BUDGET DEFICITS

AND

INFLATION IN TURKEY

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ABSTRACT

In this study , using an econometric model , the relationship between rate of change in price level and budget deficits in Turkey is investigated for the sample period 1980 - 1986 . For this purpose , a detailed analysis of different categories of government expenditures and revenues is made .

ÖZET

Bu çalışmada, ülkemizde 1980 – 1986 döneminde artan bütçe açıklarıyla enflasyonun ilişkisi ekonometrik bir model çerçevesinde çözümlenmektedir. Çalışmada, bütçe gelir ve harcamalarını oluşturan kalemlerin fiyat seviyesinde meydana gelen değişikliklerle ilişkileri detaylı olarak incelenmektedir.

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I . INTRODUCTION

It is generally accepted that inflation causes economic instability and thus reduces efficiency and in the long-run retards the growth of the economy.Today the persistence of inflation is likely to be a major policy issue.Therefore , the reasons of inflation have become major points in the planning of the economic matters of both developed and developing countries.

The reality of accelerating inflation has significantly complicated the policy programme of the government decision makers.It is known that while fiscal policy serves as an important element of price stabilization policy , its main instruments ; namely , government revenue and expenditure, are themselves affected by the inflationary process.It is said that inflation raises the cost of government services and investment,increases the budgetary demands for distributional transfers, while simultaneously increasing amount of revenue collected.In this process,however,the important point is that,all of these fiscal effects of inflation are not realized at the same time.Different categories of government revenues and expenditures respond at different speeds to price changes.

There are some studies on this subject. One of them is the study of Aghevli and Khan (1978). In this study they say that total government expenditure adjusts more rapidly than revenue to a change in the price level and in such a way that a procyclical bank-financed budgetary deficit emerges.

1

Testing the Aghevli - Khan hypothesis for a sample of twenty-four developing countries , however , Heller (1980 : 712-748) concluded that the net impact of inflation on the budget deficits is not generally predictable.

On the other hand , Tanzi (1977 : 154-167) in his study, looked at the revenue side of the problem. He concluded that, for developing countries the problem originates in an "inflation induced fall" in real revenue and in many cases, this fall becomes a contributing factor to the inflationary process when governments finance the fiscal deficits by printing money.

In Turkey there is a rising fiscal deficit . This is partly due to the governments' unwillingness to levy sufficient taxes to cover expenditures; and partly, to the fact that nominal value of revenues which have been assessed some time in the past, do not increase with price level whereas nominal government expenditures do.

This study attempts to provide a theoretical and an empirical analysis of the relative speed of adjustment of different types of revenue an expenditure to inflation in Turkey.In so doing , it provides an empirica test of the accuracy of the Aghevli - Khan hypothesis in describing the fiscal experience of Turkey over the 1980 - 1986 period .

In present study Chapter II reviews recent economic developments in Turkey; in the second part of the chapter ,budget practices during the 1980-1986 period are summarized. Chapter III deals with the theoretical framework. In Chapter IV the model is tested and the estimation results obtained for Turkey are given. Chapter V entails summary and conclusions . The graphical illustrations of some of the data can be found in the relevant chapters.

II. DEVELOPMENTS IN TURKEY

(1960-1986)

I - GENERAL ECONOMIC SITUATION

Turkish economy has been stabilized for a while following the 1958 stabilization measures and the important political changes of 1960. Over all , compared with other developing countries, economic growth performance during 1960s and most of 1970s has been good. GDP increased at an average annual rate of 6.4 percent during the First Plan period (1963 - 1967) , 6.7 percent during the Second Plan (1968 -1972) , 7.2 percent during the Third Plan period (1973-1977). This compares favorably with a sample of 55 middle income developing countries, which grew at an average annual rate of 6.0 percent during the period of 1960 - 1970 and 6.1 percent during the period 1970-1977 . (World Bank Country Study ,1980 : i)

In the Planned Period , a relatively stable economic policy has been followed. Yearly price increases have fluctuated around an average of 6 % till 1970 . However , towards 1970s , as inflationary policies began to be applied to finance the public sector , prices started to increase faster and balance of payments deterioration started. As the rate of inflation accelerated,several measures ; were adapted to prevent it.These were mainly a new major devaluation of the Turkish Lira and pas -

sage of the Financement Law to support public sector financial sources.

These measures were effective in the first years of 1970s. With devaluation, exports and workers remittances were induced and the balance of payments recorded a surplus for the first time since the unusual surpluses of the Second World War.

Unfortunately in public sector financing, in spite of new tax laws, no healty adjustment could be achieved. Beginning with the year 1971, increasing current and transfer expenditures were not from healty sources. Increasing public sector deficits affected the distribution of the Central Bank Credits and the role of the Central Bank in financement of the public sector .

There were two major developments in the international economy during the 1974-1977 period , which had an adverse effect on Turkish economy :

(1) the sharp increase in oil prices in 1974 , and

(2) the simultaneous existence of recession, inflation and rising unemployment in the industrial countries.

Both of these factors played a major part in the deterioration of Turkish economic situation. More over, domestic policy responses to these developments played at least as important a role. (World Bank, Country Study, 1980:i) The sharp

5

worsening of the international environment coincided with a strong Turkish effort to raise the rate of GDP growth.This resulted in a rapid increase in investment and consumption expenditures spearheaded essentially by the public sector. The growth rate of public investment in 1974-1977 was four and half times higher than in 1970-1973 ; and the growth rate of public consumption nearly doubled.The budget deficit, as a percentage of GDP , increased ; the rate of increase of money supply accelerated to finance this acceleration of expenditures ,there was a sharp increase in the rate of inflation .(World Bank Country Study , 1980 : ii)

These developments in the domestic economy were accompanied by and related to unfavorable developments in the balance of payments . While imports continued to increase rapidly , there was a decline in volume of exports and only a slow growth in their value . This result can be explained by the unfavorable economic situation in the importing countries ,as well as increased domestic absorption of output. On the other hand,about half of the explosive import growth went to sustain a booming economy.The decline in the workers' remittances, caused partly by worsening recession in Western Europe made the situation worse. As a reaction to this situation the governments attempted to keep the domestic boom going through external borrowing ,which was mainly short-term.According to World Bank report for Turkey short-term external debt, which was $ 219 million in 1974 , and $ 1.4 billion in 1975 ,increased to $ 6.6 billion by the end of 1977 . As a result , a confidence crisis developed ,the in flow

of external capital dried up ,and the boom collapsed by mid 1977.

In early 1978 a stabilization program was announced which had only mixed success. The current account deficit of $ 1.7 billion in 1978 was less than half of the $ 3.6 billion deficit in 1977.The Consolidated Budget deficit was about the half of the deficit in 1977 (1977 : TL 48 billion and 1978 : TL 27 billion); but losses of State Economic Enterprises were significantly higher.The inflation worsened . Prices increased at an average annual rate of 50 percent in 1978 . In March 1979 a new stabilization program was announced and distributed in subsequent months.Inflation continued to increase and at the end of the year it reached 64 per cent.

Because of the insufficiency of measures taken in 1978-1979 crises a new set of economic policy measures were adapted beginning January 1980.The most important characteristic of the new policy was that it relied on completely free market forces and price mechanism.Market imperfections were expected to be corrected by the market forces . The main duty of the government was to manage money supply and public expenditure so as to increase output at the rate of demand expansion.

In the 1980-1986 period,Turkey has gone through a series of structural changes as a result of the new economic policy.Trade strategy has shifted from interventionist import substitution to a much more market-oriented outward orientation.A substantial effort is under way to rationalize tax structure .In January 1980

- 1983 the aim of the finance policy was to decrease tax burden over capital in general,distribute this burden over various sectors according to the requirements of the political conjuncture. In this period in which privatization was intended to be implemented gradually and rapid falls in tax incomes could not be ventured , tax laws were manipulated at short intervals.

On the other hand , after December 1983 , sixteen bills, making amendments to tax laws were enacted. Through the aforementioned laws , two amendments to the income tax ,one to the corporation tax, two to the tax procedural law, were made.Value Added Tax and Petroluem Consumption Tax bills were enacted. A legal basis was formed for abolishing additional financial liabilities ,other than taxes ,on foreign trade transactions . Implementation of tax rebates to the wage earners started . (TUREL , 1985 : 114)

The tax reforms introduced since 1981 have changed the tax structure both by lowering taxes on income directly (with the introduction of Value Added Tax),and by placing a greater reliance on indirect taxation.During the 1970-1980 period there was a marked increase in income tax revenues and declining shares of revenues from taxes on goods and services and external trade.This trend was reversed in 1985 with the introduction of VAT and the elimination of most producer and sales taxes.

The interest and exchange rate policies of the seventies that brought high growth at the cost of unsustainable external

debt accumulation ;and in the end ,accelareting inflation were changed .In the 1980 model Turkish economy ,interest rate and foreign exchange rates were the major tools . While high interest rate policy was favored domestically , value of the Turkish Lira was let to fall to more realistic levels.Consequently prices started to rise.

II - BUDGET PRACTICES

Budget practices have an important role in directing the economy. It is admitted that the public sector deficits, especially the budget deficits are the main factors activating inflation or speeding up the existing one. While the budget expenditures expand parallel to inflation, budget revenues cannot adapt to this expansion and as a result the budget deficits occur.

Since this fact forms the basis of our study, it is considered to be appropriate to study the development of budget practices during the 1980-1986 period ,to which, our model is applied . (All figures are given according to the new budget regulations, which do not cover internal and external borrowing as revenue and their principal payments as expenditure. Source of figures are Ministry of Finance and Customs Annual Reports and Public Accounts Bulletins and The Central Bank of The Republic of Turkey Annual Reports.)(*)

1980

The year 1980 was a transition year, with a number of important adjustment measures taken. Consolidated budget revenues programmed to be TL. 694 billion at the beginning of 1980 was realized as TL. 915 billion with an increase of TL. 221 billion. The largest contribution to this increase came from tax revenues which increased by 35 % .

(*) In the text it will refered to as the Central Bank Annual Reports

Consolidated uses were also realized above the targets. The expenditures exceeded the programme by TL. 339 billion and reached TL. 1 trillion 78 billion. Within the expenditure items, current expenditures form the largest item increasing 87% from a year earlier. Transfers are on the second level with an amount of TL. 395 billion. At the end of 1980 there was no important change in the share of the investment expenditures which has gradually decreased within the total expenditures since 1978, and was realized by 20 % of the expenditures.

Although consolidated revenues and expenditures were realized above the program targets, the Consolidated Budget was closed with a deficit of TL. 163 billion at the end of 1980 fiscal year since the increase in expenditures were more than that in revenues. This deficit was financed by the Central Bank sources to a great extent and a short-term advance of net TL. 103 billion was utilized.

1981

During the preparation and implementation phase of the 1981 budget efforts were made to eliminate budget deficits with its pressure on the one hand , and to control inflation by ensuring an effective income distribution through new tax measures and well controlled public expenditures , on the other hand.

In 1981, deep-rooted adjustments were made in tax laws. Further more, the scope of taxation was expanded and measures

11

were taken for accelarating collection of tax revenues. The adjustments made were as follows;(Central Bank Annual Report, 1981 : 78)

a-Revisions on taxes imposed on incomes:

-Minimum wage exemptions, progressive tax table, and a new principle of classification which recognizes some privileges to wage earners were revised.

-Decrees on investments and export promotion were revised.

-Taxation of agricultural incomes was made more effective by the lump sum tax scheme.

-Tax immunities and exceptions which were no longer practical were either annulled or duly amended.

-Tax rates were rearranged to encourage institutionaliza - tion.

-Scope of taxation was enlarged to cover additional activi ties and transactions.

-A serious step was taken to annul the practice of financial balance tax.

b- Revisions on expenditures and service taxes:

-Tax rates were decreased for some taxable goods.

-Taxes on vehicles and vehicle purchases were increased.

-Stamp tax and duties were rearranged.

-Coverage of excise tax was extended and a uniform, low tax rate was introduced for all establishments.

In addition to these above mentioned modifications, further significant changes were made on the tax on wealth, on the law on collection of public claims, and on the law on tax procedures.

As a result of these implementations the total tax revenues reached TL. 1190 billion, increasing 58.7% from a year earlier. If we take into consideration the inflation rate of about 36.8 % in 1981, we can realize the real increase in tax revenues. The share of tax revenues in the total Consolidated Budget Revenues was 82 % .

The growth rate of expenditures which was 80.6 % in 1980 dropped to 40.5 % . TL. 603 billion current expenditures form the largest part of the consolidated expenditures realized as TL. 1516 billion. Whereas transfer expenses of TL. 553 billion comes second .

The Consolidated Budget deficit comes out to be TL. 64 billion at the end of this year. Compared to the TL. 63 billion of the previous year , this positive development was attributable to adjustments made in budget expenditures as well as the increases in budget revenues. It is an obvious fact that in 1981 Central Bank sources were utilized less for financing the budget deficit. The use of net short-term advances was TL. 39 billion (this is 62.1 % less than of 1980) .

1982

The Consolidated Budget of the 1982 fiscal year which was arranged to be 10 months to make the calender year and the fiscal year identical, was closed with a deficit of TL. 145 billion. Total expenditure was recorded as TL. 1 trillion 450 billion. Current expenditures, were again the biggest expenditure item forming 42.8 % of total expenditures with a amount of TL. 686 billion. Transfer expenditures dropped by 4.15 % from a year earlier. Investment expenditures totalled TL. 386 billion indicating a 7.2 % increase.

The tax incomes which increased 9.7 % from that of 1981 show a real slowdown when compared to the inflation rate of 25.5 % . However, as the budget was prepared for a period of 10 months, it would not be right to compare it with the 1981 budget of 12 months.

In order to combat inflation, Central Bank sources were not used much. Some other sources were used instead. Despite the increase in budget deficits, there is a reduction in the use of short - term advances by 17.9 % . On the contrary, net internal borrowing has increased by 12 % and net revenues from Treasury Bills by 94.7 % . (Central Bank Annual Report, 1985:92).(See Figure II.1)

FINANCING SOURCES IN BUDGET DEFICIT
(Percentage Shares)
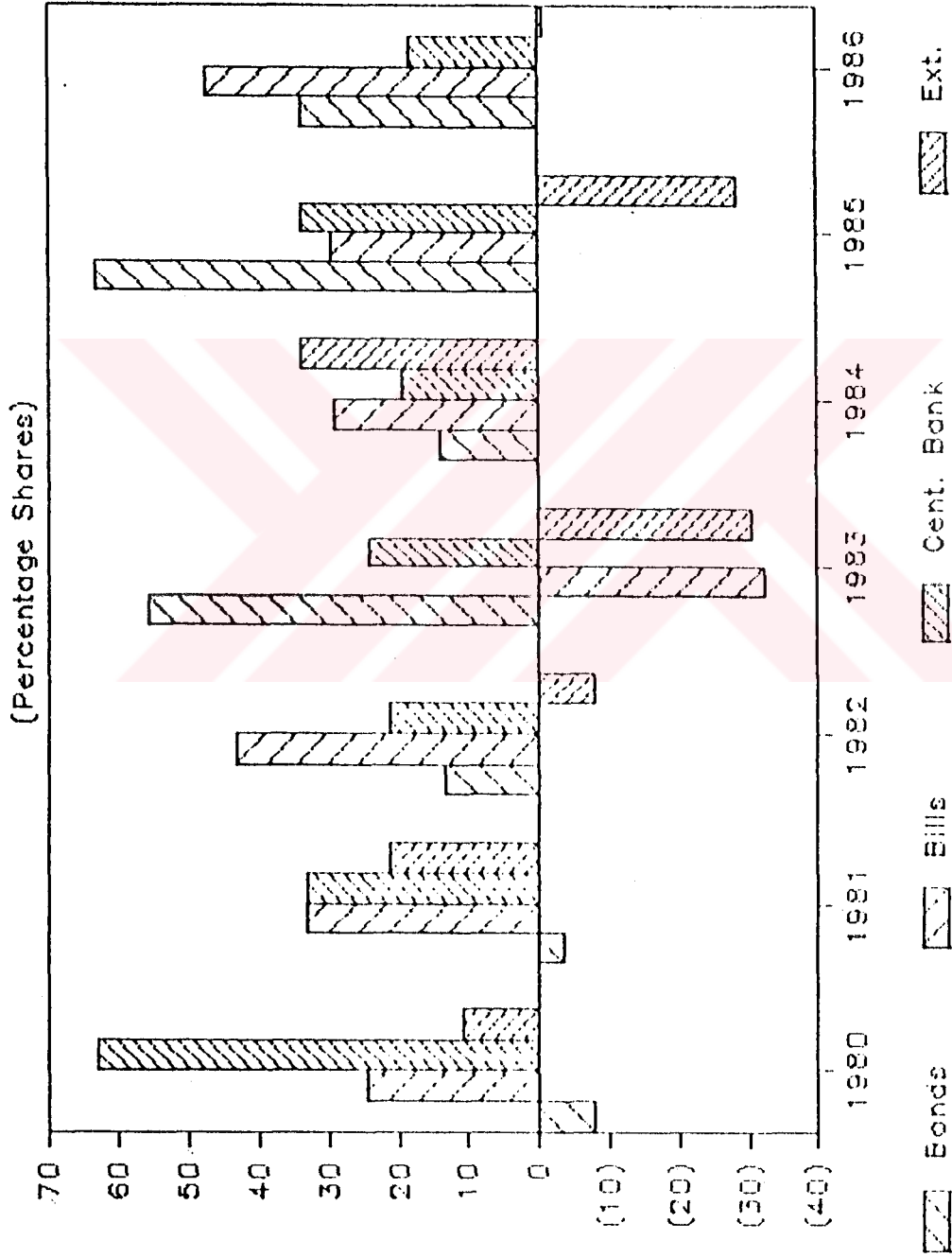
SOURCE : THE UNDERSECRETARIAT OF TREASURY AND FOREIGN TRADE.

1983

In the 1983 budget,which was aimed at combating inflation, a revenue of TL. 2324 billion was collected. TL. 1938 billion of which was tax revenues (approximately 83.3 %). During th 1983 fiscal year,efforts were made to improve the taxation system and tax administration:(Central Bank Annual Report ,1983 :62)

The restructured income tax law allowed reduction in the tax rate for low income earners. In this year, in order to reduce the tax burden,the tax rate for personal incomes below TL. 1 million was reduced from 39 % to 36 %, the corporate tax rate , on the other hand, was lowered from 50 percent to 40 percent. In addition to this, the Fiscal Balance Tax has been abolished.

The measures taken to prevent tax evasion and losses have not produced the expected results . The total tax burden declined to 16.7 percent from 18.2 percent in 1981 and 14.9 percent in 1982 (in 1982 for 10 months).

As a result of Consolidated Budget practices in 1983, total expenditures reached the level of TL. 2612 billion, increasing by 63.1 % over that of 1982. There is an significant increase in the transfer expenditures (nearly 96.2 %). The biggest share in this growth belongs to internal and external debt interest payments increasing by 239.6% and in other transfers ; namely,tax rebate for export (TL 186 billion),retirement fund (TL.114 billion) and state participations (TL. 42.3 billion).(See Figure II.2)

BUDGET EXPENDITURES
(Percentage Shares)

Person.   Oth.cur.   Inv.   Trans.
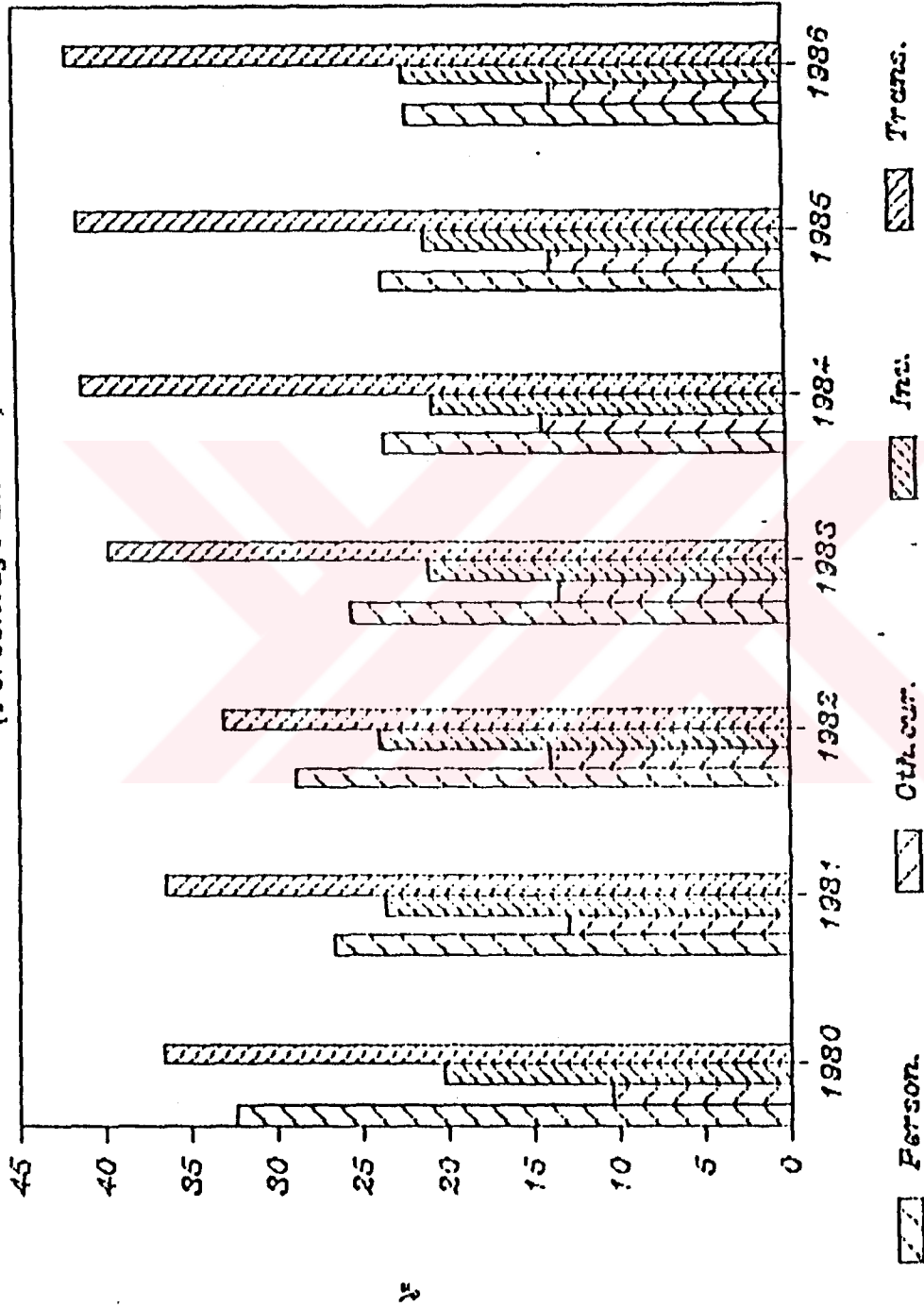
SOURCE : Table II.2.

There was an increase in the use of Central Bank short-term advances in financing of the 1983 budget deficit which was closed with TL. 284 billion. Treasury Bills were closed with repayment. Net internal borrowing was TL.207 billion, increasing by 269 % .

1984

In the 1984 fiscal year, both the measures taken to prevent inflation within the framework of the stability program put into effect in early 1980, and policies targeted on creation of sound financing resources and ensuring an effective structure in expenditures to mitigate the pressures formed by demands in the public sector, were continued to be applied.

Major arrangements in taxation put into effect in 1984 are summarized below : (Central Bank Annual Report , 1984 : 63)

- In May 1984, the rate of allocations from General Budget Tax Revenues to Municipalities and Local Governments ,were raised to 10.3 percent and 2.3 percent from 5 percent and 2.3 percent , respectively.

- Petroleum Consumption Tax Law No . 3074 was enacted in November 1984.According to the this law ,all kinds of petroluem sales ,made by oil refinery companies and institutions importing the oil were subjected to a 6 percent tax.By the same law , it was stipulated that 55 percent of the proceeds of this tax within

18

a month after its collection would be deposited as Petroleum Consumption Fund ,formed at the Central Bank.

- As of January 1, 1984, in order to reduce the cost of credits,the rate of Bank and Insurance Transactions Tax was reduced from 15 percent to 3 percent. Also, Foreign Travel Expenditures Tax was repealed.

- In 1984, the income tax rate was reduced from 36 percent to 30 percent.(for personal incomes below TL. 1 million.)

- The law amending The Financing Law No . 3089 , Motor Vehicles Purchase Tax was rearranged and the tax was raised by approximately two fold.

- By a law issued in November 1984,the Value Added Tax to be effective from January 1, 1985 on was incorparated into the Turkish tax system.The law covers delivery of goods and services and import transactions.Upon the introduction of this tax ,eight different taxes were repealed.

By the end of 1984,tax revenues reached a level TL. 2376 billion,increasing by 22.6 percent. But when the 52 percent inflation rate is considered , this increase can not be considered as a real increase.

On the other hand,total consolidated uses reached TL. 3784

billion of which,transfer expenditures , increasing by 50 % ,
formed the largest part.Especially the interest burden associated
with large domestic borrowing started to be felt on the budget.
Total interest payments increase by 53 % over that of the
previous year and reached TL. 595 billion level.

The inflation rate almost doubled from 35 percent in 1982
to 52 percent in 1984. There is no doubt that part of this is a
consequence SEE price reforms .

Budget deficits started to increase under the influence of
a steady erosion of tax revenues.The share of tax revenues in the
GNP decline from 18 percent in 1983 to 12.9 percent in 1984 .(See
Figure II-4) In financing the 1984 of TL. 930 billion , short-
term borrowing (Central Bank +Treasury Bills) of nearly TL. 474
billion and net foreign borrowing of TL. 319 billion were used.

1985

1985 saw some reduction in budget deficit due to increased
tax revenues. A set of producers' taxes was replaced by a Value
Added Tax (VAT system ;which,as it turned out, brought in
substantially more revenues than expected (VAT on domestic tran-
sactions was expected to be TL. 230 billion,but the realized
figure was TL. 570 billion (an increase of TL.340 billion).VAT on
imports was collected above the targets.It exceeded the target by
TL.23 billion and reached TL. 385 billion.).With decreasing
income tax rates, application of VAT changed the tax structure of

20

Figure : II.3

BUDGET REVENUES
(Percentage Shares)

Direct taxes   Indirect taxes   Others
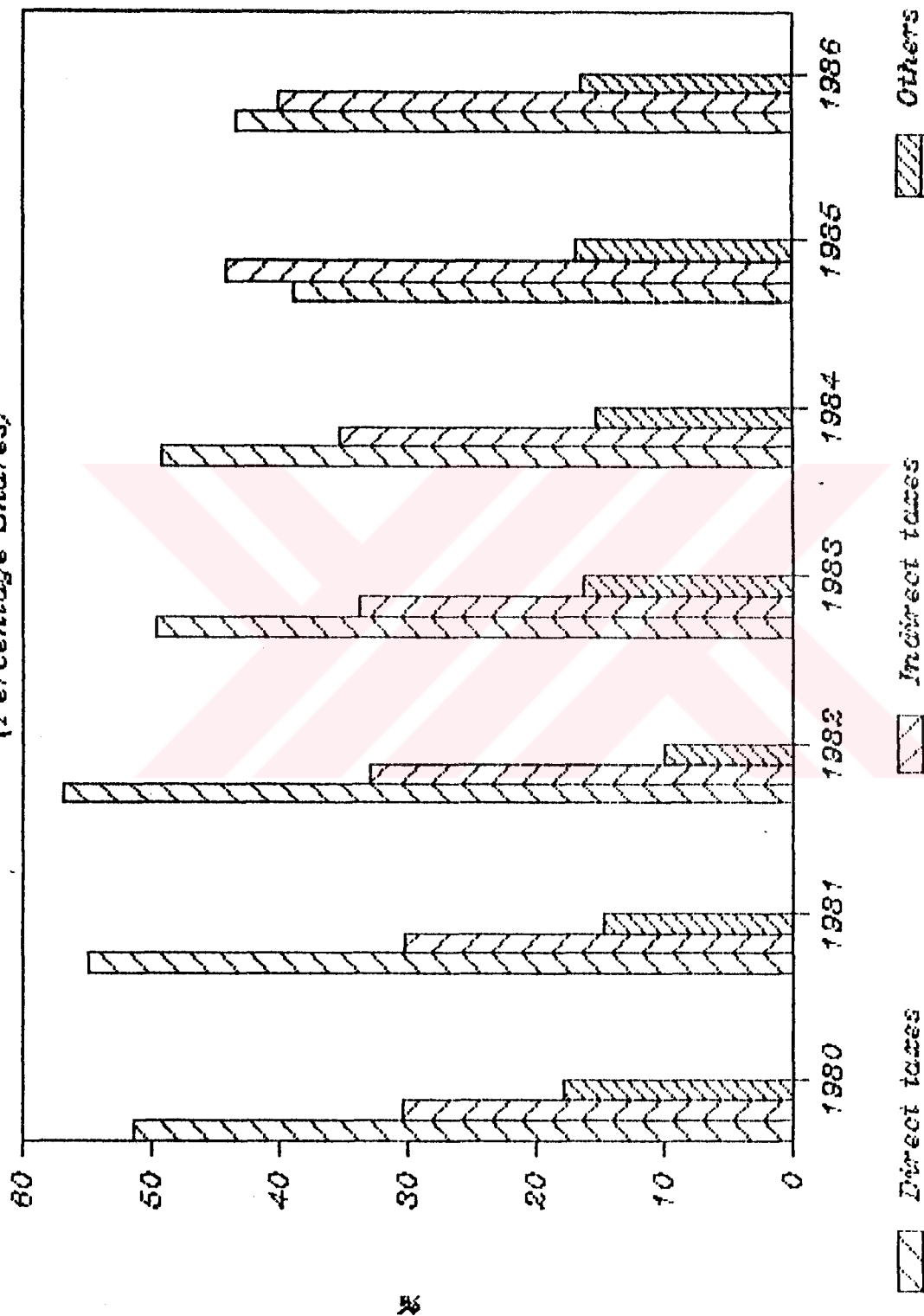
SOURCE : Table II.1

Figure : II.4

SHARE OF BUDGET REVENUES AND EXPENDITURES IN GNP
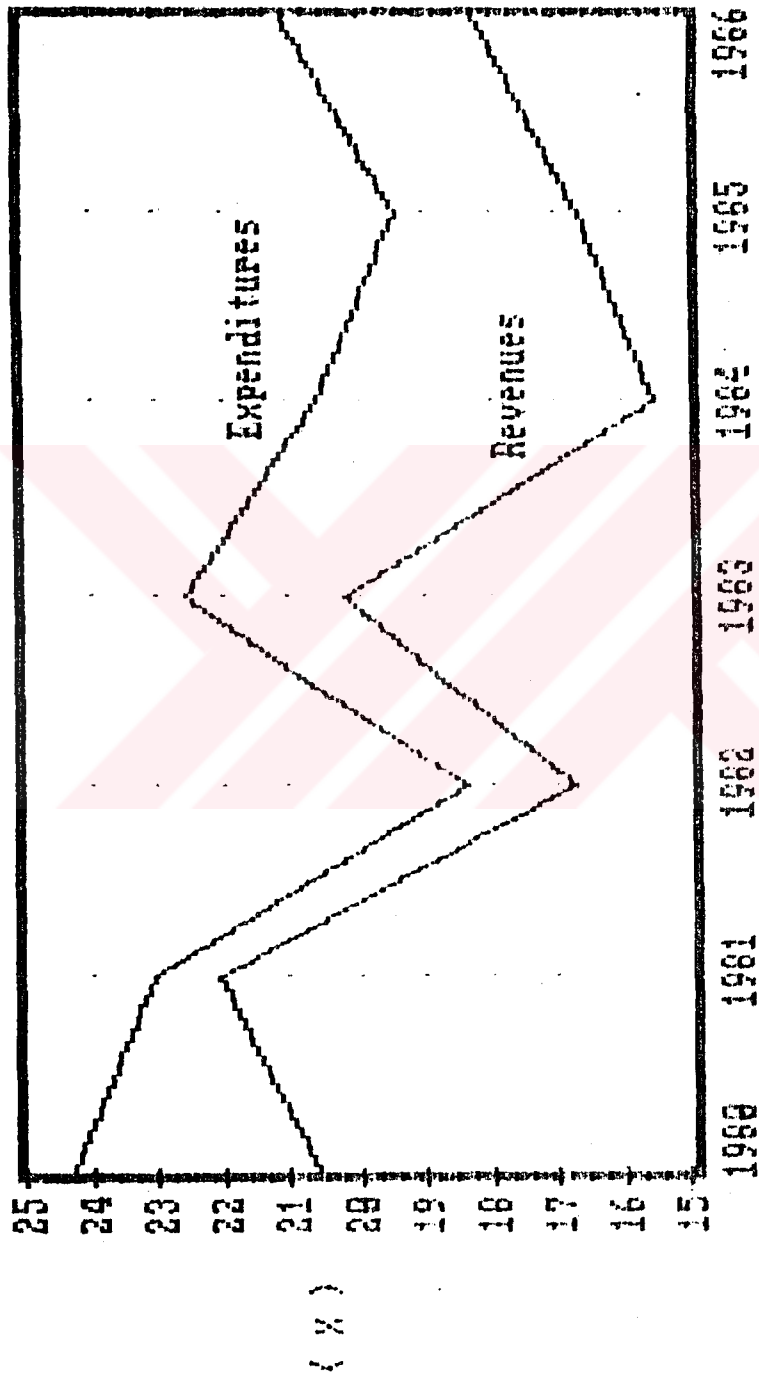
SOURCE : Table II.1 and II.2

the country in favor of indirect taxes . By the end of the year, indirect taxes were realized as TL. 2033,billion with an increase of 105.4 percent over a year earlier.(See Figure II-3)

On the other hand,the share of Consolidated Budget expenditures in the GNP was 19.4 percent.In total expenditures , the share of transfers (except transfers to SEEs) seem to increase at the expense of current expenditures.Because of increasing debt, interest payments from the budget have been on the rise.At the end of 1985 interest payments of TL. 247 billion on domestic debt and 427 billion on external debt were made ,which corresponded to 0.9 percent and 1.5 percent of GNP ,respectively.

The consolidated Budget was closed with a deficit of TL. 787 billion at the end of the year. This deficit was financed heavily by Treasury Bills and Government Bonds. Since 1982, bonds and bills have been the main source of financing the budget deficits.(See Figure II-1)

1986

A significant shortfall in budgetary revenues has been the main contributory factor in the worsening budget deficit of 1983 and 1984.From a high of 22.0 % in 1981, the ratio of budget revenues to GNP has declined continuously (in 1982 16.6 % , in 1983 20.0 % and in 1984 15.3 %). The downward trend in revenues,however,was reversed in 1985 and continued in 1986.(In 1985 revenues

made up 16.6 % of GNP and for 1986 , the figure was 18.2 % .)
(see figure II-4)

Budget expenditures in 1986 increased 54.1 percent and
reached TL. 8311 billion at the end of the year. On the
expenditure side, investment spending increased 62.3 percent. On
the other hand,the rapid increase oftransfer payments which star-
ted in 1983 ,continued.The largest component of transfer payments
are the wage-earner rebates , export tax rebates and retirement
fund ; but those growing the fastest are interest payments on
internal debt, as a result of large issue of Treasury Bills.In
1986 ,total interest payments increased by 97.5 percent while
internal interest payments by 162.7 percent over 1985.

In the financement of the deficit,as in 1985, short-term
borrowing and sale of Government Bonds were important sources.In
the same period there was net foreign debt repayment (TL. 8
billion). Since there was no foreign debt used in financing of
the budget, domestic borrowing amounting to TL. 1401 billion was
used.

Table : II-1

CONSOLIDATED BUDGET REVENUES

	1980	1981	1982	1983	1984	1985	1986
TOTAL REVENUES	914	1452	1457	2329	2854	4608	7154
Direct Taxes	471	768	826	1149	1382	1796	3106
Indirect Taxes	279	422	479	785	990	2033	2866
Others	164	262	152	395	482	779	1182
ANNUAL RATE OF GROWTH							
Direct Taxes	100	63	8	39	20	30	73
Indirect Taxes	64	51	14	64	26	105	41
Others	59	60	-42	160	22	62	52
Total Rev.	80	59	0	60	23	61	55
PERCENTAGE DISTRIBUTION							
Direct Taxes	52	53	57	49	48	39	43
Indirect Taxes	31	29	33	34	35	44	40
Others	18	18	10	17	17	17	17
Total Rev.	100	100	100	100	100	100	100
As a % of GNP							
Direct Taxes	10.6	11.7	9.5	9.9	7.5	6.5	7.9
Indirect Taxes	6.3	6.4	5.5	6.8	5.4	7.3	7.3
Others	3.7	4.0	1.7	3.4	2.6	2.8	3.0
Total Rev.	20.6	22.2	16.7	20.2	15.5	16.6	18.2

SOURCE : MINISTRY OF FINANCE AND CUSTOMS.

Table :I1-2

CONSOLIDATED BUDGET EXPENDITURES

	1980	1981	1982	1983	1984	1985	1986
TOTAL EXPENDITURES	1078	1516	1602	2612	3788	5395	8311
Current Expenditures	463	603	686	1021	1438	2021	2967
Investment Expenditures	220	360	386	551	790	1142	1854
Transfer Expenditures	395	553	530	1040	1560	2232	3490
ANNUAL RATE OF GROWTH							
Current Exp.	87	30	14	49	41	41	47
Investment Exp.	86	64	7	43	43	45	62
Transfer Exp.	72	40	-4	96	50	43	56
Total Exp.	81	41	6	63	45	42	54
PERCENTAGE DISTRIBUTION							
Current Exp.	43	40	43	39	38	37	36
Investment Exp.	20	24	24	21	21	21	22
Transfer Exp.	37	36	33	40	41	41	42
Total Exp.	100	100	100	100	100	100	100
As a % of GNP							
Current Exp.	10.4	9.2	7.9	8.8	7.8	7.3	7.5
Investment Exp.	5.0	5.5	4.4	4.8	4.3	4.1	4.7
Transfer Exp.	8.9	8.4	6.1	9.0	8.5	8.0	8.9
Total Exp.	24.3	23.1	18.3	22.6	20.6	19.4	21.1

SOURCE : MINISTRY OF FINANCE AND CUSTOMS.

III . SPECIFICATION OF THE MODEL

The model is a modified version of the model developed by Aghevli-Khan (1978), Heller (1980) and Khan-Knight (1981). Like Heller's ,in this study, we are only interested in the government sector. For this reason we shall only be concerned with the government sector of the Aghevli-Khan and Khan-Knight models. Our main interest is in the effects of price changes on the government revenues and expenditures.

I - Theoretical Issues

Heller (1980 :714) in his study, says that in determining the actual fiscal response to inflation, three principal questions must be answered:

(1) How do government decision makers adjust the desired level of alternative categories of nominal expenditure and revenue to a change in the price level?

(2) How rapidly are such adjustments reflected in actual expenditure adjustment decisions?

(3) What are the constraints or factors that determine the relative rapidity of such adjustments?

In the Aghevli-Khan model, we can find answers to only the first two questions. In their model, it is assumed that for any given real income level, the government attempts to keep its real expenditures constant in the face of an increase in the price

28

level. At the same time , it will attempt to increase or decrease the level of real revenue in response to a price change according to whether the overall tax system is intended to be elastic or inelastic to nominal income. Depending upon these assumptions, they formalized the following demand equations for government expenditures and government revenues, respectively:

$$\log \ (\ G/P\ )^D_t = g_o + g_1 \log \ (\ddot{y}_t) \qquad\qquad g_1 > 0$$

$$\log \ R^D_t = t_o + t_1(\ \log \ y_t + \log \ P_t\ ) \qquad\qquad t_1 > 0$$

Where

P = an index of prices

G = nominal government expenditures

R = nominal government revenues

y = level of real income

D = desired

In this model actual real expenditures are specified as adjusting to the difference between the desired real expenditures and actual real expenditures in the previous period.

$$\Delta \ \log \ (G/P)_t = b \ (\log \ (G/P)^D_t - \log \ (G/P)_{t-1})$$

where "b" is the adjustment coefficient , $1 > b > 0$.

Like expenditures, revenues realized in a period will close only a portion of the gap between the desired level and the amount realized in the previous period. In the following equation

"a" is the adjustment coefficient, $1 > a > 0$.

$$\Delta \log R_t = a (\log R_t^D - \log R_{t-1})$$

In this model the real expenditure function in combination with a nominal revenue formulation implies asymmetric behaviot in the components of the deficit (Khan-Knight, 1981:12). In the present study both expenditures and revenues are taken in nominal terms (*). Thus the model tested is as follows:

$$\Delta \log G_t = b (\log G_t^D - \log G_{t-1}) \qquad (1)$$

$$\log G_t^D = g_0 + g_1 (\log Y_t + \log P_t) \qquad (2)$$

Substituting equation (2) in equation (1) and solving for the (logarithmic) level of government expenditures, we obtain

$$\log G_t = g_0 b + g_1 b (\log Y_t + \log P_t) + (1-b) \log G_{t-1} \qquad (3)$$

As with expenditures, the relevant equations for nominal budget revenues are:

- - - - - - - - - - - - - - - - - - -

(*) In Aghevli-Khan study it is said that adjustment function could also be specified in terms of nominal government expenditures which states that the government adjusts its nominal expenditures and as adjustment coefficient ---> 1 , the two adjustment functions become identical.In this case , specifying the adjustment of expenditures in real or nominal terms makes no difference.(1978 :389-390)

$$\Delta \log R_t = a \ (\ \log R_t^D - \log R_{t-1})$$
(4)

$$\log R_t^D = t_o + t_1 (\log \ y_t + \log P_t)$$
(5)

Substituting equation (5) for R_t^D in equation (4) gives

$$\log R_t = t_o a + t_1 a \ (\log \ y_t + \log P_t) + (1-a) \log R_{t-1}$$
(6)

If in the long-run, government expenditures and revenues both grow at the same rate as nominal income, then this would imply that $g_1 = t_1 = 1$. Starting from an equilibrium position, this would ensure a balanced budget in the steady state. In the short-run, however, even with the condition being satisfied that income elasticities equal unity, one could observe a divergence between expenditures and revenues that would result from differences in the values of the adjustment parameters 'a' and 'b'. That is, the nominal deficit will be a function of the increase in the price level, provided that b > a , even though $t_1 = g_1$ (Khan-Knight, 1981:12)

Aghevli-Khan expresses reasons of this divergence between revenues and expenditures as follows:

"There are plausible reasons for expecting government expenditures in developing countries to adjust faster than revenues to nominal income increases arising from

31

inflation. Even if governments fully recognize the need to restrain expenditures during periods of inflation, they find it difficult to reduce their commitments in real terms. On the other hand, in contrast to the situation in most developed countries, where nominal revenues often more than keep pace with price increases, in developing countries they lag substantially behind. The contrast arises both because of low nominal income elasticities of tax systems and long lags in tax collection in developing countries. For income taxes, the income to which tax payments in a given period relate is typically less current than in developed countries. In any event, tax systems in developing countries depend rather heavily on indirect taxes and, in particular, on foreign trade taxes. The markedly lesser progressivity of indirect taxes compared with direct taxes is well known. Further, indirect taxes in developing countries are often specific, and even when they are ad valorem the adjustment of base values for some of these taxes is not frequent enough to keep pace with inflation ....."(Aghevli-Khan, 1978 : 391)

The econometric estimates of Aghevli-Khan for Brazil, Colombia, the Dominican Republic and Thailand appear to support their hypothesis.

On the other hand, Heller points out that it is clearly

difficult to generalize how government decision makers formulate their demand for expenditures and revenues, and how such demands are affected by changes in the price level. He explains that the reaction of total revenues or expenditures to price changes will reflect partly the initial structure of revenues and expenditures, partly the extent to which the rate of inflation has been anticipated and partly the government's discretionary response to it. In effect, one cannot accept the Aghevli-Khan hypothesis for a country without a more detailed analysis of the country's fiscal structure and the characteristics of the inflationary situation. In his study for developing-countries, it is seen that b>a in only 12 or 13 of the 24 countries in the sample. The hypothesis is verified most clearly in the Latin American Region, with an opposite tendency in Africa and Asia. As it is seen from Heller's study the amount of latitude available to budget decision makers to respond to a change in the rate of inflation is partly a function of the particular structure of revenues and expenditures, and partly, the perceived cost of such adjustments.

II-Expenditure Adjustment

Among the different expenditure categories, there are wide variations in the degree of exogeneity of price increases to the government. For some types of expenditures, price increases occur exogenously to the public sector, for others, government may attempt to limit such inflationary pressures through its control over commodity or factor prices. The combined impact of these exogenous pressures and the government's pricing decisions, de-

termine the extent of any relative price effect on government expenditures.

In Turkey on the basis of degree of exogeneity of price changes to decision makers, we can divide total expenditures into three categories:

A-CURRENT EXPENDITURES

-personnel expenditures (wages and salaries, etc.)

-purchases of goods and services

-other current expenditures.

B-INVESTMENT EXPENDITURES

C-TRANSFERS

-interest payments for internal and external debts

-transfers to SEE's

-tax rebates

-subsidies

-other transfers

Among these different expenditure categories it can be assumed that increases in prices, anticipated or not, are directly and rapidly transmitted to the government expenditures in the case of purchases of goods (capital or consumer) and services from the private or foreign sector.

For wages and salaries, transfers (except interest payments) and subsidies, the decision makers generally possess flexibility in determining the extent and timing of any adjust-

ments to inflation. The exception arises when such payments are legally linked to some price index.But usually, developing countries as in the case of Turkey, do not have such indexation.

Investment expenditures usually adjust automatically to price changes . Because in developing countries generally these expenses are for development oriented projects and often infrastructural type . The government finds it difficult to reduce its commitments.

The effect of inflation on the government's financial obligations depends on a combination of factors: the impact of the inflation on interest rates,the level of current fiscal deficit,the sources and costs of financing any current deficit, the frequency of turn over of existing debt and the interest rate at which old debt was contracted.

III-Revenue Adjustment

In most of the developing countries the main revenue sources are taxes. According to Tanzi (1978:423) the two critical parameters influencing the rapidity of adjustment of tax revenues to inflation are the elasticity of a tax and the length of the lag between the collection of revenue and the accurance of the taxable event upon which the tax liability accurs. He gets the following six combinations when the collection lags are characterized as short and long (1978 , 424) :

Elasticities	COLLECTION LAGS	
	Long	Short
< 1	A	B
= 1	C	D
> 1	E	F

Of these combinations ,D and F would be more typical of industrialized countries - D for those with indexation of taxes , and F for those without indexation - while A and C would be more typical for developing countries.A short lag combined with a unitary elasticity of the tax system (D) implies that inflation will have little effect on real tax revenues.A short lag combined with an elasticity greater than unity (F) implies that inflation will bring about increases in real tax revenues.Combination C will inevitably lead to a fall in real tax revenues when prices rise .And this fall will be even more significant if the long lag is combined with an inelastic tax system (A) .The absolute size of the fall depends also on the initial ratio of taxes to national income (i.e. on the initial tax burden).The higher is the initial tax burden ,the greater will be the absolute loss in tax revenues associated with a given increase in the rate of inflation.

According to the figures in table III.1 the situation in Turkey seems to support the above mentioned explanations.

Table : III . 1

	Rate of Inflation (**)	Tax Burden (***)
1980	107.2	0.169
1981	36.8	0.182
1982(*)	25.2	0.150
1983	30.6	0.167
1984	52.0	0.129
1985	40.0	0.138
1986	26.7	0.152

SOURCE : The Undersecretariat of Treasury and Foreign Trade

(*) 10 Months

(**) According to the Wholesale Price Index.

(***) Total Tax / GNP

For direct taxes, the main obstacle for adjustment is the long collection lag.Another important element which causes slow adjustment when prices change,is the tax evasion.With the high rates of inflation , marginal incentives to evade income taxes increase as the tax payers are go into higher tax brackets.

On the other hand for indirect taxes, the rapidity of adjustment to inflation is influenced significantly by whether such taxes are advalorem or specific; and by the state of the accounting system in manufacturing and wholesale establishments. Ad valorem taxes grow at a rate close to the rate of inflation, subject to limitations associated with collection lags. But specific taxes yield poor adjustment to inflation, unless there are frequent discretionary adjustments. For taxes on international trade, the rapidity of adjustment to inflation depends on whether changes in domestic prices, relative to price changes of trading partners, are reflected in exchange rate adjustments.

As a result, it can be said that, the government, both in its role as a tax collector and as a producer of goods and services, eventually becomes accustomed to the effects of a given level of inflation on its fiscal tasks. The policies implemented to take account of inflation are likely to be sensitive to the rate of inflation. The higher the inflation rate, the more important it is to develop budgetary and tax administration procedures that can insulate the real resource allocation efforts of the government from the effects of inflation.

In the next section we shall report the estimates reflecting the specific adjustment properties of different categories of revenues and expenditures, using equations (6) and (3) , respectively; and the extent to which such adjustment rates vary according to the character of the inflationary environment and according to the overall fiscal adjustment pattern.

IV. ESTIMATION RESULTS

The model described in the previous section is estimated for the period 1980 - 1986 by using quarterly data . In estimating the model, several important assumptions are made pertaining to the specification of the variables.

Price level is assumed to be exogenous to the model of fiscal behavior. While this departs from the Aghevli-Khan assumption on the endogeneity of prices; here, it is believed that fiscal posture of the government in any calender quarter is unlikely to affect the rate of inflation until subsequent quarters. (Prices in any given period are influenced only by the fiscal behavior of the previous periods.)

As many economic time series based on the quarterly data, government expenditures and revenues exhibit seasonal patterns. In order to deseasonalize these variables, the method of dummy variables are used.(GUJARATI , 1982 : 301 - 302)

Since for Turkey nominal and real Gross National Product figures are available on annual basis ,it was necessary to interpolate these variables to generate quarterly data. In this study, Ozmucur's quarterly GNP estimates are used.(OZMUCUR ,1987: 4)

With these assumptions and adjustments, all equations are
estimated using ordinary least squares. Since the model is nonli-
near in the coefficients,but are also just identified ,the stan-
dart errors of these restricted coefficients are calculated by an
approximate formula and their " asymptotic " t - ratios are
based on these standart errors.(KMENTA , 1971 : 444 , see Appen-
dix A).

Since the data is quarterly , the occurance of simple fo-
urth - order autocorrelation is more likely than first - order
autocorrelation . This ofcourse , is due to the seasonality in
the data and eventhoug dummy variables are utilized to amount for
such short - term fluctuations ,some residual seasonality may be
left over . Since the model contains a lagged dependent variable
among the regressions , a Durbin - Watson type statistic cannot
be utilized to test for simple fourth - order autocorrelation .
Thus , in the present study we utilize an asymptotic test for
this purpose , an amount of which may be found in Pagan and Hall.
(1983 : 169 - 170 and in Appendix B)

TABLE : IV - 1

ESTIMATION RESULTS OF BUDGET REVENUES

	Parameter	Point Estimate	Standart Error	t-value
TOTAL BUDGET REVENUES				
Adjustment	a	0.543	0.15	3.42
Income elasticity	t_1	0.916	0.05	19.09
Constant	t_0	-2.372	0.48	-4.91
Dummies				
2nd quarter	d2	0.119	0.06	1.86
3rd quarter	d3	-0.029	0.06	-0.86
4th quarter	d4	0.263	0.05	4.43
AR(4) (*)	p	0.191	0.22	0.83

R = 0.981

F-stat = 231.4

	Parameter	Point Estimate	Standart Error	t-value
TAX REVENUES				
Adjustment	a_1	0.473	0.14	3.25
Income elasticity	t_1	0.901	0.06	14.07
Constant	t_0	-2.592	0.60	-2.04
Dummies				
2nd quarter	d2	0.281	0.07	3.81
3rd quarter	d3	0.071	0.06	1.05
4th quarter	d4	0.324	0.06	5.00
AR(4)	p	0.175	0.23	0.74

R = 0.977

F-stat = 190.2

(*) Coefficient of AR(4) test.It is insignificant at 5 % level.

	Parameter	Point Estimate	Standart Error	t-value

DIRECT TAXES

Adjustment	a_2	0.468	0.14	3.27
Income elasticity	t_1	0.783	0.07	10.47
Constant	t_o	-2.148	0.71	-1.41*
Dummies				
2nd quarter	d2	0.432	0.08	5.20
3rd quarter	d3	0.122	0.07	1.65
4th quarter	d4	0.345	0.07	4.68
AR(4)	p	0.375	0.22	1.68**

R = 0.964

F-stat = 118.1

(*) Significant at 10 % level.
(**) Insignificant at 5 % level.

INDIRECT TAXES

Adjustment	a_8	0.524	0.16	3.16
Income elasticity	t_1	1.059	0.06	17.18
Constant	t_o	-4.801	0.61	-7.79
Dummies				
2nd quarter	d2	0.061	0.07	0.77
3rd quarter	d3	-0.002	0.08	-0.02
4th quarter	d4	0.285	0.07	3.82
AR(4)	p	-0.238	0.23	-1.00

R = 0.978

F-stat = 201.5

	Parameter	Point Estimate	Standart Error	t-value
TAXES ON GOODS AND SERVICES				
Adjustment	a_4	0.813	0.19	4.24
Income elasticity	t_1	0.956	0.07	12.26
Constant	t_o	-4.203	2.16	-1.57(*
Dummies				
2nd quarter	d2	0.067	0.13	0.49
3rd quarter	d3	-0.096	0.13	1.78
4th quarter	d4	0.237	0.13	1.78
AR(4)	p	-0.280	0.20	-1.36(**

R = 0.916

F-stat = 47.9

(*) Significant at 10 % level.
(**) Insignificant at 5 % level.

TAXES ON EXTERNAL TRADE				
Adjustment	a_5	0.875	0.21	4.12
Income elasticity	t_1	1.221	0.09	11.79
Constant	t_o	-7.579	0.86	-8.77
Dummies				
2nd quarter	d2	0.237	0.19	1.22
3rd quarter	d3	0.086	0.18	0.47
4th quarter	d4	0.418	0.17	2.45
AR(4)	p	-0.466	0.20	-2.31

R = 0.919

F-stat = 50.08

	Parameter	Point Estimate	Standart Error	t-value
NON - TAX REVENUES				
Adjustment	a_6	0.749	0.21	3.46
Income elasticity	t_1	0.964	0.12	7.77
Constant	t_0	-4.266	1.25	-3.41
Dummies				
2nd quarter	d2	-0.445	0.19	-2.30
3rd quarter	d3	-0.425	0.20	-2.03
4th quarter	d4	0.027	0.19	0.13
AR(4)	p	-0.220	0.19	-1.14

R = 0.838

F-stat = 22.8

TABLE : IV - 2

ESTIMATION RESULTS OF BUDGET EXPENDITURES

	Parameter	Point Estimate	Standart Error	t-value
TOTAL BUDGET EXPENDITURES				
Adjustment	b	1.116	0.18	5.93
Income elasticity	g_1	0.962	0.07	13.21
Constant	g_o	-2.673	0.31	-8.48
Dummies				
2nd quarter	d2	0.043	0.10	-0.40
3rd quarter	d3	-0.174	0.11	-1.54
4th quarter	d4	0.406	0.09	4.10
AR(4)	p	0.307	0.23	1.33
R = 0.971				
F-stat = 147.7				
CURRENT EXPENDITURES				
Adjustment	b_1	1.247	0.17	7.00
Income elasticity	g_1	0.879	0.03	31.08
Constant	g_o	-2.815	0.28	-10.04
Dummies				
2nd quarter	d2	-0.101	0.09	-1.02
3rd quarter	d3	-0.147	0.10	-1.42
4th quarter	d4	0.365	0.08	4.24
AR(4)	p	0.081	0.24	0.32
R = 0.966				
F-stat = 125.8				

	Parameter	Point Estimate	Standart Error	t-value
INVESTMENT EXPENDITURES				
Adjustment	b_2	0.917	0.20	4.37
Income elasticity	g_1	1.085	0.08	13.56
Constant	g_o	-5.749	2.66	-2.16
Dummies				
2nd quarter	d2	0.250	0.19	1.26
3rd quarter	d3	0.224	0.17	1.25
4th quarter	d4	0.620	0.15	3.91
AR(4)	p	0.023	0.24	0.09

R = 0.918

F-stat = 49.5

	Parameter	Point Estimate	Standart Error	t-value
TRANSFER EXPENDITURES				
Adjustment	b_3	0.661	0.20	3.28
Income elasticity	g_1	0.985	0.09	10.21
Constant	g_o	-3.836	0.89	-4.27
Dummies				
2nd quarter	d2	0.055	0.14	0.36
3rd quarter	d3	-0.223	0.16	-1.28
4th quarter	d4	0.563	0.16	3.32
AR(4)	p	0.066	0.21	0.03

R = 0.929

F-stat = 58.03

Considering the total budget revenue and expenditure equations , we find that the effect of income in the short-run is positive and significant at the five percent confidence level(*). Both budget expenditures and revenues have highly significant and close to unity nominal income elasticities but the income elasticity of revenues is smaller .This is one of the reasons of the growing budget deficits in Turkey.As it is seen from Table IV-3 Turkey's Consolidated Budget deficit has been increasing since 1982.

TABLE : IV - 3

CONSOLIDATED BUDGET DEFICIT

(Billion TL.)

	1980	1981	1982	1983	1984	1985	1986
%Δin Revenues	78.4	58.6	20.4	33.3	22.5	61.4	55.2
%Δin Expenditures	80.6	40.6	26.8	35.9	45.0	42.4	54.1
%Δin GNP	101.6	47.8	33.3	32.2	59.1	51.2	41.4
Income elas. of rev.	0.77	1.22	0.61	1.03	0.38	1.19	1.33
Income elas. of exp.	0.79	0.85	0.80	1.11	0.76	0.82	1.31
Budget Deficit	163	64	145	284	930	788	1158
Deficit/GNP(%)	3.67	0.97	1.66	2.46	5.06	2.84	2.95

(*) The short run effects of income on expenditure and revenue equations are measured by the unrestricted coefficients b g_1 and a t_1, respectively.

The adjustment coefficient of the total budget expenditures is greater than unity. The same result is seen in Heller's study for Brazil, Kenya and Elsalvador. He gets higher results for mentioned countries when he uses GDP deflator instead of consumer price index. The choice of the deflator affects the relative size of the adjustment coefficients. In this study we use GNP deflator as the price index and we think that this is partly responsible for getting some of the adjustment coefficients greater than unity . The other reason may be the length of the observation period in which inflation rate is high (1980 : 107.2 % 1981 : 36.8 % , 1982 : 25.2 % , 1983 : 30.6 % , 1984 : 52.0 % , 1985 : 40.0 % and 1986 :26.7 % (UTFT,Price Index ,1987 : 1). Heller notes in his study,that the adjustment parameters for expenditures are higher in the high inflation periods.

Very high adjustment coefficient of the total budget expenditures confirms the hypothesis that nominal government expenditures are adjusted upward automatically to keep pace with inflation. However,the adjustment coefficient of total revenues is very small. They lag substantially behind price increases.The difference between adjustment rates is quite large . That is
a = 0.543 and b = 1.116 . This supports the Aghevli-Khan hypothesis.

The average lag in the adjustment of expenditures to the difference between desired and actual expenditures in the previous period turn out to be close to zero. This shows that budget expenditures are adjusted at once in order to keep pace with

increases in income and prices. But, as theoretically expected, the lags in the adjustment of nominal budget revenues are longer:

$$\frac{1 - a}{a} = \frac{0.457}{0.543} = 0.816 \text{ quarters}$$

This shows that budget revenues in Turkey ,with 0.543 adjustment rate ,take over 0.816 quarters (almost 2.5 months) to adjust to the difference between desired and actual revenues in the previous period.

Total revenues have seasonality in the second and fourth quarters.In these quarters usually tax instalments are come closely together.On the otherhand total expenditures show seasonality especially in the last quarter. In the last quarters all associations (in both General Budget and Annexed Budget) start to spend all left over appropriations.

Autocorrelation due to seasonal factors leads to relationships between the disturbances in the corresponding quarters of successive years . AR (4) tests of both revenues and expenditures show that simple fourth - order autocorrelation does not exist in any of the regressions.

Tax revenues have a lower adjustment parameter than Total Budget Revenues. The same result was obtained by Heller.He found that for countries which have inflation rate higher than 20 per

cent (Turkey is placed in this group) per annum,the adjustment parameters of total revenues and tax revenues are 0.78 and 0.71, respectively.These rates increase as the inflation rate decreases.When the inflation rate is below 10 percent,adjustment parameters are 0.88 and 0.87,respectively (HELLER 1980 : 745).

In this study we estimated that total tax revenues realized in a period closes only 47.3 percent of the gap between the desired level and the amount realized in the previous period.This adjustment is completed in :

$$\frac{1 - a_1}{a_1} = \frac{0.527}{0.473} = 1.1141 \text{ quarters}$$

We can divide total tax revenues into two parts:direct taxes and indirect taxes. It is seen that adjustment coefficient of indirect taxes is higher than that of direct taxes. besides, indirect taxes' nominal income elasticity comes out to be higher than that obtained for direct taxes. We think that the important element in this higher adjustment rate of indirect taxes is the application of the VAT since 1985.

Direct taxes have very long adjustment lag,probably mainly due to long collection lag.The average adjustment lag of direct taxes is 1.1367 quarters whereas 0.9083 quarters for indirect taxes . Heller explains this situation as follows :

"As the inflation rate rises above 20 per cent the adjustment parameter falls.This suggests that ,as inflation increases , the high elasticity of income taxes (*) overwhelms the effect of collection lags ,thus increasing the rate of adjustment of such taxes to inflation ; however,once inflation exceeds a certain rate , the relationship reverses itself ,leading to a fall in the rapidity of adjustment."(HELLER ,1980 : 744)

Seasonality test of the direct taxes show that coefficients associated with the second, third and fourth quarters are statistically significant. Thus we may conclude that there is some seasonal factor operating in these quarters of each year. Here, we think that dating of income and corporation taxes' installments to these quarters (income taxes' instalments: March, June, September and corporation taxes' instalments: April, July and October) leads to this outcome . However , indirect taxes have seasonality only in the fourth quarter.

Both direct and indirect taxes' fourth order autocorrelation tests show that, the p's are insignificant at the five percent significant level. This means that in these estimations there is no autocorrelation due to seasonal factors .

(*) Income taxes are the largest part of the Direct taxes in
    Turkey .

The main parts of the indirect taxes are the Taxes on Goods and Services and Taxes on External Trade. The adjustment rates of both taxes are very high. On these results application of the Value Added Tax on goods and imports plays an important role. Also, application of the flexible exchange rate policy (means daily adjustments according to relative prices and balance of payments) effects the rapidity of adjustment to inflation in a positive manner . There is no great difference between the average adjustment lags of these two taxes.In the average taxes on goods and services adjust in 0.23 quarters ,but taxes on external trade adjust in 0.1428 quarters.

Both of these taxes exhibit seasonality in the last quarter . At the same time Taxes on External Trade have fourth order autocorrelation due to seasonality . This means that disturbances in corresponding quarters of the successive years are correlated.

We get very interesting results in the estimation of the non-tax revenues. The adjustment coefficient is the highest among the different revenue categories. Non tax revenues consist of the Annex Budget Revenues, Fines, Corporate Profits and State Shares, Revenues from State Property, Interest Reclaims from Concession and Lending, Special Revenues (Grants) and Funds. Corporate profits and state shares,revenues from state property and interest reclaims have a large share in the "non-tax revenues" . We think that the highest adjustment coefficient obtained here shows that the government arranges sales, rents, rates,etc. according to the

daily conditions.Here the average adjustment lag is lower than in the case of total tax revenues :

$$\frac{1 - 0.749}{0.749} = 0.3351 \text{ quarters}$$

In the non-tax revenues second and third quarters exhibit seasonality. But, since this group of revenues covers many different kinds of revenues, it is very difficult to explain this seasonality.However,there is no fourth order autocorrelation in non-tax revenues.

According to our results, current expenditures are very sensitive to price changes. Among different expenditure categories, it has the highest coefficient thus the lowest adjustment lag. Personnel expenditures comprise the main part of the current expenditures. (around 60 percent). In the personnel expenditures, the largest part is wages and salaries which are adjusted twice a year according to the economic condition of the country. So, it may be thought that the important reason of this high adjustment rate comes from adjustment of the wages and salaries.

Expenditures on investments have the highest nominal income elasticity. It is greater than unity. This means that investment expenditures tend to rise faster than national income. The adjustment parameter is almost unity; which implies that, investment expenditures rise automatically in pace with price increases. The average adjustment lag of the investment expenditures is

almost zero :

$$\frac{1 - b_2}{b_2} = \frac{0.083}{0.917} = 0.0905 \text{ quarters}$$

Nominal income elasticity of transfers is unity. But, the adjustment coefficient is the lowest among the expenditure categories. One of the reasons for this result is the high tax rebates to wage earners and exports (1983-1986 period). Secondly, changes in pricing policy of State Economic Enterprises and reduced general budget tansfers to the (A number of steps were taken to ensure that the SEEs operate in a more competitive environment. To this end, budgetary transfers were decreased, and the managers have been freed to adopt pricing policies geared to market conditions. (Central Bank Annual Report, 1985:20))Thirdly, even though nominal interest rates are highly affected by inflation and inflationary expectations, for interest payments, maturity is also important. For this reason, changes in prices do not seem to affect the interest payments automatically.

The seasonality tests of the different expenditure categories show that coefficients of the last quarter are significant at the five percent confidence level. Expenditures have some seasonal factor operating in the fourth quarter of each year.On the other hand, according to the AR(4) test, there is no autocorrelation due to seasonal factors.(t-values of q are insignificant at 5 percent significance level.)

TABLE : IV - 4

TRANSFERS

(percentage shares)

	1984	1985	1986
TOTAL TRANSFERS	100.0	100.0	100.0
-Interest Payments	28.3	30.2	38.1
-Transfers to SEEs	15.3	8.1	4.0
-Tax rebates to wage earners	1.3	11.1	18.0
-Tax rebates to exports	22.9	13.0	7.7
-Others	32.2	37.6	32.2

SOURCE : The Undersecretariat of Treasury and Foreign Trade.

V . SUMMARY AND CONCLUSION

This study examines how the rate of change in the price level and budget deficits were interrelated in Turkey in the 1980 - 1986 period . The hypothesis was that total expenditures adjust more rapidly than revenues to changes in the price level,resulting in budgetary deficits . The another main interest in this study was to estimate the specific adjustment properties of the different categories of revenues and expenditures.

A part of the model developed by Aghevli and Khan was adopted , incorparating the main elements of the process described above. The two equations involved were those explaining the government expenditures and the government revenues,respectively. The model was tested for specific categories of revenues and expenditures, using quarterly Turkish data for the period 1980 - 1986 .

The adjustment coefficient obtained for government expenditures was higher than the adjustment coefficient obtained for government revenues , supporting the main hypothesis that the government expenditures tend to adjust faster than the government revenues to price increases,thus creating deficits. Our results show that the government expenditures are adjusted upward automatically to keep pace with inflation , and the adjustment coefficients of government expenditures are higher than those of revenues.

The results suggest a considerable variability in the response of particular categories of revenues and expenditures to inflation.Current expenditures tend to adjust more rapidly than expenditures on investment and transfers.On the other hand, changes in the price level are reflected on revenues after a long lag . Here,the main reason is the low adjustment rate of the total tax revenues which are the largest part of the total revenues (more than 80 percent).In the tax revenues the main part (except for 1985) is direct taxes.As it is seen from our estimation results,these taxes have low adjustment rates and long collection lags.So , inspite of higher adjustment rate of indirect taxes,direct taxes comprise a larger part of the total and their response to price changes are slower. Also , since non-tax revenues are a very small amount ,their higher adjustment rate does not affect the adjustment of the whole.

We found that average lags in the adjustment of expenditures are negligable in most of the categories , but the corresponding revenue lag are substantially longer , leading to higher deficits in more inflationary periods.

However ,these results as whole confirm the principal assertion of the Aghevli - Khan ,the impact of inflation on the net fiscal position of the public sector is not a prior predictable. The ultimate reaction of total expenditures and revenues to a change in price level will be shaped by the discretionary response of budget decision makers,as constrained by a country's parti-

cular structure of revenue and expenditure.Fiscal decision makers confronted by the impact ofinflation , are forced to make decisions about which categories expenditure and revenue to increase or decrease.This inevitably shows the necessity of detailed analysis of the expenditure and revenue categories and insufficiency of aggregative model specification.

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61

APPENDIX A

RESTRICTED COEFFICIENTS AND CALCULATION OF THE T-VALUES

According to the model of the government sector that is used in this study, nominal government expenditures adjusts proportionally to the difference between the authorities' target -spending and the actual level of expenditure in the previous period. On the other hand, the desired level of expenditures is simply related to the nominal income. Substituting relevant equations and solving for the level of government expenditure , we obtain

$$\log G_t = g_o b + g_1 b \ (\log y_t + \log P_t) + (1-b) \log G_{t-1} + \varepsilon_t \tag{1}$$

All variables in this equation except ε_t are observable and we have three restricted parameters b , g_o , g_1 . The unrestricted counterpart of this equation is

$$\log G_t = A_1 + A_2 \log Y_t + A_3 \log G_{t-1} + \varepsilon_t \tag{1a}$$

The coefficients of equation (1a) are related to the parameters of (1) as follows :

$$A_1 = g_o b$$
$$A_2 = g_1 b$$
$$A_3 = 1-b$$

We can obtain a unique solution for the restricted parameters in terms of the unrestricted coefficients.The solution is

$$g_o = \frac{A_1}{1-A_3}$$

$$g_1 = \frac{A_2}{1-A_3}$$

$$b = 1-A_3$$

Here , g_o and g_1 are NONLINEAR functions of the unrestricted A's . To estimate the parameters of (1) , we use OLS estimates of the unrestricted coefficients of (1a) and use the solution for g_o, g_1, and b to obtain the corresponding estimates of these parameters. As for the desirable properties of the resulting estimators , Kmenta in his study (1971 : 443) notes that those estimators which are nonlinear functions of the unconstrained coefficients inherit the desirable asymptotic , but not small-sample , properties from the unconstrained estimators.The reason is that unbiasedness does not carry over via nonlinear functions . He says that , as in this study , the unconstrained estimators themselves are not unbised because of the presence of lag of dependent variable as an explanatory variable . So that none of the constrained estimators can be claimed to be unbiased.

We can determine the variance of the restricted estimator of b by reference to the variance of the unrestricted $\bar{A}_3$.

$$Var\ (\hat{b}) = Var(\hat{A}_3)$$

On the other hand , the determination of the variances of $\hat{g}_o$ and $\hat{g}_1$ is not easy because $\hat{g}_o$ and $\hat{g}_1$ are not linear functions of the unrestricted estimators. Here, there is an approximate formula that can be used (KMENTA , 1971 : 444).The formula refers to the general case where an estimator , say $\hat{\alpha}$, is a function of k other estimators such as $\hat{A}_t, \hat{A}_2 \ldots \hat{A}_k$; i.e ,

$$\hat{\alpha} = f\ (\hat{A}_1, \hat{A}_2 \ldots \hat{A}_k)$$

Then the large-sample variance of $\hat{\alpha}$ can be approximated as

$$Var(\hat{\alpha}) \approx \sum_k \left[\frac{\partial f}{\partial \hat{A}_k}\right]^2 Var\ (\hat{A}_k) + 2\sum_{j<k}\left[\frac{\partial f}{\partial \hat{A}_j}\right]\left[\frac{\partial f}{\partial \hat{A}_k}\right] Cov\ (\hat{A}_j, \hat{A}_k)\ ,$$
$$(j,\ k = 1,2 \ldots k\ ;\ k < j)$$

The approximation is obtained by using Taylor expansion for $f(\hat{A}_1, \hat{A}_2 . \hat{A}_k)$ around $\hat{A}_1, \hat{A}_2, \ldots \hat{A}_k$, dropping terms of the order of two or higher , then obtaining the variance by usual formula.

For $\hat{g}_o$ and $\hat{g}_1$ we have :

$$Var(\hat{g}_o) \approx \left(-\frac{1}{1-\hat{A}_3}\right)^2 Var(\hat{A}_1) + \left(\frac{\hat{A}_1}{(1-\hat{A}_3)^2}\right)^2 Var(\hat{A}_3)$$
$$+ 2\left(\frac{1}{1-\hat{A}_3}\right)\left(\frac{\hat{A}_1}{(1-\hat{A}_3)^2}\right) Cov\ (\hat{A}_1, \hat{A}_3)$$

$$Var(\hat{g}_1) \approx \left(-\frac{1}{1-\hat{A}_3}\right)^2 Var(\hat{A}_2) + \left(\frac{\hat{A}_2}{(1-\hat{A}_3)^2}\right)^2 Var(\hat{A}_3)$$
$$+ 2\left(\frac{1}{1-\hat{A}_3}\right)\left(\frac{\hat{A}_2}{(1-\hat{A}_3)^2}\right) Cov\ (\hat{A}_2, \hat{A}_3)$$

Since the large sample variances and covariances of the unrestricted estimators can be readily estimated by the application of the standart formulas , there is no problem in estimating large-sample variances of the restricted estimators.

In this study variances and standart errors of the restricted parameters of both expenditures and revenues are calculated by using these formulas and they are used in the determination of t - values.

APPENDIX B

FOURTH ORDER AUTOCORRELATION TEST

Many economic time series based on monthly or quarterly data exhibit seasonal patterns. Autocorrelation due to seasonal factors does not lead to relationships between disturbances in successive quarters, but to relationships between the disturbances in the corresponding quarters of successive years. (ERLAT,-1981 :IV-92).

Here, in this study our data is quarterly time series and we need to test if there is relationships between the disturbances in the corresponding quarters of the successive years. In order to do this , we need a statistic . Following Pagan and Hall (1983 :169-170) such a statistic may be derived as follows :

Let

$$Y_t = B_o + B_1 Y_{t-1} + B_2 X_t + u_t , \qquad t = 5 ,\ldots\ldots T \qquad (1)$$

where

$$u_t = p_4 u_{t-4} + \varepsilon_t \qquad t = 5 ,\ldots\ldots T \qquad (2)$$

and $\varepsilon_t \sim$ i.i. N $(0,\sigma^2)$. We wish to test $H_o : p_4 = 0$.

The statistic we shall use for this purpose may easily be derived as follows:

Let $\hat{u}_t$ be the t th OLS residual from the estimation of (1). Then add and subtract $p_4 u_{t-4}$ to (2) to obtain,

$$u_t = p_4 \hat{u}_{t-4} + p_4 (u_{t-4} - \hat{u}_{t-4}) + \mathcal{E}_t \qquad (3)$$

Substituting (3) into (2) would than yield,

$$Y_t = B_o + B_1 Y_{t-1} + B_2 X_t + p_4 \hat{u}_{t-4} + e_{t1} \qquad t = 5 \ldots\ldots T \quad (4)$$

where $\quad e_t = p_4 (u_{t-4} - \hat{u}_{t-4}) + \mathcal{E}_t$.

Since, $e_t = \mathcal{E}_t$ under Ho, one may test this hypothesis by estimating (4) by OLS and then testing if the coefficient of $\hat{u}_{t-4}$ in (4) is different from zero. The t-ratio corresponding to p_4 may be utilized for this purpose.

This statistic is, what Harvey (1981:173-174) calls the Modified Lagrange Multiplier statistic. In our application we used $\hat{u}_t$ as the dependent variable in (4). The fact that this approach leads to the same t - ratio as that mentioned above, can be demonstrated using the argument given in Erlat (1983 : 128-129).

APPENDIX   C

DATA SOURCES

1- Gross National Product : Quarterly, ÖZMUCUR, 1987.

2- Consolidated Budget Revenues : Quarterly, seasonally unadjusted,
    Ministry of Finance and Customs, Public Account Bulletins,1980-1986

3- Consolidated Budget Expenditure : Quarterly, seasonally unadjusted
    Ministry of Finance and Customs, Public Account Bulletins,1980-1986.