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THE IMPACT OF BASE PRICE POLICY IN THE AGRICULTURAL SECTOR: THE TURKISH EXPERIENCE

by

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ABSTRACT

THE IMPACT OF BASE PRICE POLICY IN THE AGRICULTURAL SECTOR: THE TURKISH EXPERIENCE

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Turkey's agricultural sector and government price policy have been investigated in this study in order to explore opportunities in the agricultural sector to improve Turkey's development performance. Even though the base price system lent itself to political influence and thus to decisions that may be more political than economic, the resulting economic consequences of implied policy was important. Therefore, to measure and evaluate the effects of government involvement through the price mechanism, a base price augmented supply model was developed.

Although the data used have been crude and results are treated as merely tendencies stemming from supposed policy scenarios, a dramatic shift came from comparing the alternate scenarios with the base case. As expected, the findings indicated that an increase in the base price leads to an increase in output supplied and the income of farmers and it stimulates demand for industrial commodities. An opposite effect occurs when the base price is decreased.

This study suggests that the government should proclaim a base price as close as possible to the world market price.

To Suheyla

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INTRODUCTION

Development has been a misunderstood and/or misjudged concept in the minds of people, or at least in the minds of bureaucrats of the developing countries. It has long been seen as a concept identical to industrialization. International development agencies have supported industrialization plans and rarely lend money for agricultural projects.[1] All efforts have been made for the rapid industrialization of those countries.

This misunderstanding and/or misjudgment eventually caused two major problems within the dual nature of developing countries. First, food production in the developing countries has barely kept pace with population growth and there has been no margin of safety.[2] Second, acceleration of the rate of inflation due to insufficient supply of agricultural products has carried certain dangers and costs in pursuing targets of development.

For 1978, the rate of growth in agriculture was 2.0 percent and population growth 2.2 percent percent in low-income countries. For middle-income countries, those figures were 3.1 and 2.4 respectively. Besides, the average rate of inflation for the first group of countries went up

from 3.0 percent to 10.6 percent during the period 1970-1978, and for the second group of countries from 3.1 percent to 13.1 percent.(3) Interestingly for both groups of countries, the average annual growth rate of investment declined from 1968 to 1978.

General deterioration of the economy of the developing countries in recent years, of course, cannot be attributed only to the insufficient agricultural production; but at least the underdeveloped agricultural sector can be shown as one of the major causes of this deterioration. It can be argued that low-income developing countries will not be able to meet domestic food demand without foreign support in the foreseeable future.

The situation in middle-income countries is different but leads us to the same conclusion. First, even though the sectoral rate of growth in agriculture on the average is slightly higher than the rate of population growth, those countries are still far from the optimal level of food consumption to prevent impairing working efficiency and productivity. Second, the major distinctive characteristic of middle-income countries is dependence upon the agricultural sector, not only to meet domestic food demand, but also to export agricultural products in order to provide a source for development. Therefore, in order to satisfy this objective, they must reach a higher rate of growth in the agricultural sector than they have already achieved.

Serious shortages of agricultural products in the developing world due to the neglect of agriculture during the process of development have started to show in the form of malnutrition and also in the form of an accelerating rate of inflation. Evidence of serious malnutrition in almost all developing countries comes from three main sources; estimation of food consumption, anthropometric and clinical studies, and data on child mortality.(4)

The estimates of food consumption by different income groups normally show that in all but the richest developing countries, consumption by a large section of the population is well below what is needed for a minimally satisfactory diet. Undernutrition is most widespread in Africa and in South Asia. It is also common in Latin America and the Middle East.

Anthropometric and clinical studies (based on measures of height, weight for height, arm circumference, skin-fold thickness, blood tests and so on) show, for example, that children from wealthier families, or from families that have migrated to developed countries, tend to grow substantially taller than do children of the poor.

The data on child mortality reflects the combined effects of sickness and malnutrition. Infections can reduce appetite and food intake in several different ways, including the action of intestinal parasites; and they can reduce

the proportion of nutrients that the body absorbs. Undernutrition in turn weakens the body's immunizing mechanisms and so lowers its defenses against the initial infection, while making it more susceptible to further infections. Malnutrition is estimated to be a contributory cause of a third or more of infant and child deaths in developing countries.(5)

Evidence of accelerating inflation comes from the price indices, and the average index of food production. The average rate of inflation went up from 3.0 percent to 10.5 percent annualy in the period of 1970-1978 for low-income countries. Similarly, for middle-income countries these figures changed from 3.0 percent to 13.1 percent respectively.

Up to this point, I have tried to emphasize the importance and, ironically, the neglect of the agricultural sector throughout the developing world. At this stage an inevitable question must be asked. That is, what has been done by the governments of developing countries to overcome difficulties in the agricultural sector. Without presuming to speak on behalf of all developing countries, I will draw upon my service in the Turkish government, as a civil servant and an economic planner, for whatever more general lessons it may offer.

Turkey today is at a turning point, faced with an unusual opportunity and a chronic obstacle in pursuing her

development objectives. The opportunity is the increase in foreign demand for agricultural products, and the obstacle is a level of productivity scarcely adequate to meet domestic food demand. The solution of the problems in the agricultural sector not only would create a relaxation in Turkey's balance of payments, but also eliminate one of the major sources of inflation, which destroys the social base of the development efforts.

Efforts to improve agricultural production in quality and in quantity have continued since the 1930's, the early years of the young republic. Despite the adoption of various policies by the government, today similar problems are still in effect. They are, namely, an insufficient level of agricultural production, the low productivity of labor, capital, and land,inefficient agricultural marketing facilities, inflation due to inelastic supply, social rigidities, and chronic unemployment in this sector. The solution of these problems in the agricultural sector will create social relief among the people, as well as economic.

Therefore, the purposes of this study are to make a survey of the Turkish economy in general and, the Turkish agricultural sector in particular, to clarify structural rigidities, to investigate the impact of government price intervention in the agricultural sector through price policy in the sector.

For the purpose of investigating the impact of government price policy, a base price augmented supply model was developed. The model allowed the tracing of the effects of government price intervention in this sector by using agricultural support price on the level of agricultural production, income distribution, patterns of consumption, and exportable agricultural surplus.

CHAPTER I

ECONOMIC DEVELOPMENT IN TURKEY

1. Introduction

The problem of transforming a traditionally agrarian country into a modern industrial state arose in Turkey at least a century later than in the countries of Western Europe. From the beginning of its transformation, Turkey was faced with the choice of using state-operated industry or private industry as the main insrument of economic development. From this standpoint, Turkish economy may be categorized in three representative periods of liberalism, etatism, and interventionism. In order to formalize state efforts to maintain or alter the environmental conditions in which the market operates, we have reviewed developments in the Turkish economy prior to the 1960s in a sequence of historical events. Such a review will lead us to evaluate explicit policies which consequently become the working rules of the Turkish economic system.

2. Early years of the Turkish Republic

The early years of the young republic cover the years between 1923 and 1938. This period is characterized by the foundation of a modern, westward-oriented community on the ruins of the Ottoman Empire, and by the efforts to provide

minimum subsistence to the population, which was worn out by the war. The first world war was over in 1918 for all participants except Turkey. She was at war until the end of 1922, ultimately regaining her independence under extremely difficult conditions. All human and nonhuman resources were devoted to the cause of the country's independence. Therefore the new Republic was founded in the land which had been completely exhausted and left with very limited resources. In spite of those difficulties, the great enthusiasm of the people led them to start major development efforts in the economy.

In the first years of the republic, Turkey had a relatively high volume of foreign trade in comparison to its national income. The volume of foreign trade was around 15.0 to 20.0 percent of the national income.(1) Turkey's export products were sold at fair prices on foreign markets and the major part of her industrial goods requirements were met by imports. This situation continued until the years of the great depression. Difficulties in foreign trade emerged following the world crisis and thus development efforts stagnated. Private enterprise was not able to create any significant capital accumulation in domestic industries. Lack of capital accumulation hindered the further development efforts of the country to reach new horizons. It was under such conditions that the state assumed the task of capital

accumulation to accelerate the pace of industrialization. To assure such a task, state economic enterprises were introduced into the economic scheme as part of the industrial plans which were being prepared.

The first plan emphasized state entrepreneurship in establishing the major new industries and state control through public financial institutions and agencies. In keeping with its new economic policy, the state established a network of monopolies and state-owned banks, founded a number of basic industries and marketing companies, and nationalized mining and public services. It is generally accepted that implementation of the first plan also terminated the liberal period of the Turkish economy. The second plan was prepared and approved in 1938. However, implementation of the second plan was interrupted by the second world war.

The war years of 1939 through 1945 brought new hardship to the development efforts of the country. Even though Turkey stayed out of the second world war, she did not entirely protect herself from its destructive effects. The burden imposed on the economy by the mobilization of the army and the cautious relationship maintained with the external world were the chief sources of the great hardship. Shortages and inflation developed rapidly as a consequence of declining foreign trade and the absorption of a great part of the trained labor force by the Turkish

army. Economically, the war years brought as extreme difficulty to the nation's economy as if Turkey had engaged actively in the war.

At the end of the second world war, Turkey enjoyed territorial integrity as well as undamaged productive power. However, the post-war period was still full of threats and pressures to her integrity. Thus, the heavy defense expenditures sustained in the war years continued and accelerated in the period of the cold war. This situation, together with the effort of the transition to multi-party democracy, slowed down the process of development. Because national attention was focused on the free general elections, priorities given to the development efforts lost their significance.

A democratic regime replaced the republican regime in 1950 after free elections. The Democratic Party having gained power over the Republicans, challenged the etatistic regime and state monopoly with a commitment to gradual transfer of state enterprises to private hands. In practice , however, there was little change in public ownership, i.e., the State Economic Enterprises (SEE), for which direct control of market activities was essential. The state monopolies retained their position in vital fields, and only a limited transfer of public enterprises to private hands took place. At the same time large scale public investment was devoted to electrical power produc-

tion and highway construction. The pace of development was greatly increased, and more attention was given to agriculture.

Increase in foreign aid in both technical and financial areas accelerated expansion of the Turkish economy, while foreign assistance programs helping the partial mechanization of the agricultural sector made possible expansion of cultivated land. The country lived in prosperity for three years following bumper crop years in agriculture and favorable international trade resulting from the Korean war. The rapid increase of investment in the early 50s was met by substantial growth in the agricultural sector and by foreign assistance.

During the middle 50s, rapid expansion of the economy outran the available resources, and this led to serious difficulties; the rate of inflation accelerated while steady deficits in the balance of payments caused severe imbalances in the national economy. The economic policy which started by following a liberal course in both domestic and foreign markets was subjected to more and more controls as shortages and difficulties emerged.

Economic difficulties emerging in the mid 50s grew worse in later years, coupled with financial shortages encountered in foreign payments. Mounting inflation, and external payments crises had forced the government to introduce a series of deflationary measures at the end of

1958. In the first instance, Turkish lira was devaluated de facto to ease foreign trade difficulties. However, the government policy response was insufficient to counter the fundamental internal and external problems and to initiate the necessary structural adjustments in the economy. Besides the deteriorating economy, social unrest had started to spread among the white-collar government employees, university professors and students, and the military forces, especially among young officers. An army coup in 1960 ended the rule of the Democratic Party, and the military government reintroduced planning as a guiding principle of economic policies. A law issued in September 1960 made the State Planning Organization (SPO) responsible for the preparation of five-year plans and annual plans within the framework of the five-year plans.

3. Economic structure prior to the planned period

There is no advanced statistical series for the period under consideration. However, to get some rough idea about the economic structure of the period, some of the series related to social and economic indicators which have been gathered for the praperation of the first five year plan[2] are presented and evaluated in this section.

TABLE 1. POPULATION OF TURKEY (1927-1960).
(in millions)

	1927	1935	1940	1945	1950	1955	1960
Total population	13.648	16.158	17.821	18.790	20.947	24.065	27.830
Rate of annual increase(%)	n.a	1.9	1.6	1.07	2.20	2.82	2.95
Rural proportion (%)	82.2	80.1	79.0	78.7	78.2	74.4	71.3

Source: State Planning Organization

The population of Turkey doubled from 1927 to 1960. The rate of growth of population approached almost 3 percent per annum in the 60s. The high level of population growth may be attributed mainly to the increase in the birth rate and the simultaneous decrease in the death rate (3) Steady movement toward urbanization may be observed in this period. The share of rural population declined from 82.2 percent to 71.3 percent. Despite the observed decline, a substantial part of the population still continued to live in the rural areas, and participate in agricultural activities.

TABLE 2. SOME INDICATORS RELATED TO SOCIAL AND ECONOMIC DEVELOPMENTS

Years	Literacy rate(%)	Number of students (in thousands)	Hospital beds	Electric power mill.k.w.	Railroads km.	Highways km.
1927	10.6	350	3.3	n.a	3 756	18 335
1930	19.2	540	5.2	106.3	5 639	29 636
1940	22.4	1 110	11.9	396.9	7 381	41 600
1950	33.6	1 780	18.8	789.6	7 671	47 100
1960	40.1	3 340	45.0	2 886.0	7 800	61 500

Source: State Planning Organization

The forty years following the foundation of the new republic brought certain achievements in the economic and social progress of the country. One of the achievements of this period was the enormous increase in the literacy rate following the adoption of the Latin alphabet. Another achievement was seen in the area of railroad and highway construction. While the construction railroads doubled, highway construction grew three-fold.

Besides the adoption of the Latin alphabet, a number of social reforms have been achieved in this period, such as legal reforms, the recognition of equal rights for women, the reorganization of the administrative body, and the reestablishment of education on secular principles. Despite such achievements of this period, Turkey today

still has not been able to complete her development process relative to other developed nations. It is a fact that all the reforms carried out in the last forty years were not able to produce an industrial revolution similar to that of Western Europe. Today, the Turkish economy is out of the development phase; and a recovery is not imminent. Worst of all, the growth rate of the economy can hardly keep pace with population growth. It may well be expected that in the absence of measures to increase the rate of growth to a satisfactory level the Turkish economy will enter a period of stagnant per capita income in a population trap.

TABLE 3. INDICES OF NATIONAL INCOME, PER CAPITA INCOME, AND AGRICULTURAL PRODUCTION.

(1938=100)

	1927	1945	1950	1958	1961
National income	53	77	121	213	226
Per capita income	65	69	101	129	125
Agricultural output	57	74	116	199	205

Source: State Planning Office

Table 3 presents a broad outline of the development of national income since 1927. As can be seen, a considerable part of the increase in the GNP is offset by population growth. Consequently, the increase in per capita income in this period was moderate despite the strong rate of growth in the GNP.

The figures presented in table 3 support the idea that

the standard of living of the people did not rise significantly in this period. It is evident that the economy had not yet reached a state of high saving capacity to support a massive investment program to create a big push or to raise per capita income so much that it would permanently grow faster than the population.(4)

Figures related to the period under consideration demonstrate a trend toward urbanization in Turkey from 1927 to 1960. Despite such a trend, a significant proportion of the country's population still lived in the rural areas. One of the main reasons for this is the less developed industrial sector, relative to agriculture. Table 4 presents shares of the economic sectors in the GNP. Despite the growing share of industry, the economic activity of the agricultural sector still is predominant. Therefore, it can be argued that the infant industrial sector, due to slow economic growth, had no significiant power to induce demand for urbanization; e.g., to pull population from rural to urban areas. The period after the 1960 coup, as will be seen in a later part of this chapter, changed the pace of urbanization due to:

1. The giving of the constitutional rights to workers,
2. The rapid growth seen in the industrial sector.

TABLE 4. THE SHARE OF THE ECONOMIC SECTORS IN THE GNP

(in percent)

Economic sectors	1927	1938	1948	1950	1958	1961
Agriculture	67	48	53	52	44	42
Industry	10	16	14	16	22	23
Services	23	36	33	32	34	33

Source: State Planning Organization

Since there is no continuous statistical series for this early period, we will hesitate to make further inferences regarding social and economical facts. Indeed it is not our task to do so. The focus of this study has been kept limited to the planned period of Turkey. Thus we will devote the remaining part of this study to evaluating the structure of the agricultural sector, following a survey of the economic environment between the years of 1962-1980.

4. Planning economic development

The subject of government intervention in the development process has been debated in economic literature since the end of the second world war. Planning as a means of government intervention attracted vigorous attacks by economists who beleive in the undebatable power of markets. Reliance upon market forces alone in developing economies would allocate resources sufficiently, and make growth faster than any other alternatives of development.
Principle assumptions underlying this argument are of

course perfect knowledge and a perfectly competitive economy. Under these assumptions,a rationally behaving consumer attempts to "allocate his limited money income among available goods and services so as to maximize his satisfaction."[5] If individual consumers behave so as to maximize satisfaction from a limited money income, individual quantities demanded will vary inversely with price.[6]

The maximization principle found its place on the supply side too. On the supply side the entrepreneur maximizes his profit subject to constraints imposed by the production function. This behavior leads us to the conclusion that an individual's or a firm's supply function will vary together with price. When we extend maximizing behavior to the resource owners and add the independent actions of participants in an exchange economy, a perfectly competitive, free enterprise system guarantees the attainment of maximum social welfare.[7] This is the dictum of Adam Smith: each individual, in pursuing his own self interest, is led as if by an invisible hand to a course of action that promotes the general welfare of all.[8]

There is no place for the government as the means of planning in such a model, to make a nation more developed relative to her current stage. Some economists think that giving an active role to government by permitting it to make plans would abondon the perfectly competitive economy with perfect knowledge assumption. Yet, this undermines

the stable, self-adjusting mechanism of supply and demand. This constitutes a serious threat to the greater part of the economic theory.(9)

Reliance on market mechanism and market prices for resource allocation is attacked for several reasons:

1. Resources in a free market are to be allocated for immediate consumption. Therefore, a smaller amount of resources will be devoted to capital accumulation to accelerate the pace of development.

2. Market prices will provide a very imperfect guide to the optimum allocation of resources because they do not reflect the use of factors of production. It is especially true for developing countries, which certainly violate the major assumption of perfect competition; e.g., people do not always have perfect knowledge and they are not always rational. This is because there is a high degree of uncertainty in the markets of developing countries. These are the primary source of price distortions which cause prices to deviate from true market prices.

3. Because of externalities, many projects that a developing country needs may not appear profitable under a pure market system. The level of investment may fall below the social optimum because private investors ignore external economies and the supplementary benefits of projects in calculating prospective returns. Therefore the investment decision rule needs to be adjusted to include external effects between projects to equate marginal social

cost to marginal social benefit.[10]

Market mechanism is unlikely to produce the rapid structural changes which development requires, due to the above shortcomings for the competitive economy. For a variety of reasons, government interference in the market mechanism is seen by some economists as a necessery prerequiste of a more rapid pace of development. For example, Yotopulos and Nugent[11] found planning useful and imperative where market imperfections are substantial, and even where the market mechanisms are working relatively well but development is not smooth, continous and automatic, and the optimum development path cannot be achieved simply by making marginal adjustments.

In response to the favorable stand for planning, defenders of the market mechanism rest their argument on the traditional classical ground. If the market does not function properly in the interest of society, there is a stronger case for making the market, and for improving its functioning, than there is for planning. Market imperfections and price distortions are not themselves arguments for planning, but rather arguments for ensuring that the price mechanism functions better.[12]

There is no simple way to take a position between advocacy of planning and of reliance upon the principle of laissez-faire. Whatever a country's political ideology is,

a development plan may be seen as an ideal means of government involvement in the market mechanism if, and only if, policy makers do use true market prices as a signal for resource allocation, production, distribution and exchange.

Turkey entered the planned period through the actions of the military government in 1960. This attempt to achieve development targets through plans and programs was in fact built into the new Turkish constitution. Planning was seen as a sefegurd of democracy which guarantees "individual rights and the welfare and prosperity of both individuals and the community."(13) The following quotation from ex-prime minister Mr. Ismet Inonu gives an idea of the spirit of the plan in the 60s.

> "The plan concords with the will and resolution expressed clearly in the constitution to direct economic and social life to the pursuit of standards of living which are compatible with human dignity on the basis of equity and full employment and,in so doing, to end once for all attempts at unplanned and arbitrary conduct.... the (plan's) object is to realize economic, social and cultural progress by democratic means, to raise national savings and to plan investment activities in the order of priority and in directions which will assure the most benefit to the community as a whole."(14)

The preparation of the development plan was based essentially on "the plan objectives and strategy" as indicated in the introduction of the first five year development plan. The plan objectives and strategy take into account the structure, problems and resources of Turkey and are based on the belief that development can be attained by making use of the possibilities afforded by a mixed economy

in a democratic system.(15) As a requirement of the free and democratic system, the plan is of an imperative nature in the case of the public sector and of an indicative nature in the case of the private sector.(16) This means that the planning function was conceived as direct control of the activities of the public sector and guidance to the private sector.

The importance given to planning was due to reaction against the uncoordinated investment policies of the previous period and the resulting inflation with recurrent foreign exchange crices.(17) The newly established State Planning Organization was considered responsible for initiating widespread economic change independent of uncoordinated political preferences of political authorities. For a short time such an approach to planning perspective worked out under the military guidance. However, political life having returned to its normal course, inevitable conflicts arose about the position of the SPO, and as a result the power of the office was restricted by giving it a more technical role in economic policy making.

In the late 70s, Turkey faced a mounting combination of economic problems; rapidly accelerating inflation, rising unemployment, expanding public deficits and severe balance of payments difficulties. The more than 200 state economic enterprises, originally set up to deliver essential goods and services that the free market was not

providing, had grown fat and inefficient on a diet of tax subsidies and guaranteed markets. Agricultural productivity badly needed improvement through the use of better seeds, more fertilizers and farm machinery, and the quality of livestock was also substandard and at the same time, the country was torn by student unrest and labor strikes, often based on political and ideologiocal complaints with little relevance to traditional labor issues. In the first eight months of 1980, strikes cost more man days of lost labor than in the previous six years. As the government lost its authority and the economy bled, political violence began to claim up to 30 Turkish lives a day.(18)

On January 24, 1980, the government launched an economic stability program to overcome current difficulties. It devalued the Turkish lira, freed interest rates, and cut subsidies to the state economic enterprises. However, violence in the streets and the countryside continued to grow. On September 12, military acted to correct the country's political crisis and accompanying violence. In the meantime a major shift in development strategy was initiated. The focus was shifted from prescriptive to indicative planning, which would enable private firms to make their decisions freely with the incentive of the market ensuring that private and social profitability coincided.

5. An overview of economic development

Following the introduction of the first plan at the beginning of 1960, economic performance began to improve visibly until the end of the second five-year plan period. Improvement was particularly marked in respect of the rate of growth, which was averaged around 7 percent per year. This was due to a substantial increase in the investment expenditures of both the public and private sectors. In most respects, the ten years of the planned period were satisfactory in terms of overall economic performance. Real GNP and industrial output rose substantially and the effects of growth were reflected in the expansion of employment and real wages.

However, the achievements of the first two plans were not long-lasting. From 1974 through 1977, the effects of sharp oil price increases as well as inflation, recession and rising unemployment in the industrial countries adversely affected the Turkish economy. Over this period, both domestic and external factors contributed to a gradual deterioration in term of trade and balance of payments.

Turkey's low degree of export orientation and increasing dependence on imports presented a structural balance of trade vulnerability and made the required adjustment process difficult and time-consuming. Imports rose at a significiantly greater rate than the GNP as a result of increased import prices, primarily the price of

oil, and a sustained high level of demand for intermediate and investmend goods. Exports declined in real terms due to the world recession, excess domestic demand, which absorbed goods that otherwise would have been exported, uncompetitive exchange rates and certain inefficiencies in the pricing and subsidization of agricultural exports. External trade policies continued to encourage import substitution than export promotion. Furthermore, beginning in 1975, remittances of foreign exchange from Turkish workers resident abroad decreased significantly, reflecting

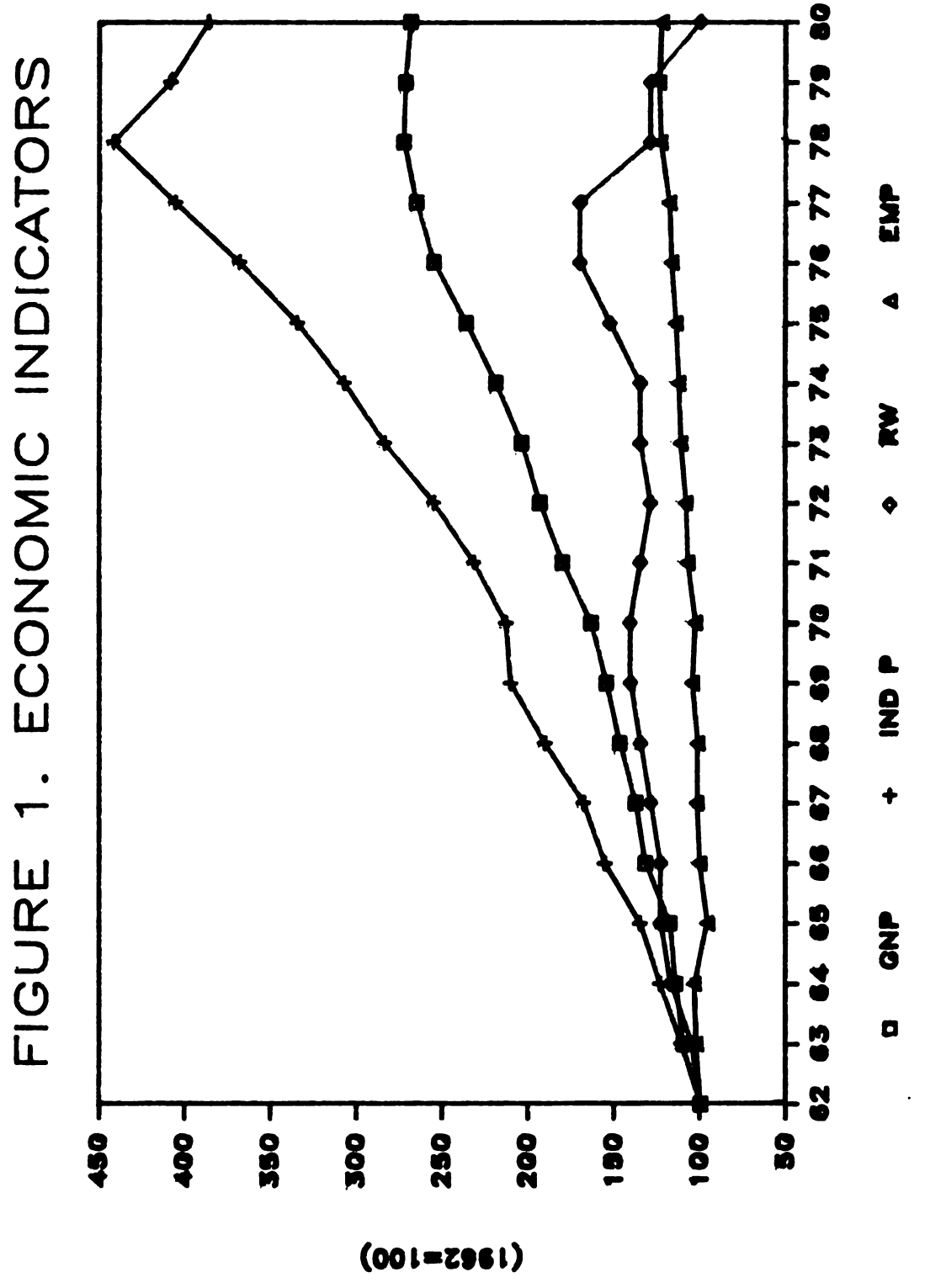


FIGURE 1. ECONOMIC INDICATORS
(1962=100)
450
400
350
300
250
200
150
100
50
62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
□ GNP
+ IND P
◆ RW
▲ EMP

rising unemployment among such workers and paralel market exchange rate differentials, as well as the assimilation of Turkish workers into foreign societies and decreased numbers of workers going abroad, following limitations on immigration imposed by certain host-country governments. The external financing of balance of payments deficits was accomplished almost exclusively through a reduction of reserves and an increase in various short-term obligations, including foreign rescheduling. In addition, on the domestic front, increasing public sector deficits financed largely through borrowing from the Central Bank, created excessive demand in the economy. Consequently, the money supply increased rapidly and inflation accelerated. (19)

By the end of 1979, Turkey encountered a second oil shock before recovering from the effects of the first one. As a result the economy was driven into a severe bottleneck and faced a combination of economic problems including shortage of foreign exchange, a large deficit in the balance of payments, a heavy burden of short term external debt, a high rate of inflation, a large public sector deficit, a slowing of growth and increasing unemployment.

These developments provided the context in which agricultural base price decisions were made over the planned period. It is appropriate therefore to review some of the developments in the real economy in greater detail.

6. Education and development of human resources

One of the most pervasive stimulants to growth during the planned period was the expansion in population and the large increase in demand for goods and services it generated. The impact spread from housing to schools and various services of government. The newborn of twenty years before were reaching marriageable age, and a large wave of family formation was imminent.

The annual percentage of increase in population had slowed since the 1960s, while the birth rate was declining. This could have had advantages, since earlier high birthrates had resulted in urban congestion, intensive pressure on educational facilities, and growing burdens on the government. These pressures would have been eased somewhat by slower population growth, but economic growth would than have had to depend more on technical progress and investment.

The increase in the quality of labor through education is one of the important factors of development, and the basic ingredient of a higher standard of living. Investments in education supported by the government had fallen dramatically since the 60s. In the meantime, it is contradictory that college enrollment had tripled. This yields striking results-poor education and unrespectiveness to new knowledge. The effects of decreased investment in human

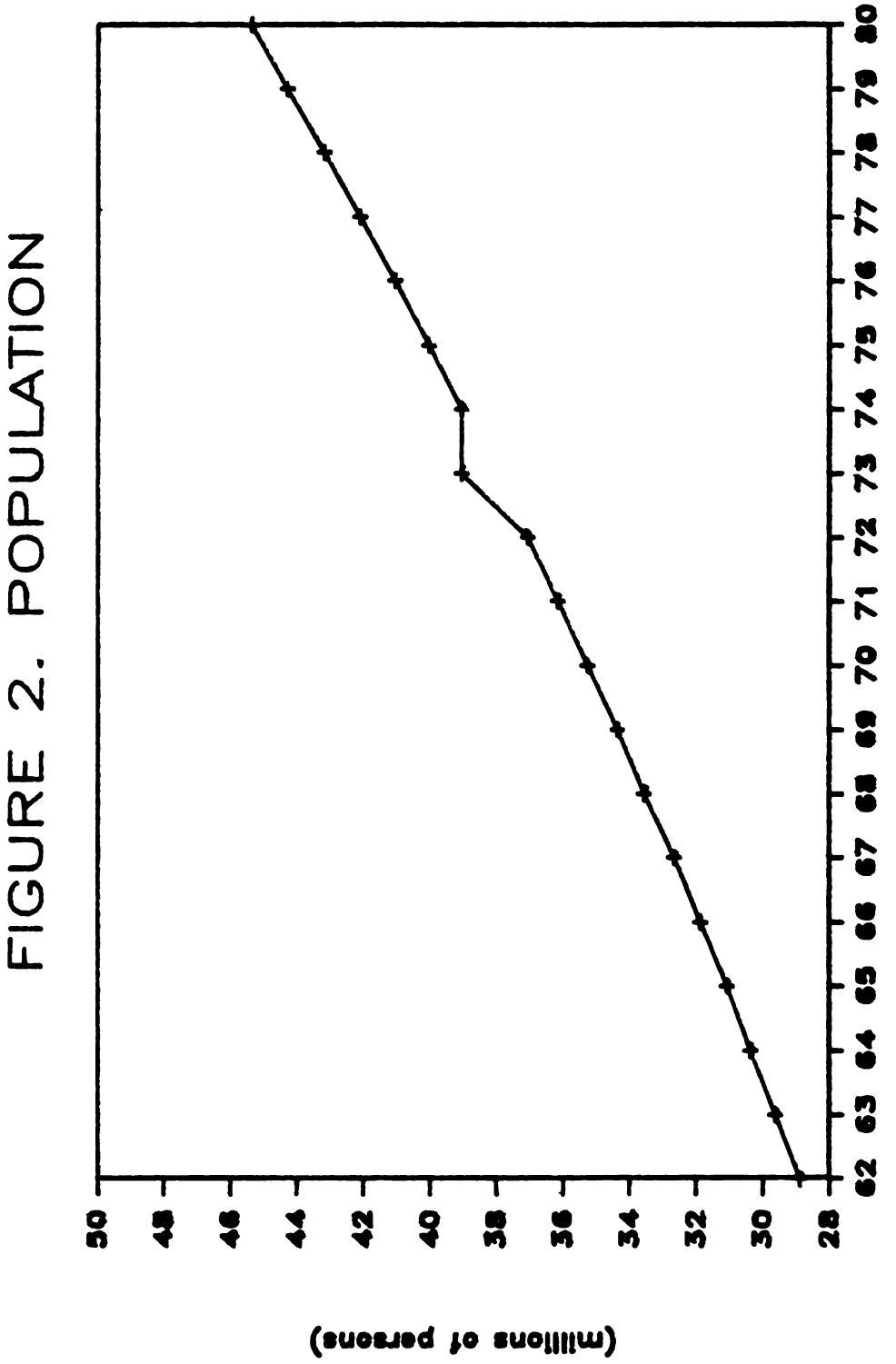


FIGURE 2. POPULATION

capital may account for decreasing productivity and earnings of labor.[20] Moreover, it impedes the process of development which seems imminent for Turkey.

7. Fixed investment

With rapidly increasing population, the upward course of fixed investment proceeded with few interruptions. In the early years of the planned period, the share of fixed investment in the GNP was relatively modest, but investment advanced rapidly from 1975 through 1979. As a share of the GNP, total investment expenditures varied between 19 and 23 percent. This is strategic in terms of maintaining high resource use and economic growth, and it remains a central objective of monetary policy.

The public share of investment relative to the private sector was high, except for three years of the planned period. This was because of the strategy of the planned period, which was to accelerate the overall development by constructing an infrastructural framework rapidly. Such policy makes the private sector take over the development of the manufacturing industry in the long run.

8. Industrial production

Industrial production in Turkey advanced rapidly relative to other sectors. Thus, the percentage share in the GNP increased up to 22 percent in 1978. Although the growth rates of industrial production were large over the

FIGURE 3. CRUDE BIRTH RATE

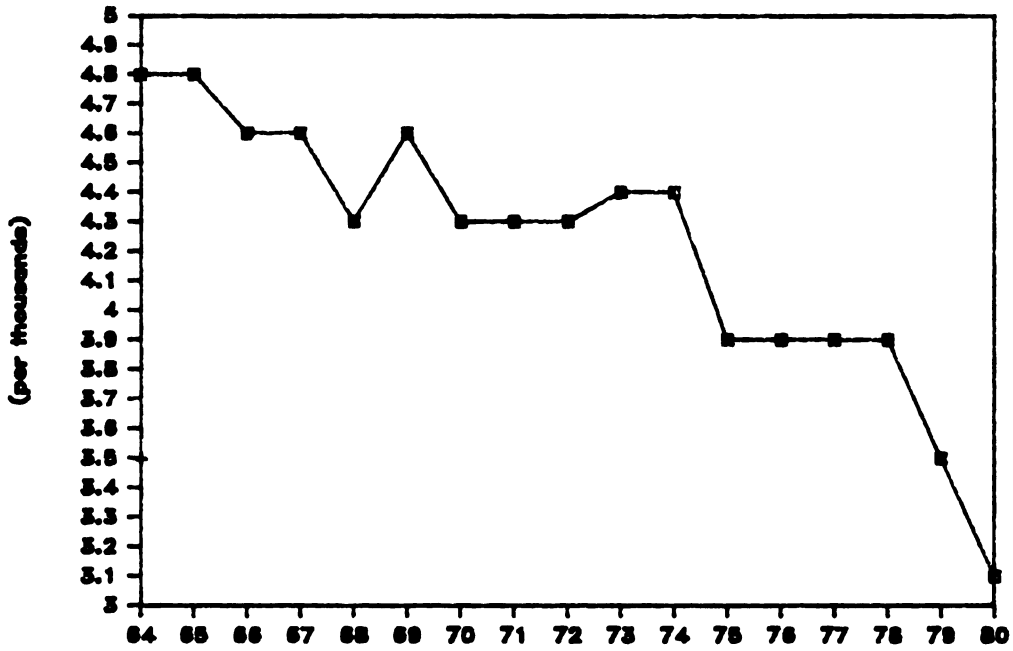


FIGURE 4. POPULATION INCREASE

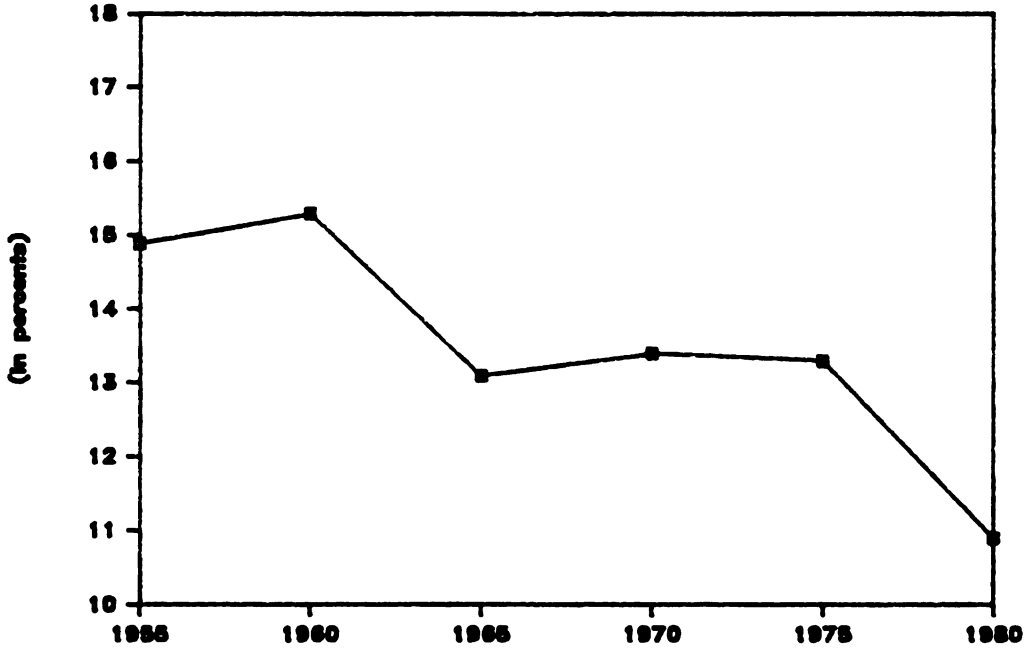


FIGURE 5. UNIVERSITY ENROLMENTS

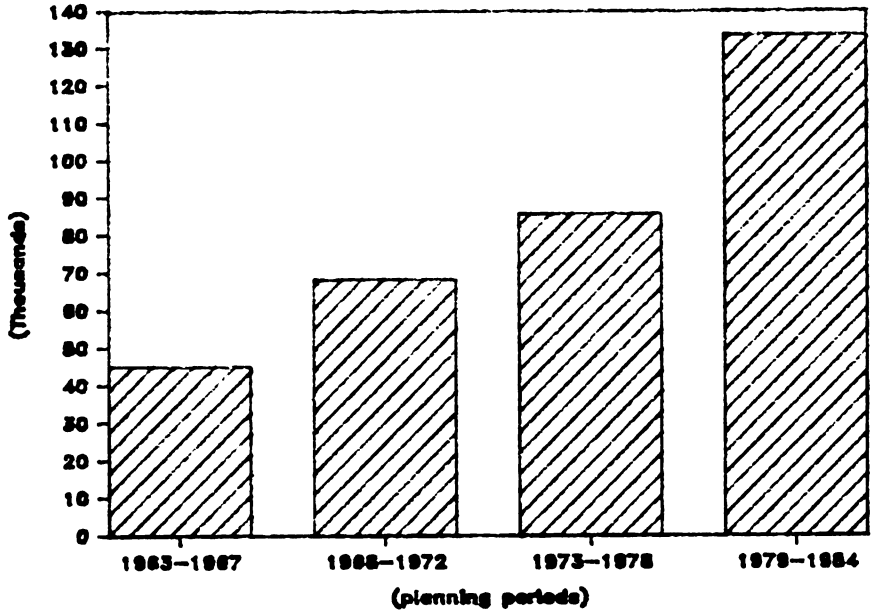


FIGURE 6. TEACHING STAFF,UNIVERSITIES

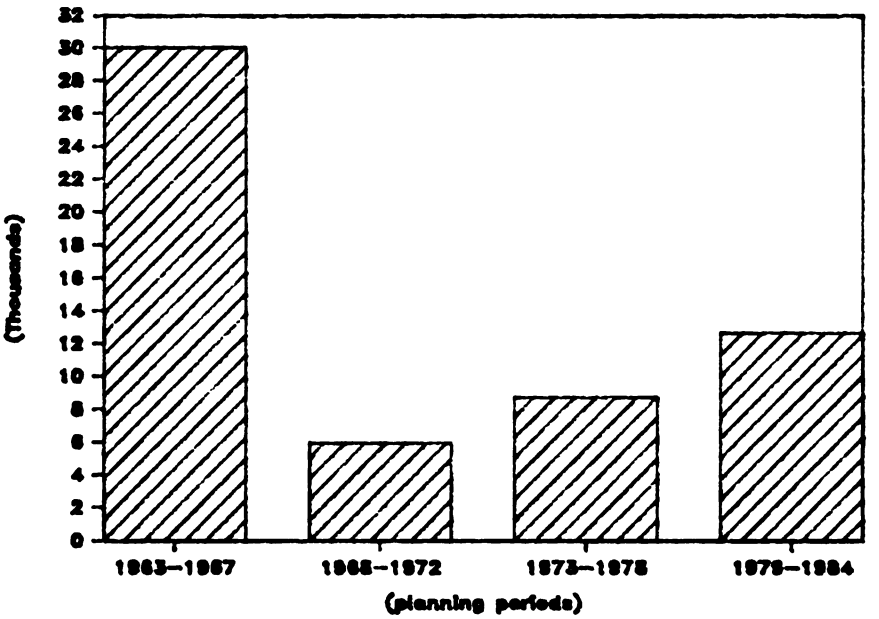


FIGURE 7. PUBLIC/PRIVATE INVESTMENT

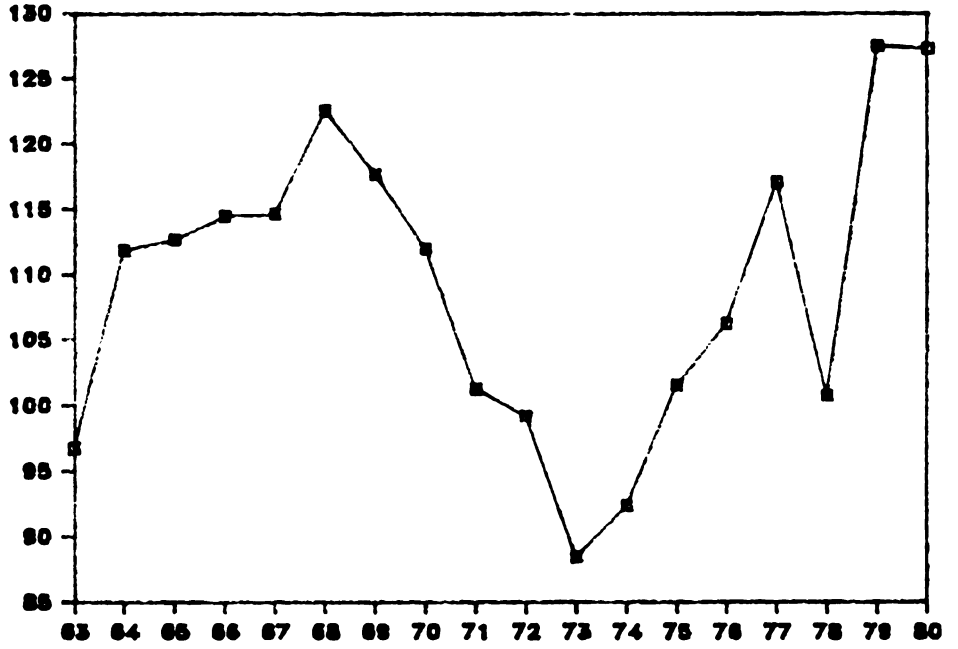
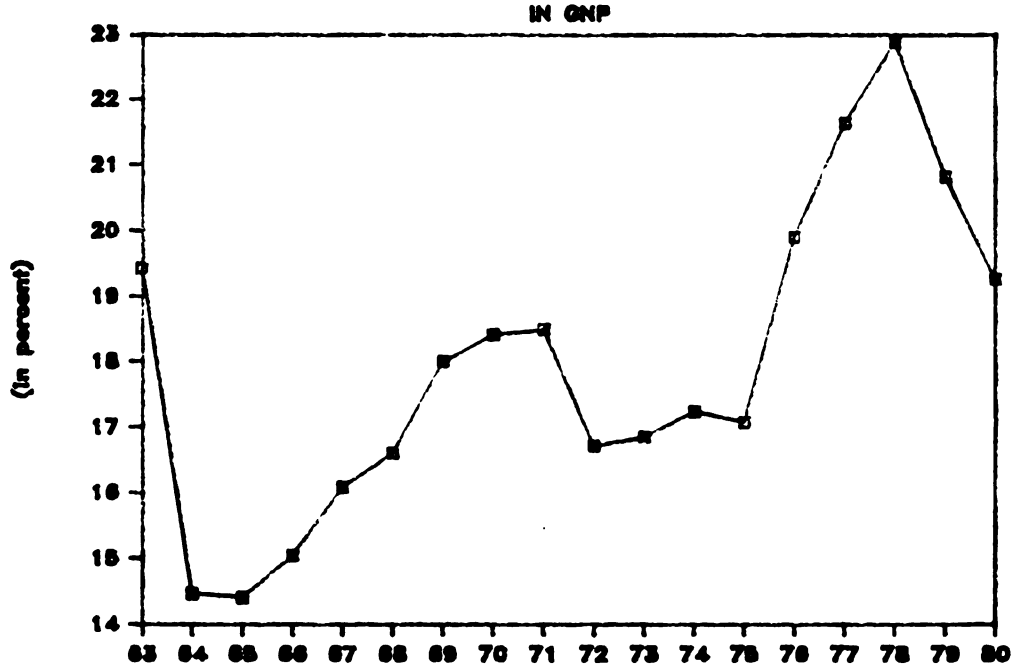


FIGURE 8. THE SHARE OF INVESTMENT



planned period, political instability and growing violence were costly in terms of output and employment. There are two major downturns during 1970 and 1979 in the rate of growth of industrial output. Both of them were ended by the military leaders' interrupting the parliamentary democracy in Turkey.

9. Prices

The accelerating rate of inflation became a major problem during this period. Wholesale prices rose sharply at the end of the second plan and during the fourth planned period. The rise in 1970-1973 reflected mainly the world-wide rise in oil prices, the so-called first oil shock. Starting with 1978, Turkey was turn by student unrest and labor strikes besides an acute balance of payments crisis, coupled with dropping foreign currency earnings. After 1979, Turkey encountered the second oil shock before recovering from the effects of the first one. As a result the economy was driven into a severe bottleneck and the rate of inflation went as high as 100 percent. The rate of inflation slowed as far down as 27 percent after the implementation of the stabilization program of January 1980.

Consumer and wholesale prices showed more or less paralel movements in the planned period. The consumer price index generally rose above the wholesale price index. This largely reflected increased retail prices and cost of

services.

10. Productivity_and_unit_labor_cost

There is no productivity index which presents developments in industrial productivity. Therefore, to meet this need in the present study an index of productivity has been constructed based on the data collected from the censuses of industry.(21) Unit labor cost have been calculated

FIGURE 9. INDUSTRIAL PRODUCTION

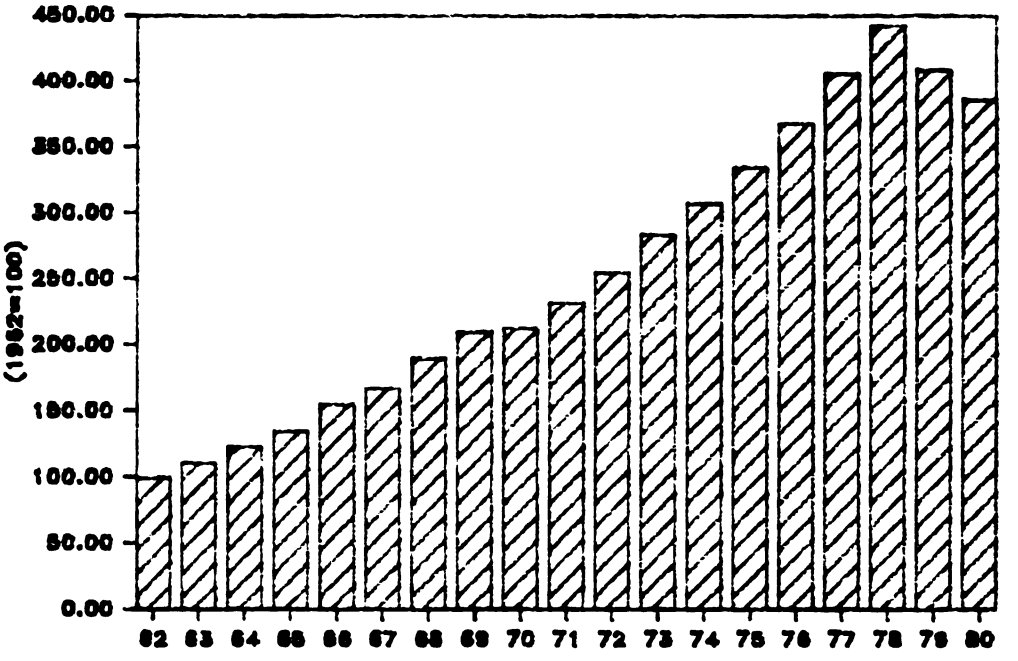


FIGURE 10. INDUSTRIAL PRODUCTION

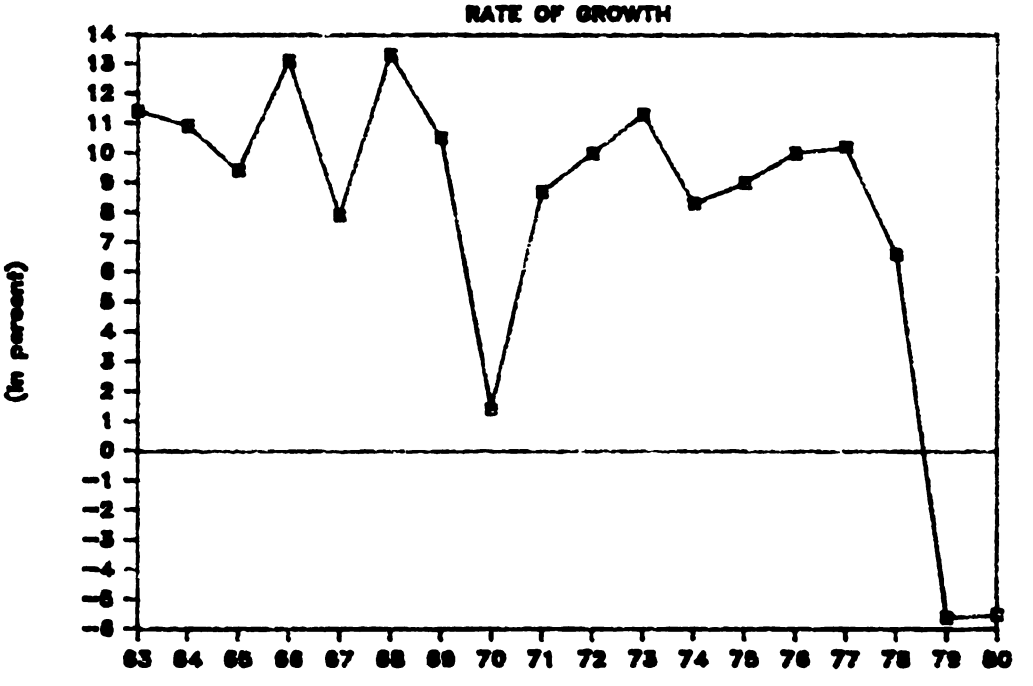
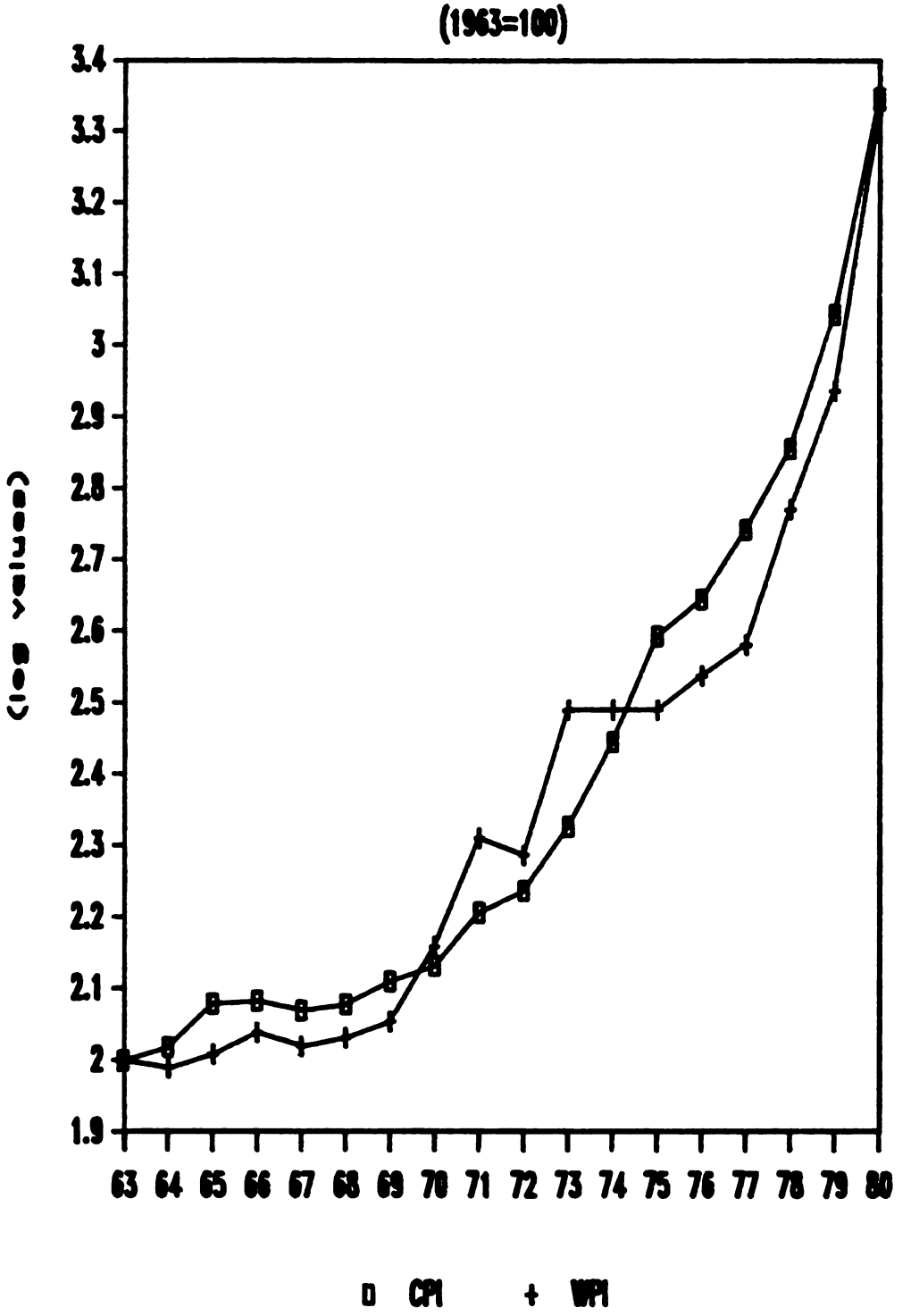


FIGURE 11. PRICE DEVELOPMENTS



from the same source. Public and private sectors are separately covered in both the productivity and the unit labor cost indices.

The productivity index shows large fluctuations for the public sector during the planned period. There are three noticeable downturns in the index related to the public sector. The first one started in 1969 and terminated in 1971. During these years Turkey was politically unstable, and the number of strikes jumped from 9 to 50 in the public sector. Productivity in the private sector showed a more or less steady increase, due to the normal phase of labor negotiations. The first military intervention in 1971 brought a considerable period of peace in the union negotiations. Therefore, the productivity index presented remarkable recovery in the public sector, while the phase accelerated in the private sector. The second downturn occured immediately after the first oil shock in both sectors and continued until 1974. 1975 brought another downturn for the public sector; this was mainly because of the low prices of the state enterprises and the disturbed work environment in that sector. However, in the same years private sector productivity showed an astonishing increase in spite of the large number of labor strikes. The major means of such a development was the huge subsidies given by the government to imports, and the state enterprises which produce most of the inputs of the private sector. Such a policy, considering the increase in

the market prices of manufactured goods, made the value added in the private sector high and increased productivity measured by value added per worker. This favorable trend ended in 1978 when the economy faced extremely serious difficulties in the balance of payments. Besides the economic difficulties, political unrest and violence became common among the labor unions as well as among the workers, and continuing strikes were usual in the daily life of the workers. As a result, the pattern changed dramatically in both the public and private sectors, and productivity gains ended.

The ratio of average unit labor cost to average productivity and number of strikes in private sectors showed similar trends in both the public and the private sectors until 1977. The ratio diminished during the first plan period due to low wages in the industrial sector, considering the relatively high productivity of workers in both sectors. The direction of the trend changed during the second plan period in the mentioned sectors in favor of wages; i.e., unit labor cost. For the private sector, this was because of the power of the labor union organised in the private sector. The labor union organized in the private sector later on turned politically into a radical left-wing organization and it was banned from activity after the 1980 military coup. The moderate labor union organised in the public sector has not created as much

difficulty as its counterpart in the private sector in wage negatiotion. Therefore, without causing strikes, wage negotiations with the government easily settled down, and as a result the average unit cost relative to average productivity increased in the public sector, too.

The year 1975 brought a relatively high rate of inflation, with an increased number of strikes. The public sector settled such strikes generally by agreeing to pay high wages to workers; thus the unit labor cost dramatically increased relative to the average productivity in that sector. However, the private sector was not as moderate in wage settelements as public sector was. Therefore, the increasing number of strikes caused only a low output, and the ratio of average unit cost to average productivity remained almost same till 1980.

11. Government_budget

Avoiding inflation and recession depends on fiscal as well as monetary policy. Deficits in the budget have contributed importantly to the instability which has damaged the economic and social order in Turkey in recent years. The budget has moved toward a huge deficit during the planned period. Deficit financing was used as an inflationary way of financing public investment expenditures until 1970. But when the expanded defense

effort began in mid 1973, the rapid escalation of expenditures created presures on prices and caused instability. After 1976 an extreme budget deficit occurred due both to diminished government revenues and to increased government expendiutres on non-defense government services, and on the price support programs of the state enterprises.

FIGURE 12. LABOR PRODUCTIVITY INDEX

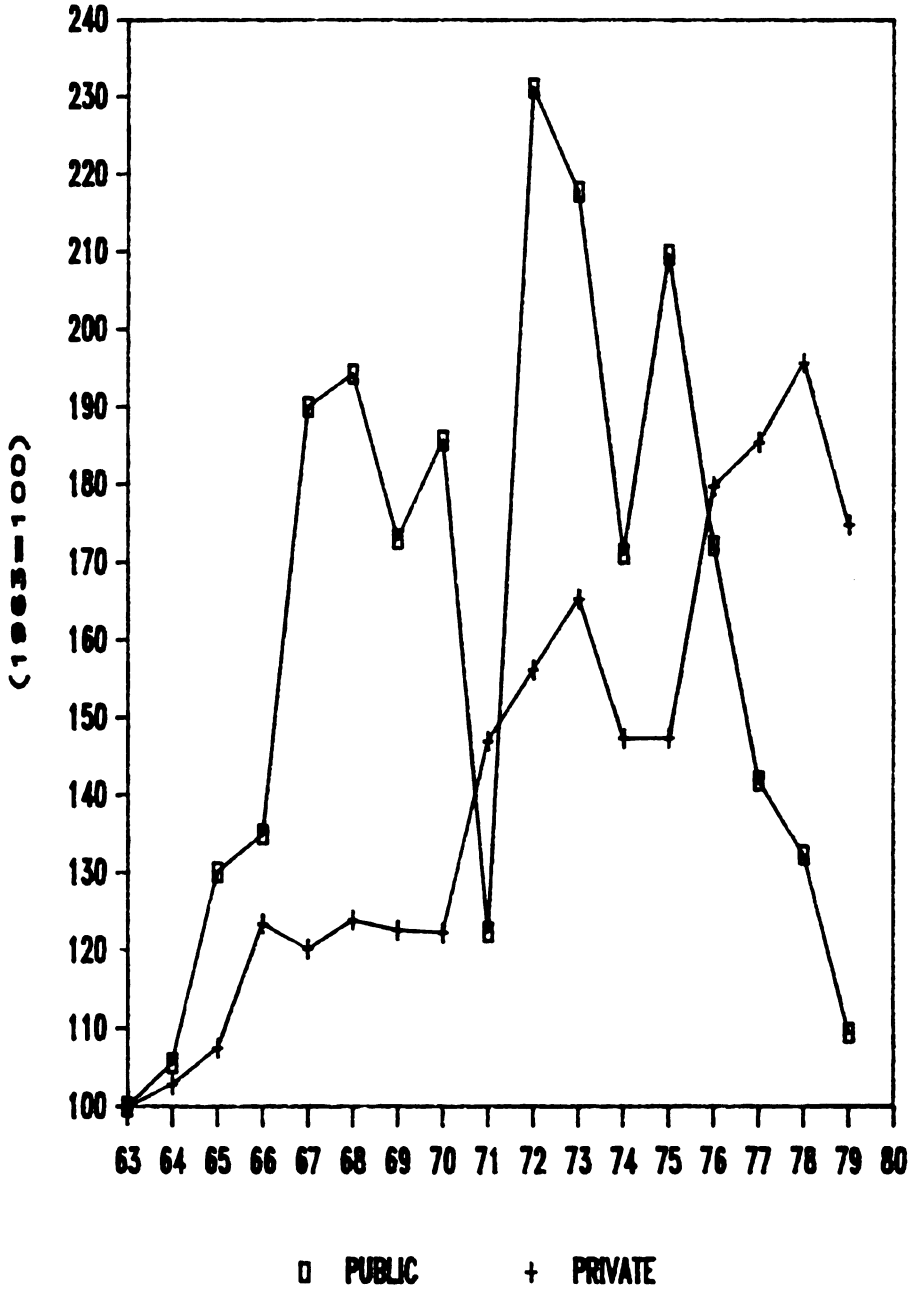


FIGURE 13. LABOR COST AND STRIKES

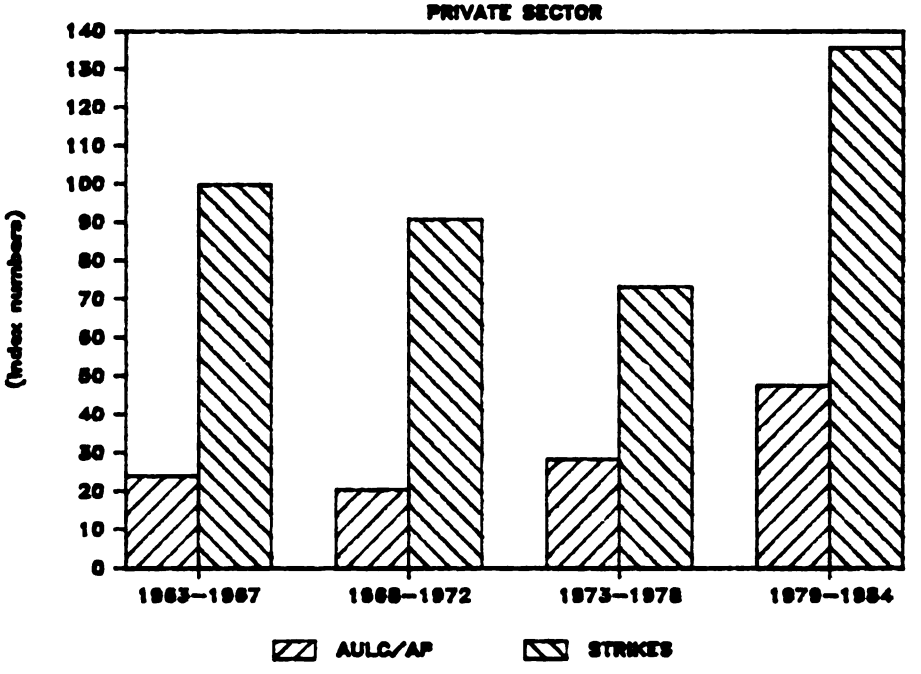
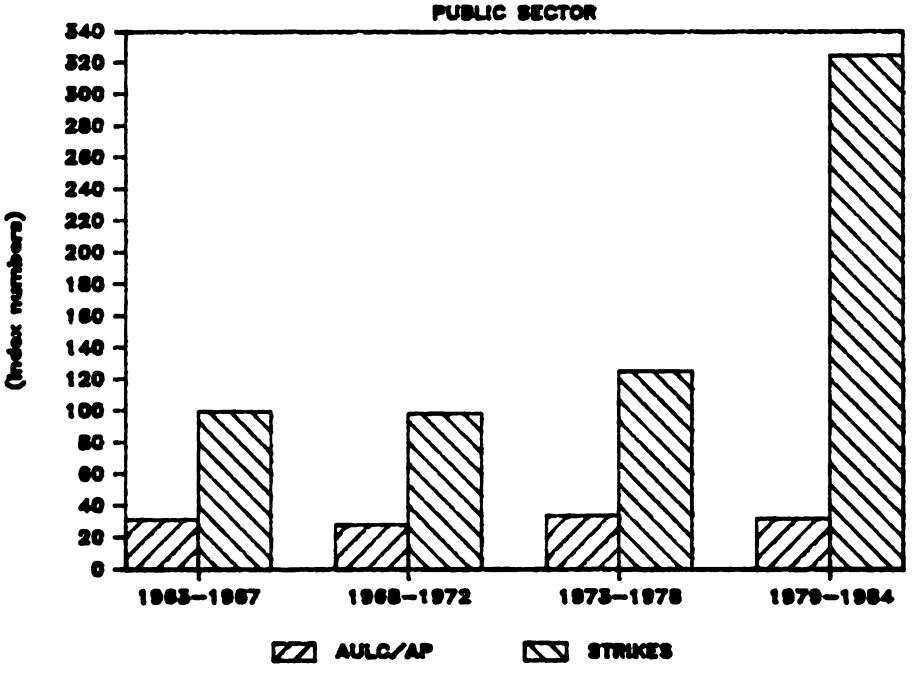


FIGURE 14. LABOR COST AND STRIKES



12. Employment

The growth of government and private spending for services and the rapid increase in industrial production have profoundly affected the structure of employment. The share of non agricultural employment increased from 20 percent in 1962 to 40 percent in 1980. The massive migration into the central cities was also a mojor influence on the changing structure of employment. Service employment, including those engaged in trade in private and in public services, increased to a considerably high amount as a result of a population boom in the central cities.

Massive migration from rural areas to urban and the limited employment capacity of the industrial sector caused the unemployment rate to increase in Turkey. The rate of unemployment increased from 11 percent in 1962 to 16 percent in 1980. These figures do not cover disguised unemployment, which does exist but is hard to quantify. Structural unemployment problems cannot be solved by aggregate monetary and fiscal policies alone. However, with the social cost of unemployment extraordinarily high, the need to maintain a growing and developing economy has

become more urgent.

13. Foreign_trade_and_the_balance_of_payments

The target of the planned period was to lessen economic dependence on external resources. Therefore, import-substituting industrialization was the development strategy based on the planned substitution of domestically produced goods for imports.

FIGURE 15. BUDGET DEFICIT

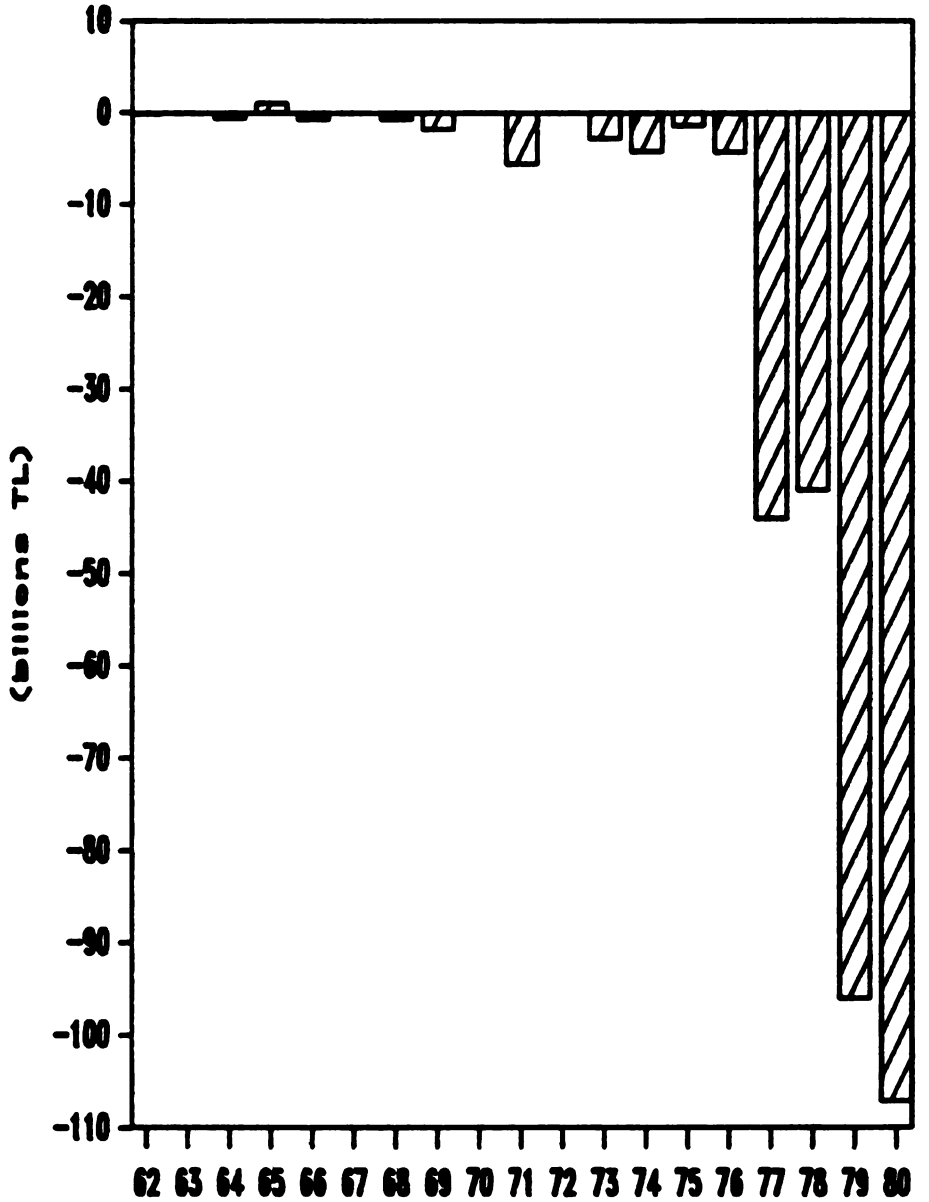


FIGURE 16. EMPLOYMENT BY SECTORS

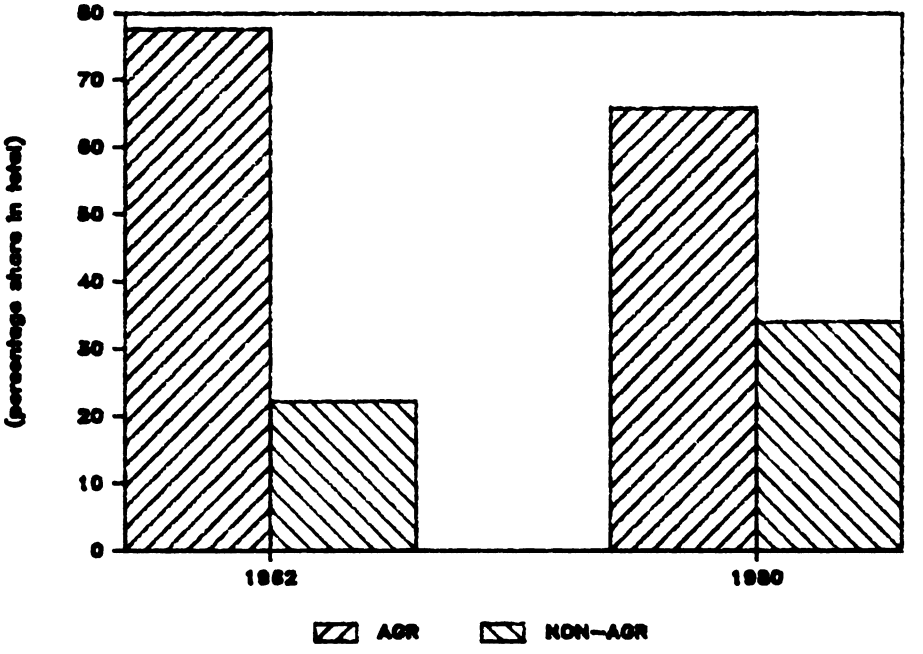
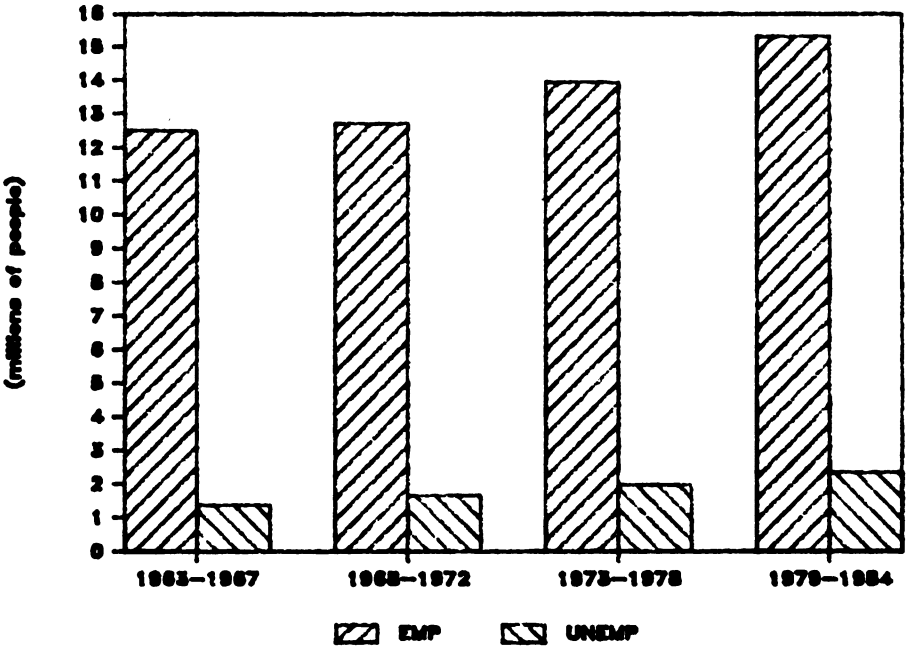


FIGURE 17. UNEMPLOYMENT IN TURKEY



Import substitution seemed to promise very rapid growth and it should be able to decrease gradually the relative importance of the trade gap.

Despite rising prices for some of Turkey's major exports, the worldwide boom in commodity prices, in particular of crude oil and of imported machinery, had disturbed the trade balance as of 1973. The current account deficit widened dramatically, while foreign exchange earnings almost dried up. With Turkey's current account deficit, it proved difficult to close the gap between 1973 and 1979. However, workers' remittances of foreign exchange sharply increased because of devaluation in 1970 and a booming number of immigrant workers abroad, and contributed to deteriorating balance of payments as much as credits from foreign suppliers.

The growth rate of imports reached 5.9 percent per annum in the first plan period, and 17.1 percent per annum in the second. The oil price rise caused an increase in the total value of imports after 1971, resulting an increase in the growth rate of imports by almost six fold. Thus import growth reached 40.2 percent annually in the third plan period. The overall trend of current imports was 20.1 percent between 1963 and 1980. Although this would seem rather high in comparison to the growth rate of the GNP, it is considered a rather unhealthy figure from the standpoint of development, because this trend reflects

the rather high oil bills that the country paid after 1971. Figure 19 compares the share of the oil bill in total imports from 1963 to 1980. In 1963 the share of the raw materials in total imports was 49.6, and 20.0 percent of it belonged to oil purchases. In 1980, the share of raw materials increased to 77.3 percent, while the oil share of it jumped to 60.0 percent.

One of the noticeable features of Turkey's foreign trade in the planned period has been the rapid improvement in export performance. Turkey's exports increased by more than $ 2 500 million between 1963 and 1980. Exports grew 8.2 percent per annum during the first plan period, and 19.7 percent per annum during the first three years of the fourth plan period. While total exports grew, the relative share of agriculture declined in favor of the industrial sector from 1963 to 1980 (Figure 19). Despite higher industrial sales abroad, the overvalued exchange rate increasingly obstructed further efforts to expand exports by attracting sales in the home markets.

The export performance of Turkey basically depends upon sales of traditional products such as textiles, leather goods, and processed agricultural products, besides new entries on the exports list - iron and steel and transportation equipment.

Despite the increasing volume of exports, imports rose even more during the same period widening the trade balance

from $ 320 in 1963 to $ 4 999 in 1980. Such an unmanagable trade balance brought the country to a foreign exchange crisis. As a result, Turkey stopped its development effort by putting a stabilization programe into effect in 1980.

The balance of payments problem, which is common to all developing countries in this century, does still exist for Turkey, and is a serious constraint on the development efforts of the country. One way to deal with such a problem is to enlarge the exportable surplus of goods and services to whichever country has competitive advantages in that particular area. Since the agricultural sector has a dominant place in both the social and economic life of Turkey, it can easily be expanded to create more exportable surplus. It is recognized that export opportunities are greater in this area than previously realized, and an export-led strategy of development can be supported by stimulating agricultural output.

14. Direction of trade

Turkey's diplomatic position was not changed essentially by the proclamation of the public in 1923. Politically, Turkey acquired the reputation of being on the edge of Europe. Commercially, long association had established Turkey as a traditional export market. Strategically, the proximity of the Soviet Union had rooted it in the soil of the West's vital interests. (22)

In the area of international trade, Turkey's political and strategic place has always influenced its direction of trade. Being a member of NATO and OECD, Turkey developed almost all its trade with the West. 1962 Figures reflect Turkey's favorable trade with the west within a warm, and friendly political environment and mutual trust with the trading partners. The EEC and the USA were the major trading partners of Turkey before 1974. Imports with these countries covered 71 percent of the total, while exports established 72 percent of the total. The friendly warm political environment has not been long lasting. The Cyprus crisis brought some serious questions onto the scene, while casting a shadow on the mutual trust Turkey shared with her major trading partners. As a result Turkey sought a new diplomatic position for herself without disturbing her existing commitments to the West.

Turkey has started to utilize newly emerged markets to promote her exports since 1974. Middle East and North African countries, whose rising oil revenues have substantially enlarged their capacity to imports, became increasingly valuable trading partners of Turkey toward 1980. The center of gravity of the foreign trade changed its source from the traditional markets of Europe and the USA to the Middle East and North Africa, as well as to Eastern Bloc countries. In 1980 the percentage share of imports from the EEC and the USA decreased to 34 percent, while exports declined to 46 percent. In the same year Middle East and

Eastern European markets gathered 48 percent of the total imports, as opposed to 36 percent of the total exports.

FIGURE 18. FOREIGN TRADE

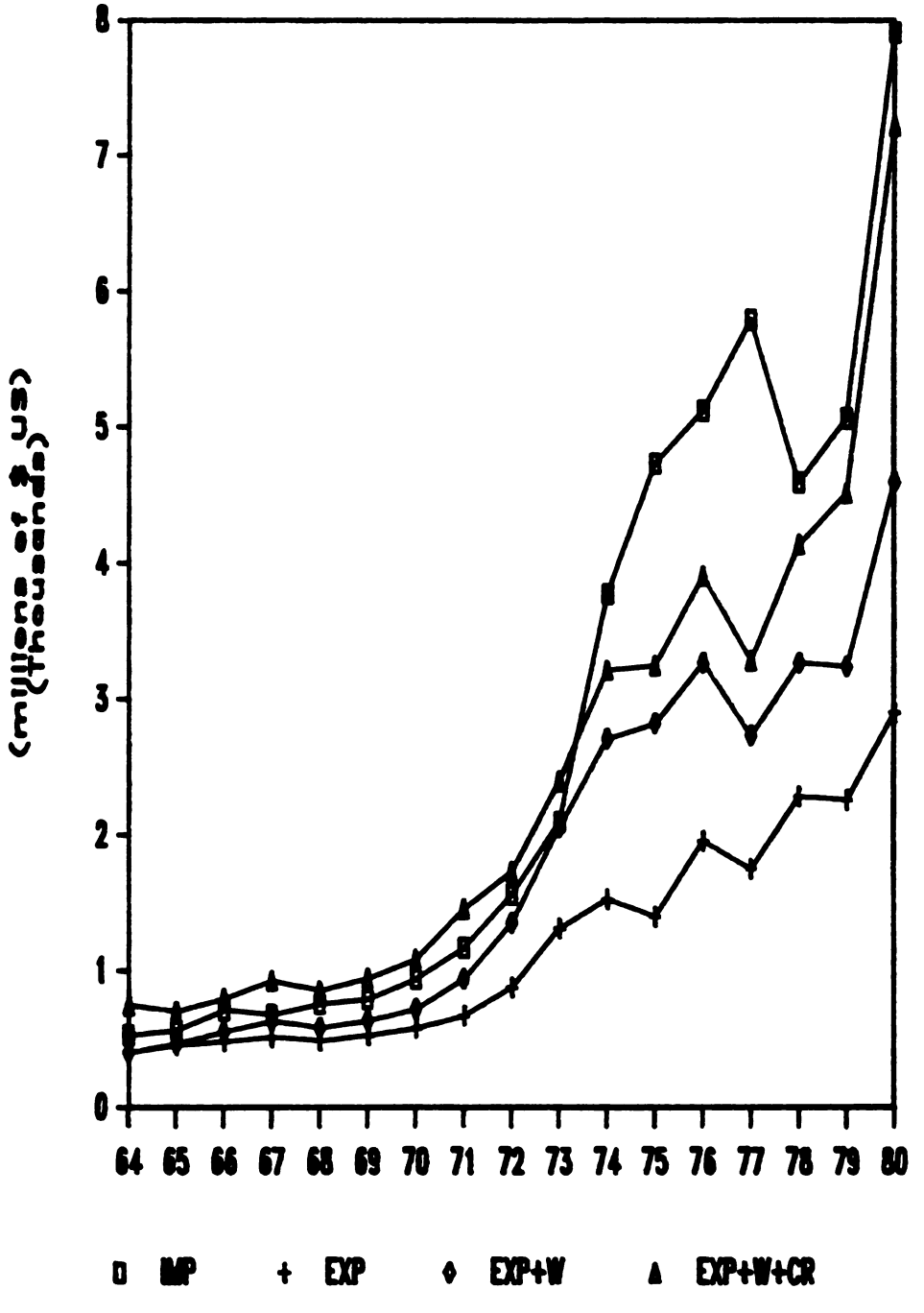
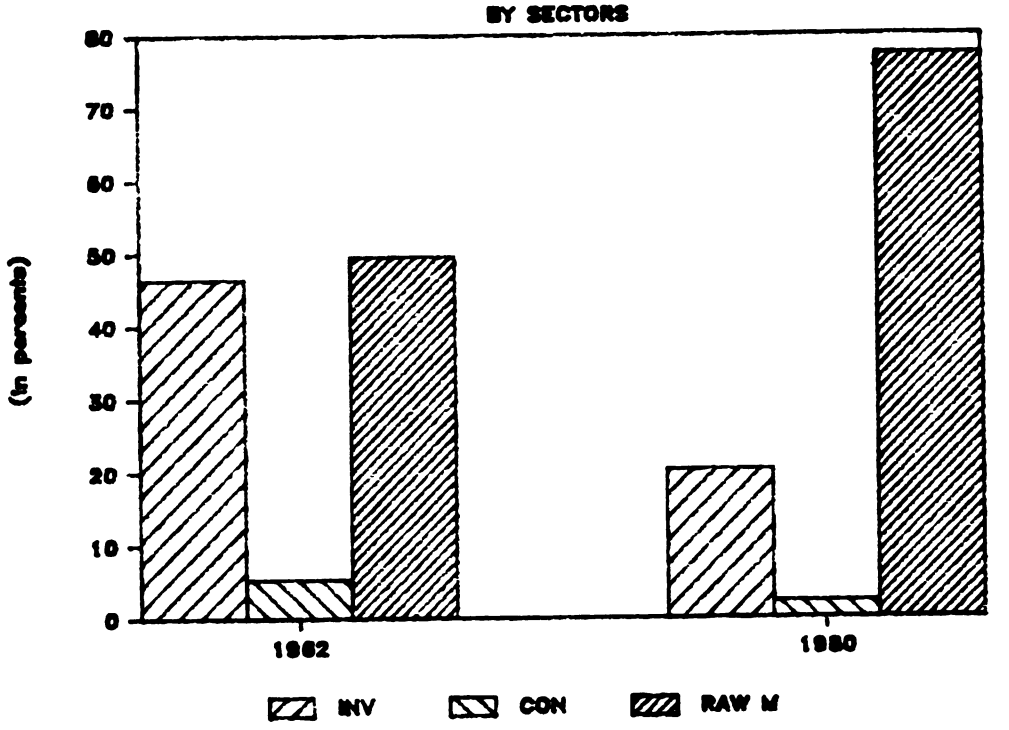


FIGURE 19. DISTRIBUTION OF IMPORTS



DISTRIBUTION OF EXPORTS

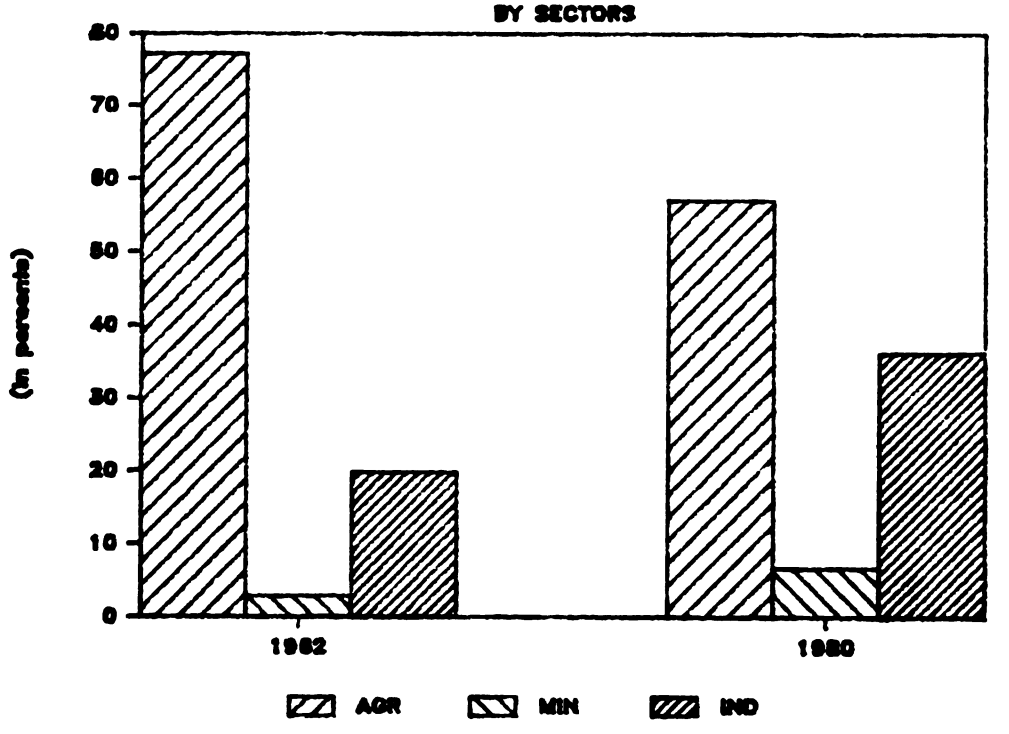
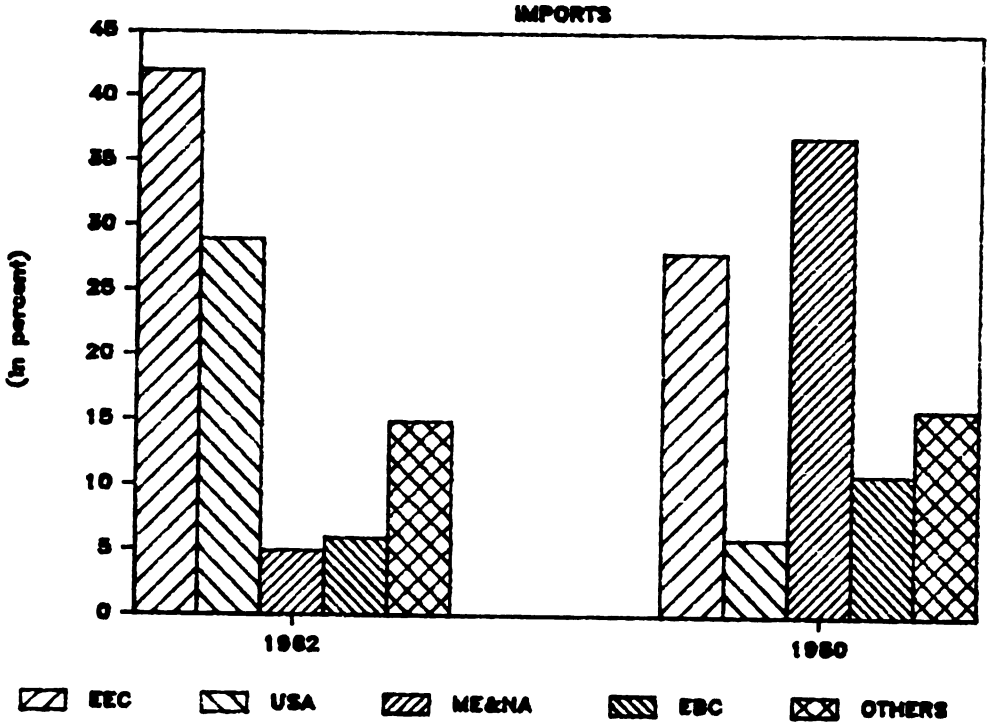
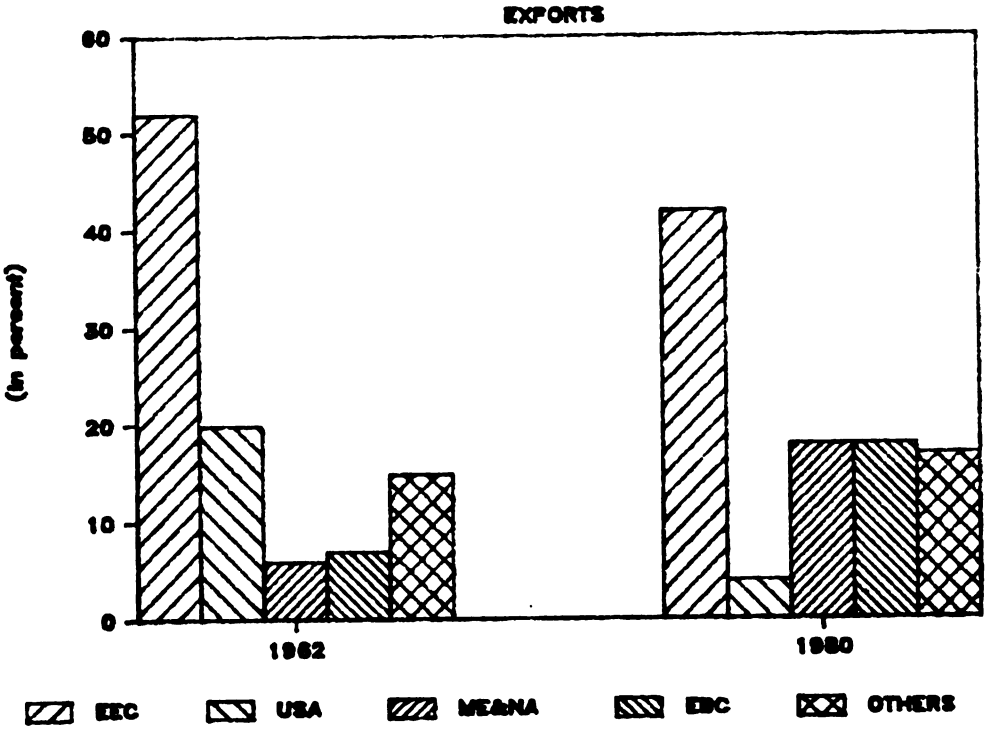


FIGURE 20. MAJOR TRADING PARTNERS



MAJOR TRADING PARTNERS



CHAPTER II

THE ROLE OF AGRICULTURE

1. Introduction

The role of agriculture in economic development has been studied in great detail in the literature. At the beginning of the 19th century the status of agriculture gradually began to change from a self-contained economy to an interdependent sector of a vast and complicated economic system. It is accepted that agriculture is an integral part of the national economy, the various sectors of which are united under a common exchange system. This being so, the economic problems of the agricultural sector do not arise solely within the agricultural sector, but may grow out of conditions existing within the economy as a whole.(1)

The role of the agricultural sector in the development process is quite important because the development of agriculture plays a crucial role in establishing a base for industrialization. Given the dominance of the agricultural sector in the economic structure of developing countries, such factors as the physical attributes of the land, the land tenure system, the ratio of labor to land and the extent of the natural resource endowments are likely to exert a major influence on the speed of development as

determinants of the pace of agricultural advance and the pace of industrialization based on a healthy agricultural sector or the exploitation of indigenous resources.(2)

In most of the developing countries, the agricultural sector not only produce food for domestic consumption, but also supplies a major share of the foreign exchange earnings from commodity exports. While it is true that reliance on primary products for exports has it is dangers, recent research suggests that the instability of primary product prices has been damaging to most developing countries than its commonly supposed.(3)

In the relationship between agriculture and trade in economic development, agriculture is usually depicted as providing exports to earn the foreign exchange requisite to industrial growth. In this context, agriculture may play a further related role in development by displacing agricultural imports to further release the foreign exchange constraints on the industrial growth.(4)

During the planned period the strategy of industrialization in Turkey was based upon capital-intensive investment programs which suggested a large increase in the import of capital goods. Turkey's low degree of export orientation, coupled with increasing dependency on imports, presented structural balance of trade difficulties. In the mean time, the agricultural sector was squeezed by relatively low agricultural base price to provide the savings

necessary to finance industrial products. These policies overencouraged industry at the expense of agriculture. As a result, exports were discouraged, resources were allocated inefficiently, and the industrialization process itself was constrained. Moreover, industrialization policies were found to have had negative effects on employment and to have widened income inequalities.(5)

The capital-intensive strategy of growth resulted in a large increase in imports and tended to increase demand for consumer goods, as well as diverting resources from capital goods and hence from growth. There is little place for investment in a consumer goods sector such as agriculture in such strategy, and trade tends to be ignored or treated simplistically, with the export growth rate and with the foreign debt given exogenously and imports primarily comprised of machinery for increased capital goods production.(6) Besides, such strategy inevitably increases the rate of employment too.(7) Mollor and Umalele argue that the capital-intensive strategy of growth in the short-run reduces employment and thus squezes demand for agricultural goods; this causes a further increase in unemployment, laying off workers in the agricultural sector. Such shortcomings of the capital-intensive strategy induced policies to shift to employment oriented strategies, which use agriculture as a means of employment and higher wage earnings. In other words, the agricultural sector is a crucial source of wage goods, and it provides much of the

increase in employment directly through raising agricultural production, indirectly through the stimulus of increased income to the farmers and the demand effects of the consequent expenditure.

The larger agricultural production results in increased marketings of food and increased cash incomes to farmers from the marketings of that food. The higher volume of cash incomes provides a demand for increased nonagricultural production and consequently a rise in employment. The expanded employment of wage earners, who spend most of their income on food, provides the demand for additional food production.(8) Beside the high employment opportunities which are elaborated in the pivotal role of agriculture, it is recognized that export oppportunities have been greater in agriculture to employ export-based strategies of development, as well. It is realized that the more agricultural products a country can export, the more foreign exchange it has available for those items needed for the industrialization process.(9)

Increased agricultural production is the key to economic development with high employment and export-oriented growth. Therefore, from this standpoint government policy toward agriculture needs to be inspected in great detail to reveal the true role and capacity of agriculture in development efforts. Our purpose in this study is to evaluate the impact of the base price policy in the

agricultural sector to reveal such macro effects on production, consumption and trade. Such information having been obtained from past experience in Turkey, smooth and effective base price policy to achieve high employment and growth is to be suggested.

In this chapter Turkey's agricultural sector is to be studied in regard to its major characteristics, as well as its existing production potential, prior to a model simulation concluding our effort.

2. Land use and its characteristics

The soils of Turkey vary greatly in their type. Most of them have good structure with a high ph. (7.5 to 8.5) and high lime content. The salt content of the soil is often relatively high and irrigated land is frequently saline. A small portion of the soil along the Black Sea coast is acid, which makes it possible to grow tea and other acid-tolerant plants. The soils are almost uniformly deficient in phosphate and nitrogen. Potash deficiencies are limited to small geographic areas, but may expand with more intensive cultivation and the use of high rates of nitrogen and phosphate applications. Near Samsun cobalt and molybdenum deficiencies have been observed. The soil is generally low in organic matter due to climatic conditions and poor soil management practices. (10)

The data in Table 5 shows the land resources of

Turkey. The long-term changes in land use patterns can be seen from the table. The total cultivated area of Turkey amounts to 27.5 million hectares or 35 percent of the total land area.(11) The areas of natural grazing and of forests account for, respectively, 24.5 percent and 23.7 percent of the total land area.

The data show a large increase in cropped area. The significant change in land use is due to growing mechanization and increasing population. A sharp expansion of the cropped area took place between 1948 and 1953. The introduction of nearly 40 000 tractors and a number of combines, together with the development of the road system, high price supports for wheat, and exceptionally favorable weather between 1950 and 1954, encouraged farmers to plow up previously uncultivated land.(12) Much of this land is marginal, representing an abortive wheat revolution that should have been prevented, at least partly, according to FAO. FAO estimated that the average acreage plowable, without the danger of serious erosion, is only about 16 million hectares or two-thirds of the total acreage. It is recommended that parts of the cropped area be used for agricultural purposes only after soil and water conservation practices have been instituted. The other parts are subject to heavy erosion, and should be used for pasture only after establishing continuous vegetation.(13)

It seems obvious that only marginal land is left

uncultivated in the dry, rainfed areas of Turkey, and that no further economical expansion of cropping is possible in these areas. The expansion of irrigation facilities will serve mainly to increase the productivty of existing arable land.

There are some areas in which cultivation can be expanded by the reclamation of saline-alkaline soils and swamps and by the improvement of strips of land in the coastal areas. It is estimated that approximately 3.3 million hectares could be reclaimed in this way. In addition there are about two million hectares of land which can be cultivated by reclamation of olive groves, pistachio forests, and other bushes.(14) Major developments of last two decades have been the doubling of the amount of area producing fruit and vegetables, and the area covered by forests. Increasing domestic as well as world demand for vegetables and fruit encouraged farmers to produce such foods. However, the expansion of forest area stemmed solely from intensive government projects aimed toward increasing forest land.

TABLE 5. DISTRIBUTION OF CULTIVATED AREA AND FORESTS

(in thousand hectares)

Years	Crop area		Vegatable gardens*	Vine-yards	Orchards	Olive grows	Forests
	Sown	Fallow					
1950	9 868	4 674	n.a	561	608	297	10 418
1960	15 305	7 059	n.a	782	730	548	10 584
1961	15 128	7 948	n.a	775	793	586	10 584
1962	15 167	8 093	n.a	802	816	599	10 584
1963	15 276	8 547	n.a	794	824	607	10 584
1964	15 367	8 476	n.a	800	832	636	10 584
1965	15 294	8 262	n.a	800	862	643	10 584
1966	15 454	8 528	n.a	830	888	663	10 584
1967	15 515	8 383	n.a	840	900	674	12 578
1968	15 400	8 692	416	848	938	723	18 273
1969	15 848	8 824	445	838	951	726	18 273
1970	15 591	8 705	448	845	1 019	731	18 273
1971	15 924	8 603	451	847	1 044	740	18 273
1972	16 047	8 996	530	850	1 052	751	18 273
1973	16 154	8 506	501	795	1 187	785	20 170
1975	16 241	8 177	490	790	1 163	801	20 170
1976	16 343	7 922	619	768	1 263	810	29 170
1977	16 531	7 941	591	760	1 290	816	20 155
1978	16 349	8 200	571	790	1 321	811	20 155
1979	16 607	8 388	616	850	1 352	812	20 155
1980	16 372	8 188	596	820	1 386	813	20 199

* Until 1968 related data was included in orchards.
Source: Statistical Yearbook of Turkey, 1980.

For the country as a whole, the percentage of fallow land remained at the same level, although it varies from one region to another. In souhthern and eastern central Anatolia, where the climate and land conditions are poor, it is 42 percent. In southeastern Anatolia it is as high as 45 percent, and it is between 17 and 20 percent in the Marmara and Black Sea regions.

3. Irrigation potential

The state holds itself responsible for water resource development projects. The investment made by the state will be repaid by the private users in projects other than those which have a public utility character, such as flood control projects. Terms of repayment are arranged according to the profitability of the project and the rate of utilization. The water potential corresponding to the rainfall in Turkey is about 518 billion cubic meters. Approximately 32 per cent of this goes into streams and rivers. It is estimated that only 80 billion cubic meters of this flow can be utilized. For this reason, the seasonal fluctuation in available fresh water should be regulated by approximately 430 dams.

Of the 26 million hectares of agricultural land in Turkey, 16.7 million are suitable for irrigation. Land classification studies indicate that the amount of land which is suitable for irrigation is 12.5 million hectares or 74 percent of the estimated figure. However, when the

water potential of the basins is considered, the portion of the land which is suitable for irrigation is reduced to 8.5 million hectares.(15) Currently, 1.8 million hectares are under irrigation and 7.0 million hectares are ready for irrigation. One of the principal problems in the development of water resources for irrigation is the time gap between the completion of the dams, main irrigation canals, ext., and the adoption of advanced wet farming techniques. The reduction in this time gap will be a significant factor in the acceleration of the rate of growth in the agricultural sector.

Although investment in irrigation works consumes about 30 percent of the government's total investment budget and about 70 percent of investment in the agricultural sector, the distribution and use of water resources in Turkey is insufficient and inefficient. FAO emphasizes the following difficulties:(16)

1. Lack of coordination in the construction programs for dams and in distribution and drainage systems,
2. General lack of knowledge on the part of farmers regarding modern irrigation methods and practices,
3. Lack of suitable farm machinery and equipment for irrigation farming,
4. Lack of suitable technology to go with the water.

Because of problems, less than 50 percent of the expected advantages of the irrigation systems have been

obtained. Irrigation is considered to be one of the most important factors to increase the output of the agricultural sector. The total area for which irrigation programs are under consideration amounts to 2.4 million hectares. If those entire areas were successfully developed, it would obviously make a great impact on the total level of agricultural production in Turkey.

4. Farm_size_and_land_tenure

Today, most of the population of Turkey still lives in villages, occupied in a various kinds of farming activities. According to recent census figures,(17) 56.1 percent of the total population lives in villages, while 55.09 percent of the economically active population earns a living from the agricultural sector. Most of Turkey's rural population lives on small family farms. There are approximately 3.6 million farms in Turkey. The average farm size is about 10 hectares. Table 6 gives land distribution in Turkey for 1963, 1970, and 1980.

The share of small holdings (less than 5 hectares of land) increased during the first decade of the planned period. It was mainly due to migration to the major cities of Turkey, as well as departure to some European countries as hired labor.

TABLE 6. LAND DISTRIBUTION IN TURKEY

Size of farms (in hectares)	Number of farms (in thousands) 1963	1970	1980	The share in the total (in percent) 1963	1970	1980
0.0- 5.0	2132.3	2228.3	2266.9	68.8	72.9	62.1
5.1-20.0	853.4	716.5	1159.9	27.5	23.4	31.8
20.0+	115.1	113.0	224.0	3.7	3.7	6.1
Total	3100.8	3057.8	3650.8	100.0	100.0	100.0

Source: The data derived from Statistical Yearbook of Turkey, 1980,1983.

In 1963 the percentage of small farms was 68.8 of the total farms and the land cultivated by them was about 25 percent of the total arable land. Due to immigration from rural areas and due to traditional rules of inheritance, in 1970 the number of small farms had increased to 72.9 percent. However, the second decade of the planned period presented an accumulation of arable land in the medium-sized and large farms slightly different from the previous diversification of medium-sized and large-sized farms. The share of the small farms in the total diminished to 62.1 percent and the percentage share of the arable land went down to 20 percent. Such an accumulation of land can best be explained by two major points. First, farmers migrating to cities and abroad invested their money in the villages again, buying farm land. Second, efforts of development showed astonishing growth performance during the first decade of the planned period. This of course meant an increase in food demand, which consequently created high

income for farmers, enabling them to increase farm size by buying more land.

TABLE 7. DISTRIBUTION OF THE LAND ACCORDING TO FARM SIZE

(in percent)

Size of the farms	1963	1970	1980
0.0- 5.0	25.0	27.2	20.0
5.0-20.0	42.0	42.0	45.1
20.0+	33.0	30.8	34.9

Source: Data derived from Statistical Yearbook of Turkey, 1980,1983.

Exact data concerning land distribution according to ownernship are not available before the completion of cadastral surveys. Most of the land in Turkey is not registered at land offices. This situation gives rise to disputes, and makes land consolidation and the granting of agricultural credit difficult. It is estimated that about 1.6 million hectares of cultivated land are owned by the state, and this is either used as state farms or rented to farmers. (18)

According to 1980 agricultural censuses, the land tenure system shows only a relatively limited number of farmers who do not own part of the land that they farm. Farmers who farm their own land account for 90 percent of the total farms, and 86.7 percent of the total arable land.

For the country as a whole, about 10.6 percent of the

farmers are engaged only in crop production. On the other hand, 87.6 percent of the total farms are engaged in both crop production and livestock production. This figure seems unreasonably high, because in most of the farms of Turkey, draft animals play a crucial role in farm life and it is also common to rural families to deal with livestock production mainly for their own consumption. Therefore, most of the farms under this group can be reclassified as crop-producing farms, according to their main activities. Considering this fact, it can be argued that around 55 percent of the farms are engaged in crop production basically.(19) Farmers engaged only in livestock production represented 1.8 percent of the total farmers in the country in 1980.(20)

Around 50 percent of the total farm land is cultivated by unpaid family members alone. Land cultivated by hired labor alone is about 4 percent of the total farm land. The rest of the farm land is cultivated by both unpaid family members and hired labor. Therefore, there is a considerably high amount of labor demand in the agricultural sector in Turkey.(21)

5. Inputs in the agricultural production

The increasing production of agricultural output is the consequence of a world-wide process of expansion of arable land and of the continuing intensification of agri-

culture. One of the main components of this process is the increasing use of fertilizers. Following substantial reduction in fertilizer prices resulting from government subsidy programs, fertilizer consumption in Turkey grew from 107.7 thousand tons in 1960 to 7666.0 thousand tons in 1979. In 1980 fertilizer consumption declined considerably due to substantial increases in the price of fertilizers, and due to insufficient demand stemming from declining industrial production because of political and economic turmoil in the late 70s.

The consumption of fertilizers in large quantities represents a relatively recent development in Turkey. The consumption of fertilizers increased rather slowly during the 1950s and early 1960s. The sharp increase in fertilizers consumption in Turkey during the last two decades can be seen from the data presented in Table 8. The data show that consumption of fertilizer had increased more than 55 times, compared with 1960. From 1960 to 1979, the annual compound rate of increase was 22 percent. Such a development resulted in a dramatic increase in the area fertilized in Turkey. The area fertilized as a percentage of cultivated area was 2 percent in 1965. This amount reached 44 percent in 1979 and 42 percent in 1980.(22) Between 40 and 50 percent of the total fertilizer consumption in Turkey belongs to wheat production.

One of the problems in the subject of fertilizer is

in the area of production. In the 1963, around 74 percent of the total fertilizer consumption was provided domestically. However, in 1963 the amount of fertilizer supplied was very limited, and was insufficient, considering the potential level of demand. Fertilizer consumption in 1980 increased dramatically and, due to insufficient use of productive capacity, 60 percent of total consumption was met by imports.(23)

TABLE 8. FERTILIZER CONSUMPTION

(in thousands of tons)

Years	Fertilizer	Years	Fertilizers
1960	107.3	1972	3284.3
1963	426.4	1973	3720.4
1964	532.0	1974	3136.1
1965	802.7	1975	3691.6
1966	1027.0	1976	5944.6
1967	1538.0	1977	6577.0
1968	2116.6	1978	7474.0
1969	2448.4	1979	7666.0
1970	2217.3	1980	5967.5
1971	2536.5		

Source: State Plannig Office

The increasing dependency on imported fertilizers created problems in the financing of expenditures in foreign currency and pressures on the balance of payments. Concerning the total fertilizer requirements of the country, which is about 12 million tons, the government should pay more attention to domestic fertilizer production in order to improve the quantity and quality of agricultural production.

Together with an increase in the irrigated area from about 6 percent about 33 percent of the total cultivated area (1.5 million of hectares to 8.0 million hectares) and

improved water management, the rapidly increasing use of fertilizers represents one of the main factors in the Turkish agricultural development.

Strategy regarding the agricultural sector during the 1950s was based upon rapid mechanization in this sector to increase production from existing farm land and put additional acreage under cultivation. Such a strategy was advocated by the U.S. government, and thus agricultural machinery accounted for half of the total economic aid which the U.S. government assigned to Turkey. Predictably, the tractor became the symbol of capital formation in Turkey's agricultural sector in the early 50s.(24) This item accounted for nearly three quarters of the fixed capital formation which the Ziraat Bankasi (The Agricultural Bank) and other banks financed by means of long term credits.(25) Table 9 shows trends in the use of tractors during the planned period.

As a result of the mechanization effort, the number of tractors increased from 17 000 to 43 000 between 1950 and 1960. Overaccumulation in Turkey's tractor fleet continued during the planned period because of the impetus given to the agricultural sector by the government in the five-year plans. The number of tractors went up almost tenfold during the 1962-1980 period. The total available horse power, on the other hand, increased by 25-fold during the

TABLE 9. TRACTORS AND AREA SOWN

(in hectares)

Years	Area sown (10^3)	Number of tractors	Total horse power	Area sown per tractor	Area sown per horse power
1962	15 167	43 747	815 925	346.6	18.6
1963	15 276	50 844	1 916 843	300.4	8.0
1964	15 367	51 781	1 876 525	296.8	8.2
1965	15 294	54 668	1 931 500	279.8	7.8
1966	15 454	65 103	2 406 878	237.4	6.4
1967	15 515	74 982	2 836 599	206.9	5.6
1968	15 400	85 475	3 293 792	180.2	4.7
1969	15 848	96 407	3 801 144	164.4	4.2
1970	15 591	105 865	4 218 649	147.3	3.7
1971	15 924	118 525	4 777 450	134.3	3.3
1972	16 047	135 726	5 557 255	118.2	2.9
1973	16 062	156 139	6 566 761	102.8	2.4
1974	16 154	200 466	8 600 836	80.6	1.9
1975	16 241	243 066	10 911 616	66.8	1.5
1976	16 343	281 320	12 820 223	58.1	1.3
1977	16 531	320 578	14 585 767	51.6	1.0
1978	16 349	370 259	17 058 314	44.2	.9
1979	16 607	402 777	18 587 264	41.2	.8
1980	16 372	436 367	20 112 906	37.5	.8

Source: The Summary of Agricultural Statistics, 1981.

same period. Such an increase in the mechanical power in the agricultural sector was due to subsidized prices of tractors and due to demonstration effects common among farmers. First, employing tractors in rural transportation became cheaper relative to trucks, and therefore demand for tractors for such purposes increased, given subsidized prices. Second, in the villages the tractor is a symbol of wealth and power; thus, demand for tractors reflects such a need, independent of its practical use in farming. Both factors encouraged the strong demand for farm machinery.

Table 10 shows the area sown per tractor and per horse power. It is obvious that both figures represent a steady decline since 1962. On the other hand, this table gives agricultural production measured by constant prices per tractor and per horse power. The decline in the average productivity of the tractors since 1962 has been noticed. Thus, it is concluded that the mechanization effort by subsidized prices resulted in inefficient employment of farm equipment in general, and of tractors in particular.

The number and the total horse power of tractors in Turkey is excessive, and power is underutilized. Therefore, the social cost of the tractor is greater than the social benefit of the tractor, which has underused capacity. To increase efficiency and to utilize the full capacity of tractors,

TABLE 10. TRACTORS AND AGRICULTURAL PRODUCTION

(in thousands TL.)

Years	Agricultural production per tractor	Agricultural production per horse power
1962	1 570	84
1963	1 487	39
1964	1 521	42
1965	1 483	42
1966	1 446	39
1967	1 255	33
1968	1 184	31
1969	1 110	28
1970	1 074	27
1971	1 057	26
1972	988	24
1973	904	21
1974	756	18
1975	673	15
1976	628	14
1977	576	13
1978	520	11
1979	478	10
1980	435	9

Source: Data derived from Statistical Yearsbook of Turkey, 1980, and 1983.

first the immediate elimination of subsidies is necessary. Subsidies distort the free market price of tractors and create excess demand for them without utilizing the full capacity of the existing tractor fleet. Secondly, to increase efficiency and to reduce excess capacity, production of small power tractor models should be encouraged. Since 95 percent of farms have less than 200 ha of land, it is better for small and medium farmers to use smaller and cheaper tractors which best fit the size of the land proportionally. Such a strategy is also counted among the goals of agricultural policy in development suggest the support of capital-conserving strategies by using available equipment correctly and efficiently. (26)

The relative role of agriculture has decreased over the last two decades. Agricultural production , including animal products and excluding forestry, fishing and hunting, accounted for 39.1 percent of the total GNP in 1962. As is seen in Table 11, the relative share of agricultural income in GNP continously declined until 1980, and it became 21.1 percent in this year.

The decline in the share of agriculture certainly does not mean that relative importance of the agricultural sector

TABLE 11. CONTRIBUTION OF THE AGRICULTURE TO NATIONAL INCOME

(in billions of TL.)

Years	GNP	Agricultural production*	The share of agriculture (in percent)	Index of per capita agric. production**
1963	60.8	23.7	39.1	100.0
1964	64.7	23.4	36.2	100.1
1965	69.2	22.9	33.1	97.1
1966	82.9	27.8	33.5	90.6
1967	90.8	29.0	31.9	98.0
1968	101.2	30.3	29.9	95.1
1969	112.2	32.4	28.9	94.3
1970	133.4	37.5	28.0	92.5
1971	173.4	48.5	28.0	92.4
1972	215.2	57.5	26.7	101.8
1973	280.0	70.7	25.3	98.9
1974	387.1	102.6	26.5	86.2
1975	485.0	132.4	27.0	92.8
1976	610.7	172.2	28.2	100.1
1977	806.0	211.1	26.2	105.6
1978	1206.0	289.9	24.0	101.8
1979	2058.9	448.7	21.8	101.3
1980	4199.6	891.3	21.2	100.4

Source: State Plannig Organization.
* Covers animal products, excludes forestry, fishing and hunting.
** Calculated based on mid-year population.

diminished during the period under consideration. The agricultural sector's contribution to the GNP is still crucial and important relative to the industrial sector, considering its share in the GNP in 1980, which was about 19.8 percent. The share of industry was 12.4 percent in 1962. Although the growth performance of the agricultural sector has been disappointing, the main cause for the decline in the relative share has been the growth performance of the services sector. In fact, the share of the services sector increased to 55.8 percent from 49.3 percent between 1962 and 1980.

The index of per capita agricultural production is given on the table. Clearly it may raise serious problems for the future efforts of Turkey in the path of development, considering the more than 2 percent per annum growth rate of the population. In fact, per capita agricultural production increased slightly in 1980 over 1963.

Given its level of development, there are, no doubt, substantial reserves in Turkey's agriculture that could be mobilized, provided that the small size of farm units and lack of capital and know-how can be overcome. Experience in western Europe has shown that small farmers can benefit considerably through adherence to marketing and credit cooperatives and their nationwide unions, which can bring to bear considerable economy of scale and competitive power. (27)

TABLE 12. DISTRIBUTION OF THE AREA SOWN BY PRODUCT TYPE

(in thousands hectares)

Agricultural products	Area sown	Percentage share
Total area sown	16 372	
Cereals	13 291	81.2
Wheat	9 021	72.2
Barley	2 800	
Others	1 471	
Pulses	732	4.5
Industrial crops	1 226	7.5
Tobacco	223	
Sugar beets	269	
Cotton lint	672	7.1
Oil seeds	708	4.3
Sunflower	500	3.0
Tuber crops	268	1.6

Source: The summary of Agricultural Statistics, 1981.

The percentages of agricultural income contributed by agricultural forestry and fishing are rather small in Turkey. The share of forestry and fishing increased slightly, however, during the planned period. The share of farming, on the other hand, declined from 97.6 percent in 1963 to 96.5 percent in 1980. Accordingly, the share of forestry increased from 1.4 percent to 2.5 percent and fishing from .5 percent to 1.2 percent respectively in the same period.

The area cultivated increased only about 8 percent from 1963 to 1980. The largest part of the cultivated area is devoted to wheat production. In 1980, the total area sown in Turkey had the composition on Table 12.

Cereals accounted for 81.2 percent, with wheat and barley alone having a share of 72.2 percent; pulses accounted for 4.5 percent; industrial crops for 7.5 percent, of which tobacco, sugar beets, and cotton have a share of 7.1 percent; oil seeds for 4.3 percent, and tuber crops for 1.6 percent. The above figures illustrate the dominant role of wheat and barley in Turkey's agriculture. The role of wheat and barley is quite important because the people's diet is based on significant consumption of bread.

The following table shows the level of production for some major agricultural products.

TABLE 13. AGRICULTURAL PRODUCTION BY PRODUCTS

(in thousands tons)

Products	1962	1977	1978	1979	1980	Percentage change*
Wheat	8450	16650	16700	17500	16500	95.3
Cotton	245	575	475	476	500	100.3
Grapes	3382	3180	3496	3500	3600	6.4
Hazelnuts	122	290	310	300	250	100.5
Citrus fruit	2348	1147	1081	1147	1158	49.3
Barley	3500	4750	4750	5240	5300	51.4
Tobacco	90	248	292	217	228	153.3
Sugar beets	2731	8995	8836	8760	8766	220.9
Oil seeds	588	1517	1374	1503	1654	181.3
Olives**	290	400	1100	430	1350	48.3

Source: State Institute of Statistics.
* Represents the percentage changes of 1980 over 1962.
** The olive harvest follows a two year cycle. Therefore comparison is made with 1979 level of production to base period.

Sugar beets, oil seeds and tobacco present a remarkable increase during the plan horizon. Wheat production

increased by 96.3 percent over the planned period primarily because of an increase in cultivated area, technological advances, the use of fertilizers, and improvement of education among the rural population. A similar increase in the production of other products of agriculture occurred for the same reasons.

The introduction of improved technology, including the use of fertilizers, water resources, plant protection chemicals, and farm machinery, has lowered the high level of crop fluctuations. The following table gives the coefficient of variations for four major crops whicha cover 78 percent of the total area sown in Turkey.

TABLE 14. YIELD FLUCTUATIONS FOR FOUR MAJOR CROPS

(by percents)

Plan periods	Coefficient of variations for wheat	barley	sugarbeet	cotton lint
1963-1967	7	11	19	11
1968-1972	13	10	7	10
1973-1977	20	21	8	6
1978-1982	3	5	11 (4)*	5

* The coefficient of variation for sugar beets is 4, excluding 1980.

Coefficient of variation (28) shows increasing fluctuations in the average yields through the third plan period for wheat and barley. The dramatic decline in the coefficient of variations for the last plan period is attributed

to technological improvments, as indicated above. The fluctuations in the average yield of sugar beets declined in general except for an upward turn in the last period. The upward swing in the coefficient of variations stemmed from a considerable decline in the average yield of this product in 1980. Fertilizer is known as an important input in the process of production of sugar beet. Fertilizer prices increased exceptionally due to an insufficient level of supply in 1980. A five-fold increase in the price of fertilizers caused a decline of 22 percent in the consumption of it. Lack of fertilizer held down the average yield by 19 percent in 1980. Considering this development, in calculating the coefficient of variation the 1980 figure has been excluded. The related coefficient, in this case, declined to 4 percent, proving the argument about declined crop yield fluctuations for sugar beets, as well.

The average yield fluctuation in cotton presents a similar situation to wheat and barley, except that a favorable decline started from the second planned period, earlier than for others.

Cotton is quite an important crop in Turkish agriculture. In addition to supplying fiber for an expanding textile industry,cotton has become a leading crop in agricultural export, as well. Tobacco, dried fruits (figs and raisins), and hazelnuts are counted among the exportable agricultural products. Favorable prices in foreign mar-

kets for those products stimulated farmers and as a result, the level of production increased significantly during the planned period under consideration.

The value of total Turkish agricultural exports increased at an average annual rate of 20 percent from 1962 to 1980.(29)

Distribution of total agricultural exports among leading products according to 1980 figures are as follows: 6 percent figs and raisins, 13.6 percent hazelnuts, 8 percent tobacco, 11.3 percent cotton. The proportion of cotton exported has varied between 50 and 60 percent of the annual crop. The amount of tobacco and cotton exported had nearly tripled since 1962, with the quantity exported representing about 50 percent of the tobacco produced in Turkey each year. Ranking as the world's largest leading producer of hazelnuts, Turkey is also the leading exporter of hazelnuts.

Remembering the balance of payments difficulties due to inadequate export performance mentioned in the previous chapter, it is recommended to increase agricultural exports in total value by increasing production of traditional exportable crops as well as to include new varieties of products marketable abroad. Unless exports are increased, the country will be unable to finance the volume of imports required for the current consumer needs and investments, and repay the foreign debts of Turkey.

CHAPTER III

GOVERNMENT INVOLVEMENT

1. Introduction

Throughout the world, governments dominate the economic scene. Their spending determines whether full employment prevails; their taxes influence countless decisions; their policies control international trade; and their domestic regulations extend to almost every economic act.(1)

Government is an important and often a critical economic variable. However, the study of government as an economic variable has been dominated by emotional and ideological factors typically entering analysis as implicit antecedent normative premises. Almost the entire treatment of government in analysis is normative rather than positive.(2)

The market system of economic organization is based upon the decentralized decisions of rational consumers and producers, each operating in his own self-interest. There is no need for centralized decisions in order for the entire system to work. Adam Smith's famous invisible hand, which drove individuals to promote the public

interest while pursuing their self-interest, is a timeless illustration of the principle. However, this is true to the extent that imperfect competition, significant externalities, increasing returns to scale, and public goods hinder the achievement of a position of optimality, as defined in Paretian terms.(3)

There are a number of situations where the presence of market failure requires some of collective action necessitating some of government to establish the rules of the game.(4) The role of government in this sense is to do something that the market cannot do for itself, namely, to determine, arbitrate, and enforce the rules of the game.(5) Friedman sees monopoly and similar market imperfections, and externality as two general classes of market imperfections in which government may intervene indirectly to correct market failures.(6)

Another form of market imperfections arises whenever there are goods present which, because of a quality of non-excludibility, exhibit a significant degree of publicness.(7) Imperfections and public goods exist, and their presence introduces leakages into the flow of the system towards an optimal solution. Government is then used as a sort of plug to eliminate the difficulties that this presence creates.(8)

Most discussions of government involve the properiety or legitimacy of some governmental action. This is espe-

cially the case with normative principles of government used to support or condemn particular governments or government policies. Government is an instrument available for use by whoever can succeed in controlling it. Competition exists not only for markets, but also for the state. The principle of the use of government is a purely positive proposition, whose application either in criticism or as program requires an additional normative premise.(9)

Government is one specialized agency in the division of labor, which is able to enforce its decisions upon all other agencies or individuals in the area. A democratic government is one, therefore, chosen periodically by means of popular elections in which two or more parties compete for the votes of all adults. Since none of the appurtenances of office can be obtained without being elected, the main goal of every party is the winning of elections. Thus, all its actions are aimed at maximizing votes, and it treats policies merely as means toward this end.(10)

If government is merely a name for the collective action of consumers, and if government decisions are the collective decisions of individuals, some process of reaching these decisions is still needed. However, Arrow's impossibility theorem concludes that with at least three possible choices, there can be no method of aggregating preferences under majority rule that simultaneously satisfies these conditions and the principle of voter

sovereignty. The only methods of passing from individual tastes to social preference which will be satisfactory and which will be defined for a wide range of sets of individual orderings are either imposed or dictatorial.(12)

The introduction of this difficulty presents a serious obstacle to the effective operating of the system. If simple majority voting is used to determine collective choices, then these will reflect either an absence of voter's sovereignty or a violation of Arrow's conditions of rationality.(13)

It is therefore clear that government is an arena in which and for which various claimants or participants compete for advantage; that is, government is an object of power play or jockeying for position. What government does is a function of the use made of it by those in control of it.(14)

2. Farm_prices_and_the_power-related_cost

The economy is a decision-making, or policy making process with regard to the basic economic problems of resource allocation, income distribution, and the level of aggregate income.(15) Different structures of decision making will yield very different definitions of the conditions necessary for life and action, the distribution of costs and sacrifices, and the distribution of opportunities and benefits.(16)

Given physical resorce availability, cost is a function of three sets of interdependent variables; technology, preferences, and power. Power determines whose interest count as a cost to others, and also influences the choice of technological alternatives and whose preferences are to count.(17)

Any cost structure is specific to an opportunityset structure between individuals and to the choices made from within opportunity sets by individuals, and the opportunityset structure including the composition of mutual coercion; so that costs registered through the market by a firm or other economic actor are a partial function of rights or power structure. Cost is a function of power which is a function of the relative use of government by interested parties to get their interest to count.(18)

The introduction of a farm price is an example of power-related costs in the economy. Farm prices will effect relative cost in a variety of markets through the intermediate effect upon opportunity sets and demand and supply function.(19) It is therefore, our task to trace the effects of guaranteed prices of the government in the basic macro frame based upon the assumption that price system brings a certain cost on output in which allocational decisions in productions are made.

3. Base_price_policy_(Turkey's_experience)

Government influence on the agricultural sector through price mechanism involve the price of output and the price of inputs such as land, agricultural machinery, fertilizers. Farmers, on the other hand, respond to the government policies by varying the level of cultivation and consequently the level of output. The middle farmers is more liable to respond to government policy due to his marginal situation, which renders him more sensitive to the manipulation of production function and price variables. The middle farmer is in a marginal situation in terms of his surplus production ability. The portion of surplus that he decides to bring to the market will be a function of prices. The fact that his surplus is small implies his inability to plan for marketing over a period of time. Unlike the large surplus producer, the middle farmer cannot protect himself against a short-term decline in price, or profit from speculation. That he usually produces a single crop adds to the difficulty of portfolio management, and implies additional hardship during times of shortage.

This special condition of the middle farmer in times of shortages is due to his basic consumption. Without any substantial savings, unable to reduce his needs at subsistence level, yet without the possibility of returning to self-sufficiency due to the earlier commitment to specialization, the middle farmer feels the impact of a crisis more

strongly than the othert sectors of peasantry. This hardship is further complicated, since most of his purchases are often from state monopolies, where prices tend to remain rigid even in the times of crisis. Politically, he does not have a large surplus which would allow him to form alliances with alternative political structures. The large commercial farmer, for example, does not rely exclusively on the policy of the local state.(20)

The larger farmer with a stable and high level surplus production can often act as his own middleman in bringing the surplus to the market. He has sufficient capital to immobilize a portion there of in merchandise to be sold in the market when prices become favourable. The middle farmer, however, is able to advance a productive capital only sufficient to replace his annual constant capital. And he is usually subordinate to the suppliers of commercial capital when it comes to marketing the surplus.(21) In the situation which we will discuss, the state assumes the role of the commercial capitalist, by arranging to buy directly from the farmer at the guaranteed base price for common agricultural products which the country has the power to produce.

Base price policy or a price support program is implemented to support the farmers who produced the essential food requirements of the country. The price support program was introduced in 1932. During that time, world price

conditions were such that if external prices had translated to the internal market without tampering by the government, all wheat farmers would have had to cease cultivation, except for their own needs. The government began to purchase from the farmers at a price considerably above the market price of wheat. The program started modestly with a small number of purchasing stations. By 1934, however, the impact of the program was beginning to be felt, with additional stations as the number of administrative divisions expanded.(22)

The prices for export crops were allowed to vary with the world price initially. Later on, however, base prices became considerably lower than world prices, especially during the period of stabilization programs. The important effect of the base price program was the creation of a client group which to depend on the government for the marketing of its agricultural surplus. It is clear that such a dependency was beneficial to the middle farmer; however, for some periods this dependency caused a transfer of gains on surplus production to the sectors of industry and trade.

As was mentioned before, the early years of the republic was a period in which the breaucracy pursued autarchic development which required the state-supported building of an import-substituting industrial sector. In the absence of foreign capital, and with a small basis of reproduction,

the burden of the industrialization program had to fall on the agricultural sector. During this period, the government consciously followed a policy of increasing agricultural production in order to widen the base of possible surplus for industrialization.(23)

A similar price policy was pursued by the government at the beginning of the planned period, as well. The first five year plan gave due importance to the place occupied by the agricultural sector in the general economy. "in conformity with the general objectives of the plan, to raise agricultural production with a view to expanding exports and meeting the growing industrial needs for raw materials," and thus fostering industrialization is among the major objectives of the plan.(24)

The situation existing till 1969 was a balance between the government purchasing price and the world market price. This balance, which had been developing almost from 1936, was favorable to the middle farmers. Government prices after this date fell behind world prices, and the policy became one of stabilization of prices rather than of support. Table 15 compares the base price index with world prices and with the CPI for the planned period.

Commodity support prices have been set largely on the basis of production costs, without adequate attention to the level and structure of domestic demand and supply, and

international market conditions. Until 1970, base prices were slightly higher than world prices and below the CPI. It was because of the policy objective of the government during the first two plan periods, which was to protect farm incomes from the distortions in the world markets and to stimulate agricultural modernization to sustain Turkey's industrialization drive.

TABLE 15. AGRICULTURAL BASE PRICE INDEX, WORLD PRICE INDEX, AND CONSUMER PRICE INDEX.

(1963=100)

Years	Base price index *	World price index **	Consumer price index ***
1961	87.32	98.76	86.40
1962	100.00	98.10	98.10
1963	100.00	100.00	100.00
1964	100.00	97.71	104.40
1965	107.23	102.20	120.10
1966	107.90	109.67	121.20
1967	107.90	104.74	117.50
1968	109.53	107.65	119.80
1969	113.65	113.57	129.10
1970	121.25	144.39	135.70
1971	142.58	194.52	160.90
1972	142.58	204.84	172.50
1973	172.12	193.43	212.40
1974	302.63	309.79	279.30
1975	331.93	309.51	392.30
1976	363.11	345.94	441.10
1976	363.11	345.94	441.10
1977	399.00	381.66	552.90
1978	464.74	590.77	718.50
1979	752.94	867.41	1108.40
1980	1499.88	2154.83	2228.00

* Base price index is computed based on ten major agricultural products subject to the support program. The level of production of 1974 is used to weight the index.

** The world price index is driven from the FAO prices and covers US prices for eight common agricultural products. The index was converted to Turkish lira utilizing exchange rates quoted in IFS year book.

*** The consumer price index of Istanbul for cereals and their products. Source: The Istanbul Chamber of Commerce.

Commodity support prices have been set during the normal periods largely on the basis of production costs, without adequate attention to the level and structure of domestic demand and supply, and international market conditions. Untill 1970, base prices were slightly higher than world prices and below the CPI. It was because of the policy objective of the government during the first two plan periods, which was to protect farm incomes against the distortions in the world markets and to stimulate agricultural modernization to sustain Turkey's industrialization drive.

4. Base price policy to influence political choices

After 1970, base prices tended to proceed below international levels and the CPI until 1974. After 1974, base price policy became a major tool for the political parties to maximize votes and political support of the rural population. The years between 1974 and 1980 brought heavy conflicts between the two major competitive parties, namely, the Republican and Justice parties. The 1973 and 1977 elections gave no firm majority in the parliament to either of the competitive parties. Within the last seven years of the period considered, seven coalition governments were established, including the latest government supported by the military. Thus, conflicts among coalition governments and increasing political tension in the country allowed the early election expectation of the two competi-

tive parties to increase. Therefore, the party who was in power, which kept the control in the government, consciously allowed base price hikes in order to maximize the votes of the rural population. Initially such policy was in favor of farmers, considering the base price given above the CPI. There was an income transfer to farmers from the industrial sector, as well, taking relative prices between industrial and base prices into account. The following table, Table 16, is presented to support the above argument. In fact, the 1974 base price hike, which was about 75 percent and was brought about by the Republicans, dropped the value of the DEN/BEF index significantly to 0.925. The value of the CPI/BF index, which is about 0.923, shows that the income transfer occurred directly to farmers as a result of government intervention in the agricultural sector.

In 1975 the favorable effect of the previous year's base price hike may be said to continue, considering the relative price of industry to base prices; however, one can hardly claim that in that year income transfer occured to farmers from industry; because the CPI/BEF indicates that the market price of agricultural commodities increased more than base prices and this increased yield income transfered to traders instead of farmers.

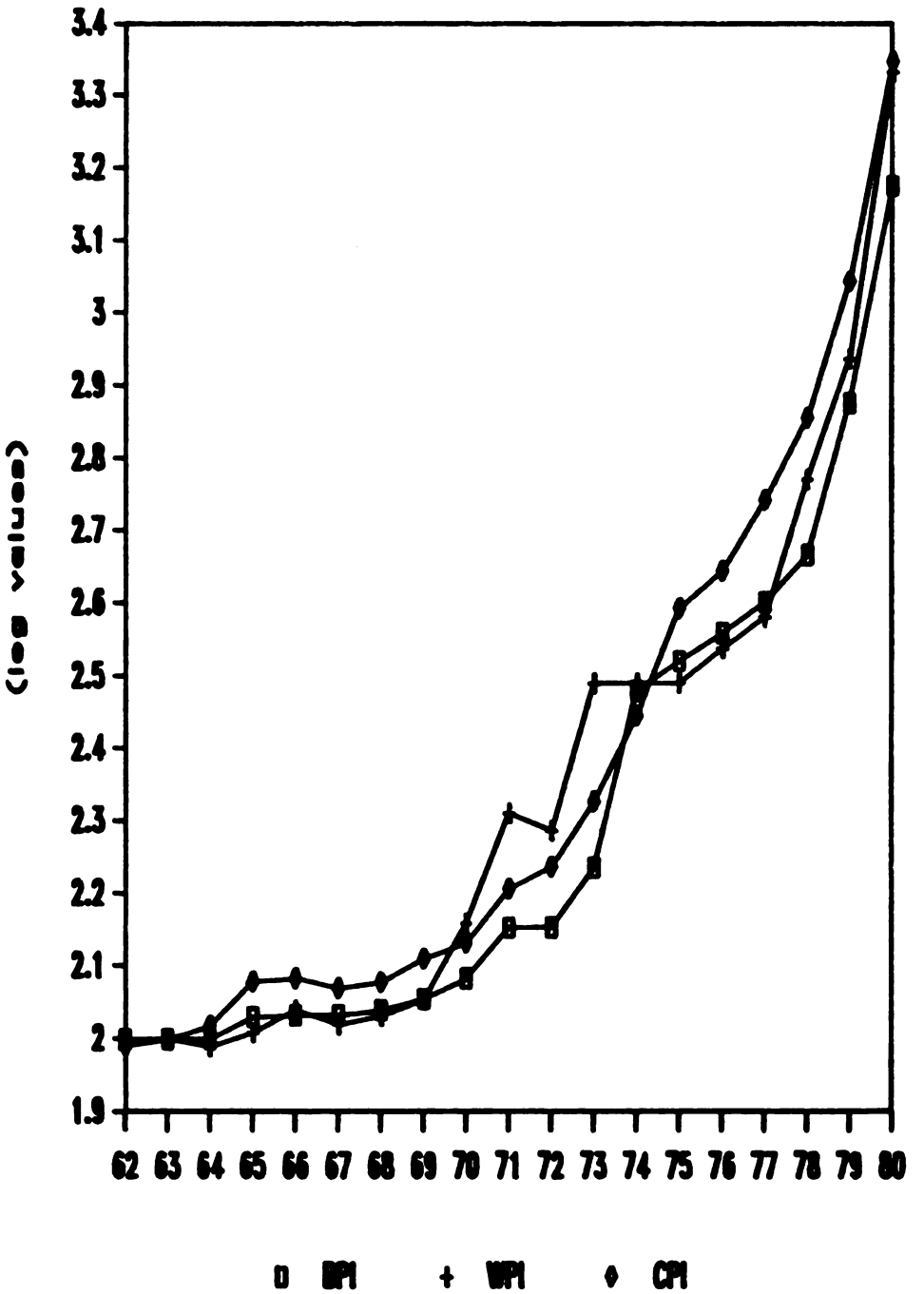
Until 1977 support prices tended to rise above international levels, altough since 1979, successive

TABLE 16. RELATIVE AGRICULTURAL PRICES

Years	DEN/BEF *	CPI/BEF **	WEF/BEF ***
1963	1.000	1.000	1.000
1964	1.011	1.044	.977
1965	1.004	1.120	.958
1966	1.049	1.123	1.016
1967	1.078	1.089	.971
1968	1.079	1.094	.983
1969	1.052	1.134	.999
1970	1.075	1.112	1.191
1971	1.114	1.128	1.364
1972	1.235	1.201	1.437
1973	1.214	1.234	1.705
1974	.925	.923	1.024
1975	.943	1.182	.932
1976	.963	1.215	.953
1977	1.081	1.383	.957
1978	1.603	1.546	1.271
1979	1.876	1.472	1.152
1980	2.093	1.485	1.437

* Relative price of industry to base prices.
** Relative price of consumer to base prices.
*** Relative price of world market to base prices.

FIGURE 21. PRICE INDICES



devaluations and a deliberate attempt to lower price supports in real terms have brought base prices below their international level, and the base price policy became one of change in attitude of the government was perfectly foreseeable, because "what government gives with one hand (agricultural support) is taken by the other (inflation)."(25)

The most common reason stated to be behind support policy is politics. This usually is emphasized in lay arguments, especially in the price, and the motivation is usually given as the vast voting power of the rural population. Erguder, the political scientist, accused and concluded: "Whatever its merits and demerits, observers have been unanimous in identifying the culprit behind the ills of agricultural price policy in Turkey: politics... The evidence analysed in this paper points to the fact that income stability, and thus the support of the grower rather than crop, is an important policy goal in Turkey... It is our conclusion that agricultural price support has been viewed in the 1950s and the 1960s, both by policy makers and agricultural producers, as tool providing income security rather than as a tool of allocative efficiency which in turn has led to its political importance."(26)

Forker, the agricultural economist, states the importance of politics on several occasions: "... the system lends itself to political influence and thus decisions that

may be more political than economic... It is apparent that the motivating forces behind the intervention programs and the established price levels are both economic and political, but mostly political."(27) There is a naive assumption by many prominent persons that economic consideration dominate in setting agricultural prices. "In practice, political considerations dominate."(28)

What these conclusions tell us is that price policy is one of the tools of government to achieve certain political goals, including maximizing its political support. Table 17 has been prepared to support the above argument.

Marked increases in the base price index coincide with critical political events: these are grouped under three categories as indicated on the table. What it tells can best be explained with the following assertion: when political competition is intense and political tension is high in critical periods, and thus builds pressures in the agricultural population, a fresh surge in support price policy is used to ease tension and to gain the political support of the majority of the population by the political party who holds power. As a result of such a policy, the well-being of the rural masses increases and hence they become faithful allies of the status quo. However, the gain did not continue after 1977, considering relative prices as indicated on Table 16. Although transferring of resources from agriculture to industry has started since

TABLE 17. BASE PRICE INCREASES AND CRITICAL POLITICAL EVENTS

Years	Percentage change in base price	Military intervention *	National elections **	Early election expectation
1962	14.5	1	0	0
1963	0.0	0	0	0
1964	0	0	0	0
1965	7.2	0	1	0
1966	0.6	0	0	0
1967	0	0	0	0
1968	1.5	0	0	0
1969	3.8	0	1	0
1970	6.7	0	0	0
1971	17.6	1	0	0
1972	0	0	0	0
1973	20.7	0	1	0
1974	75.3	0	0	1
1975	9.5	0	0	0
1976	9.4	0	0	0
1977	10.1	0	1	0
1978	16.2	0	0	0
1979	62.0	0	0	1
1980	99.2	1	0	0

* An attempted coup by some officers was not successful in 1962; however, it is included due to its important political concequences.

** Includes the consultative assembly.

that year, political gain has continued due to the farmers' significant response to nominal prices.

In order to support the critical claim as mentioned above, the following econometric investigation has been carried out to create some evidence based on the data introduced on Table 17.

First it is postulated that critical political events in Turkey have no effect on the increase of the base price index (BEF1). It is equivalent in the covariance analysis to say that there is no difference between the group means. To proceed with such a test, a DUMMY variable is defined having a value of 1 if there is a critical political event for that year, and zero otherwise. The resulting regression is as follows:

$$BEF1 = \underset{.571}{.044} + \underset{2.693\ *}{.301}\ DUMMY \qquad ....3.4.1$$

$R^2 = .299$

$F_{(1,17)} = 7.250$

* The t values is given under related parameters.

Since the coefficient of DUMMY is significant ($\alpha = .05$), the hypothesis that two population means are equal is rejected. That is to say, the mean increase in the base price index is significantly different from the mean increase when a critical political event has occurred.

Second, it has been attempted to test whether the mean increase in the base price index is significant for the times of military intervention, national election, and early election expectation. The variables DUMMY1, DUMMY2, and DUMMY3 represent each qualitative event respectively. The resulting regression is reported below.

$$BEF1 = \underset{.749}{.004} + \underset{3.226}{.394}\ DUMMY1 + \underset{.552}{.061}\ DUMMY2 + \underset{4.474}{.643}\ DUMMY3 \quad .... \quad 3.4.2$$

$$R^2 = .641$$

$$F_{(3,15)} = 8.913$$

F test (α = .05) indicates that the slopes of the regression equation are not jointly equal to zero. That is to say, there is a significant difference between the groups means. When the individual coefficient is examined, it is seen that the coefficients of DUMMY1 and DUMMY2 are significantly different from zero, indicating that the mean increases in the base price index during the time of military interventions and early election expectations respectively are significantly different from the mean increases of normal periods.(29)

Base price policy has always served for political gains; however it has carried especially a significant role during times of crisis. This fact is supported by the above tests, as well. The significance of base price policy as a stimulus for political support or vote

maximization is now well recognized. The political role of base prices became more important during times of crisis because of the imminent need for the support of the rural masses.

Politically determined base price means politically controlled prices received by farmers because of the oligopolistic nature of the market orientation, due to the uncertainty and imperfect knowledge of farmers. This subject will be crucial in the last chapter and thus explained in detail. Therefore, holding base prices low relative to industrial sector prices makes it easy to transfer income from or to agriculture. In certain years, however, it is noticed that by keeping base prices relatively low, the government caused income transfer to traders, not to industry. For those years, the CPI for agricultural commodities was high relative to the prices of the industrial sector, indicating an excess demand for agricultural commodities. However, by keeping base prices relatively low and thus helping to establish low prices which farmers receive in the markets, the government hindered income from being transferred to farmers as it would if the market were allowed to operate free from government intervention. Table 16 shows significant increases in the CPI over the price index, especially after 1976.

5. Base price policy to develop the agricultural sector as a market

In the 50s the most dominant theoretical discussion of development was about the role of the agricultural sector in establishing the framework for industrial development.[30] Agriculture was viewed simply as a self-sufficient sector that at the same time would be the supplier of surplus food, funds for capital formation, taxes and labor. Therefore, economic growth in less advanced countries depends heavily upon improving the performance of the agricultural sector, just as it did in the more advanced countries at earlier stages of their development.[31]

Before the planned period, the basic approach to the agricultural sector covered such aims as indicated as above. Base price policy between 1923 and 1950 was directed toward the middle farmer, to form the alliance with the newly marketized majority of the population. With base prices, the middle farmer stratum was protected against crisis and depression, and it was prepared as the producer of the necessary agricultural surplus in cereals; while at the same time policies were created enabling the transfer of this surplus to the state for purposes of industrialization.[32] The way this was done was by increasing the dependence of the middle farmer on the market with active price supports, but later on by reversing the determined prices by decree of the state.

The significance of the poorer farmers as potential political allies was recognized by a radical faction of the ruling Republican Party. A land reform bill was promoted to distribute land to poor farmers. It passed, but was ineffectual, tread on too many toes and eventually backfired. In 1950, the Democratic party took over. Its policy was not to become allies with the poor farmers, but to make poor farmers richer. Hence, various price policies were implemented with the purpose of transferring resources to agriculture. The political motive of such policies was to increase the welfare of the rural masses to make them faithful allies, to integrate subsistence farmers into the market economy to make them consumers of capital goods from the industrial sector, and to stimulate technological improvement by forcing farmers to exchange. As a consequence, the industrial sector got a strong stimulus for development, even with adversely developing terms of trade.(33)

The same policy was used in the 60s and the early seventies with different degrees of success. The base price policy of the early seventies was aimed at relieving problems of low demand for industrial products.(34) With the increase of the purchasing power of farmers through support purchases, there was a corresponding increase in the expansion of market for industrial products and increase in commercial activities.(35)

The base price policy during the late 70s changed considerably. Base prices were high in nominal terms in order to produce the political aim; however relative prices yielded a resource transfer from agriculture to industry. This was the major shift in Turkey against middle farmers in general. In the meantime, it was the initial signal indicating the shift in the power structure toward industrial farms from middle farmers.

CHAPTER IV

BASE PRICE AUGMENTED MACRO MODEL

1. introduction

In order to measure and evaluate the effects of government intervention through the price mechanism, it is necessary to set up a model which links policy variable to major macro variables such as production, consumption, and exports.

There are at least three ways in which base prices can be used to evaluate a country's system of domestic prices and to formulate policy recommendations. First, base prices can be used to evaluate the pattern of foreign trade in the light of its trading opportunities. Second, they can be used to evaluate productivity in agricultural production. Third, consumer prices and base prices can be compared to provide insights into the pattern of consumption forced upon the country by government market interventions.

In studying the agricultural market, we are interested in several kinds of actions that farmers take part in. To do this we need an analytical framework broad enough to recognize the relevance of available theory that can be applied in each case, and also to provide a way of taking

account of real life phenomena that will affect farmers' behavior.

The problem of looking at farmers' behavior with their decision-making process is complex. This complexity reflects many dimensions in farmers' limited ability to perceive, process and interpret information. Evidence shows that they cannot comprehend all the facts that are directed toward them. Values, attitudes and beliefs serve as a screen and make it more difficult for them to see the nature of reality.(1) Since they perceive all that there is to be known in their environment, farmers necessarily make decisions with the knowledge of the limited alternatives open to them.

Change is the most noteworthy of the dynamic world. The future will be different from the past or present. Thus change, with the limited ability to perceive, process and interpret information, leads to imperfect knowledge and imperfect foresight. Lack of perfect knowledge and foresight leads to uncertainty.(2)

2. Decision_making_under_uncertainty

Farmers are faced with the classical problem of decision making under uncertainty. They are two basic uncertainties: endogenous and exogenous uncertainties. The former is statistical (probabilistic); the latter is subjective uncertainty. Subjective uncertainty is con-

cerned exclusively with those variables whose probability distributions are unknown and cannot be empirically determined, such as wars, strikes etc.(3) Within this study we will deal only with endogenous uncertainties that farmers try to avoid.

The endogenous uncertainty that farmers must face comes from two sources. First, the economy is imperfectly known because it is complex and all the information that farmers need is not channeled toward them. Besides, the classical problems of inadequate education and bounded rationality are also among the sources of endogenous uncertainty. Second, the economy is subject to technological change and this has not been fully grasped by farmers. In addition to this, there are social, political and, most important, natural events that bring uncertainty for the future and affects farmers' decision about the level of production.

Given uncertain environment, farmers use a transformation function available from empirical observations to eliminate the true state of the world. As profit maximizers, their concern is to make necessary decisions about the level of output, given input prices with certainty and expected output prices in order to determine the expected profit which would accrue to them. In this study, it is assumed that uncertainty about the market price of output is reduced to a minimum by observing exogenous input prices and the base price announced by the government. The base

price adds strength to the expectation, removing an element of uncertainty. At each expected price, the amount supplied is likely to be greater if the price is supported than if it is not.[4]

3. The role of expectations and transformation function

Implicit in the definition of the supply function are the expected price of the product, its inputs and substitutes and complements in production. Measurement of the supply function for a specific time span is complicated by difficulty of measuring both expectations and their strength. If the support program were instrumental in establishing price, then farmers would be attentive to the prospective government program. Outlook information influences expectations.[5]

The selection of an appropriate expectation model involves implicit assumptions about farmers' level of knowledge and understanding of economic relationship. Farmers may recognize some of the important factors affecting product and input prices. But in formulating expectations, they may not go through the complex process of attempting to forecast these variables and assess their relative importance in establishing price. The magnitude of this undertaking may force even the best informed farmers to construct simple mechanistic expectation models.[6]

In general, such models utilize time series information. Price expectations are established as some function of present and past prices. In this study it is assumed that the government affects the farmer's expected price by signalling the base price which incorporates with the market price through the farmer's transformation function.

The farmer's transformation function, which links the exogenous base price and the farmer's expected market price to the market price is assumed to fit the following form: (7)

$$P_{ft} = \alpha + \beta Q_{ft} + \theta P^{*}_{ft} \quad \ldots\ldots\ldots \quad 4.3.1$$

where $P^{*}_{ft} = E(P_{ft})$ i.e., expected price of farmers at time t, and Q_{ft} = base price at time t, P_{ft} =market price at time t (prices received by farmers).

Since the expected price of farmers is not observable, we need to manipulate the above equation to get the farmer's expected price and consistent estimates of parameters α, β, θ.

By taking the expectation of equation 4.3.1,

$$E(P_{ft}) = P^{*}_{ft} = \alpha + \beta E(Q_{ft}) + \theta P^{*}_{ft} \quad \ldots\ldots\ldots \quad 4.3.2$$

and rearranging terms, the farmer's expected price function turns out to be

$$P^{*}_{ft} = \alpha / (1-\theta)\, Q^{*}_{ft} \qquad \ldots\ldots\ldots \quad 4.3.3$$

In order to estimate the parameters of this equation, we need to substitute equation number 4.3.3 into equation number 4.3.1. This substitution gives

$$P_{ft} = \alpha + \beta Q_{ft} + \theta \left(\alpha /(1-\theta) + \beta /(1-\theta)\, Q^{*}_{ft} \right) + \epsilon_{t} \quad ..4.3.4$$

The empirical test shows a high degree of autocorrelation between the base price at time t and the base price at time t-1.[9] Utilizing this information, an autocorrelation function for Q_{ft} in the first degree form is defined,

$$Q_{ft} = \rho Q_{ft-1} + u_{t} \qquad \ldots\ldots\ldots \quad 4.3.5$$

Taking the expectation of equation 4.3.5,

$$E(Q_{ft}) = Q^{*}_{ft} = \hat{\rho} Q_{ft-1} \qquad \ldots\ldots\ldots \quad 4.3.6$$

is obtained. Substituting 4.3.5 into 4.3.4, we get

$$P_{ft} = \alpha /(1-\theta) + \beta Q_{ft} + (\theta\beta /(1-)) \hat{\rho} Q_{ft-1} + \epsilon_{t} \quad \ldots\ldots 4.3.7$$

The farmer's expected price may easily be obtained, given the estimated parameters of this reduced form. Thus, the farmer's expected price function is

$$P^{*}_{ft} = \hat{a}_{0} + \hat{a}_{1} Q_{ft} + \hat{a}_{2} Q_{ft-1} \qquad \ldots\ldots\ldots \quad 4.3.8$$

where $a_0 = (\alpha/(1-\theta))$, $a_1 = \beta$, $a_2 = (\theta\beta/(1-\theta))\hat{\rho}$

Equation number 4.3.8 considers base prices to serve as signals which impart certain information to farmers in formulating their expectations about the true state of the world.

4. The formal treatment of aggregate supply function

We are primarily interested in the aggregate supply of agricultural products in a developing economy. In general, the production function for agricultural output can be written as

$$y = f(x_1, \ldots, x_m ; z_1, \ldots, z_n) \qquad \ldots\ldots\ldots 4.3.9$$

where x_i $(i=1,\ldots, m)$ is the i^{th} variable factor of production and z_j $(j=1,\ldots, n)$ is the j^{th} fixed factor and where the production function f has the usual desirable properties; i.e., it is monotonic and convex.

The profit function of farmers, per unit of time, is

$$\pi = P\, f(x_i ; z_j) - \sum_{i=1}^{m} w_i x_i \qquad \ldots\ldots\ldots 4.3.10$$

where P is output price and w_i is factor cost of i^{th} input. The cost of fixed factors is excluded, since according to the definition of profit, under profit maximization, they

do not effect the optimal combination of the variable inputs.[10] Given profit maximization, the value of the marginal product of each factor must be equal to the factor price:

$$P\, df/dx_i = w_i \qquad (i=1,\ldots,m) \qquad \ldots\ldots\ldots 4.3.11$$

Therefore, equation 4.3.11 can be solved simultaneously in the m variable factors of production to yield factor demand equations:

$$x_i^* = h_i(w_i/P\,;\, z_j) \qquad (i=1,\ldots,m;\ j=1,\ \ ,n) \ldots\ldots 4.3.12$$

where x_i^* is the optimal input of the i^{th} variable factor and h_i is a function of the factor prices and the fixed inputs. Substitution of 4.2.12 into 4.3.10 yields the profit function G^{11}, which relates the farmer's maximized profit π^* to the price of his fixed factors:

$$\pi^* = P\, G(w_i/P\,;\, z_j) \qquad \ldots\ldots\ldots 4.3.13$$

Then the supply function can be obtained by substituting 4.3.12 into 4.3.9; it is;

$$y^* = g(w_i/P\,;\, z_j) \qquad \ldots\ldots\ldots 4.3.14$$

where y^* is the optimum quantity supplied.

Let the production function be in the generalized Cobb-Douglas form in all inputs, when output y is related to inputs x_i and z_j by the following function:

$$y^* = \beta_0 \prod_{i=1}^{m} x_i^{\beta_i} \prod_{i=1}^{n} z_j^{\gamma_j} e^{bt} \qquad \ldots\ldots\ldots 4.3.15$$

where $\sum_{i=1}^{n} \beta_i < 1$ and b=the rate of neutral technical change. The constraint of $\sum \beta_i < 1$ is required, since constant or increasing returns in the variable inputs are inconsistent with profit maximization.(12)

The factor demand functions for the case of Cobb-Douglas technology have been obtained in Lou and Yotopulos(13) and in Zarembka.(14) They are

$$x_i^* = \beta_i (w_i/P)^{-1} A\, e^{(b/(1-v))t} \prod_{i=1}^{m} (w_i/P)^{-\beta_i/(1-v)} \sum_{j=1}^{n} z_j^{\gamma_j/(1-v)} \qquad \ldots\ldots\ldots 4.3.16$$

where $A = \prod_{i=1}^{m} \beta_i^{1/(1-v)}$ and $v = \sum \beta_i$ is the returns to scale to variable inputs.

Substituting this into the production function or using the duality approach,(15) we can obtain the supply function as

$$y^* = Ae^{(b/(1-v))t} \prod_{i=1}^{m} (w_i/P)^{-\beta_i/(1-v)} \prod_{j=1}^{n} z_j^{\gamma/(1-v)} \qquad \ldots\ldots\ldots 4.3.17$$

5. Base_price_augmented_supply_function_(BASF)

Let the production process, in which land, labor, capital and fertilizers are combined for the aggregate production of the nation's agricultural sector, exhibit Cobb- Douglas technology. Then the aggregate production function can be written as

$$y = K_a L X_{nf} Z e^{bt} \quad \text{..... 4.3.18}$$

where t = time

b = technical change

K = Capital (tractors)

L = Labor

X_{nf} = Fertilizers

Z = Land

Considering the class of production functions given by Cobb- Douglas technology with the strong assumption that $\sum_{\beta_i} < 1$, i.e., it exhibits decreasing return to scale technology, input demands functions which maximize profit, as follows:

$$K_1^* = A e^{(b/1-v))t} (R_a/P_f)^{-\beta_1/(1-v)} (w/P_f)^{-\beta_2/(1-v)} (P_{nf}/P_f)^{-\beta_3/(1-v)} Z^{\gamma(1-v)} \quad \text{..... 4.3.19}$$

$$L_2^* = A e^{(b/(1-v))t} (R_a/P_f)^{-\beta_1/(1-v)} (w/P_f)^{-\beta_2/(1-v)} (P_{nf}/P_f)^{-\beta_3/1-v)} Z^{\gamma(1-v)} \quad \text{..... 4.3.20}$$

$$X_{nf} = A\, e^{(b/1-v))t}\,(R_a/P_f)^{-\beta_1/(1-v)}\,(w/P_f)^{-\beta_2/(1-v)}\,(P_{nf}/P_f)^{-\beta_3/(1-v)}\,Z^{\gamma(1-v)} \quad \ldots\ldots\ldots 4.3.21$$

where $v = \sum_{i=1}^{3} \beta_i$; K^* = profit maximizing capital demand; L^* = profit maximizing fertilizers demand; R_a = rate of interest; w= wage rate; P_{nf} = price of fertilizers; P_f = price received by farmer ; Z = area sown.

By substituting input demand functions into production function, the market price augmented supply function is obtained, and it is formulized as follows:

$$Y_a = A(R_a/P_f)^{-\beta_1/(1-v)}\,(w/P_f)^{-\beta_2/(1-v)}\,(P_{nf}/P_f)^{-\beta_3/(1-v)}\,Z^{\gamma(1-v)}\,e^{(b/(1-v))t} \quad \ldots\ldots\ldots 4.3.22$$

where Y_a =agricultural output.

The above concepts of profit maximization and of supply function are unambiguous within the deterministic framework of the model postulated by economic theory. They need more delicate interpretation when uncertainties about both production and price are introduced.(16)

In our model it is assumed that farmers maximize the mathematical expectation of profit, input prices are known with certainty and output price is statistically independent of the production function disturbance, with

expectation P_f^* and $P_f^* = E(P_f) = p(Q)$.

Under these assumptions, the farmer's expected profit is

$$E(\pi) = p(Q)\, E(Y_a) - \sum_{i=1}^{3} P_i X_i \qquad \ldots\ldots\ldots 4.3.23$$

where P_i price of i^{th} input, and X_j j^{th} input. In our case $i,j = 1,2,3$.

6. Agricultural demand function and response to base price changes

On the supply side it is assumed that farmers respond to base prices efficiently and quickly by transforming information obtained from the government into their expected market price. The expected market price enters into their decision-making process, and performs a crucial role in determining the level of output.

Realized output creates the agricultural income of that sector, and induces income flows in the whole economy. Thus, it may well be argued that base prices affect the pattern of aggregate demand by inducing income flows in the economy and stimulating the level of output in agricultural sector. To trace the aggregate effects of such inducements on the demand side, income flows must be analyzed.[17]

$Y_{acd_{ef}}$, is essentially determined by the market price, and the level of output, X_f, given the exogenous input

prices of capital, labor, and fertilizers.

$$Y_{ac} = d_{ef}\, X_{f} \qquad \ldots\ldots\ldots \quad 4.6.1$$

Equation 4.6.1 defines value-added income in the sector.

The second group of income earners in the economy consists of laborers. Wage income, Y_{wp}, at the aggregate level, can be set up as a linear function of agricultural and industrial incomes, since the level of incomes in both sectors are the major determinants of the labor demand in the economy as a whole. Thus, assuming wages are exogenous, wage income can be expressed as a function of incomes in the agricultural and industrial sectors. This relationship can be formulated in a linear form as follows:

$$Y_{wp} = a_{30} + a_{31}\, X_{nc} + a_{32}\, Y_{ac} \qquad \ldots\ldots\ldots \quad 4.6.2$$

The third class of income flows to profit earners. It is the mark- up income, Y_{z}, in the industrial sector, which can be set up as a unique function of wage income; it is

$$Y_{zp} = a_{41} + a_{42}\, Y_{w} \qquad \ldots\ldots\ldots \quad 4.6.3$$

Equations 4.6.1, 4.6.2, 4.6.3 allow us to specify total expenditure or aggregate demand function in the economy in the following form,

$$G_{np} = a_{51}\, Y_{wp} + a_{52}\, Y_{zp} \quad a_{53}\, Y_{ac} \qquad \ldots\ldots\ldots \quad 4.6.4$$

In the two-sector economy, the cost of acquiring the base consumption levels, B, of agricultural and industrial products, i_f and i_{nf} respectively, is defined as

$$B = \theta_c d_f + \theta_n d_{en} \quad \ldots\ldots\ldots \quad 4.6.5$$

where d_{en} is the price of industrial production.

Aggregate demand above the base level, $(G_{np} - B_c)$, is split between the two sectors, according to the marginal budget shares m_f and m_{nf}. Determination of the consumption function of the two sectors above the base level is as follows:[18]

$$C_f = \theta_f + (m_f / d_f)(G_{np} - B_c) \quad \ldots\ldots\ldots \quad 4.6.6$$

$$C_{nf} = \theta_n + (m_n / d_{en})(G_{np} - B_c) \quad \ldots\ldots\ldots \quad 4.6.7$$

Substituting 4.6.5 into 4.6.6 and 4.6.7, we can simplify agricultural and industrial consumption functions. They are

$$C_f = a_{70} + a_{71} G_{npf} - a_{72} R_{en} \quad \ldots\ldots\ldots \quad 4.6.8$$

where $a_{70} = m_n \theta_n$, $a_{71} = m_f$, $a_{72} = m_n \theta_f$,
$G_{npf} = G_{np} / d_{ef}$, $R_{ef} = d_{en} / d_{ef}$

$$C_n = a_{80} + a_{81} G_{np} - a_{82} R_{en} \quad \ldots\ldots\ldots \quad 4.6.9$$

where $a_{80} = (1-m)\theta$, $a_f = m$, $a_{81} = m\theta$, $a_{82} = m_f$
$G_{npn} = G_{np}/d_{ef}$, $R_{en} = d_{ef}/d_{en}$

Up to this point the foreign sector is ignored. In order to see the base price effect on trade the following identity is introduced.

The Turkish economy is charecterized as an agricultural surplus economy. Even though productivity in agriculture is low, and inefficient and less developed agricultural technology is in effect, more food is produced than the country's subsistence demand. The surplus agricultural production which is subjected to export, E_x, can be defined as

$$E_x = Y_{ac} - C_f \qquad \ldots\ldots\ldots 4.6.10$$

By exporting agricultural surplus, a base for imports of industrial semi-manufactured goods is established. Assuming there is no hardship exporting agricultural surplus as a small country with high world food demand due to insufficient supply of food, Turkey may hasten the country's economic development by increasing the size of agricultural surplus.

7. Statistical inference

Goldberger defines econometrics as a social science in which the tools of economic theory, mathematics, and statistical inference are applied to the analysis of econo-

mic phenomena.[19] On the other hand, Theil's view of econometrics is as the empirical determination of economic laws.[20] Definitional approaches to the art of econometrics along these lines are common in the economic literature.

Besides improvements in data collecting, use of computers, and estimation techniques, the task of the econometrician is to seek good results to provide basic evidence in identifying, clarifying, or verifying problems encountered in economic theory. Good results depend basically on the art of the econometrician, which, in the words of Malinvaud, is to find the set of assumptions which is both sufficiently specific and sufficiently realistic to allow him to take the best possible advantage of the data available to him.[21]

One other task of the econometrician is to fit the econometric methods in current use to the needs of economic policy.[22] When our concern becomes economic policy, two important aspects of the real policy-making problem need to be recognized. They are the high degree of uncertainty resulting from random events and the nature of the decision-making process.[23] The uncertainty that decision makers must face comes from two sources. First, the system is not perfectly known, it is complex and its basic structure is not well defined. Second, it is subject to unexpected random technological, political, and natural events. The former is among the exogenous uncertainties, the

latter is among the endogenous uncertainties. Thus a policy maker in order to affect economic events, faces classical problem of decision making under uncertainty.(24)

Our purpose in this study is to contribute to the decision process by making conditional forecasts of the outcomes of the alternative courses of action which are taken by the government by announcing base prices in the area of agriculture. For this purpose, we will discuss the estimation process and the econometric properties of our base price augmented agricultural model in the remaining part of this chapter concerned with endogenous uncertainties.

7.1 A formal investigation

In econometrics our main concern is statistical inference. Descriptive statistics is relevant only as statistics which summarizes various characteristics of the data, such as averages, measures of dispersion, etc. In statistical inference such characteristics related to a population are also used. However, the two are different and the difference lies in the fact that in the field of descriptive statistics such measures represent ends in themselves, but in statistical inference they are only means in the process of inquiry.(25)

Statistical inference is concerned with generalizations

or simplifications, as we put it, about the population on the basis of information provided by a sample. Such a procedure is frequent in everyday life. For instance, we make generalizations on the life expectancy of a person, given his sex, age, etc., on the basis of our past experience. In statistical inference this is done in a more scientific way because the way in which the sample is selected is also taken into account, and generalizations are expressed in specific probability terms.(26)

In general we are not interested in knowing everything in a population, but are concerned with only some of its characteristics, which we call parameters. The purpose of sampling and statistical inference is to make judgments about population parameters. These judgments are guesses endowed with a specific degree of reliability and they can be of two types. One is concerned with the estimation of parameter and the other with testing some hypothesis about it. Judgements in the form of hypothesis testing involve an a prior assumption about the value of a parameter. If the sample information provides evidence against the hypothesis, the hypothesis is rejected, otherwise, it is accepted. The evidence provided by the observations in the sample is for the purpose of hypothesis testing, summarized in the form of a test statistic. This is then used in arriving at a conclusion concerned with the hypothesis.

We face a serious problem with regard to hypothesis

testing. It is whether to accept a false hypothesis instead of a true one. Blaug, arguing about the dark spot of statistical inference, states that if we are worried about the danger of accepting false hypotheses, we raise the level of significance at which we screen hypotheses, in consequence of which we will also end up rejecting some true hypotheses; on the other hand, if we are worried about the danger of rejecting true hypotheses, we lower the level of significance and that means we will accept some false hypotheses.(27) Therefore,one may well argue that the cutoff point where we begin accepting hypotheses is entirely arbitrary and depends upon our normative judgements. Thus, resting on solely statistical hypotheses, testing for the purpose of validation exercise does not produce conclusive results from the point of Blaug's dilemma about making a type two error.(28)

To reduce the destructive effect of such an error, one may suggest testing a model from the standpoint of predictive power. If a model predicts economic events accurately, a set of relations depicted within a model structure is said to be unassailable only within the sample period in which parameters of the model structure are estimated.(29) A mode ,predicting economic events properly does not mean that the model subject to our concern is valid beyond the sample period, since a proper model needs to predict economic events that we are concerned with experiments. Yet, the science of economics has no proper

laboratory to make such experiences for validation exercisis.

In this study our model is kept limited within the sample period of 1962-1980. Therefore, our simulation exercise will be bounded with the set of information which sample period carries.

From the point of statistical inference, the problem of estimation carries considerable similarities to hypotheses testing, since both are concerned with questions of some unknown population parameter. However, in estimation, unlike in hypothesis testing, we make no prior claims about the credibility of the parameter.

The problem of point estimation is that of producing an estimate that will represent our guess about the value of the parameter. An estimator, O, is commonly considered to be desirable, or we may say a best guess, if it satisfies the following properties:

A) For small samples:

1. $\hat{\theta}$ is an unbiased estimator of θ,

2. $\hat{\theta}$ is an efficient estimator of θ,

3. $\hat{\theta}$ is a best linear unbiased estimator of θ.

B) For large samples:

1. $\hat{\theta}$ is an asymptotically unbiased estimator of θ,

2. $\hat{\theta}$ is consistent estimator of θ,

3. $\hat{\theta}$ is an asymptotically efficient estimator of O.

(30)

Having defined the desirable properties of an estimator, we need to depict a technique to generate estimates which carries the desirable properties mentioned above. The appropriate technique which we may adopt depends upon maintained assumptions about residuals or disturbance term u_i. There are two possible ways of rationalizing the insertion of the u_i term in a functional relationship. First, in explaining human behavior the list of relevant factors may be extended infinitely. Many of the factors, however, will not be quantifiable: and even if they are, it is not usually possible in practice to obtain data on all of them. Even if we can do that, the number of factors is still almost certain to exceed the feasible number of observations, so that no statistical means exist for estimating their influence. Moreover, many variables may have very slight effects, so that even with substantial quantities of data, the statistical estimation of their influence will be difficult and uncertain.(31) In this case disturbance u represents the net effect of the excluded variables. It is well known that such an assertion about residuals creates difficulties in estimation, and downgrades the reliability of an estimator because the existence of an omitted variable or excluded variable creates bias and worst of all, inconsistency in estimating parameters.(32)

A second justification for the presence of a disturbance term is to assume that in the total effect of all

relevant factors, there is a basic and unpredictable element of rondomness in human responses which can be adequately characterized only by the inclusion of a random variable term.[33]

The initial specification of the relationship needs to include some assumptions about the probability distribution of the disturbance term. Usual assumptions about disturbance term or residuals are as follows:

1. $E(u_i / X_i) = 0$ for all i.
2. $Cov(u_i, u_j) = 0$ for all $i \neq j$
3. $Var(u_i / X_i) = \sigma^2$
4. $Cov(u_i, X_i) = 0$

The first assumption states that the conditional expected value of u_i, conditional upon the given X_i, is zero. That is, the average or mean value of the residuals corresponding to any given X_i should be zero. The assumption postulates that the disturbances u_i and u_j are uncorrelated. Technically, this assumption is known as the assumption of no serial correlation, or no autocorrelation. The third assumption represents the assumption of homoscedasticity, or equal variance. Assumption 4 states that the disturbance u and the explanatory variable X are uncorrelated. Assumption four is automatically fulfilled if the X variable is non random or nonstochastic.[34] The assumption that the residuals u_i are normally distributed is needed to make confidence interval statements and to apply the test

of significance[35] for finite samples. However, assymptotically valid tests do not require specific distributional assumption about the residuals.

Once we ensure that the residuals of an equation satisfy the above assumptions, the technique which is known as OLS (ordinary least squares) provides desirable estimates of the parameters subject to investigation.

OLS technique is applied only to a single equation in isolation from a larger economic model. For example, the demand equation for a particular commodity is typically one in a system of equations that determines the equilibrium price and quantity in the market for that commodity; the economic model for a market will generally include a demand equation, a supply equation, and an equation describing the equilibrium process in the market.[36] Under certain circumstances, regular OLS technique no longer gives consistent estimators.[37] When our concern is focused upon simultaneous equations models, we need to investigate different methods of estimation to obtain reliable estimates of structural parameters.

In econometric literature, simultaneous equation estimators are classified under two categories: One of them is the so-called single equation methods, the other one is system methods. In a single equation methods we estimate each equation separately, using only the information about the restrictions on the coefficients of that particular

equation. The restrictions on the coefficients of the other equations are not used. In the system methods we estimate all equations jointly, using the restrictions on the parameters of all equations as well as the variances and covariances of the residuals.

The most commonly used single-equation methods are OLS (ordinary least squares), ILS (indirect least squares), 2SLS (two-stage least squares), and LIML (limited-information maximum likelihood). Besides those, 3SLS (three-stage least squares) and FIML (full-information maximum likelihood) methods are among the system estimation methods.[38]

All simultaneous equation estimation methods discussed here except OLS[39] have some desirable asymptotic properties. These properties become effective in large samples. Unfortunately, our knowledge in the small sample properties of these estimators is not complete. Most of the evidence on the small sample properties of the simultaneous equation estimators comes from sampling (i.e., Monte Carlo) experiments.[40] The essence of MOnte Carlo study is that various sets of parameter values are specified for postulated distributions underlying a model; repeated numerical drawings from the resultant distribution generate a large number of samples of finite size. Various estimating techniques are applied to these samples, and the sampling distributions of the estimates are studied in relation to

the true value of the parameter and to theoretical expectations about asymptotic distributions.[41] The results are conditional on the numerical values used to generate the samples, but a range of such studies can build up valuable information.

Among the empirical studies, general agreement can be found on the question of bias. The OLS estimates display the greatest finite sample bias, but the means of the sampling distributions are not usually significantly from the true values.[42] The evidence about OLS bias is not in complete agreement. Quandt's study, for example, found that OLS bias is almost invariably less than the 2SLS bias when there is substantial multicolinearity among the exogenous variables.[43] Cragg, on the other hand, considered six different degrees of colinearity in the exogenous variables and found that OLS is badly biased, even though multicolinearity is present.[44] His results suggest that multicolinearity can produce a substantial increase in the bias of the consistent estimators, as well. More important, however, the danger of using OLS estimators in a simultaneous-equation context arises in hypothesis testing. Because the sampling distribution of the OLS estimator is centered around a biased expectation, rather than the true value of a parameter, there is a risk of making incorrect inferences.[45] HOwever, it is known that inference procedures producing consistent estimators work reasonably well.

The state of current knowledge on the various structural coefficient estimators is well summarized in Cragg's study. Cragg studies OLS, 2SLS, UBK (k-class estimator), LIML, 3SLS and FIML, and makes the following arguments about the performance of mentioned procedures. Given the small differences among the estimators and the variability in the relative performances, OLS is usually the poorest method and 3SLS and FIML are better than 2SLS, UBK, and LIML. In most cases, differences in the central tendencies of the distributions of consistent estimators from the true values of the coefficients were not very serious, but large disturbances and multicolinearity could change this conclusion. On criterion, FIML and LIML seemed slightly superior to other methods. The differences of its medians from the true values is a serious problem for OLS. This feature, rather than wide dispersions, is the reason for the poor rankings of OLS. It weighted more heavily against OLS when larger samples were used. Cragg concludes that the use of the standart errors of the consistent methods would lead to reliable inferences, but this was not always the case. The standard errors of OLS were not useful for making inferences about the true values of the coefficients. (46)

The experiments performed give no clear guidelines for the choice of an estimator for econometric models. The results suggest that, because the consistent estimators do not differ greatly and their relative performances are sensitive to the data and structure studied, 2SLS may well

be the best estimator to choose, since it is the cheapest and easiest method to compute.(47) The Nager study also shows that 2SLS has the smallest bias in all cases, and the asymptotic standart errors of two stage least squares give a rather satisfactory picture of the variability of the estimates about the true value.(48) This is not true for least squares in all cases considered.

7.2 Stochastic specification and estimation

When econometric models are correctly specified, statistical theory provides well defined procedures for obtaining point and interval estimates and evaluating the performance of various linear and usually unbiased estimators.(49) However, uncertainties usually exist about the stochastic specifications underlying the econometric model. In this section, disturbance term will be introduced to the model and be specified with the underlying assumptions upon it.

Specifying the production function in agriculture, we have selected a production function which represents a Cobb- Douglas form. Zellner, Kmenta, and Drèze have found that classical least squares provides consistent estimators of the parameters of the Cobb-Douglas production function. With the normality assumption, these parameters are also unbiased and maximum-likelihood estimators.(50) Since base price augmented supply function is also in Cobb-Douglas form, due to duality between production and cost functions,

it can be estimated by least square technique, assuming that farmers maximize the mathematical expectations of their profit, input prices are known certainty and the output price is statistically independent of the supply function disturbance with expectation P_f^*. The later assumption is reasonable because of disturbance-representing factors such as weather and any kind of unpredictable variations.(51) The base price augmented supply function relates a farmer's profit-maximizing supply of output to the variables that can be considered exogenous to his decisions. Thus following Zellner, Kmenta, and Drèze, the least square technique is found to be appropriate to estimate unknown parameters of the base price augmented supply function.

Stochastic specification of the demand side equations are relatively easy. It is assumed that every equation contains an additive error term representing uncertainty concerning random causes on dependent variables. Disturbances are assumed to be uncorrelated with the disturbance of base price augmented supply function. Furthermore, it is assumed that they are nicely behaved. On the demand side, unknown parameters are estimated by employing two-stage least square procedure to every equation of the model. Since all equations are overidentified by exclusion restrictions, 2SLS estimates are consistent and asymptotically equal to LIML.(52)

8. The aggregate model

The complete system of equations, constructed from the guidelines established in this chapter is set out below. The logarithmic form of related variables is represented by the letter Z.

Stochastic equations of the model:

$$PF = a_{10} + a_{11} QF + a_{12} QF(-1) + u_1 \quad \ldots\ldots\ldots \quad 4.8.1$$

$$ZYA7 = a_{20} + a_{21} ZW + a_{22} ZPXRA + a_{23} ZPNF + a_{24} ZASV + a_{25} TT + u_2 \quad \ldots\ldots\ldots \quad 4.8.2$$

$$YWP = a_{30} + a_{31} XNC + a_{32} YAC + u_3 \quad \ldots\ldots\ldots \quad 4.8.3$$

$$YZP = a_{40} + a_{41} YWP + u_4 \quad \ldots\ldots\ldots \quad 4.8.4$$

$$GNP = a_{51} YWP + a_{52} YZP + a_{53} YAC + u_5 \quad \ldots\ldots\ldots \quad 4.8.5$$

$$CF6 = a_{60} + a_{61} GNPF + a_{62} REF + u_6 \quad \ldots\ldots\ldots \quad 4.8.6$$

$$CN6 = a_{70} + a_{71} GNPN + a_{72} REN + u_7 \quad \ldots\ldots\ldots \quad 4.8.7$$

Identities and definitional equations:

$$W = W7/PEF \quad \ldots\ldots\ldots \quad 4.8.8$$

$$PNF = PN7/PEF \quad \ldots\ldots\ldots \quad 4.8.9$$

PXRA = RA/PEF 4.8.10

YAC = DEF*YA7 ..... 4.8.11

GNPF = GNP/DEF 4.8.12

GNPN = GNP/DEN 4.8.13

CN6 = CN/DEN 4.8.14

CF6 = CF/DEF 4.8.15

REN = DEF/DEN 4.8.16

REF = 1/REN 4.8.17

EX = YAC - CF 4.8.18

Endogenous variables in the system of equations are YWP, YA7, YZP, GNP, CF6, CN6, YAC, PF, EX; and predetermined variables are QF(-1), QF, W7, PN7, RA, DEF, PEF, DEN, ASV, XNC, TT.

8.1. Alphabetical list of symbols

ASV ..... Area sown (10^3 hectares)

CF ..... Domestic agricultural consumption (105TL.) by current prices.

CF6 ..... Agricultural consumption normalized by agricultural prices (by 1974 prices)

CN ..... Domestic industrial consumption by current prices (10^5 TL.).

CN6 ..... Industrial consumption normalized by

industrial prices (by 1974 prices).

EX ..... Exports by current prices.

GNP ..... Gross national product by current prices.

GNPF ..... GNP normalized by agricultural prices.

GNPN ..... GNP normalized by industrial prices.

PF7 ..... Prices received by farmers (1974=100).

PN7 ..... Price of fertilizers (1974=100).

PNF ..... Price of fertilizers normalized by farmer's expected prices.

PXRA ..... Interest rate normalized by farmer's expected prices.

PEF ..... Farmer's expected prices (1974=100).

QF ..... Base price index (1974=100).

QF(-1) ..... Base price at time t-1.

REF ..... Relative price of agricultural products.

REN ..... Relative price of industrial products.

RA ..... Real interest rate.

TT ..... Time trend

W ..... Average wages.

W7 ..... Wage index (1974=100).

XNC ..... Industrial production by current prices.

YA7 ..... Agricultural production by 1974 prices.

YAC ..... Agricultural income by current prices.

YWP ..... Wage income by current prices.

YZP ..... Mark-up income by current prices.

DEF ..... Agricultural price index (1974=100).

DEN ..... Industrial price index (1974=100).

Theoretical analysis in economics inevitably contains a causal sequence which links economic events to certain activities. In economic theory we find different causal sequences which are suggested by various economists as an ideal type. Those causal links require different policies and social actions to produce desired results.(53) In this study we have developed a simple macro economic model to depict the causal link between the government-announced base price and the major aggregate variables of the economy. The scheme of this causal sequence is given below.

The starting point of our model is the base or support prices. On the supply side, base price is seen as a unique determinant of the farmers expected price in the market.(54) Assuming there is no change in input prices, any change in base prices produces a parallel change in farmer's expected prices. Therefore, the optimum level of factors which are to be used in production will change. Thus it can be argued that base prices are the major determinant of the level of output in the agricultural sector within the framework of our model, holding all exogenous factors constant.

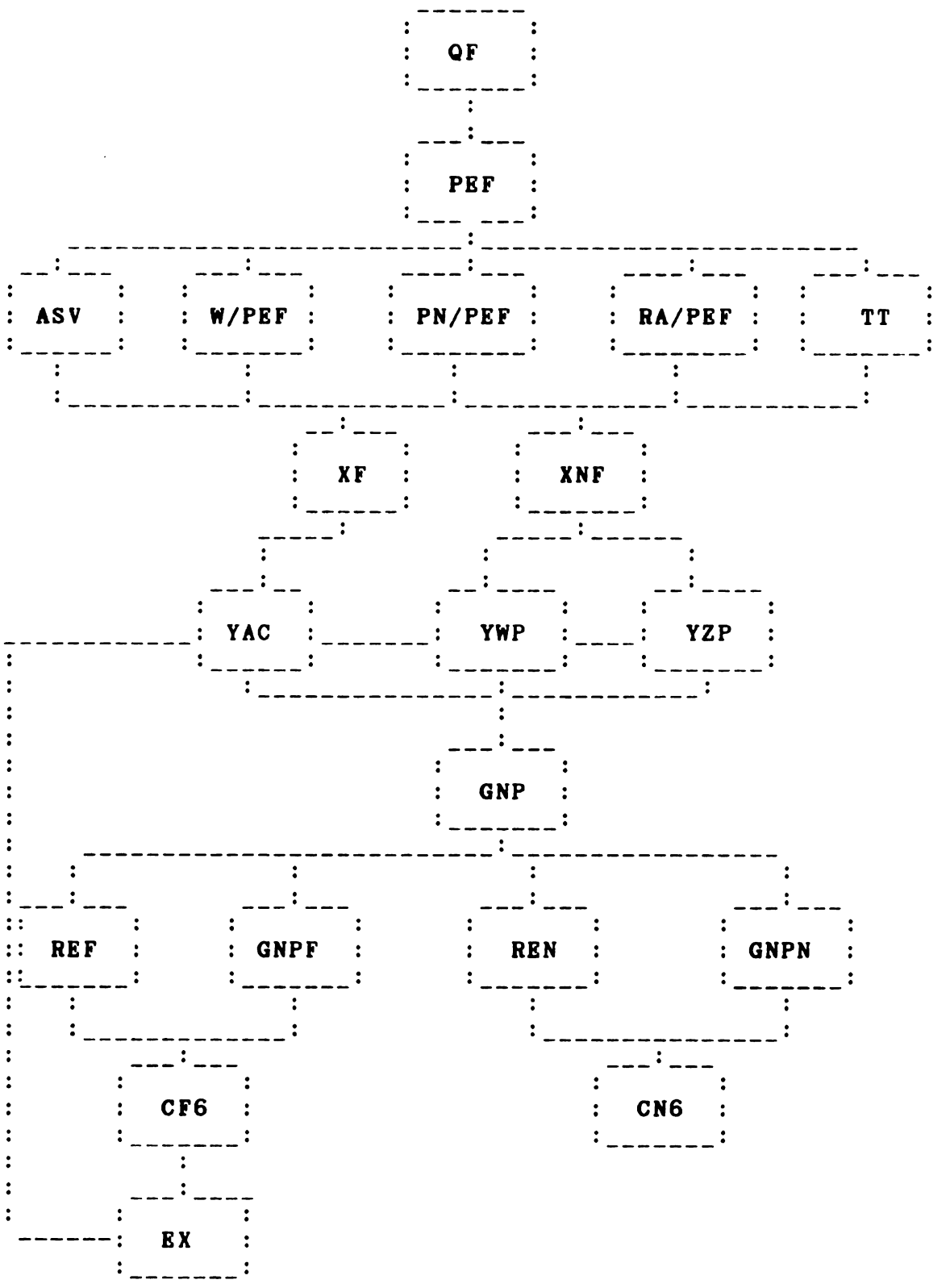
Once a decision has been made about the level of production, the amount of output which is harvested will determine income in the agricultural sector, given the exogenous market price of output. Agricultural income, together with industrial output, regulate the volume of wage income, and thus the volume of mark-up income. Since aggregate demand is set up among all these income earning groups, base price level impact on aggregate demand occurs as a consequence, and thus on the domestic level of agricultural and industrial demands.

Up to the this point we have argued that the major impact of base prices is seen not only on the supply side alone, but on the demand side as well. We have shown that this effect stemmed from the scheme of income flows of the economy. Since base price affects both the level of output and the level of consumption in the agricultural sector and the level of consumption in the industrial sector, it determines both sector's deficits or surpluses as well. A developing country's objective is to cover its deficit by trading its surplus output in foreign markets. Defining such an objective function for a representative country, we can carry base price policy impact on country's balance of trade as well, as depicted in our model.

The causal sequence proposed here makes it possible to trace the impact of base price policy change on major macroeconomic variables as indicated above. To validate

our model, we have applied it to the Turkish economy, in which base price policy has been used as an effective policy instrument by the Turkish government for a long period of time. Our estimation period is between the years of 1962 and 1980.

8.2. Causal formulation of the model



8.3. Estimated form of the stochastic equations

PF = -.0048 + .831 QF + .255 QF(-1) 4.8.3.1
-.178 19.03 2.77

R^2 = .998 DW = 2.50 F (2, 15) = 3257.39

ZYA7 = -4.973 - .104 ZW - .002 ZXRA - .719 ZNF +
- .276 - .927 - .145 -1.072

.481 ZSV +.027 TT 4.8.3.2
.257 2.702

R^2 = .935 DW = 1.75 F (5, 13) = 37.61

YWP = - 615.309 + .0017 XNC + .023 YAC 4.8.3.3
- .137 .133 1.822

R^2 = .968 DW = 1.39 F (2, 16) = 241.08

YZP = 8272.85 + 1.588 YWP 4.8.3.4
1.785 21.537

R^2 = .967 DW = 2.67 F (1, 17) = 496.37

GNP = 144.704 YWP - 104.741 YZP + 5.290 YAC 4.8.3.5
2.276 4.164 2.331

R2= .968 DW = 2.80

CF6 = 685561 + .109 GNPF - 147766 REF 4.8.3.6
6.425 8.298 - 1.868

R^2 = .840 DW = 1.56 F (2, 16) = 41.91

CN6 = - 44071.1 + .292 GNPN - 130552 REN 4.8.3.7
- 1.227 43.249 - 2.436

R^2 = .995 DW = 1.96 F (2,16)= 1692.97

8.4 Result of the structural estimation

The base price augmented macro model consists of eighteen equations, eleven of which are identities or definitions. Definitions explain the deflated value of input process, agricultural value added (measured by current prices) and exports.

The results of the structural estimation are provided. Each functional relationship is assumed to be linear in parameters. The model as a whole achieves a sound level of statistical significance, as evidenced by the associated t values of the estimated parameters reported under them. The signs of all parameters appear to be reasonable in terms of a prior expectations. However, there is an indication of malticolinearity in equation 4.8.3.2. Since it is not a problem for prediction, (55) coping with it is found irrelevant from our considerations.

By simulating the model during the period for which historical data for all variables are available, a validation test is performed. The comparison of the original data series with the simulated series for each endogenous variable presents a good match for real world behavior. Therefore, the performance of the model in the historical run can be utilized as a supporting argument in the

validation.

The summary statistics for each endogenous variable are introduced on the Table 18, and the related graphics for the historical run are in appendix.

TABLE 18. RESULTS OF HISTORICAL SIMULATION

(SUMMARY STATISTICS)

Endogenous variable	R	RMS error	Mean absolute error	Mean error
PF	.9987	.0548	.0340	.1729E-05
YA7	.9627	.0431	.0351	.3046E-02
YAC	.9996	.7587E 05	.4645E 05	.1334E 05
YWP	.9855	9372	5786	427
YZP	.9595	.2529E 05	.1406E 05	1062
GNP	.9982	.6312E 06	.5300E 06	.1021E 06
CF6	.9115	.1047E 06	.7925E 05	.5101E 05
CN6	.9927	.2189E 06	.1970E 06	.1051E 06
EX	.9753	.6714E 05	.5230E 05	-5683

CHAPTER V

POLICY SIMULATION

1. Introduction

In the previous chapters, particularly Chapters III and IV, base prices announced by the government were discussed as a major determinant of agricultural output. The doctrine that farmers in developing countries respond pervasively to changes in prices is the a prior hypothesis maintained for the supply side of the model.(1)

The general debate over supply responsiveness has been reviewed. In our model the supply responsiveness was founded on base price rather than market price because of the presumption that farmers prefer certainty over uncertainty in real life.(2) In reality, there is no discernible difference between the farmer's price and the base price in general.(3) This is because of the fact that the buyer's market is imperfect and it is inefficiently organized, where the government, being the major purchaser, has the power to impose its price as the true market price. Therefore, base price change positively affects the level of output; and this can be justified on theoretical ground, and it has been justified empirically in the literature.(4)

Once the level of output is determined, given the price

received by farmers, it determines the large proportion of agricultural family expenditures. Therefore, the effects of base price policy spread through out the economy by effecting income flows and thus demands for agricultural and industrial goods.

The income effect induced by the government intervention in the agricultural sector is traced in the model developed. The basic purpose of this chapter is to trace the economic consequences that would have resulted from changes in the base price policy. The policy analysis consists of two sets of counterfactual simulations. The first one is to trace the economic consequences of the world market price of agricultural products by assuming that the government is able to predict it consistently and replace it by the base price to eliminate or to reduce domestic market uncertainty. The second one is to trace the policy outcome resting upon the assumption that the government increases base price as much as the increase in the industrial sector price; that is to say, that government policy is aimed toward keeping relative prices constant.

2. Base run price policy

The sample period investigated has been divided into four subperiods. Subperiods reflect a change in government policy toward agriculture in Turkey.

Between 1963 and 1969, farmers were protected against world-wide low prices of agricultural goods. The average level of protection measured by the percentage deviation from the world market price is about 3.7 percent. The level of protection in this period varied between .7 percent and 6.9 percent. Despite protection, the farmer's relative well-being in the domestic market was weakening because of the increase in the relative prices in favor of the industrial sector. In fact, the industrial sector price increased 12.3 percent above the increase in the base price.(5) Therefore, it can be said that farmers did not utilize fully the benefit of the price protection against the world market because farmers were left unprotected in the domestic market. Such a policy was the result of the import substituting strategy of the development plan.

The period between 1970 and 1974 showed a shift in the agricultural support policy by which it weakened the farmers' position further in the domestic and in the international market. In this period the base price was set 31.3 percent below the level of the world market on the average. Such a policy was aimed toward increasing the market share of Turkish agricultural goods by increasing their competitiveness in the world market. Therefore, farmers did not utilize the benefits of the world market price because of the restricted price policy of the government.(6) Industrial prices, on the other hand, were 20.1 percent above the level of the base price

In the years 1975-1977, the government pursued a support policy comparable to the policy implemented during the period of 1963-1969. The basic impetus of the policy pursued was again to protect farmers against low international market prices, but not to protect them in the domestic market against the industrial sector. Therefore, the spirit of the policy was to transfer income from agriculture to industry in order to stimulate industrial sector growth.

Base price was increased by 9.6 percent on the average between 1975 and 1977 and an increase yielded 7.4 percent protection against world markets. On the other hand, relative prices changed in favor of farmers at the margin. The years after 1977 witnessed high inflation and more important than that, political turmoil which damaged the productive capacity of the industrial sector. The base price, on the other hand, increased by 59.2 percent on the average until 1980. Such an increase may seen remarkably high, considering the previous period's averages. However, it was still 25.7 percent below the industrial price. Therefore, the increase in base price was only in money price and basically was aimed to gain the political support of the rural population. Thus farmers were again protected unfavorably in domestic and international markets.

3. Simulation results

The economic consequences of the two alternative base price policies were evaluated by comparing the outcomes of the alternative scenarios, scenario 1 and scenario 2, with the base run. Scenerio 1 is the case where the base price matched the world market price, and scenario 2 is the case where the base price matched the industrial price increase. Therefore, scenario 1 assumed no protection against the world market and this reflects the government behavior, which placed greater reliance on the market forces. It is a basic policy shift to use market incentives rather than protection.

Scenerio 2 assumed corective action taken by the government in favor of the agricultural sector by determining the base price to keep the relative base price constant. It is a policy aimed to establish a planned balance between sectors in order to divert the inflationary effects of an import-substituting policy.(7)

The analysis presented is based upon projections of the model developed in this study. It is important to remember that all model results are conditional upon the specific base price scenarios and the value of exogenous variables in the base case that are being used.

TABLE 19. PERCENTAGE DEVIATION OF THE FARMER'S EXPECTED PRICE FROM THE BASE RUN

(in percent)

Years	Scenario 1		Scenario 2	
1963	- 2.5		7.8	
1964	- 4.3		9.4	
1965	- 6.8		8.5	
1966	- 1.7	-3.8 **	12.6	11.94
1967	- 4.5	(1.7)	15.3	(3.38)
1968	- 2.6		16.2	
1969 *	- 2.6		13.8	
1970	13.2		15.2	
1971	30.4		19.2	
1972	38.7	30.24	30.8	19.94
1973	62.2	(22.02)	31.3	(11.73)
1974	6.7		3.2	
1975	- 8.1		1.6	
1976	- 7.7	-7.6	3.7	6.7
1977	- 7.0	(-.56)	14.8	(7.09)
1978	19.6		64.6	
1979	13.8	23.73	99.2	95.87
1980	37.8	(12.53)	123.8	(29.74)

* Underlined years shows start of policy shift.
** Shows period averages with standard deviations in parenthesis.

4. The_farmer's_expected_price

Table 19 presents percentage divergence of the farmer's expected price from the base run price.

Scenerio 1 projected a decline in the farmer's expected price compared with the base run during the period of 1963-1969. Such a decline was expected, since farmers' prices were being protected in the base run by the government against the world market. Scenerio 2, on the other hand, projected a 11.94 percent increase in the expected price above the base level.

For the period between 1970 and 1974, scenario 1 presented an average increase in the base price of 31.3 percent and scenario 2 of 20.13 percent, respectively, above the base run. In the 1975-1977 period, the base price was lowered by 7.45 percent from its base run level in order to trace world market developments in scenario 1, and it was increased 7.63 percent above the base run to balance the industrial sector price upsurge in the scenario 2. As a result, the expected price of farmers ran 7.6 percent below and 6.7 percent above the base run respectively.

The period from 1978 to 1980 resulted in a 27.73 percent increase in the farmer's expected price above the base case upon a 25.69 percent average price increase in scenario 1, and a 95.87 percent increase against a 100.62 percent increase in the base price in scenario 2.

TABLE 20. PERCENTAGE DEVIATION OF AGRICULTURAL OUTPUT FROM THE BASE RUN

(in percent)

Years	Scenerio 1		Scenerio 2	
1963	- .43		1.34	
1964	- .74		1.61	
1965	- 1.17		1.45	
1966	- .30	- .66	2.12	2.02
1967	- .79	(.29)	2.57	(.55)
1968	- .74		2.70	
1969	- .46		2.32	
1970	2.22		2.55	
1971	4.83		3.16	
1972	5.98	4.62	4.88	1.82
1973	8.96	(3.11)	4.95	(1.82)
1974	1.12		.55	
1975	- 1.36		.29	
1976	- 1.30	-1.28	.65	1.13
1977	- 1.19	(-.09)	2.45	(1.16)
1978	3.20		9.15	
1979	2.30	3.76	12.86	12.40
1980	5.79	(1.81)	15.19	(3.05)

5. Agricultural production

Table 20 compares total agricultural output with the base case under the proposed scenarios.

Scenario 1 predicted a .66 percent average decline in agricultural sector production, while scenario 2 predicted a 2.02 percent increase between 1963-1969. In the second period (1970-1974), the world price effect is much stronger than the domestic price effect. The world price of agricultural commodities increased above the increase in domestic prices of the industrial sector by about 7.3 percent. There are two reasons for such an increase: first, the price of agricultural commodities grew 13.1 percent on the average; and secondly, the Turkish lira devalued by about 10.03 percent against the US dollar. As a result, agricultural output showed a 4.63 percent increase above the base run in scenario 1, while the increase in scenario 2 stood at 3.23 percent. For the third period, 1975-1977, scenario 1 predicted a mild decrease in the agricultural output of about 1.25 percent on the average. Scenario 2, on the other hand, showed a 1.09percent increase in the output. For the last period, 1978-1980, both scenarios predicted a good performance above the base case. Output increased by 3.53 percent in scenario 1, while it increased 3.77 percent in scenario 2.

The outcome of this experiment confirms that the

agricultural sector responds to base price policy efficiently. Supply response to the base price was the a prior hypothesis of the model developed in the previous chapter.

Even though base price policy can be used to stimulate agricultural output, it is a limited tool, considering the elasticity of agricultural output, it is a limited tool, considering the elasticity of agricultural output to base price. The base price elasticity of agricultural output is .083 for the base run, .059 for scenario 1, and .036 for scenario 2.[8] Considering that scenario 1 represented the true market price, it can be claimed that output response to the base price decreases as the base price increases above the level of the market price. This conclusion is important from the stand point of policy.

6. Income flows

Table 21 presents percentage changes relative to the base case in the flow of incomes as a result of base price policy changes. Scenario 1 projected a mild decrease in the mark-up income by .37 percent and agricultural income by .67 percent on the average. A strong decline in wage earnings is observed during the first period. Wage earnings deviated from the base run by .71 percent. By contrast, high prices in scenario 2 showed a favorable increase for the wage earners, compared with the others.

TABLE 21. PERCENTAGE DEVIATIONS OF AGRICULTURAL INCOME, WAGE INCOME, AND MARK-UP INCOME FROM THE BASE RUN

FOR SCENARIO 1

(in percent)

Years	Agricultural income		Wage income		Mark-up income	
1963	- .43		- .48		- .23	
1964	- .74		- .81		- .39	
1965	- 1.16		-1.27		- .63	
1966	- .30	- .67	- .32	- .71	- .17	- .37
1967	- .79		- .83		- .46	
1968	- .74		- .78		- .44	
1969	- .46		- .49		- .28	
1970	2.22		2.29		1.43	
1971	4.83	4.63	4.89	4.63	3.28	2.78
1972	5.98		5.98		4.28	
1973	8.96		8.87		6.94	
1974	1.16		1.13		.95	
1975	- 1.36		-1.13		-1.14	
1976	- 1.30	-1.28	-1.27	-1.25	-1.17	-1.12
1977	- 1.19		-1,15		-1.04	
1978	3.20		3.04		2.83	
1979	2.30	3.76	2.16	3.53	2.07	3.39
1980	5.79		5.40		5.27	

TABLE 21. (CONT'D.).

FOR SCENARIO 2

(in percent)

Years	Agricultural income		Wage income		Mark-up income	
1963	1.34		1.47		.70	
1964	1.61		1.76		.85	
1965	1.45		1.57		.79	
1966	2.12	2.02	2.26	2.14	1.20	1.15
1967	2.57		2.71		1.50	
1968	2.74		2.83		1.60	
1969	2.32		2.40		1.42	
1970	2.55		2.62		1.64	
1971	3.16	3.22	3.20	3.23	2.15	2.32
1972	4.88		4.89		3.50	
1973	4.95		4.90		3.84	
1974	.56		.54		.45	
1975	.29		.28		.24	
1976	.65	1.13	.63	1.09	.55	.98
1977	2.45		2.37		2.15	
1978	9.15		8.69		8.09	
1979	12.86	12.40	1.21	3.77	11.58	11.17
1980	15.18		1.42		13.84	

In the scenario 2, wage income increased 2.14 percent above the base case. The increase for agricultural income was 2.02 percent and for mark-up income was 1.15 percent. For the second period, 1970-1974, world price development created a much more beneficial position for agricultural earners, compared with the others. Agricultural and wage incomes increased by 4.63 percent and mark-up income increased by 2.78 percent. For this period, scenario 2 prices grew at a lower rate compared with scenario 1. The average increases for scenario 2 were 3.22 percent for agricultural income, 3.23 percent for wage income, and 2.32 percent for mark-up income.

For the third period, a decline in the base price due to decline in the world market price resulted in almost an equal decline for the three income groups. However, agricultural and wage incomes declined more than the mark-up income. Higher prices compared to scenario 1 were simulated in scenario 2 and this gave a favorable increase for agricultural and wage incomes.

For the last period, 1978-1980, prices increased above the base case in both scenarios, however, the scenario 2 price was higher than the scenario 1 price. Both scenarios projected an increase in income earnings relative to the base run. Price increase stimulated agricultural income in both scenarios, while it stimulated mark-up income much more strongly in scenario 2. Scenario 1 and scenario 2

projections for agricultural income show 3.76 percent and 12.40 percent increases for wage income 3.53 percent and 3.77 percent increases, and for mark-up income 3.39 percent and 11.17 percent increases, respectively.

Considering income flows, high base price created unfavorable developments for the wage income, compared with agricultural and mark-up incomes in general.

7. Structure of demand

The change in the structure of demand as a result of a change in simulated base price policies is presented in Table 22. These results reveal an important fact that one should consider in base price strategy. It is the base price effect on industrial consumption demand.

For the first period, 1963-1969, industrial consumption declined 7.78 percent in scenario 1, while it increased 19.91 percent in scenario 2. Agricultural consumption, on the other hand, showed a slight decrease in scenario 1, compared to a 1.39 percent increase in scenario 2. In the second period, both scenarios projected increase in industrial and agricultural consumption. Scenario 1, however, stimulated consumption more than scenario 2, due to the high base price simulated in scenario 1. In the third period, scenario 1 projected a 1.65 percent decline for industrial consumption, while it projected a .72 percent decline for agricultural consumption. In the scenario 2

TABLE 22. PERCENTAGE DEVIATIONS OF INDUSTRIAL AND AGRICULTURAL INCOMES FROM THE BASE RUN

(in percent)

Years	Industrial consumption				Agricultural consumption			
	Scenario 1		Scenario 2		Scenario 1		Scenario 2	
1963	-15.43		47.55		- .31		.96	
1964	-14.69		31.96		- .54		1.17	
1965	-14.75		18.30		- .85		1.06	
1966	- 1.74	-7.78	12.22	19.91	- .21	-.46	1.47	1.39
1967	- 3.50	(6.74)	11.42	(14.65)	- .53	(.21)	1.74	(.34)
1968	- 2.49		10.64		- .50		1.83	
1969	- 1.49		7.29		- .31		1.53	
1970	5.70		6.53		1.41		1.61	
1971	10.18	8.44	6.67	6.10	3.05	2.76	1.99	1.93
1972	10.93	(4.79)	8.93	(3.13)	3.60	(1.76)	2.94	(1.06)
1973	13.76		7.60		5.08		2.81	
1974	1.61		.77		.66		.31	
1975	- 1.80		.38		- .77		.16	
1976	- 1.67	-1.65	.83	1.42	- .72	-.72	.36	.63
1977	- 1.47	(.17)	3.04	(1.42)	- .66	(.06)	1.36	(.64)
1978	3.88		11.11		1.82		5.22	
1979	2.71	4.45 (2.08)	15.18	14.67 (3.34)	1.39	2.24 (1.12)	7.78	7.40 (2.02)
1980	6.75		17.73		3.51		9.20	

* By 1974 prices

the increase in industrial consumption is 1.42 percent, and in agricultural consumption is .63 percent.

In the last period, 1978-1980, both scenarios again projected an increase in the industrial and the agricultural consumption. The percentage increase above the base case is much stronger in scenario 2, compared to scenario 1. Industrial consumption increased 14.67 percent in scenario 2, while there was a corresponding increase of 4.45 percent in scenario 1. Agricultural consumption, on the other hand, grew 2.24 percent above the base case in scenario 1 and 7.4 percent in scenario 2. Comparing the growth rates, it can be argued that base price policy affects the pattern of consumption; a high base price stimulates industrial consumption more than it stimulates agricultural consumption.

8. Agricultural exports

Turkey's dependence on the agricultural sector in the country's export is emphasized in Chapter I. Therefore, the effect of base price policy on export potential is examined in the simulation exercises. The assumption maintained in the simulations is the country's ability to export its bumper product without any constraint.

Scenario 1 projected a 1.26 percent decline in agricultural exports for the period of 1963-1969. For the same period, the scenario 2 projection was a 3.98 percent

TABLE 23. PERCENTAGE DEVIATIONS OF AGRICULTURAL EXPORTS FROM THE BASE RUN

(in percent)

Years	Scenario 1		Scenario 2	
1963	- .75		2.32	
1964	- 1.26		2.75	
1965	- 1.97		3.98	
1966	- .58	-1.26	4.09	3.98
1967	- 1.63	(.50)	5.32	(1.47)
1968	- 1.56		5.68	
1969	- 1.06		5.29	
1970	6.11		7.01	
1971	13.41		8.78	
1972	21.44	20.51	17.51	13.35
1973	54.26	(19.82)	29.97	(10.62)
1974	7.34		3.50	
1975	- 8.66		1.83	
1976	- 10.20	-9.46	5.12	8.88
1977	- 9.52	(.77)	19.69	(9.50)
1978	18.12		51.87	
1979	8.04	15.41	44.98	49.83
1980	20.06	(6.45)	52.65	(4.22)

increase. Both scenarios showed a good performance for agricultural exports. However, scenario 1, which represented higher price, performed well compared with the scenario 2 export performance. The increase in agricultural exports is 20.51 percent for scenario 1, and 13.35 percent for scenario 2.

In the third period, 1975-1977, exports showed weak performance in scenario 1 relative to the base run performance because of a simulated decline in the base price. A simulated increase in scenario 2, however, created a push in agricultural export by 8.88 percent above the base case.

During last period, 1978-1980, simulated base price in both scenarios gave a big stimulus to agricultural exports. While the projected increase was 15.41 percent above the base case in scenario 1, scenario 2 projected an export boom for agricultural commodities due to a simulated high base price.

Concerning the country's exports, it is concluded that a high price stimulates agricultural exports if there is no marketing constraint.

9. Macroeconomic stability

One of the targets of agricultural support policy is to reduce price and income instability.[9] Once price and income stability is achieved, it can well be argued that macroeconomic stability will occur as a consequence.

Therefore, macroeconomic stability is examined through a coefficient of variations calculated for the base case, in scenario 1 and scenario 2. The coefficient of variations for every endogenous variable in the model is presented in Table 24.(10)

TABLE 24. COEFFICIENT OF VARIATIONS

(in percent)

Variables	Base run	Scenario 1	Scenario 2
PEF	1.09	1.28	.80
YA7	.16	.17	.19
YAC	1.46	1.89	1.54
YWP	1.51	1.54	1.58
YZP	1.32	1.35	1.39
GNP	1.66	1.69	1.74
CN6	.75	.74	.73
CF6	.27	.25	.25
EX	1.61	1.78	1.84

Comparing the coefficients of variations listed in Table 24, it can be seen that macroeconomic instability has been reduced in the base case for the period of 1963-1980. Therefore, government base price strategy achieved its target concerning stability. However, such a conclusion should not be final, and the subject should be elaborated. First, a high base price, as should be noticed, reduced instability in the farmer's expected price. This outcome of

the experiment confirms the hypothesis maintained about the farmer's behavior under uncertainty. A high base price reduces uncertainty in the agricultural sector; therefore, instability was reduced in scenario 2. Second, the macroeconomic instability which occurred in scenario 1 is marginal. For example, the coefficient of variation in agricultural output is .16 percent for the base run and .17 percent for scenario 1; however, the contribution of scenario 1, the world market price scenario, to agricultural output is 4.12 percent (11) more than the base run. Even tough the base price strategy of the government achieved macroeconomic stability compared to the other two scenarios, the economic gain resulting from the marginal instability in scenario 1 is quite important.

Our conclusion in this study concerning stability is that support price policy has not been effective in reducing macroeconomic instability, given the implied tradeoff with the agricultural output. This conclusion confirms previous studies on this subject in the literature. (12)

10. Final remarks

The macroeconomic implication of the base price policy in Turkey has been investigated in the framework of the base price augmented supply model of an open and regulated agricultural sector.

The simulated increase in the base price led to an increase in the level of agricultural output supplied; however, it was noticed that the output response to base price decreased as divergence from the world market price increased. Other things being equal, an increase in the base price above the base case stimulated the flow of incomes as a result of an increase in the output supplied. A high base price led to a depression in the wage income, compared to the mark-up and agricultural incomes. It may also be noticed that a high base price changes income distribution in favor of the agricultural sector.

Base price policy affected patterns of consumption as appears in two equations in the model. It is noticed that increasing the base price above the level of the world market would stimulate industrial consumption (demand for industrial goods) more than agricultural consumption (demand for agricultural goods). The opposite trend is observed when base price is determined below the level of the world market price.

Since increased base price and agricultural income altered the demand and consumption for agricultural and industrial products, it is therefore logical to expect that income changes would also affect foreign trade in general. In the absence of restricting trade policies, demand for imports would increase. The increase in the agricultural supply, on the other hand would result in an increase in

the exportable surplus product. In fact, the simulation exercise confirms the increase in exports due to the increase in the base price . However, the exports gain should not be unique strategy of the government base price policy without considering world market prices.

SUMMARY

Development has been misunderstood and/or misjudged by identifying it with the level of industrialization. As a result of such identification, most of the developing countries, including Turkey, have devoted their resources to rapid industrialization without giving much attention to the agricultural sector. However, historical records clearly show that no country has moved from chronic stagnation into the take-off stage of economic development without first achieving a substantial gain in agricultural production. Therefore, it can be claimed that economic growth in the developing countries depends heavily upon improving the performance of the agricultural sector, just as it did in the more advanced countries at earlier stages of their development.

Turkey's agricultural sector and government price policy have been investigated in this study in order to expose opportunities in the agricultural sector to improve Turkey's development performance.

The economic development of Turkey was reviewed chronologically in Chapter I to evaluate explicit policies which consequently became the working rules of the Turkish economy, in which the state assumed the task of capital accumulation to accelerate the pace of industrialization.

Government policies carried out during the planned period were not able to produce a rapid industrialization similar to Western Europe. Additionally, it has been seen that Turkey's economic moved out of the development phase in the late 70's with steady deficits in the balance of payments. To enlarge the exportable surplus of the agricultural sector which Turkey has, the competitive advantage was seen as a way of easing the pressure of the balance of payments deficit.

In Chapter III, the role of the agricultural sector in the process of development was investigated, and it was concluded that an export-led strategy of development without employment can be achieved by stimulating agricultural output. In order to recognize structural rigidities in the agricultural sector, as well as its potential to improve output in that sector, land use and its characteristics and inputs in agricultural production were investigated.

The role of the government in economic life was discussed in Chapter III. The government was found to have a critical and important role in economic life. The government was seen as an arena in which and for which various participants compete for power. Cost was defined as a function of power, which was a function of the relative use of government by interested parties. Base price was given as an example of power-related cost in the economy. From

this point of view, the base price experience in Turkey has been investigated and it was concluded that the system lent itself to political influence and thus decisions that might be more political than economic in setting agricultural prices.

Even though the base price system lent itself to political influence and thus to decisions that might be more political than economic, the resulting economic consequences of implied policy were important. Therefore, to measure and evaluate the effects of government involvement through the price mechanism, a base price augmented supply model was developed. On the supply side of the model, it was assumed that farmers respond to the base price by transforming information obtained from the government into their expected market price. The expected market price enters into their decision-making process and performs a crucial role in determining the level of output. The level of output, given the price received by farmers, determines a large proportion of agricultural family expenditures and thus base price policy effects spread throughout the economy by inducing income flows, consequently, demand for agricultural and industrial goods. Given agricultural production and the level of domestic demand, exportable surplus was calculated as a residual.

Parameters of the model were estimated. Having information about estimates, the model was simulated for the

period for which historical data were available. The model was validated by comparing the original data series with the simulated series for each endogenous variable in this chapter.

In the last chapter, Chapter V, two base price policy scenarios were defined for policy simulations. They were scenario 1, based upon the world market price, and scenario 2, based upon the domestic industrial price. Simulated results of these scenarios were evaluated comparing them to the base case results derived from the historical base price policy of the government.

CONCLUSION

The role of agriculture in economic development has been studied from different viewpoints in the literature. Models constructed to analyze various agricultural policies differ from the stand point of assumptions about the price of output, and whether it is fixed by government policy in the regulated model, as opposed to being determined by supply and demand in the open model. The relevance of one or the other model depends on the institutional context of the specific economy. In any actual situation it is important to know which variables are subject to direct control and which are to be determined as a result of market forces.[1]

In this study, we have presented a model to trace the macroeconomic effects of regulated agricultural price. The treatment of agriculture was based on a partial analysis in a macroeconomic equilibrium. In that framework, resource flows to agriculture incorporated sectorial income flows into a general equilibrium model. In this context, exogenous support price (base price) became a sole determinant of the expected price of output, which determines input demands and thus the level of output. The supply of output has been viewed as the link between agricultural and

industrial consumption. Consequently, the supply of and the demand for agricultural output have become the sole determinant of exportable surplus.

The macro economic model in this study demonstrates that the impact of base price policy in the agricultural sector is quite important, considering the economic consequences of implied government policy, and the following conclusions are derived from the experience of Turkey:

1. Agricultural supply responds to base price policy positively; however, this response decreases when higher divergence from world market price occurs.

2. Base price increase above the world market price stimulates agricultural income and mark-up income while it depresses wage income. In such a case, the increase in the agricultural income is much stronger than the increase in mark-up income. Therefore, it is claimed that base price policy has affected income distribution in Turkey; however, the effect did not favor the agricultural sector, due to distorted agricultural price as a result of government involvement.

3. Base price policy affects patterns of consumption. High base price induces industrial consumption more than it induces agricultural consumption. Since high base price induces agricultural consumption more than it induces production, exportable surplus in agriculture accumulates.

4. Base price policy reduces macraeconomic instability in general. However, the economic gain resulting from

stability due to government involvement is less than the economic gain resulting from the marginal instability implicated by world market price.

Although the data used have been crude and results are treated as merely tendencies resulting from supposed policy decisions, a dramatic shift came from two alternate scenarios compared with the base case. As expected, the findings indicated that an increase in the base price leads to increase in output supplied and the income of farmers and it stimulates demand for industrial commodities. As opposite effect occurs when base price is decreased.

From the perspective of our analysis, base price policy as portrayed in the base case is inefficient compared it to the world price scenario. Overall gain resulting from world market price in agricultural output is greater than that of the base case. Base price policy in Turkey has been used for political advantage without giving much attention to its economic consequences. This study suggests that the government should proclaim base price as close as possible to the world market price if the government is not about to abolish it.

APPENDIX A

DATA RELATED WITH FIGURES

DATA RELATED WITH FIGURES

time	Real GNP	Industrial production	Real wages	Employment	Growt rate, industrial production
1962	100.00	100.00	100.00	100.00	0.00
1963	109.69	111.42	104.92	102.44	11.40
1964	114.16	123.55	117.22	103.38	10.90
1965	117.74	135.21	123.09	95.94	9.40
1966	131.85	155.66	123.09	100.36	13.10
1967	137.40	167.98	128.96	101.96	7.90
1968	146.56	190.38	134.82	101.56	13.30
1969	154.51	210.38	140.58	104.58	10.50
1970	163.41	213.21	140.68	102.75	1.40
1971	180.04	231.84	134.82	107.20	8.70
1972	193.44	255.06	128.96	108.43	10.00
1973	203.84	283.98	134.82	111.35	11.30
1974	218.90	307.45	134.82	112.49	8.30
1975	236.32	334.98	152.40	114.33	9.00
1976	255.04	368.36	169.99	116.74	10.00
1977	264.95	405.80	169.99	118.05	10.20
1978	272.54	441.97	128.96	123.03	6.60
1979	271.44	408.47	128.96	123.97	-5.60
1980	268.47	385.98	99.65	122.25	-5.50

Population (in millions)	INV/GNP	INV PUB/PRV	IND PROD/GNP	IND PROD INDEX
28.90	0.00	0.00	13.90	100.00
29.65	19.44	96.80	14.10	111.40
30.40	14.47	111.90	15.00	123.50
31.10	14.41	112.70	15.90	135.20
31.90	15.05	114.50	16.40	155.70
32.70	16.09	114.70	16.90	168.00
33.60	16.61	122.60	18.00	190.40
34.40	18.01	117.70	18.90	210.40
35.30	18.42	112.00	18.10	213.20
36.20	18.50	101.30	17.80	231.80
37.10	16.72	99.20	18.30	255.10
39.09	16.85	88.50	19.30	284.00
39.07	17.24	92.40	19.50	307.40
40.06	17.08	101.60	19.60	335.00
41.08	19.91	106.30	20.00	368.40
42.13	21.64	117.10	21.20	405.80
43.20	22.88	100.80	22.00	432.60
44.31	20.82	127.50	20.80	408.50
45.40	19.27	127.30	19.90	386.00

INV=Investment
PUB=Public
PRV=Private
IND=Industry
PROD=Production

CPI	WPI	Public labor productivity	Private labor productivity	Budget deficit (million TL)	Import (thousand $)
n.a	n.a	n.a	n.a	-100	n.a
100.00	100.00	100.00	100.00	-5	n.a
102.70	99.00	105.70	102.90	-614	537
107.80	104.30	130.20	107.60	1100	572
112.20	111.70	135.10	123.60	-691	718
122.30	119.90	190.10	120.30	99	685
128.90	122.10	194.40	124.10	-692	764
136.50	132.20	n.a	n.a	-1826	801
153.60	144.80	n.a	n.a	255	948
182.10	169.40	122.50	147.10	-5646	1171
222.40	195.60	231.20	156.30	31	1565
264.70	236.70	217.80	165.40	-2853	2099
322.50	300.40	171.20	147.40	-4201	3775
318.60	334.60	209.70	147.40	-1402	4739
371.60	392.60	172.20	179.90	-4312	5129
469.70	504.30	141.90	185.60	-44030	5796
779.20	774.80	132.40	195.80	-40958	4599
460.20	1357.00	109.60	174.90	-95958	5069
152.10	2581.90	n.a	n.a	-107044	7909

EXPORTS (thousand $)	EXP AND WORK REM	EXP AND WORK AND CRED	Crude Birth Rate (per thousand)
411	411	755	4.80
464	473	712	4.80
490	560	805	4.60
523	638	934	4.60
496	589	865	4.30
537	644	953	4.60
588	729	1092	4.30
677	950	1462	4.30
885	1356	1736	4.30
1317	2057	2400	4.40
1532	2715	3222	4.40
1401	2827	3253	3.90
1960	3272	3910	3.90
1753	2736	3291	3.90
2288	3270	4144	3.90
2261	3244	4521	3.10
2910	4604	7223	3.10

Period	AGR Employment	Imports Investment	Imports Consmp	Imports Raw Mat	Exports Agricultural
	(percentage shares in total)				
1962	77.65	46.5	5.4	49.6	77.2
1980	65.91	20.4	2.3	77.3	57.1

Exports Mining	Exports Inds Prod	Petrolium %of Raw Mat	Imports EEC	Imports USA	Imports ME&NA
	(percentage shares in total)				
2.9	19.9	20	42	29	5
6.8	36.3	60	28	6	37

Imports EBC	Imports Others	Exports EEC	Exports USA	Exports ME&NA	Exports EBC	Exports Others
	(percentage shares in total)					
6	15	52	20	6	7	15
11	16	42	4	18	18	17

Planning Periods	University Enrollments	Teaching staff Universities	UCL/AP Public	UCL/AP Private
1963-1967	45304	30070	24.20	31.70
1968-1972	68427	5990	20.60	28.40
1973-1978	85863	8800	28.60	34.20
1979-1984	133547	12717	47.80	32.30

Strikes Public	Strikes Private
100.00	100.00
90.90	98.80
73.50	125.50
135.60	324.70

AGR=Agriculture
EEC=Common Market Countries
ME&NA=Middle East and North Africa
EBC=Eastern Black Countries
EXP=Exports
WORK=Workers in abroad
CRED=Capital transactions
USL=Unit labor cost
AP=Average productivity

APPENDIX B

DATA AND FIGURES RELATED WITH ESTIMATION

		ID	YAT	YPC	CF	CN
1962	.	1962.00	0.746662	11812.3	210000.	120000.
1962	.	1963.00	0.818206	13620.5	212941.	128105.
1962	.	1964.00	0.814305	12615.8	208701.	128894.
1962	.	1965.00	0.779021	12508.1	197738.	149436.
1962	.	1966.00	0.863509	16462.9	274980.	182453.
1962	.	1967.00	0.859017	17463.1	255365.	212962.
1962	.	1968.00	0.874009	17133.8	268747.	233432.
1962	.	1969.00	0.879000	18355.3	293456.	252113.
1962	.	1970.00	0.900537	19794.5	326562.	324805.
1962	.	1971.00	1.01762	26344.3	430501.	409273.
1962	.	1972.00	1.01243	27147.0	500337.	522705.
1962	.	1973.00	0.905825	29651.3	602513.	692583.
1962	.	1974.00	1.00000	54831.8	956728.	958175.
1962	.	1975.00	1.10659	73156.9	0.124169E 07	0.126879E 07
1962	.	1976.00	1.19691	99163.8	0.153247E 07	0.152786E 07
1962	.	1977.00	1.18300	102490.	0.193461E 07	0.204372E 07
1962	.	1978.00	1.20820	127132.	0.253391E 07	0.306521E 07
1962	.	1979.00	1.24027	179635.	0.402225E 07	0.516284E 07
1962	.	1980.00	1.25864	329252.	0.761746E 07	0.111666E 08
		1	2	3	4	5

LINE 77. PRINT

	ID	XNC	ASV	EX
1962	1962.00	71610.	15167.0	-6532.01
1962	1963.00	84480.	15276.0	21788.6
1962	1964.00	92480.0	15367.0	25726.8
1962	1965.00	107780.	15294.0	31297.4
1962	1966.00	130580.	15454.0	3221.81
1962	1967.00	147910.	15515.0	35368.3
1962	1968.00	172860.	15400.0	34167.3
1962	1969.00	191900.	15848.0	30630.3
1962	1970.00	213800.	15591.0	48929.9
1962	1971.00	282470.	15924.0	54489.1
1962	1972.00	346860.	16047.0	74814.3
1962	1973.00	461590.	16062.0	104457.
1962	1974.00	660700.	16154.0	69553.6
1962	1975.00	798450.	16220.0	82426.9
1962	1976.00	979250.	16317.0	189744.
1962	1977.00	0.129706E 07	16531.0	176297.
1962	1978.00	0.232070E 07	16352.0	365347.
1962	1979.00	0.416695E 07	16605.0	464419.
1962	1980.00	0.877819E 07	16390.0	0.129531E 07
	1	2	3	4

LINE 78. PRINT

		ID	PN7	PF7	W7	R
1962	.	1962.00	0.506933	0.338081	0.241283	0.899999E-01
1962	.	1963.00	0.506933	0.317147	0.262233	0.899999E-01
1962	.	1964.00	0.506933	0.331916	0.285526	0.899999E-01
1962	.	1965.00	0.568548	0.369204	0.316877	0.899999E-01
1962	.	1966.00	0.525255	0.393515	0.344565	0.899999E-01
1962	.	1967.00	0.500283	0.383287	0.378553	0.899999E-01
1962	.	1968.00	0.474250	0.393295	0.413419	0.899999E-01
1962	.	1969.00	0.449278	0.416621	0.479701	0.899999E-01
1962	.	1970.00	0.480122	0.434001	0.517433	0.105000
1962	.	1971.00	0.480122	0.459859	0.576033	0.105000
1962	.	1972.00	0.527518	0.475616	0.642836	0.105000
1962	.	1973.00	0.527518	0.579242	0.797099	0.899999E-01
1962	.	1974.00	1.00000	1.00000	1.00000	0.105000
1962	.	1975.00	0.838568	1.16775	1.25337	0.105000
1962	.	1976.00	0.838568	1.15970	1.68913	0.105000
1962	.	1977.00	0.838568	1.29881	2.14664	0.105000
1962	.	1978.00	0.838568	1.73644	3.04615	0.105000
1962	.	1979.00	0.838568	2.37455	4.31160	0.140000
1962	.	1980.00	5.27285	4.69858	6.25491	0.160000
			1	2	3	4	5

LINE 81. PRINT

ID	QF7	DEF7	DEN7	WEF7
1963.00	0.330432	0.279549	0.353651	1.32991
1964.00	0.330432	0.291528	0.362869	1.33898
1965.00	0.354311	0.296472	0.383966	0.366612
1966.00	0.356486	0.313927	0.405063	0.627898
1967.00	0.356486	0.329765	0.413502	1.94721
1968.00	0.361924	0.337701	0.421941	0.990995
1969.00	0.375497	0.359246	0.426161	11.2329
1970.00	0.400642	0.406288	0.464135	2.81071
1971.00	0.471121	0.464372	0.565401	92480.0
1972.00	0.471121	0.553525	0.628692	11570.2
1973.00	0.568684	0.761468	0.746835	8543.60
1974.00	1.00000	1.00000	1.00000	0.899999E-11
1975.00	1.09672	1.16591	1.11814	3601.59
1976.00	1.19974	1.49200	1.24895	130589.
1977.00	1.31826	1.73865	1.54009	18016.2
1978.00	1.53555	2.33817	2.65823	13691.1
1979.00	2.48769	3.52482	5.34221	0.899999E-11
1980.00	4.95559	6.89987	11.2025	4979.80
1	2	3	4	5

NL 75. PRINT

	ID	YZP	YWP
1962	1963.00	4560.80	2175.00
1963	1964.00	5496.00	2551.40
1963	1965.00	8543.60	3126.60
1963	1966.00	9611.20	3601.50
1963	1967.00	13691.1	4325.10
1963	1968.00	15492.2	4979.80
1963	1969.00	13137.8	6151.90
1963	1970.00	13390.4	7989.30
1963	1971.00	18655.9	9591.60
1963	1972.00	23210.9	11475.6
1963	1973.00	40090.9	14913.0
1963	1974.00	55544.6	19822.5
1963	1975.00	59591.0	23157.0
1963	1976.00	76882.0	35659.0
1963	1977.00	95810.0	55579.0
1963	1978.00	141272.	96981.0
1963	1979.00	281783.	137459.
1963	1980.00	311827.	206236.
	1	2	3

LINE105. STOP

****

END OF OUTPUT FOR ABAAN

WORKING SPACE= 9957 WORDS

LEGENDS FOR APPENDIX B

YA7=Index of real agricultural production

YPC=Agricultural production by current prices (10^5 TL.)

CF=Agricultural consumption by current prices (10^5 TL.)

CN=Industrial consumption by current prices (10^5 TL.)

XNC=Industrial production by current prices (10^5 TL.)

ASV=Area sown (10^3 hectares)

EX= Agricultural exports less agricultural imports (10^5 TL.)

PN7=Index of fertilizer prices

PF7=Index of price received by farmers

W7=Wage index

R=Interest rate

DEF7=Agricultural price index

DEN7=Industrial price index

QF7=Base price index

WEF7=World price index

YWP=Wage income by current prices (10^6 TL.)

YZP=Mark-up income by current prices (10^6 TL.)

APPENDIX C

DATA RELATED WITH SIMULATION RESULTS

LINE 88 TIME SERIES PROCESSOR VERSION 2.9

FIGURE B1. REAL AGRICULTURAL PRODUCTION (YA7)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES PLOT OF RE

ID	ACTUAL	FITTED	RESIDUAL
1963	0.8182	0.7866	0.316E-01
1964	0.8143	0.8056	0.859E-02
1965	0.7790	0.8173	-0.383E-01
1966	0.8635	0.8494	0.141E-01
1967	0.8590	0.8729	-0.139E-01
1968	0.8740	0.8922	-0.181E-01
1969	0.8790	0.9225	-0.435E-01
1970	0.9005	0.9388	-0.383E-01
1971	1.018	0.9949	0.227E-01
1972	1.012	1.029	-0.168E-01
1973	0.9058	1.066	-0.160
1974	1.000	1.077	-0.775E-01
1975	1.107	1.119	-0.125E-01
1976	1.197	1.140	0.570E-01
1977	1.183	1.189	-0.650E-02
1978	1.208	1.281	-0.726E-01
1979	1.240	1.428	-0.188
1980	1.259	1.410	-0.152

```
LINE 89.    GENR
   EYA6
LINE 90.    GENR
   EYAC
LINE 91.    ACTFIT
```

LINE 91 TIME SERIES PROCESSOR VERSION 2.5 JULY,1974

FIGURE B2. AGRICULTURAL PRODUCTION BY CURRENT PRICES (YAC)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES PLOT OF RES

ID	ACTUAL	FITTED	RESIDUAL
1963	0.2347E 06	0.2257E 06	0.905E 04
1964	0.2344E 06	0.2319E 06	0.249E 04
1965	0.2290E 06	0.2403E 06	-0.112E 05
1966	0.2782E 06	0.2737E 06	0.453E 04
1967	0.2907E 06	0.2954E 06	-0.470E 04
1968	0.3029E 06	0.3092E 06	-0.629E 04
1969	0.3241E 06	0.3401E 06	-0.160E 05
1970	0.3755E 06	0.3915E 06	-0.160E 05
1971	0.4850E 06	0.4741E 06	0.109E 05
1972	0.5752E 06	0.5847E 06	-0.951E 04
1973	0.7070E 06	0.8317E 06	-0.125E 06
1974	0.1026E 07	0.1106E 07	-0.795E 05
1975	0.1324E 07	0.1339E 07	-0.150E 05
1976	0.1722E 07	0.1640E 07	0.821E 05
1977	0.2111E 07	0.2122E 07	-0.116E 05
1978	0.2899E 07	0.3074E 07	-0.174E 06
1979	0.4487E 07	0.5167E 07	-0.680E 06
1980	0.8913E 07	0.9987E 07	-0.107E 07

LINE 92. GENR
EYWP
LINE 93. ACTFIT

FIGURE B3. WAGE INCOME BY CURRENT PRICES (YWP)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES PLOT OF

ID	ACTUAL	FITTED	RESIDUAL
1963	2075.	4830.	-0.275E 04
1964	2551.	4991.	-0.244E 04
1965	3027.	5213.	-0.219E 04
1966	3601.	6037.	-0.244E 04
1967	4325.	6578.	-0.225E 04
1968	4980.	6945.	-0.196E 04
1969	6052.	7703.	-0.165E 04
1970	7989.	8947.	-957.
1971	9592.	0.1101E 05	-0.142E 04
1972	0.1148E 05	0.1371E 05	-0.224E 04
1973	0.1491E 05	0.1971E 05	-0.480E 04
1974	0.1982E 05	0.2649E 05	-0.667E 04
1975	0.2816E 05	0.3221E 05	-0.405E 04
1976	0.3566E 05	0.3959E 05	-0.393E 04
1977	0.5558E 05	0.5147E 05	0.411E 04
1978	0.9698E 05	0.7558E 05	0.214E 05
1979	0.1375E 06	0.1279E 06	0.955E 04
1980	0.2062E 06	0.2491E 06	+ -0.429E 05 0

LINE 94. GENR
EYZP
LINE 95. ACTFIT

FIGURE B4. MARK-UP INCOME BY CURRENT PRICES (YZP)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

PLOT OF F

ID	ACTUAL	FITTED	RESIDUAL
1963	4561.	0.1594E 05	-0.114E 05
1964	5496.	0.1620E 05	-0.107E 05
1965	8544.	0.1655E 05	-0.801E 04
1966	9611.	0.1786E 05	-0.325E 04
1967	0.1369E 05	0.1872E 05	-0.503E 04
1968	0.1549E 05	0.1930E 05	-0.381E 04
1969	0.1314E 05	0.2050E 05	-0.737E 04
1970	0.1339E 05	0.2248E 05	-0.909E 04
1971	0.1866E 05	0.2575E 05	-0.709E 04
1972	0.2321E 05	0.3005E 05	-0.634E 04
1973	0.4009E 05	0.3957E 05	521.
1974	0.5554E 05	0.5034E 05	0.521E 04
1975	0.5959E 05	0.5941E 05	177.
1976	0.7688E 05	0.7113E 05	0.575E 04
1977	0.9581E 05	0.8999E 05	0.582E 04
1978	0.1413E 06	0.1283E 06	0.130E 05
1979	0.2818E 06	0.2114E 06	0.704E 05
1980	0.3118E 06	0.4038E 06	-0.920E 05

LINE 96. GENR
EGNP
LINE 97. ACTFIT

FIGURE B5. GNP BY CURRENT PRICES

PLOT OF ACTUAL(*) AND FITTED(+) VALUES PLOT OF R

ID	ACTUAL	FITTED	RESIDUAL
1963	0.6084E 06	0.2230E 06 +	0.385E 06
1964	0.6468E 06	0.2527E 06 +	0.394E 06
1965	0.6920E 06	0.2920E 06 +	0.400E 06
1966	0.8290E 06	0.4508E 06 +*	0.378E 06
1967	0.9081E 06	0.5543E 06 +*	0.354E 06
1968	0.1012E 07	0.6192E 06 +*	0.393E 06
1969	0.1122E 07	0.7663E 06 +	0.356E 06
1970	0.1334E 07	0.1011E 07 +	0.323E 06
1971	0.1734E 07	0.1404E 07 +*	0.330E 06
1972	0.2151E 07	0.1930E 07 +	0.221E 06
1973	0.2800E 07	0.3107E 07 +	-0.307E 06
1974	0.3871E 07	0.4411E 07 +	-0.540E 06
1975	0.4850E 07	0.5522E 07 *+	-0.672E 06
1976	0.6107E 07	0.6955E 07 *+	-0.848E 06
1977	0.8060E 07	0.9250E 07 * +	-0.119E 07
1978	0.1206E 08	0.1376E 08 *+	-0.170E 07
1979	0.2059E 08	0.2370E 08 * +	-0.311E 07 0
1980	0.4200E 08	0.4659E 08 * +	-0.459E 07 0

```
LINE 98.    GENR
   EGNPF
LINE 99.    GENR
   EGNPN
LINE100.    GENR
   ECF6
LINE101.    ACTFIT
```

FIGURE B6. AGRICULTURAL CONSUMPTION NORMALIZED (CF6)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1963	0.7617E 06	0.5832E 06	0.179E 06
1964	0.7440E 06	0.5928E 06	0.151E 06
1965	0.6903E 06	0.5989E 06	0.914E 05
1966	0.8759E 06	0.6518E 06	0.224E 06
1967	0.7744E 06	0.6839E 06	0.905E 05
1968	0.7958E 06	0.7013E 06	0.946E 05
1969	0.8169E 06	0.7433E 06	0.736E 05
1970	0.8038E 06	0.7886E 06	0.151E 05
1971	0.9271E 06	0.8360E 06	0.911E 05
1972	0.9039E 06	0.8987E 06	0.522E 04
1973	0.7923E 06	0.9869E 06	-0.195E 06 0
1974	0.9567E 06	0.1020E 07	-0.630E 05
1975	0.1065E 07	0.1061E 07	0.373E 04
1976	0.1093E 07	0.1096E 07	-0.281E 04
1977	0.1113E 07	0.1136E 07	-0.232E 05
1978	0.1084E 07	0.1161E 07	-0.768E 05
1979	0.1141E 07	0.1209E 07	-0.678E 05
1980	0.1104E 07	0.1183E 07	-0.793E 05

```
LINE102.    GENR
   ECN6
LINE103.    ACTFIT
```

FIGURE D7. INDUSTRIAL CONSUMPTION NORMALIZED (CNO)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

PLOT OF

ID	ACTUAL	FITTED	RESIDUAL
1963	0.3572E 06	0.3598E 05	0.321E 06
1964	0.3552E 06	0.5857E 05	0.297E 06
1965	0.3892E 06	0.8085E 05	0.308E 06
1966	0.4504E 06	0.1801E 06	0.270E 06
1967	0.4908E 06	0.2437E 06	0.247E 06
1968	0.5532E 06	0.2805E 06	0.273E 06
1969	0.5916E 06	0.3716E 06	0.220E 06
1970	0.6998E 06	0.4785E 06	0.221E 06
1971	0.7239E 06	0.5747E 06	0.149E 06
1972	0.8314E 06	0.7385E 06	0.929E 05
1973	0.9274E 06	0.1039E 07	-0.112E 06
1974	0.9582E 06	0.1115E 07	-0.157E 06
1975	0.1135E 07	0.1264E 07	-0.129E 06
1976	0.1223E 07	0.1437E 07	-0.214E 06
1977	0.1327E 07	0.1564E 07	-0.237E 06
1978	0.1153E 07	0.1354E 07	-0.201E 06
1979	0.1024E 07	0.1239E 07	-0.215E 06
1980	0.9968E 06	0.1091E 07	-0.945E 05

```
LINE104.     GENR
   ECF
LINE105.     GENR
   ECN
LINE106.     ACTFIT
```

FIGURE B8. AGRICULTURAL CONSUMPTION (CF)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES PLOT OF R

ID	ACTUAL	FITTED	RESIDUAL
1963	0.2129E 06	0.1630E 06 +	0.499E 05
1964	0.2087E 06	0.1663E 06 +	0.424E 05
1965	0.1977E 06	0.1716E 06 +	0.262E 05
1966	0.2750E 06	0.2046E 06 +*	0.704E 05
1967	0.2554E 06	0.2255E 06 +*	0.298E 05
1968	0.2687E 06	0.2368E 06 +*	0.319E 05
1969	0.2935E 06	0.2670E 06 +	0.264E 05
1970	0.3266E 06	0.3204E 06 +	0.615E 04
1971	0.4305E 06	0.3882E 06 +*	0.423E 05
1972	0.5003E 06	0.4974E 06 +	0.239E 04
1973	0.6025E 06	0.7505E 06 **	-0.148E 06
1974	0.9567E 06	0.1020E 07 +	-0.630E 05
1975	0.1242E 07	0.1237E 07 +	0.435E 04
1976	0.1532E 07	0.1536E 07 +	-0.394E 04
1977	0.1935E 07	0.1975E 07 +	-0.403E 05
1978	0.2534E 07	0.2714E 07 **	-0.180E 06
1979	0.4022E 07	0.4261E 07 **	-0.239E 06
1980	0.7617E 07	0.8165E 07 * +	-0.547E 06 0

LINE107. ACTFIT

FIGURE B9. INDUSTRIAL CONSUMPTION (CN)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

PLOT OF R

ID	ACTUAL	FITTED	RESIDUAL
1963	0.1281E 06	0.1291E 05 +	0.115E 06
1964	0.1289E 06	0.2125E 05 +	0.108E 06
1965	0.1494E 06	0.3104E 05 +*	0.118E 06
1966	0.1825E 06	0.7297E 05 +*	0.109E 06
1967	0.2030E 06	0.1008E 06 +*	0.102E 06
1968	0.2334E 06	0.1183E 06 +*	0.115E 06
1969	0.2521E 06	0.1583E 06 +	0.938E 05
1970	0.3248E 06	0.2221E 06 +	0.103E 06
1971	0.4093E 06	0.3249E 06 +*	0.844E 05
1972	0.5227E 06	0.4643E 06 +	0.584E 05
1973	0.6526E 06	0.7762E 06 +	-0.837E 05
1974	0.9582E 06	0.1115E 07 +	-0.157E 06
1975	0.1269E 07	0.1413E 07 +*	-0.144E 06
1976	0.1528E 07	0.1795E 07 +*	-0.267E 06
1977	0.2044E 07	0.2409E 07 * +	-0.366E 06
1978	0.3065E 07	0.3601E 07 * +	-0.535E 06
1979	0.5163E 07	0.6248E 07 * +	-0.108E 07 0
1980	0.1117E 08	0.1223E 08 * +	-0.106E 07 0

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LINE108.    GENR
   EX
LINE109.    GENR
   EEX
LINE110.    GENR
   IM
LINE111.    GENR
   EIM
LINE112.    ACTFIT
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FIGURE B10. AGRICULTURAL EXPORTS (EX)

PLOT OF ACTUAL(*) AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1963	0.2179E 05	0.6266E 05	-0.409E 05
1964	0.2573E 05	0.6564E 05	-0.399E 05
1965	0.3130E 05	0.6872E 05	-0.374E 05
1966	3222.	0.6906E 05	-0.658E 05
1967	0.3537E 05	0.6991E 05	-0.345E 05
1968	0.3417E 05	0.7239E 05	-0.382E 05
1969	0.3063E 05	0.7307E 05	-0.424E 05
1970	0.4893E 05	0.7104E 05	-0.221E 05
1971	0.5449E 05	0.8594E 05	-0.315E 05
1972	0.7481E 05	0.8721E 05	-0.124E 05
1973	0.1045E 06	0.8120E 05	0.233E 05
1974	0.6955E 05	0.8609E 05	-0.165E 05
1975	0.8243E 05	0.1018E 06	-0.193E 05
1976	0.1897E 06	0.1037E 06	0.860E 05
1977	0.1763E 06	0.1475E 06	0.288E 05
1978	0.3653E 06	0.3600E 06	0.530E 04
1979	0.4644E 06	0.9059E 06	-0.441E 06
1980	0.1295E 07	0.1823E 07	-0.527E 05

LINE113. ACTFIT

TABLE C1. FARMER'S EXPECTED PRICE

	ID	PF7	EPF70	EPF71	EPF72
1963	1963.00	0.317147	1.349268	0.375314	0.339825
1963	1964.00	0.330916	1.349268	0.381134	0.333965
1963	1965.00	0.369204	1.358851	0.400081	0.345237
1963	1966.00	0.383515	1.374876	0.421928	0.368532
1963	1967.00	0.383287	1.375250	0.432843	0.358929
1963	1968.00	0.393295	1.378946	0.441583	0.364324
1963	1969.00	0.416621	1.392603	0.446678	0.382459
1963	1970.00	0.434001	1.416652	0.481199	0.417657
1963	1971.00	0.450859	1.481844	0.574184	0.628495
1963	1972.00	0.475616	1.493564	0.646259	0.685250
1963	1973.00	0.579242	1.578221	0.759172	0.937847
1963	1974.00	1.00000	1.567488	0.998126	1.03259
1963	1975.00	1.16775	1.12520	1.14369	1.04099
1963	1976.00	1.15970	1.23079	1.27697	1.14228
1963	1977.00	1.29881	1.35087	1.55091	1.26218
1963	1978.00	1.73644	1.55890	2.56661	1.86496
1963	1979.00	2.37455	2.41856	4.81773	2.75276
1963	1980.00	4.69858	4.71361	10.5473	6.49459
	1	2	3	4	5

LINE 9. PRINT

TABLE C2. REAL AGRICULTURAL PRODUCTION

LINE 8. PRINT

		ID	YA7	EYA70	EYA71	EYA72
1963	.	1963.00	0.818206	0.776261	0.786629	0.772888
1963	.	1964.00	0.814305	0.792831	0.805617	0.786953
1963	.	1965.00	0.779021	0.805589	0.817272	0.796172
1963	.	1966.00	0.863509	0.831801	0.849436	0.829287
1963	.	1967.00	0.859017	0.851107	0.872943	0.844418
1963	.	1968.00	0.874009	0.869677	0.892156	0.862229
1963	.	1969.00	0.879000	0.891593	0.922471	0.897410
1963	.	1970.00	0.900537	0.915453	0.938802	0.935816
1963	.	1971.00	1.01762	0.964400	0.994872	1.01095
1963	.	1972.00	1.01243	0.981264	1.02918	1.03994
1963	.	1973.00	0.995824	1.01535	1.06561	1.11632
1963	.	1974.00	1.00000	1.07152	1.07746	1.08397
1963	.	1975.00	1.10659	1.11592	1.11912	1.11077
1963	.	1976.00	1.19691	1.13252	1.13987	1.11778
1963	.	1977.00	1.18300	1.16101	1.18950	1.14724
1963	.	1978.00	1.20820	1.17351	1.28084	1.21101
1963	.	1979.00	1.24027	1.26560	1.42834	1.29469
1963	.	1980.00	1.25864	1.22442	1.41037	1.29528
			1	2	3	4	5

LINE 9. PRINT

TABLE C3. AGRICULTURAL INCOME BY CURRENT PRICES

	ID	YAC	EYAC0	EYAC1	EYAC2
1963	1963.00	234730.	222708.	225683.	221741.
1963	1964.00	234428.	229259.	231940.	226567.
1963	1965.00	229035.	236846.	240281.	234178.
1963	1966.00	278202.	267990.	273672.	267181.
1963	1967.00	290733.	288144.	295435.	285781.
1963	1968.00	302914.	301066.	309204.	298831.
1963	1969.00	324086.	332409.	340107.	330867.
1963	1970.00	375492.	381717.	391452.	380207.
1963	1971.00	484990.	459615.	474138.	481802.
1963	1972.00	575151.	557435.	584656.	590765.
1963	1973.00	706970.	792446.	831665.	863443.
1963	1974.00	0.102628E 07	0.109969E 07	0.110579E 07	0.111247E 07
1963	1975.00	0.132412E 07	0.133528E 07	0.133911E 07	0.131715E 07
1963	1976.00	0.172222E 07	0.162954E 07	0.164011E 07	0.161833E 07
1963	1977.00	0.211091E 07	0.207167E 07	0.212250E 07	0.204710E 07
1963	1978.00	0.289926E 07	0.281611E 07	0.307357E 07	0.299610E 07
1963	1979.00	0.448667E 07	0.457832E 07	0.516701E 07	0.468352E 07
1963	1980.00	0.891277E 07	0.967045E 07	0.998718E 07	0.917223E 07
	1	2	3	4	5

LINE 10. PRINT

TABLE C4. WAGE INCOME BY CURRENT PRICES

	ID	YWP	EYWP0	EYWP1	EYWP2
1963	1963.00	2075.00	4769.14	4829.98	4737.43
1963	1964.00	2551.40	4914.38	4990.89	4864.66
1963	1965.00	3026.60	5132.61	5213.25	5067.61
1963	1966.00	3601.50	5913.45	6036.82	5884.43
1963	1967.00	4325.10	6404.42	6577.91	6351.28
1963	1968.00	4979.80	6753.54	6944.59	6701.99
1963	1969.00	6051.90	7522.52	7703.23	7486.32
1963	1970.00	7989.30	8718.21	8946.76	8917.54
1963	1971.00	9591.60	11666.5	11997.5	11187.4
1963	1972.00	11475.6	13075.1	13714.1	13857.6
1963	1973.00	14913.0	18792.0	19712.7	20458.8
1963	1974.00	19822.5	26351.6	26494.9	26651.6
1963	1975.00	28157.0	32122.1	32212.3	31696.5
1963	1976.00	35659.0	39345.1	39593.2	38847.2
1963	1977.00	55579.0	50278.0	51471.2	49791.1
1963	1978.00	96981.0	69534.3	75580.9	71646.8
1963	1979.00	137490.	114121.	127941.	116591.
1963	1980.00	206236.	219216.	249129.	229996.
	1	2	3	4	5

LINE 11. PRINT

TABLE C5. MARK-UP INCOME BY CURRENT PRICES

	ID	YZP	FYZP0	FYZP1	FYZP2
1963	1963.00	4560.80	15930.3	15941.1	15794.2
1963	1964.00	5496.00	16159.3	16196.5	15996.2
1963	1965.00	8543.60	16421.6	16549.6	16318.4
1963	1966.00	9611.20	17645.4	17857.2	17615.3
1963	1967.00	13691.1	18440.8	18716.3	18356.4
1963	1968.00	15492.2	18995.1	19298.4	18911.8
1963	1969.00	13137.8	20216.0	20502.9	20158.5
1963	1970.00	13390.4	22114.3	22477.2	22430.8
1963	1971.00	18655.9	25207.5	25748.8	26034.5
1963	1972.00	23210.9	29031.5	30046.1	30273.8
1963	1973.00	40090.9	38107.9	39569.7	40754.2
1963	1974.00	55544.6	50119.9	50337.2	50586.2
1963	1975.00	59591.0	59271.5	59414.1	58595.7
1963	1976.00	76882.0	70738.9	71132.9	69948.4
1963	1977.00	95810.0	88096.6	89991.9	87180.6
1963	1978.00	141272.	118669.	128269.	122023.
1963	1979.00	281783.	199457.	211398.	193378.
1963	1980.00	311827.	354724.	403802.	373426.
	1	2	3	4	5

LINE 12. PRINT

TABLE C6. GNP BY CURRENT PRICES

	ID	GNP	EGNP0	EGNP1	EGNP2
1963	1963.00	608436.	209814.	223040.	224185.
1963	1964.00	646842.	235961.	252668.	226968.
1963	1965.00	692047.	275559.	291987.	262316.
1963	1966.00	829000.	423663.	453838.	419789.
1963	1967.00	908070.	518932.	554277.	508103.
1963	1968.00	0.101205E 07	530275.	619197.	569586.
1963	1969.00	0.112235E 07	729473.	766291.	722099.
1963	1970.00	0.133404E 07	964487.	0.101105E 07	0.109510E 07
1963	1971.00	0.173435E 07	0.133450E 07	0.140396E 07	0.144061E 07
1963	1972.00	0.215114E 07	0.179995E 07	0.193014E 07	0.195936E 07
1963	1973.00	0.279989E 07	0.291969E 07	0.310727E 07	0.325927E 07
1963	1974.00	0.387124E 07	0.438175E 07	0.441091E 07	0.444287E 07
1963	1975.00	0.484980E 07	0.553338E 07	0.552168E 07	0.541666E 07
1963	1976.00	0.610687E 07	0.690403E 07	0.695458E 07	0.689261E 07
1963	1977.00	0.806049E 07	0.900682E 07	0.924990E 07	0.988927E 07
1963	1978.00	0.120602E 08	0.125285E 08	0.137604E 08	0.129589E 08
1963	1979.00	0.205893E 08	0.208882E 08	0.237039E 08	0.213914E 08
1963	1980.00	0.419960E 08	0.402875E 08	0.465855E 08	0.426875E 08
	1	2	3	4	5

LINE 13. PRINT

TABLE C7. AGRICULTURAL CONSUMPTION

		ID	CF	ECF0	ECF1	ECF2
1963	.	1963.00	212941.	161465.	163719.	160959.
1963	.	1964.00	208701.	164381.	166304.	163496.
1963	.	1965.00	197738.	169762.	171557.	168315.
1963	.	1966.00	274980.	201648.	204617.	201225.
1963	.	1967.00	255365.	221667.	225529.	220484.
1963	.	1968.00	268747.	232563.	236815.	231395.
1963	.	1969.00	293456.	253019.	267032.	262204.
1963	.	1970.00	326562.	315325.	320412.	319761.
1963	.	1971.00	430501.	389606.	388194.	392199.
1963	.	1972.00	500337.	483225.	497449.	500642.
1963	.	1973.00	602513.	729975.	750468.	767074.
1963	.	1974.00	956728.	0.101651E 07	0.101970E 07	0.102319E 07
1963	.	1975.00	0.124169E 07	0.123534E 07	0.123734E 07	0.122587E 07
1963	.	1976.00	0.153247E 07	0.153089E 07	0.153641E 07	0.151981E 07
1963	.	1977.00	0.193461E 07	0.194840E 07	0.197496E 07	0.193556E 07
1963	.	1978.00	0.253391E 07	0.257894E 07	0.271353E 07	0.262596E 07
1963	.	1979.00	0.402225E 07	0.395351E 07	0.426113E 07	0.400848E 07
1963	.	1981.00	0.761746E 07	0.747645E 07	0.816451E 07	0.773866E 07
		1	2	3	4	5

LINE 17. PRINT

TABLE C8. AGRICULTURAL CONSUMPTION NORMALIZED

	ID	CF6	ECF60	ECF61	ECF62
1963	1963.00	761732.	577592.	583151.	575783.
1963	1964.00	743958.	535968.	592825.	582816.
1963	1965.00	690252.	592597.	598862.	587546.
1963	1966.00	875937.	642340.	651797.	640992.
1963	1967.00	774384.	672198.	683908.	668610.
1963	1968.00	795812.	698665.	701257.	685207.
1963	1969.00	816866.	732117.	743314.	729874.
1963	1970.00	803771.	776111.	788633.	787032.
1963	1971.00	927061.	819614.	835956.	844580.
1963	1972.00	903909.	872996.	898693.	904469.
1963	1973.00	792292.	959901.	986850.	0.100869E 07
1963	1974.00	956728.	0.101651E 07	0.101970E 07	0.102319E 07
1963	1975.00	0.106499E 07	0.105955E 07	0.106126E 07	0.105142E 07
1963	1976.00	0.109306E 07	0.109193E 07	0.109587E 07	0.108403E 07
1963	1977.00	0.111271E 07	0.112064E 07	0.113591E 07	0.111325E 07
1963	1978.00	0.108371E 07	0.110297E 07	0.116053E 07	0.112308E 07
1963	1979.00	0.114112E 07	0.112162E 07	0.120889E 07	0.113722E 07
1963	1980.00	0.110400E 07	0.108356E 07	0.118329E 07	0.112157E 07
	1	2	3	4	5

LINE 16. PRINT

TABLE C9. INDUSTRIAL CONSUMPTION

	ID	CN	ECN0	ECN1	ECN2
1963	1963.00	128105.	8746.39	12905.4	7393.09
1963	1964.00	128894.	16106.2	21253.5	13741.1
1963	1965.00	149436.	25240.1	31042.9	22368.5
1963	1966.00	182453.	65025.2	72969.9	63892.8
1963	1967.00	202962.	91438.1	100772.	87272.4
1963	1968.00	233432.	106964.	118344.	103839.
1963	1969.00	252113.	147585.	158349.	145429.
1963	1970.00	324805.	218478.	222091.	220359.
1963	1971.00	409273.	304606.	324913.	335631.
1963	1972.00	522705.	426255.	464320.	472862.
1963	1973.00	692583.	721395.	776236.	820672.
1963	1974.00	958175.	0.110641E 07	0.111494E 07	0.112428E 07
1963	1975.00	0.126879E 07	0.140746E 07	0.141281E 07	0.138210E 07
1963	1976.00	0.152786E 07	0.178036E 07	0.179514E 07	0.175071E 07
1963	1977.00	0.204372E 07	0.233834E 07	0.241941E 07	0.230398E 07
1963	1978.00	0.306521E 07	0.324038E 07	0.360054E 07	0.336622E 07
1963	1979.00	0.516284E 07	0.542441E 07	0.624759E 07	0.557152E 07
1963	1980.00	0.111666E 08	0.103838E 08	0.122251E 08	0.110855E 08
	1	2	3	4	5

LINE 15. PRINT

TABLE C10. INDUSTRIAL CONSUMPTION NORMALIZED

	ID	CN6	ECN60	ECN61	ECN62
1963	1963.00	357187.	24387.0	35983.4	21613.7
1963	1964.00	355208.	44385.6	58570.8	37865.2
1963	1965.00	389189.	69339.6	80848.1	58256.5
1963	1966.00	450431.	169531.	180145.	157735.
1963	1967.00	490837.	218713.	243703.	211057.
1963	1968.00	553233.	253505.	280474.	246199.
1963	1969.00	591591.	346313.	371571.	341254.
1963	1970.00	699808.	449175.	478506.	474755.
1963	1971.00	723863.	538744.	574660.	593616.
1963	1972.00	831417.	678904.	738549.	752136.
1963	1973.00	927357.	965936.	0.103937E 07	0.109887E 07
1963	1974.00	958175.	0.117641E 07	0.111494E 07	0.112428E 07
1963	1975.00	0.113473E 07	0.125874E 07	0.126353E 07	0.123607E 07
1963	1976.00	0.122332E 07	0.142549E 07	0.143733E 07	0.140175E 07
1963	1977.00	0.132702E 07	0.151832E 07	0.156447E 07	0.149601E 07
1963	1978.00	0.115316E 07	0.121900E 07	0.135449E 07	0.126634E 07
1963	1979.00	0.102393E 07	0.107580E 07	0.123906E 07	0.110498E 07
1963	1980.00	996792.	926918.	0.109128E 07	989550.
	1	2	3	4	5

LINE 14. PRINT

TABLE C11. AGRICULTURAL EXPORTS

	ID	EX	EEX0	EEX1	EEX2
1963	. 1963.00	21788.6	61243.3	62663.6	60781.4
1963	. 1964.00	25726.8	63878.4	65636.1	63070.5
1963	. 1965.00	31297.4	67083.8	68723.9	65762.1
1963	. 1966.00	3221.81	66342.4	69055.1	65955.7
1963	. 1967.00	35368.3	66377.1	69905.7	65296.6
1963	. 1968.00	34167.3	69593.2	72388.4	67436.3
1963	. 1969.00	30630.3	69399.3	73074.4	68663.1
1963	. 1970.00	48929.8	66392.2	71040.3	70446.0
1963	. 1971.00	54489.1	79119.7	85943.4	89602.7
1963	. 1972.00	74814.3	74210.0	87207.1	90123.9
1963	. 1973.00	104457.	62471.6	81196.9	96369.2
1963	. 1974.00	69553.6	83177.0	86089.0	89278.0
1963	. 1975.00	82426.0	99937.0	101765.	91281.0
1963	. 1976.00	189744.	93650.0	103697.	88524.0
1963	. 1977.00	176297.	123273.	147540.	111540.
1963	. 1978.00	365347.	237974.	360046.	280037.
1963	. 1979.00	464419.	624911.	905876.	675039.
1963	. 1980.00	0.129531E 07	0.119401E 07	0.182268E 07	0.143357E 07
		1	2	3	4	5

LINE 18. STOP

END OF OUTPUT FORABAAN

WORKING SPACE= 12541 WORDS

LEGENDS FOR APPENDIX C

(1) Variable name indicates the original time series.

(2) 0 at the end of each variable indicates base run.

(3) 1 at the end of each variable indicates simulated series for scenario 1.

(4) 2 at the end of each variable indicates simulated series for scenario 2.

FOOTNOTES

INTRODUCTION

(1) A.P. Thirlwall, Growth and Development (New York: John Willey & Son., 1977), p. 39.

(2) Ibid., p. 39.

(3) The world Bank, World Development Report 1980 (Washington D.C: The World Bank, 1980), p. 112.

(4) Ibid., p. 59.

(5) Ibid., pp. 59-60.

CHAPTER I

(1) State Planning Organization, Development Plan, First Five Year Year (The Central Bank of the Republic of Turkey, 1963), p. 6.

(2) Ibid., p. 6.

(3) State Institute of Statistics, Turkiye'de Toplumsal Gelismenin 50. Yili (The 50th year of the social development of Turkey) (Devlet Istatistik Enstitusu Matbaasi, 1973), p. 45.

(4) Clarence Zuvekas, Jr., Economic Development (New York: St. Martin's Press, 1979), pp. 84-85.

(5) C.E. Ferguson, Microeconomic Theory (Illinois: Richard D. Irwing, Inc. 1972), p. 35.

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(2)
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(6)
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Necmi Sonmez (1963), p. 64.

(19)
This estimation was done basically from data in the 1963 Statistical Yearbook.

(20)
All figures cited here are country averages.

(21)
Data derived from Statistical Yearbook (1983).

(22)Statistical Yearbook of Turkey 1971, 1983; cultivated area covers crop area sown and fallow, vineyards, vegetable and fruit gardens.

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(24)
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(25)
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(27)
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(28)
The actual variation or dispersion as determined from the standard deviation is called absolute dispertion. If the absolute dispertion is the standart deviation "s" and the average is the mean "x", the relative dispersion is called the coefficient of variation, V= s/x, and is generally expressed as a percentage. It is independent of units used. For this reason it is useful in comparing distributions where units may be different.
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(2)W. J. Samuels, "State Law, and Economic Organization," Research in Law and Sociology (Volume 2): 65-69.
(3)
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(4)
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(9)
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Downs, p. 35.
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(12)Ibid., p. 59.
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Warren J. Samuels, "Organization and Control in The political Economy," (Unpublished Work.)
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(25)
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(28)
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(29)
Jan Kmenta, Elements of Econometrics (New York: Macmillan, 1971) and George G. Judge & Others, Theory and Practice of Econometrics, (New York: John Willey and Sons, 1980).
(30)
Lewis(1954), and Ranis and Fai (1961) are well known proponents of this stand.

(31)
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(32)
Birtek and Keyder (1975): 452.
(33)
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(34)
O. Varlier, Turkiye Tariminda Yapisal Degisme Teknolojisi ve Toprak Bolusumu (Ankara: State Planning Organization, publication no: 1636)
(35)
Findings of Aksoy study. Cited in Somel (1979).
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(2)
It was Knight's contribution to show that presence of uncertainity about the future may allow entrepreneours to earn positive profits despite product exhaustion and competitive equilibrium. Production takes place in anticipation of consumption, and since the demand for factors is derived from the expected consumers' demand for output, the entrepreneur is forced to speculate on the price of his final product. The product price is not determined unless the price of output is known. The entrepreneur resolves this dilemma by guessing the price at which output will sell, thereby translating the marginal physical products of the factors hired into anticipated marginal value products. Although the factors hired must be awarded their anticipated value of the marginal product, the entrepreneur as residual claimant may make a profit if realized total receipts prove to be greater than forecasted total receipts. Fore more detail see Blaug (1980).
(3)
Arnold H. Packer, Models of Economic Systems (Massachusetts: MIT Press, 1972), pp. 13-14.
(4)
John N. Ferris, Agricultural Market Analysis (1964). p.230.
(5)
Ibid., p. 227.
(6)
Ibid., p. 228.

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Such an expectation model is suggested by Andersen (1979) and Meyer and Rasche (1980). In such a model, it is assumed that prices received by farmers respond base price immidiately provided that it is announced in advance and believed (or otherwise expected).

(8)
K.C. Koguki, Macroeconomic Models (New York: Harper and Row, 1971), p. 82.

(9)
There is a high degree correlation between base price at time (t-1) and base price at time t. The estimated correlation coefficient is .96.

(10)
Paul Zarembka, Toward a Theory of Economic Development (San Fransisco: Halden Day Inc., 1974).

(11)
This was first introduced by Mc. Fadden in "Cost Revenue and Profit Functions," An Econometric Approach to Production Theory (Danial Mc. Fadden editor, Amsterdam: 1972).

(12)
Lawrence Lou and Pan A. Yotopoulos, "A Test of Relative Efficiency and Aplication for Indian Agriculture," American Economic Review 61 (1971): 94-109.

(13)
Ibid.

(14)
P. Zarembka, (1974).

(15)
The Duality approach states that the profit maximizing factor demands are given by

$$X^* = dG/dW_i/P$$

i=1,...,m, and the supply function is given by

$$Y^* = \pi^*/P - \sum_1^m dG/dW_i/P\ (W_i/P)$$

Thus we can first specify profit function 13, and then input demand function 12 and supply function 14. See Zarembka(1974) for more detail.

(16)
A. Zelner, J. Kmenta, J. Dreze, "Specification and Estimation of Cobb-Douglas Production Models," Econometrica (October, 1966): 784-795.

(17)
Lance Taylor, Macro Models for Developing Countries New York: McGraw Holl Comp., 1979), pp. 73-83.

(18)
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Arthur S. Goldberger, Economic Theory (New York: John Willey and Sons. Inc., 1971), p. 1.

(20)
H. Theil, Principles of Econometrics (New York: Jhon Willey and Sons. Inc., 1971), p. 1.

(21)
E. Malinvaud, "Econometrics Faced with the Needs of Macroeconomic Policy," 6 Econometrica (Novamber, 1981): 1363-1375.

(22)
Ibid.

(23)
Arnold H. Packer (1972), p. xii.

(24)
Ibid., p. 5.

(25)
J. Kmenta, p. 3.

(26)
Mark Blaug, Economik Theory in Retrospect (Cambridge University Press, 1980), p. 704.

(27)
Ibid.

(28)
Ibid., p. 707.

(29)
Ibid.

(30)
J. Kmenta, p. 154-168.

(31)
J. Jhonston, Econometric Methods (New York: Mc. Graw Hill, 1978), pp. 36-41.

(32)
Peter Schmidt, Econometrics (New York: Marcel Dekker, Inc., 1976), pp. 39-40., and also see G.G Judge and others (1980), pp. 411-413.

(33)
J. Jhonston (1961), p. 11.

(34)
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(35)
G. Madala (1977), p. 76.

(36)
Herry H. Kelejian and Wallace E. Oates, Introduction to Econometrics (New York: Harper and Row, 1974), p. 224.

(37)
OLS technique is still appropriate for a reqursive system of equations if covariance matrix is diogonal.

(38)
Maddala (1977), p. 231.

(39)
The OLS does not give consistent estimates of the parameters because of the correlation between the residual and the regressor, whereas the other methods give consistent estimates.

(40)
Kmenta p. 583.
(41)
Johnston p. 408.

(42)Ibid., p.410.
(43)
Ibid., pp. 410-417.
(44)
J.C. Cragg, "On the Relative Small Sample Properties of Several Structural Equation Estimators," Econometrica 35 (1967): 89-110.
(45)
Johnston, p. 413.
(46)
Cragg (1967): 109.
(47)
A.L. Nagar, "A Montecarlo Study of Alternative Simultanous Equation Estimators," Econometrica 28 (1960): 573-590.
(48)
Ibid.
(49)
Judge p. 4.

(50)Zellner, Kmenta, and Dreze (1966): 784-795.
(51)
The expected profit maximizing supply curve is defined as a function of input prices normalized by the expected output price. The major source of deviations from optimality is the difference between anticipated and realized prices which occur due to human errors. Since production function disturbance results largely from acts of nature, it is reasonable to assume that normalized input prices are independent of the disturbance of the supply function. See Maddala p. 251.
(52)
If the equation under consideration is overidentified, 2SLS gives asymptotically efficient estimates to LMIL or they are assymptotically equal.
(53)
Maurice Dobb, Theories of Value and Distribution Since Adam Smith (Cambridge: Cambridge University Press, 1973), p. 30.
(54)
The adaptive expectation model was also assumed for the farmer's transformation function. Under such an assumption, transformation function turned to the form of

$$Pf = a0 + a1Qf + a2Pf(t-1) + u.$$

Considering this information true, the model was estimated and resulted in R2 compared with the R2 obtained from

the original form. Since it is higher rhan the above one, the original function is employed in the model according to the principle of max R2.

(55)

Maddala p. 186.

CHAPTER V

(1)

Farmer's price responsiveness has been discussed in J.R. Behrman, Supply_esponse_in_Underdeveloped_Agriculture (Amsterdam: North Holland, 1968), and for Turkish Experience, S. Imrohoroglu and H. Kasnakoglu, "Supply Response in Turkish Agriculture," METU_Studies_in_Development 6 (1979): 327-339.

(2)

Implicit in the definition of the supply function are the expected price of the product and its inputs. Farmers are conscious of many of the important factors affecting price, such as production, consumption, consumer income, prices of competing products, and the government support program. If the government support program was instrumental in establishing price, than farmers would be attentive to the prospective government program. Outlook information influences expectations. See J.N. Ferris, pp. 227-228.

(3)

M. Donmez Celik, Turkiye'de_Tarimsal_Destekleme_Fiyat_Politikasinin_Etkinligi (Ankara: Maliye Bakanligi Tetkik Kurulu, 1979).

(4)

Ekmekcioglu and Kasnakoglu (1979): pp. 113-143, and I. Bulmus, Tarimsal_Fiyat_Olusumuna_Devlet_Mudahalesi (Ankara: AITIA yayini, 1979).

(5)

Prices mentioned here are the indices of prices used in the model estimation.

(6)

The increase in the world market price is 13.07 percent: however, the increase was coupled during the translation to domestic price, due to devaluation of the Turkish lira in that period.

(7)

Changes in the price differentials between the agricultural and industrial sectors have actually moved against the agricultural sector. This means that price differentials have moved to retard, not stimulate, the agricultural sector's development.

(8)

Elasticities are calculated by using the first and the last period averages.

(9)
Kutlu Somel (1979): p. 281.

(10)
Coefficient of variations are calculated based on the sample period of 1963-1980.

(11)
The simple average of percentage deviations from base case to scenario 1.

(12)
Somel (1979): 275-323.

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(1)
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