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Planning for growth: the case of Turkey

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I. INTRODUCTION

During the past few decades less developed countries (LDC's) adopted industrialization strategies which aimed at rapid GNP (gross national product) growth. Development became synonymous with growth, a unidimensional concept usually measured in terms of increases in GNP or per capita GNP. Development, on the other hand, is a multidimensional concept which includes growth as well as other factors such as the quality of life and the educational attainment of the population. The proponents of growth believed that the gains from increased output resulting from high savings and high investment would permeate the whole economy through employment and multiplier effects. However, as industrialization policies failed to generate expected levels of employment and correct inequalities in income distribution in the LDC's, a reexamination of the whole process of development took place. As a consequence, "GNP as a major and all encompassing objective, ..., became, widely, but not universally dethroned" [28] and new development strategies emphasizing employment and income distribution emerged.

The change in the weights attached to employment and income distribution in the welfare function of policy makers and planners resulted from 1) a growing awareness of the nature and causes of unemployment and underemployment in the

LDC's and 2) the realization that redistribution policies are very difficult to design and implement in the LDC's.

The concern with unemployment and underemployment grew as GNP in LDC's that adopted rapid industrialization policies increased at spectacular rates but employment creation fell short of expectations. It has been shown [37] that shortages of skilled labor, increases in productivity, the scale of operation, factor market distortions, and excess capacity can reduce the employment effects of growth. In addition, the situation can be aggravated by "exogenous" and "endogenous" factors influencing employment. Among the exogenous factors Pyatt and Thorbecke [28] list population explosion influenced by medical advances which reduce the mortality rate and tied aid, both public and private, which leads to adoption of "inappropriate" techniques. Among the endogenous factors they cite policies that worsen factor price distortions namely, overvaluation of the exchange rate, tax incentives for investment, subsidized interest rates, minimum wage legislations and other social benefits. They also point out to the fact that accelerated rural-urban migration in many LDC's has tended to substitute urban unemployment and underemployment in the services and trade sectors for agricultural underemployment.

The widely held belief that increments in income resulting from rapid growth of GNP could be redistributed proved to

be inoperational in the LDC's. Thorbecke [35] argues that "the political power balance is at least partially related to primary income distribution (before taxes), so that it is very difficult in most developing countries to design and implement policies acceptable to the power groups which would permit redistribution of increased output and corresponding income." He, furthermore, states that "even if there is a political will to use fiscal and other instruments to alter income distribution, the actual institution, enforcement and administration of these measures is often beyond the administrative capability of these countries." Finally, he objects to the whole notion of redistribution after output has increased because he argues "a simple redistribution scheme would not remove the sense of frustration and lack of human dignity associated with being unemployed".

The pressing nature of unemployment and underemployment and the persisting (or increasing) inequalities in income distribution in the LDC's has led to the formulation of a new strategy of development emphasizing employment and income distribution. The new approach views employment and income distribution within the context of the means-ends continuum. Employment relates to income distribution and income distribution to other objectives in particular political stability. If an egalitarian income distribution is accepted as an objective, employment may be the best means through which it

could be achieved since income in terms of wage payments will be provided to those who would otherwise be unemployed. An employment policy would also influence the objective of political stability by reducing widespread unemployment which causes political dangers [39]. The question then arises: would output be sacrificed if income distribution and employment are given higher weights?

In the Neoclassical framework with continuous substitution there is no conflict between output and employment. Unemployment in this framework occurs because of excessive relative wage. In a two sector model, conflict between output and employment exists when the production function in one of the sectors exhibits fixed coefficients and one of the factors of production is scarce.

In the growth literature, income distribution and output are seen in terms of a trade-off. The argument is based on the premise that propensities to save vary between income groups. The propensity to save out of profits usually is assumed to be greater than that out of wages. An egalitarian income distribution would jeopardize growth since the overall propensity to save would fall, total savings would decrease, and, therefore, investment would decline. In this framework, an uneven income distribution is to be tolerated to achieve growth. However, Stewart and Streeten [32] and Pyatt and

Thorbecke [28] do not believe that output, employment, and income distribution should necessarily be conflicting. Pyatt and Thorbecke state that "it might be possible to design a development strategy which permits an improvement in the distribution of income within a growth context."

With these considerations in mind the Turkish development experience is summarized. Rapid industrialization has been a major objective of the Turkish Republic since 1923. However, until 1960 industrialization policy was formulated in terms of industrial projects without any comprehensive plans coordinating them. After the 1960 Revolution, five-year development plans, the first one starting in 1962, were drawn. A target rate of 7% a year was set for GNP. Accelerated growth remained the main objective while employment and income distribution were still thought to be of secondary importance.

During the period 1962-70 significant changes took place in the Turkish economy. GNP grew at 6.4% a year on the average over the period; value added in agriculture decreased to 26% of GDP (gross domestic product) while that of industry increased to 17%. Total gross investment increased to 19% of GDP; balance of payments problems worsened with accelerated growth but were later solved as remittances by Turkish workers abroad increased considerably. However, unemployment and inequalities in the distribution of income remained unsolved.

Over the period 1950-1970 population increased at an average compound rate of 2.7% a year; urban population grew at 5% a year, and rural-urban migration accelerated. Unemployment figures reported by the Government Employment Agency remained insignificant while others estimated 1-2 million unemployed. Seasonal unemployment was estimated at 9% in July and August and 77% in December in 1967. Disguised unemployment, total available labor minus the peak season demand for labor, stood at 10% for the same year.

It is only recently that planners and policy makers became concerned with the employment and income distribution problems. The evidence of this concern are the numerous studies on employment and income distribution undertaken by the State Planning Organization (SPO), the State Institute of Statistics (SIS), as well as independent researchers.[1] However, judging from the development plans, it cannot be said that the "all-encompassing" objective of GNP growth has been dethroned in Turkey.

The purpose of this study is to analyze the impacts of alternative growth rates of GDP on sectoral output, employment, and income distribution in Turkey for 1977. Sectoral projections are made within a disaggregated consistency frame-

[1]For detailed listing of income distribution and employment studies see [24] and [25].

work which involves the use of a macroeconometric model together with an input-output table. Sectoral estimates will, therefore, be consistent with overall growth rates of GDP derived through the macro model. The organization of the study is as follows: Chapter II is devoted to a survey of the Turkish economy over 1952-1970 with special emphasis on growth indicators, resource utilization (in particular labor), and the distribution of income. In Chapter III the conceptual framework is described and the basic steps of the framework outlined. Chapter IV consists of the specification of the macro model and its estimation. Tests of the predictive ability of the model are also given in this chapter. Chapter V presents the empirical results for 1977. First, projections for 1977 under alternative growth rates for predetermined variables are discussed. Second, sectoral estimates computed within the input-output system and consistent with the growth rate of GDP determined through the macro model are presented. In Chapter VI the study is summarized, policy implications discussed, and suggestions for further study are made.

II. SURVEY OF THE TURKISH ECONOMY

The purpose of this chapter is to review the development experience of Turkey over the period 1952-1970. Special emphasis is given to growth indicators such as gross domestic product (GDP), gross domestic capital formation, the foreign sector, and the public sector. Unemployment, underemployment, and the distribution of income is discussed in detail. The data is taken from the publications of the State Planning Organization (SPO), State Institute of Statistics (SIS), and the Ministry of Commerce.

A. Growth Indicators

1. Gross domestic product

The major policy objective of Turkish planners and policy makers is rapid growth. It is believed that rapid growth is to be achieved by changing the structure of the economy from its heavy reliance on agriculture to industry. This then implies the creation of a rapidly growing industrial sector.

Over the 1952-1970 period Turkey has been rather successful in achieving her goal of rapid growth through industrialization. GDP increased at an average annual rate of 6.3%, the share of agricultural value added in GDP declined from 42% to 26% and that of industry increased from 13% to 17%. The decline in the share of agricultural value added in GDP

has also helped reduce the impact of the erratic performance of this sector on total output.

Table 2.1 gives the yearly changes in GDP, value added in agriculture, and industry. Wide fluctuations in agricultural value added indicates heavy reliance on natural forces. Efforts are being made to reduce the dependence of agriculture on natural forces. The data indicates that these efforts have not yet been very successful.

Large fluctuations are also seen in industrial value added. Industry is composed of manufacturing, mining, and the energy sectors. Value added in manufacturing accounts for almost 90% of industrial value added. Close to 98% of enterprises in manufacturing are privately owned. Private investment is known to be volatile and dependent on economic and noneconomic factors, especially political stability. The low growth rates of 1.3%, 3.2%, and 2.6% in industrial value added correspond to 1961, the year following the Revolution, and to 1968-1970, a period of growing unrest in Turkey. These factors can explain the unsteady performance of the Turkish industrial sector.

2. Gross domestic capital formation

Turkish development plans call for ambitious marginal savings rate, of the order of 39-42% and high ratios of gross domestic investment to GDP. The Second Five-Year Development

Table 2.1. Gross domestic product, value added in agriculture and industry, 1952-1970, billion TL. (at factor cost of 1961)[a]

Year	GDP	Yearly % Changes in GDP	Value Added in Agriculture	Yearly % Change in Agricultural Value Added	Value Added in Agriculture as a % of GDP	Industrial Value Added	Yearly % Changes in Industrial Value Added	Industrial Value Added as % of GDP
1952	36.4		15.5		42.5	4.9		13.4
1953	40.9	12.3	17.0	16.1	41.5	5.4	10.2	13.2
1954	36.9	-9.7	13.6	-20.0	36.8	5.6	3.7	15.1
1955	39.6	7.3	14.9	9.5	37.6	5.9	5.3	14.8
1956	42.1	6.3	16.2	8.7	38.4	6.2	5.0	14.7
1957	44.8	6.4	16.6	2.4	37.0	6.7	8.0	14.9
1958	50.0	11.6	19.5	17.4	39.0	7.0	4.4	14.0
1959	52.6	5.2	19.4	-0.5	36.8	7.2	2.8	13.6
1960	53.8	2.3	19.6	1.0	36.4	7.4	2.7	13.7
1961	53.9	1.8	19.0	-3.0	35.2	7.5	1.3	13.9
1962	57.3	6.3	20.1	5.7	35.0	8.1	8.0	14.1
1963	61.6	7.5	21.7	7.9	35.2	8.7	7.4	14.1
1964	64.6	4.8	21.7	0.0	33.6	9.5	9.1	14.7

[a]Sources: Devlet Istatistik Enstitusu [10], and Korum [22].

Table 2.1 (Continued)

Year	GDP	Yearly % Changes in GDP	Value Added in Agriculture	Yearly % Change in Agricultural Value Added	Value Added in Agriculture as a % of GDP	Industrial Value Added	Yearly % Changes in Industrial Value Added	Industrial Value Added as % of GDP
1965	67.1	3.8	20.9	-3.6	31.1	10.3	8.4	15.3
1966	73.8	9.9	23.3	11.4	31.5	11.4	10.6	15.4
1967	78.5	6.3	23.5	0.8	29.9	12.8	12.2	16.3
1968	83.8	6.7	24.0	2.1	28.6	14.1	10.1	16.8
1969	88.9	6.0	23.9	-0.4	26.8	15.4	3.2	17.3
1970	93.1	4.7	24.2	1.2	26.0	15.8	2.6	17.0

Plan (SFYDP) reports that in the period 1966-1968 the marginal savings rate was 24.5%. It has been estimated [2] that the major portion (45%) of total savings in 1967 were generated by the affluent members of the society. Only 7% of total savings in the same year came from the broad masses. SPO annual programs indicate that the ratio of domestic savings to GNP increased from 13.4% in 1963 to 19.6% in 1970. The ratio of gross investment to GDP stands at 19.2% in 1970 if SIS figures are used. This implies that almost 1/5 of GDP is used to increase and replace the stock of capital in Turkey. A better idea about capital formation can be obtained by analyzing private and public investment together with their components.

Table 2.2 gives the total as well as the breakdown of private and public gross investment into their components: machinery and equipment, housing, and, other construction. An examination of total public investment and total private investment over the period 1952-1070 reveals that until 1963 public investment was less than private investment with the trend changing in 1963. In 1962, private investment was 52% of total and by 1970 public investment accounted for 53%.

Turning to the various components of public and private investment it can be seen that the share of "other construction" in public investment which covers all government work related to infrastructure has increased to 73% in 1970. The share of housing investment in private investment has risen

Table 2.2. Private and public investment, 1952-1970, billion TL., (1961 prices)[a]

Year	Private Investment						
	Total	Machinery & Equipment	% of Total	Housing	% of Total	Other	% of Total
1952	3.4	1.3	56.0	1.2	35.0	0.3	8.0
1953	3.2	1.4	44.0	1.2	37.0	0.6	18.0
1954	3.4	1.2	35.0	1.7	50.0	0.5	14.0
1955	3.8	1.3	34.0	1.9	50.0	0.6	15.0
1956	3.1	1.1	35.0	1.5	48.0	0.5	16.0
1957	2.9	0.9	31.0	1.6	55.0	0.4	13.0
1958	3.4	1.3	38.0	1.6	47.0	0.5	14.0
1959	3.5	1.6	45.0	1.4	40.0	0.5	14.0
1960	3.7	1.7	46.0	1.5	40.0	0.5	13.0
1961	3.9	1.9	49.0	1.5	38.0	0.5	12.0
1962	4.1	2.0	48.0	1.6	39.0	0.5	12.0
1963	4.2	2.1	50.0	1.4	33.0	0.7	16.0
1964	4.1	1.6	39.0	1.8	43.0	0.7	17.0
1965	4.3	1.4	32.0	2.2	51.0	0.7	16.0
1966	5.5	2.3	42.0	2.3	41.0	0.9	16.0
1967	6.1	2.5	41.0	2.7	44.0	0.9	14.0
1968	6.4	2.5	39.0	2.9	45.0	1.0	15.0
1969	7.1	2.3	32.0	3.7	52.0	1.1	15.0
1970	8.4	2.7	32.0	4.3	51.0	1.4	16.0

[a]Source: Devlet Istatistik Enstitusu [10].

Public Investment						
Total	Machinery & Equipment	% of Total	Housing	% of Total	Other	% of Total
1.9	0.7	36.0	0.03	1.0	1.2	63.0
2.6	0.7	26.0	0.03	1.0	1.9	73.0
2.3	0.6	26.0	0.02	1.0	1.7	73.0
2.4	0.5	20.0	0.02	1.0	1.9	79.0
2.5	0.6	23.0	0.05	2.0	1.9	75.0
2.7	0.3	11.0	0.03	1.0	2.4	88.0
2.4	0.2	8.0	0.01	1.0	2.2	91.0
2.9	0.6	20.0	0.03	1.0	2.3	73.0
3.6	1.0	27.0	0.02	1.0	2.6	72.0
3.7	1.0	27.0	0.04	1.0	2.7	72.0
3.7	1.1	29.0	0.05	1.0	2.6	70.0
4.6	1.0	21.0	0.18	3.0	3.5	76.0
5.0	1.0	20.0	0.02	0.0	4.0	80.0
5.5	1.2	21.0	0.08	1.0	4.3	78.0
6.4	1.4	21.0	0.22	3.0	4.8	75.0
7.0	1.5	21.0	0.10	1.0	5.4	77.0
8.1	2.0	24.0	0.13	1.0	6.0	74.0
9.1	2.3	25.0	0.10	1.0	6.7	73.0
9.5	2.4	25.0	0.11	1.0	7.0	73.0

to 51% in 1970, and that of machinery and equipment has declined to 32%. Steps were taken to divert private investment into other activities besides housing, but private investment into housing has consistently exceeded plan targets. Another problem connected with private investment has been its concentration in small-scale family-type enterprises engaged in simple processing, light consumer goods production, and in services, such as transportation. The lack of organized capital markets, and difficulties in obtaining loans might be important factors causing this problem.

3. The public sector

In Turkey, the prime mover of the economy is the public sector. Starting in the 1930's, as Turkey embarked on rapid industrialization, the provision of basic infrastructures and the establishment of new industries fell upon the government. The importance of this sector prevailed even in the 1950's when the Democratic Party, which favors private enterprise, was in power. Today the State, through the State Economic Enterprises, is still very active in almost all sectors of the economy.

Table 2.3 shows Central Government Revenue, its components--revenue from direct and indirect taxes, and Central Government Expenditures over the period 1952-1970. The table reveals how important indirect taxes are to the

Table 2.3. Government tax revenue and expenditures 1952-1970, billion TL., (1961 prices)

Year	Total Revenue	% Annual Change in total Revenue	Total Direct Taxes	Direct Taxes as % of Total	% Annual Change in Direct Taxes
1952	4.1		1.0	24.0	
1953	4.6	12.0	1.2	26.0	20.0
1954	4.5	-2.0	1.3	28.0	8.0
1955	4.7	4.0	1.5	31.0	15.0
1956	5.0	6.0	1.7	34 0	13.0
1957	5.4	8.0	1.6	29.0	-5.0
1958	5.5	1.0	1.8	32.0	12.0
1959	6.2	12.0	2.0	32.0	11.0
1960	6.2	0.0	2.2	35.0	10.0
1961	6.6	6.0	2.5	37.0	13.0
1962	6.7	1.0	2.1	31.0	-16.0
1963	7.5	11.0	2.4	32.0	14.0
1964	8.0	6.0	2.6	32.0	8.0
1965	8.6	7.0	2.8	32.0	7.0
1966	9.8	13.0	3.3	33.0	17.0
1967	11.0	12.0	3.7	33.0	12.0
1968	11.5	4.0	4.0	34.0	8.0
1969	12.9	12.0	4.6	35.0	15.0
1970	14.3	10.0	5.3	37.0	15.0

[a]Source: Devlet Istatistik Enstitusu [8].

Total Indirect Taxes	Indirect Taxes as % of Total	% Annual Change in Indirect Taxes	Public Investment	Public Consumption
3.1	75.0		1.9	6.0
3.4	73.0	3.0	2.6	5.9
3.2	71.0	-5.0	2.3	5.4
3.2	68.0	0.0	2.4	5.8
3.3	66.0	3.0	2.5	5.7
3.8	70.0	15.0	2.7	5.3
3.7	67.0	-2.0	2.4	5.8
4.2	67.0	13.0	2.9	6.5
4.0	64.0	-4.0	3.6	6.8
4.1	62.0	2.0	3.7	7.6
4.6	68.0	12.0	3.7	8.4
5.1	68.0	12.0	3.6	8.8
5.4	67.0	5.0	5.0	9.3
5.8	67.0	7.0	5.5	9.5
6.5	66.0	12.0	6.4	9.6
7.3	66.0	12.0	7.0	9.2
7.5	65.0	2.0	8.1	9.6
8.3	64.0	10.0	9.1	10.0
9.0	62.0	8.0	9.5	10.2

generation of revenue in Turkey. The administrative ease of collecting indirect taxes has resulted in the dependence of the Turkish Government upon such taxes for revenue. Revenue from direct taxes has always been a minor source of income for the Turkish Government (i.e. around 30% of total revenue from taxes).

Despite many tax revisions and reforms especially after 1960, revenue from direct taxes has not shown the expected increases.[1] This can be explained by the deficiencies in the structure of direct taxes. Agricultural incomes were exempt from taxation until 1961. Even after 1961, when agricultural incomes could be taxes, exemptions were so generous and loopholes so abundant that revenue from this source was only 1.0% of total tax revenue. Among other factors accounting for low revenue from direct taxes the insignificance of inheritance taxes and tax evasion can be mentioned. Despite many improvements in the collection system, the problem of tax evasion has not yet been solved. Furthermore, the bulk of incomes from real estate go untaxed because of undervaluation of such estates.[2]

The structure of indirect taxes is not flawless either. Indirect taxes are not linked to the fastest growing compo-

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[1] This and the following paragraphs draw on [27].

[2] Improvements in the collection system and revisions in tax rates have taken place after 1970.

nents of national output. They are, on the other hand, linked to such consumer goods as tobacco, alcoholic beverages, etc., items for which expenditures do not grow as fast as incomes of households do. The base of indirect taxes is rather narrow, and most of the durable goods escape taxation. In other words, indirect taxes suffer from low income elasticity.

Import duties are an important component of indirect taxes in Turkey. Turkey relies on import duties for revenue and uses them as a check on consumer goods imports. Import duties have been rather successful in reducing consumer good imports. However, relying on import duties as a source of revenue has drawbacks since most of Turkey's imports are capital goods and raw materials; goods for which duty concessions are provided. Imports of raw materials plus capital goods accounted for 90% of total imports in 1965.

Another important component of indirect taxes is the tax on bank and insurance transactions. Such taxes make borrowing from commercial banks very difficult especially for small enterprises. Therefore, most investment is financed through family savings or from profits.

The last point to be discussed in connection with the public sector is the large gap that usually exists between government revenue and expenditures in Turkey. In 1952 public investment plus public consumption stood at 7.9 billion

Turkish lira (TL.), TL. 3.8 billion over tax revenue. In 1970 expenditures stood at TL. 19.7 billion and total tax revenue at TL. 14.7 billion. It can be seen from Table 2.3 that large gaps between revenue and expenditures have existed through 1952-1970. This means that in the absence of capital markets, the Government resorts to deficit financing by borrowing from the Central Bank. The Central Bank then becomes the Government's bank in the sense that every time revenue falls short of expenditures the Central Bank has to finance the deficit. The Central Bank is then left with no policy tools at its disposal. The only tool the Central Bank of Turkey has to control the money supply is the ceiling on Government borrowing which is set as a percentage of the Budget. The Central Bank Law passed after 1970 is aimed at giving the Central Bank more control over the money supply. The evidence of how this power is used is not yet available.

4. Foreign trade sector

The final growth indicator to be analyzed is the foreign trade sector. For a long time Turkey has suffered from a weak structure of exports. High levels of exports were reached in certain years due to bumper crops, and big declines registered the next year. Traditional exports dominate the picture, and variation in harvest or international prices of these commodities account for the changes in the total value

of exports. In recent years an effort has been made to include citrus fruits and manufactured items in the list of exports. On the other hand, exports of ores which had played an important role in Turkey's exports have been declining. In 1963 efforts were made to encourage exports. Tax refunds on exports of textiles and manufactured goods, improvement of quality, standards and marketing arrangements were started. However, increases in exports of manufactured goods cannot have a big impact on total exports since at the moment these items are a small portion of total exports. What is needed is to improve agricultural productivity and develop processing and marketing facilities. In view of the growing domestic consumption and industrial activities, export surpluses are likely to be reduced. This is especially true for cotton. It is necessary for output to increase faster than it recently has.

Table 2.4 shows the total commodity imports and exports and their share in GDP. On the average, imports stood at 5.2% of GDP for the period. Exports were 4.3% of GDP. In 1961, a large increase in the share of imports in GDP took place. This should be associated with the introduction of the Development Plan. Imports of investment goods were necessary to achieve the growth rate planned. The share of exports, on the other hand, has remained at about the same level despite efforts to increase it. Imports of consumer

Table 2.4. Foreign trade statistics, 1952-1970 (current prices), billion TL.[a]

Year	GDP	Imports	Imports / GDP in %	Exports	Exports / GDP in %
1952	14.2	1.5	10.5	1.0	7.4
1953	16.8	1.4	8.3	1.1	6.5
1954	17.0	1.3	7.6	0.9	5.2
1955	21.0	1.3	6.1	0.8	3.8
1956	24.0	1.1	4.5	0.8	3.3
1957	30.5	1.1	3.6	0.9	2.9
1958	38.5	0.8	2.0	0.6	1.5
1959	47.9	1.3	2.7	0.9	1.8
1960	51.2	2.2	4.2	1.6	3.1
1961	53.9	4.5	8.3	3.1	5.7
1962	60.4	5.5	9.1	3.4	5.6
1963	69.2	6.2	8.9	3.3	4.7
1964	74.4	4.8	6.4	3.6	4.8
1965	79.7	5.1	6.3	4.1	5.1
1966	92.9	6.5	6.9	4.4	4.7
1967	103.6	6.2	5.9	4.7	4.5
1968	114.3	6.9	6.0	4.4	3.8
1969	127.8	6.7	5.2	4.8	3.7
1970	145.5	9.5	6.5	6.4	4.3

[a]Source: Turkiye Cumhuriyeti Ticaret Bakanligi [39].

goods have been reduced by quotas, tariffs, and other quantitative measures. Most of the imports at the present are raw material and investment good imports. In contrast with export targets that remain unachieved, import targets set in the plans are in general exceeded.

For many years, Turkey faced a chronic balance of payments problem. Foreign assistance was used to fill the growing trade deficit.[1] In the late 1960's remittances by Turkish workers employed in Europe increased and helped eliminate the balance of payments problem. Total remittances reached $140 million in 1969. At the moment, the balance of payments problem is solved, but for how long can Turkey count on workers' remittances? As the plans point out, the growth rate of remittances has slowed down, but there is no doubt that they will continue to be an important factor in the balance of payments of Turkey.

The flow of foreign funds to Turkey has been increasing since 1956 with the exception of 1960, which was the Revolution year.[2] In the period 1949-1969, the United States has provided a total of $2.534 billion in assistance, $953 million of which were grants and $1035 million were loans. $546 million of the total were P.L. 480 shipments. It should be

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[1] More will be said about foreign assistance in the following paragraph.

[2] This and the following paragraphs draw on [16].

pointed out that lately United States assistance shifted from grants to loans due to difficulties in the Balance of Payments of the United States. In 1962 an aid Consortium was established. It was made up of most of the West European countries, United States and the World Bank. For the period 1963-1965, the Consortium provided $250 million a year on the average. However, for the same period there was a gap between agreed amounts and disbursements.

In 1965, Russia, who had played an important role in the Development of Turkey during the 1940's, reappeared on the scene. Russia extended assistance for technical and project financing purposes. Most of the projects Russia is involved in are for the producers goods sector.

B. Underemployment and Unemployment

Before we discuss underemployment and unemployment in Turkey a note of caution is in order. Manpower statistics in Turkey are very confused. The confusion results from definitional difficulties that arise in a country with a large agricultural sector and where rapid urbanization takes place. The agricultural worker, working a few months a year is recorded as employed. A man selling lighters, pins and combs on a small counter at the corner of a street and who sells two or three lighters and five or six pins a day is entered

as "employed on own account". This, no doubt, is underemployment. Underemployment is defined as 1) short work weeks or months, and/or 2) abnormally low income. In the urban sector, the majority of underemployed is in the services and commerce sectors. In a country where there are no unemployment benefits, no one can afford to be unemployed. So, a head of a household who has come to the city with the expectation of higher income and has failed to find a job sets up a counter on a street and becomes self-employed and is entered thus in the employment statistics.

Conflicting unemployment figures are usually reported by different sources. Unemployment figures reported by the Government Employment Agency fluctuate around insignificant numbers of tens of thousands. The Population Census of 1965 reported 55,700 unemployed, in the entire country but the Sample Labor Force Survey of 1966 found unemployed in only eight cities to be 73,800 [40]. Hershlag [16] reports that several studies have estimated 1-2 million unemployed in Turkey in 1965. Comparing these estimates with the labor force of 13.5 million in 1965 shows that according to the 1965 population census there was only 4% unemployment in Turkey. Unemployment in only eight cities stands at 5.5% if the Sample Labor Force Survey estimate is considered. If on the other hand the number of unemployed in 1965 was around 1 million this would imply an unemployment rate of 7.4%.

The First Five-Year Development Plan (FFYDP) made rather optimistic estimates of employment opportunities, but the realization rate was 42.4% under target, with only industry exceeding the target established [25]. Detailed studies were then undertaken by the State Planning Organization and as a result the Second Five-Year Development Plan reported unemployment in the nonagricultural sector to be 9.5% in 1967. Seasonal unemployment in agriculture for the same year was estimated at 9% for July and August and 77% for December and February.[1] Disguised unemployment in agriculture for the same year was estimated at 10%.[2] Studies by Celasun [3] and Hamurdan [14] show that unemployment in the agricultural and urban sectors will continue to be rather high in the 1970's. Celasun estimates that unemployment in the urban areas will reach 13% in 1977 and 21% in 1982. Hamurdan finds that there will be no sign of improvement in agricultural seasonal and disguised unemployment in the 1970's.

Even though there is little information on labor markets in Turkey, it is clear that rapid urbanization rates have

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[1]Seasonal unemployment in agriculture is based on a 45-hour work week and different workable days estimated for different seasons. Seasonal unemployment is calculated as the supply of manpower available minus seasonal manpower demand.

[2]Disguised unemployment is defined as total available labor minus the peak season demand for labor.

worsened the urban unemployment problem. Increases in urban wages have further aggravated the situation. Increases in urban wages have on the one hand reduced the demand for labor and on the other increased the supply of urban labor by inducing rural-urban migration. Celasun [3] computes the ratio of urban to rural incomes per head to be 5.0 in 1969. He believes this has been a major factor in rapid urbanization (urban population has been increasing at a compound annual rate of 5% over 1960-65 period). Ongut [26] reports that between 1963-1968 money wages in the manufacturing industries in Istanbul have increased by 69% and the cost of living by 38%, therefore, implying a 4.5% a year increase in real wages. Miller [25] reports that a study on employment in the manufacturing sector found that for everyone percentage point increase in the minimum wage to consumer price index ratio there is 1/3 of a percentage point decline in the rate of growth of employment in that sector. It would at first seem paradoxical that urban wages could increase in the face of considerable urban unemployment. But it is believed that institutional forces, minimum wage laws, and pressures by unions have caused urban wage rates to rise [26].

To provide an answer to the low realization rates of employment projections under the FFYDP we can mention the following in addition to factors already discussed above: policies lowering the price of capital below its scarcity value and

relative to labor and increases in labor productivity resulting from the very process of growth.

Ongut [26] examines the impact of certain policies on employment. He focuses on the overvaluation of the exchange rate which reduces the cost of imported capital goods relative to labor and tax and credit policies to encourage private investment.[1] He points out that special credit arrangements lower the interest rates on loans from the commercial bank rate of 15-18% to 11-12%. To quantify the effects of these distortions he investigates a project at the Industrial Development Bank of Turkey. Under different assumptions about tax and credit incentive, wage rate growth, and exchange rates, he compares the private rate of return to investors of a labor and capital intensive versions of the project. His calculations show that under the existing tax and credit incentives in Turkey, with an overvalued exchange rate and wages increasing at 5% a year, the capital intensive project has a higher rate of return.[2] The elimination of tax and credit incentives does not change the ranking. However, adjusting the exchange rate makes the labor intensive project more

[1]Incentives for industrial investment in Turkey take the form of tariff concessions on imported capital equipment, payment facilities for import duties on investment goods, income tax exemption for investment in fixed assets, accelerated depreciation allowance, and concessionary credit for specific industries.

[2]The study was done before 1970, the year the Turkish lira (TL.) was devalued.

attractive. Combining the corrected exchange rate with the assumption that wages remain constant widens the gap in the profitability of the labor and capital intensive projects in favor of the former.

Demirgil [7] reports that labor productivity in the public manufacturing sector has been increasing at 3.4% a year. He reports that productivity increases in the mining and energy sectors have been even higher due to considerable increases in the capital to labor ratio. He also reports that during the 1955-1969 period productivity in construction, transportation, and services has been increasing at 2%, 5%, and 3.5% a year respectively. Demirgil also believes the same trends will continue into the 1970's.

C. Income Distribution

Changes take place in an economy as a result of development. The existence of some of the changes like increases in GDP is easily established. Others like changes in the distribution of income require substantial effort. At the same time, these changes may very well be more important than those whose existence is easily visible. The best example of the latter are changes in the distribution of income since such changes influence major economic and noneconomic variables such as the composition of aggregate demand, accumulation of

capital, employment, and political stability.

There are several studies on income distribution in Turkey. Most of these studies are, however, partial studies covering a few sectors and a few occupations. There are only two comprehensive studies one for 1963 by the State Planning Organization and the other for 1968 by Bulutay et al. [1]. The Bulutay et al. study estimates the distribution of income after taxes at the country, regional, and occupational levels. The same team of researchers will provide a similar study for 1973. As the estimates for 1973 are made available, it will be possible to make statements about changes in the distribution of income in Turkey. Nothing can be said about changes in the distribution of income at the present since there are no comparable studies at two different points in time.

The estimates of the Bulutay et al. study [1] for 1968 show that the distribution of income in Turkey is very uneven with 55.8% of population receiving 17.8% of total income and the top 10% receiving 44%. The Gini coefficient is reported to be 0.5648 and 0.6639 when households and persons employed are considered respectively.[1] The rather uneven distribution of income can be explained in terms of wage

[1]The Gini Coefficient calculates the ratio of the area between the Lorenz curve and the line of perfect equality (the 45° line). The values of the coefficient range between 0-1 with zero indicating perfect equality and 1 perfect inequality.

differentials that exist between sectors and the fact that the majority of the economically active population (EAP) is employed in agriculture where the distribution of income is the most uneven.

In Turkey, the majority of the EAP has been and still is employed in agriculture where wages are very low. In 1968, 70% of the EAP was employed in agriculture. The average daily wage in this sector was 10-13 Turkish lira (TL.) whereas the average daily wage in Turkey in 1968 was TL. 28. Average daily wages in construction and transportation for the same year were TL. 29 and TL. 34, respectively. Lower wages in agriculture can partly be explained in terms of the lack of unionization of agricultural workers. Unlike workers in nonagricultural sectors who are increasingly becoming unionized, agricultural workers still remain unorganized. Unions have increased their membership considerably since 1960. They are now accepted by the government and the employers. They have so far been very effective in increasing wages for their members.

Bulutay et al. [1] find that at the occupational level the distribution of income for farmers and farm workers shows the highest inequality with 49% of those in the group receiving 13.7% of the total income of the group and the top 5.7% receiving 39.5%. The Gini coefficient for this group

was estimated at 0.5898. The Lorenz curves for occupations is given in Figure 2.1. Recalling that 70% of the EAP was engaged in agriculture in 1968 can help explain the unequal distribution of income in Turkey for that year.

The skewed distribution of income in agriculture can in turn be explained in terms of the uneven distribution of agricultural land. The Agricultural Census of 1963 reported that 9% of households in agriculture had no land at all. The Census also reported that 45% of households in agriculture owned lots less than 30 donum (4.39 donum = 1 acre). Bulutay et al. [1] estimate that in 1968 17.5% were landless and 56% owned lots less than 30 donum. The same study shows that the top 2% of households in agriculture owned 28% of total agricultural land [ranking is by farm size]. See Table 2.5 for details of the Agricultural Census and the Bulutay et al. udy.

At the regional level Bulutay et al. find that inequality in the distribution of income is highest in Eastern Anatolia. The Gini coefficient for this region stands at 0.6211. This region shows the highest inequality in the distribution of land as well as income after taxes. The Lorenz curves of the distribution of income for five regions are given in Figure 2.2.

Concluding this chapter we can say that Turkey has been rather successful in achieving her goal of rapid growth

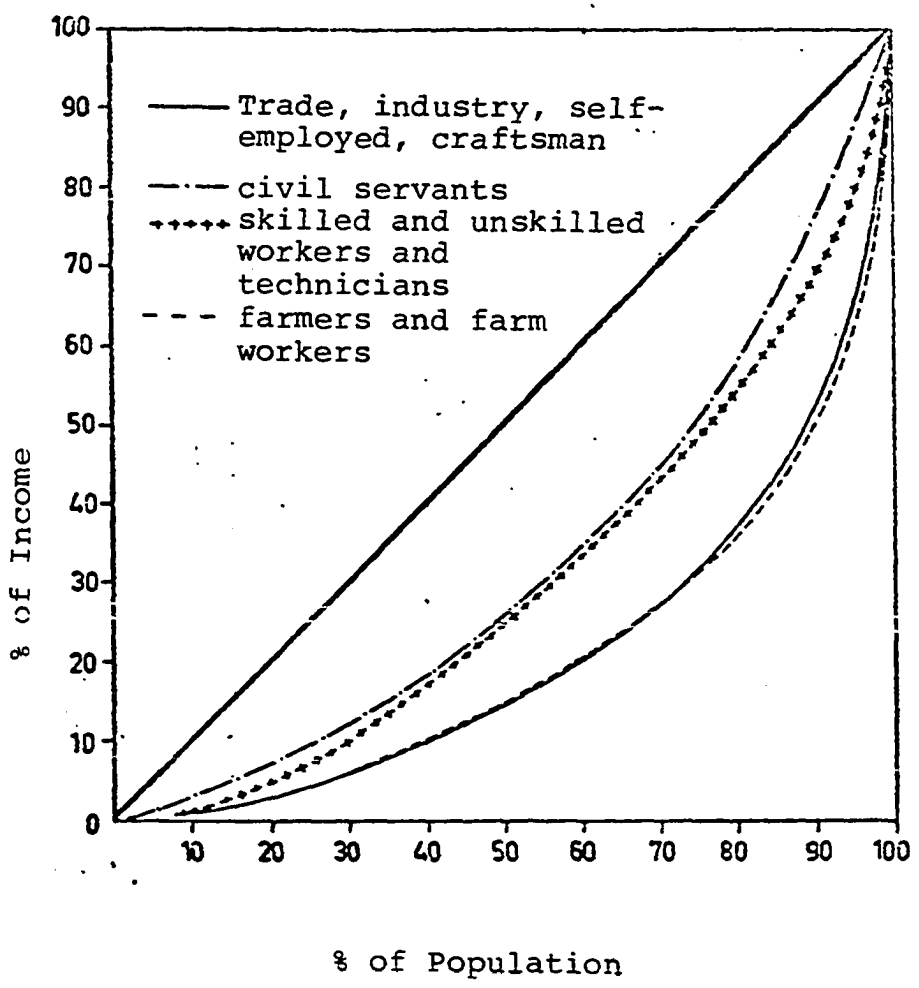

Figure 2.1. Lorenz curves for four occupations: 1968

Table 2.5. Distribution of agricultural land: 1963, 1968[a]

Land Groups (Donum)[b]	% of Households 1963 Census	Area Owned in %	% of Households Bulutay et al.	Area Owned in %
No land	9.14	0.00	17.52	0.00
1-5	11.06	2.87	9.24	0.84
6-10	10.66	3.16	11.30	2.30
11-20	13.97	4.91	15.55	6.22
21-30	9.96	5.13	12.49	8.15
31-40	8.33	6.05	6.97	6.29
41-50	6.35	5.84	8.73	10.31
51-100	15.88	21.41	11.39	20.44
101-200	8.29	21.40	4.83	16.77
201-500	2.79	15.29	1.31	9.37
501-1000	0.34	4.00	0.33	6.30
1000+	0.13	6.28	0.34	13.01

[a]Source: Bulutay [1].

[b]One acre = 4.39 donum.

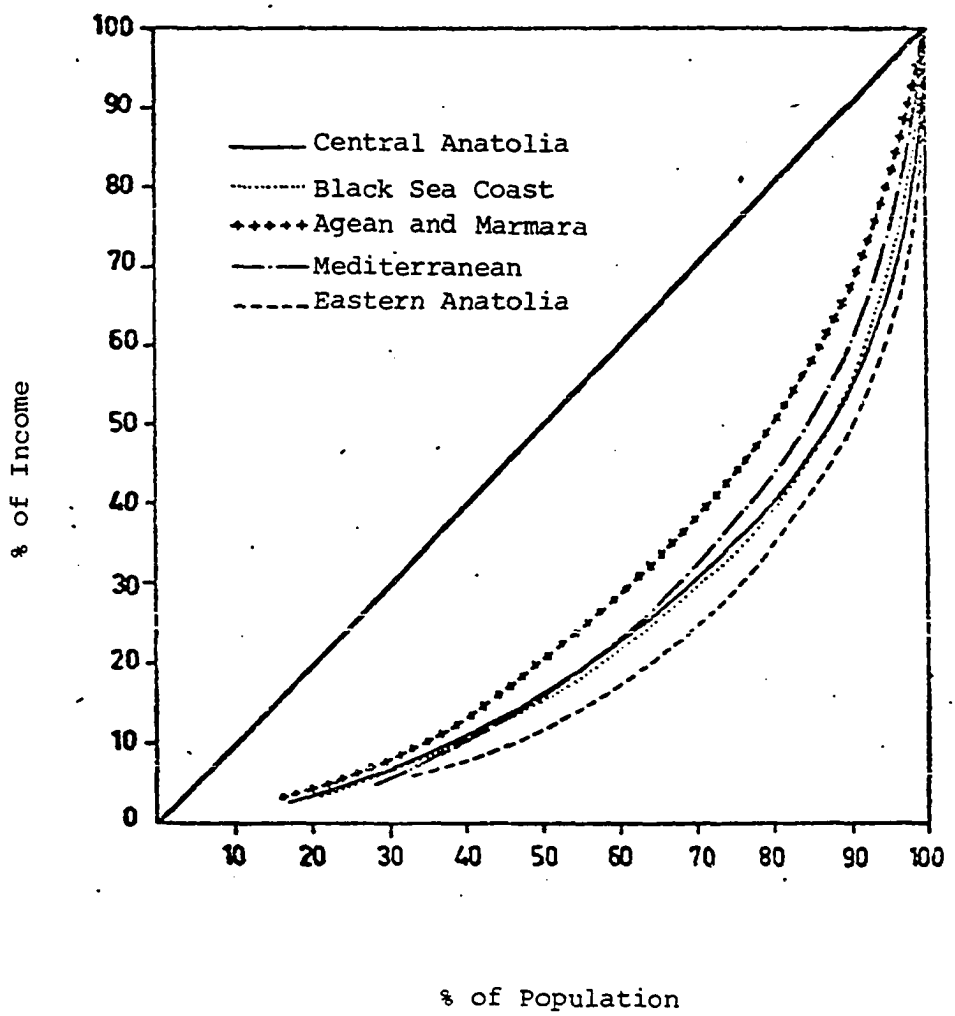

Figure 2.2. Lorenz curves for five regions: 1968

through industrialization: GDP increased at a rate close to the target rate of 7%; the structure of the economy has shifted toward industry; and almost 1/5 of GDP is at the present being used to increase and replace the domestic capital stock.

The performance of the Turkish economy in terms of utilization of resources and distribution has however, not been so spectacular. Unemployment in the urban sectors and underemployment in agriculture has reached alarming rates. Urban wages rose due to institutional forces as well as pressures by unions. Rural-urban migration has reached high rates due to wide differentials in incomes. The employment creation capacity of many sectors has been limited due to policies that reduced the price of capital below its scarcity value and relative to labor. A dual economy with a modern industrial sector where the wages are high and an agricultural sector where wages are low has emerged as evidenced by the uneven distribution of income. Dualism has also developed within the agricultural sector as well as between sectors. In agriculture large mechanized farms coexist with small farms that have no access to credit, technical assistance, and inputs such as fertilizers and improved seeds. Bulutay et al. [1] suggest that the uneven distribution of income in Turkey is mainly influenced by the uneven distribution of wealth, particularly land. No efforts have been made

to redistribute land over the 1952-1970 period. The land reform proposed in conjunction with the First Five-Year Development Plan in 1962 was not implemented until 1970. Very recently much debate has taken place about the implementation of the land reform and it is reported that a few pilot areas have been selected for gradual implementation.

Even though there still seems to be a higher weight attached to the growth objective relative to the efficiency and equity goals, there is a growing concern with employment and income distribution in Turkey at the present. However, the treatment of these problems by the Development Plans is not very satisfactory. A framework that quantifies the sectoral employment and income distribution effects of growth is needed. A framework within which employment and income distribution can be analyzed is outlined in Chapter III.

III. THE CONCEPTUAL FRAMEWORK

Turkey has for a long time been interested in creating a strong industrial sector. She is now also interested in creating employment for the large number of people who are unemployed and reducing income differentials between sectors. To analyze these interrelated objectives, quantify the impacts of alternative policies, and also make policy recommendations a disaggregated consistency framework seems to be warranted. A disaggregated consistency framework would entail the use of a macroeconometric model that specifies the relationships between major macro variables together with an input-output table that captures the intersectoral relationships. The consistency framework can also be used for projection purposes.

The macroeconometric model can be used to derive an overall rate of growth for the economy over the projection period. The input-output table would then test the consistency of this growth rate with sectoral expansion. Estimates of overall growth derived through a macro model may not be consistent with sectoral growth. The input-output table, by taking intersectoral relationships into account would help derive sectoral estimates corresponding to and consistent with the overall growth rate. The different phases of the intersectoral consistency framework are outlined below.

The first step in a disaggregated consistency framework to be used for projection purposes is the specification of a macro model. Econometric models involve a set of relations explaining the behavior of variables that are determined by the model. These variables are called endogenous variables. Other variables in the model are not directly affected by the mechanism of the model and, therefore, are called predetermined variables. Predetermined variables can be exogenous variables or lagged endogenous variables. Economic theory helps determine which relations make up the model, which variables are to be included in each relation, and the signs of some of the partial derivatives. When functional relations are specified and timing of variables decided on, the model becomes an econometric model ready to be tested.[1]

The basic requirement of an economic model is that the number of variables whose values will be explained by the model be equal to the number of independent relations in the model. Otherwise, the values of endogenous variables will not be determinate. A model is said to be "simultaneous" if all the relations involved are needed to determine the value of at least one of the endogenous variables in the model. This implies that at least one of the relations of the model contains more than one endogenous variable. Estimating the

[1]This and the following paragraph draw on [21].

parameters of such models creates difficulties. In particular, estimating a relation that is part of the model requires special techniques. The estimation technique used in this study will be discussed in Chapter IV.

An econometric model can be expressed in matrix form as follows:

$$\beta y_t + \Gamma x_t = u_t \tag{3.1}$$

where β is the matrix of coefficients of current endogenous variables, Γ is the matrix of coefficients of predetermined variables, and y_t, x_t, and u_t are column vectors of current endogenous variables, predetermined variables, and disturbances, respectively. Assuming β is nonsingular, the endogenous variables, can be expressed in terms of predetermined variables only:

$$y_t = \Pi x_t + v_t \tag{3.2}$$

where Π is the matrix of reduced form coefficients and v_t is a column vector of reduced form disturbances. Note $\Pi = -\beta^{-1}\Gamma$ and $v = \beta^{-1}u_t$. The Π matrix is also called the matrix of impact multipliers. The elements of the matrix, the multipliers, indicate the magnitude of the direct and indirect influence of the predetermined variables upon the current endogenous variables. Each reduced form coefficient measures the change in the endogenous variable that results

from a unit change in the predetermined variable with other predetermined variables held constant. An analysis of the reduced form matrix helps determine the relative importance of predetermined variables on key endogenous variables such as GDP.

Macro models are not an end in themselves. They are built for policy or projection purposes. Before making projections with a macro model, its predictive ability should be tested over the sample period. In other words, the macro model must yield reliable predictions of the endogenous variables over the sample period. This type of forecasting is called ex-post forecasting.

There are three types of ex-post forecasting: the partial method, the total method, and the final method. Each differs in the amount of information (observation) that must be used in each equation to forecast the current endogenous variable. The partial method requires that values of all predetermined variables on the right-hand side of the equation be supplied to obtain the value of the endogenous variable. This method forecasts one endogenous variable at a time. It does not use the whole model.

The total method utilizes the whole model. Values of all predetermined variables for each year of the sample period are supplied, and using the reduced form, (i.e., Equation 3.2), the values of the endogenous variables are derived.

The final method requires the values of the exogenous variables over the sample period and the values of the lagged endogenous variables for the first year of the period only. In successive years, forecasts of the lagged endogenous variables generated by the model are used.

The predictive ability of the model is determined by either plotting together the actual and the predicted values of the endogenous variables over the sample period or by a regression analysis.[1] In the regression analysis, actual values of the endogenous variables are regressed on the predicted values to determine to what extent predicted values explain the actual values. Perfect forecasting requires zero intercept and a slope of one.

The Durbin-Watson d statistic is used to test for serial correlation. Serial correlation would indicate a tendency for the model to underestimate for certain years and overestimate for others. Such a tendency could be due to structural changes not approximated by linear relations.

A comparison of the standard deviation of the actual and the predicted series would also give an idea about the quality of forecasts. If the standard deviation of the actual series is greater than that of the predicted, it can be concluded that predicted series are smoother. This outcome is to be

[1]For other methods see [33].

expected. If on the other hand, the standard deviation of the actual is less than that of the predicted, it can be concluded that predictions are not very satisfactory.

The coefficient of multiple determination corrected for degrees of freedom ($\bar{R}^2$) is another criterion that can be used. High $\bar{R}^2$ would imply that the predicted series explain the actual series adequately.

If the predictive ability of the model over the sample period is satisfactory, the model is used to make projections. The values of the predetermined variables must be known over the projection period so that the path of the endogenous variables over the same period can be determined. If growth rates of predetermined variables over the projection period are known their values for each year over the same period can be computed by using the following equation:

$$P_{it} = (1 + r_i)^t P_{i0} \qquad (3.3)$$

where:

P_{it} = the value of the ith predetermined variable at time t

r_i = the growth rate of the ith predetermined variable over the projection period

P_{i0} = the value of the predetermined variable at the initial period

The values of the endogenous variables such as GDP over

the projection period can be derived by using Equation (3.2) where now x_t is the vector of projected predetermined variables.

It should be noted at this point that the expansion in GDP predicted through the macro model may not be compatible with the expansion of sectoral outputs. The input-output table which takes intersectoral relationships into account would help estimate sectoral outputs that are consistent with the rate of growth of GDP estimated through the macro model. To derive sectoral magnitudes through the input-output system the final demand vector must be known. The final demand components of the input-output system for the projection period are derived from the aggregates computed with the macro model. Sectoral values of private consumption (C^p) can be derived by using the growth rate of GDP and sectoral income elasticities of demand. Other components such as public consumption (C^g), investment (I), exports (Ex) and changes in stocks (ΔSt) by sectors can be computed by allocating the projected aggregates of the macro model to sectors on the basis of sectoral shares of the base year. Sectoral imports of intermediate goods should be consistent with sectoral gross output levels. Furthermore, imports of final capital and consumer goods plus imports of intermediate goods should add up to the aggregate value derived through the macro model. Therefore, the following procedure can be used to find

sectoral imports of final capital and consumer goods.

Let the total final demand vectors be represented as:

$$\vec{F} = \vec{C} + \vec{I} + \vec{Ex} + \Delta\vec{St} - \vec{M}_c \qquad (3.4)$$

where:

$\vec{F}$ = final demand

$\vec{C}$ = total consumption vector

$\vec{I}$ = total investment vector

$\vec{Ex}$ = total export vector

$\vec{St}$ = changes in stocks vector

$\vec{M}_c$ = competitive imports (imports of final goods) vector

Gross outputs can be derived as:

$$\vec{X} = (I-A)^{-1}\vec{F} \qquad (3.5)$$

where $\vec{X}$ stands for the vector of gross outputs.

Assuming competitive imports are distributed in the same proportions as in the base year, the vector of competitive imports is:

$$\vec{M}_c = \vec{p}m_c \qquad (3.6)$$

where:

m_c = total competitive imports

$\vec{p}$ = vector of proportions

Total intermediate goods imports (noncompetitive imports) can be represented as:

$$m_{nc} = \sum_{i=1}^{n} m_i X_i \tag{3.7}$$

where m_{nc} = total noncompetitive imports and

$$m_i = m_{nc_i}/X_i \tag{3.8}$$

Total imports, therefore, are:

$$\sum_{i=1}^{n} m_i X_i + m_c = M \tag{3.9}$$

where M is the value for imports derived with the macro model. Expressing the first term of Equation 3.9 as vectors:

$$\vec{m}\,\vec{X} + m_c = M \tag{3.10}$$

Using 3.9, 3.5 and 3.4, 3.10 is expressed as:

$$\vec{m}(I-A)^{-1}[\vec{C} + \vec{I} + \vec{E}x + \Delta\vec{S}t - \vec{M}_c] + m_c = M \tag{3.11}$$

Solving for m_c in 3.11 gives:

$$m_c = \frac{M-\vec{m}(I-A)^{-1}[\vec{C} + \vec{I} + \vec{E}x + \Delta\vec{S}t]}{-\vec{m}(I-A)^{-1}\vec{p}+1} \tag{3.12}$$

Once the final demand vector of an input-output table is known, sectoral gross outputs can be derived.

Let the input-output system be represented as:

$$AX + F = X \tag{3.17}$$

where:

AX = matrix of intermediate demands

F = final demand vector

X = sectoral gross outputs

Solving for sectoral gross outputs (X's) in this system gives:

$$X = (I-A)^{-1}F \tag{3.18}$$

Note that sectoral outputs computed with Equation 3.18 will be consistent with the projections of the macro model since the final demand vector is derived from these projections.

Assuming that the ratio of value added to gross output in each sector is constant over the projection period, sectoral value added is derived by the following equation:

$$V_i = v_i X_i \tag{3.19}$$

where:

V_i = value added in sector i

v_i = the proportion of value added in gross output in sector i

X_i = gross value added in sector i

The proportion of sectoral value added in gross output indicates the extent of the dependence of sectors on intermediate inputs. High ratios of value added to gross output imply little dependence on intermediate inputs. This would mean

that growth in such sectors would not provide much backward linkages. In other words, an expansion in the output of sectors where the share of value added in output is high would not create much demand for the outputs of other sectors. Growth in other sectors would not be stimulated much.

Sectoral demand for labor depends on the growth of value added and also on changes in labor productivity. Changes in labor productivity result from "learning by doing", changes in the capital to labor ratios, education, etc. The following equation can be used to derive sectoral labor demand:

$$r_{ei} = \frac{1 + r_{oi}}{1 + r_{pi}} - 1 \qquad (3.20)$$

where:

r_{ei} = growth rate of employment in sector i

r_{oi} = growth rate of output in sector i

r_{pi} = growth rate of labor productivity in sector i

The last step of the disaggregated consistency framework is the derivation of sectoral income distribution. This entails distinguishing between the two components of sectoral value added: wage and nonwage income. The distribution of wage income on a sectoral basis can be derived by first computing average wage income by sectors and by ranking sectors on this basis. Large differences in average wages will exist in dual economies. Average income in a sector can

be computed as follows:

$$w_i = \frac{W_i}{E_i} \qquad (3.21)$$

where:

w_i = average annual wage income per person employed in sector i

W_i = total wage income in sector i

E_i = total employment in sector i

It is possible to estimate national income within the intersectoral consistency framework. The sum of sectoral value added is GDP. National income and GDP differ by depreciation, indirect taxes, and income from abroad. The sum of sectoral nonwage incomes can be adjusted for these three factors and added to total wage income. This would give national income. The share of adjusted nonwage income in national income can be computed. It will be of interest to see how the ratio of nonwage income to national income varies under different growth alternatives.

The intersectoral consistency framework outlined in this chapter is presented in a schematic form in Figure 3.1. The framework provides for consistency at several levels: First, relating a macro model to an input-output table makes it possible to combine time series data with the detailed data made available by the input-output table for the year for

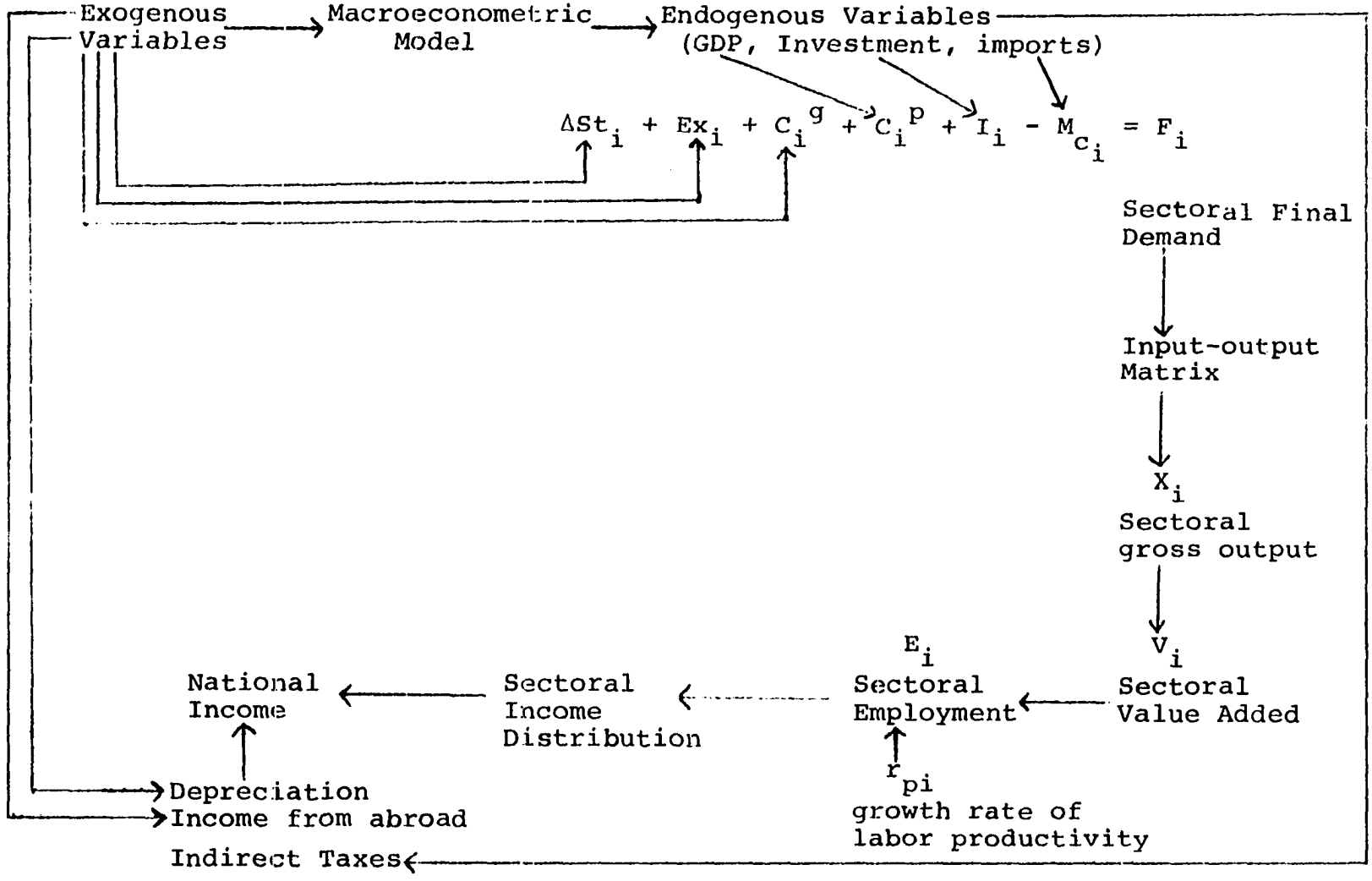

Figure 3.1. The intersectoral consistency framework

which it is built. Second, given the projections of major macro variables, their sectoral implications can be analyzed. This would amount to analyzing the compatibility of final demand estimates based on time series to the disaggregated structure of the economy for a given year. Third, deriving sectoral employment responses within this framework brings consistently to the employment analysis. Sectoral labor demand estimates are not arbitrary but dependent on the composition of final demand, the production structure of the economy, and on sectoral expansion.

The consistency framework that is outlined in this chapter is used to quantify the sectoral output, employment, and income distribution impacts of alternative growth rates of GDP for 1977. A macroeconometric model is specified in Chapter IV and sectoral estimates derived in Chapter V.

IV. A MACROECONOMETRIC MODEL FOR TURKEY

The model that will be discussed in this chapter attempts to describe the structure of the Turkish economy over the period 1952-1970. All variables are expressed in 1961 prices.

The logical structure of the economy derives from the survey of the Turkish economy summarized in Chapter II. The model does not include an aggregate production function nor does it incorporate financial variables for the following reasons. There are no capital markets in Turkey and interest rates remain fixed over long periods of time. The specification of a portfolio adjustment mechanism where changes in the money supply change the relative cost of capital and, therefore, influences investment is not appropriate. The lack of an aggregate production function is compensated by using an input-output table which reflects sectoral production functions.[1]

The model consists of five behavioral equations that explain private consumption and investment, imports and taxes, and four identities. There are 19 variables in total, of which nine are endogenous and 10 are predetermined. Of the 10 predetermined variables, 9 are exogenous and one is a lagged jointly dependent variable.

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[1]The input-output table is explained in detail in Chapter V.

The equations form a simultaneous system. In Chapter III it was shown that endogenous variables can be expressed in terms of predetermined variables only as follows:

$$y_t = \Pi x_t + v_t \tag{4.1}$$

It is clear from Equation 4.1 that each endogenous variable in y_t may be influenced by each and every disturbance term. Consider the equation for y_{2t}:

$$y_{2t} = \Pi_2 x_t + v_{2t} \tag{4.2}$$

where Π_2 is the second row of Π and $v_{2t} = f_2 (u_{1t},\ldots,u_{gt})$ assuming there are g endogenous variables. f_2 is determined by the elements of the second row of β^{-1}. If y_{2t} is used to explain y_{1t} it is most likely that it will be correlated with the disturbance of the equation. Correlation between the explanatory variable and the disturbance makes the Ordinary Least Squares estimates inconsistent. In such cases special techniques such as Two Stage Least Squares can be used.

The present model has been estimated with the Two Stage Least Squares technique, using yearly data.[1] The structural equations and the variables are listed below. They are

[1]The 2SLS estimates were obtained by using ECONPK, a batch of economics-oriented programs developed under the auspices of the Economics Department at Iowa State University, Ames, Iowa.

followed by the estimated equations. The coefficients of multiple determination (R^2's) and the "t" ratios are given. The Durbin-Watson d statistic is not reported since it is not a valid test of serial correlation in this case.

A. The Structural and Estimated Equations

$$C^p = \alpha_0+\alpha_1 C^p_{-1} + \alpha_2 Y^d + u_1 \quad (4.3a)$$

$$I^p = \alpha_0+\alpha_1 \text{ NWY} + \alpha_2 I^g_{-1} + u_2 \quad (4.4a)$$

$$M = \alpha_0+\alpha_1 \text{ NY} + \alpha_2 P_m/P_{gnp} + u_3 \quad (4.5a)$$

$$T^d = \alpha_0+\alpha_1 \text{ NY} + u_4 \quad (4.6a)$$

$$T^i = \alpha_0+\alpha_1 C^p + \alpha_2 M + u_5 \quad (4.7a)$$

$$I = I^p + I^g \quad (4.8)$$

$$Y = C^p + C^g + I + X - M + \Delta St \quad (4.9)$$

$$NY = Y - T^i - Dep + Y^f \quad (4.10)$$

$$Y^d = NY - T^d \quad (4.11)$$

It is assumed ($u_{1t}, \ldots u_{5t}$) are distributed as identical independent multivariate normal with zero mean vector and covariance matrix Σ.

Endogenous variables:

C^p = Private consumption

I^p = Gross private investment

M = Total imports

T^d = Direct taxes

T^i = Indirect taxes

I = Gross total investment

Y = Gross Domestic Product (GDP)

NY = National income

Y^d = Disposable income

Predetermined variables:

Exogenous variables:

NWY = nonwage income

$\frac{P_m}{P_{gnp}}$ = ratio of the price of imports to the GNP deflator

I^g = government investment

C^g = government consumption

X = total imports

ΔSt = changes in stocks

Dep = depreciation

Y^f = income from abroad

I^g_{-1} = government investment lagged one year

Lagged jointly dependent variable:

C^p_{-1} private consumption lagged one year

Two stage least squares estimates:

$$C^p = .1637 + .1583\ C^p_{-1} + .7363\ Y^d \qquad (4.3b)$$
$$(.2840)\quad (1.582)^*\quad (8.989)^{***}\quad R^2 = 0.997$$

$$I^p = 1.543 + .0215\ NWY + .5864\ I^g_{-1} \qquad (4.4b)$$
$$(3.058)^{***}\ (.2976)\quad (1.975)^{**}\quad R^2 = 0.939$$

$$M = -4.702 + .1011\ NY + 3.335\ \frac{P_m}{P_{gnp}} \qquad (4.5b)$$
$$(-3.089)^{***}\ (8.526)^{***}\ (2.759)^{***}\ R^2 = 0.819$$

$$T^d = -1.382 + .07506\ NY \qquad (4.6b)$$
$$(7.446)^{***}\ (21.82)^{***}\quad R^2 = 0.965$$

$$T^i = -1.268 + .1412\ C^p + .06108\ M \qquad (4.7b)$$
$$(4.325)^{***}\ (10.57)^{***}\ (.5708)\quad R^2 = 0.973$$

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* Indicates significance at the 10% level.

** indicates significance at the 5% level.

*** indicates significance at the 1% level.

Equation 4.3a explains private consumption in terms of the level of disposable income and lagged private consumption. The theoretical basis for the form of the consumption function is the hypothesis that past consumption patterns as well as the level of current disposable income are important determinants of current consumption. The estimated Equation 4.3b shows that current disposable income is more important a determinant of current consumption than past consumption patterns. The coefficient of disposable income should be interpreted as the short run marginal propensity to consume (MPC) due to the presence of lagged consumption in the function. In other words, Equation 4.3 assumes a partial adjustment mechanism.

Let the long run consumption function be specified as:

$$C_t^{p*} = a + bY_t \tag{4.12}$$

where b is the long run MPC. Specify an adjustment mechanism:

$$C_t^p - C_{t-1}^p = \gamma(C_t^{p*} - C_{t-1}^p) \tag{4.13}$$
$$0 < \gamma \leq 1$$

where γ is the coefficient of adjustment. Solving for C_t^{p*}:

$$C_t^{p*} = \frac{1}{\gamma} C_t^p + \frac{\gamma-1}{\gamma} C_{t-1}^p \tag{4.14}$$

Substituting for C_t^{p*} in 4.12 and solving for C_t^p gives:

$$C_t^p = \gamma a + \gamma b Y_t + (1-\gamma) C_{t-1}^p \qquad (4.15)$$

which is the same as Equation 4.3a. For the estimated Equation $1-\gamma = .1583$. $\gamma b = .7363$ which yields $b = .874$. The long run MPC for Turkey is .874 which implies a long run marginal propensity to save .126. The short run MPC is .7369.

Equation 4.4a explains private investment as a function of nonwage income and public investment lagged one year. The specification of an investment function is usually very difficult. First, the theory of investment is still in a state of flux. Second, there are many economic and non-economic variables that influence private investment.

Several functions were tried for Turkey and rejected either because the variables that were included were non-significant or because they had wrong signs. The first version of the equation explained private investment in terms of an accelerator. In other words, private investment was regressed on $Y_t - Y_{t-1}$. Since the theory is in terms of ΔY, it would have been sufficient to have the sum of the coefficients of Y_t and Y_{t-1} come out positive. However, the negative coefficient associated with Y_{t-1} was much larger than that for Y_t. Another version explained private investment in terms of lagged public and private investment and the level of GDP. None of the variable were significant and GDP had a negative

coefficient. Finally the present form explaining private investment as a function of profits and in terms of Hirshman's theory of development was tried.

Hirshman argues that in less developed countries social capital provides investment opportunities since it creates external economies. In Chapter II it was shown that public investment accounts for 53% of total gross investment and that 70% of public investment goes for infrastructure. The basic aim of the Turkish government has been and still is to create investment opportunities and encourage private investment by providing the necessary infrastructure.

The reason for selecting profits as an explanatory variable is the fact that there are no capital markets in Turkey and that most investment is financed through profits. Since there is no data on profits in Turkey, nonwage income is used as a proxy.

In the estimated function 4.4b the intercept is revealed to be highly significant. This indicates, autonomous investment plays a major role in explaining total gross private investment. The level of profits, on the other hand, is not significant. Public investment lagged one year is significant. One unit change in lagged public investment leads to a change of 0.58 in private investment. This result confirms Hirshman's theory. Social capital does provide

opportunities for private investment in Turkey.

Equation 4.5a explains total imports as a function of national income and relative prices. The ratio of the price of imports to the price level at home allows for the effects of quotas, tariffs, as well as for the competitive position of Turkey in the world market.

The estimated Equation 4.5b shows that for a unit change in national income there is a change of 0.10 in imports. The income elasticity of imports defined as $\frac{\partial M}{\partial NY} \cdot \frac{\overline{NY}}{\overline{M}}$ turns out to be 1.38.[1] This indicates import demand is income elastic in Turkey.

Total imports normally are expected to decline when the price of imports increase relative to prices at home. Equation 4.5b shows that imports increase as the ratio of prices increases. This result can be explained by the fact that the large portion of imports in Turkey are capital goods and raw material import. Turkey had to import increasing amounts of capital goods so that the target growth rate of GDP could be achieved. Table 2.4 showed that imports increased sharply with the introduction of Development Plans in 1961.

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[1] $\frac{\partial M}{\partial NY}$ is 0.1011 and $\frac{\overline{NY}}{\overline{M}}$ expresses the mean of the variables over the sample period. The ratio of the means is equal to 13.69 over 1952-1970. Therefore, the elasticity of import demand with respect to national income is 0.1011x13.69= 1.38. Notice the value of the elasticity is valid when $\frac{\overline{NY}}{\overline{M}}$ = 13.69.

Equation 4.6a explains direct taxes as a function of national income. The intercept and the level of income are highly significant. The marginal tax rate is small: 0.075. This indicates that for a unit change in national income there is only a change of 0.075 in direct tax revenue. It was pointed out in Chapter II that increases in national income resulting from rapid growth had not led to significant increases in direct tax revenue because of tax evasion and a number of other factors. The significant negative intercept for direct taxes indicates that direct taxes in Turkey are progressive.

Indirect taxes are explained by Equation 4.7a as a function of private consumption and imports. The intercept for indirect taxes is negative which implies indirect taxes are progressive. This result is important since indirect taxes are often regressive. The coefficient of private consumption is 0.1412 which implies that for a unit change in private consumption expenditures indirect tax revenue changes by 0.14. In the estimated equation imports are not significant. It was pointed out earlier in connection with the import equation that the majority of imports in Turkey are capital goods. It was also mentioned in Chapter II that imports of capital benefit from import duty concessions. This may explain the low "t" value of the coefficient of imports.

B. The Predictive Ability of the Model

The model for Turkey is specified for projection purposes. However, before obtaining projections, the predictive ability of the model over the sample period must be tested. The total method of ex-post forecasting which uses Equation 3.2 is selected for this purpose.[1] The important feature of the total method is that the reduced form matrix is used to predict the values of the endogenous variables over the sample period.

The reduced form matrix brings out the salient features of the structure of the economy. Each cell in the matrix gives the impact of a unit change in the predetermined variables on the endogenous variables. At this point a discussion of the implications about the Turkish economy of the reduced form matrix derived from the Two Stage Least Squares estimates of the model is in order.

The impact of the predetermined variables on endogenous variables can be analyzed in terms of elasticities which give the percentage change in the endogenous variables given a one percent change in the predetermined variables. Elasticities make it possible to compare the influences of predetermined variables which may not be expressed in comparable

[1] See the discussion of other methods in Chapter III.

units. The elasticity of an endogenous variable (y) with respect to a predetermined variable (x) is defined as:

$$\frac{\partial y}{\partial x} \cdot \frac{\bar{x}}{\bar{y}} \qquad (4.16)$$

the value of the first term in Equation 4.16 is obtained from the reduced form matrix (i.e. the coefficient corresponding to the variables in question). The second term is the ratio of the means of the two variables over the sample period.

Table 4.1 gives the reduced form coefficients. The endogenous variable of interest in this study is GDP. Substituting in Equation 4.16 the values for the first and the second term, the elasticity of GDP (Y) with respect to C^p_{-1} is computed as follows: .309 x .686 = .212. The coefficient of GDP with respect to C^p_{-1} is .309. The ratio of the means over the sample period is .686. The elasticity with respect to C^p_{-1} shows that for every one percent increase in C^p_{-1} GDP grows by .21 percent. The elasticities of GDP with respect to public consumption and investment are .275 (2.110 x .130) and .160 (2.110 x .076), respectively. The highest elasticity of GDP is with respect to public consumption. It can be concluded therefore that fiscal policy is very important in Turkey in terms of the growth of GDP. For every one percent increase in government consumption GDP

Table 4.1. Reduced form coefficients derived from two stage least squares estimators

Predetermined Variables	Endogenous Variables								
	C^p	I^p	M	T^d	T^i	I	Y	NY	Y^d
a	12.672	1.542	-2.996	-0.115	0.338	1.542	17.211	16.873	16.988
C^p_{-1}	0.335	0.000	0.026	0.019	0.048	0.000	0.309	0.260	0.240
NWY	0.028	0.021	0.004	0.003	0.004	0.021	0.045	0.041	0.038
P_m/P_{gnp}	-4.613	0.000	2.650	-0.508	-0.489	0.000	-7.263	-6.773	-6.265
I^g	1.303	0.000	0.193	0.143	0.195	1.000	2.110	1.914	1.770
C^g	1.303	0.000	0.193	0.143	0.195	0.000	2.110	1.914	1.770
X	1.303	0.000	0.193	0.143	0.195	0.000	2.110	1.914	1.770
ΔST	1.303	0.000	0.193	0.143	0.195	0.000	2.110	1.914	1.770
Dep	-1.303	0.000	-0.193	-0.143	-0.195	0.000	-1.110	-1.914	-1.770
Y^f	1.303	0.000	0.193	0.143	0.195	0.000	1.110	1.914	1.770
I^g_{-1}	0.764	0.586	0.113	0.084	0.114	0.586	1.237	1.122	1.038

increases by over 1/4 of a percent.

The elasticities of GDP with respect to various predetermined variables indicate that the public sector plays an important role in the Turkish economy. This result confirms the statement made in Chapter II that the public sector in Turkey is the prime mover of the economy.

The predictive ability of the model is tested by comparing actual values of endogenous variables over the sample period with those calculated with the reduced form matrix. In this study, the actual and predicted series are first plotted. Then, a regression analysis is made. The plots are given in Figures A.1-A.9 in the Appendix. The plots show that private consumption, private investment, direct taxes, and indirect taxes track the actual values reasonably well. The predictions for total investment, GDP, national income, and disposable income track even better. The results of the regression analysis that determines how well the predicted series (P) explain the actual (A) are given below. The coefficients of multiple determination corrected for degrees of freedom ($\bar{R}^2$'s), the standard deviation of the actual and predicted series (SD), the Durbin-Watson d statistic, and the standard errors of coefficients (given in parentheses) are used as criteria for judging the predictive ability of the model.

	$\bar{R}^2$	SD	d
$C^P = 0.6138 + 0.09852\ P$ (1.400) (.031)	0.982	42.926 (A) 42.946 (P)	1.165
$I^P = 0.0003 + 0.9999\ P$ (.287) (.061)	0.935	1.525 (A) 1.478 (P)	1.200
$M = 0.0263 + 0.9917\ P$ (.410) (.101)	0.841	1.621 (A) 1.507 (P)	0.865
$T^d = 0.0200 + 0.9900\ P$ (.128) (.046)	0.961	1.190 (A) 1.180 (P)	0.742
$T^i = 0.0376 + 0.9922\ P$ (.192) (.035)	0.976	1.867 (A) 1.861 (P)	1.011
$I = -0.0019 + 1.0002\ P$ (.227) (.023)	0.990	3.917 (A) 3.898 (P)	1.200
$Y = 0.6813 + 0.9817\ P$ (1.415) (.022)	0.990	18.266 (A) 18.409 (P)	1.067
$NY = 0.6954 + 0.9851\ P$ (1.316) (.024)	0.989	15.575 (A) 15.728 (P)	1.048
$Y^d = 0.6868 + 0.9855\ P$ (1.285) (.025)	0.988	14.415 (A) 14.547 (P)	1.157

The $\bar{R}^2$'s for all equations except imports are high. This implies the predicted series explain the actual well. The standard deviation of the predicted series is smaller than that of the actual for private investment, imports, direct taxes, indirect taxes, and total investment. This implies smoother predicted series and is indicative of satis-

factory predictions. The Durbin-Watson d for all equations except direct taxes is in the inconclusive range. At the 1% level and 17 degrees of freedom the lower limit of the statistic is 0.77 and the upper limit 1.25. The low value of the d statistic for direct taxes indicates the presence of serial correlation in the equation.

Perfect prediction require a slope of one and an intercept of zero. To test for zero intercept, the estimate of intercept is subtracted from zero and divided by the standard error of the estimate. To test for slope equal to one the same procedure is used except that the estimate of the slope is subtracted from one. The null hypotheses of zero intercept and slope equal to one cannot be rejected at the 1% level for any of the equations.

In conclusion, it seems the model approximates the structure of the Turkish economy over the sample period of 1952-1970 reasonably well. Therefore, the model can be used to make projections for 1977. The projections are given in Chapter V.

V. EMPIRICAL RESULTS

The purpose of this chapter is to present the projections of endogenous variables for 1977 obtained from the macro model specified in Chapter IV and discuss sectoral estimates consistent with the overall growth rates of GDP.

A. Macroeconomic Projections for 1977

The macroeconometric model discussed in Chapter IV is used to project the endogenous variables to 1977. Endogenous variables can be projected with the reduced form matrix if the values of the predetermined variables over the projection period are known. In other words, the procedure entails using Equation 3.2 where the vector of predetermined variables (x) contains the projected values of these variables. The value of a predetermined variable for each year of the projection period can be computed with Equation 3.3. This entails making assumptions about the future growth rates of predetermined variables. It can be assumed that over the projection period predetermined variables will grow at the same rates as they have in the past. Alternatively, future growth rates specified in Development Plans can be used.

Forecasts of endogenous variables depend on the reduced form matrix and on the projected values of predetermined variables. The accuracy of the projections of predetermined

variables influences the accuracy of the forecasts of endogenous variables. The growth rate of GDP, an endogenous variable in the macro model for Turkey, will, therefore, be sensitive to the projected values of predetermined variable, such as public investment and consumption. Therefore, the forecasts of endogenous variables in the macro model for Turkey are made under alternative assumptions about the growth rates of predetermined variables. First, it is assumed that past growth rates of predetermined variables will prevail over the projection period of 1971-1977 (Alternative I). Second, future growth rates specified in the Third Five-Year Development Plan are used (Alternative II).

The two sets of growth rates are given in Table 5.1. No growth rate is specified for the lagged jointly dependent variable (C^p_{-1}) since it is decided to let the model determine the values of this variable for each year over the projection period. The procedure, therefore, involves specifying the values of all predetermined variables for each year over 1971-1977 including the value of C^p_{-1} for the first year (1971) only. The second year, 1972, the value of C^p for 1971 generated by the model is used for C^p_{-1}. The growth rates of public expenditures and exports under Alternative II seem rather ambitious in view of past growth rates of these variables. However, it will be interesting to compute the resulting

Table 5.1. Compound annual growth rates of predetermined variable (1971-1977)[a] (in percentages)

Variable	Alternative I	Alternative II
C^p_{-1}	from model	from model
NWY	6.00	7.00
I^g	9.00	13.00
$I^g{}_{-1}$	9.00	13.00
P_m/P_{gnp}	0.98	0.98
C^g	6.00	8.00
X	6.00	9.00
Dep	3.00	4.20
ΔSt	3.00	3.00
Y^f	4.00	4.00

[a]Sources: Devlet Istatistik Enstitusu [10], Turkiye Cumhuriyeti Basbakanlik Devlet Planlama Teskilati [38], and Turkiye Cumhuriyeti Ticaret Bakanligi [39].

growth rate of GDP.

The values of the endogenous variables over 1971-1977 under Alternative I and II are shown in Table 5.2 and 5.3, respectively. In the last column of each table the compound annual growth rates of the variables over the projection period are presented. Under Alternative I, GDP increases at a compound annual rate of 7% while private consumption and

Table 5.2. Projections of endogenous variables: 1971-1977 (Alternative I)[a] (billion TL., 1961 prices)

Variable	1971	1972	1973	1974	1975	1976	1977	Compound annual growth rate 1971-1977
GDP	98.6	105.4	112.8	120.8	129.4	138.6	148.5	7.0
C^p	70.3	75.1	80.3	85.9	92.0	98.5	105.5	6.9
I^p	8.0	8.6	9.2	9.9	10.6	11.4	12.2	7.2
M	8.8	9.3	9.9	10.5	11.2	11.9	12.7	6.3
T^d	5.0	5.5	6.0	6.5	7.1	7.7	8.4	8.7
T^i	9.2	9.9	10.6	11.5	12.4	13.3	14.4	7.7
I	18.4	19.9	21.5	23.3	25.2	27.3	29.6	8.2
NY	86.2	92.1	98.7	105.7	113.3	121.5	130.3	7.1
Y^d	81.1	86.6	92.7	99.2	106.2	113.8	121.9	7.1

[a]Source: Macro model in Chapter IV.

Table 5.3. Projections of endogenous variables: 1971-1977 (Alternative II)[a] (billion TL., 1961 prices)

Variable	1971	1972	1973	1974	1975	1976	1977	Compound annual growth rate 1971-1977
GDP	100.2	109.6	120.4	132.4	145.7	160.5	176.9	9.9
C^p	71.3	77.8	85.3	93.8	103.2	113.6	125.2	9.9
I^p	8.0	8.8	9.7	10.7	11.8	13.1	14.5	10.3
M	9.0	9.7	10.6	11.6	12.7	13.9	15.3	9.3
T^d	5.1	5.8	6.5	7.3	8.2	9.2	10.3	12.1
T^i	9.3	10.3	11.4	12.6	14.0	15.6	17.3	10.8
I	18.8	21.0	23.4	26.2	29.3	32.9	36.9	11.9
NY	87.6	96.0	105.5	116.2	128.0	141.1	155.7	10.1
Y^d	82.4	90.1	99.0	108.8	119.8	131.9	145.4	9.9

[a]Source: Macro model in Chapter IV.

investment grow at 6.9% and 7.2%, respectively. Under Alternative II GDP and private consumption grow at 9.9% a year while private investment grows at 10.3%. The growth rate of imports is closely tied to the growth rate of GDP. Under Alternative I imports increase at 6% a year. Under Alternative II imports grow at 9% a year.

It is believed that a growth rate of 7% a year of GDP can be easily achieved in Turkey. Over the First and Second Five-Year Planning period 1962-1972, on the average GDP increased at 6.3% a year. Higher growth rates have been reached when agriculture performed well. On the other hand, a growth rate of GDP of 9.9% a year will be difficult to achieve and sustain. First, the growth rate of GDP is highly influenced by the erratic performance of the agricultural sector which accounts for over 25% of GDP. Unless agricultural output expands at a steady rate consistent with the "high" growth rate of GDP "high" growth rates of GDP in certain years will be followed by lower rates in others. Second, under Alternative II public investment must increase at 13% a year. In the past public investment has grown at 9% a year. Over the First and Second Five-Year Planning period realized levels of public investment were 10-20% below target levels. Third, the high growth rate of GDP will put heavy burdens on the saving capacity of an economy

where per capita income in 1970 was $360. Total savings were 19% of GDP in 1970. The incremental capital-output ratio is expected to be around 3.0 over the period 1973-1977.[1] A growth rate of 9.9% a year implies the share of investment in GDP must be 29%. It will be very difficult to generate the necessary savings for the "high" growth rate of GDP. Fourth, the large amounts of imports that will be necessary under Alternative II may cause difficulties in the balance of payments. Turkey depends on exports and remittances by Turkish workers in Europe as a source of foreign exchange. Exports must increase at 9% a year under Alternative II. But, Turkey's exports are mostly agricultural goods and suffer from low income elasticities of demand. In the past, exports have increased at 7% a year. If exports fail to grow at 9% a year and remittances by Turkish workers abroad do not increase rapidly to generate additional foreign exchange Turkey may again face balance of payments problems.

B. Sectoral Projections for 1977

The Turkish economy has for a long time suffered from inconsistencies in sectoral expansion. Therefore, it is necessary to determine sectoral growth rates that are con-

[1] The incremental capital-output ratio is defined as $\frac{I}{Y} \div \frac{\Delta Y}{Y}$ where I stands for investment and Y for total output.

sistent with the alternative growth rates of GDP. Planning for growth must be accompanied by consistency checks at the sectoral level. In this study, sectoral projections for 1977 consistent with the annual growth rates of 7% and 9.9% of GDP are made with the input-output model.

The input-output model, sometimes referred to as the Leontief model for its originator W. W. Leontief provides a linear general equilibrium analysis with empirical orientation. The first attempt at constructing a static open input-output system for Turkey was made in 1961 in conjunction with the First Five-Year Development Plan (FFYDP). The lack of statistical data limited the scope of the study and many sectors such as professional and personal services, ownership of dwelling, banking and insurance were ignored. 1959 was chosen as the base year since the other two alternatives, 1958 and 1960, were years of devaluation and revolution, respectively. The input-output table was to serve as a supplement to the simple Harrod-Domar type model used during the formulation of the FFYDP. The input-output table at first consisted of 20 sectors and following Professor Tinbergen's suggestion, certain cells were left empty. Due to lack of data and with no industrial censuses or other source of systematic information being available, the table turned out to be unsatisfactory even to those who prepared it. At the end many sectors were left out, and the number of sectors

was reduced to fifteen.

In 1963 a thorough study was made, additional sources of statistical information were utilized, and a second attempt was made to construct an input-output table. 1963 was selected as the base year because 1) 1963 was the first year of the implementation of the FFYP; and 2) this particular year was suitable from the point of view of data availability. The number of sectors for the second input-output table was 37, and economic activity was separated into a) primary production, b) manufacturing industries, and c) tertiary activities.

Primary production covered agriculture, fishing, animal husbandry, forestry, and mining. Manufacturing industries covered a wide range of consumer and producer's goods industries. Tertiary activities consisted of services such as transportation, trade, banking, insurance, etc. This provided a detailed breakdown of income by industrial origin. Depreciation and wage income were not estimated on a sectoral basis.

The third interindustry transactions table was built by the State Planning Organization (SPO) for 1967 following the same sectoral breakdown as in the 1963 table. A basic improvement over the previous table was the treatment of imports. Imports of intermediate and final good were

distinguished. Imports of final goods were reported as a column vector and imports of intermediate goods as a row vector. The sectoral breakdown of wage income and capital income was still not available.

The 1967 input-output table is used in this study to derive sectoral outputs consistent with the growth rates of GDP determined with the macro model under the two growth alternatives. The original 37x37 table has been consolidated into a 9x9 matrix resulting in the following sectors:

a) Agriculture including forestry, hunting, and fishing

b) Mining and quarrying

c) Manufacturing (consumer and producer's goods industries)

d) Energy (electricity generation and distribution)

e) Transportation and communication

f) Construction (building and nonbuilding)

g) Trade

h) Services (public and private including finance)

i) Ownership of dwelling

The consolidated interindustry transactions table for 1967 and the corresponding matrix of coefficients are shown in Tables 5.4 and 5.5, respectively.[1] Coefficients for value

[1]Tables where entries are expressed in monetary values are called interindustry transactions tables. Tables where quantities are reported are called input-output tables. In this study input-output is used as a general term.

Table 5.4. Interindustry transactions table for Turkey, 1967 (million TL.)

	Agriculture	Mining	Manufac-turing	Energy	Transpor-tation & Communi-cation	Con-struc-tion	Trade	Services	Ownership of dwelling
Agriculture	9847	63	9185	0	80	153	0	392	0
Mining	1	15	1085	105	97	234	0	87	43
Manufacturing	1517	149	9347	309	3159	3551	165	1413	63
Energy	5	57	745	68	17	2	39	126	6
Transportation & Communication	495	61	1881	19	156	518	156	356	19
Construction	0	0	0	0	0	0	0	0	0
Trade	444	50	2154	35	1038	1050	195	290	43
Services	647	51	912	122	705	161	427	734	116
Ownership of dwelling	0	0	0	0	0	0	332	980	0
Total domestic Inputs	12956	446	25309	658	5252	5669	1314	4378	290
Imports of inter-mediate goods	219	4	2292	1	52	66	1	67	0
Total inputs	13175	450	27601	659	5304	5735	1315	4445	290
Total outputs	44492	2106	50156	1449	17136	11413	9752	20529	4808

Table 5.5. Coefficient matrix, 1967

	Agriculture	Mining	Manufac-turing	Energy	Transpor-tation & Communi-cation	Con-struc-tion	Trade	Services	Ownership of dwelling
Agriculture	.2213	.0299	.1831	0	.0047	.0134	0	.0191	0
Mining	0	.0071	.0216	.0725	.0057	.0205	0	.0042	.0089
Manufacturing	.0341	.0708	.1864	.2133	.1843	.3111	.0169	.0688	.0131
Energy	.0001	.0271	.0149	.0469	.0010	.0002	.0040	.0061	.0012
Transportation & Communication	.0111	.0290	.0375	.0131	.0091	.0454	.0160	.0173	.0040
Construction	0	0	0	0	0	0	0	0	0
Trade	.0100	.0237	.0429	.0242	.0606	.0920	.0200	.0141	.0089
Services	.0145	.0242	.0182	.0842	.0411	.0141	.0438	.0358	.0241
Ownership of dwelling	0	0	0	0	0	0	.0340	.0477	0
Imports of inter-mediate goods	.0049	.0019	.0457	.0007	.0030	.0058	.0001	.0033	0
Value Added	.7040	.7863	.4497	.5451	.6905	.4975	.8652	.7836	.9398

added in Table 5.5 show which sectors have strong backward linkages in the Turkish economy. The proportion of value added in manufacturing, energy, and construction are much lower than that in other sectors. This implies that expansion in these sectors will create strong influences on the outputs of other sectors since these sectors will be demanding more inputs from other sectors. Ownership of dwelling, on the other hand has the highest coefficient for value added. Expansion in this sector will not generate much demand for the outputs of other sectors. It should be noted that the share of value added in gross output changes over time as development takes place. For example, value added in agriculture declines as more inputs are used in this sector.

The calculation of sectoral estimates for 1977 consistent with the growth rates of GDP derived from the macro model requires the projection of sectoral final demand components (i.e. private and public consumption, investment, exports, changes in stock, and imports of final goods by sectors). Within the intersectoral consistency framework outlined in Chapter III projections of final demand components are derived from the projections obtained with the macro model. Projections from the macro model can be referred to as "control totals". The derivation of sectoral final demand projections entails allocating "control totals" to the various

sectors of the input-output system.

Two adjustments were made in this study before allocating "control totals" to sector. First, "control totals" were converted into 1967 prices so that the projected sectoral outputs for 1977 could be compared with the 1967 values. Second, some of the "control totals" have been adjusted for discrepancies between the time series and input-output magnitudes. For example public consumption in the 1967 input-output table differed by a factor of 0.88 from the time series estimate for the same year. The resulting final demand vectors for Alternative I and II are presented in Table 5.6. The $(I-A)^{-1}$ matrix that is premultiplied with the final demand vectors to obtain sectoral output projections is shown in Table 5.7.

1. GDP grows at 7% a year (Alternative I)

Sectoral projections consistent with a 7% growth rate of GDP are shown in Table 5.8. The levels of sectoral output for 1977 as well as annual compound growth rates over 1967-1977 are shown. Growth rates of sectoral output should be interpreted as rates required to equate supply and demand in sectors. The only constraint on sectoral outputs in an input-output system is that accounted for by intersectoral flows of goods. The growth rates shown in Table 5.8 are, therefore, rates required to equate supply and demand in each sector when there are no other constraints on outputs.

Table 5.6. Final demand vectors: 1977[a] (billion TL., 1967 prices)

	Alternative I growth rate of GDP = 7%	Alternative II growth rate of GDP = 9.9%
Agriculture	34.176	38.613
Mining	.298	.339
Manufacturing	57.495	83.220
Energy	.965	1.387
Transportation and Communication	26.249	34.732
Construction	33.139	41.340
Trade	8.844	11.228
Services	30.675	38.569
Ownership of dwelling	8.275	11.655

[a]Source: Macro projections with the model in Chapter IV.

Industry which consists of the mining, manufacturing, and energy sectors is required to grow at 7% a year. Based on past experience it is believed that industry can expand at the required rate. During the First and Second Five-Year Planning periods, 1962-1967 and 1968-1972, industrial output has increased at 9% and 7.6%,respectively.

Agricultural output is required to increase at 4.5% a

Table 5.7. $(I-A)^{-1}$ matrix for the 1967 consolidated input-output table for Turkey

	1	2	3	4	5	6	7	8	9
1	1.2993	0.0659	0.3001	0.0776	0.0650	0.1166	0.0089	0.0495	0.0061
2	0.0016	1.0121	0.0296	0.0845	0.0185	0.0308	0.0017	0.0078	0.0097
3	0.0612	0.1107	1.2665	0.3048	0.2429	0.4125	0.0322	0.9989	0.0216
4	0.0013	0.0309	0.0212	1.0572	0.0058	0.0083	0.0052	0.0086	0.0021
5	0.0176	0.0361	0.0541	0.0314	1.0217	0.0662	0.0189	0.0234	0.0058
6	0	0	0	0	0	1.0000	0	0	0
7	0.0174	0.0335	0.0636	0.0458	0.0757	0.1187	1.0243	0.0222	0.0114
8	0.0224	0.0343	0.0363	0.1049	0.0534	0.0340	0.0495	1.0439	0.0267
9	0.0016	0.0027	0.0038	0.0065	0.0051	0.0056	0.0371	0.0505	1.0061

Table 5.8. Sectoral projections for 1977 consistent with the growth rate of GDP = 7% (Alternative I) (billion TL., 1967 prices)

	Agriculture	Mining	Manufac-turing	Energy	Transpor-tation & Communi-cation	Con-struc-tion	Trade	Services	Ownership of dwelling
Gross output	68.980	3.808	98.817	3.057	33.706	33.138	20.064	38.181	10.778
Compound annual growth rate of output: 1967-1977 (%)	4.5	6.1	7.0	7.7	7.0	11.2	7.5	6.4	8.4
Value added	48.562	2.994	44.438	1.666	23.274	16.486	17.359	29.918	10.129
Nonwage income	18.454	1.697	23.553	.950	16.059	7.913	10.415	14.361	10.129
Wage income	30.108	1.347	20.885	.716	7.215	8.573	6.944	15.557	-
Employment (million)	9.270	.142	1.655	.056	.390	.815	.600	1.386	-
Wage income Per person employed (TL.)	3248	9486	12619	12785	18500	10519	11573	11224	-

year. Based on the past performance of this sector it is doubtful the required rate can be achieved. The growth rate of agricultural output over the period 1962-1970 has on the average been 3% a year. If agricultural output does not expand at the required rate, food prices will increase, bottlenecks will appear in the economy, and since most of Turkey's exports are agricultural goods, exports will suffer. Since agricultural output is a major component of GDP a failure in this sector will jeopardize the growth rate of GDP.

Among other key sectors, transportation and communication and construction deserve attention. Transportation and communication is required to grow at 7% a year. Over 1962-1970 transportation has expanded at an annual rate of 7%. Therefore, it is believed that the required rate can be achieved. Construction is required to grow at 11% a year. During 1962-1970 this sector has grown at 8% a year. It may be difficult to achieve the required rate in this sector. The construction sector includes building and nonbuilding (i.e. infrastructure) construction. Provision of infrastructure creates incentives for private investment. Therefore, if construction fails to expand at the required rate, it may constrain the growth rate of GDP by hindering the growth of private investment.

Table 5.8 shows the estimates of sectoral employment.

Sectoral labor demand depends on the expansion of output and on changes in sectoral labor productivity. The growth rates of labor productivity assumed to prevail over 1967-1977 under Alternative I are shown in Table 5.9. These rates together with the growth rates of sectoral output are used in Equation 3.20 to derive sectoral employment estimates for 1977. In 1977, 57% of the labor force will be in agriculture. Total employment will be 14.314 million. Labor force for 1977 estimated on the assumption that over 1971-1977 population will grow at 2.7% a year and the participation rate will be 38% stands at 16.215 million.[1] Comparing total employment and labor force gives 1.9 million unemployed in 1977 which implies an unemployment rate of 11.7%. This shows that a growth rate of 7% a year in GDP will not solve the unemployment problem in Turkey by 1977.

Sectoral value added derived with Equation 3.19 and its components wage and nonwage income are also shown in Table 5.8. Sectoral value added is computed on the assumption that the share of value added in sectoral gross output in 1977 will be the same as in 1967. The breakdown of value added into its components requires explanation.

There is no information about the distribution of value

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[1]The growth rate of population of 2.7% a year over 1960-1970 is assumed to prevail over 1971-1977. The participation rate is taken from [38].

Table 5.9. Compound annual growth rates of labor productivity: 1967-1977[a] (in percentages)

Sector	Alternative I growth rate of GDP = 7%	Alternative II growth rate of GDP = 9.9%
Agriculture	4.1	5.7
Mining	4.2	5.9
Manufacturing	4.2	5.9
Energy	4.2	5.9
Transportation & Communication	5.0	7.0
Construction	2.6	3.6
Trade	3.0	4.2
Services	3.5	4.9

[a]Sources: Demirgil [7], Turkiye Cumhuriyeti Basbakanlik Devlet Planlama Teskilati [38].

added between wage and nonwage income in the input-output tables for Turkey. Therefore, an attempt was made to estimate sectoral wage income for 1967 using data on sectoral employment, daily wages, and yearly workable days in agriculture and nonagricultural sector. Sectoral employment figures were taken from The Third Five-Year Development Plan [38], daily wages from the Statistical Yearbook of Turkey [8], yearly workable days in agriculture from Hamurdan [14], and those in the nonagricultural sectors from

Korum [22]. Table 5.10 shows the data used and the estimates of sectoral wage income for 1967. Sectoral nonwage income is derived as a residual by subtracting wage income from sectoral value added. Estimates of wage income for 1977 are calculated on the assumption that sectoral shares of wage income will remain constant over 1967-1977. Sectoral nonwage income for 1977 is derived as a residual.

The breakdown of value added into its components is used to get an idea about the distribution of income in 1977. First, sectoral annual wage income per person employed (i.e. average annual wage) is calculated. Sectoral average annual wages for 1977 are shown in Table 5.8. There will be large differential in wage incomes in 1977. The lowest average annual wage income will be in agriculture. The highest will be in the transportation and communication sector.

Many factors account for sectoral wage income differentials. Labor productivity is one of them. Labor productivity in agriculture has always been much lower than that in other sectors. Moreover, pressures by trade unions have increased wages in nonagricultural sectors by more than productivity growth while the wages of unorganized agricultural workers have remained low. The occupational composition of a sector is another factor that influences average wages. The majority of those employed in agriculture are unskilled workers with little or no education. In contrast, 30% of

Table 5.10. The distribution of value added between wage and nonwage income: 1967[a] (billion TL., current prices)

	Agriculture	Mining	Manufacturing	Energy	Transportation & Communication	Construction	Trade	Services	Ownership of dwelling
Value added	31.277	1.655	22.620	.789	11.824	5.672	8.435	16.094	4.519
Employment (million)	9.000	.120	1.283	.041	.325	.369	.395	1.058	-
Daily average wage (TL.)	10.0	21.0	28.0	28.0	38.0	27.0	29.0	27.0	-
Wage income[b]	19.350	.740	10.561	.336	3.631	2.929	3.342	8.398	-
Nonwage income[c]	11.927	.916	12.059	.453	8.193	2.743	5.095	7.696	4.519
Wage income as % of value added	62.0	45.0	47.0	43.0	31.0	52.0	40.0	52.0	-

[a]Sources: Devlet Istatistik Enstitusu [8], Hamurdan [14], Korum [22], and Turkiye Cumhuriyeti Basbakanlik Devlet Planlama Teskilati [38].

[b]Wage income is computed on the basis of 215 and 294 working days in agriculture and non-agricultural sectors, respectively.

[c]Total value added in ownership of dwelling is assumed to be nonwage income.

those employed in the finance sector are classified as professional. This group has a high school or university education. Krueger [23] reports that the daily wage of a university graduate with three years of experience is 4.8 times higher than that of an unskilled worker with 13-15 years of experience. The daily wage of a high school graduate is 1.5 times higher than that of an unskilled worker with 7-10 years of experience. Therefore, agriculture, where the majority of people employed is unskilled with little or no education shows low average wages. In addition to the factors mentioned above, workers in the nonagricultural sectors work 1.4 times as many days as those employed in agriculture.

Large differentials in wage incomes indicate that the distribution of income in 1977 will be quite uneven. Agricultural wage income will be 2.8 times lower than the lowest nonagricultural wage income and 3.8 times lower than the average nonagricultural wage income. Moreover, 57% of the labor force will be employed in agriculture where wage income is lowest.

A better idea about the distribution of income can be obtained by computing the share of nonwage income in national income. National income and GDP differ by indirect taxes, depreciation, an income from abroad. The sum of sectoral value added represents GDP. To arrive at national income,

GDP must be adjusted for the three factors above. In this study first, total nonwage income has been adjusted by the projected values of indirect taxes, depreciation, and income from abroad obtained from the macro model. Then, adjusted nonwage income which stands at TL. 83.1 billion was added to total labor income of TL. 90.3 billion to give national income of TL. 173.4 billion for 1977. Adjusted nonwage income accounts for 47% of national income while wage income in agriculture accounts for 17%. This shows that while a small portion of the population who derives income in the form of rent, interest, and profits gets almost half of national income the bulk of the population will have to share a much smaller portion of it.

2. GDP grows at 9.9% a year (Alternative II)

Sectoral estimates consistent with the overall growth rate of GDP of 9.9% a year are shown in Table 5.11. Sectoral outputs are required to grow at rates much higher than those under Alternative I. In view of past experience it will be difficult for many sectors to achieve the required rates. In particular, agriculture is required to grow at 6.6% a year which is double the historic rate.

The derivation of sectoral value added and its components follows the same procedure as before. However, the derivation of sectoral employment for this alternative requires explana-

Table 5.11. Sectoral projections for 1977 consistent with the growth rate of GDP = 9.9% (Alternative II) (billion TL., 1967 prices)

	Agriculture	Mining	Manufac-turing	Energy	Transpor-tation & Communi-cation	Con-struc-tion	Trade	Services	Ownership of dwelling
Gross output	84.444	5.106	138.186	4.263	44.653	41.340	26.070	48.443	14.852
Compound annual growth rate of output: 1967-1977 (%)	6.6	9.2	10.7	11.4	10.0	13.7	10.3	9.0	11.9
Value added	59.448	4.015	62.142	2.324	30.833	20.566	22.556	37.959	13.958
Nonwage income	22.570	2.208	32.935	1.325	21.275	9.872	13.539	18.221	13.958
Wage income	36.878	1.807	29.207	.999	9.558	10.694	9.022	19.738	-
Employment (million)	9.720	.162	1.988	.068	.425	.929	.691	1.544	-
Wage income per person employed (TL.)	3794	11154	14692	14691	22489	11511	13056	12784	-

tion. Sectoral employment estimates under the "high" growth rate of GDP could not be estimated by using the same growth rates of labor productivity that were used for Alternative I. It should be remembered that public and private investment under Alternative II increase at much greater rates than under Alternative I. This means the capital stock will grow at greater rates under Alternative II. Capital-labor ratios will increase at faster rates, therefore, labor productivity will grow at greater rates than under Alternative I.

Sectoral growth rates of labor productivity used for Alternative II are presented in Table 5.9. These rates are computed in proportion to the growth rate of GDP. The resulting sectoral employment estimates are shown in Table 5.11. Total employment stands at 15.527 million. Compared with the labor force of 16.215 million in 1977 this implies a 4.2% unemployment rate in 1977. There will be a great improvement in the unemployment situation, as compared with Alternative I but, this depends a great deal on the performance of sectors.

Large differentials in wage incomes between agriculture and the nonagriculture sectors exist. Average wage income in agriculture is the lowest. Agricultural wage income is 2.9 times lower than the lowest nonagricultural wage income and 3.7 time lower than the average wage income in the non-agricultural sector. National income under this alternative

stands at TL. 227.1 billion 48% of which is nonwage income. Wage income in agriculture is only 16% of national income. These imply that the distribution of income under Alternative II will be more uneven as compared with the previous case. A larger portion of the labor force (60%) will be in agriculture. A smaller share (16%) of national income will go to those employed in agriculture. Moreover, nonwage income will account for a larger portion (48%) of national income. This outcome confirms the statement that "given the economic and political setting of Turkish society, the growth strategy is implementable only by creating or permitting a skewed income distribution" [2].

VI. CONCLUSIONS, POLICY IMPLICATIONS, SUGGESTIONS FOR FURTHER STUDY

This study has been concerned with quantifying the impacts of alternative growth rates of GDP on the Turkish economy for 1977. First, the structure of the economy over the 1952-1970 period has been approximated by a macroeconometric model and alternative growth rates of GDP derived. Second, sectoral output expansion consistent with the overall growth rates of GDP has been determined within the input-output system, sectoral labor demand estimated, and sectoral average wage incomes compared.

The results of the study can be summarized in two categories: the conclusions from the macro model and those from the input-output system. The most important conclusions to be drawn from the macro model are:

1) GDP in Turkey will grow at a compound annual rate of 7% over 1971-1977 if past trends of growth of the predetermined variables are maintained.
2) The public sector has a stimulative impact on the private sector and also on the whole economy. In other words, the macro model shows that the public sector is the "prime mover" of the Turkish economy.
3) High growth rates of GDP can be achieved if the key variables (i.e. public investment and consumption) in

the economy grow at rates much higher than those observed over 1952-1970. For GDP to grow at 9.9% a year public investment and consumption have to grow at 13% and 8% respectively, as compared with their historic rate of 9% and 6%.

The conclusions from the input-output system are that:

1) The rates of growth of some sectors consistent with the growth rate of GDP may be difficult to sustain in view of the past performance of those sectors. Agriculture in particular, has expanded at rates much lower than those consistent with the growth rates of GDP considered in this study.

2) If the production structure of 1967 is maintained over 1967-1977, GDP grows at 7% a year, and sectoral outputs expand at rates consistent with the growth rate of GDP, high rates of unemployment will prevail in 1977. Turkey, therefore, cannot count on a 7% growth rate of GDP to solve the unemployment problem.

3) Under Alternative I, sectoral average wage incomes will show large differentials in 1977. Among the nine sectors, the lowest average wage income will be in agriculture. Since over 50% of the labor force will be employed in this sector income distribution will be quite uneven in 1977. A large share (47%) of national income being accounted for nonwage income will also contribute to the inequality in income

distribution.

4) If the production structure of 1967 is maintained, GDP grows at 9.9% a year, sectoral outputs expand at required rates then the unemployment rate in 1977 will be only 4.2% as compared to 11.7% under Alternative I. However, it should be remembered that sectoral employment is sensitive to the growth of sectoral output and changes in labor productivity. Failure of sectors to expand at required rates or higher growth rates of labor productivity will lead to greater unemployment.

5) The distribution of national income will be more uneven under a "high" growth rate of GDP. In comparison with Alternative I a larger share of the labor force will be employed in agriculture where wages will be lowest and a higher share of income will be accounted for by nonwage income.

Policy implications of these results are discussed under four categories: the public sector, the agricultural sector, industrialization policies, and the labor strategy and income distribution.

The public sector:

The stimulative impact of the public sector on private investment and on the economy as a whole has been demonstrated

in this study through the reduced form of the macro model. The public sector in Turkey took it upon itself to provide the necessary infrastructure and start new industries in the early 1930's when Turkey embarked on rapid industrialization. However, an adequate infrastructural base is still lacking. This limits entrepreneurial activities to a large extent and creates "push factors" for internal migration. Many areas in Turkey are still without the basic amenities such as drinking water, electric power, waste disposal, schools, hospitals, etc. The public sector should, therefore, provide the necessary social and physical infrastructure in particular in the rural areas so that private enterprises are encouraged to go to these areas and the "push factors" of migration are reduced. Establishing nonagricultural activities in rural areas will create employment and therefore reduce migration to the cities.

Over 1962-1970 period public investment has been lower than target rates. Whatever the target rate of growth of GDP, public investment should increase at a rate consistent with it. The provision of infrastructure should be at a rate compatible with the growth rate of GDP. Turkey is planning for higher growth rates in GDP than in the past, therefore, a heavy burden will be put on the public sector.

Agriculture:

Even though the share of the agricultural sector in Turkey has been reduced, the importance of this sector has not diminished. Turkey depends on agriculture as a source of foreign exchange since close to 60% of Turkey's exports are agricultural goods. She also depends on agriculture to provide food for a population growing at 2.7% a year. To increase exports and feed the growing population, agricultural output has to be increased rapidly.

It should be pointed out that the agricultural sector has not been fitted in the growth strategy of Turkey. This has been partly due to lack of knowledge about this sector and also due to the belief that the industrial sector has to be the leading sector during the growth process. This has led to inconsistencies between the agricultural sector and other sectors of the economy.

The agricultural sector in Turkey should be made an integral part of the development plan not only because of its impacts on the economy already mentioned above but because of its influences on the distribution of income. In 1977 a large portion of the labor force will still be employed in agriculture. If differentials in wage incomes between agriculture and the other sectors of the economy is not reduced income distribution will be very uneven. To bridge the gap, labor productivity in agriculture should be increased by ex-

tending credit together with technical assistance to owners of small farms, by providing educational facilities, and by introducing yield increasing techniques. In addition, the transportation system should be improved so that the increased agricultural output can be easily marketed. At the present, large rural areas in Turkey have no or limited access to major markets. At the same time the land reform that is being contemplated should be implemented so that inequalities in the distribution of land which seem to be the major cause of inequalities within agriculture are reduced.

An egalitarian income distribution is recommended on the basis of equity as well as its demand increasing effects. An even distribution of income means improving the lot of the majority of population in Turkey. It also means increased demand for goods and services by the people engaged in this sector.

Industrialization policies:

Industrialization policies in Turkey have resulted in factor price distortions which ultimately have influenced the choice of techniques. Wages in the nonagricultural sectors have increased beyond productivity increases because of social pressures and growing union power. Capital has been underpriced through various techniques such as over-evaluation of the exchange rate, tax breaks and subsidies

on investment, and duty concessions on imported capital goods.

A bias toward fixed capital has also been expressed in the money markets in Turkey. The market is at the present segmented with respect to interest rates and availability [2]. Low interest rates are charged for long term investment and credit is easily available for fixed capital rather than payment of wages. The bias toward fixed capital has been intensified by inflation which lowers the real rate of interest below the nominal rate. In addition, the money market favors loans secured with inventories and real estate.

A money market where interest rates are determined on the basis of risk, duration, and liquidity is needed. The elimination of biases on the basis of securities backing a loan is necessary.

To encourage the use of the relatively abundant resource, labor, measures should be taken to let factor prices reflect true scarcity values. This would imply eliminating overvalued exchange rates and subsidies on capital and restraining increases in wages beyond productivity growth in the non-agricultural sectors.

Employment strategy and income distribution:

The results of this study indicate that unemployment will reach alarming rates in 1977 unless GDP grows at a "high" rate of 10%. It is believed that the "high" growth rate of GDP

should not be counted on to solve the unemployment problem in Turkey. A 10% growth rate of GDP puts a heavy burden on the saving capacity of an economy where the income of the majority of population is very low. It is more reasonable to expect that GDP will increase at 7% over 1971-1977. Since this rate of growth results in high unemployment, an employment strategy should be considered.

An employment strategy does not mean employment should be created at the expense of efficiency. It means measures should be taken to eliminate policies that prejudice the use of one input over another. It means policies that distort factor prices should be eliminated. The employment strategy is justified not only on ethical grounds that every one is entitled to a job, but also because it is a mechanism for including a maximum number of people in the production and economic growth process, and, thus providing a more equitable income distribution than that will prevail under strategies which treat employment as a consequence of growth [2]. An employment strategy that aims at an egalitarian income distribution is also recommended on the basis that GDP is not a good measure of welfare. This study has shown that GDP may be increasing at high rates but that the resulting income distribution may not be acceptable.

Welfare is believed to be maximum when like persons share goods and services produced within the society equally. If

development moves a society toward equality in income distribution while maintaining growth, then greater welfare is achieved, ceteris paribus. An egalitarian distribution can either be achieved through redistribution or an employment strategy. Because of difficulties of redistribution and due to the merits of an employment strategy the latter is recommended for Turkey.

This study has quantified the sectoral implications of the growth process in Turkey. Additional research should aim at expanding and reestimating the model as data becomes available. Further research should also aim at disaggregating sectors on the basis of modern and tradition sectors. Finally, sectoral production functions should be estimated to derive labor productivity endogenously. At the moment, even a CES production function which requires that sectoral wage income and return to capital be known cannot be estimated due to lack of data. So far, the State Planning Organization and the State Institute of Statistics have not been interested in a functional distribution of income.

This study has made several contributions to the understanding of the growth process in Turkey. First, it has demonstrated the importance of the public sector in Turkey during the growth process. Second, by linking a macro model to the input-output system it has brought consistency to sectoral output estimates and eliminated the arbitrariness

in sectoral projections. Third, the study has shown that growth may not generate enough employment for the growing labor force. It has also indicated that income distribution under a growth strategy may be quite uneven. Thus the study has shown that growth cannot be considered a panacea for all the ills of the Turkish economy. It has, therefore, become clear that at a time when there is much concern with unemployment and income distribution in Turkey a development strategy that gives higher weights to these objectives rather than growth is needed.

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IX. APPENDIX

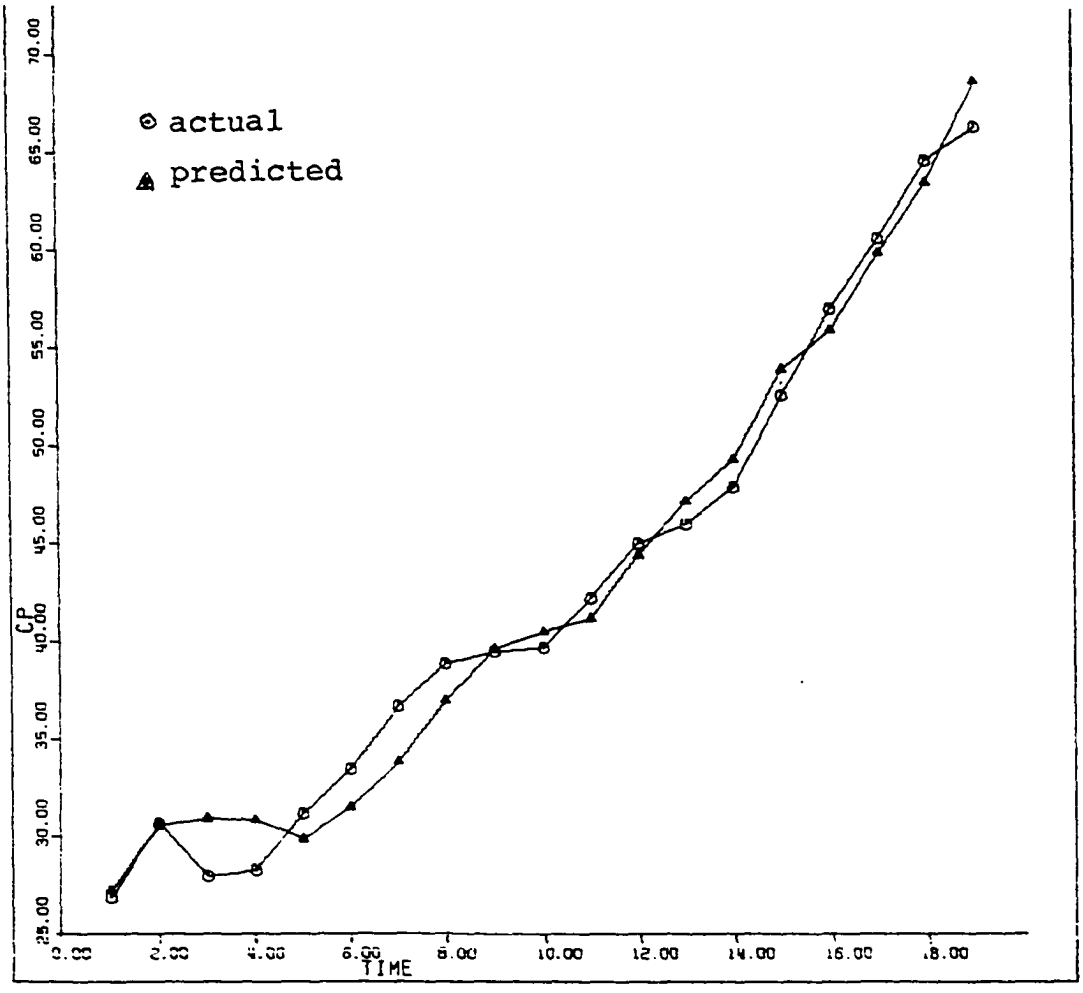


Figure A.1. Actual and predicted private consumption

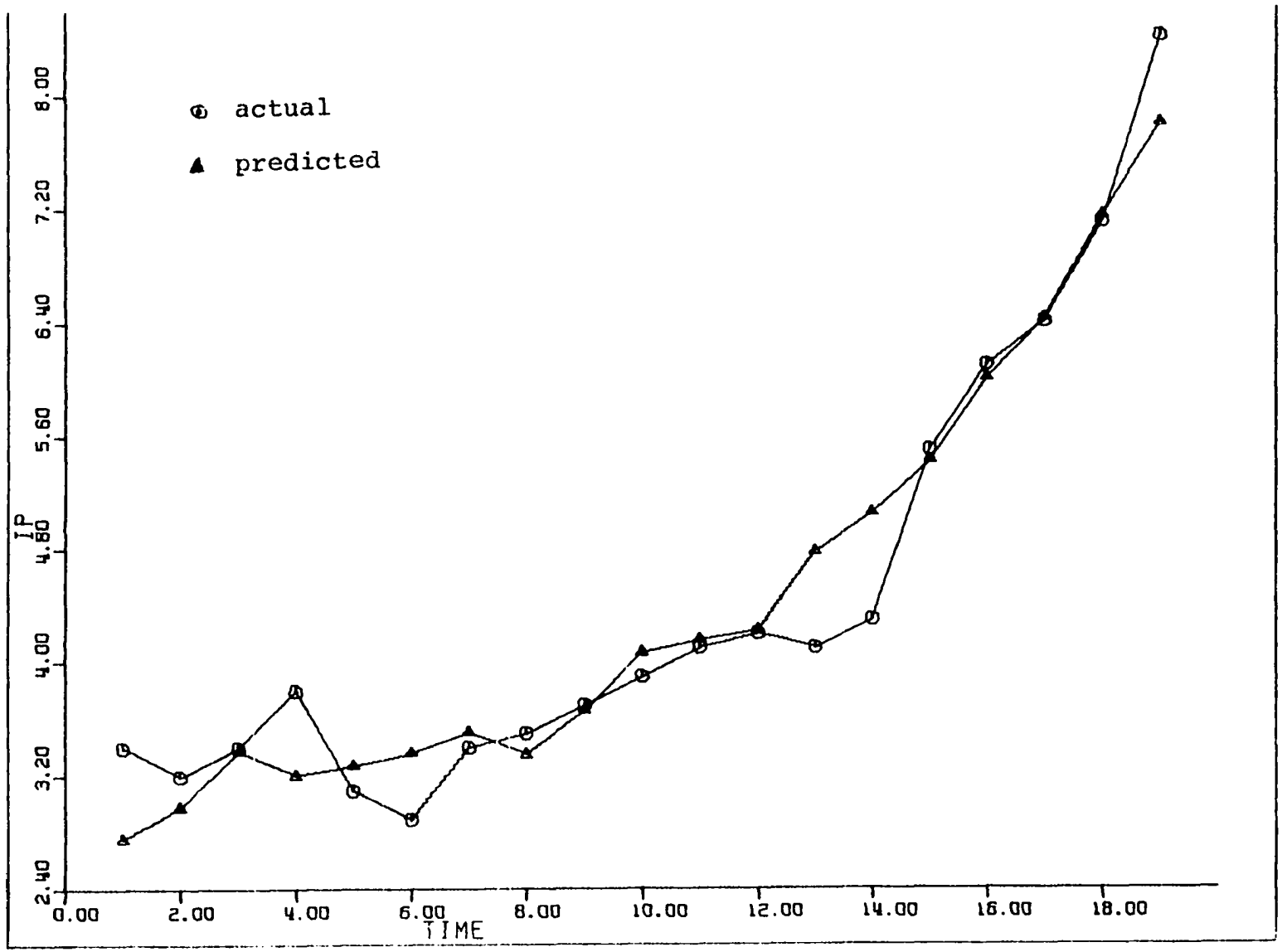


Figure A.2. Actual and predicted private investment

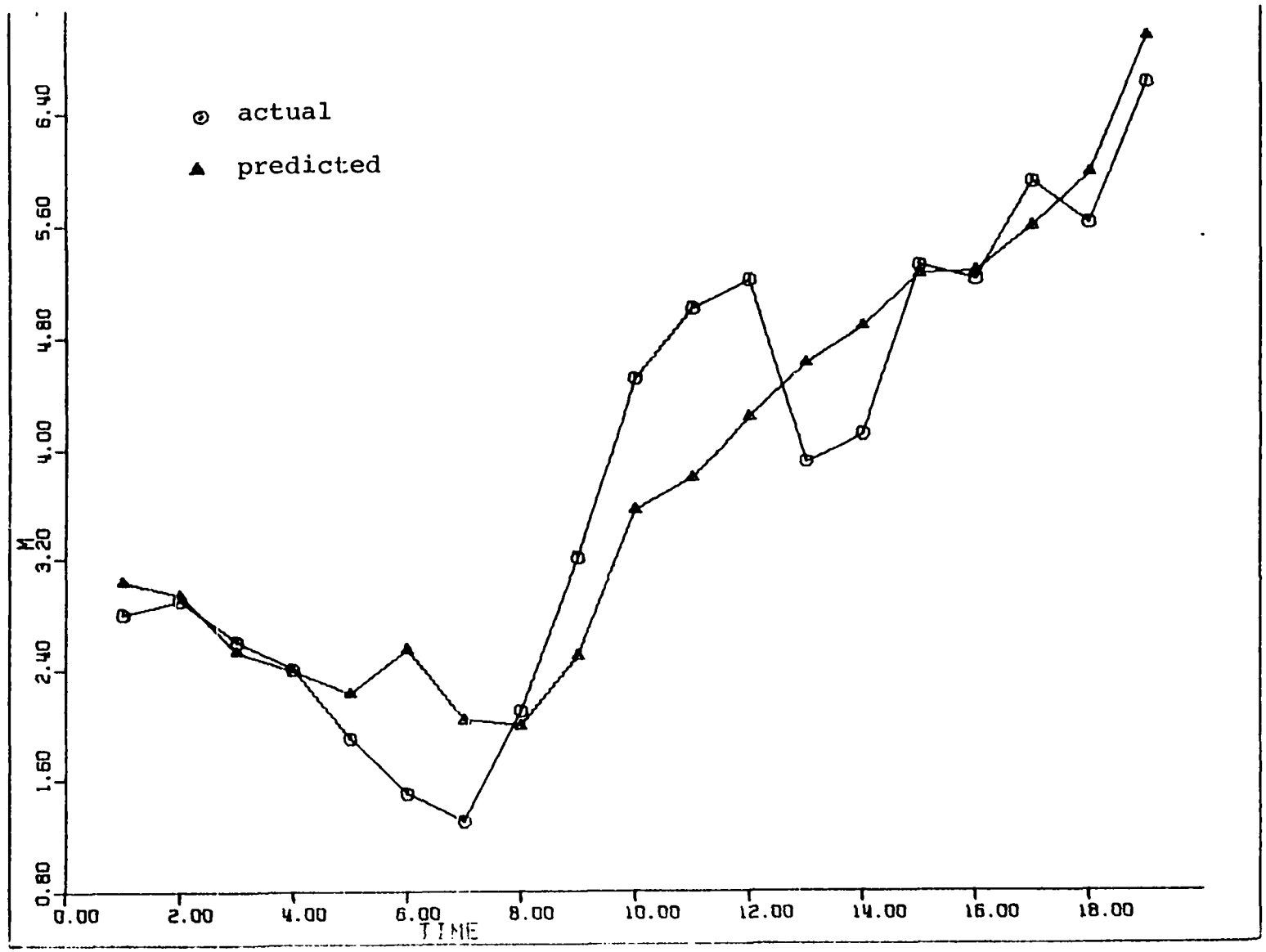


Figure A.3. Actual and predicted imports

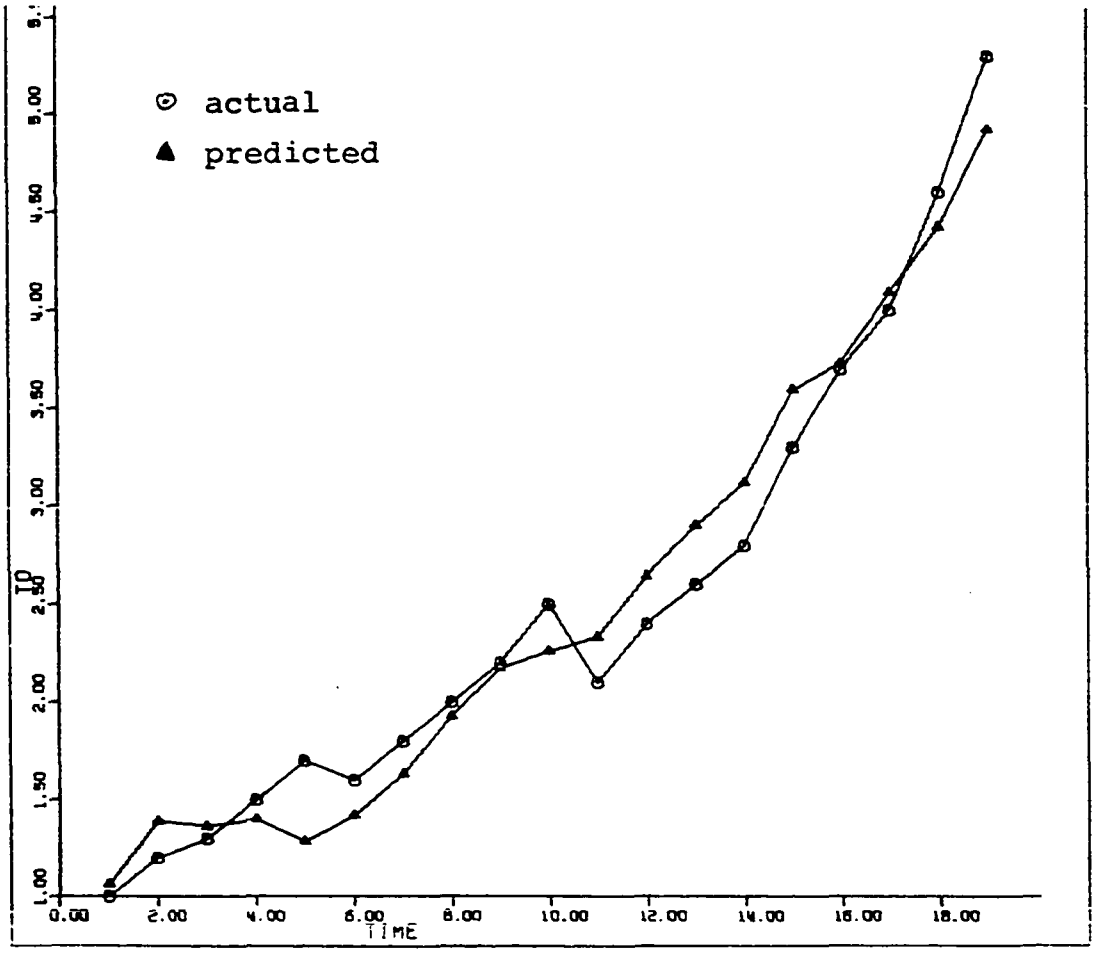


Figure A.4. Actual and predicted direct taxes

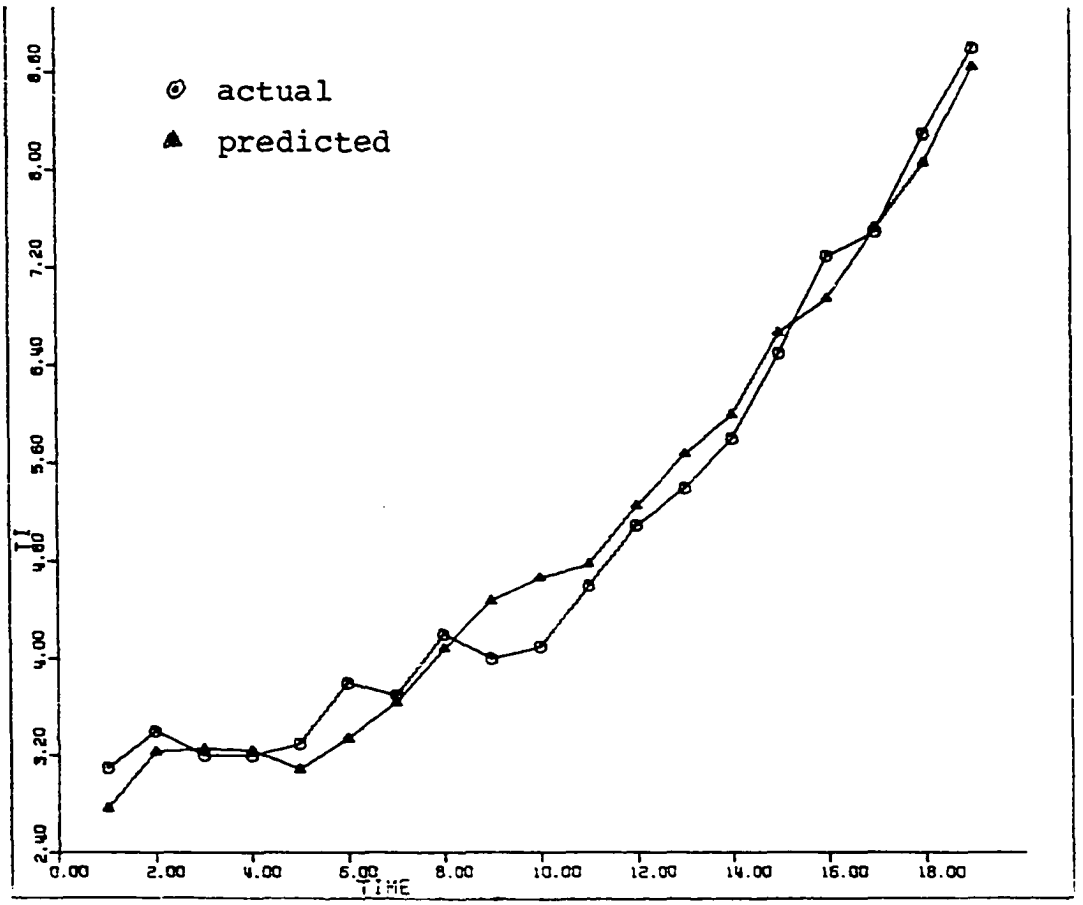


Figure A.5. Actual and predicted indirect taxes

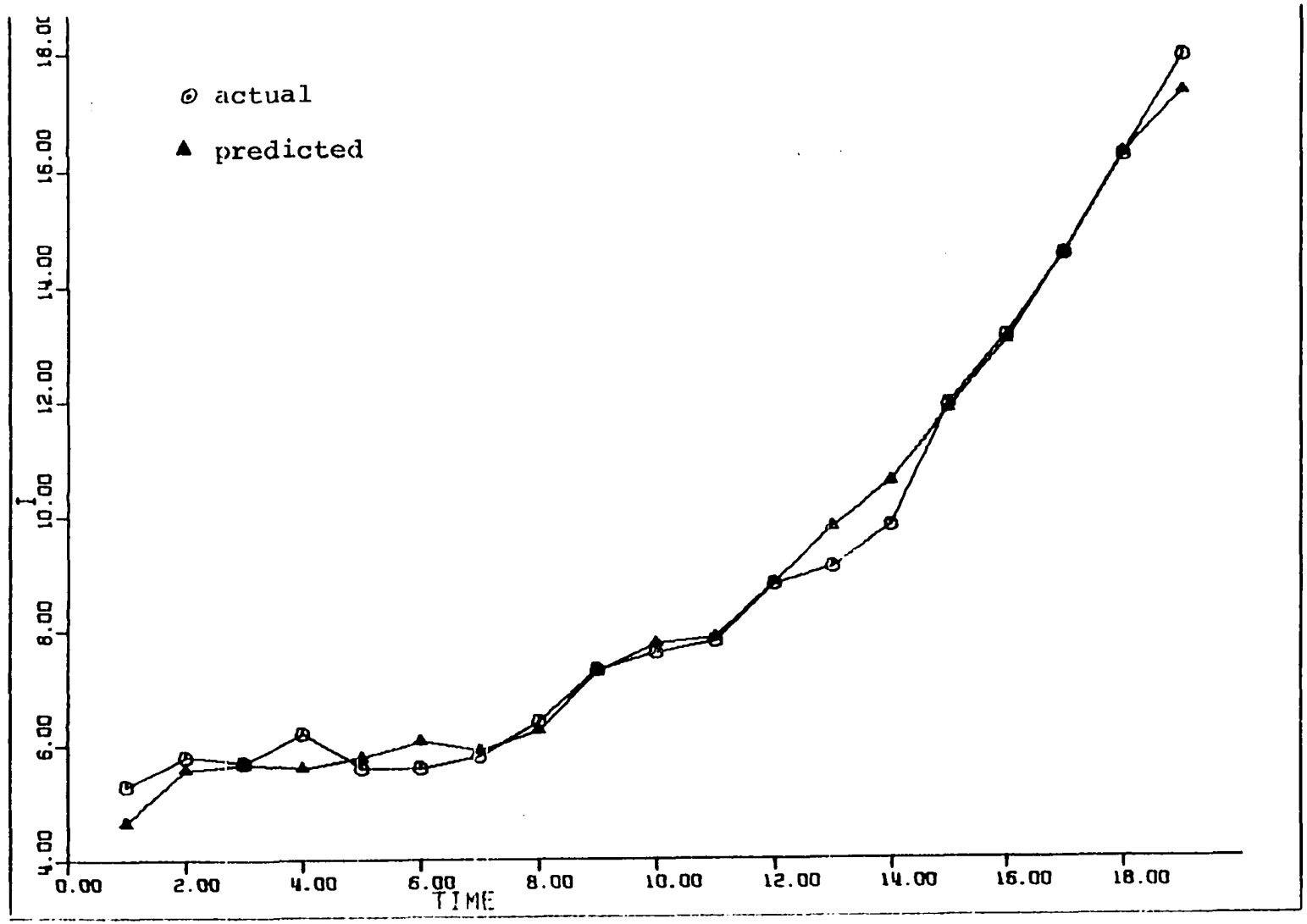
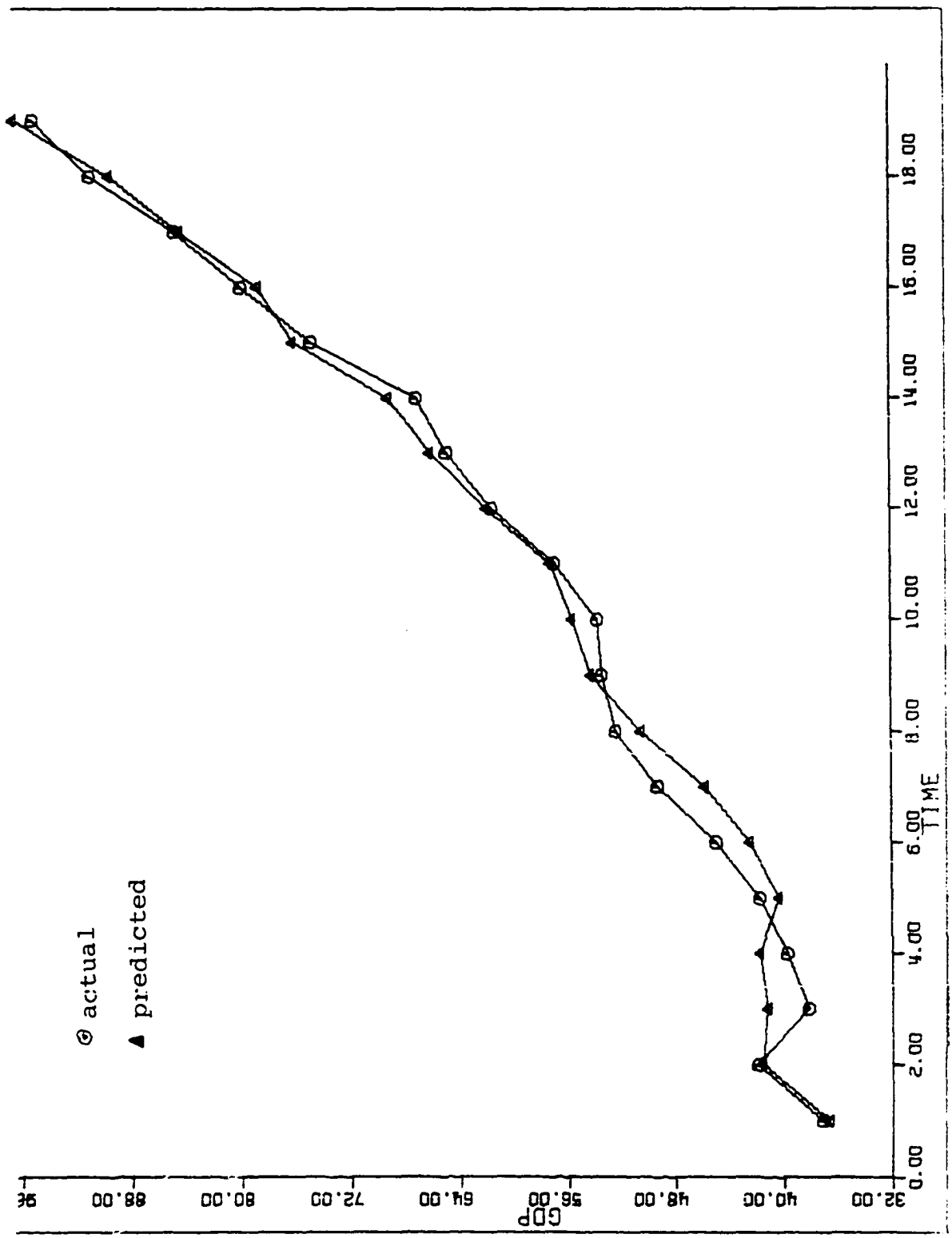


Figure A.6. Actual and predicted total investment

Figure A.7. Actual and predicted GDP


actual
predicted
GDP
TIME
32.00
40.00
48.00
56.00
64.00
72.00
80.00
88.00
0.00
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8.00
10.00
12.00
14.00
16.00
18.00

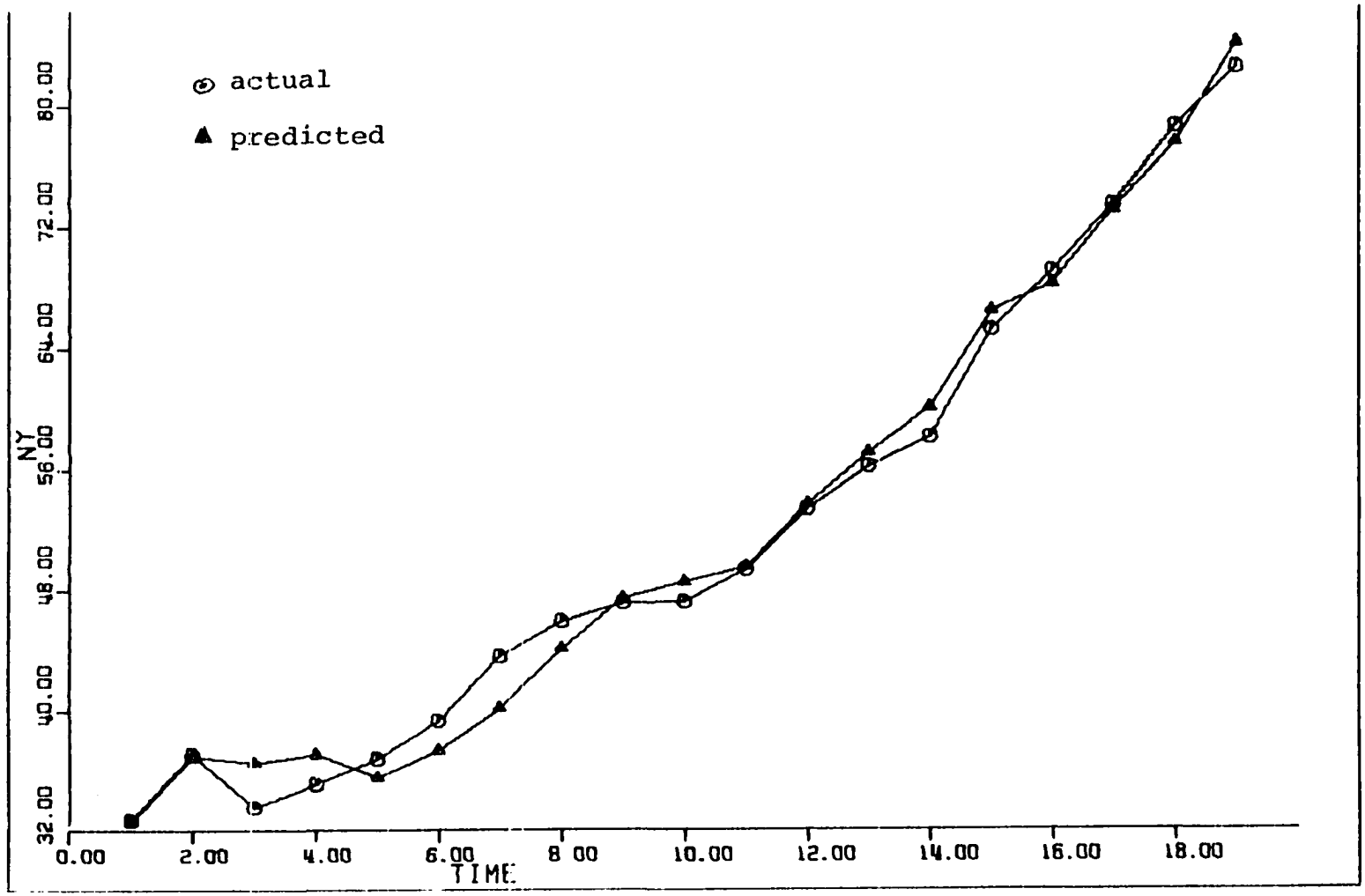

Figure A.8. Actual and predicted national income

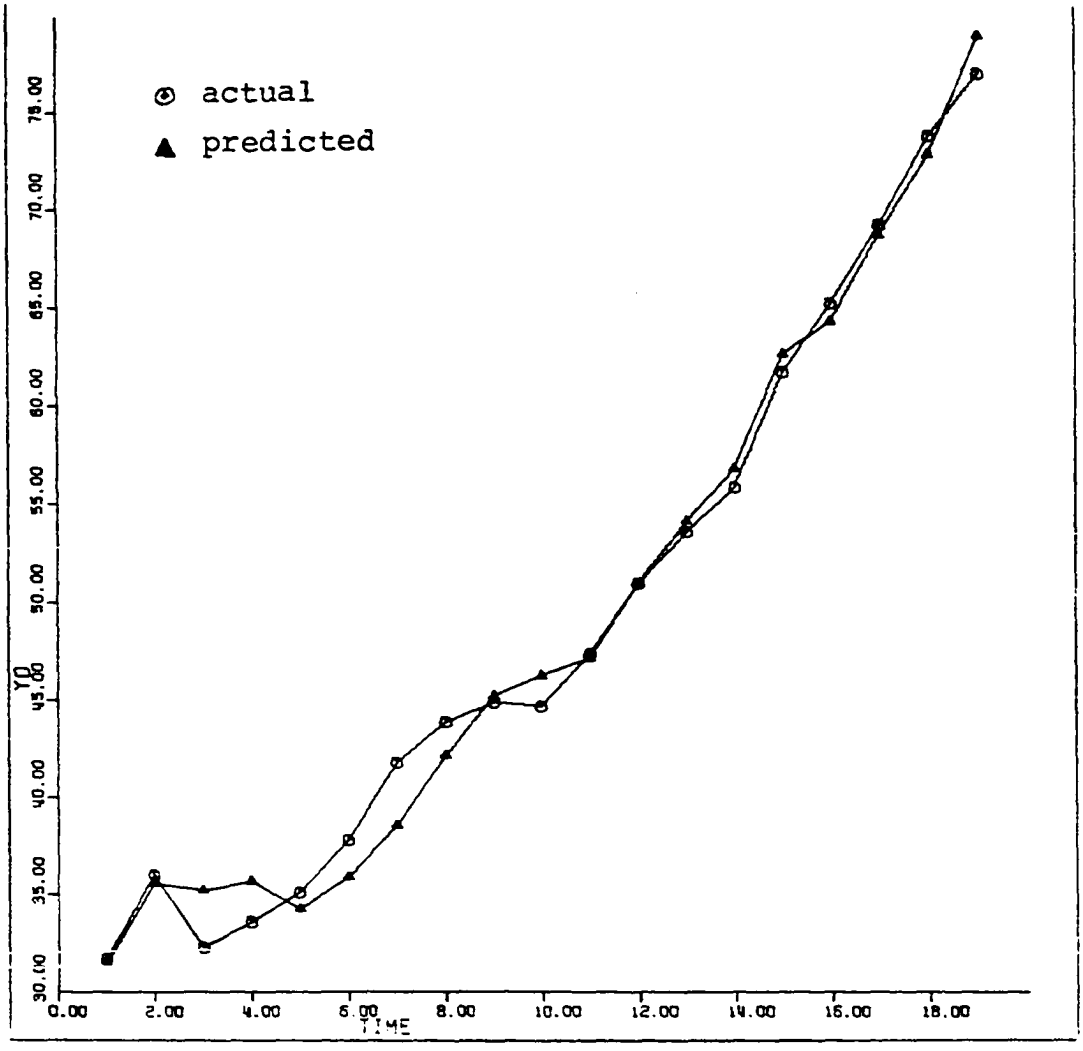

Figure A.9. Actual and predicted disposable income