005	0.0005	0.0000	0.0000	0.0000
- 0.2E-4	- 0.2E-4	0.0032	0.0000	0.0000
- 0.4E-5	- 0.4E-5	0.00000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.4E-5	- 0.4E-5	0.0000	0.0000	1.0000
0.0000	0.0000	0.0000	1.0000	1.0000
0.4E-5	0.4E-5	1.0000	1.0000	- 1.0000
0.3E-4	0.3E-4	0.0000	0.0000	0.0000
- 0.2E-7	- 0.2E-7	0.0000	0.0000	0.0000
0.3E-4	0.3E-4	0.0000	0.0000	0.0000
- 0.3E-4	- 0.3E-4	0.0000	0.0000	0.0000
0.1E-7	0.1E-7	0.0000	0.0000	0.0000
- 0.3E-5	- 0.3E-5	- 0.6679	- 0.6679	0.6679
0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0001	0.0000	0.0000	0.0000
0.0000	1.0000	0.0000	0.0000	0.0000
1.0001	1.0001	0.0000	0.0000	0.0000
1.0001	0.0001	0.6679	0.6679	- 0.6679
- 0.3E-5	- 0.3E-5	- 016679	- 0.6679	0.6679

Matrix B_{II} (continued)

Number of columns:

16	17	18	19	20
0.0000	0.0001	0.0000	0.0181	0.0000
0.0000	0.0218	0.0000	- 7.5478	0.0000
0.0000	- 0.0436	0.0000	- 15.0684	0.0000
0.0000	- 0.0654	0.0000	- 22.5981	0.0000
0.0000	- 0.7466	0.0000	- 258.0363	0.0000
0.0000	0.0000	0.0000	0.0027	0.0000
0.0000	- 0.0007	0.0000	- 0.2423	0.0000
0.0000	0.1E-4	0.0000	0.0023	0.0000
0.0000	0.0000	0.0000	0.0019	0.0000
0.0000	0.1E-4	0.0000	0.0023	0.0000
0.0000	- 3.1533	0.0000	- 1089.8104	0.0000
0.0000	0.0326	0.0000	- 7.9511	0.0000
0.0000	0.0159	0.0000	- 3.8637	0.0000
0.0000	0.0167	0.0000	11.8148	0.0000
0.0000	- 3.4697	0.0000	- 1199.1752	0.0000
0.0000	1.6093	0.0000	- 199.5632	0.0000
0.0000	- 0.7514	1.2195	- 259.7283	0.0000
0.0000	- 51.8585	0.0000	- 1620.6313	0.0000
1.0000	- 0.7514	1.2195	- 253.7283	0.0000
0.0000	- 51.8585	0.0000	- 1620.6313	0.0000
- 1.0000	- 51.1071	- 1.2195	- 1360.9030	1.0000
0.0000	- 0.0108	0.0000	- 3.7649	0.0000
0.0000	- 0.1E-6	0.0000	- 0.2E-4	0.0000
0.0000	- 0.0108	0.0000	- 3.7649	0.0000
0.0000	0.0108	0.0000	3.7649	0.0000
0.0000	0.7E-7	0.0000	0.2E-4	0.0000
0.6679	30.6074	0.8145	908.9471	- 0.6679
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 2.9248	0.0000	- 1010.6645	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 2.9248	0.0000	- 1010.6645	0.0000
- 0.6679	- 33.5322	- 0.8145	- 1919.6116	0.6679
0.6679	30.6074	0.8145	908.9471	- 0.6679

Matrix B_{II} (continued)

Number of columns:

21	22	23	24	25
- 0.1E-5	0.0000	- 0.1706	- 0.0035	0.0136
- 0.3E-6	0.0000	- 0.0855	- 1.4631	- 3.7186
0.0000	0.0000	0.0000	- 2.9210	- 7.4285
- 0.1E-5	0.0000	- 0.2561	- 4.3806	- 11.1335
0.0000	0.0000	0.0000	- 50.0202	- 127.2081
0.0000	0.0000	2.2553	0.0000	- 0.7819
0.0002	0.0000	1.8376	- 0.0473	- 0.7591
- 0.2E-5	0.0000	0.0007	0.0004	0.0012
0.0000	0.0000	1.5722	0.0000	- 0.5451
- 0.E-5	0.0000	0.0007	0.0004	0.0012
- 0.9093	0.0000	- 12.2159	- 211.2669	- 536.9080
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 1.0005	0.0000	- 13.4418	- 232.4680	- 590.7879
- 0.9088	0.0000	1.2593	21.9315	55.7339
0.4E-5	0.0000	1127.9378	- 50.3460	- 124.6440
0.0000	0.0000	0.0000	- 1625.6170	- 799.3341
0.4E-5	0.0000	1127.9378	- 50.3460	- 124.6440
0.0000	0.0000	0.0000	- 1625.6170	-799.3341
0.4E-5	0.0000	- 1127.9378	- 1575.2710	- 674.6901
- 0.3E-4	0.0000	- 0.0334	- 0.7304	- 1.8539
0.2E-7	0.0000	- 0.7E-5	- 0.4E-5	- 0.1E-4
1.0000	0.0000	- 0.0334	- 0.7304	- 1.8539
- 1.0000	1.0000	0.0334	0.7304	1.8539
- 0.1E-7	5.5410	- 888.1491	- 166.1370	0.8E-5
0.3E-5	0.0000	852.8924	1052.1235	450.6255
0.0000	0.0000	56.0773	0.0000	64.0250
- 0.0001	0.0000	303.1143	- 195.9166	-497.9266
0.0000	0.0000	56.0773	0.0000	64.0250
- 0.0001	0.0000	359.1916	- 195.9166	- 433.9016
- 0.0001	- 5.5410	394.4483	- 1081.9031	- 884.5271
0.3E-5	5.5410	- 35.2567	885.9865	450.6255

Matrix B_{II} (continued)

Number of columns:

26	27	28	29
- 0.0012	0.0000	0.0000	0.0000
0.5009	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
1.4997	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0161	0.0000	0.0000	0.0000
- 0.0001	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
- 0.0001	0.0000	0.0000	0.0000
72.3347	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
79.5936	0.0000	0.0000	0.0000
- 7.5095	0.0000	0.0000	0.0000
- 6.2118	1.9488	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
-6.2118	1.9488	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
6.2118	- 1.9488	0.0000	0.0000
0.2506	0.0000	0.0000	0.0000
0.1E-5	0.0000	0.0000	0.0000
0.2506	0.0000	0.0000	0.0000
-0.2506	0.0000	0.0000	0.0000
- 0.7E-6	0.0000	- 287.2382	- 51.3803
- 4.1489	1.3016	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
67.0731	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
67.0731	0.0000	0.0000	0.0000
71.2220	- 1.3016	287.2382	51.3803
- 4.1489	1.3016	- 287.2382	- 51.3803

Matrix T_{II}

Number of columns:

1	2	3	4	5
0.6520	- 0.0004	0.0001	- 0.1E-4	0.0072
0.3270	0.4806	0.3E-4	0.0059	0.0036
0.0000	0.0000	0.0000	0.0119	0.0000
0.9790	0.4802	0.0001	0.0178	0.0108
0.0000	0.0000	0.0000	0.7839	0.0000
0.0000	0.0000	0.0000	0.0000	- 0.3025
0.0106	0.0052	0.0006	0.0002	- 0.2469
- 0.0001	- 0.0001	0.0003	0.2E-5	- 0.1E-5
0.0000	0.0000	0.0000	0.0000	- 0.8262
- 0.0001	- 0.0001	0.0003	0.2E-5	- 0.1E-5
47.2130	23.1578	0.0622	0.8592	0.5208
0.0000	0.0000	0.0821	0.0000	0.0000
0.0000	0.0000	0.0904	0.0000	0.0000
0.0000	0.0000	- 0.0083	0.0000	0.0000
51.9509	25.4817	0.0684	0.9454	0.5731
- 4.9010	- 2.4039	3.2155	- 0.0892	- 0.0541
- 4.0550	- 1.9890	- 0.0004	0.2053	7.6744
0.0000	0.0000	0.0000	1.2805	0.0000
- 4.0550	- 1.9890	- 0.0004	0.2053	7.7644
0.0000	0.0000	0.0000	1.2805	0.0000
4.0550	1.9890	0.0004	1.0752	- 7.6744
0.1631	0.0800	0.0041	0.0030	0.0018
0.1E-5	0.1E-5	- 0.3E-5	- 0.2E-7	0.1E-7
0.1631	0.0800	0.0041	0.0030	0.0018
- 0.1631	- 0.0800	- 0.0041	- 0.0030	- 0.0018
- 0.1E-5	- 0.3E-6	0.2E-5	0.1E-7	- 0.1E-7
- 2.7083	- 1.3285	- 0.0003	- 0.7181	5.1257
0.0000	0.0000	0.0000	0.0000	0.0000
43.7842	21.4762	0.0120	0.7962	0.4830
0.0000	0.0000	0.0000	0.0000	0.0000
43.7842	21.4762	0.0120	0.7962	0.4830
46.4925	22.8047	0.0123	1.5143	- 4.6427
- 2.7083	- 1.3285	- 0.0003	- 0.7181	5.1257

Matrix T_{II} (continued)

Number of columns:

6	7	8	9	10
0.0000	0.0005	0.0000	- 0.0002	- 0.1E-5
0.0000	0.0002	0.0000	0.0821	- 0.3E-6
0.0000	0.0000	0.0000	0.1638	0.0000
0.0000	0.0007	0.0000	0.2457	0.1E-5
0.0000	0.0000	0.0000	10.7831	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000
- 0.2761	0.0162	0.0000	0.0026	0.1E-4
0.0000	- 0.0083	0.0000	- 0.2E-4	- 0.3E-5
0.0000	0.5283	0.0000	0.0000	0.0000
0.0000	- 0.0082	0.0000	- 0.2E-4	- 0.3E-5
0.0000	- 1.6055	0.0000	11.8500	- 0.0006
0.0000	- 0.0961	0.4131	0.0000	0.0000
0.0000	- 0.1501	0.0000	0.1482	0.0000
0.0000	0.2462	- 0.4131	- 0.1482	0.0000
0.0000	- 1.7666	0.0000	13.0392	- 0.0007
0.0000	- 3.5057	0.4131	- 1.2303	0.0002
0.0000	- 0.0029	0.0000	2.8230	0.4E-5
0.0000	0.0000	0.0000	17.6255	0.0000
0.0000	- 0.0029	0.0000	2.8230	0.4E-5
0.0000	0.0000	0.0000	17.6255	0.0000
0.0000	0.0029	0.0000	14.8025	- 0.4E-5
0.0000	- 0.1126	0.0000	0.0410	- 0.4E-4
0.0000	0.0001	0.0000	0.2E-6	0.3E-7
0.0000	- 0.1125	0.0000	0.0410	- 0.4E-4
0.0000	0.1125	0.0000	- 0.0410	0.4E-4
0.0000	11.5558	0.0000	- 0.1E-6	- 0.2E-7
0.0000	- 0.0019	0.0000	- 9.8866	0.3E-5
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 0.1757	0.0000	10.9887	- 0.0001
0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	- 0.1757	0.0000	10.9887	- 0.0001
0.0000	- 11.7296	0.0000	20.8753	- 0.0001
0.0000	11.5539	0.0000	- 9.8866	0.3E-5

Matrix T_{II} (continued)

Number of columns:

11	12	13	14
0.0000	0.0000	0.1E-5	- 0.1E-5
0.0000	0.0000	0.3E-6	- 0.3E-6
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.1E-5	- 0.1E-5
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	- 0.4E-5	0.1E-4
0.0000	0.0000	0.2E-5	- 0.4E-5
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.2E-5	- 0.4E-5
0.0000	0.0000	0.0005	- 0.0007
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0005	- 0.0009
0.0000	0.0000	- 0.2E-4	0.0003
0.8650	0.0000	- 0.4E-5	0.4E-5
0.0000	0.0000	0.0000	0.0000
0.8650	0.0000	- 0.4E-5	0.4E-5
0.0000	0.0000	0.0000	0.0000
- 0.8650	0.0000	0.4E-5	- 0.4E-5
0.0000	0.0000	0.3E-4	- 0.6E-4
0.0000	0.0000	- 0.2E-7	0.4E-7
0.0000	0.0000	0.3E-4	- 0.0001
0.0000	0.0000	- 0.3E-4	0.0001
0.0000	0.0000	0.1E-7	- 0.3E-7
0.5777	0.0000	- 0.3E-5	0.3E-5
0.0000	0.0000	1.1587	0.0000
0.0000	0.0000	0.0001	- 0.0001
0.0000	0.0000	1.1587	0.0000
0.0000	0.0000	1.1588	- 0.0001
- 0.5777	0.0000	1.1588	- 0.0001
0.5777	0.0000	- 0.3E-5	0.3E-5

APPENDIX - 4

EX - POST SIMULATION OF MODEL

Note: xxx: actual values, Fxxx: fitted values,

$$Rxxx = \frac{Fxxx - xxx}{xxx} \cdot 100$$

ENTRY	YC 1	FYC 34	RYC 67
77- 1	11.7830	11.2667	-4.38162
78- 1	12.2710	11.6569	-5.00472
79- 1	12.7860	11.9790	-6.31193
80- 1	12.8850	12.3326	-4.28746
81- 1	12.9390	12.3117	-4.84798
82- 1	13.0000	12.3893	-4.69783
83- 1	13.0790	12.4380	-4.90076
84- 1	13.1190	12.5508	-4.33131

ENTRY	YS 2	FYS 35	RYS 68
77- 1	85.6080	103.935	21.4085
78- 1	89.0750	107.976	21.2193
79- 1	88.7770	109.041	22.8262
80- 1	88.5090	106.979	20.8679
81- 1	94.1230	107.717	14.4428
82- 1	97.5530	111.853	14.6589
83- 1	101.849	122.999	20.7658
84- 1	107.756	114.233	6.01047

ENTRY	YM 3	FYM 36	RYM 69
77- 1	35.5470	44.9397	26.4234
78- 1	36.8180	47.9615	30.2665
79- 1	34.8810	46.0170	31.9257
80- 1	32.9910	43.8406	32.8866
81- 1	35.8530	47.0941	31.3533
82- 1	37.6690	47.6348	26.4562
83- 1	41.2310	50.0507	21.3909
84- 1	45.3010	51.6642	14.0465

ENTRY	Y 4	FY 37	RY 70
77- 1	203.358	230.562	13.3773
78- 1	209.183	238.613	14.0692
79- 1	208.343	238.936	14.6842
80- 1	206.121	234.888	13.9564
81- 1	214.672	238.880	11.2767
82- 1	224.543	248.198	10.5348
83- 1	231.793	281.122	21.2813
84- 1	244.803	257.075	5.01285

ENTRY		L 5	FL 38	RL 71
77-	1	2191.30	2939.00	34.1213
78-	1	2206.10	3095.35	40.3089
79-	1	2152.40	3051.66	41.7792
80-	1	2204.80	2968.40	34.6334
81-	1	2228.40	3052.00	36.9590
82-	1	2264.80	3067.34	35.4352
83-	1	2327.20	3120.71	34.0973
84-	1	2439.00	3183.50	30.5248

ENTRY		PYM 6	FPYM 39	RPYM 72
77-	1	3.64889	8.38313	129.745
78-	1	6.30319	11.6222	84.3852
79-	1	11.9462	16.1179	34.9206
80-	1	26.3964	30.6584	16.1461
81-	1	36.6731	40.5858	10.6691
82-	1	48.1237	53.6945	11.5760
83-	1	62.9376	67.3345	6.98611
84-	1	89.2058	94.3033	5.71431

ENTRY		PYA 7	FPYA 40	RPYA 73
77-	1	5.21036	12.4449	138.850
78-	1	6.95836	14.3661	106.458
79-	1	10.4630	16.3573	56.3347
80-	1	20.4348	19.1719	-6.18017
81-	1	29.2607	19.4273	-33.6060
82-	1	34.8307	20.5465	-41.0105
83-	1	42.8034	26.1439	-38.9210
84-	1	66.0190	34.0775	-48.3823

ENTRY		PYS 8	FPYS 41	RPYS 74
77-	1	4.39495	14.5418	230.876
78-	1	6.19005	15.8700	156.379
79-	1	10.8788	17.2436	58.5068
80-	1	21.6441	25.2426	16.6254
81-	1	30.5111	30.8005	.948375
82-	1	39.7712	39.0521	-1.80799
83-	1	50.8904	43.4869	-14.5480
84-	1	72.2971	53.6672	-25.7686

ENTRY	PYC 9	FPYC 42	RPYC 75
77- 1	3.57260	6.31773	76.8385
78- 1	5.21490	8.59879	64.8890
79- 1	8.12076	11.0991	36.6752
80- 1	16.5335	20.1414	21.8218
81- 1	22.0584	23.9985	8.79542
82- 1	27.4664	31.6297	15.1579
83- 1	34.2220	38.5417	12.6226
84- 1	50.6618	53.9343	6.45945

ENTRY	PY 10	FPY 43	RPY 76
77- 1	4.29240	1.35345	-68.4687
78- 1	6.17029	2.04183	-66.9087
79- 1	10.5572	3.46484	-67.1804
80- 1	21.5172	12.0094	-44.1872
81- 1	30.5284	17.4886	-42.7138
82- 1	38.9015	25.4633	-34.5440
83- 1	49.5494	30.1216	-39.2089
84- 1	71.3161	42.7201	-40.0975

ENTRY	CP 11	FCP 44	RCP 77
77- 1	599.200	198.225	-66.9185
78- 1	913.200	295.323	-67.6607
79- 1	1550.00	510.295	-67.0770
80- 1	3187.30	1992.20	-37.4958
81- 1	4675.50	3013.16	-35.5542
82- 1	6208.80	4748.58	-23.5186
83- 1	8428.10	6300.04	-25.2495
84- 1	12987.8	7627.56	-41.2714

ENTRY	IP 12	FIP 45	RIP 78
77- 1	34.0350	36.8134	8.16324
78- 1	31.9730	35.0202	9.53039
79- 1	28.2510	34.4853	22.0676
80- 1	23.3720	32.4092	38.6668
81- 1	21.3440	31.1612	45.9951
82- 1	22.5070	30.5339	35.6640
83- 1	23.5830	30.9977	31.4408
84- 1	24.8560	32.1085	29.1783

ENTRY	IM 13	FIM 46	RIM 79

77- 1	18.6150	19.1904	3.09089
78- 1	16.2353	18.7635	15.5723
79- 1	14.3757	18.6652	29.8387
80- 1	14.0499	17.6311	25.4899
81- 1	13.0962	16.7385	27.8116
82- 1	11.9542	16.2048	35.5569
83- 1	11.8235	15.6599	32.4471
84- 1	11.3742	15.2449	34.0300

ENTRY	IR 14	FIR 47	RIR 80
77- 1	15.4200	17.6230	14.2866
78- 1	15.7377	16.2566	3.29745
79- 1	13.8753	15.8201	14.0162
80- 1	9.32215	14.7781	58.5264
81- 1	8.24778	14.4227	74.8679
82- 1	10.5528	14.3291	35.7853
83- 1	11.7595	15.3378	30.4291
84- 1	13.4818	16.8637	25.0850

ENTRY	YD 15	FYD 48	RYD 81
77- 1	689.134	235.381	-65.8439
78- 1	986.850	342.224	-65.3216
79- 1	1684.07	578.768	-65.6328
80- 1	3509.91	2209.38	-37.0530
81- 1	5140.70	3332.81	-35.1682
82- 1	7283.75	5242.37	-28.0265
83- 1	9180.20	6949.53	-24.2987
84- 1	14175.6	8410.26	-40.6709

ENTRY	FR 16	FFR 49	RFR 82
77- 1	60.4000	228.679	278.608
78- 1	34.1000	233.371	584.374
79- 1	46.5000	425.599	815.267
80- 1	244.100	809.774	231.739
81- 1	230.600	1162.44	404.094
82- 1	187.700	1371.38	630.621
83- 1	475.600	1636.67	244.179
84- 1	611.400	2110.27	245.153

ENTRY	EM 17	FEM 50	REM 83
77- 1	585.800	902.136	54.0007
78- 1	621.300	933.182	50.1983

79- 1	785.100	937.912	19.4640
80- 1	1047.40	1087.90	3.86651
81- 1	2290.10	2688.11	17.3798
82- 1	3429.40	3879.39	13.0924
83- 1	3658.30	4973.31	35.9460
84- 1	5144.60	5578.87	8.44120

ENTRY	MIN 18	FMIN 51	RMIN 84
77- 1	3363.00	9767.65	190.445
78- 1	2876.00	8999.61	212.921
79- 1	3377.00	8852.12	162.130
80- 1	5916.00	9554.15	61.4968
81- 1	6547.00	11504.5	75.7224
82- 1	6338.00	12139.5	91.5359
83- 1	6675.00	10921.3	63.6156
84- 1	7624.00	8839.00	15.9365

ENTRY	E 19	FE 52	RE 85
77- 1	1753.00	2069.34	18.0454
78- 1	2288.20	2600.08	13.6300
79- 1	2261.20	2414.01	6.75799
80- 1	2910.10	2950.60	1.39163
81- 1	4702.90	5100.91	8.46317
82- 1	5746.00	6194.99	7.81397
83- 1	5727.80	7042.81	22.9584
84- 1	7133.60	7567.87	6.08761

ENTRY	M 20	FM 53	RM 86
77- 1	5796.30	12200.9	110.495
78- 1	4599.00	10722.6	133.151
79- 1	5311.40	10786.5	103.082
80- 1	7667.40	11305.6	47.4496
81- 1	8933.40	13890.9	55.4945
82- 1	8842.70	14644.2	65.6083
83- 1	9235.00	13481.3	45.9810
84- 1	10756.9	11971.9	11.2951

ENTRY	BC 21	FBC 54	RBC 87
77- 1	3385.00	9473.31	179.862
78- 1	1418.00	7229.73	409.854
79- 1	1186.00	6508.30	448.761
80- 1	3210.00	6807.65	112.076

81- 1	2084.00	6643.53	218.788
82- 1	835.000	6187.55	641.024
83- 1	1828.00	4759.33	160.357
84- 1	1407.00	2187.73	55.4893

ENTRY	TI 22	FTI 55	RTI 88
77- 1	78.7800	35.0634	-55.4920
78- 1	104.800	45.8900	-56.2214
79- 1	169.620	65.4977	-61.3856
80- 1	279.080	182.288	-34.6827
81- 1	422.530	258.287	-38.8714
82- 1	479.000	369.489	-22.8624
83- 1	785.000	439.062	-44.0685
84- 1	988.000	608.226	-38.4386

ENTRY	TD 23	FTD 56	RTD 89
77- 1	89.4700	26.0989	-70.8295
78- 1	141.620	41.6548	-70.5869
79- 1	235.870	73.6499	-68.7752
80- 1	470.770	253.793	-46.0897
81- 1	767.670	363.878	-52.5997
82- 1	826.000	561.790	-31.9867
83- 1	1149.00	708.243	-38.3601
84- 1	1381.00	1049.97	-23.9706

ENTRY	YG 24	FYG 57	RYG 90
77- 1	183.760	76.6723	-58.2759
78- 1	303.870	144.985	-52.2873
79- 1	515.450	249.108	-51.6718
80- 1	925.240	611.471	-33.9122
81- 1	1412.90	844.864	-40.2035
82- 1	1451.30	1077.58	-25.7508
83- 1	2305.00	1518.30	-34.1299
84- 1	3292.80	2571.99	-21.6525

ENTRY	GD 25	FGD 58	RGD 91
77- 1	52.9510	160.039	202.239
78- 1	22.5410	181.426	704.972
79- 1	38.7410	305.083	687.495
80- 1	135.853	449.622	230.962
81- 1	164.842	732.878	344.594
82- 1	589.884	963.605	63.3550

83- 1	327.352	1114.05	240.321
84- 1	422.709	1133.52	168.155

ENTRY	NDA 26	FNDA 59	RNDA 92
77- 1	216.760	4531.27	1990.45
78- 1	304.220	4464.82	1367.63
79- 1	460.530	3966.56	748.275
80- 1	846.970	4262.50	403.264
81- 1	1142.15	4048.68	254.479
82- 1	1510.87	3814.03	152.443
83- 1	2179.94	4002.43	83.6027
84- 1	4379.62	5040.98	15.1009

ENTRY	NFA 27	FNFA 60	RNFA 93
77- 1	-65.1800	-7302.37	11103.4
78- 1	-88.1300	-5826.94	6511.76
79- 1	-136.910	-5381.86	3830.95
80- 1	-368.470	-5731.39	1455.46
81- 1	-327.300	-5644.74	1624.64
82- 1	-321.720	-5527.35	1618.06
83- 1	-609.750	-4802.91	687.684
84- 1	-1660.70	-3595.94	116.532

ENTRY	DDCOM 28	FDDCOM 61	RDDCOM 94
77- 1	62.9530	93.7580	49.9334
78- 1	86.0330	108.157	25.7160
79- 1	154.480	142.821	-7.54714
80- 1	286.019	224.416	-21.5380
81- 1	458.468	439.543	-4.34608
82- 1	651.235	644.069	-1.10034
83- 1	806.060	847.323	5.11906
84- 1	1042.64	1028.43	-1.36278

ENTRY	DT 29	FDT 62	RDT 95
77- 1	34.4000	10346.3	29976.4
78- 1	44.4100	10723.8	24047.2
79- 1	83.3100	10774.2	12832.0
80- 1	177.940	10808.8	5974.43
81- 1	665.150	11440.3	1619.95
82- 1	1212.23	12058.4	894.728
83- 1	1347.47	13648.5	912.901
84- 1	2926.33	12891.1	340.521