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The Political Economy of Agricultural Pricing Policy

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^u Trade, Exchange Rate,
and Agricultural Pricing Policies
in Egypt

Volume I The Country Study^u

Jean-Jacques Dethier



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Volume I The Country Study

Jean-Jacques Dethier

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The series *The Political Economy of Agricultural Pricing Policy*, under the direction of Anne O. Krueger, Maurice Schiff, and Alberto Valdés, was undertaken to examine the reasons underlying pricing policy, to quantify the systematic and extensive intervention of developing countries in the pricing of agricultural commodities during 1960-85, and to understand the effects of such intervention over time. Each of the eighteen country studies uses a common methodology to measure the effect of sectoral and economywide price intervention on agricultural incentives and food prices, as well as their effects on output, consumption, trade, intersectoral transfers, government budgets, and income distribution. The political and economic forces behind price intervention are analyzed, as are the efforts at reform of pricing policy and their consequences.

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ABSTRACT

This study examines twenty-five years of government intervention in agricultural price policy in Egypt. The study focuses on Egypt's five main crops: cotton, rice, wheat, maize, and sugarcane. It shows that, during the period 1960-85, the price regime has discriminated strongly against agriculture. The net effect of all types of intervention, both sectoral and economy-wide, was to reduce the prices received by producers of those five crops. Urban consumers, on the other hand, and particularly those in the lowest income groups, benefited from this intervention.

The negative effects of intervention on the prices received by agricultural producers were particularly strong between 1960 and 1973. During that period, the government of Egypt was determined to transfer resources out of agriculture as a way of helping to pay for industrialization and military expenditures. Agricultural exports as a share of all exports fell rapidly from the 80 percent figure chalked up in 1960. Despite the reduced importance of agricultural exports, though, Egypt still dominates the world market for extra long staple cotton.

After 1973, when world prices of farm commodities surged upward and the country became a net importer of food, the Egyptian government became increasingly concerned with stabilizing domestic prices and adopted a more flexible agricultural price policy. Implicit taxation of agricultural producers through exchange rate and trade policies fell from an average of 29 percent during the 1960-72 period to an average 12 percent between 1973 and 1980. Meanwhile, agricultural input subsidies (especially for fertilizer) increased sharply.

Notwithstanding this more benign approach to agricultural producer prices, government intervention has, on balance, largely favored consumers. Consumer subsidies during the 1973-85 period boosted incomes of urban and landless rural workers but had a sharply negative impact on the macroeconomy.

The study reports the effects of agricultural price intervention on output, consumption, income levels, the government's budget and foreign exchange earnings.

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INTRODUCTION

This report is the final product of the Egypt case study in the Comparative Study of the Political Economy of Agricultural Pricing Policies in Developing Countries, a research project (RPO 673-64) directed by Anne O. Krueger, Maurice Schiff, and Alberto Valdes and financed by the World Bank. The project, which uses a common methodology to analyze eighteen countries, was initiated in May 1985.

The Egypt case study examines twenty-five years of pricing policies in agriculture, covering the period 1960-85. During this period, the price regime has discriminated strongly against agriculture. The study proceeds mostly by analyzing the objectives and implications of government intervention on five major crops, cotton, rice, wheat, maize, and sugarcane.

The study is organized in three parts. The first part of the study examines the economic history of price intervention, both at the sectoral and at the economy-wide level, affecting agriculture. After an introductory essay (chapter 1) outlining political, macroeconomic, and sectoral developments, the objectives and instruments of agricultural policy during the period 1960-85 are examined (chapter 2). Then the study examines the incidence of intervention on relative prices and values added (chapter 3).

The second part of the study analyzes the effects of price

intervention on agricultural output (chapter 4), on rural and urban incomes (chapter 5), on consumption (chapter 6), on foreign exchange earnings (chapter 7), on the government budget (chapter 8), and on resource flows in and out of agriculture (chapter 9).

The third part of the study examines the determinants of agricultural pricing policies. The influence of world prices and the relationship between government intervention and price variability are analyzed (chapter 10). In the conclusions, a political-economic interpretation of twenty-five years of price interventions is given, and recent reform attempts are examined (chapter 11). Finally, background material such as time series data, calculations, and more detailed description of economic policies and institutions are given in the appendices.

Chapter 1

ORIGINS OF AGRICULTURAL PRICING POLICIES IN EGYPT

During the twenty five year period covered by this study, major political and economic changes have taken place in Egypt. Policies, institutions and ideology have shaped economic trends. Agricultural pricing policies must be understood in the broad context of these structural changes which are described in this first chapter.

ECONOMIC AND POLITICAL EVOLUTION, 1960-85

The geography and demography of Egypt delineate its basic economic problem. Although the total area of the country is 386,000 square miles (a little over 1 million square kilometers), less than 4 percent of this land is habitable or even usable. In fact, without the Nile, which flows through the country for about a thousand miles without a single tributary, Egypt would be little more than part of the Sahara. This fertile river, a cradle of civilizations, has provided populations with food and facilitated commerce for thousands of years. Still, 98 percent of Egypt's population remains packed into an area of 15,000 square miles along the Nile and in the Nile Delta.

Egypt occupies the northeastern corner of Africa, extending south from the thirty-second parallel to below the Tropic of Cancer. It is a Mediterranean country; an Arab country, bordered by Libya to the West and by the Sudan to the South; and a Middle Eastern

country, with its eastern frontiers stretching from the Taba harbor on the Red Sea Gulf of Aqaba to Rafa on the Mediterranean.

The Nile Valley is traditionally divided into regions: Upper Egypt extends from south of Aswan north to Cairo; Lower Egypt encompasses the Nile Delta, which forks into two main branches just north of Cairo and contains the most fertile land in the world. The remainder of the country is mostly desert: the Eastern desert of the Sinai; the huge Western desert, extending to the Libyan border; and the mineral-rich but agriculturally sterile area of the South along the coast of the Red Sea.

As suggested, geography and demography have had enormous significance for Egypt. This has been true not only for Egypt's internal development but for its relations with the rest of the world. Over the centuries, Egypt's centrality to the historic trade between the Mediterranean and Sub-Saharan and Arabian Africa made it very cosmopolitan. Modern Egypt has continued to trade extensively with other nations, and the openness of the economy is considerable. The inland transportation system today includes 1,000 miles of Nile River (with barges and feluccas transporting much of the agricultural supplies), the Suez Canal, and a railway system of 4,000 miles. There is also a road network of 14,000 miles (5,000 of which are hard surface) in the Delta and along the Nile that links Cairo with the major ports--Alexandria, Suez, and Ismailia.

The country has few natural resources other than the agricultural capacity of the Nile Valley. Oil and gas fields were

discovered in and around the Red Sea in the early 1970s, and production in this sector now generates the bulk of foreign exchange earnings. Other major minerals are phosphates and iron ore. Industrialization has progressed very slowly, although its origins date to the rule of Muhammad Ali in the mid-nineteenth century. The country embarked on an import substitution strategy in the late 1920s and has some important traditional industries: cotton spinning and weaving, sugar processing, and cement production. Egypt also has developed some modern industries: fertilizers, iron and steel, rubber tires, pulp and paper, and food processing. The newest industries, reflecting recent resource discoveries, are in the chemical and petrochemical sector.

The population of Egypt has increased fivefold since the beginning of the century and has more than doubled since 1947 (see Table 1-1). The 1986 census (whose results were just becoming available at this writing) shows that the population now exceeds 50 million. Because of the limited habitable area, Egypt's population density is extremely high--more than 2,600 inhabitants per square mile (roughly 1,000 per square kilometer). Total cropland has remained constant since 1960 at about 6 million acres, because the gains in arable land from costly reclamation schemes have been offset by losses to urbanization and desertification. Agricultural production increases, thus, are almost exclusively obtained through more intensive cultivation. The harvested area has increased by 20

percent since 1947 and has now reached 12 million feddans.¹ The harvested area per capita has decreased by 40 percent since 1960, however; it is now approximately 0.25 feddans. There are less than 3 harvested feddans per person employed in agriculture. The changes over time of both rural and urban components of the population and of land area per capita are given in Tables 1-1 and 1-2.

The population of Egypt was more than 55 percent rural, according to the census of 1976. Agriculture still accounts for 40 percent of employment in the economy, but it has declined in importance as a source of income in rural areas.

Egypt's literacy rate increased from 29 percent in 1960 to 43.5 percent in 1976, reflecting an investment in education during the Nasser period. By 1976, only 2.2 percent of the population had a higher education degree, however (Ikram 1980, Table 6-8).

¹One feddan equals 1.038 acre or 0.42 hectare.

Table 1.1.

URBAN AND RURAL POPULATION, 1960-85.

YEAR	POPULATION			
	RURAL (mill.)	URBAN (mill.)	TOTAL (mill.)	URBAN in percent of total
1947	12.60	6.36	18.97	34%
1960	16.12	9.86	26.09	38%
1966	17.70	12.03	30.14	40%
1970			33.05	
1976	20.59	16.04	38.20	42%
1980			42.29	
1985			48.51	

- NOTES: (1) Census years: 1947, 1966, 1976.
(2) Urban and rural figures may not equal to total population due to statistical discrepancies.
- SOURCES: (1) Population: 1960-1981 World Bank; 1982-1983 CAPMAS Statistical Yearbook (1984); 1985 World Bank.
(2) Urban and rural figures from CAPMAS (1984).

Table 1.2.

EMPLOYMENT IN AGRICULTURE AND HARVESTED AREA, 1960-85.

	EMPLOYMENT			HARVESTED AREA		CROP LAND AREA	
	LABOR FORCE EMPLOYED ('000)	NUMBER EMPLOYED IN AGRIC ('000)	SHARE OF AGRICULTURE EMPLOYMENT IN TOTAL	Feddans ('000)	PER PERSON EMPLOYED IN AGRIC.	Feddans ('000)	PER PERSON EMPLOYED IN AGRIC.
1960	6006.00	3245.00	54%	10792	3.33	6115	1.88
1965	7373.90	3751.00	51%	10869	2.90	6342	1.69
1970	8044.20	4108.50	51%	11138	2.71	6155	1.50
1975	9433.00	4218.00	45%	11585	2.75	6046	1.43
1980	11180.00	4200.00	38%	12020	2.86	5933	1.41
1985	11595.00	4345.00	37%	12162	2.80	6184	1.42

- NOTES: (1) Number of persons employed in agriculture includes fishermen.
(2) Harvested area reflects multiple cropping.
- SOURCES: (1) Labor force and agricultural employment: ILO Yearbook (various years) and World Bank.
(2) Harvested and land area: Gardner/Parker (1985) and World Bank.

Economic Performance, 1960-85. The performance of the economy in the period 1960-85 was uneven, as shown in Table 1-3. Population increased by about 2.25 percent per year during the past two decades. The average growth rate of GDP was about 6 percent from 1960 to 1965. There was a period of sluggish growth from 1965 to 1973, probably less than 3 percent per year. Then, from 1973 to 1980, Egypt achieved a very high growth rate of GDP of 8 to 9 percent in real terms. A large part of all this growth came from the booming petroleum sector and from an increase in unproductive government services and employment (Hansen and Radwan 1982, p. 29). Real production per head, then, may have increased only by 2 or 3 percent from 1960 to 1965, followed by virtual stagnation from 1965 to 1973, and then by increases of some 5 percent per year from 1973 to 1980. After 1980, economic growth again began to slow. In fiscal year 1984-85, for example, growth of GDP was in the 5- to 6-percent range (World Bank 1986a, p. 2).

Gross investment reached 22 percent of GNP during the First Five-Year Plan (1960-65) but fell to 15 percent in 1970 and reached a low of 13 percent in 1971-72. After the 1967 war, investments added very little to existing capacity and went mainly to maintenance and repairs of the capital stock. In 1975, gross investment reached a high of 33 percent of GNP. Since then, it has been maintained at about 25 percent per year.

Development policy between 1960 and 1985 went through two distinct periods: planning and liberalization. By contrast to the

Table 1.3. GROSS DOMESTIC PRODUCT AND ITS COMPONENTS, In real terms, 1960-84.

	Nominal GDP (LE mil)	Real GDP (LE mil)	Real GDP per capita (LE)	----- in real LE Million -----				Share in GDP of			
				Investment	CA Def.	Imports	Exports	Investment	CA Deficit	Import	Export
1960	1,443	4,358	167	1,244	142	1,906	1,996	29%	3%	44%	46%
1965	2,340	6,263	213	2,176	-824	2,757	2,297	35%	-13%	44%	37%
1970	3,058	7,378	223	1,607	-497	3,023	2,087	22%	-7%	41%	28%
1971	3,241	7,631	226	1,375	-457	2,915	2,008	18%	-6%	38%	26%
1972	3,390	7,786	225	1,383	-723	2,983	2,058	18%	-9%	38%	26%
1973	3,806	8,119	230	1,687	-1,139	2,910	1,815	21%	-14%	36%	22%
1974	4,339	8,047	222	1,270	-1,508	2,997	1,651	16%	-19%	37%	21%
1975	5,218	8,765	237	2,154	-2,332	3,618	1,769	25%	-27%	41%	20%
1976	6,727	10,045	263	2,197	-1,889	3,415	2,237	22%	-19%	34%	22%
1977	8,344	10,889	281	2,444	-1,657	3,615	2,448	22%	-15%	33%	22%
1978	9,795	11,986	301	3,286	-2,542	4,437	2,606	27%	-21%	37%	22%
1979	12,705	12,705	310	3,763	-2,624	6,141	3,777	30%	-21%	48%	30%
1980	17,320	14,358	340	3,898	-1,901	7,007	4,792	27%	-13%	49%	33%
1981	20,171	15,451	355	4,555	-2,222	7,252	4,951	29%	-14%	47%	32%
1982	23,259	16,421	369	4,393	-3,612	7,004	4,764	27%	-22%	43%	29%
1983	27,488	17,245	377	4,138	-3,001	7,801	4,961	24%	-17%	45%	29%
1984	32,516	18,102	384	3,985	-3,082	7,567	5,338	22%	-17%	42%	29%

NOTES:(1) GDP at market prices 1960-80 from Gardner/Parker (1985); 1981-83 from World Bank; 1984-85 from US Embassy, Cairo, Agricultural Report (1986).

GDP deflator from World Bank Report No.6195-EGT. Base 1979 = 100.

(2) Population from Table 1.1.

(3) Gross fixed investment, current account deficit, imports and exports of goods and non-factor services all in LE million deflated by GDP deflator (1979 = 100).

1960-1973 data from World Bank, World Tables (1983); 1974-85 from Report No.6195-EGT.

CA = Current Account of the Balance of Payments.

early phase of industrialization of Egypt (1930-52), during which the only policy instruments used were tariffs and import controls, post-1956 development policy relied on (1) massive public investments, (2) public ownership of industry, (3) virtual public monopoly on foreign trade, (4) "semimarket mechanisms" such as administered prices, and (5) guidelines for wage and employment policies (Mabro and Radwan 1976, pp. 64-75).²

Between the years 1960 and 1973--the planning period--the macroeconomic mechanics, briefly stated, were as follows.³ Prices, to a large extent, were administered. The balance between supply and demand in all sectors of the economy was brought about via quantity adjustments. In growth policy, planners allocated a sizable fraction of GNP to current consumption, compared with investment, because of the government's commitment to equity and social welfare. Consumption during that period was allowed to grow at "reasonable rates" (Hansen 1968). The planning decisions for the long run related mainly to the investment program, which was financed by domestic savings and by foreign loans. Until the mid-

²Until 1930, Egypt had ninety years of free trade, imposed by the European powers after an abortive attempt at industrialization under Muhammad Ali. During that period, the cotton economy, trade, finance, and infrastructure developed, but almost no industrialization took place. Between 1930 and 1950, however, industrialization was encouraged by the government through the use of import tariffs. Following the Korean War boom, the government further encouraged industry by increasing tariff protection, licensing imports, and imposing other taxes and duties on imports.

³Macroeconomic policies are described in greater detail in Appendix G.

1970s, markets, including labor markets, responded without major disequilibria. Adjustments were made via short-term fiscal, monetary, and foreign exchange policies.

Planning was not the only allocative mechanism; entire sectors of the economy, although tightly controlled, were market-determined. In fact, the five-year plan of 1960-65 was little more than a schedule of investment projects with growth projections, and planning virtually disappeared after that first attempt.⁴ The main function of the five-year plan was not to create a compulsory framework for implementing policies but rather to schedule projects that had been drawn up. The material balance in the economy and the generation of savings to be channeled into those investment projects was not monitored by the plan but by "semimarket mechanisms" and by various measures of control. As Hansen (1968, p. 20) pointed out, the balance of demand and supply in the economy was handled, once the investment schedule was determined, by short-term fiscal and monetary policies in accordance with the prospects of securing foreign loans.

After 1973, major structural disequilibria were handled with an increasing volume of government deficit and of foreign borrowing. At the end of 1973, foreign reserves were at their lowest. The

⁴The second plan was never implemented, and the 1967 war interrupted the planning velleities of Arab socialism. Planning efforts were taken up only ten years later with a five-year "rolling" plan for 1978-82 that was revised for 1980-84, but this plan's function seems to have been only to counterbalance the anarchic nature of the "opening up."

years 1974-85--the liberalization period--witnessed major changes in the orientation of economic policies. Sadat introduced the policy of Infitah ("opening up"), under which the economy was slowly and incrementally liberalized in certain sectors but kept most of its institutional characteristics--in particular, the preeminence of the public sector (Clark 1984).

Under the "opening," there was an attempt to rely more on the private sector and on market mechanisms. The most important reforms were in the foreign trade and investment regimes, as the economy adjusted to major external shocks that led to a major balance of payments crisis in 1976-77. Investment funds were derived from massive foreign aid and, after 1978, from the high-growth petroleum sector. Inflation, until then "repressed" by controls on the prices of basic necessities (including food), surfaced after the war of 1973 and since then has been a permanent concern for policymakers. Quantity adjustments were too slow to respond, and there was an increasing reliance on price adjustment mechanisms.

Imports and exports, expressed as shares of GNP, were fairly constant over the period, with the exception of the 1974-75 and post-1980 periods, during which imports rose to 40 percent of GNP (see Table 1-3). During 1977-80, there was a dramatic change in the composition of exports that was largely responsible for the comfortable foreign exchange situation of 1978-82. It happened that the four "engines of growth" of the economy were foreign exchange earners. Oil exports, the Suez Canal, tourism, and remittances from migrant workers increased foreign exchange earnings so fast that

despite declining earnings from cotton and other traditional exports and growing debt service payments, imports almost doubled from 1974 to 1979 without causing an increasing current account deficit. After 1980, however, the current account situation deteriorated rapidly.⁵

The savings-investment gap has widened enormously since the mid-1960s, largely because of deteriorating public savings, which dropped from 12.5 percent of GDP in 1970 to about 2.7 percent of GDP in 1978, mainly because of the growth of defense expenditures and food subsidies.

The availability of foreign exchange has been an important determinant of the growth rate of GNP during the years 1960-85. Growth has been financed to a large extent by foreign borrowing. Egypt has been dependent on foreign assistance since 1959, after it used up foreign reserves accumulated during World War II and the Korean War. Foreign aid and loans from abroad--on average amounting to 5 percent of GDP--were substantial during the First Five-Year Plan (Hansen 1968, p. 37). Since then, availability of foreign exchange has grown considerably under regimes of bilateral agreements with Eastern-bloc countries and of GATT-type generalized preferences with capitalist countries.⁶

⁵See Table G-3 in Appendix G.

⁶For a comparison of foreign aid from the Soviet Union and the United States, see Abdel-Khalek (1982).

During the period 1959-73, Egypt relied on external financing from the Soviet Union and from the United States. After 1967, Western assistance virtually ceased. In particular, food aid shipments from the United States (which had reached US\$110 million in 1966) ceased abruptly, and were resumed only in 1974.⁷ Arab countries (Libya, Saudi Arabia, and Kuwait) provided large bridge-gap grants. The Soviet Union and Eastern bloc countries were the major source of development assistance, and OECD countries provided substantial suppliers' credits during the 1967-73 period (Ikram 1980, p. 344). The growth phase of the 1970s was accompanied by massive capital inflows from abroad, first from Arab countries, then from the United States. The share of foreign savings, which fluctuated around 5 percent of GDP during the 1960s, soared to 20 percent in 1975 (Ikram 1980, p. 44).

Political Developments. In 1952, after years of constitutional monarchy and political tensions between the king, the British occupiers, and the Wafd party (representing the national bourgeoisie), Gamal Abdel Nasser and a group of nationalist officers took power. The years 1952-56 were ones of political consolidation for the new regime and included an agrarian reform. Otherwise, conventional economic policies prevailed.

After the Suez crisis and the ensuing economic sanctions against Egypt in 1956, and the decision to construct the High Dam in Aswan, the regime took a radical economic approach (Hufbauer and

⁷On the history of U.S. food aid, see Appendix O.

Schott 1985, pp. 269-274). The government considerably extended its control over the economy by nationalizing foreign trade and the most important industries. It also undertook major public investments. Trade policies were strongly biased in favor of industry. In the agricultural sector, the agrarian reform continued, and a system of cooperatives was established. Agriculture remained a privately owned but tightly controlled sector.

The years 1967-73, following the war with Israel, were a period of internal crises for the Nasserist regime. Political, military, social, and economic problems forced realignments in the political sphere. The economic policies of the previous period were continued, in particular the strong import substitution policies in trade and industry. No major economic decisions were taken, because the infrastructure of the country had to be rebuilt after the war years. After Nasser's death in 1970, a slow transition--punctuated by sharp ideological debates within the regime--led to Anwar el Sadat's ascendancy and to the emergence in decision-making circles of advocates of liberalization and rapprochement with the West.

Sadat catalyzed major transformations in Egypt's foreign political and economic alliances and brought concomitant shifts in domestic economic policies and in the dynamics of policy change. The October 1973 war with Israel enhanced Sadat's legitimacy and made it possible for him to undertake reforms. Arguing that the country had reached an economic "stage zero" (Marhalat as-Sifr; quoted in Scobie 1981, p. 31), Sadat initiated a liberalization in trade and finance known as the "economic opening" (Al-Infitah al-

iqtisadi). He strengthened his position in 1974-75 by launching a public debate over Nasser's heritage that came to be known as a "de-Nasserization" campaign.

Difficulties mounted for Sadat, however, when, in exchange for continued aid, international donors requested further economic reforms, including cuts in food subsidies. The ensuing food riots of January 1977, unprecedented since the 1952 revolution, put a temporary end to Sadat's reform attempts. The final period of Sadat's presidency was marked by the signing of the Camp David agreement and by growing opposition to his dictatorial management style. In 1980, seeking to assuage mass discontent, Sadat personally assumed the premiership and instituted populist measures, increasing price controls and cutting the prices of popular goods. But in 1981, Sadat resorted to repression and arrested 1,500 oppositionists from all quarters. He was assassinated a month later.

Hosni Mubarak assumed the presidency upon Sadat's death. From 1982 to 1985, Mubarak maintained Sadat's economic and foreign policies, but an increasingly adverse international context modified their impact. Diplomatically, difficulties over the Palestinian question and the Lebanon war led to a period of "cold peace" with Israel. Economically, oil, remittances from Egyptian workers abroad, the Suez Canal, and foreign aid provided abundant foreign exchange from 1978 to 1980. These sources began to decline after 1981, however, bringing a slow-down in economic growth. Servicing of Egypt's foreign debt emerged in the mid-1980s as the major

challenge for policymakers.

Whereas Sadat had carried out economic liberalization without political liberalization--for example, by maintaining the one-party system--Mubarak has pursued economic liberalization within a context of "controlled democracy." Elections for the People's Assembly (Maglis esh Shab) have taken place twice under Mubarak's presidency. Currently, although the official National Democratic party (Hezb el Watani) totally controls the Assembly, the multiparty system enables the opposition to voice its criticism of government policies. The freer political climate, however, seems insufficient to dispel noticeable social tensions created by the economic policies. Ultimately, this represents a political gain for the Islamic fundamentalist movement (Sadowsky 1987, March).

STRUCTURAL CHANGES IN AGRICULTURE

The Egyptian agricultural sector underwent major structural changes during the years 1960-85. Before industrialization got a start in the 1930s, and until the early 1960s, agriculture dominated the Egyptian economy in terms of output and employment. Cotton exports dominated foreign trade. After 1960, however, agriculture's importance in the economy declined considerably. Agriculture's share in GDP fell from 28 percent in 1960 to about 19 percent in 1985, as Table 1-3 shows. In the late 1970s, the share of petroleum increased markedly, reaching about 10 percent of real GDP in 1980. The share of manufacturing industry has been almost unchanged since 1960, fluctuating around 17 percent.

The decline in the share of agriculture in total employment has been substantial. It fell from around 50 percent in 1960 to 40 percent in 1980. Agricultural employment appears to have peaked around 1975, at 4.2 million persons (see Table 1-2), but the increase in the 1960-76 period, as recorded by the official labor force sample surveys, is viewed somewhat skeptically by experts, as reported by Hansen and Radwan (1982, p. 59). Some observers even believe that employment in the sector has remained virtually constant since 1937, although Hansen and Radwan themselves do not share that view. In any case, there seems to have been a sharp decline after 1972, which is consistent with the important increase in agricultural wages observed during the late 1970s and with the general impression of labor shortages in agriculture.⁸

As indicated in Table 1-4, agricultural exports as a share of total exports have declined from 80 percent in 1960 to 18 percent in 1980. Agricultural imports (mainly wheat and flour) at current prices have increased threefold from 1974--the year in which Egypt became a net importer of agricultural product--until 1983.

Agriculture traditionally provided the economy with food crops and export crops and was the major foreign exchange earning sector before it was displaced by the oil sector. But the aggregate growth rate of the sector and productivity have declined sharply since the mid-1960s. At constant prices, agricultural growth averaged 2.6

⁸On agricultural wages, see Table 2-8. On labor shortages, see Richards and Martin (1983) and Commander and Hadhoud (1986).

percent during the 1964-70 period, 3.5 percent during the 1970-80 period, and 2.6 percent during the 1980-83 period. But in 1983-84, the rate of growth for the sector was negative (-0.2 percent).⁹ Throughout the 1970s, agricultural production declined in per capita terms, as shown by the production index in Table 1-5. For agriculture as a whole, there has been a noticeable increase in production from 1978 to 1983, mainly caused by increases in the production of vegetables and fruits and of livestock and dairy products. Overall, though, agriculture was by far the most sluggish sector of the Egyptian economy during the 1970s.¹⁰

⁹Index numbers are based on Fisher's index, the geometric mean of the Laspeyres and Paasche indices (World Bank 1986a, pp. 19-20).

¹⁰The rate of growth of the agricultural sector is low compared to the 8.6-percent growth rate for the economy as a whole, obtained mainly as a consequence of oil production, Suez canal reopening, tourism, investment in the service sector, and external resources in the form of remittances and foreign aid. The declining share of agriculture in the economy, in terms of output, employment, and income is a phenomenon that is universally observed during the process of development. It would be desirable if it were simultaneous with industrialization and generation of sufficient export earnings to sustain it. But in the case of Egypt, this has been a developmental myth. The spectacular growth of the economy during the 1970s bears "little relation with industrialization and development efforts" (see Hansen and Radwan 1982, p. 29).

Table 1.4.

AGRICULTURAL PRODUCTION, IMPORTS AND EXPORTS, 1960-1984.

	Ag GDP (nominal) -- LE million --	Ag GDP (real)	Agriculture as % of:		Agricultural Imports		Agricultural Exports		
			GDP	Total Employment	US\$ million	As % of Total Imports	US\$ million	--- As percent of --- All Exports	--- Agr. GDP
1960	404	N/A	28%	54%	109	14%	468	80%	4%
1965	612	N/A	26%	51%	221	23%	513	90%	4%
1970	780	N/A	26%	51%	153	13%	615	75%	4%
1971	774	N/A	24%		253	20%	660	78%	4%
1972	854	N/A	25%		240	19%	622	76%	3%
1973	1062	N/A	28%		N/A	N/A	N/A	N/A	N/A
1974	1280	2201	29%		1045	33%	983	59%	5%
1975	1468	2336	28%	45%	1086	25%	780	50%	3%
1976	1744	2369	26%		1295	31%	743	46%	3%
1977	2038	2303	24%		1100	25%	811	41%	3%
1978	2286	2431	23%		1537	29%	622	32%	2%
1979	2530	2530	20%		1782	27%	602	25%	3%
1980	3326	2665	19%	38%	2696	36%	709	18%	3%
1981	3743	2639	19%		2680	30%	724	18%	3%
1982	4353	2718	19%		2395	28%	640	16%	3%
1983	5157	2775	19%		3274	39%	680	18%	3%
1984	6131	2846	19%	37%	N/A	N/A	N/A	N/A	N/A

SOURCES

- (1) Agricultural GDP from World Bank (1986).
- (2) Conversion to real terms uses agricultural GDP deflator, 1979 = 100
- (3) Agricultural employment as share of total employment from Table 1.2.
- (4) Agricultural Imports in US \$ 1960-1972 from World Bank, in LE converted to US \$ at official exchange rate; 1974-1984 in US\$ from World Bank
- (5) Agricultural exports in US \$: 1960-1972 from World Bank, converted to US \$ from LE at official exchange rate, 1974-1984 from Gardner/Parker (1985).
- (6) Agricultural GDP was converted to US \$ at official exchange rate to compute share of agricultural exports in agricultural output.

Table 1.5. CHANGES IN AGRICULTURAL PRODUCTION DURING THE 1970s.
(BASE 1969-71 = 100)

	Average 1969-71	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980

Value of Production											
Crops	1270.0	1296.0	1314.4	1307.5	1272.8	1287.9	1323.7	1274.7	1360.4	1428.9	1490.8
Livestock	554.9	571.6	581.7	596.8	618.3	667.0	673.3	707.1	709.6	726.6	732.5
Total Ag.	1824.9	1867.8	1896.1	1904.3	1891.1	1954.9	1997.0	1981.8	2070.0	2155.5	2223.3
Total Food	1475.7	1525.7	1550.8	1572.2	1592.4	1695.2	1728.1	1709.0	1771.0	1825.6	1862.7
Production Indices											
Crops	100.0	102.0	103.0	103.0	100.0	101.0	104.0	100.0	107.0	113.0	117.0
Total Ag.	100.0	102.0	104.0	104.0	104.0	107.0	109.0	109.0	113.0	118.0	122.0
Total Food	100.0	103.0	105.0	107.0	108.0	115.0	117.0	116.0	120.0	124.0	126.0
Per Capita Ag	100.0	100.0	99.0	98.0	95.0	96.0	96.0	93.0	95.0	96.0	96.0
Per Capita Food	100.0	101.0	100.0	100.0	99.0	103.0	102.0	99.0	100.0	101.0	100.0
Population Index	100.0	102.3	104.6	107.0	109.4	111.8	114.3	116.9	119.7	122.9	126.6

SOURCE: USDA (1984)

Value of production in millions of US\$ at constant prices.

There has been a sharp decline in the self-sufficiency ratio for all major food crops throughout the 1970s and 1980s.¹¹ The corollary of the lagging domestic agricultural supply has been a growing reliance on food imports. Egypt became a net importer of agricultural commodities in 1974. By 1981, Egypt was already importing 48 percent of all the staple food consumed domestically and had a food import bill of US\$4 billion.

Because food crops are tradable in Egypt, low domestic prices and subsidized imports encourage consumption. But the growth process during the 1970s had a strong income effect, creating excess demand in virtually all commodity markets. The annual growth rate of real income per capita was 8 to 9 percent from 1973 to 1980, making Egypt one of the fastest-growing countries during the 1970s. The surge in real private income, however, overheated the economy, putting inflationary pressure on markets, and has further increased the demand for imported grains and for meats and dairy products.

Because of the relatively low level of per capita income, and because of the unequal distribution of income, the aggregate income elasticity of demand for food is extremely high in Egypt. Demand for food also is growing rapidly because the population growth rate was almost 3.0 percent at the end of the 1970s, and the urban fraction of the population was growing faster than the rural

¹¹The self-sufficiency ratio is shown in Table E-9. It is defined as domestic production divided by total domestic use. Total domestic use equals production plus imports minus exports. In the case of sugar and cotton, the raw material equivalents of the traded quantities are used.

fraction. This has had serious economic implications, because food subsidies tend to be concentrated in urban areas. Government policies--more specifically, wheat imports and the subsidy system for bread--have also contributed in maintaining the elasticity of demand for food at a high level. Since the mid-1970s, the proposed solution to the problems of the economy became increasingly tied with food policy objectives, and food security (Amn el-geza'i) became the dominant theme of agricultural policy.

Changes in the cropping pattern during the past twenty-five years reflect the shift to perennial irrigation after the completion of the Aswan High Dam and the impact of government policies.¹² The total cropped area increased by about 8 percent between 1960 and 1985, reflecting the further-expanded irrigation, new land development, and an intensified cultivation (World Bank 1983b, p. 107). Most of this increase took place in the 1960s, however, and the total crop area has shown virtually no increase since 1975. By contrast, orchard land during this period increased by 240 percent and vegetable land by 225 percent. In geographic terms, much of the expansion took place in the Cairo Vegetable Zone, comprising nearly 500,000 feddans of Egypt's best Southern Delta soils (Waterbury 1983, p. 291). The area devoted to sugarcane in Upper Egypt increased rapidly during the 1960s and early 1970s, reflecting yield gains with increased water availability, but these increases in

¹²The main determinants of agricultural production are examined in detail in Appendix H.

cultivated area stabilized after the second half of the 1970s, as the relative profitability of the crop weakened.

The crop rotation system has changed significantly. The most important shift has been the progressive increase in the area devoted to full-season berseem, which is used for animal fodder. This increase has been mainly at the expense of cotton, whose area declined from 1.8 million feddans in 1960 to around 1.1 million in 1985, and secondarily at the expense of beans and lentils. Among the winter crops, wheat has remained roughly stable in area planted during the entire period. As a consequence of the spread of perennial irrigation because of the High Dam, the area under summer crops increased more rapidly than that under winter crops. Areas under rice and maize increased rapidly during the 1960s. Rice declined during the 1970s, but maize has continued to increase during the 1970s and 1980s because the green stalk of maize is used as animal feed during the summer months--a trend that corresponds to the increase of berseem in winter. The maize area increase thus reflects increased demand resulting from the higher profitability of animal production.

In Egyptian agriculture, animals are not just a source of meat and dairy production but provide draft power for lifting water, cultivating land, and transporting produce. Animals are being increasingly replaced in these functions by machines, however, because the relative scarcity of land has pushed up the opportunity cost of maintaining animals for draft power only (World Bank 1986a, p. 121).

Livestock production has been favored by the fact that the government generally has not controlled meat and dairy prices. Moreover, the government has subsidized many inputs, including animal feed. Increased animal production has led to increased demand for fodder. Because crop residues are limited, and because rangeland is unavailable, livestock production depends on fodder grown on arable land. In 1985, about 25 percent of winter land and 23 percent of summer land were tied to the production of animal fodder. In Egypt, then, meat competes directly for resources with food and export crops.

Labor shortages and increased returns to meat and dairy products have boosted mechanization of many farm operations since the late 1970s.¹³ Most farmers, though, continue to maintain animals as assets and as collateral for credit. The shift in mechanization in the long run can be expected to improve the efficiency of meat and milk production. Despite the release of animals through mechanization and greater fodder availability since the early 1970s, meat production has grown at only a slightly faster pace. This reflects the high land intensiveness of animal production and the low level of livestock productivity in Egypt compared with other countries. Demand for red meat increased at a rate approaching 7 percent per year after 1974, as a result of income growth and urbanization. Because of bottlenecks in domestic supply, prices

¹³See Appendix H.

also rose sharply.¹⁴ This led the government to increase substantially the level of meat imports after 1980. Similar trends in production, consumption, and imports have characterized milk and dairy products.

Poultry production (chicken-meat and eggs) is not constrained by land availability and has grown more rapidly than livestock production. There was a major transformation in poultry during the past twenty-five years. During the 1960s, informal village production accounted for almost 90 percent of the total supply of chicken and eggs, whereas by 1985, commercial poultry operations provided more than half of domestic supply. The government established the first commercial poultry operation in the mid-1960s, but the Infitah policy propelled growth in the sector through a big surge in private investment. In fact, the bulk of domestic lending for agro-industries in the late 1970s went to poultry and eggs, accounting for 10 percent of total investment within the Law No. 43 Infitah framework (World Bank 1986a, p. 131). Most of the equipment for hatcheries and feed mills is imported. Maize and soybean meal, the main components of poultry feed, are imported by the government and sold to feed mills at subsidized prices.

¹⁴Demand per capita fell from 9.8 kilograms in 1960 to 8.8 kilograms in 1974, then rose to 10.8 kilograms in 1981. See World Bank (1986a), p. 130.

SOCIAL CHANGE AND THE ROLE OF THE STATE IN AGRICULTURE

The central element of the development policy of the Nasser regime was its industrialization program. Because agriculture was the main sector capable of generating savings, the industrialization policy was predicated on transferring resources from agriculture to industry. The productivity of the agricultural sector was to be increased by large public investment in the Aswan High Dam.¹⁵

Resource transfers were largely the result of the agricultural price policy, exchange rate policy, and trade policy inaugurated at the end of the 1950s by the Nasser regime and pursued under Sadat. Although an emphasis on administered economic relations was far from a new phenomenon in Egypt, Nasser increasingly tended to rely on administrative decisions rather than on market mechanisms in agriculture.¹⁶ The government regulated production and prices of cotton through open market operations, acreage restrictions, and other means after World War II. Regulations applying to cereals, mainly influenced by the growing demand for food, were also important (Hansen and Marzouk 1965, pp. 95-112). But, aside from

¹⁵In real terms, by taxing export crops and food crops, resources amounting to 50 percent of agricultural GDP from 1965 to 1970 were transferred out of the sector. Thirty-five percent of agricultural GDP on average was transferred out of the sector during the 1970s. After 1981, the trend was reversed, and resources were transferred into agriculture via price and investment policies. These transfers refer to direct price intervention affecting cotton, rice, wheat, maize, and sugarcane (see Table 7-9).

¹⁶Governments have intervened in Egyptian agriculture since at least 1800 A.D. See Scobie (1981), p. 17.

cereals and cotton, the government intervened less in agricultural production planning and marketing.

Increasingly, during the 1950s, government agencies became active in regulating production and in pricing and marketing agricultural products, from cotton to vegetables. After the nationalizations of June and July 1961, foreign trade of all major agricultural commodities (export of cotton and rice, import of cereals) was put directly under state control. The government took over large-scale storage and processing of cereals and established the General Organization for Mills, Silos, and Bakeries. The government created other public companies for importing, exporting, and retailing agricultural products during the mid-1960s.

The other important dimension of development policy was the government's strong commitment to equity, which implied low and stable food prices. During the 1960s, food subsidies for consumers were not significant, but stabilization and food security objectives became prominent after 1973, during the "liberalization period."

The policy pursued during the 1960-73 period followed a theory that viewed Egypt as a dual economy, dependent on the world market. In that theory, traditional agriculture supplies cheap food and labor to the modern sectors of the economy and helps build the industrial sector, whose products then compete with imported goods and reduce the country's external dependency. This dual model of development, strongly influenced by Arthur Lewis (1954) and prevalent in many developing countries from the 1950s to the 1970s,

was shared by policymakers of the Nasser regime.¹⁷

Notwithstanding its popularity in Nasser's Egypt, Lewis's model was based on two postulates that have been proved invalid for Egypt. The first is that there is surplus labor in agriculture, and that labor can be drawn out of that sector without affecting its productivity (Hansen 1969; Richards and Martin 1983; Commander 1987). The second is that forced savings can be extracted out of the agricultural sector without affecting aggregate supply in that sector and can be used to finance industrialization.

The development strategy adopted by the Nasser regime inherently implied that there was a political alliance between urban consumers and the state and that the peasantry could be counted on to mobilize agricultural savings and to carry out a transfer of funds from country to town.¹⁸ In this regard, some of the political and economic debates during the 1960s in Egypt recalled the

¹⁷In "Economic Development with Unlimited Supply of Labour" (1954), Lewis specifically cites Egypt as a country with an unlimited supply of labour. For a critique, see Hansen (1969), "Employment and Rural Wages in Rural Egypt." On the Egyptian views, see Mabro (1967), "Industrial Growth, Agricultural Underdevelopment and the Lewis Model: The Egyptian Case, 1937-1965."

¹⁸Radwan and Lee (1979), "The State and Agrarian Change: A Case Study of Egypt 1952-1977," p. 200, suggest a Kaleckian interpretation of Egypt's development along those lines. Cf. Kalecki (1976), "Observations on Social and Economic Aspects of Intermediate Regimes."

industrialization debate of the 1920s in the Soviet Union.¹⁹

The land reform and the decision to leave agriculture in private hands created a political problem for the implementation of the new industrial development policy in the countryside.²⁰ Policymakers soon realized that mobilizing the agricultural surplus on a large scale would be impossible without radically reorganizing the institutional setup. Convinced that market mechanisms would not secure sufficient quantities of food and export crops each year, the

¹⁹The industrialization debate in the Soviet Union is analyzed in Mitra (1977); see, in particular, p. 70, regarding the role of agricultural prices in development. It is analyzed more formally in Sah and Stiglitz (1984). Baker (1978) gives a good summary of the debate in Egypt.

²⁰When the government introduced the agrarian reform in 1952, cotton prices had collapsed after the Korean War boom. The government reintroduced the acreage restrictions for cotton that had been suspended when the boom started in 1949. Speculation on cotton futures was halted when the government took the decision to close the Alexandria market. On the other hand, the new government continued the policy of the previous regime and gave incentives to farmers to grow more wheat, conscious that precautionary measures were required, despite the surplus position in the current account, to meet future increases in demand generated by the new investment program. The government was also concerned with the issue of expanding the cultivated area and improving productivity in agriculture. The blueprints for the Aswan Dam were drafted during that period, and so were several ambitious land reclamation projects. The Ministry of Public Works, on the other hand, continued the policy of improvements to the irrigation and drainage system. In 1957, the first plan for agriculture commenced. A third of the planned increase in production was to come from agriculture. The plan was superseded by the comprehensive five-year plan of 1960-65. Part of the increase in yields between 1960 and 1965 was to come from the reallocation of land to more valuable crops for export, and production of fruits, vegetables, meat, and dairy products was encouraged by the Ministry of Agriculture. The plan, of course, presupposed technological improvements--many research and agricultural extension projects were created during that period--and the possibility that farmers would adopt them.

Nasser regime established a national network of cooperatives that were to provide inputs to and buy outputs from farmers under terms determined by the government.

After the agrarian reform of 1952, participating in a cooperative became obligatory for all beneficiaries of land reform. The new land reform cooperatives were very different from their predecessors.²¹ At first, the reformed cooperative system was tried in two model cooperatives, in Beni Suef and in Kafr-el-Sheikh. Then, it was extended to the whole country. The majority of the cooperatives were different from the original land reform coops oriented toward production; the vast majority of the other coops were concerned only with the purchase of inputs and the marketing

²¹The first agricultural cooperatives in Egypt date from the beginning of the century. The indebtedness of the peasantry, at a time where most commercial banks were controlled by foreign capital, prompted Egyptian landowners and cotton merchants to establish in 1902 the Agricultural Bank of Egypt. But for the majority of the peasants, small loans were almost impossible to obtain. Peasants were obliged to turn to local moneylenders, who charged usury rates averaging 35 percent. In 1908, the first cooperative was founded. The movement soon gathered momentum, supported by the nationalist middle class, who viewed it as an instrument of national emancipation. In 1914, there were twenty-three cooperatives in the country and several legislative proposals at the Assembly. The movement was short-lived, however, because big landlords were in effect controlling these institutions and preventing them from having much benefit for smallholders. A movement of reform started in the 1920s, and the government passed several laws and decrees regulating the activities of the cooperatives and tightly controlling them. In 1931, the Credit Agricole d'Egypte was created to provide cooperatives with the required funds. By the end of World War II, there were over 2,500 cooperatives in Egypt, involving over 800,000 farmers, but the system reflected the main features of the agrarian system at that time--namely, the predominance of big landlords in the rural economy (see Radwan 1977).

of output. Hansen (1968, p. 72) argued that they were modeled on the British Gezira project in the Sudan and adopted as "a clever way of combining large-scale advantages in irrigation, crop rotation, and marketing with small-scale production and private initiative." Between 1956 and 1960, the government tried to convince farmers to associate voluntarily in cooperatives and thus to become eligible for cheap credit and subsidized inputs. After the nationalization of 1961, most of the inputs used by the farmers were produced or distributed by the public sector. According to political decision (the Nasserist Charter, adopted in 1962), agriculture was to remain based on private ownership, but cooperation was to be the key factor of the increase in production. Thus, the cooperative system was given a fundamental role. By 1960, virtually all farmers had become members of cooperatives, so that when the government decided to make membership compulsory at the end of 1962, there was hardly any political reaction. It was not until 1963, however, that the cooperative system actually got under way (Baker 1978, p. 203).

Ideologically, the cooperative movement was, in the eyes of the Nasserist regime, the privileged instrument to "transform rural Egypt," based on the premise that peasants have a "natural interest in socialism." Cooperatives were created precisely because the peasantry had been abused by big landlords and rural moneylenders. But, as it turned out, the cooperatives merely replaced one form of corruption and inefficiency with another.

Cooperatives did not change traditional village relationships and favored mostly the rich peasantry. For example, loans to

farmers owning more than 25 feddans (who comprised only 2.5 percent of the recipients of credit) made up 75 percent of the total amount loaned to farmers by the cooperative system in 1968 (Baker 1978, p. 212). Mabro (1967) stated more cautiously that "there is some evidence suggesting that these groups receive a disproportionate share of total credit" (p. 77) and asserted that interest-free loans, given after 1961, led to inefficient allocation and discouraged savings. It is clear that rich peasants dominated the cooperatives and that corruption and abuses were widespread. Through 1968, in fact, 300 boards of directors of village cooperatives were dissolved by the Ministry of Agriculture for "causes ranging from misuse of influence and embezzlement to dealing on the black market."²²

On several occasions, the regime tried to modify the system to curb its abuses--for instance, by passing a law in 1962 whereby four-fifths of the members of a board of directors had to be owners of less than 5 feddans. Because peasants were poorly educated and ill-mobilized, they participated only nominally in the decisions of the cooperatives "except at times when fertilizer or pesticides had to be distributed" (Baker 1978, p. 208). In effect, the decision-making process was controlled by the government-appointed supervisor (mushrif ta'awni), whose connections with the village major (umdah) and large landowners had several times been stigmatized in

²²Al-Ahram Al-Iqtisadi, May 15, 1968, quoted in Baker (1978), p. 206.

government reports. In a manner parallel to practices in the private nonagricultural sector, wealthy members of the private agricultural sector were able to benefit from government intervention in the rural economy.

The government passed a law (Law 51) in 1969 confirming its intention of extending administrative control and of abandoning its attempt to mobilize the poor peasants politically to involve them in the development process. As Baker (1978) put it, "The regime apparently felt in 1969 that it could only be secured with the threat of punishment...combined with material incentive" (p. 213).

The illusion of founding a development strategy on the poor peasantry was given up once and for all when Sadat took over. By then, it had become clear that the rural middle class was in firm control of agrarian politics. The "October Paper" of 1974, which described the philosophy of Sadat's regime, gave the cooperative sector only a few lines, stating that "it is also in need of a strong drive so as to keep pace with the desired rates of development." In contrast, the private sector was touted as the engine for the future growth of agriculture.

Thus, in the early 1970s, the dominant view was that the cooperatives had in fact slowed the rate of growth of agriculture. As early as 1969, the Institute of National Planning published a critique of cooperatives, accusing them of bureaucratic abuses, of interfering with private marketing, and of being increasingly used by the government for fiscal purposes. Intervention and controls were viewed merely as distortions to agricultural incentives leading

to loss of income for farmers.²³ In response, the Nasserist opposition argued that the regime had done little to help the mass of landless peasants and small landowners (see Radwan 1977, chapter 3; Richards 1982).

The agrarian reform and the institutional changes of the past three decades profoundly transformed social relations in Egyptian agriculture. Economic and political control by the landed gentry vanished after 1952, and a class of largely village-based notables emerged. Although these notables control land in a personal or familial capacity in holdings that rarely exceed 50 feddans, they maintain close links both to the agents of the local government and to the ruling party.²⁴

As Binder (1978), Waterbury (1983), Commander (1987), and others have noted, the so-called rural notables have viewed the state as a basic support structure on and around which private initiatives could be built. For the most part, the rural notables, who are involved in directly supervising cultivation and marketing, have been content to manipulate the state machinery for their own ends. In a detailed study, Binder (1978) described the rural middle class as a convenient but by no means indispensable ally of the regime, as an instrument of political and social control in the

²³INP Memorandum no. 933, December, 1969, quoted in Mabro (1974), p. 79.

²⁴This social class is called the "second stratum" by Binder (1978), the "rural middle class" by Waterbury (1983), and the class of "notables" by Commander (1987).

countryside that was allowed to become the local overseer for much of what the state undertook in rural areas.

From the point of view of political economy, it is striking how the rural middle class, by no means politically hegemonic, has been able to benefit from government intervention in agriculture. Perhaps this may be explained by the fact that although the Nasser regime demonstrated hostility toward the rural middle class, in particular in 1961, this hostility was no greater than that shown toward the private sector in general. In fact, needing an ally, the Nasser regime tolerated many of the rural notables' abuses, including manipulation of official pricing arrangements and violations of rent laws and of landholding ceilings (Waterbury 1983, p. 279).²⁵

This is not to say that important members of the Nasserist regime, however superficial their socialism, did not want to isolate and destroy politically the "kulaks" of Egypt. During the period 1966-68, in fact, some in the regime formed a "Committee for the Liquidation of Feudalism," using as a pretext the Kamshish incident, in which a member of the ruling party was assassinated by a major landowning family (Ansari 1986).

Yet despite periods of hostility, the rural middle class was allowed to control, directly or indirectly, agricultural

²⁵A study of procurement quotas for rice and cotton quotas noted that the probability of violating the law increased with the size of land holding and decreased with an expected increase in government prices by £E 1 per qantar of cotton; see Abdou, Gardner, and Green (1986).

institutions because it remained basically an ally of the regime. Moreover, after 1967, the hostility slackened, and the rural middle class improved its position further. Fundamentally, this was because the June War and the balance of payments situation had forced a major policy realignment. Waterbury (1983) argued convincingly that after 1970 and under Sadat, the middle class formed an effective lobby that actively sought changes in land tenure arrangements and in credit policy. Also, it vigorously worked to obtain favorable terms for fruits and vegetables and for livestock and poultry, which expanded considerably during the 1970s and 1980s.

In the context of growing middle-class power, cooperatives lost their importance as a focal point of economic and political activity, especially after they were reorganized by Minister of Agriculture 'Abd el-'Azim Abu el-'Atta in July 1976. Real power now shifted to the village banks, supervised by the Principal Bank for the Development of Agricultural Credit. With the cooperative system neutralized, many pricing regulations eliminated after 1985, and subsidized credit for machinery secured, the rural middle class has clearly gained.

Thus, during the 1960-85 period, the rural middle class has consolidated its control of the countryside in Egypt. It has responded to government intervention in agriculture on the basis of narrow, middle-class interests, welcoming it when it has supported private initiative by providing cheap credit and subsidized inputs and undermining it when it has meant fixed prices, procurement

quotas, or regulated crop rotations.

Despite its important role, the Egyptian rural middle class has continued to function as an "ally" of the state. That is, the rural middle class has left the conduct of development policy to the state. It has not attempted to shape a development strategy that would serve rural interests maximally. In this regard, India's agrarian interests have been far more assertive than Egypt's. Waterbury (1983) summed up this mutually self-serving relationship:

Egypt's capitalist interests have, since the death of Nasser launched a limited offensive to promote their specifically rural goals.... There is considerable money to be made in capitalist agriculture.... Sadat serviced this clientele because it appeared useful to him in containing a potentially hostile and uncontrollable milieu, because its members shared his antipathy for the socialist experiment of the 1960s and its authors, and because the private initiative and productivity of the rural middle class corresponded nicely to the rural growth strategies urged upon Egypt by the international donor community. (pp. 303-304)

Chapter 2

OBJECTIVES AND INSTRUMENTS OF PRICING POLICIES AFFECTING AGRICULTURE

Egyptian agricultural pricing policy should be understood in terms of its principal objectives and policy instruments and in the context of the actual implementation of policies. This chapter thus treats the historical framework within which Egyptian policy goals were defined, the types of direct and indirect intervention typical for agricultural commodities, and the specific institutional structures and practices through which the government has carried out policy since 1960.

OBJECTIVES OF AGRICULTURAL POLICY

Agricultural policy in Egypt has two broad objectives: first, to provide adequate basic food to all groups of the population, including the poorest; and second, to make the nation self-sufficient in food commodities, except wheat. Two political factors have helped to determine these goals: the security of social peace and stability, on the one hand, and external independence, on the other (Von Braun and de Haen 1983, p. 20).

The broad goals of Egyptian agricultural policy should be seen in historical context. During the "planning period," 1960-73, agriculture was mainly subordinated to the objective of industrialization (Cuddihy 1980, p. 11; see also chapter 1 above). Such policies discriminating against the agricultural sector would

change, President Mubarak's minister of agriculture, Youssef Wally, promised in 1982:

The agricultural pricing policy resulted in distributing the income in a way...against the interest of the agricultural sector. Preferential pricing policies resulted in low prices for the farmers, and reduced their real incomes in favor of other sectors as well as the urban population. The next phase will witness a change in the way the State regards agriculture, regarding designing pricing policies that aim at redressing the distribution of income in the rural sector in order to narrow the internal gap between the rural and urban communities.¹

Table 2-1 presents an overview of specific objectives for agriculture and shows their relative weight from 1960 to 1985. The table is based on official statements and on relevant studies of agricultural policy.

¹Wally made these remarks in "Strategy of Agricultural Development in the Eighties" (p. 54), a document prepared for discussions with the USDA/USAID Presidential Mission on Agricultural Development, which visited Egypt in March-April 1982.

Table 2-1
CHANGES IN AGRICULTURAL POLICY OBJECTIVES, 1960-85

Objective	Weight			Expected Effect on Producer Price
	Period I (1960-73)	Period II (1973-80)	Period III (1981-85)	
Consumer Welfare	.20	.20	.20	-
Farm Income	.10	.15	.25	+
Government Revenue	.25	.20	.15	-
Foreign Exchange	.20	.15	.10	-
Price Stability	.10	.20	.20	-
Support of Processing Industry	.10	.05	.05	-
Regional Equity	.05	.05	.05	?
SUM	1.00	1.00	1.00	

NOTE: Adapted from A. Siamwalla, "A History of Rice Price Policies in Thailand," Food Research Institute Studies 14:3 (1975), Table 3, p. 247.

During the twenty-five years from 1960 to 1985, three distinctive periods of policy change may be discerned. The first period corresponds to the planning period, 1960-73. The next period, the liberalization period, is here split into two subperiods: 1973-80 and 1981-85. The objectives mentioned in Table

2-1 reflect the intended goals of policymakers. The objective of food self-sufficiency noted above is subsumed here within Price Stability and Consumer Welfare. Together, these two latter objectives can be described as an objective of food security, from the government point of view. The effect that each separate objective shown in the table is expected to have on prices is indicated in the last column. A "+" indicates that emphasis on this objective is likely to increase farm prices, whereas a "-" indicates that it is likely to depress farm prices. A "?" indicates that the direction of the effect is unclear. Growth rates of agricultural output are ex post facto outcomes of economic factors and of the bargaining process and reflect the conflicting claims of groups within the government and the lobbying of other groups for favorable prices.

Later chapters will examine how effective policy instruments have been in achieving the various objectives. Here, the general features of each policy are treated.

Farm Income. To maintain real farm income at a "reasonable" level, despite low producer prices, the government has subsidized farm inputs during specific periods. For instance, between 1975 and 1980, the government subsidized imported fertilizers heavily to compensate for increases in world prices. (During the period 1960-73, however, imported fertilizers were actually taxed to protect the domestic industry.) The government has used income support objectives particularly in cotton price policy. Cotton prices are set on the basis of estimated production costs plus a

markup the ministry considers adequate to prevent a decline in real farm income. Because cotton lost importance throughout the period 1960-85, its influence on this objective declined. But farm income support objectives were important for other crops, as attested by increases in fixed government prices for all procured crops during the 1973-85 period (see Table 2-3, below).

Price Stabilization. Stabilizing producer prices to insulate producers from instabilities in world prices has been a predominant objective of Egyptian agricultural policy. Price stability was particularly important during the post-World War II and post-Korean War periods, and it gained renewed importance after the 1973 cereals world price increases. The price stability objective can be seen to increase in importance with increases in the instability of the world market price for particular agricultural commodities. During the 1964-84 period, the instability index for the international price of sugar was 90.8; for rice it was 33.0; for wheat, 24.3; for maize, 16.6; and for cotton, 14.3. This means that during a typical year, one could expect the world price for sugar, for example, to be 90.8 percent above or below the trend value for that year (World Bank 1986c, pp. 86-87).

Government Revenue and Export Earnings. Earning foreign exchange and increasing government revenue from export crops--or saving on foreign exchange in the case of import substitutes--clearly have been important policy objectives throughout the period analyzed. The objective of generating foreign exchange has declined in importance, however, with the decline in importance of food self-

sufficiency. Simultaneously, the commitment to cheap food for consumers has persisted as the share of agricultural exports in total exports has declined. Maintaining Egypt's world market share of extra-long-staple cotton seems to have become the policy objective of Egypt, rather than maximizing export revenues.

Self-Sufficiency. It is difficult to rank the objective of generating revenue relative to the objective of self-sufficiency. After 1973, because of the progressive decline in the self-sufficiency ratio of most food crops, the objective of food security became preponderant.² Official statements and actions seem to indicate that food security ranked highest as a policy objective in the late 1970s. There was clearly an obsession with the goal of self-sufficiency after 1973 (Anderson and Hayami 1986, pp. 98-99). When domestic rice production declined in 1980 and 1981, for example, exports of rice were considerably reduced to satisfy domestic demand. Similarly, exports of cotton have declined as the need to satisfy domestic demand increased.³

²See Goueli (1981), "Food Security Program in Egypt." Food security is today a major theme of government rhetoric. In fact, the Ministry of Agriculture recently has been renamed the Ministry of Agriculture and Food Security. The phrase Amn' el geza'i ("food security") can have several meanings in Egyptian policy circles. It usually is taken to mean either "hedging against fluctuations in world food prices" or "increasing domestic production of food crops." In my reading, Amn ("security") also has a paternalistic--if not military--connotation in Egypt linked to the nature of the state and dating to the Nasser era (see Abdel-Malek 1968).

³Official newspapers even spoke of "clothing security" (Amn' el Hudumi) on such occasions!

Whether the goal of self-sufficiency outranks the objectives of generating revenue and foreign exchange from the agricultural sector depends on the economic cost of alternative development strategies. If the welfare component of agricultural policy ("cheap food") is taken as given, we may ask what the least costly way is for a country such as Egypt, with limited arable land and a growing population, to achieve self-sufficiency. Should Egypt try to balance its agricultural trade position, paying for food imports with the proceeds of exports of cotton, oranges, and vegetables? Or should the nation protect itself from fluctuations in international terms of trade by growing food crops, thus giving up a comparative advantage in cotton and other products?

Consumer Welfare. Consumer welfare was arguably the most important dimension of price policy throughout the period. This objective has major distributional implications, because the declared goal of the government is to provide cheap food for the whole population independently of the cost to the economy.⁴

During the 1960s, it seems, the prime objective of food policy was not for the government to obtain food cheaply but to balance development and equity considerations. If cheap food as such were the objective, the government would have bought inexpensive wheat on the world market. But because this would have required foreign exchange needed for the investment program, the government instead

⁴ This agricultural policy objective is not independent of the objectives pursued by the government in setting wages in the public sector.

sought to secure food from Egyptian farmers through the system of compulsory deliveries and fixed prices.

Within the context of Nasser's planned economy, food subsidies and rationing were guided by social equity considerations, and until 1973, consumers were subsidized by implicitly taxing producers. As growth rates in agriculture declined and the degree of self-sufficiency in food products decreased, Egypt moved to an explicit food subsidy scheme, and after 1973, consumer subsidies were financed directly out of the government budget. This was really the only option available to the government, given its food policy objectives; a major change in consumer price policy would have had to occur for Egypt not to have drifted toward an explicit subsidy scheme.

Moderating inflationary pressures by keeping down real wages was an important component of the economic policies of the government during the period 1960-85. But this policy had unintended consequences. Increased subsidy expenditures were responsible for the increased domestic inflation rate at the end of the 1970s. Thus, the very purpose of the subsidy program--to maintain low food prices--was defeated by its method of financing (Hansen and Radwan 1982, p. 222). The government also had to manipulate exchange rates to hold down the price of certain commodities. Basic foodstuffs were imported at a rate below other official rates and well below long-run equilibrium rates. Moderating the rate of measured domestic price inflation and disguising the cost to the treasury of food subsidies were apparent

objectives of this exchange rate manipulation (see Scobie 1983, p. 21). There is some evidence to suggest that the impact of such price manipulation on economic equilibria and on inflation was taken into account by the government, especially in the late 1970s. But whether the policies were successful is another matter.

Achieving an equitable price policy across governorates was an objective that explains certain aspects of pricing policy. Differential pricing of the specific varieties of cotton, wheat, and rice that are grown in different governorates takes regional equity considerations into account. The same is true of pricing of cotton and sugarcane (which replaces cotton in the rotation, in Southern governorates). For example, a deliberate effort was made during the 1960s not to disfavor farmers required to grow sugarcane.

POLICY INSTRUMENTS

In analyzing Egyptian agricultural pricing policy, one must discuss pricing intervention that affects supply and demand of agricultural products.⁵ But it is important to recognize also that other types of intervention affect agricultural supply: public provision of agricultural services, public sector assumption of operating costs on irrigation and drainage, and unrecovered public investment cost. The government also subsidizes agriculture by exempting farmers from paying land and income taxes, by not revising

⁵The instruments of agricultural pricing policy are discussed specifically in Appendix H.

land tax schedules, by not levying water charges, and by making certain public sector investments.

Indirect subsidies are more difficult to quantify than direct subsidies but are far more important than direct payments in terms of budgetary expenditures. The World Bank (see Ikram 1980, p. 208) estimated that at the end of the 1970s, net indirect subsidies averaged fE 75 million a year (after deducting fE 15 million in land taxes), compared with an average of fE 15 million for direct subsidies.

Prices of major agricultural commodities, rather than being determined by market forces only, are influenced by several policy instruments. The main types of sector-specific intervention influencing prices are (1) delivery quotas for certain crops, (2) fixed producer prices for food and export crops that are procured, and (3) subsidization of agricultural inputs, either through explicit subsidies or through pricing of some inputs (water and fuel) below marginal cost. There is also an extensive consumer subsidy and rationing system for basic food items. Markets for major crops combine intervention on the demand side with intervention on the supply side, as shown in Table 2-2.

Intervention at the producer and at the consumer level is considered direct intervention, because it has a direct incidence on prices. But prices of agricultural products are also indirectly affected by economy-wide intervention such as exchange rate policy and trade policy. Because of its indirect incidence on prices,

economy-wide intervention is called indirect intervention.⁶

The pricing structure in Egyptian agriculture combines several types of taxes and subsidies. Direct subsidies (measured by the difference between government revenues gained from the sale of subsidized goods and the cost of purchasing them from farmers or of importing them) are paid both to producers and to consumers. Food subsidies, paid either directly to the consumer or at the intermediate level, make up the bulk of the total direct subsidies and appear in the budget. Indirect subsidies, in contrast, do not appear in the government budget. Indirect taxes or subsidies result from deliberately fixing the price of agricultural products below their true scarcity value, and are reflected in lower value added than would otherwise be the case. Finally, implicit taxes or subsidies result from overvaluation of the Egyptian currency and from protection of nonagricultural activities.

⁶Direct intervention is discussed more fully in chapter 3. A detailed history of the changes in the exchange rate and trade regimes over the period 1960-85 is given in Appendix A.

Table 2-2
GOVERNMENT INTERVENTION IN MARKETS FOR
FIVE MAJOR AGRICULTURAL COMMODITIES

CROP	SUPPLY	DEMAND
COTTON	-Main export crop -Entirely procured (with area planning) at fixed producer prices	-No rationing -Selling price by gov't marketing agency to cotton mills is heavily subsidized, so that price of cloth to consumers is subsidized
WHEAT	-Main importable -Quota (average > 20%) procured at gov't price slightly below free domestic market price	Wheat flour (milled) and bread (baked) are subsidized, and available to all consumers without quotas or restrictions
RICE	-Export <u>Paddy</u> procured at gov't price (quota average 50%) at prices roughly equal to free domestic market price during the 1970s	-Milled rice subsidized and rationed with a two-tier price system: -basic ration -additional ration
MAIZE	-Import; animal feed and human consumption -No procurement -No gov't intervention -Price affected by the price of wheat	-No rationing system -Subsidy for imported (yellow) maize for feed
SUGARCANE	-Importable -Sugarcane entirely procured (through delivery contracts to mills) at predetermined prices	-Sugar (processed) rationed and subsidized with a two-tier system: -basic ration -additional ration

Sector-Specific Intervention Affecting Agriculture. Fixed producer prices and procurement of crops are important policy instruments for the Egyptian government. Minister of Agriculture Youssef Wally (1982) has noted that the ministry classifies crops into four pricing groups:

In the first group, prices are set and farmers are obliged to deliver all their product to the government. This applies to cotton and sugarcane. In the second group, prices are set for a certain quota of production that farmers are obliged to deliver to the pooling centers. The balance of the crop is marketed freely. Examples are rice, sesame and groundnuts. The third group includes crops the price of which the government indirectly determines since it controls imports and, consequently, affects domestic prices. Wheat and maize are examples. The fourth group includes commodities whose price is determined in general by forces of supply and demand. Examples are vegetables, fruits, meat, dairy products, eggs, fish and berseem. (p. 44)

Fixed producer prices of cotton, rice, wheat, and sugarcane have increased very little during the 1960s. Since 1974, the policy of the government has been to increase the producer price of those four crops bringing it closer to the border price. Table 2-3 shows the evolution of government prices for major procurement crops from 1965 to 1985.⁷ The evolution of procurement quotas for rice and wheat during the same period is shown in Table 2-4. The nonquota production that can be sold on the free market is sold to private traders or, in some instances, to government cooperatives when the procurement price is above the free market price. Strict

⁷Procurement prices and average producer prices are derived in Appendix C.

enforcement of quota regulations and low producer prices have encouraged breaking the law. A recent study has shown that violation of rice and cotton quotas is pervasive in Egypt (Abdou, Gardner, and Green 1986, pp. 120-26). Moreover, the study found that the probability of violating the law increases with the size of land holding, decreases with the distance from the market, and decreases (by about 10 to 12 percent) with an expected increase in government prices by fE 1 per qantar of cotton.

Table 2-3
FIXED PRODUCER PRICES OF PROCUREMENT CROPS

(Annual Percentage Increase, Five-Year Averages, 1965-85)

YEAR	COTTON	RICE	WHEAT	SUGARCANE
1965-70	2.4	n.a.	n.a.	0.6
1970-75	7.3	8.7	8.3	20.4
1975-80	14.0	14.1	10.1	8.3
1980-85	14.6	11.1	9.7	21.5

SOURCE: Appendix C.

Table 2-4
PROCUREMENT QUOTAS FOR RICE AND WHEAT, 1965-1984

(Share of Total Production)

YEAR	RICE	WHEAT
1965	.50	.18
1966	.50	.18
1967	.51	.19
1968	.51	.19
1969	.52	.11
1970	.44	.12
1971	.42	.17
1972	.41	.15
1973	.41	.15
1974	.39	.19
1975	.48	.19
1976	.47	.15
1977	.46	.08
1978	.47	.07
1979	.52	.16
1980	.51	.07
1981	.50	.07
1982	.48	.04
1983	.47	.08
1984	.44	.06
1985	.49	.07

SOURCE: Appendix C.

According to official documents, the government priced the commodities it bought based on its estimates of production costs. But the data on yearly increases in costs of production and government prices for 1965-85 in Table 2-5 show that even at distorted prices, increases in costs outpaced price increases. This confirms that the government has not taken the cost-of-production approach as a strict guideline. In fact, the government has not followed that approach rigorously since the

Table 2.5. ANNUAL PERCENTAGE CHANGE IN COSTS OF PRODUCTION AND FARMGATE PRICES, 1965-85

	COTTON			RICE.			WHEAT		
	Cost of Prod	Cost of Prod.	Farmgate Price	Cost of Prod	Cost of Prod	Farmgate Price	Cost of Prod	Cost of Prod	Farmgate Price
	I.	II		I.	II.		I	II	
1965	25.9	22.8	-4.3	19.5	22.0	17.7	25.8	18.8	7.4
1966	28.6	26.3	-3	16.2	15.2	25.8	3.0	2.8	9.6
1967	-10.2	-13.0	5.8	-4.6	-4.2	15.0	10.9	11.8	11.1
1968	-10.3	-9.0	2.8	3.0	3.6	-3.1	-2.5	-2.9	-12.0
1969	-4.5	-19.6	2.7	5	1.3	3.9	3.1	4.5	2.8
1970	8.7	35.9	1.0	-6.1	-0.9	-8.4	-11.1	-11.1	17.7
1971	-2.3	-2.6	3	1.4	1.9	-3.1	-8.9	-7.8	-8.0
1972	-7.6	-5.5	8.9	3	-1.5	-2.6	6	1.2	-5
1973	13.0	10.0	-2.5	2.5	4.1	4.7	-8.7	-9.7	7.6
1974	17.3	10.9	22.4	22.4	19.3	28.2	20.5	20.7	23.5
1975	21.8	14.8	7.4	12.1	6.8	11.8	17.8	10.3	10.0
1976	10.6	7.9	25.5	32.5	27.7	24.3	14.2	13.7	-7.3
1977	6.8	1.2	8.2	4.1	-1.3	12.4	16.0	12.8	14.0
1978	-14.2	-16.4	1.4	6.7	12.3	17.7	17.2	12.5	12.9
1979	16.4	19.0	34.2	21.2	16.3	-3	28.5	34.2	5.7
1980	21.5	18.7	8	22.1	30.7	23.4	28.8	25.3	35.9
1981	45.9	32.0	23.0	27.1	22.7	21.5	5.5	4.2	5.2
1982	23.6	14.1	2.9	19.6	10.1	31.7	8.8	6.5	-11.2
1983	19.7	14.9	8.8	7.8	-3.0	-3.1	26.3	13.4	33.9
1984	11.9	5.7	10.6	30.4	19.3	3.6	13.3	7.0	13.9
1985	5.7	2.3	27.8	-3.0	1.0	N/A	7.9	5.7	38.1
1965-70	2.5	4.1	1.5	1.8	3.0	6.6	7	1.0	5.8
1970-75	8.5	5.5	2.4	7.8	6.1	7.8	4.3	2.9	6.5
1975-80	8.2	6.1	7.3	17.3	17.1	15.5	21.0	19.7	12.3
1980-85	21.4	13.8	14.6	16.4	10.0	15.4	12.4	7.4	16.0

NOTES. (1) Cost of Production I. = Includes labor costs
(2) Cost of Production II. = Excludes labor costs
(3) For cotton and sugarcane, Farmgate Price = Procurement Price
For wheat and rice, average of free market and procurement prices

SOURCE Computed from data on cost of production (Appendix F)
and farmgate prices (Appendix C).

Table 2.5. ANNUAL PERCENTAGE CHANGE IN COSTS OF PRODUCTION AND FARMGATE PRICES, 1965-85.
(continued)

	MAIZE.			SUGARCANE.		
	Cost of	Cost of	Farmgate	Cost of	Cost of	Farmgate
	Prod.	Prod.	Price	Prod.	Prod.	Price
	I.	II.		I.	II.	
1965	-11.9	-16.2	-3.4	1.0	-3.9	0
1966	7.7	7.5	19.1	-5.3	-2.7	-9.5
1967	10.8	11.9	14.7	4.1	4.1	11.3
1968	2.5	2.0	-21.5	-2.0	-1.3	1.4
1969	-6.9	-6.0	13.0	-3.5	-6.7	-1.4
1970	2.0	2.4	2.4	9.8	11.5	1.4
1971	3.0	2.0	-.2	-1.4	-.6	-5.9
1972	2.9	2.7	10.1	.5	-1.3	12.9
1973	7.3	5.5	22.5	5.2	4.6	21.2
1974	14.3	12.0	60.2	33.0	22.0	73.4
1975	15.5	9.4	-29.6	18.7	8.8	.3
1976	12.3	9.5	-1.0	36.7	36.0	16.2
1977	25.0	27.0	51.4	17.4	16.4	12.0
1978	13.9	6.9	-6.2	7.1	.3	6.9
1979	22.0	26.4	3.7	15.2	17.9	2.9
1980	7.7	4.1	65.9	55.1	51.9	3.7
1981	21.9	18.0	-23.7	17.5	20.5	55.2
1982	20.7	14.3	33.2	16.3	19.8	4.0
1983	17.1	15.0	34.2	26.1	25.6	17.4
1984	3.8	-4.3	3.1	5.2	.4	11.0
1985	13.3	11.1	20.5	13.1	7.3	19.8
1965-70	3.2	3.5	5.6	.6	1.0	.6
1970-75	8.6	6.3	12.6	11.2	6.7	20.4
1975-80	16.2	14.8	22.8	26.3	24.5	8.3
1980-85	15.4	10.8	13.5	15.6	14.7	21.5

NOTES and SOURCES: see preceding page.

early 1970s, when it decided to increase prices to farmers to reduce the gap between domestic and international prices. Other discrepancies between costs and prices are introduced when the government considers various pricing criteria in discussions among the various administrations: farmers' income, terms of trade between commodities bought and sold by the farmer, opportunity cost of alternative rotations/planting, international prices, consumer retail prices, and other policy considerations such as cropping patterns and input subsidies (Hindy 1975). There is room for lobbying, as well, by farmers' organizations and other special interest groups.⁸

Subsidization of agricultural inputs is another important instrumentality. The impact on farm incomes of the wedge between border prices and domestic procurement prices of controlled crops is dampened by the fact that the government subsidizes imported agricultural inputs (fertilizers, pesticides, and machinery). The government pays direct subsidies on pest control, fertilizer, improved seeds, gypsum for soil improvement, fuel oil, diesel, concentrate feed mix, and other items. These subsidies have increased sharply since 1973. Direct subsidies paid by the government on fertilizer and seeds are shown in Table 2-6 under the heading Agricultural Stabilization Fund. In addition, agricultural credit is subsidized through preferential rates. During the 1970s, incentive payments were made to expand cotton plantings or for early

⁸See the section below on implementation of agricultural price policy.

Table 2.6.

Direct Subsidies Related to Agricultural and Food Policy.
(millions of L.E.)

	1974	1975	1976	1977	1978	1979	1980/81	1981/82	1982/83	1983/84	1984/85
GASC	329.1	490.9	321.5	313.4	449.6	1001.9	1108.0	2190.5	1645.4	2055.3	1815.2
of which Wheat & Flour	216.4	260.9	171.6	149.1	222.8	647.0	776.0	736.0	758.0	861.6	614.7
Ag. credit corporation	8.5	5.0	8.7	.1	.1	.1	5.3	3.9	7.6	4.5	5.3
Ag. stabilization fund		81.5	34.2	34.7	38.3	101.9	119.1	227.9	159.1	142.3	135.2
Price adjustment fund				228.0							
of which: GASC				124.0							
Subsidies in other sectors of the economy	72.4	44.7	69.1	73.4	222.0	248.1	339.1	486.9	550.5	631.0	745.5
Total	410.0	622.1	433.5	649.6	710.0	1352.0	1571.5	2909.2	2362.6	2833.1	2701.2
Wheat and flour subsidies (as percent of total subsidies	52.8%	41.9%	39.6%	42.0%	31.4%	47.9%	49.4%	25.3%	32.1%	30.4%	22.8%

NOTES: 1)The Special Fund for Subsidies was established in 1975, prior to which direct subsidies were included in various sections of the budget.

2)Agricultural stabilization fund is for fertilizers and seeds; includes Treasury Fund payments.

3)The Price Adjustment Fund was established in 1977 to finance the cost of phasing in the domestic price impact of commodities imported at the paralled rather than the official exchange rate.

4)Arrears of GASC (General Authority for Supply Commodities):

1978 includes LE 122.1 million arrears financed in 1981/82.

1979 includes LE 595 million expenditure incurred by GASC which was monetized in 1981/82.

1983/84 includes LE 266 million in arrears.

1984/85 (estimate) includes LE 742 million in arrears.

5)Wheat and flour as percent of total subsidies for 1977 includes GASC price adjustment fund.

SOURCE: GASC and Ministry of Finance.

cotton plantings. Most of the payments went to pest control operations for cotton until the early 1970s.

Since 1975, subsidies for imported fertilizer have represented the bulk of the direct subsidies, although during the period 1960-73, imported fertilizers actually were taxed to protect the domestic fertilizer industry. After world prices began rising sharply in 1974, domestic fertilizer production--which accounts for 40 percent of Egypt's total fertilizer requirements--also was heavily subsidized. Domestic prices of fertilizers have remained relatively fixed since 1960.

Pesticides are almost entirely imported. Cotton fields receive the bulk of pesticide applications (approximately 80 percent), with the remaining 20 percent applied to truck crops such as potatoes, fruits, and vegetables. The foreign exchange cost of importing pesticides has increased substantially since 1973, mainly as a result of price increases. But because of the increase in subsidies on fertilizers, pest control payments as a proportion of total direct farm subsidies have declined considerably since 1973.

Pest control, it might be noted, is crucial for Egyptian agriculture, and the Ministry of Agriculture directs an extensive program. For wheat, maize, rice, and most other crops, control of pathogens is achieved mainly through breeding disease-resistant varieties. The cost of such research efforts is an indirect subsidy. For cotton and sugarcane, the government, through its cooperative network, intervenes directly by spraying pesticides at the field level and by not charging full cost to the farmer.

Fertilizers are used in large amounts in Egypt. By far the largest demand is for nitrogenous fertilizer (85 percent of the total), followed by phosphates. In comparison, consumption of potassic fertilizer (which is entirely imported) is small. Nitrogenous fertilizer is applied to almost all crops, but 90 percent is used for cotton, rice, wheat, maize, and vegetables. Phosphatic fertilizer is used mainly for cotton (32 percent), berseem (33 percent), and rice (24 percent). Potassic fertilizer is used only for potatoes, fruits, and vegetables. There is an important fertilizer industry in Egypt, but a large expansion in domestic production has failed to keep pace with increased use, and imports have increased as well. Egyptian policy is to estimate import quantities on the basis of the difference between domestic consumption and output and on the availability of foreign exchange (Choksi, Meeraus, and Stoutjesdijk 1980, chapter 10).

Cooperative sale prices of fertilizer have been subsidized since 1960. The price of imported potash has remained unchanged since 1960. Prices of nitrogenous and phosphatic fertilizers have been adjusted upward by a series of decrees, but they remain well below their international equivalents because of the overvaluation of the exchange rate and the pricing policy. Because the prices of domestic and imported fertilizers are equalized, the difference between the cooperative price and the CIF price of imports--including transport, storage, and packaging costs and customs duties--has to be paid by the government (through the Agricultural Stabilization Fund, formerly the Fertilizer Subsidizing Fund; see

Table 2-6). Until 1973, imports of nitrogenous and phosphatic fertilizers actually were taxed to protect the domestic industry. After 1973, subsidies increased sharply as a result of the rise in world prices, as the nominal protection coefficients in Table 2-7 indicate. Domestic fertilizer production was protected until 1973 and taxed after 1973.

Credit and mechanization policy has played a significant role in Egyptian agriculture. In terms of costs, the main factor affecting returns to crops has been the sharp growth of wages during the 1970s, as indicated in Table 2-8. The impact of increases in labor costs has varied from crop to crop. Fodder crops, such as maize and berseem, have been affected minimally, whereas sugarcane and cotton, as well as vegetables and fruit orchards, have been affected particularly (World Bank 1983c, p. 152). Rural incomes are supported through consumer subsidies.⁹ The food subsidy program is, in effect, a general wage subsidy. It does not alter the relative cost of labor between sectors, but it tends to reduce the cost of labor relative to capital in agriculture.

In the opposite direction, subsidized loans for machinery have an important impact on technology. The net direction of the factor bias is difficult to estimate. Rising wages and labor shortages have accelerated the pace of mechanization in recent years, especially increasing the use of tractors and pumps. This tendency has been reinforced by the government's farm credit subsidy policy.

⁹Alderman and von Braun (1984) show that both the urban and rural populations benefit from consumer subsidies in Egypt.

Table 2.7. FERTILIZER: DOMESTIC PRICE, BORDER PRICE, AND NOMINAL PROTECTION RATE, IN LE/TON, 1966-85.

(100% Nitrogen Basis)

	Domestic Price to Farmer	Import Price (CIF)	Nominal Protection Rate (percent of border price)
1966	135	124	8.9
1967	135	122	10.7
1968	135	98	37.8
1969	135	88	53.4
1970	135	77	75.3
1971	135	74	82.4
1972	135	90	50.0
1973	135	120	12.5
1974	135	201	-32.8
1975	137	310	-55.8
1976	139	359	-61.3
1977	139	366	-62.0
1978	148	374	-60.4
1979	178	381	-53.3
1980	178	470	-62.1
1981	243	420	-42.1
1982	243	360	-32.5
1983	245	352	-30.4
1984	245	340	-27.9
1985	245	312	-21.5

- NOTES: 1) Prices are based on two-year averages.
 2) Prices are averages of various N-fertilizers, and are computed on the basis of 100% Nitrogen.
 3) NPC = (Domestic Price / Import Price) - 1.

- SOURCES: 1) Domestic prices: PBDAC and Agricultural Price Balancing Fund.
 2) 1966-78 Import prices: Von Braun and de Haen, IFPRI, 1983, p.28.
 3) 1979-85 Import prices: Based on FOB price of TSP (on 100% Nitrogen basis) plus 15% freight (World Bank Commodity Price Trends, 1986).

TABLE 2-8
NOMINAL AND REAL WAGE RATES IN AGRICULTURE, 1969-85
(in fE/day)

YEAR	NOMINAL	REAL
1969	.16	.34
1970	.19	.40
1971	.22	.45
1972	.25	.49
1973	.28	.49
1974	.34	.52
1975	.54	.83
1976	.61	.88
1977	.71	.86
1978	.92	.87
1979	1.05	1.05
1980	1.55	1.42
1981	1.90	1.55
1982	2.84	1.99
1983	3.56	2.29
1984	3.67	2.02
1985	5.17	2.44

SOURCES: Moursi (1986), p. 190 and table L-2.

NOTE: Wage has been deflated by average rural CPI (Table L-2).

Agricultural loans are mostly of three kinds.¹⁰ Planting loans for field crops accounted for nearly 80 percent of the total during the 1971-78 period, followed by loans for orchards and vegetables. Loans for livestock came next, followed by loans for agricultural machinery, which increased in volume. Preferential interest rates for purchasing machinery are offered by the PBDAC, and interest rates are held to an annual 8-percent rate. The standard market rate has varied between 13 and 15 percent, so that the cost of capital for agriculture is significantly negative in real terms.

Most power-intensive operations in agriculture, such as plowing, are now almost universally mechanized. Animal traction has been displaced. Tillage with an animal-drawn plow requires eight times more labor than the same operation done with a tractor. Clearly, such technological shifts have reduced costs. They have also released labor for other activities. As Commander and Hadhoud (1986, pp. 350-54) pointed out in a recent study on mechanization, technological change is the result of public subsidy policy as much as of rising wages.

¹⁰The credit system for agriculture was totally reformed in 1976, and the organization was renamed the Principal Bank for Development and Agricultural Credit (PBDAC). Since 1976, the various branches of the PBDAC have been allowed to loan directly to farmers. Each farmer is entitled to a short-term loan for the full crop production cost. {Farmers are not required to provide security for planting loans, but they are required to sell their output through specified marketing agencies.}

Consumer Food Subsidies and Rationing. At the beginning of the industrialization phase (First Five-Year Plan), consumer subsidies were not significant. During most of the 1960s, in fact, consumers paid more than the world price for wheat. The small subsidies of the 1960s stemmed from the difference between domestic prices to producers and consumers. To deal with food shortages in 1966, the government issued ration cards for kerosene, sugar, oil, and tea. In 1967, however, the government made other subsidized items available without strict rationing. The rationing measures of 1965-66 were based on equity considerations and on the government's desire to repress inflation in the presence of excess demand. Wheat subsidies were an attempt to insulate the economy from international price fluctuations and short-term domestic shortages.

Egyptian consumers receive basic food items at low and stable prices. In the current system, three types of products are subsidized or rationed (Alderman, von Braun, and Sakr 1982). Wheat flour and bread are sold at a fixed price, uniform throughout the country, in unlimited quantities. Sugar, tea, cooking oil, rice, beans, and lentils are sold at subsidized prices and are rationed in fixed monthly quotas, which vary according to governorates and to the rural or urban location of households. Monthly quotas are less assured for beans and lentils. Additional quantities are available at higher prices (but lower than the free market price) in cooperatives and government stores. Finally, meat, poultry, and fish (frozen) are also subsidized, but in limited quantities.

The bulk of the food items subsidized through the minister of supply are marketed to consumers, but some subsidized items are used as inputs for the food processing sector: flour (to bakeries), oil (e.g., for margarine), and imported yellow maize (for poultry, feed concentrate, and other industrial processes).

Most subsidized commodities are imported by the General Authority for Supply Commodities (GASC), acting as an agent for the minister of supply in the international market. The responsibility of GASC ends at the port, and deliveries to storage companies occur at subsidized prices. Most of the food subsidy bill is absorbed in the GASC budget.

The Principal Bank of Development and Agriculture Credit (PBDAC) is the second largest purchaser of subsidized items. The PBDAC receives rice, beans, lentils, and wheat (in the last case, voluntary deliveries) from domestic producers. The PBDAC also receives maize and beans from the GASC for distribution to consumers and industrial users.¹¹ Wholesale packing and distribution to final outlets (cooperative stores and licensed private grocers) of rationed or price-regulated foodstuffs are handled by two public

¹¹The PBDAC and other government agencies also receive from farmers agricultural products earmarked for export: cotton, rice, onions, sesame, peanuts, and small quantities of fruits and vegetables, subject to quota deliveries at fixed prices.

companies.¹²

Economy-wide Intervention Affecting Agriculture. In Egypt, macroeconomic and trade policies have affected agricultural prices significantly through their impact on the real exchange rate. The real exchange rate--that is, the ratio of the domestic price of tradable goods to the price of nontradables--is a long-term signal for the allocation of resources among tradable and nontradable, agricultural and nonagricultural sectors. The determinants of the real exchange rate are world market prices, the nominal exchange rate, and government policies. Among government policies, trade, fiscal, and external policies (devaluation of the nominal exchange rate, reserve changes, and foreign borrowing) affect the real exchange rate (Valdes 1986, p. 164).¹³

Egypt has a multiple exchange rate system. The weighted average nominal exchange rate has depreciated throughout the 1960-85 period. After the major devaluation of 1979 and an unsuccessful attempt to unify rates, the weighted average real exchange rate appreciated rapidly until 1983. It then stabilized around 0.48 £E/\$US from 1983 to 1985, largely because of a highly depreciated nominal rate in the parallel market, despite the fixed official

¹²Average consumer prices for wheat, rice, maize, sugar, and cotton for 1960-85 are computed in Appendix D. Per unit subsidy levels are computed in chapter 8. Direct subsidies paid by GASC related to food subsidies are shown in Table 2-6.

¹³Exchange rate policy, macroeconomic policy, and trade regimes are described in detail in Appendix G.

nominal rate.

Agricultural exports and imports were valued at the official (central bank) rate from 1960 to 1985. The official rate was fixed in nominal terms from 1963 to 1973, from 1974 to 1979, and from 1979 to 1985. In real terms, it depreciated (expressed in £E/\$US) considerably from 1960 to 1964, then was relatively stable until the major devaluation of 1979. Since 1979, the official real rate has appreciated considerably. By valuing tradable agricultural goods at the official exchange rate, the government has artificially cheapened wheat imports and has raised the demand for wheat and bread. By not paying exporters the opportunity cost of their product, it has also accentuated the taxation of the sector and has contributed to its declining performance.

IMPLEMENTATION OF AGRICULTURAL PRICE POLICY

Since the early 1960s, the public sector has been increasingly involved in agricultural marketing and trade. The system of control of agriculture by the state, both in inputs and in outputs markets, was generalized at the beginning of the 1960s when the First Five-Year Plan was implemented. A report of the Ministry of Planning dated July 1967 criticized the chaotic state of the pricing system, the conflicting procedures adopted by the various agencies administering prices, and an almost total absence of coordination.¹⁴

¹⁴The report, FURP 1960/61-1964/65, Part II, 1967, is quoted in Mabro and Radwan (1976), p. 71.

These difficulties plagued agricultural price policy throughout the 1960s. To set a more rational price policy, the government (in Presidential Decree no. 2017) created the Price Planning Agency. A few months later, the government (under Law no. 2429 of 1971) created the Agricultural Commodities Stabilization Fund.

The government monopoly of cotton trade, the system of intervention by the Ministry of Agriculture, and the system of consumer subsidies have given rise to a vast and overstaffed administrative apparatus controlled by the government. These factors also have created a complex consulting and decision-making process for pricing in which a multiplicity of groups representing diverse interests at the ministerial, committee, and private sector levels take part.¹⁵ It is hardly surprising, therefore, that suboptimal compromises are often made, because so many groups, representing various constituencies, are involved in the policy process.

¹⁵In the public sector and related political institutions, those interests are represented at the level of the Ministries of Agriculture, Supply, Economy and Finance, Trade, and Planning; by the Ministerial Production Committee, Cotton Higher Board, National Institute of Planning, General Authority for Export and Import Controls, Green Revolution High Commission, Ministerial Economic Commission, Principal Development Bank, Agricultural Orientation Agency, Agriculture and Irrigation Committee of the Peoples' Assembly, Plan and Budget Committee of the Peoples' Assembly, National Democratic Party, National Food Security Company, Ministerial Committee for the Development of Animal Wealth, and so on. See USAID, Country Development Strategy Statement FY 1984, Annex: Agricultural Prices and Policies in Egypt 1974-1981, Washington, 1982, p. 13. Private sector entities, such as the Cairo Chamber of Commerce or the Federation of Vegetable and Fruit Exporters, have an advisory capacity in the pricing process.

Debates in the National Assembly and in parliamentary committees are important elements of the policymaking process for agriculture. Constitutionally, half of the seats in the Assembly must be filled by representatives of farmers. The Agricultural and Irrigation Committee of the Assembly discusses matters of agricultural policy, giving the executive branch of the government a better understanding of special interests at the district level. Lobbying on quotas for input distribution and for crop procurement in each district, and on the agricultural investment plans takes place in the Assembly, before being translated into decrees.

The Council of Ministers formulates agricultural policy. Implementation of the policy is then left to various administrations depending on the type of agricultural product. The policy process starts at the level of the High Committee of Planning, composed of the ministers from the departments concerned. The High Committee initiates policy changes, allocates inputs, sets targets for outputs, and has the responsibility for coordinating the views of the government on issues presented by the Ministry of Agriculture. A combined position is then forwarded to the Council of Ministers, which submits recommendation to the Agricultural and Irrigation Committee of the People's Assembly for ratification. The draft proposal is then returned to the full Assembly and eventually becomes a presidential decree.

Important decisions concerning the agricultural sector, such as setting delivery quotas and prices of major crops, are deliberated upon by the Council of Ministers. A report is prepared

jointly by the services of several ministries, usually the Ministry of Agriculture and the Ministry of Supply, and presented for debate at the council. Once a decision is reached, the matter is implemented jointly by the ministers concerned. Other decisions having lesser political impact or less significant budgetary implications are carried out by the ministry technically responsible for the matter (agriculture, transportation, irrigation, industry, etc). In matters of area planning, for instance, the Ministry of Agriculture is responsible. For delivery quotas, the Ministries of Agriculture and Supply are jointly responsible. For setting prices, as noted, several agencies and administrations share responsibility.

The search for viable policies inevitably leads to conflicts among different departments, as an Egyptian commentator recently observed:

The Minister of Supply is mainly concerned about consumer interests, particularly those living in urban areas. The Minister of Industry is concerned about providing cotton fibers, sugarcane, cotton seeds, and linen at reasonable, low prices to the factories affiliated with his ministry. The Minister of Planning focuses his attention on overcoming inflation, and in setting government payments to farmers to limit their purchasing power. Finance, Commerce, and Foreign Trade are concerned about maintaining low prices of the export crops, to increase government revenues." (Abdel-Youssef 1981, pp. 26-27)

As for the Ministry of Agriculture, it essentially views its role as that of a farm lobby. As a result, decisions are made more on the basis of short-run payoffs to specific groups (farmers, public sector enterprises, etc.) than on the basis of long-run

objectives of agricultural growth.

The day-to-day administration of agricultural policy is the responsibility of the Ministry of Agriculture, in cooperation with the Ministry of Irrigation.¹⁶ But other ministries are also involved in administering and planning. The most important of these is the Ministry of Supply, which is responsible for the trade of agricultural inputs and outputs, and in particular for wheat imports, as well as for administering the subsidy program for basic foods. The Ministry of Industry is involved in setting the procurement price for domestically processed products, and the Ministry of Planning is concerned with sectoral investment plans for agriculture.

Policy decisions in specific areas are carried out by the agencies concerned. The most important implementing agencies are the Department of Cooperatives and the Principal Bank for Development and Agricultural Credit (PBDAC), both under the

¹⁶The Ministry of Agriculture, with various policy instruments, intervenes in several ways.

A. It assigns certain regions to grow certain crops (or varieties of crops) and forbids other regions to grow these crops. In the case of cotton, the MOA must designate yearly, before January 1st, the varietal zones to be grown.

B. It consolidates crop rotations at the village, district and governorate level and determines the sequence of crops in the rotation and the area allotted to each crop.

C. It sets the timing for the planting, harvesting, and removal of residues of crops. It also determines planting methods, seed rates, and all cultural practices, including rates and types of fertilizers and pesticides and irrigation schedules.

D. Finally, it intervenes in the marketing of agricultural products by issuing specification for preparing and handling crops to be marketed and sets regulations covering cooperative marketing.

jurisdiction of the Ministry of Agriculture; the General Authority for Supply Commodities (GASC), handling subsidized food items, under the jurisdiction of the Ministry of Supply; and the General Organization for Cotton, under the twin jurisdiction of the Ministry of Economy (trade matters) and the Ministry of Industry (industrial matters).

Implementation of Cotton Price Policy. Cotton is the only crop that has been entirely controlled by the government since the early 1960s. Prices of cotton are set by the High Committee for Economy and Planning of the Council of Ministers. Cotton varieties are classified according to grade (staple length) and geographical location, and prices are determined on the basis of variety and grade. Farmers of Upper Egypt, who are required to plant middle-length varieties that are priced lower, particularly resent being forced to grow cotton (Adams 1986, p. 66).

Farmgate prices are determined according to expected export price, selling price to domestic mills, transport and processing costs, alternative production possibilities, and budget requirements of the state. The Ministry of Economy and Finance is normally the first to suggest a price change, because of its responsibility for the state budget and because it supervises the cotton gins. The Ministry of Trade also deals with cotton prices, because it supervises the cotton companies. The Ministry of Industry supervises the spinning and weaving mills. It also is interested in cotton prices, because they have a strong influence on the operating costs of those industries, which sell cloth to the public

at low subsidized prices. The Ministry of Agriculture has often anticipated the Ministry of Finance in proposing increases in the farmgate price of cotton to achieve the desired area response and to satisfy its constituency. In sum, government policy for cotton prices during the period under study was to stabilize both the selling price to the local spinning industry and the buying price from farmers. The government absorbed fluctuations in export prices.

Implementation of Cereals Price Policy. In the case of the major cereals (wheat, rice, and maize), final pricing authority rests with the Council of Ministers, because policy changes here are seen to have a strong impact on the macroeconomy. An increase in the farmgate price of rice, for instance, implies a larger budget deficit. Wheat and rice prices paid to farmers for the quota they have to deliver are determined by the Ministry of Supply, which is responsible for food subsidies and for rice exports.¹⁷ In the case of wheat--the major importable crop--the Ministry of Supply has a great deal of weight in the pricing decision. It supervises the activities of the GASC, the agency responsible for importing additional amounts to meet demand. Import levels influence domestic

¹⁷ Prices of wheat and rice are announced at harvest time, not at planting time, which makes it impossible for farmers to respond during the current season. Previously, price changes were usually announced when the Ministry of Supply feared that farmers would be likely not to deliver the targeted quota. Since 1974, the government has been attempting to bring domestic farmgate prices closer to international prices by increasing prices every year, and farmers plant according to the expectation that prices will keep on increasing.

farmgate prices, because part of the wheat is sold on the free market. Although maize prices are not controlled, maize is a close substitute for wheat, and the decisions of the Ministry of Supply concerning imports of yellow maize (used exclusively for feed) also have an influence on maize prices and on the price of wheat straw, which is used as fodder (Habashy and Fitch 1981).

Administering subsidized food crops requires a lot of personnel. Nearly 16,000 workers are employed in the distribution section of the Ministry of Supply in Cairo alone. That ministry also supervises forty-two public companies (wholesale, retail, mills, husking plants, silos, bakeries, etc.), maintaining personnel in every district of the country (Alderman, von Braun, and Sakr 1982, p. 38).

It is impossible to compare the efficiency of the public sector with that of the private sector. There is little doubt that government and public companies involved in administering agricultural prices are overstaffed and that productivity of such operations could be increased. Overstaffing, however, reflects not merely the growth of price administration but more generally government employment policies in the public sector (Hansen and Radwan 1982, pp. 62, 146).

Implementation of Sugar Price Policy. Prices of sugarcane are set by the Ministry of Industry. The government-owned Egyptian Sugar and Refining Company operates eight cane mills and offers milling contracts to growers. In fact, the government has a

monopoly to mill, refine, and trade centrifugal sugar.¹⁸ The pricing problem here is similar to that for rice and wheat: Because sugar is subsidized for consumers, the government cannot provide a higher price to growers without having a negative impact on the budget unless it raises the consumer price. Hence, the Ministries of Supply and Finance must have a say in pricing.¹⁹

¹⁸The private sector does not operate sugar mills. A sugar beet mill located in the Delta was established as a private company, but in reality it is owned by public sector organizations. The government operates eight mills, mostly in Upper Egypt, for extracting and refining sugar from cane. Two of the mills were originally built around the turn of the century.

¹⁹Other procured food crops, such as beans, lentils, and sesame, are also priced by the Ministry of Supply in consultation with the Ministry of Agriculture. Other export crops, such as winter onions and groundnuts, are procured only in limited zones by state-owned export companies supervised by the Ministry of Economy and Finance. Pricing for those products is done by the latter ministry in coordination with the Ministry of Agriculture. Minor delivery crops such as garlic, oranges, and potatoes, which are not subject to delivery quotas, are also priced for the quantities sold to the state-owned companies by those two Ministries. Many institutional arrangements have been made for those products. They range from the delivery of the crop by the farmer to the cooperative to more complex contracts distinguishing between grades and quality types.

Chapter 3

MEASUREMENT OF THE INCIDENCE OF SECTOR-SPECIFIC AND ECONOMY-WIDE INTERVENTION ON PRICES

This chapter examines the incidence of government intervention on the relative price of agricultural commodities. The prices of the five major crops affected by intervention (cotton, rice, wheat, maize, and sugarcane) are considered and are deflated by a nonagricultural price index. Intervention is measured for producer prices and for consumer prices. The effects of sector-specific and economy-wide intervention are examined by looking at the evolution of protection coefficients over the period 1960-85. The first section of the chapter treats nominal protection, the second discusses effective protection, and the third presents some conclusions.¹

For each of the five crops, Figures 3-1 to 3-10 compare the

¹Protection rates are based on the data found in Appendixes B, C, and D. Appendix B contains the data on nonagricultural price and value added indices. Appendix C contains time series data on farmgate prices and border-price equivalents. Farmgate prices are shown in Table C-1, and border-price equivalents are derived in Tables C-7 to C-11. Appendix C also explains how border prices were adjusted at the farmgate. Appendix D contains time series data on consumer prices and explains how border prices were adjusted at the consumption point. Average consumer prices are derived in Tables D-1 to D-5, and border-price equivalents are derived in Tables D-7 to D-11.

evolution of the relative price of crop A vis-à-vis nonagriculture at actual intervention levels (P_A/P_{NA}) with what the relative price would have been without direct intervention (P'_A/P_{NA}) and with what the relative price would have been without direct and indirect intervention (P^*/P^*_{NA}).² Producer prices (P_p) and consumer prices (P_c) are shown in the graphs. The change in producer price policy that occurred after 1973 is noticeable in the figures. The relative price of crops vis-à-vis nonagriculture began to increase slowly after 1973. The world price of these commodities, however, increased even more in most cases. As a result, taxation of agriculture continued to grow.

INCIDENCE OF PRICE INTERVENTION ON RELATIVE PRICES

Incidence of Direct Price Intervention. Direct intervention in markets for agricultural commodities takes the form of fixed prices for partially or totally procured crops, on the producer side, or for rationed or nonrationed goods, on the consumer side, leading to distortion in production and consumption.

The direct effect of price policy on relative prices is measured by the nominal rate of protection, NPR_D , defined as

$$NPR_D = \frac{P_A/P_{NA} - P'_A/P_{NA}}{P'_A/P_{NA}} = \frac{P_A - P'_A}{P'_A} \quad (1)$$

where

²All figures are presented at the end of this chapter.

P_A = the (producer or consumer) price of crop A
 P'_A = the border-price equivalent of crop A
 P_{NA} = the nonagricultural price index.

For tradable crops, NPR_p measures the deviation of the average (producer or consumer) price from the border-price equivalent, evaluated at the farmgate (producer) or at the point of consumption (consumer), in percentage of the border-price equivalent. Border prices P'_A are measured at the official exchange rate deflated by the nonagricultural price index.

A negative nominal protection rate indicates that the crop is taxed on the producer side and subsidized on the consumer side as a result of the government controls. A positive nominal protection rate indicates that the crop is protected on the producer side and taxed on the consumer side.

The NPR_p s for the five crops are presented in Table 3-1 for producer prices and in Table 3-2 for consumer prices. The results in Table 3-1 measure the incidence of direct intervention on output prices, without taking into account subsidies and taxes on inputs. The results in Table 3-2 show the incidence of direct intervention on consumer prices. In both cases, border prices are measured at the official (central bank) exchange rate, the rate at which world prices of agricultural tradables expressed in foreign currency were actually converted to domestic currency.

Producers of cotton, rice, and wheat have been consistently taxed, whereas consumers of cloth, rice, and bread have been

Table 3.1. NOMINAL PROTECTION RATES FOR PRODUCER PRICES
in percent of border prices
DIRECT INTERVENTION.

	Cotton (NPRd)c	Rice (NPRd)r	Wheat (NPRd)w	Maize (NPRd)m	Sugar- cane (NPRd)s
1960	-23%	-28%	25%	7%	-218%
1961	-24%	-35%	33%	-2%	-205%
1962	-19%	-51%	13%	-6%	-240%
1963	-33%	-56%	-20%	-28%	-36%
1964	-22%	-62%	-34%	-20%	60%
1965	-33%	-59%	-17%	-26%	-231%
1966	-28%	-51%	-6%	-6%	-196%
1967	-47%	-48%	2%	8%	-215%
1968	-25%	-57%	-1%	-11%	-215%
1969	-32%	-50%	5%	-4%	-341%
1970	-32%	-34%	34%	0%	-391%
1971	-32%	-30%	0%	-8%	-1215%
1972	-27%	-33%	0%	3%	25%
1973	-62%	-64%	-10%	-3%	-9%
1974	-63%	-87%	-57%	-7%	-74%
1975	-55%	-82%	-40%	-35%	-56%
1976	-36%	-64%	-34%	-39%	45%
1977	-49%	-36%	-11%	11%	466%
1978	-22%	-43%	-6%	-1%	1363%
1979	-52%	-69%	-26%	-13%	-21%
1980	-51%	-64%	-44%	-16%	-79%
1981	-40%	-67%	-51%	-53%	-38%
1982	-22%	-59%	-55%	-35%	102%
1983	-18%	-40%	-28%	22%	157%
1984	-31%	-21%	-21%	-8%	1296%
1985	-18%	20%	0%	33%	-1528%

NOTE: (1)
$$\frac{Pa/Pna - P'a/Pna}{P'a/Pna} = \frac{Pa - P'a}{P'a}$$

(2) "N/A" for sugarcane indicates that border price is negative.

SOURCE: Computed from Farmgate Prices and Border Equivalent (Appendix C).

Table 3.2. NOMINAL PROTECTION RATES FOR CONSUMER PRICES
in percent of border price
DIRECT INTERVENTION.

	Cotton (NPRd)c	Rice (NPRd)r	Wheat (NPRd)w	Maize (NPRd)m	Sugar- cane (NPRd)s
1960	-9%	N/A	19%	N/A	129%
1961	-8%	N/A	30%	N/A	145%
1962	-2%	N/A	-7%	N/A	112%
1963	-22%	N/A	-29%	N/A	-6%
1964	-40%	N/A	-39%	N/A	22%
1965	-26%	-37%	-9%	-13%	119%
1966	-21%	-16%	-3%	19%	143%
1967	-45%	-6%	-6%	50%	127%
1968	-29%	-14%	5%	17%	129%
1969	-37%	-27%	9%	9%	77%
1970	-37%	-10%	20%	27%	93%
1971	-40%	-7%	-4%	11%	69%
1972	-42%	-13%	-4%	18%	18%
1973	-63%	-44%	-19%	12%	18%
1974	-64%	-79%	-71%	-27%	-33%
1975	-58%	-75%	-65%	-24%	-8%
1976	-36%	-54%	-55%	-27%	55%
1977	-49%	-33%	-44%	2%	110%
1978	-24%	-37%	-56%	45%	135%
1979	-53%	-56%	-68%	10%	-3%
1980	-52%	-56%	-85%	-11%	-47%
1981	-41%	-65%	-76%	-42%	-17%
1982	-24%	-67%	-76%	-39%	49%
1983	-20%	-56%	-69%	-5%	49%
1984	-33%	-47%	-73%	-27%	90%
1985	-21%	-36%	-34%	-16%	131%

NOTE:
$$\text{NPRd} = \frac{P_a/P_{na} - P^1_a/P_{na}}{P^1_a/P_{na}} = \frac{P_a - P^1_a}{P^1_a}$$

SOURCE: Computed from consumer prices and border equivalents (Appendix D).

subsidized. Wheat producers were protected and consumers taxed in the early 1960s and early 1970s, when world wheat prices were particularly low.

Maize production, for which no price controls were in effect during the period, has been taxed in most years as a result of import policy. Maize consumption was taxed from 1966 to 1973, after which it has been subsidized (except in 1977-79), reflecting the growing importance of subsidized maize imports for livestock.

The case of sugarcane deserves some comment. The border-price equivalent of cane for the producer was negative throughout the 1960s (except 1963-64) until 1971 because milling costs on a per-ton basis exceeded the price of the cane.³ To obtain border prices of cane at the farmgate, we converted world prices of refined sugar (the internationally traded commodity) to cane equivalent at the standard conversion factor (11 percent). With negative border prices, the nominal protection rates do not have meaning for those

³See the discussion in Appendix C. See also Hansen and Nashashibi (1975), pp. 236-39, on the competitiveness of the sugar industry from 1960 to 1973.

years.⁴

INCIDENCE OF INDIRECT PRICE INTERVENTION

Exchange rate and trade policies are indirect forms of intervention that alter relative producer and consumer prices. The relative price at actual intervention levels is P_A/P_{NA} . Without indirect intervention, it would be $(E^*/E_0)P_A/P_{NA}^*$, with

$$P_{NA}^* = a \frac{E^*}{E_0} \frac{P_{NA}(T)}{(1 + t_m)} + (1-a) P_{NA}(NT) \quad (2)$$

where

a = share of tradables in the index
 t_m = equivalent tariff rate on nonagricultural tradables
 E^* = equilibrium exchange rate
 E_0 = official exchange rate
 $P_{NA}(T)$ = index of prices of nonagricultural tradables
 $P_{NA}(NT)$ = index of prices of nonagricultural nontradables.

That is, to correct for indirect intervention, relative border prices should be evaluated at the equilibrium exchange rate, E^* , and deflated by a nonagricultural price index, P_{NA}^* , to correct prices

⁴Average yearly CIF prices of raw sugar may not represent a good measure of the opportunity cost of growing sugarcane. World prices of sugar have been highly unstable in the last twenty years, partly because of the oligopolistic structure of the world market, partly because of protectionist barriers in major importing countries, and partly because of the natural cycle of cane harvesting. The price instability index of sugar for the period 1964-84 was 90.8, meaning that one could expect the price in a typical year to be 90.8 percent below or above the trend value for that year, whereas it was 14.3 for cotton and 24.3 for wheat in the same period. See World Bank (1986c), p. 86.

of tradables for exchange rate overvaluation and trade policy distortion. The nominal rate of protection in the case of indirect intervention, NPR_1 , is therefore defined as

$$NPR_1 = \frac{P_A/P_{NA} - (E^*/E_0)P_A/P_{NA}^*}{(E^*/E_0)P_A^*/P_{NA}^*} = \frac{1/P_{NA} - (E^*/E_0)/P_{NA}^*}{(E^*/E_0)/P_{NA}^*} \quad (3)$$

where

- P_A = the (producer or consumer) price of crop A.
- P_A^* = the border-price equivalent of crop A, evaluated at the equilibrium exchange rate
- P_{NA} = the nonagricultural (NA) price index
- P_{NA}^* = the NA price index adjusted for exchange rate and trade policies.

As Equation 3 shows, the incidence of indirect intervention is the same for all tradable crops and depends only on E^*/E_0 , representing the level of exchange rate overvaluation, and on t_m , representing the impact of trade policies on $P_{NA}(T)$, the tradable component of nonagriculture. Table 3-3 shows the incidence of indirect intervention on both producer and consumer prices. Indirect intervention acted as a tax on production of agricultural exports and as a subsidy on agricultural imports throughout the period. The exchange rate overvaluation had a greater effect on agriculture in the period 1960-72 than in the period 1973-85.

Incidence of Total Price Intervention. We call total intervention the sum of direct (i.e., agricultural price policies) and indirect (i.e., exchange rate and trade policies) intervention

on relative prices. The incidence of total intervention is measured by NPR_T , defined as

$$NPR_T = \frac{P_A/P_{NA} - (E^*/E_0)P'_A/P^*_{NA}}{(E^*/E_0)P'_A/P^*_{NA}} \quad (4)$$

The incidence of total intervention on producer prices and on consumer prices is shown in Tables 3-4 and 3-5.

Table 3.3. NOMINAL PROTECTION RATES FOR PRODUCER AND CONSUMER PRICES
in percent of border price
INDIRECT INTERVENTION.

Year	NPRi for all crops
1960	-40%
1961	-35%
1962	-26%
1963	-24%
1964	-27%
1965	-31%
1966	-34%
1967	-6%
1968	-28%
1969	-30%
1970	-34%
1971	-37%
1972	-31%
1973	5%
1974	-1%
1975	-9%
1976	-19%
1977	-18%
1978	-29%
1979	-15%
1980	-6%
1981	-17%
1982	-20%
1983	-13%
1984	-15%
1985	-15%

$$NPRi = \frac{1/Pna - (E^*/Eo)/P^*na}{(E^*/Eo)/P^*na} - 1 = \frac{P^*na Eo}{Pna E^*} - 1 \text{ where } Eo \text{ is the official exch. rate.}$$

SOURCES: computed from data in appendices A and B.

Table 3.4 NOMINAL PROTECTION RATES FOR PRODUCER PRICES
in percent of border prices
TOTAL (DIRECT AND INDIRECT) INTERVENTION.

	Cotton (NPRt)c	Rice (NPRt)r	Wheat (NPRr)w	Maize (NPRt)m	Sugar- cane (NPRt)s
1960	-62%	-69%	-33%	-41%	351%
1961	-57%	-67%	-19%	-40%	-769%
1962	-40%	-66%	-23%	-26%	-743%
1963	-48%	-68%	-37%	-42%	-61%
1964	-43%	-73%	-50%	-39%	-34%
1965	-53%	-73%	-41%	-47%	-383%
1966	-52%	-68%	-35%	-35%	-260%
1967	-49%	-51%	-4%	2%	-204%
1968	-46%	-70%	-26%	-33%	-306%
1969	-53%	-66%	-23%	-28%	344%
1970	-56%	-59%	-6%	-29%	68%
1971	-58%	-59%	-34%	-38%	-16%
1972	-51%	-56%	-28%	-23%	-53%
1973	-59%	-62%	-7%	0%	25%
1974	-66%	-88%	-61%	-14%	-76%
1975	-63%	-85%	-49%	-43%	-66%
1976	-60%	-78%	-57%	-59%	-43%
1977	-68%	-62%	-41%	-22%	15%
1978	-58%	-71%	-45%	-38%	8%
1979	-60%	-74%	-37%	-24%	-42%
1980	-56%	-68%	-49%	-22%	-81%
1981	-55%	-75%	-62%	-63%	-58%
1982	-44%	-71%	-67%	-51%	2%
1983	-44%	-62%	-49%	-9%	14%
1984	-63%	-62%	-54%	-43%	52%
1985	-64%	-56%	-52%	-28%	82%

$$Pa/Pna - (E^*/Eo) P^1a/P^*na$$

NOTE: (1) NPRt= -----
(E*/Eo) P¹a/P^{*}na

(2) "N/A" for sugarcane indicates that border price is negative.

SOURCE: Computed from farmgate prices and border equivalents (Appendix C) and Pna and P*na (Appendix B).

Table 3.5. NOMINAL PROTECTION RATES FOR CONSUMER PRICES
in percent of border price
TOTAL (DIRECT AND INDIRECT) INTERVENTION.

	Cotton (NPRT)c	Rice (NPRT)r	Wheat (NPRT)w	Maize (NPRT)m	Sugar- cane (NPRT)s
1960	-54%	N/A	-40%	N/A	15%
1961	-47%	N/A	-26%	N/A	40%
1962	-28%	N/A	-31%	N/A	58%
1963	-39%	N/A	-45%	N/A	-27%
1964	-56%	N/A	-55%	N/A	-10%
1965	-49%	-55%	-37%	-38%	53%
1966	-47%	-43%	-36%	-18%	62%
1967	-48%	-11%	-11%	42%	115%
1968	-48%	-36%	-23%	-13%	67%
1969	-55%	-47%	-22%	-20%	26%
1970	-58%	-37%	-20%	-11%	29%
1971	-62%	-38%	-39%	-26%	8%
1972	-59%	-36%	-33%	-13%	-17%
1973	-61%	-42%	-15%	16%	24%
1974	-67%	-81%	-73%	-32%	-39%
1975	-64%	-78%	-70%	-34%	-22%
1976	-60%	-70%	-72%	-51%	-2%
1977	-68%	-55%	-64%	-31%	34%
1978	-58%	-64%	-76%	-14%	30%
1979	-61%	-63%	-73%	-6%	-18%
1980	-56%	-60%	-86%	-18%	-52%
1981	-55%	-73%	-82%	-55%	-37%
1982	-45%	-76%	-82%	-55%	7%
1983	-45%	-69%	-79%	-33%	2%
1984	-63%	-70%	-85%	-58%	5%
1985	-65%	-70%	-70%	-60%	3%

NOTE:
$$\text{NPRT} = \frac{P_a/P_n - (E^*/E_o) P^*_a/P^*_n}{(E^*/E_o) P^*_a/P^*_n}$$

SOURCE: Computed from consumer prices and border equivalents (Appendix D) and P_{na} and P*_{na} (Appendix B).

Figures 3-11 to 3-20 present the evolution of nominal protection rates for direct and total intervention, producer and consumer prices, for each of the five crops. As is clear from Equations 1, 3, and 4, the sum of NPR_D and NPR_I is not equal to NPR_T . Therefore, in the figures showing the evolution of protection levels as a result of direct and total intervention over the period 1960-85, we have used a "corrected" version of NPR_D , called NPR_d . It is defined as

$$NPR_d = NPR_T - NPR_I = \frac{P_A/P_{NA} - P'_A/P^*_{NA}}{(E^*/E_0)P'_A/P^*_{NA}} \quad (5)$$

The accuracy of the results on nominal protection depends on the data presented in Appendixes A, B, C, and D. For border prices, we have used the best possible information concerning exchange rate, transportation, handling and processing costs, and quality differences between Egyptian varieties and internationally traded varieties. But, because transportation and processing are public sector activities, in the absence of reliable data on the competitiveness of those nontradable activities, it was difficult to ascertain how biased the protection results were by the lack of correction for distortion in those activities. For example, transportation costs would be higher, and border prices lower, if subsidies on freight were removed from the computations. Competitive processing costs, especially for sugarcane, would modify the measurement of border prices.

On the other hand, prices received by farmers would be higher if the price of the by-product was taken into account, especially in the case of wheat straw.

INCIDENCE OF INTERVENTION ON RELATIVE VALUES ADDED

So far, only the effects of price intervention on output prices have been measured. The combined effects of government intervention on the prices of crops and of agricultural inputs is captured by effective protection rates rather than by nominal rates.

The effective rate of protection (ERP) is the ratio of value added at domestic prices to value added at world prices, expressed as a percentage of value added at world prices. Value added for each crop is divided here by an index of value added in nonagriculture to obtain an effective protection rate in relative terms.

In the case of direct intervention, the effective protection rate (ERP_D) is given by

$$ERP_D = \frac{VA_A/VA_{NA} - VA'_A/VA_{NA}}{VA'_A/VA_{NA}} = \frac{VA_A - VA'_A}{VA'_A} \quad (6)$$

where

VA_A = value added of agricultural product A, at domestic prices of tradable outputs and inputs

VA'_A = value added of agricultural product A, at border prices of tradable outputs and inputs, evaluated at official exchange rate

VA_{NA} = value added index for nonagriculture.

In the case of total intervention, the effective protection rate (ERP_T) is given by

$$ERP_T = \frac{VA_A/VA_{NA} - (E^*/E_0)VA'_A/VA^*_{NA}}{(E^*/E_0)VA'_A/VA^*_{NA}} \quad (7)$$

with

$$VA^*_{NA} = a \frac{E^*/E_0}{(1 + t_m)} VA_{NA}(T) + (1-a) VA_{NA}(NT) \quad (8)$$

where

- a = share of tradables in the value added index
- t_m = equivalent tariff rate on nonagricultural tradables
- E_m = equilibrium exchange rate
- E₀ = official exchange rate
- VA_{NA}(T) = index of VA of nonagricultural tradables
- VA_{NA}(NT) = index of VA of nonagricultural nontradables.

For each crop analyzed, the concept of value added used here refers to the sum of the returns to all nontraded inputs, not only to labor and capital. The ERPs measure the increase in domestic value added (i.e., the increase in returns to nontraded inputs) permitted by the structure of trade protection, exchange rate, and domestic price controls on output and input prices over the level of value added in the absence of such restrictions. A positive ERP indicates that the crop, relative to nonagriculture, was subject to net subsidization or, in other words, that government policies provided positive incentives for that activity. By contrast, a negative ERP indicates net taxation and disincentives for that particular activity.

The ERP calculations are based on the data presented in Appendixes B and F. The derivation of the VA_{NA} and VA*_{NA} indices may

be found in Appendix B, Table B-3. The indices are based on GDP deflator data. Appendix F contains historical data on costs of production and value added for the five crops analyzed, with prices of tradable inputs and outputs measured at domestic prices, at border prices evaluated at the official exchange rate, and at border prices evaluated at the equilibrium exchange rate. The procedure used for the valuation of traded inputs (fertilizers, pesticides, seeds, and machinery) at border prices is also explained in Appendix F. The calculations are based on the assumption that technological coefficients are constant and are not affected by changes in the relative price of traded to nontraded inputs.

The results, presented in Table 3-6, indicate that the major tradable export and food crops subject to government intervention have been taxed in net terms throughout the period, whether one considers direct intervention only or both direct and indirect intervention.⁵ In other words, government policies have consistently discriminated against those activities during the past twenty years, despite the subsidization of agricultural inputs that became an important counterweight to crop price taxation after 1973. Maize, which was not subject to government

⁵In other words, export and food crops are taxed in net terms whether world prices are valued at the official or at the equilibrium exchange rate.

Table 3 6. EFFECTIVE PROTECTION RATES, 1964-85
in percent of value added at border price
DIRECT AND TOTAL INTERVENTION.

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(ERPd)c	(ERPt)c	(ERPd)r	(ERPt)r	(ERPd)w	(ERPt)w	(ERPd)m	(ERPt)m	(ERPd)s	(ERPt)s
1964	-33%	-51%	-61%	-79%	-40%	-59%	-24%	-48%	94%	-44%
1965	-58%	-56%	-60%	-76%	-22%	-44%	-30%	-49%	N/A	N/A
1966	-52%	-55%	-53%	-71%	-9%	-35%	-8%	-34%	N/A	N/A
1967	-108%	-57%	-47%	-57%	1%	-35%	8%	-4%	N/A	N/A
1968	-41%	-52%	-54%	-74%	-7%	-33%	-17%	-40%	N/A	N/A
1969	-61%	-59%	-64%	-73%	-2%	-30%	-9%	-35%	N/A	N/A
1970	-63%	-61%	-64%	-65%	38%	-3%	-6%	-34%	N/A	160%
1971	-64%	-64%	-45%	-66%	-8%	-40%	-15%	-43%	N/A	-18%
1972	-47%	-55%	-39%	-63%	-6%	-32%	-4%	-27%	25%	-60%
1973	-200%	-65%	-38%	-70%	-15%	-13%	-5%	-3%	-12%	27%
1974	-197%	-69%	-62%	-91%	-64%	-67%	-5%	-12%	-76%	-79%
1975	-142%	-65%	-88%	-88%	-44%	-52%	-33%	-40%	-58%	-68%
1976	-55%	-62%	-81%	-81%	-34%	-61%	-38%	-59%	113%	-41%
1977	-103%	-70%	-62%	-65%	11%	-37%	42%	-8%	N/A	64%
1978	-26%	-60%	-26%	-74%	17%	-42%	20%	-31%	N/A	53%
1979	-116%	-62%	-48%	-78%	-26%	-37%	-6%	-17%	-17%	-41%
1980	-111%	-57%	-67%	-73%	-48%	-52%	-9%	-16%	-83%	-85%
1981	-60%	-54%	-60%	-79%	-52%	-64%	-52%	-63%	-33%	-57%
1982	-29%	-46%	-62%	-76%	-68%	-77%	-39%	-54%	444%	33%
1983	-22%	-47%	-65%	-67%	-36%	-59%	37%	-4%	N/A	57%
1984	-51%	-66%	-44%	-68%	-28%	-64%	-7%	-47%	N/A	210%
1985	-24%	-67%	23%	-60%	3%	-60%	54%	-30%	N/A	237%

NOTES (1) ERPd = Effective Protection Rate at official exchange rate.

$$= \frac{VAa/VA_{na} - VA'a/VA_{na}}{VA'a/VA_{na}} = \frac{VAa - VA'a}{VA'a}$$

(2) ERPt = Effective Protection Rate at equilibrium exchange rate

$$= \frac{VAa/VA_{na} - (E^*/E_0) VA'a/VA^*_{na}}{(E^*/E_0) VA'a/VA^*_{na}}$$

(3) "N/A" for sugarcane indicates that value added at border price is negative

SOURCES. Computed from data in appendices B and F.
Data prior to 1964 are not available

control on output prices, benefited from subsidized input prices and had positive ERPs in 1977-79 and 1982-85.

The measurement problem for sugarcane is identical to the one mentioned in the section on nominal protection. Because of high milling costs, the crop exhibited negative value added in 1965-71, 1977-78, and 1983-84, with traded inputs and output priced at border prices with the official exchange rate, and in 1965-69 with the equilibrium exchange rate. The ERP measures for those years, therefore, are meaningless.⁶

The data in Table 3-6 indicate a general pattern of discrimination against the production of the main export and food crops. But no definitive conclusions concerning changes in the structure of effective protection for those five crops can be inferred from this analysis for two main reasons. First, ERP analysis is static by the nature of its assumptions. One of the main assumptions underlying the ERP calculations is that technological coefficients are unaffected by changes in the relative price of traded inputs, so that price changes do not affect the choice of technology and do not induce substitution between nontraded and traded inputs. We know (see chapter 2) that this assumption does not hold in the case of Egypt. The relative price of traded to nontraded inputs has changed as a result of wage pressure and subsidy policy, and this has induced important changes

⁶If negative border prices were replaced by zero, the ERP would then become infinity.

in agricultural technology between 1964 and 1985.

Second, the results of Table 3-6 should be viewed with caution because of the nature of the data. Effective rates of protection usually are based on estimated farm management costs, which are not very precise indicators of the actual costs and returns of agricultural activities, even at the level of a specific farm. The cost data of Appendix F (based on official data from the Ministry of Agriculture) are even more imprecise to the extent that they are a national average of farms at different levels of efficiency. They tell us little about the profitability of rotations that include controlled crops for individual farmers. There is evidence that some farmers growing sugarcane, wheat, rice, and even cotton have done very well in Egypt, even though the overall ERP for those crops indicates that they do not appear to be profitable activities.⁷

Moreover, because of additional data limitations, the actual level of returns (value added) is underestimated. First, as mentioned in Appendix F, returns to land are underestimated.⁸ Second, returns would be higher if the prices of by-products were included in the calculations. Because of government controls and winter feed shortages observed in the livestock sector since

⁷Strictly speaking, the ERP is a measure of the protection afforded to an activity, not to a commodity.

⁸In Appendix H, we give an example from the governorate of Minya indicating that in 1986, official rents (used in the data of Appendix F) may have been ten times less than actual market rents. Unfortunately, data on actual returns to land are not available.

approximately 1975, wheat straw has become almost as profitable for the farmer as grain.⁹ In our calculations for wheat, we do not take the price of straw into account for lack of reliable data over the entire period. The omission of straw from the ERP computations in this study therefore causes an overestimate of the extent of taxation of wheat producers. By contrast, by-products of cotton, rice, and maize fetch a very low price, so omitting them should not bias results.

CONCLUSIONS

From this exercise, three interesting conclusions may be drawn concerning the incidence of government intervention.

First, the data show that producers of major crops were heavily and consistently taxed throughout the period by means of direct and indirect price intervention. Correspondingly, the public sector cotton industry and domestic consumers of rice and wheat have received substantial subsidies during most years. The degree of taxation of producers and of subsidization of consumers varies by year and by crop, largely as a function of fluctuations in world prices. Period averages reveal broad changes in protection levels. These are revealed in Tables 3-7 and 3-8, showing average NRP/ERP data for producers and consumers for three distinct periods. On

⁹According to Khedr and Clark (1979), revenue per feddan for wheat was £E 75, and for straw £E 50 in 1978. The high price of straw explains in part why farmers are reluctant to adopt new, high-yielding, pest-resistant wheat varieties producing less straw.

the producer side, the incidence of direct price policy was most significant during the 1973-80 period. It decreased after 1980. By contrast, the incidence of exchange rate overvaluation and trade policies (indirect intervention) was most significant between 1960 and 1972. In terms of crops, the most heavily taxed crops since 1960 have been rice and cotton. Wheat and maize have been less taxed than both export crops, although after 1980, cotton taxation was substantially reduced. On the consumer side, the data show that the level of subsidization increased sharply during the period 1973-80. Consumer subsidies resulting from indirect intervention were substantial during 1964-72, but direct intervention had hardly any impact on consumers. After 1980, subsidies continued to increase for wheat, maize, and sugar, whereas the percentages declined for cotton and rice as a result of both direct and indirect policies.

Second, there are no noticeable differences between levels of nominal and effective taxation of producers. This is indicated in Table 3-9. The comparison between nominal and effective rates reveals that taxation was high for most years, in both gross and net terms (i.e., on prices and on values added), as a result of direct and indirect intervention. Whereas nominal protection rates measure the extent of protection caused by policies affecting the prices of outputs only, effective protection rates measure the extent of protection resulting from both output and input price policies. In some cases--for example, for wheat and maize in 1977-78--the ERP is greater than the NRP, indicating that subsidization of inputs has compensated favorably for the taxation of outputs. But, in general,

there are no noticeable differences between nominal and effective protection. However, the caveats of the preceding section regarding ERP calculations must be kept in mind.

Table 3-7.

Average Rates of Protection for Producers.

	Period I		Period II		Period III	
	1964-72		1973-79		1980-85	
NRP	ERP	NRP	ERP	NRP	ERP	

DIRECT INTERVENTIONS						
Cotton	-31%	-59%	-48%	-120%	-30%	-50%
Rice	-47%	-54%	-64%	-58%	-39%	-46%
Wheat	-2%	-6%	-27%	-22%	-33%	-38%
Maize	-7%	-12%	-12%	-3%	-10%	-3%
Sugar	--	--	245%	--	--	--
TOTAL INTERVENTIONS						
Cotton	-51%	-57%	-62%	-65%	-54%	-56%
Rice	-64%	-69%	-74%	-78%	-65%	-70%
Wheat	-27%	-35%	-42%	-44%	-55%	-63%
Maize	-30%	-35%	-28%	-24%	-36%	-36%
Sugar	--	--	-26%	-12%	2%	66%

Data for sugarcane not available when border prices are negative.

SOURCE: Table 3-9.

Table 3-8.

Average Rates of Nominal Protection for Consumers.

	Period I	Period II	Period III
	1960-72	1973-79	1980-85

DIRECT INTERVENTIONS.			
Cotton	-28%	-50%	-32%
Rice	-16%	-54%	-55%
Wheat	- 1%	-54%	-69%
Maize	17%	- 1%	-23%
Sugar	91%	39%	43%

TOTAL INTERVENTIONS.

Cotton	-50%	-63%	-55%
Rice	-38%	-65%	-70%
Wheat	-32%	-63%	-81%
Maize	-12%	-22%	-46%
Sugar	32%	1%	12%

**Period I data for rice and maize is from 1965-72.

SOURCES: Tables 3-2 and 3-5.

One explanation for the absence of significant differences between levels of nominal and effective protection is that the share of nontraded inputs in total production costs is high for all five crops, and that prices of nontraded inputs, including labor, have been rising faster than prices of traded inputs. Since 1977, agricultural wages, in particular, have been rising sharply (see Table 2-8). As a result, the discrimination against agriculture through low producer prices and overvalued exchange rate could not be compensated significantly by the subsidies paid on tradable inputs such as fertilizer.

Third, the importance of exchange rate and trade policies as an instrument of taxation of agricultural producers and subsidization of consumers is clear. These policies penalized the production of agricultural tradables, especially during the 1960-72 period. Rice and cotton were particularly affected. If agricultural tradables had been exchanged at a rate closer to the equilibrium rate and trade policies had not discriminated against agriculture, net taxation of the sector would have decreased by approximately 50 to 200 percent (see Table 3-6). The taxation of agriculture by indirect means has been significant except in 1967 and 1973, the years in which the exchange rate was actually undervalued (see Table 3-3). According to our calculations, the average rate of taxation of producers (and, correspondingly, of subsidization of consumers) caused by indirect intervention reached 29 percent for the period 1960-72, fell to 12 percent during the

period 1973-80 and increased slightly to 16 percent in 1981-85.¹⁰ By contrast, exchange rate and trade policies have benefited the public sector cotton industry, the livestock and poultry industry using maize as an input, and consumers of wheat, rice, and maize. During the period 1960-72, for example, the subsidy on wheat resulting from direct price policy was negligible. But the implicit subsidy resulting from exchange rate and trade policies amounted to 30 percent of border-price equivalents measured at the equilibrium exchange rate. After 1973, the subsidy on wheat increased as a result of both direct and indirect intervention.

¹⁰We have based the calculations on the estimates of the long-run equilibrium exchange rate and tariff equivalent in Appendix A. The figures represent period averages from the data in Table 3-3.

Table 3.9. NOMINAL AND EFFECTIVE PROTECTION RATES FOR FIVE CROPS, 1964-1985.
INCIDENCE OF DIRECT PRICE INTERVENTIONS.

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(NPRd)c	(ERPd)c	(NPRd)r	(ERPd)r	(NPRd)w	(ERPd)w	(NPRd)m	(ERPd)m	(NPRd)s	(ERPd)s
1964	-22%	-33%	-62%	-61%	-34%	-40%	-20%	-24%	60%	94%
1965	-33%	-58%	-59%	-60%	-17%	-22%	-26%	-30%	N/A	N/A
1966	-28%	-52%	-51%	-53%	-6%	-9%	-6%	-8%	N/A	N/A
1967	-47%	-108%	-48%	-47%	2%	1%	8%	8%	N/A	N/A
1968	-25%	-41%	-57%	-54%	-1%	-7%	-11%	-17%	N/A	N/A
1969	-32%	-61%	-50%	-64%	5%	-2%	-4%	-9%	N/A	N/A
1970	-32%	-63%	-34%	-64%	34%	38%	0%	-6%	N/A	N/A
1971	-32%	-64%	-30%	-45%	0%	-8%	-8%	-15%	N/A	N/A
1972	-27%	-47%	-33%	-39%	0%	-6%	3%	-4%	25%	25%
1973	-62%	-200%	-64%	-38%	-10%	-15%	-3%	-5%	-9%	-12%
1974	-63%	-197%	-87%	-62%	-57%	-64%	-7%	-5%	-74%	-76%
1975	-55%	-142%	-82%	-88%	-40%	-44%	-35%	-33%	-56%	-58%
1976	-36%	-55%	-64%	-81%	-34%	-34%	-39%	-38%	45%	113%
1977	-49%	-103%	-36%	-62%	-11%	11%	11%	42%	466%	N/A
1978	-22%	-26%	-43%	-26%	-6%	17%	-1%	20%	1363%	N/A
1979	-52%	-116%	-69%	-48%	-26%	-26%	-13%	-6%	-21%	-17%
1980	-51%	-111%	-64%	-67%	-44%	-48%	-16%	-9%	-79%	-83%
1981	-40%	-60%	-67%	-60%	-51%	-52%	-53%	-52%	-38%	-33%
1982	-22%	-29%	-59%	-62%	-55%	-68%	-35%	-39%	102%	444%
1983	-18%	-22%	-40%	-65%	-28%	-36%	22%	37%	157%	N/A
1984	-31%	-51%	-21%	-44%	-21%	-28%	-8%	-7%	1296%	N/A
1985	-18%	-24%	20%	23%	0%	3%	33%	54%	N/A	N/A

SOURCES: Tables 3.1., 3.4., and 3.5.

NOTE: "N/A" for sugarcane indicates that border price (or value added measured at border prices) is negative for that year.

Averages:

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	NRP	ERP	NRP	ERP	NRP	ERP	NRP	ERP	NRP	ERP
1964-72	-31%	-59%	-47%	-54%	-2%	-6%	-7%	-12%	N/A	N/A
1973-79	-48%	-120%	-64%	-58%	-27%	-22%	-12%	-3%	245%	N/A
1980-85	-30%	-50%	-39%	-46%	-33%	-38%	-10%	-3%	N/A	N/A

Table 3.9. NOMINAL AND EFFECTIVE PROTECTION RATES FOR FIVE CROPS, 1964-1985.
(continued) INCIDENCE OF TOTAL PRICE INTERVENTIONS.

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(NPrT)c	(ERPt)c	(NPrT)r	(ERPt)r	(NPrT)w	(ERPt)w	(NPrT)m	(ERPt)m	(NPrT)s	(ERPt)s
1964	-43%	-51%	-73%	-79%	-50%	-59%	-39%	-48%	-34%	-44%
1965	-53%	-56%	-73%	-76%	-41%	-44%	-47%	-49%	N/A	N/A
1966	-52%	-55%	-68%	-71%	-35%	-35%	-35%	-34%	N/A	N/A
1967	-49%	-57%	-51%	-57%	-4%	-35%	2%	-4%	N/A	N/A
1968	-46%	-52%	-70%	-74%	-26%	-33%	-33%	-40%	N/A	N/A
1969	-53%	-59%	-66%	-73%	-23%	-30%	-28%	-35%	344%	N/A
1970	-56%	-61%	-59%	-65%	-6%	-3%	-29%	-34%	68%	160%
1971	-58%	-64%	-59%	-66%	-34%	-40%	-38%	-43%	-16%	-18%
1972	-51%	-55%	-56%	-63%	-28%	-32%	-23%	-27%	-53%	-60%
1973	-59%	-65%	-62%	-70%	-7%	-13%	0%	-3%	25%	27%
1974	-66%	-69%	-88%	-91%	-61%	-67%	-14%	-12%	-76%	-79%
1975	-63%	-65%	-85%	-88%	-49%	-52%	-43%	-40%	-66%	-68%
1976	-60%	-62%	-78%	-81%	-57%	-61%	-59%	-59%	-43%	-41%
1977	-68%	-70%	-62%	-65%	-41%	-37%	-22%	-8%	15%	64%
1978	-58%	-60%	-71%	-74%	-45%	-42%	-38%	-31%	8%	53%
1979	-60%	-62%	-74%	-78%	-37%	-37%	-24%	-17%	-42%	-41%
1980	-56%	-57%	-68%	-73%	-49%	-52%	-22%	-16%	-81%	-85%
1981	-55%	-54%	-75%	-79%	-62%	-64%	-63%	-63%	-58%	-57%
1982	-44%	-46%	-71%	-76%	-67%	-77%	-51%	-54%	2%	33%
1983	-44%	-47%	-62%	-67%	-49%	-59%	-9%	-4%	14%	57%
1984	-63%	-66%	-62%	-68%	-54%	-64%	-43%	-47%	52%	210%
1985	-64%	-67%	-56%	-60%	-52%	-60%	-28%	-30%	82%	237%

Averages:

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	NRP	ERP	NRP	ERP	NRP	ERP	NRP	ERP	NRP	ERP
1964-72	-51%	-57%	-64%	-69%	-27%	-35%	-30%	-35%	N/A	N/A
1973-79	-62%	-65%	-74%	-78%	-42%	-44%	-28%	-24%	-26%	-12%
1980-85	-54%	-56%	-65%	-70%	-55%	-63%	-36%	-36%	2%	66%

- 101 -
 Figure 3.1. COTTON.
 Relative Producer Prices.

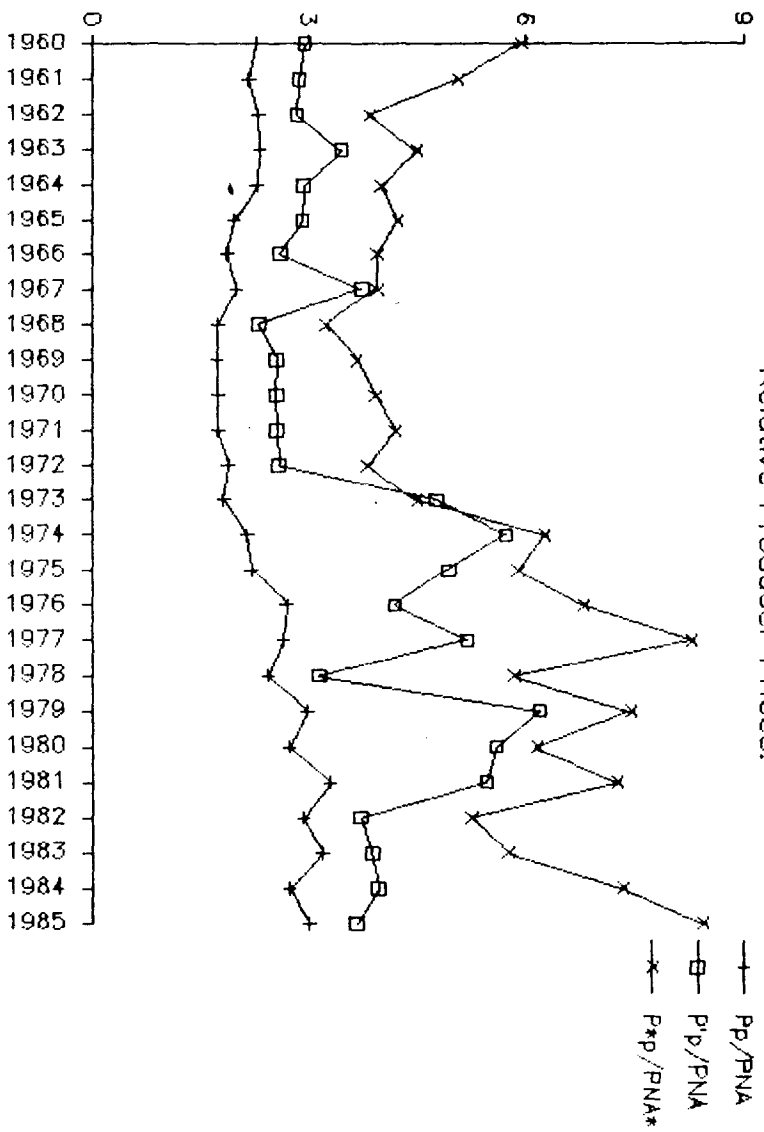


Figure 3.2. COTTON.
 Relative Consumer Prices.

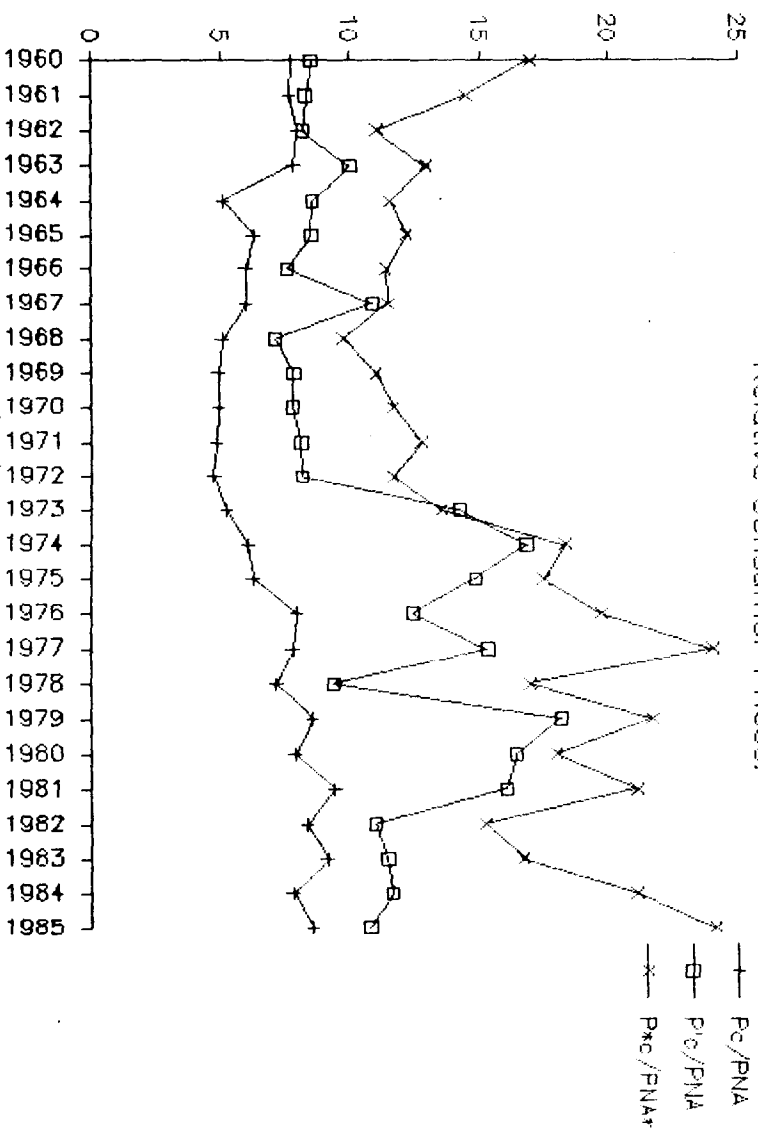


Figure 3.3. RICE.
Relative Producer Prices.

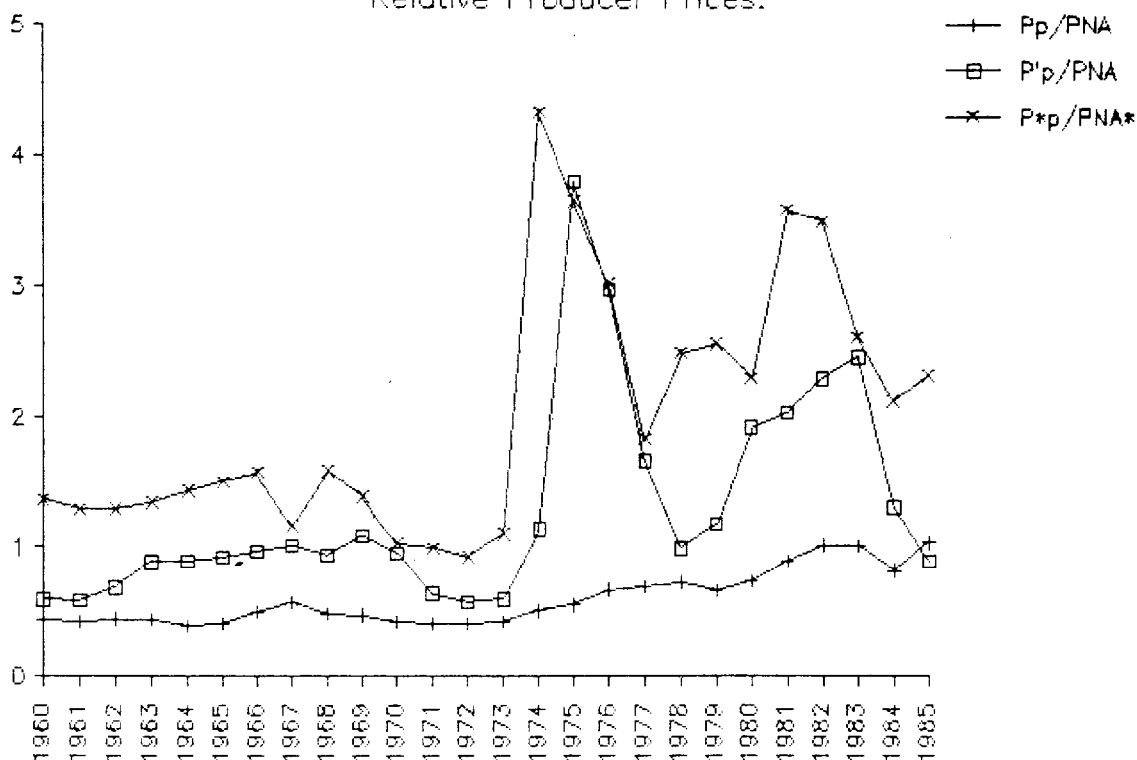
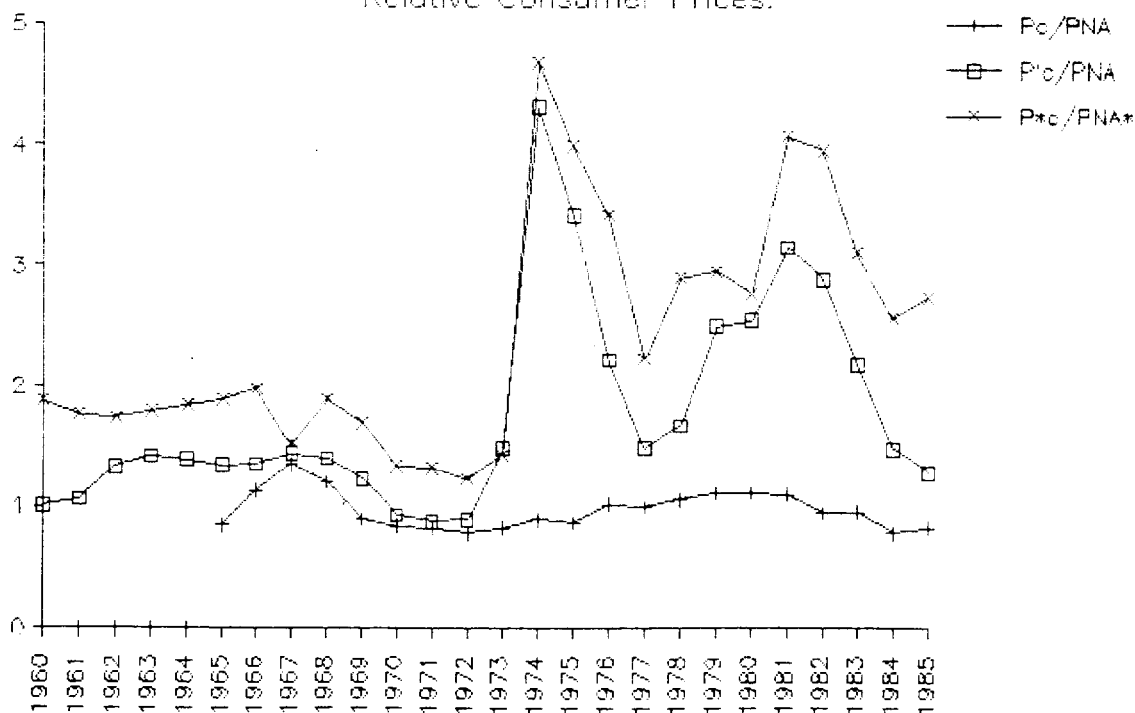


Figure 3.4. RICE.
Relative Consumer Prices.



P_c for 1960-64 not available

- 103 - Figure 3.5. WHEAT.
Relative Producer Prices.

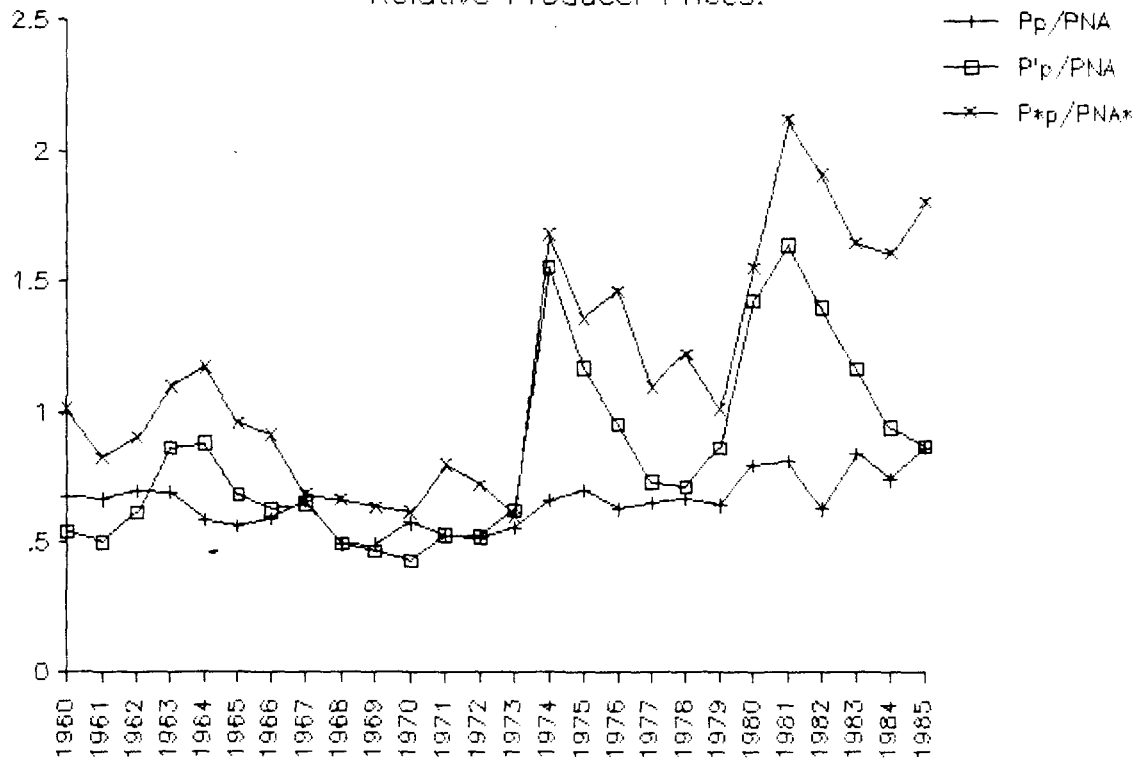


Figure 3.6. WHEAT.
Relative Consumer Prices.

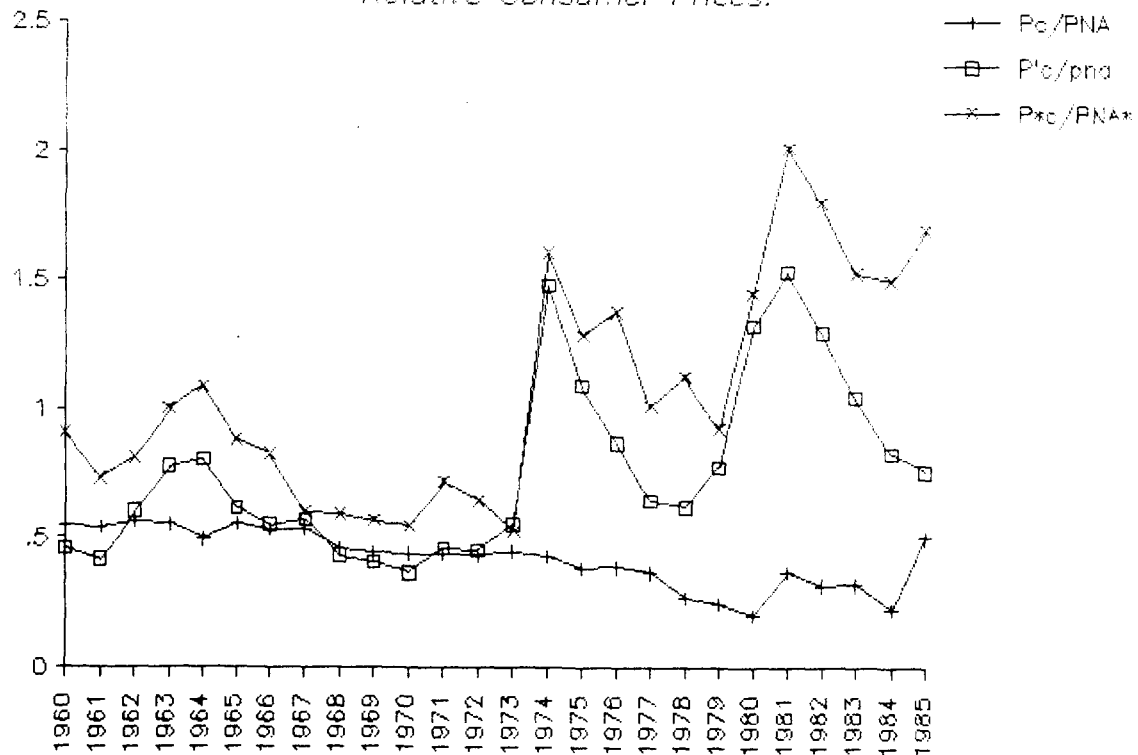


Figure 3.7. MAIZE.
Relative Producer Prices.

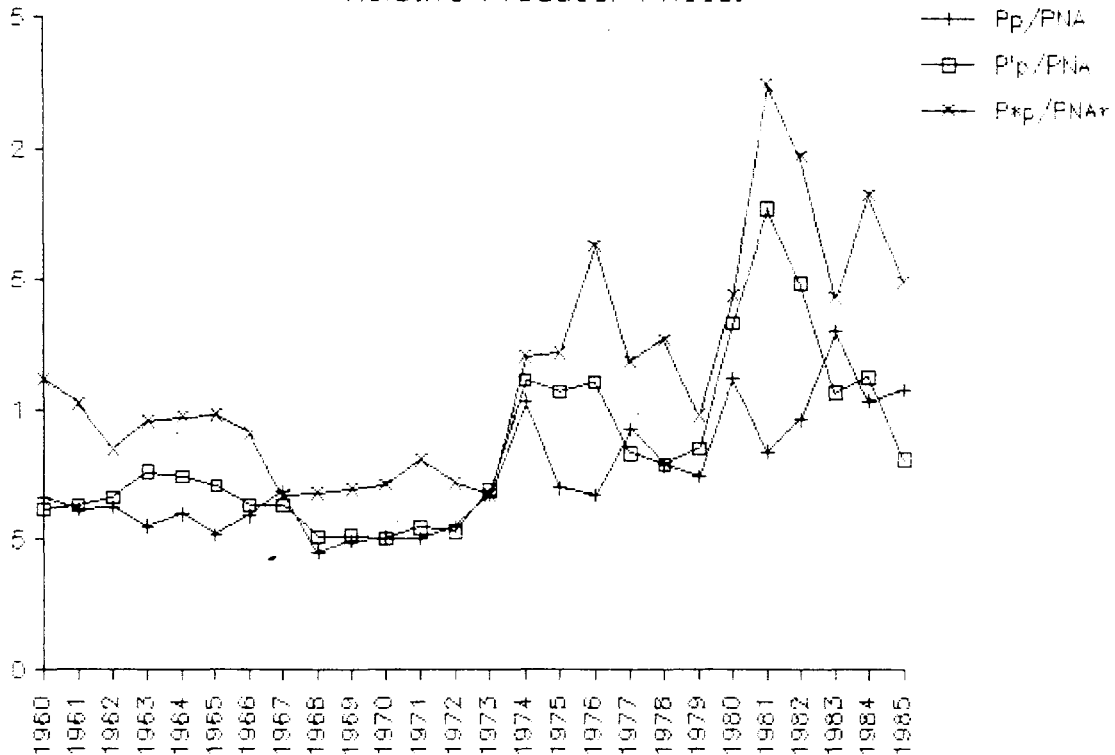
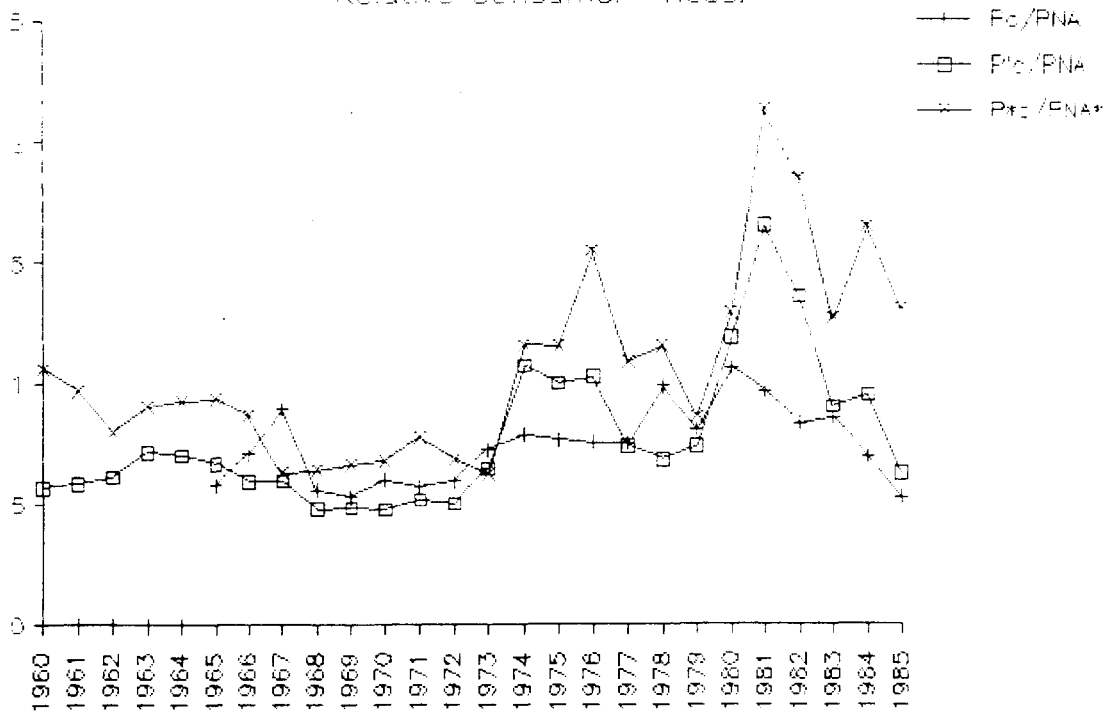


Figure 3.8. MAIZE.
Relative Consumer Prices.



P_c for 1960-64 not available

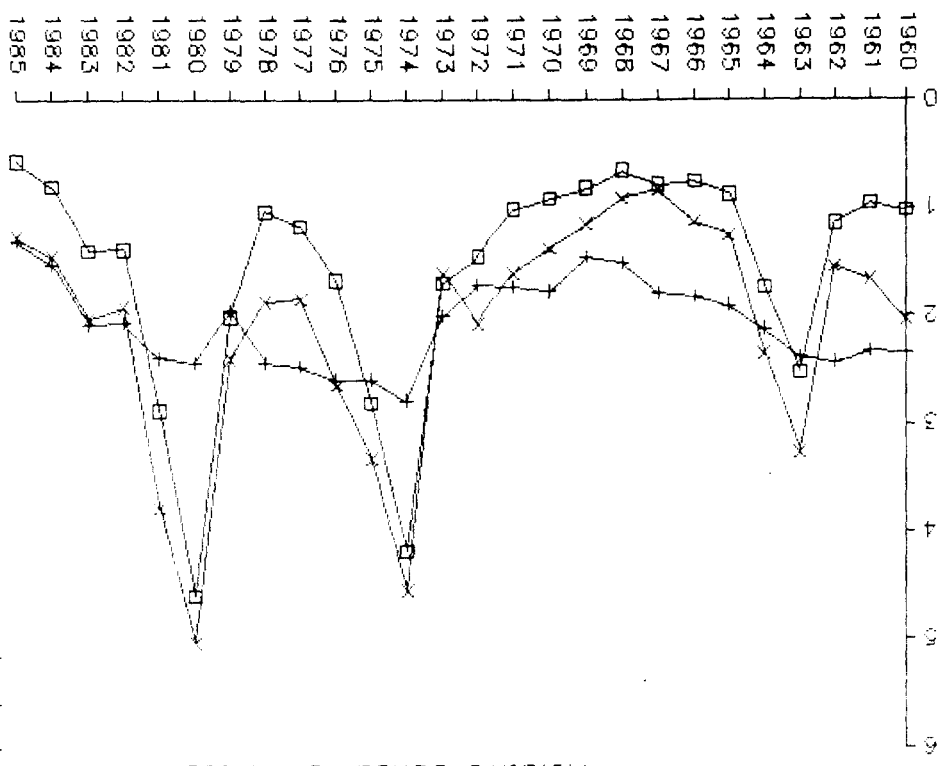


Figure 3.10. SUGAR. Relative Consumer Prices.

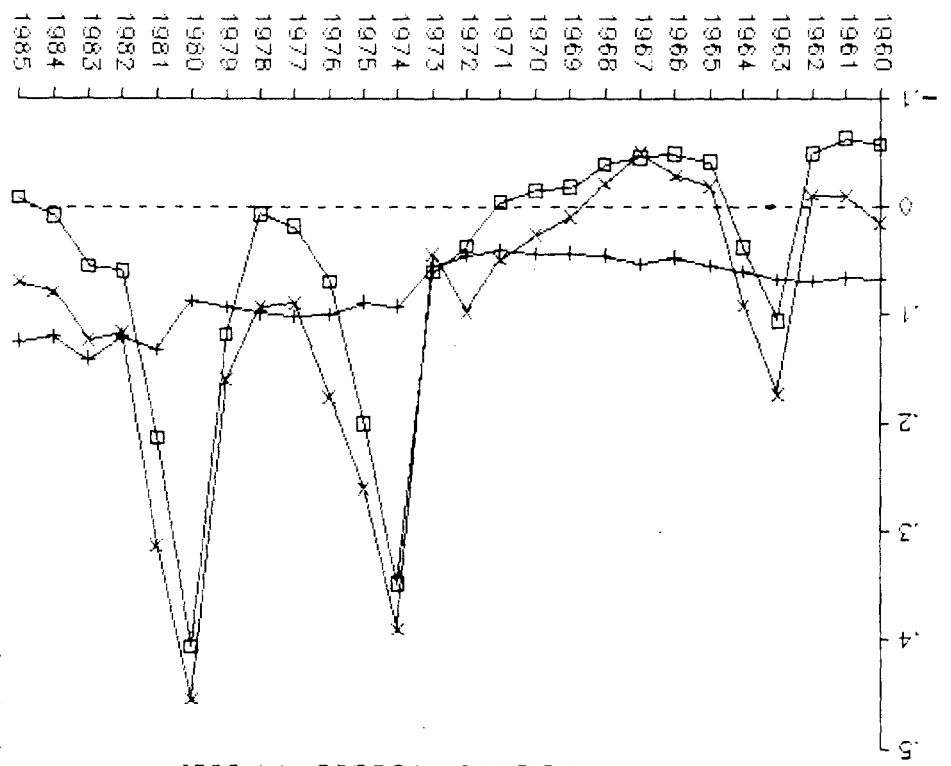


Figure 3.9. SUGARCANE. Relative Producer Prices.

Figure 3.11. COTTON: Nominal Protection Rates.
Direct and Total Intervention on Producer Prices.

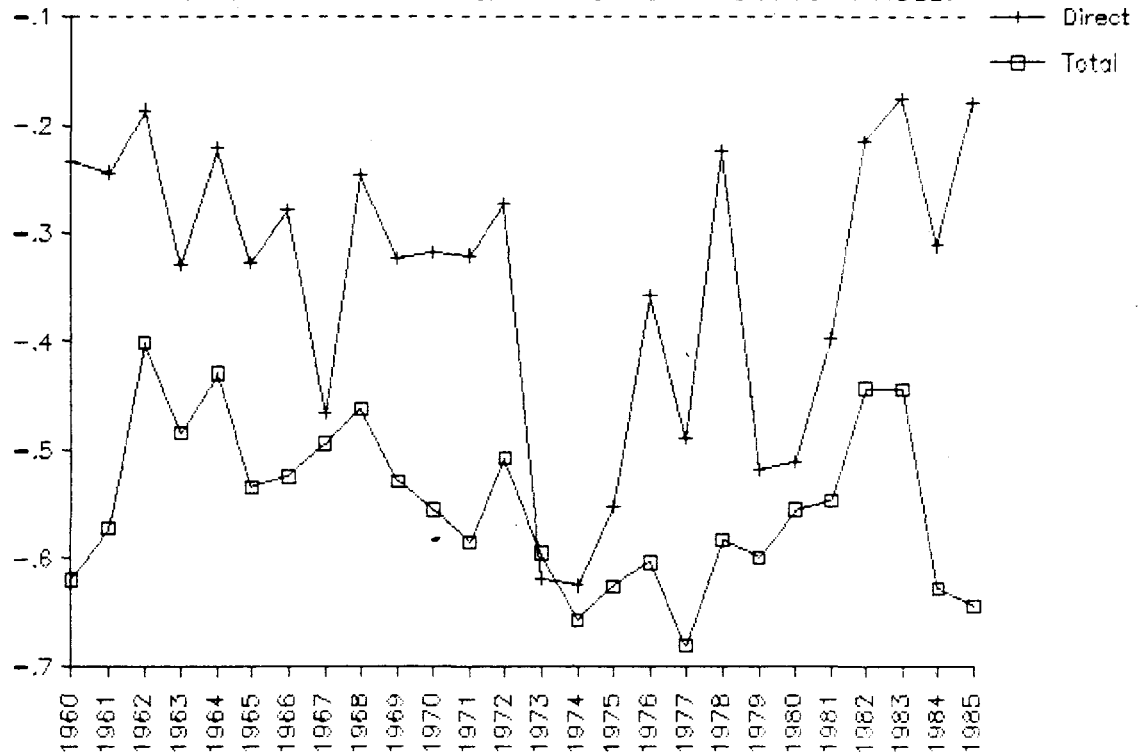


Figure 3.12. COTTON: Nominal Protection Rates.
Direct and Total Intervention on Consumer Prices.

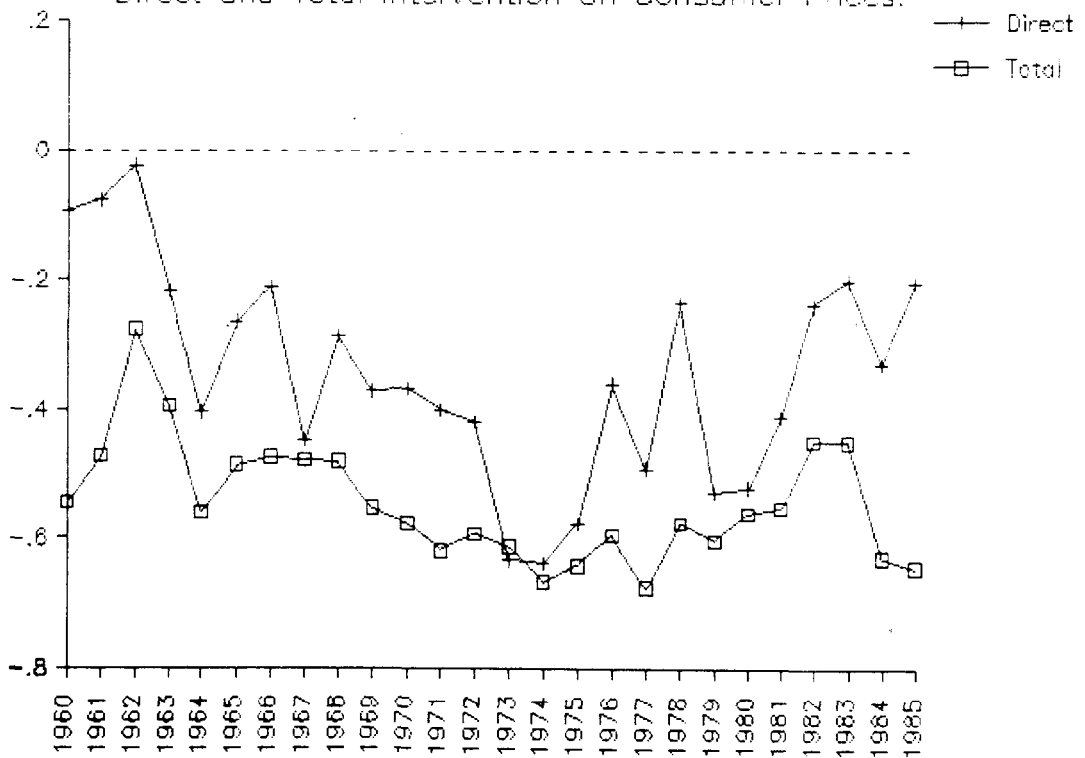


Figure 3.13. RICE: Nominal Protection Rates.

Direct and Total Intervention on Producer Prices.

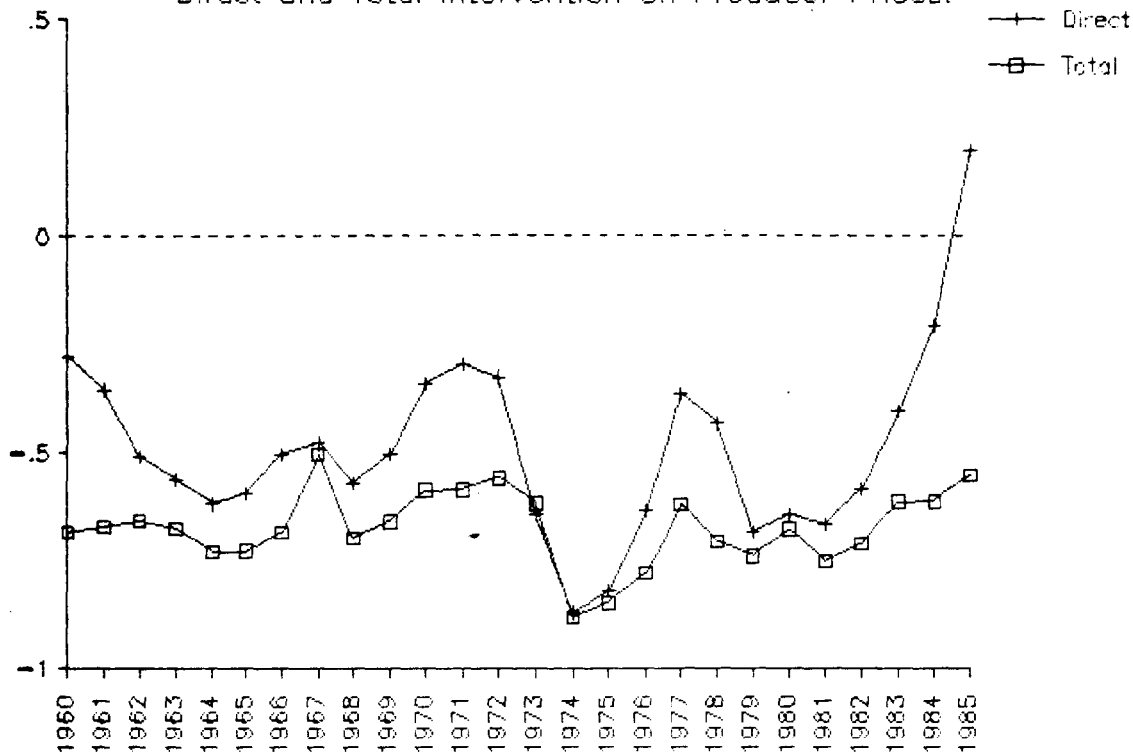
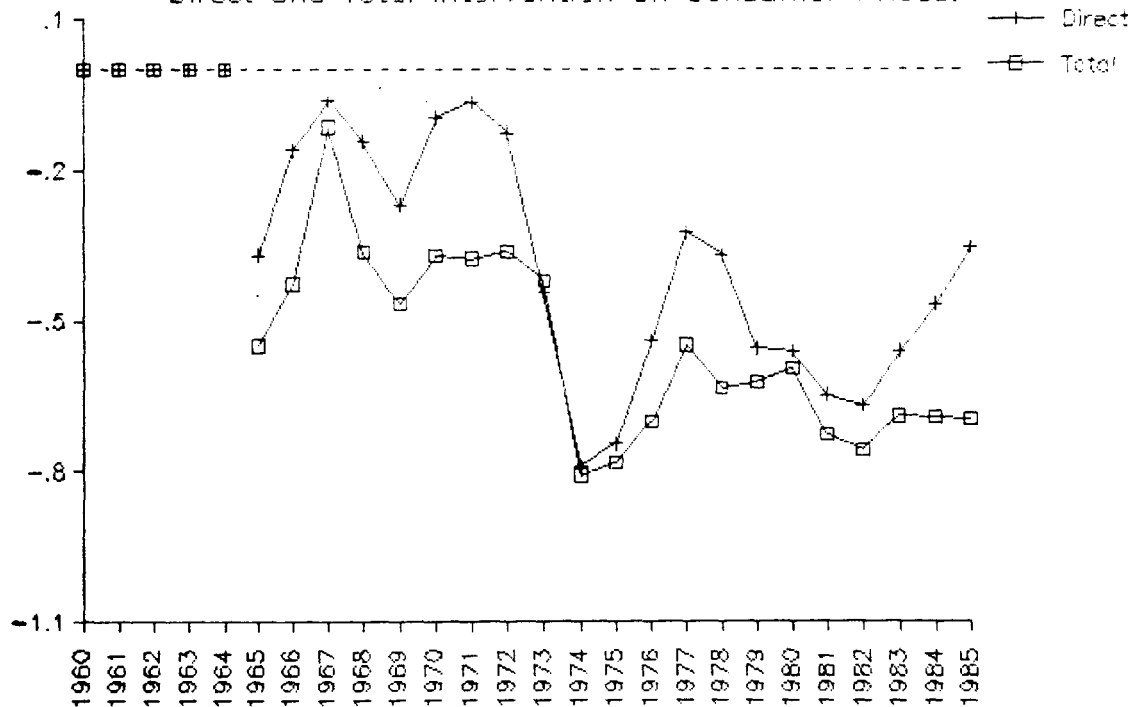


Figure 3.14. RICE: Nominal Protection Rates.

Direct and Total Intervention on Consumer Prices.



Data for 1960-64 not available.

- 108 - Figure 3.15. WHEAT: Nominal Protection Rates.

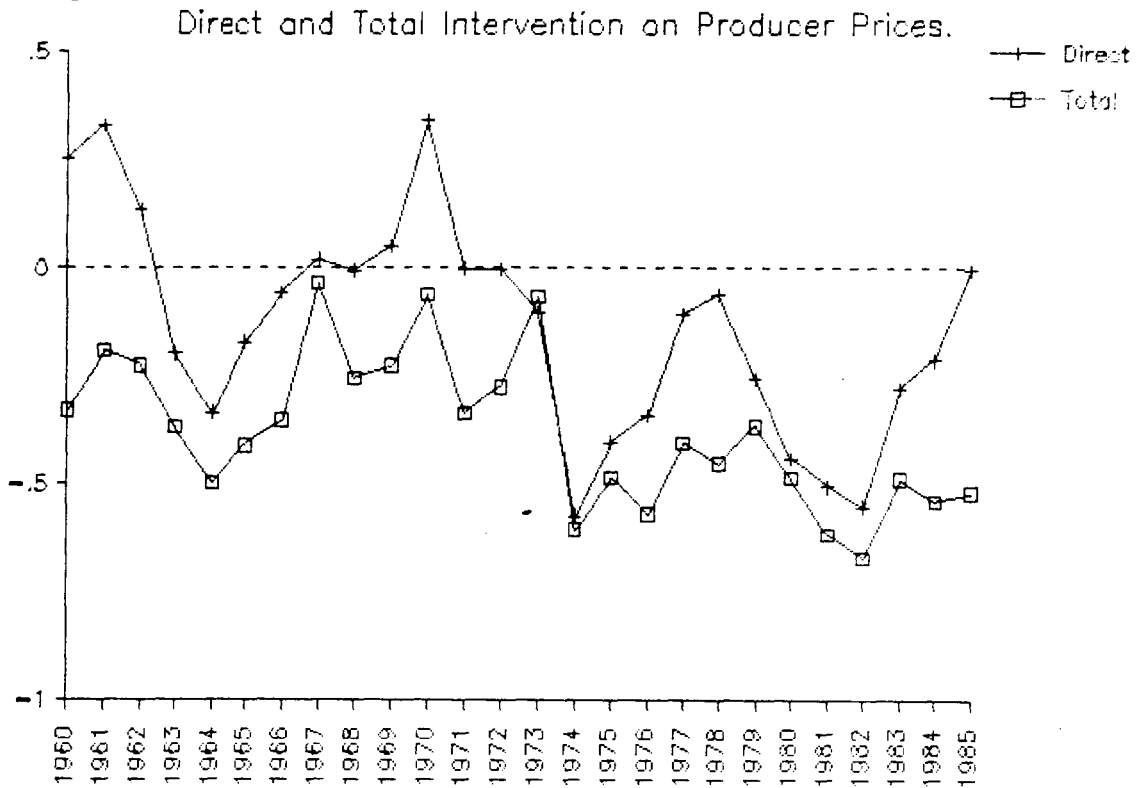
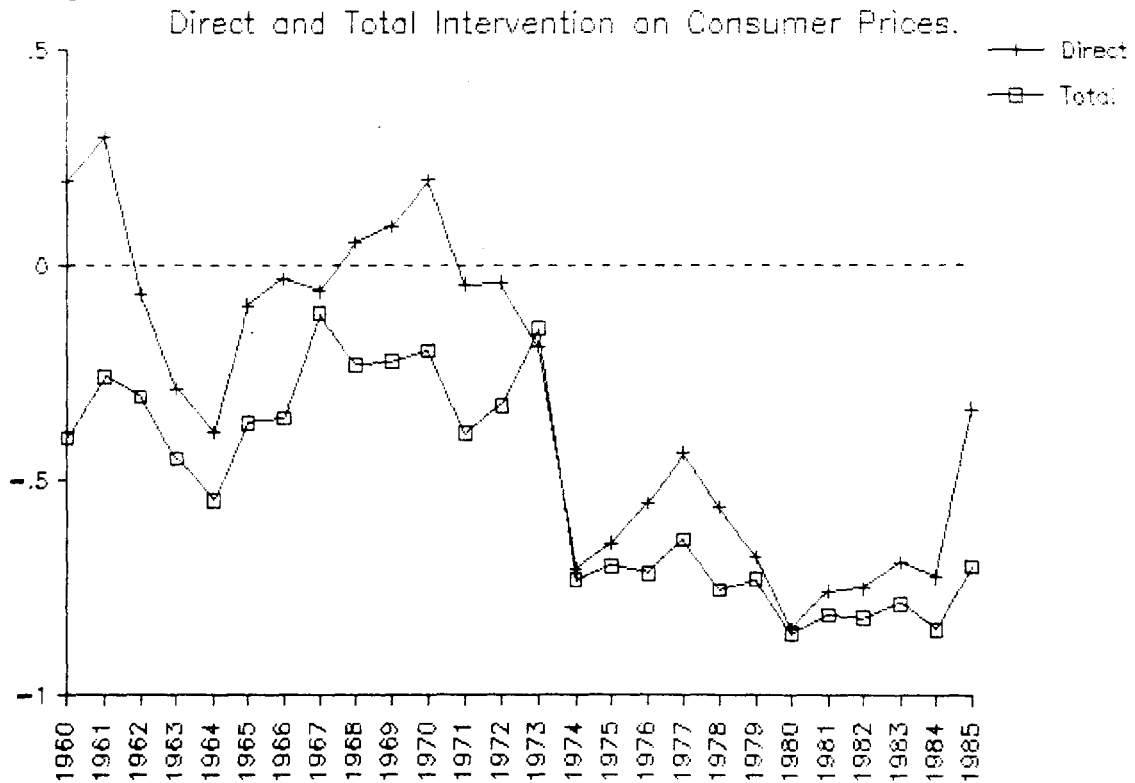


Figure 3.16. WHEAT: Nominal Protection Rates.



- 109 - Figure 3.17. MAIZE: Nominal Protection Rates.
Direct and Total Intervention on Producer Prices.

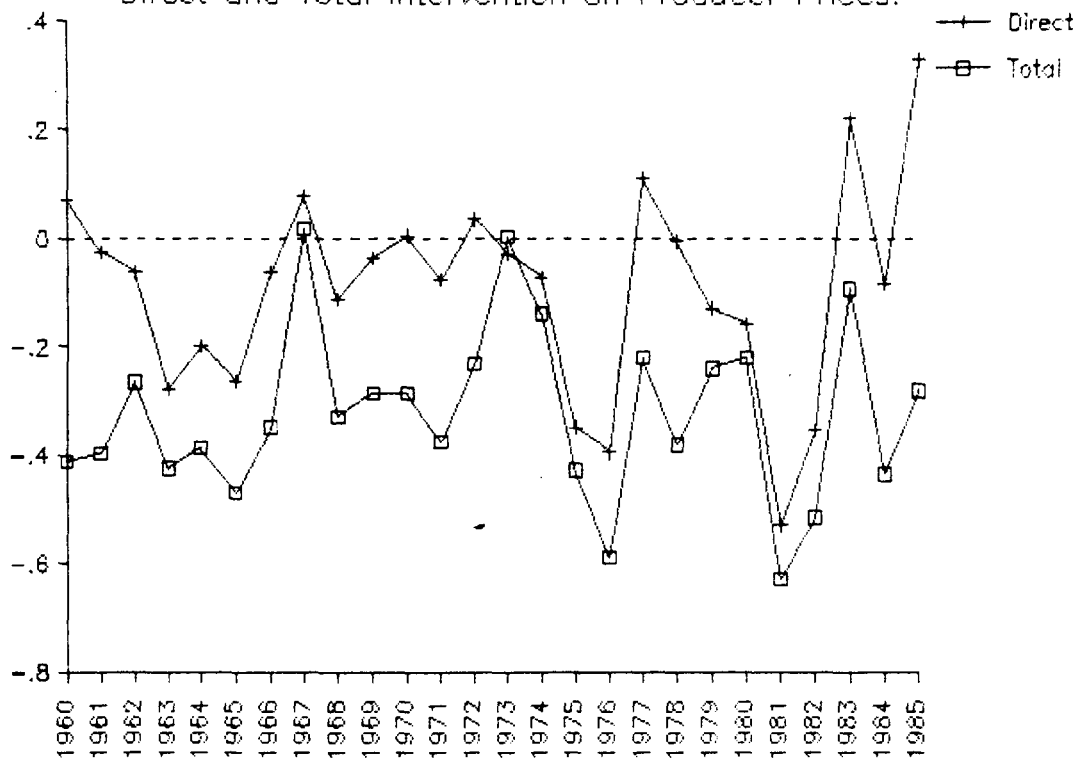
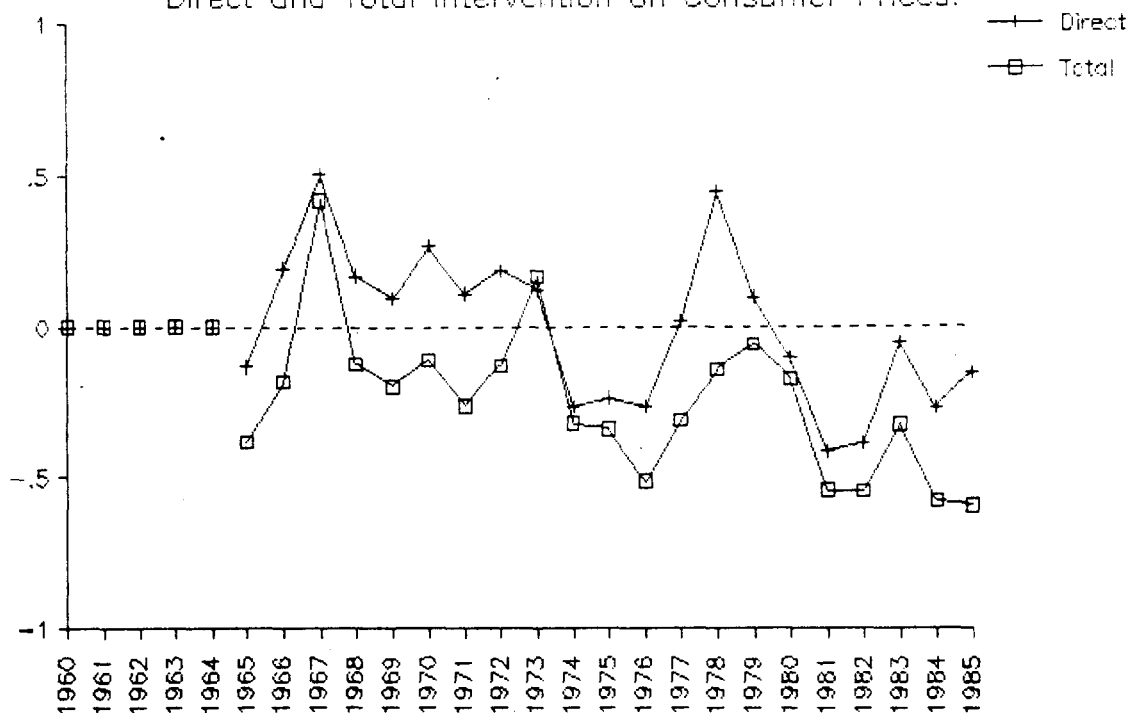


Figure 3.18. MAIZE: Nominal Protection Rates.
Direct and Total Intervention on Consumer Prices.



Data for 1960-64 not available.

Figure 3.19. SUGARCANE: Nominal Protection Rates.
Direct and Total Intervention on Producer Prices.

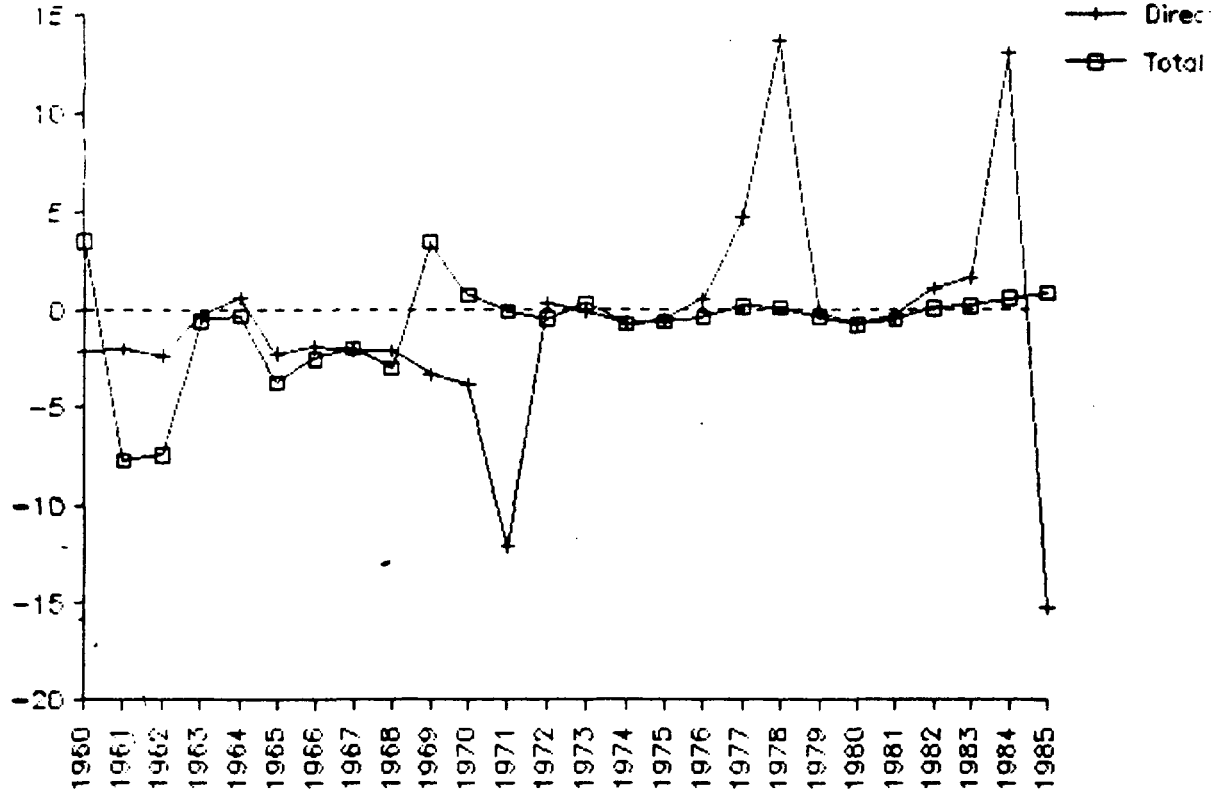
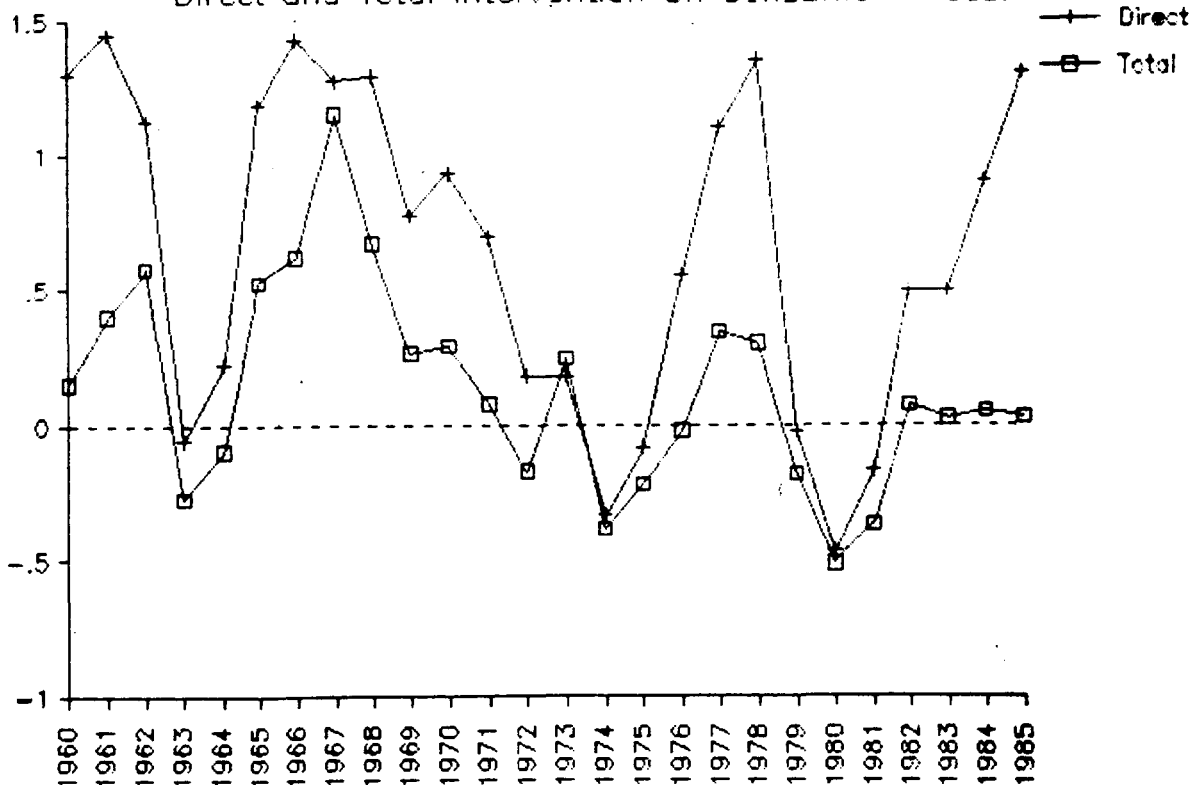


Figure 3.20. SUGAR: Nominal Protection Rates.
Direct and Total Intervention on Consumer Prices.



CHAPTER 4

EFFECTS OF PRICE INTERVENTION ON AGRICULTURAL OUTPUT

What have been the effects of direct and indirect price intervention on levels of agricultural output? The answer to this question clearly depends on the response of agricultural supply, but, unfortunately, the econometric evidence on supply parameters in Egypt does not greatly clarify the issue.¹ Estimates of supply elasticities vary considerably because of differences in the methodologies of studies and because of the complexity of Egyptian agriculture. Most estimates are on the low end of the spectrum in comparison with other countries (Ghatak and Ingersent 1984, pp. 203-213).

The low elasticities of supply in Egypt may be explained in several ways. In the short run, the typical farmer--growing the traditional cotton-based rotation and using animal power--faces restrictions both on the input and on the output side that are determined by agronomic and policy considerations. Farmers' ability to reallocate labor among different crops has been reduced by the system of government controls on inputs. Relative prices and revenues of alternative crop rotations appear to influence planting decisions over the long run. They also appear to influence

¹See the review of econometric evidence in Appendix I.

investment decisions and decisions concerning labor allocation.

Farmers' input choices are strictly constrained by government agricultural policy. The cropping pattern in every village is planned on the basis of government-allocated and government-subsidized inputs distributed by the cooperative system. Government agencies allocate and apply pesticides for cotton. The government determines fertilizer quotas for each crop, and farmers can divert fertilizer to other crops only if they are willing to risk paying a penalty or producing below-quota amounts of procured crops (Abdou, Gardner and Green 1986). Growers of cash crops such as vegetables can purchase additional quantities of imported fertilizer during some years, but only well-off farmers can afford to do this.

The government controls irrigation and supplies water free and in sufficient quantities. Land rents are fixed by law, although an active "extralegal" market for seasonal rental of land does exist. The prices of other traded inputs, such as tractors and machinery, are influenced by government policy. Because farmers use animals for field work and transport, for milk and dairy, and for meat, they must allocate some land every year to forage crops (e.g., berseem, which is also an important nitrogen-fixer in the rotation, and maize). The prices of forage crops are not controlled, and this influences farmers' decisions to plant. Thus, the only variable input in the short run is labor, which can be drawn from the family farm or hired during peak season.

Farmers' output choices are limited by government policies and by crop rotation constraints. Farmers have procurement obligations

for cotton, rice, sugarcane, wheat, and minor crops. The yearly planning of the cropping pattern also influences farmers' planting decisions, although, historically, observers have seen a systematic gap between allocated area and actual planted area for major crops. The agronomic necessities of crop rotation impose important constraints on planting decisions.² For example, wheat takes about seven months from sowing to harvesting, so it cannot be followed in the rotation by cotton, which also takes seven months.

Constraints on cropping patterns apply regardless of farm size, according to the 1976 Farm Management Survey. Regional differences may be more important in cropping pattern variations than are differences in farm size.³

A MODEL OF OUTPUT EFFECTS OF PRICE INTERVENTION

To examine the output levels that could have been achieved in the absence of direct and indirect intervention affecting agricultural prices, we use a simple Nerlovian model estimating

²See Appendix H for a more detailed description of cropping practices.

³In general, one would expect large farms to produce relatively more noncontrolled crops and small farms to produce more controlled crops, because of the latter's limited access to credit, to investment funds for tree crops, to imported fertilizer, and to hired labor. This is not empirically verified, however. For further details, see chapter 5.

short- and long-run output effects (Nerlove 1958).⁴ The short-run supply response effect is mainly caused by farmers' reallocation of variable inputs (mainly labor) in response to output price changes. The long-run effect is cumulative and is caused by the effect of price changes on output of farmers' reallocation of factors that are fixed in the short run but mobile over a longer period. The long-run effect of price policy changes, it should be noted, is the sum of the short-run response and the impact effect (with declining weights in the lags) via reallocation of inputs (Mundlak 1985, p. 11).

Now, let us define the following variables:

$dx_{i,t}$	=	change in output of crop i in period T
a	=	coefficient of adjustment
v_i	=	share of value added in price of crop i (at domestic values)
b_i	=	long run own-price elasticity
v_j	=	share of value added in price of competing crop j (at domestic values)
c_j	=	long-run cross-price elasticity
$ERP_{j,t-1}$	=	effective rate of protection for crop j in period t-1.

The variable $dx_{i,t}$ represents the change in output of crop i in period t resulting from a change in the previous period's value added of crop j (for all j, including i) relative to an index of nonagricultural value added, multiplied by v_j . Measures of

⁴We have also referred to an internal project memorandum, M. Schiff and A. Valdes, "Dynamic Output Effects of Price Policies," World Bank, Agricultural Pricing Policy Project Memorandum no. 19 (Mimeo), April 1986.

intervention on values added (effective rates of protection) are lagged one year, because price changes in Egypt are announced after planting each year. Because estimated elasticities of output with respect to prices of inputs are not available for Egypt, we use elasticities with respect to output prices, premultiplied by the ratio of value added to price of output.

In the short run, output is assumed given ($dx_{i,t-1} = 0$), so the effect on output is

$$dx_{i,t} = a (v_i b_i ERP_{i,t-1} + \sum_j v_j c_j ERP_{j,t-1}) \quad (1)$$

where the relevant price variable for direct effects is

$$ERP_D = \frac{VA_A/VA_{NA} - VA'_A/VA_{NA}}{VA'_A/VA_{NA}} = \frac{VA_A - VA'_A}{VA'_A} \quad (2)$$

and for total effects is

$$ERP_T = \frac{VA_A/VA_{NA} - VA^*_A/VA_{NA}}{VA^*_A/VA_{NA}} = \frac{VA_A - VA^*_A}{VA^*_A} \quad (3)$$

We may ask what the cumulative effect would be on output in the long run of setting prices at their nonintervention level at $t=1$, the first year of the sample period. We are measuring here the dynamic path that output would have followed if intervention had been removed at $t=1$. Because price changes are announced after planting, there would be no effect on output at $t=1$. At $t=2$, the cumulative effect would be the same as the short-run effect. At $t=3$, the change in output would depend both on changes in prices

(ERP) at t=2 and on the change in output (dX) at t=2. At t=4, the change in output would depend both on changes in prices (ERP) at t=3 and on the cumulative change in output (dX) at t=3. It can be shown that the cumulative effect on output over time is given by Equation 4 below.

$$dX_{i,t} = a (v_i b_i ERP_{i,t-1} + \sum_j v_j c_j ERP_{j,t-1}) + (1-a) dX_{i,t-1} \quad (4)$$

where the relevant variable for direct effects is

$$ERP_D = \frac{VA_A/VA_{NA} - VA'_A/VA_{NA}}{VA'_A/VA_{NA}} = \frac{VA_A - VA'_A}{VA'_A}, \quad (5) \quad \text{(same as 2)}$$

and for total effects is

$$ERP_T = \frac{VA_A/VA_{NA} - (E^*/E_0) VA'_A/VA^*_{NA}}{(E^*/E_0) VA'_A/VA^*_{NA}} \quad (6)$$

where

$$VA^*_{NA} = a E^*/E_0 \frac{VA_{NA}(T)}{(1 + t_m)} + (1-a) VA_{NA}(NT)$$

Equations 1 and 4 have been estimated for the period 1965-85. The calculations require data on the ratio of value added to price (v_j), on production levels achieved at distorted prices, and on effective rates of protection.⁵ The equations are estimated using

⁵These data can be found in chapter 3 and in Appendixes C, E, and F. The ratio of value added to price used for the calculations is computed at prevailing domestic prices and would considerably increase (up to an average of .90 to .95) if computed at border

the elasticities shown in Table 4-1.

The impact of price changes on output in the long run via its impact on investment in fixed factors is taken into account in our estimation to the extent that a trend variable was included in the model estimated by Esfahani (1984) on which elasticities are based.

The results for the effects of direct price intervention on output in the short run are shown in Table 4-2. The long-run (cumulative) effects are shown in Table 4-3. The effects of total price intervention on output in the short run are shown in Table 4-4, and the long-run effects are shown in Table 4-5.

Results are shown in percentage of actual output of crop *i* and in physical quantities. A negative sign indicates that actual output levels are *x* percent (or *x* thousand tons) below what they would have been in the absence of intervention. For example, as a result of intervention on output and input prices for cotton, rice, wheat and maize, the output of cotton in 1976 was 20.94 percent lower than it would have been without direct controls in the short run, and 28.79 percent lower in the long run. This amounts to a loss of 227,020 and 312,070 tons of cotton, respectively.

prices.

Table 4-1
LONG-RUN SUPPLY ELASTICITIES AND
COEFFICIENTS OF ADJUSTMENT

		Change in Price				
		COTTON	RICE	WHEAT	MAIZE	SUGARCANE
Change in Supply	COTTON	0.377*	-0.212**	-0.084*	-0.131**	0
	RICE	-0.314**	0.271*	0.071	0.082	0
	WHEAT	-0.307*	0.176	0.481**	0.261**	0
	MAIZE	-0.343**	0.145	0.186**	0.238**	0
	SUGARCANE	0	0	0	0	0.11
		Coefficient of Adjustment				
		0.83	0.84	0.75	1.00	0.14

* Significant at 0.05 level

** Significant at 0.10 level

SOURCE: Appendix I.

Table 4.2.

EFFECTS OF DIRECT PRICE INTERVENTIONS ON OUTPUT IN THE SHORT RUN.

Year	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)
1965	4.65%	69.74	-7.47%	-133.54	-15.33%	-195.05	-8.47%	-181.26	1.11%	52.46
1966	-1.16%	-15.01	-2.43%	-40.84	-7.50%	-109.86	-1.22%	-28.97	.00%	.00
1967	-3.97%	-47.99	-.13%	-2.99	-.02%	-.27	5.03%	108.75	.00%	.00
1968	-22.11%	-267.53	15.36%	397.22	17.07%	259.10	26.95%	618.95	.00%	.00
1969	-1.70%	-25.21	-1.47%	-37.57	-1.83%	-23.16	1.66%	39.34	.00%	.00
1970	-5.93%	-83.27	1.44%	37.61	3.05%	46.22	7.77%	185.88	.00%	.00
1971	-8.87%	-125.79	3.95%	100.10	14.48%	250.34	14.42%	337.74	.00%	.00
1972	-9.43%	-134.05	5.59%	140.21	3.72%	60.14	9.86%	238.33	.00%	.00
1973	-6.44%	-88.08	3.33%	75.65	2.79%	51.23	7.43%	186.31	.31%	22.60
1974	-45.92%	-552.91	36.59%	822.28	29.88%	563.01	49.99%	1319.86	-.16%	-11.10
1975	-38.10%	-404.29	28.40%	688.03	13.35%	271.31	38.58%	1072.90	-.98%	-77.79
1976	-20.94%	-227.02	12.86%	295.78	3.48%	68.23	19.92%	606.95	-.74%	-62.10
1977	1.65%	20.74	-5.87%	-133.39	-12.00%	-203.72	-4.88%	-132.95	1.42%	119.36
1978	-23.24%	-320.91	14.90%	350.29	22.95%	443.58	32.50%	1012.89	.00%	.00
1979	-6.23%	-92.41	3.30%	82.84	9.66%	179.21	10.85%	318.86	.00%	.00
1980	-24.08%	-339.09	17.55%	418.32	11.59%	208.17	25.61%	827.44	-.18%	-15.90
1981	-18.44%	-244.50	11.76%	262.87	2.78%	53.96	18.24%	603.12	-.98%	-86.07
1982	-1.15%	-13.93	-1.79%	-43.75	-12.65%	-255.18	-4.46%	-149.26	-.35%	-30.72
1983	6.86%	73.33	-8.90%	-217.24	-21.13%	-421.67	-13.30%	-466.83	4.53%	381.50
1984	.78%	8.16	-5.09%	-113.80	-3.94%	-71.58	2.52%	93.31	.00%	.00
1985	-5.86%	-67.69	2.23%	51.61	-2.14%	-40.00	5.45%	201.65	.00%	.00

NOTES: (1) Price elasticities from Table 4.1.

(2) Where sugarcane value added is negative, effective rates of protection here have been set to zero.

Table 4.3.

EFFECTS OF DIRECT PRICE INTERVENTIONS ON OUTPUT IN THE LONG RUN.

Year	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)
1965	4.65%	69.74	-7.47%	-133.54	-15.33%	-195.05	-8.47%	-181.26	1.11%	52.46
1966	-.37%	-4.83	-3.63%	-60.90	-11.33%	-166.02	-1.22%	-28.97	.95%	49.42
1967	-4.04%	-48.76	-.71%	-16.21	-2.85%	-36.84	5.03%	108.75	.82%	43.06
1968	-22.80%	-275.83	15.25%	394.28	16.36%	248.27	26.95%	618.95	.70%	42.75
1969	-5.58%	-82.57	.97%	24.80	2.26%	28.72	1.66%	39.34	.60%	41.57
1970	-6.88%	-96.59	1.60%	41.66	3.61%	54.80	7.77%	185.88	.52%	36.10
1971	-10.04%	-142.37	4.21%	106.59	15.38%	265.96	14.42%	337.74	.45%	33.52
1972	-11.13%	-158.32	6.27%	157.08	7.57%	122.28	9.86%	238.33	.38%	29.65
1973	-8.33%	-113.97	4.33%	98.44	4.68%	85.98	7.43%	186.31	.64%	46.90
1974	-47.34%	-569.96	37.29%	837.85	31.05%	585.05	49.99%	1319.86	.39%	27.42
1975	-46.15%	-489.67	34.36%	832.58	21.11%	429.14	38.58%	1072.90	-.65%	-51.23
1976	-28.79%	-312.07	18.36%	422.23	8.76%	171.66	19.92%	606.95	-1.29%	-109.20
1977	-3.25%	-40.93	-2.93%	-66.66	-9.82%	-166.57	-4.88%	-132.95	.31%	26.20
1978	-23.79%	-328.54	14.43%	339.26	20.49%	396.15	32.50%	1012.89	.27%	22.31
1979	-10.27%	-152.43	5.61%	140.82	14.78%	274.30	10.85%	318.86	.23%	20.33
1980	-25.83%	-363.68	18.44%	439.71	15.29%	274.53	25.61%	827.44	.01%	1.24
1981	-22.83%	-302.73	14.71%	328.85	6.61%	128.02	18.24%	603.12	-.97%	-84.98
1982	-5.03%	-60.93	.56%	13.69	-11.00%	-221.87	-4.46%	-149.26	-1.18%	-103.26
1983	6.00%	64.18	-8.81%	-215.05	-23.88%	-476.56	-13.30%	-466.83	3.51%	295.91
1984	1.80%	18.87	-6.50%	-145.30	-9.91%	-179.92	2.52%	93.31	3.02%	253.64
1985	-5.55%	-64.15	1.19%	27.58	-4.61%	-86.39	5.45%	201.65	2.60%	237.46

NOTES: (1) Price elasticities from Table 4.1.

(2) Where sugarcane value added is negative, effective rates of protection here have been set to zero.

Table 4.4.

EFFECTS OF TOTAL PRICE INTERVENTIONS ON OUTPUT IN THE SHORT RUN.

Year	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)
1965	6.35%	95.35	-9.53%	-170.34	-20.40%	-259.52	-11.99%	-256.74	-.38%	-17.90
1966	4.47%	57.67	-7.76%	-130.37	-16.20%	-237.32	-9.33%	-221.62	-2.62%	-136.20
1967	1.20%	14.50	-5.10%	-116.14	-9.63%	-124.34	-3.26%	-70.47	-2.18%	-114.85
1968	-5.41%	-65.40	.98%	25.42	-1.03%	-15.66	6.84%	157.00	-1.93%	-117.13
1969	1.54%	22.77	-4.97%	-126.98	-8.93%	-113.36	-3.85%	-91.09	-2.42%	-166.27
1970	-.92%	-12.97	-2.77%	-72.14	-6.43%	-97.42	-.69%	-16.46	-25.86%	-1796.00
1971	-4.12%	-58.40	.40%	10.14	1.85%	32.01	4.60%	107.75	2.01%	150.90
1972	-3.06%	-43.47	-.31%	-7.88	-8.23%	-133.05	-.47%	-11.38	-.08%	-6.53
1973	-2.29%	-31.31	-1.07%	-24.34	-6.68%	-122.77	.25%	6.23	-.69%	-50.71
1974	-7.47%	-89.94	2.25%	50.64	4.15%	78.28	10.39%	274.40	.48%	33.46
1975	-.91%	-9.67	-4.56%	-110.44	-15.54%	-315.89	-2.19%	-60.78	-1.02%	-80.61
1976	.38%	4.07	-4.90%	-112.68	-15.49%	-303.69	-5.37%	-163.48	-.89%	-75.03
1977	3.11%	39.14	-6.71%	-152.36	-20.68%	-350.94	-10.56%	-287.72	-.51%	-42.62
1978	-7.68%	-106.13	2.47%	57.96	-2.26%	-43.75	7.79%	242.81	.89%	73.90
1979	-2.20%	-32.62	-2.14%	-53.65	-8.03%	-149.12	.17%	5.09	.82%	72.17
1980	-3.44%	-48.43	-1.44%	-34.22	-7.00%	-125.80	2.15%	69.48	-.44%	-38.19
1981	-2.20%	-29.17	-2.16%	-48.36	-10.76%	-208.59	-.33%	-10.99	-1.00%	-88.00
1982	4.37%	52.92	-7.40%	-180.65	-19.67%	-396.83	-11.52%	-385.52	-.61%	-53.03
1983	6.09%	65.11	-8.79%	-214.69	-23.56%	-470.16	-13.97%	-490.03	.36%	30.07
1984	-1.11%	-11.69	-2.88%	-64.43	-10.17%	-184.65	-.44%	-16.37	.62%	52.18
1985	-1.49%	-17.17	-2.25%	-52.02	-16.47%	-308.33	-4.76%	-176.04	2.44%	223.45

NOTES: (1) Price elasticities from Table 4.1.

(2) Where sugarcane value added is negative, effective rates of protection have been set to zero.

Table 4.5.

EFFECTS OF TOTAL PRICE INTERVENTIONS ON OUTPUT IN THE LONG RUN.

Year	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)	(percent)	(000 tons)
1965	5.74%	86.17	-9.09%	-162.56	-23.15%	-294.47	-13.03%	-278.94	-.52%	-24.63
1966	5.56%	71.66	-9.40%	-157.79	-24.60%	-360.35	-10.68%	-253.79	-.45%	-23.21
1967	2.49%	30.11	-7.00%	-159.46	-19.04%	-245.85	-5.14%	-111.16	-.38%	-20.22
1968	-4.03%	-48.75	-1.10%	-28.34	-9.80%	-148.76	4.02%	92.39	-.33%	-20.08
1969	.78%	11.54	-5.14%	-131.39	-14.03%	-178.01	-5.13%	-121.48	-.28%	-19.52
1970	-.43%	-6.10	-3.95%	-102.95	-13.22%	-200.38	-2.58%	-61.86	-.24%	-16.95
1971	-3.67%	-51.98	-.76%	-19.19	-4.55%	-78.73	2.78%	65.14	1.53%	114.63
1972	-3.32%	-47.18	-.87%	-21.72	-12.04%	-194.51	-2.02%	-48.81	1.11%	85.36
1973	-2.60%	-35.62	-1.47%	-33.52	-11.58%	-212.81	-.89%	-22.37	.23%	16.54
1974	-7.34%	-88.32	1.54%	34.68	-1.18%	-22.31	8.67%	228.79	.56%	39.01
1975	-2.19%	-23.26	-4.30%	-104.08	-15.63%	-317.74	-2.02%	-56.29	-.54%	-42.59
1976	.02%	.17	-5.62%	-129.31	-18.31%	-358.96	-4.75%	-144.67	-1.32%	-111.69
1977	3.10%	39.05	-7.60%	-172.66	-25.31%	-429.44	-10.58%	-288.19	-1.65%	-138.20
1978	-6.95%	-96.01	1.06%	24.90	-9.33%	-180.30	7.24%	225.71	-.59%	-48.63
1979	-3.32%	-49.25	-2.05%	-51.46	-11.82%	-219.37	-.65%	-19.15	.16%	14.46
1980	-3.99%	-56.17	-1.77%	-42.31	-10.07%	-180.95	2.07%	67.01	-.30%	-26.26
1981	-2.88%	-38.16	-2.45%	-54.71	-13.28%	-257.40	-.33%	-10.99	-1.26%	-111.08
1982	3.86%	46.73	-7.78%	-189.82	-23.02%	-464.36	-11.52%	-385.46	-1.69%	-148.04
1983	6.67%	71.26	-9.98%	-243.64	-29.37%	-586.14	-13.94%	-489.29	-1.12%	-94.19
1984	.02%	.25	-4.49%	-100.31	-17.83%	-323.69	-.65%	-24.03	-.37%	-31.22
1985	-1.47%	-17.05	-2.98%	-68.87	-20.99%	-392.97	-4.80%	-177.41	2.11%	192.68

NOTES: (1) Price elasticities from Table 4.1.

(2) Where sugarcane value added is negative, effective rates of protection have been set to zero.

Implications of Model Results. The results obtained depend on the period of adjustment, on the value of the elasticities, and on the protection rates. Equations 1 and 4 are valid for small changes only. Therefore, a significant margin of error can be expected when price changes are large.

As expected, there are major differences in output effects depending on the period of adjustment considered. The cumulative impact of price changes is distributed over several years, with declining effect over time. Crops with a high speed of adjustment of output (i.e., with a small difference between short-run and long-run elasticities) exhibit a smaller cumulative impact than crops with slower adjustment. The differences between short-run and long-run elasticities of cotton and rice are not very large, so there are no significant differences between short-run and cumulative effects. The difference is more significant in the case of wheat. In the case of maize, there is no lagged effect on output (coefficient of adjustment = 1). The differences between the two sets of results are attributable entirely to the different value added indices used. Sugarcane adjusts very slowly, but the lagged effect is not easy to discern because of the data. For most years during the period under study, value added at border prices is negative, so the effective rates of protection for those years have no meaning. For those years, the output effects have been set to zero in the calculations.

In most cases, output effects are large. Results are determined by the value of the elasticities and by the level of taxation of the crop. When the own-price elasticity is high, large differences

between value added measured at domestic and at world prices have often resulted in large negative output effects.

Cross-price elasticities have a significant influence on output effects. But not all estimated values in the supply elasticities matrix of Table 4-1 are statistically significant. The pairwise cross-elasticities between rice, wheat, and maize are not statistically significant. Those for cotton are significant. Those for sugarcane are zero.⁶ To separate the influence of competing crops from that of the crop's own-price, Appendix J presents a different version of the computations using only own-price elasticities of supply. The difference between results in this chapter and those in Appendix J is caused by the influence of competing crops' prices on output, which is left out in Appendix J. This comparison only makes sense for the short-run case because in the short run only direct price intervention is included in the relative value added measure. In the cumulative case, both direct and indirect intervention is at work, so one cannot directly compare results with and without cross-price elasticities.

The influence of prices of competing crops on output is particularly striking in the case of cotton. Removing all price intervention on the five crops would increase cotton output in the short run by an average of 15.3 percent in 1964-72, 28.8 percent in 1973-79 and 17.6 percent in 1980-85, but it actually would result

⁶Sugarcane is a perennial crop that does not compete with any other. Therefore, cross-price elasticities are zero.

in much lower increases-- 6.07, 19.89 and 6.98 percent respectively-- if the influence of cereals, with which cotton competes for resources, was taken into account.

Exchange rate overvaluation and trade policies have depressed the output of all crops. The change in output resulting from the total price intervention on the own price of all crops is negative (see Table J-3) because rates of effective protection are negative for all crops (except for maize in some years), implying net taxation of the crop.⁷

Finally, it should be mentioned that our results, to the extent that they are an indication of the impact of price intervention on agricultural output, are probably underestimates because they leave out the influence of technological change in the long run. It is likely that a more favorable price environment would have accelerated the pace of technological change, which, in turn, would have increased output above the levels measured by a Nerlovian model.

⁷The own-price elasticities of wheat and cotton used here are very close to those reported in Scobie (1981) for the area response of those crops.

Table 4-6
SHORT RUN OUTPUT EFFECTS

(period averages, in percentages)

	Period I 1964-72	Period II 1973-79	Period III 1980-85
EFFECT OF DIRECT PRICE INTERVENTIONS.			
Cotton	-6.07%	-19.89%	-6.98%
Rice	1.86%	13.36%	2.63%
Wheat	1.70%	10.00%	-4.25%
Maize	7.00%	22.10%	5.68%
Sugarcane	--	-.02%	.50%

EFFECT OF TOTAL PRICE INTERVENTIONS.

Cotton	.01%	-2.44%	.37%
Rice	-3.63%	-2.10%	-4.15%
Wheat	.63%	-9.22%	-14.60%
Maize	2.27%	.07%	-4.80%
Sugarcane	-4.18%	-.13%	.23%

Source: Tables 4-2 and 4-4.

Final Comments. The annual average growth rate of the agricultural sector was 2.6 percent for the 1964-70 period. It increased to 3.5 percent during the period 1970-80, but declined to 2.6 percent in 1980-83 and became negative, at -0.2 percent, in 1983-84.⁸ The output of controlled crops has not responded well to farmgate price increases (indicated in Table 2-5) that followed the

⁸Index numbers are based on Fisher's index, the geometric mean of Laspeyre's and Paasche's indices. See World Bank (1986a).

change in policy after 1974.⁹ The agricultural output of controlled crops has stagnated, especially after 1980-81, because of a combination of yield gains and deterioration in profitability. The comparison between the evolution of production and yields of controlled and noncontrolled crops, shown in Table 4-7, is particularly revealing.

Trends in output and cropping pattern seem to reflect changes in relative profitability. In recent years (1980-85), the relative profitability of major controlled crops (cotton, wheat and sugarcane) has deteriorated, that of maize and rice has remained unchanged, and that of noncontrolled crops such as berseem, onions, fruits, and vegetables has improved.¹⁰

Production of cotton, rice, and sugarcane was lower than it was in 1979-80. Wheat was below its level of 1977-78. Maize production has continued to increase.

Cotton production, which had increased substantially after 1978 to a peak of 539,000 tons in 1980-81, declined to only 398,000 tons in 1983-84. The fall in output was caused by yield and area decreases and reflected a rapid rise in costs of production, particularly labor, relative to procurement prices. In response,

⁹Hindy (1975) presents the first official statement known to us indicating that the role of prices in agriculture should be reassessed. Another official declaration, issued seven years later (Wally, 1982), points out that price policy had a negative impact on growth and producer welfare in the past.

¹⁰The information in this section is based on World Bank (1986a), pp. 19-20.

TABLE 4.7.

INDICES OF AGRICULTURAL PRODUCTION AND YIELD, 1974-1985.
(1974/75 = 100)

Agricultural Year
Ending October 31. 1975/76 1976/77 1977/78 1978/79 1979/80 1980/81 1981/82 1982/83 1983/84 1984/85

PRODUCTION INDICES

Crops analyzed in this study:

Cotton (lint)	86.62	89.80	90.48	109.75	119.95	113.15	111.11	90.70	90.48	99.32
Rice (paddy)	94.92	93.77	97.03	103.63	98.39	92.28	100.74	100.78	92.28	95.34
Wheat	96.41	83.47	95.08	91.29	88.34	95.33	99.21	98.18	89.28	92.08
Maize 1/	109.56	97.95	112.08	105.65	116.18	118.99	120.35	126.18	132.97	135.05
Sugarcane	106.88	106.04	104.99	111.25	109.06	111.43	110.71	106.61	106.25	N/A

Other Crops:

Beans	108.55	115.38	98.72	100.85	91.03	88.89	111.11	126.07	115.81	129.06
Onions 2/	104.80	114.85	97.38	68.56	144.54	143.23	129.26	97.82	69.87	82.53
Sorghum	97.94	83.61	87.87	81.94	82.84	84.26	76.90	80.26	72.39	69.03
Groundnuts	100.00	107.14	92.86	96.43	92.86	92.86	85.71	71.43	75.00	82.14
Citrus Fruits	87.76	78.68	97.73	120.04	105.33	101.97	147.09	128.04	138.89	138.10
Dates	100.48	111.08	90.84	97.83	107.47	94.22	106.02	113.25	114.22	122.65
Other fruits	110.16	100.63	112.03	117.34	120.00	132.81	145.63	154.69	159.69	162.81
Potatoes	124.03	140.28	107.22	141.53	168.61	165.97	164.44	152.08	165.14	205.28
Other vegetables	103.95	99.84	109.60	116.47	116.33	117.74	120.36	124.45	125.91	143.60

YIELD INDICES

Crops analyzed in this study:

Cotton (lint)	93.42	104.28	96.71	133.22	139.80	139.47	140.13	131.91	135.55	133.22
Rice (paddy)	92.61	95.22	99.13	104.78	106.52	101.74	103.48	104.78	98.70	108.70
Wheat	95.89	96.58	95.89	91.10	92.47	95.21	100.68	103.42	105.48	108.22
Maize 1/	105.92	101.32	107.89	102.63	111.84	113.16	113.82	118.42	123.03	126.97
Sugarcane	96.41	92.82	92.40	97.65	94.48	96.93	95.08	93.09	93.09	N/A

Other Crops:

Beans	103.16	96.84	102.11	100.00	91.58	91.58	100.00	107.37	105.26	115.79
Onions 2/	90.00	82.67	89.42	78.72	98.72	97.79	95.58	100.23	97.91	100.81
Sorghum	101.27	100.63	99.37	98.73	99.37	100.00	98.73	100.00	97.47	101.90
Groundnuts	101.15	95.40	95.40	100.00	103.45	103.45	94.25	86.21	102.30	94.25
Potatoes	95.89	90.41	82.19	98.63	99.45	103.01	106.03	108.63	110.00	114.25

1/ Includes Nili Maize.

2/ Winter (export) crop only.

SOURCE: World Bank, Report no.6195-EGT (1986).

the government raised cotton prices by about 28 percent in late 1984. Area planted in 1984-85 was up by about 10 percent and production rose by 1,000 kantars.

Cereal production had shown a positive response to the government's renewed efforts to improve varieties and to improve producer incentives in the early 1980s, but in 1983-84 it fell. Wheat production dropped from over 2 million tons in 1981-82 to 1.8 million tons in 1983-84. In response, the government raised the average wheat procurement price by about 20 percent in 1984 and wheat output reached 1.9 million tons in 1984-85. Wheat consumption, by contrast, is increasing by about 5 percent annually, and the official subsidy on wheat and wheat products is estimated to have been at least US\$1.2 billion in 1983.

Incentives to rice producers have not lagged as far behind the costs of production as cotton and wheat (see Table 2-5). But although rice yields have increased through the introduction of an integrated HYV program, output has remained stagnant at about 2.2 to 2.4 million tons because of acreage decreases. Maize production has increased steadily in both area and yields because of the introduction of HYVs. In addition, this trend reflects the higher profitability of maize relative to other summer crops because of its use as a feed for livestock. Use of maize for feed has grown rapidly, and maize availability is reported as a constraint to livestock production.

Other field crops, such as beans (production has shown an increase of over 45 percent between 1981 and 1985), have increased,

in part because procurement prices have kept better pace with costs than wheat, the other major winter crop. The livestock and fruit and vegetable subsectors, which are less controlled, continue to be the most dynamic because of their generally higher profitability.

Chapter 5

INCOME EFFECTS OF PRICE INTERVENTION

The discussion below is divided into two main sections, treating the income effects of price intervention for rural households and for urban households, respectively.

INCOME EFFECTS FOR RURAL HOUSEHOLDS

Price intervention has an effect on the real income of rural households through its impact on output and value added. The nominal income of a typical farm household in income group k (Y_k) may be defined as

$$Y_k = (\text{SUM}_i \text{VA}_i Q_i) + (\text{VA } Q)^{\text{OA}} + w_F L_F + w_{\text{NF}} L_{\text{NF}} + rK \quad (1)$$

where $\text{SUM}_i \text{VA}_i Q_i$ is income (value added) from crop production ($i = \text{cotton, rice, wheat, maize}$); $(\text{VA } Q)^{\text{OA}}$ is income (value added) from other agricultural (OA) activities; $w_F L_F$ is wage income from on-farm employment; $w_{\text{NF}} L_{\text{NF}}$ is wage income from nonfarm employment; and rK is income from productive assets. The real income of the same household group k then can be written as

$$Y_k = Y_k / \text{CPI}_k \quad (2)$$

where CPI_k is an income group-specific price deflator defined as

$$CPI_k = \sum_i a_{1i} P_i + a_2 P_A + a_3 P_{NA} \quad (3)$$

where P_i is the consumer price of the crops, P_A is the consumer price index of other agricultural products, and P_{NA} is the nonagricultural price index. The weights are consumer budget shares, with $\sum_i a_{1i} = a_1$, equal to the share of crop i in the rural households consumer price index, and with $a_1 + a_2 + a_3 = 1$.

The magnitude of the impact of price changes on real incomes will vary depending on the time period being considered. The instantaneous impact ($t = t_0$) of changes in output and input prices is on values added only, because during that period, output is given. In subsequent periods (short run, $t = t_0 + 1$ and long run, $t > t_0 + 1$), changes in output and input prices in the previous period also have a lagged output effect, which is given by

$$dX_{i,t} = a (v_i b_i dVA_{i,t-1}) + (1-a) dX_{i,t-1} \quad (4)$$

where

dX_T = change in output in period T
 a = coefficient of adjustment
 v_i = share of value added in per unit price of crop i
 b_i = long run own-price elasticity
 $dVA_{i,t-1}$ = change in value added of crop i (lagged).

Over time, output effects will result in income losses or gains. Equation 4, describing output adjustment to price changes,

is estimated in Appendix J. To estimate the hypothetical effect of a removal of direct intervention in the short run, the relevant measure of change in value added, from chapter 4, is

$$ERP_D = \frac{VA_A - VA'_A}{VA'_A} \quad (5)$$

and for total effects, the measure is

$$ERP_T = \frac{VA_A - VA^*_A}{VA^*_A} \quad (6)$$

To compute the cumulative effect on output over time, the relevant value added measure for direct effects is the same as in Equation 5, and, for total effects, it is

$$ERP_T = \frac{VA_A/VA_{NA} - (E^*/E_0)VA'_A/VA^*_{NA}}{(E^*/E_0)VA'_A/VA^*_{NA}} \quad (7)$$

with

$$VA^*_{NA} = a \frac{E^*/E_0}{1 + t_m} \frac{VA_{NA}(T)}{1 + t_m} + (1-a) VA_{NA}(NT)$$

The output effects over time result in income losses or gains reflecting the difference between the price and marginal cost of the crop.

Given the above, for a typical farm household, the effect on real farm income of direct price intervention is given by

$$Y_D = (Y - Y') / Y' \quad (8)$$

and the effect on real farm income of total price intervention is given by

$$Y_T = (Y - Y^*) / Y^* \quad (9)$$

where

$$\begin{aligned} Y &= Y / \text{CPI}_R \\ Y' &= Y' / \text{CPI}_R' \\ Y^* &= Y^* / \text{CPI}_R^* \end{aligned}$$

Landless rural households derive their income mainly from wage labor. Their nominal income therefore is not affected by price intervention at $t = t_0$, and the only change in real income resulting from changes in price policy comes from a change in the price deflator. So, for landless households, we have

$$Y_D = (\text{CPI}_R' / \text{CPI}_R) - 1 \quad (10)$$

$$Y_T = (\text{CPI}_R^* / \text{CPI}_R) - 1 \quad (11)$$

The distributional impact of government intervention is estimated by comparing the differences in real income of various rural household groups with and without intervention. The hypothetical effects of removing both direct and total price intervention on prices of agricultural inputs and outputs are

considered.

We examine the impact on the real income of five different categories of rural households, classified according to two criteria. The first is land tenure--that is, differentiating between landless and landholding households and, among the latter group, differentiating by farm size. The second criterion is to differentiate on the basis of the household's level of income. Five household categories are analyzed here:

1. Landless households
2. Landholding households, farm size 0 to 1 feddan
3. Landholding households, farm size 1 to 3 feddans
4. Landholding households, farm size 3 to 5 feddans
5. Landholding households, farm size greater than 5 feddans.

Regarding income distribution, we have assumed that landless households and farm households with a farm of size 0 to 1 feddan had the same average income, corresponding to expenditures of £E 75-100 in 1974-75. Farm households with farms of size 1 to 3 feddans, 3 to 5 feddans, and greater than 5 feddans, respectively, have been considered to be in the expenditure brackets of £E 300-350, £E 600-700, and more than £E 2,000 in 1974-75, respectively. We also considered the impact on the average real income of landholding households.

The welfare changes (losses/gains in real income) caused by changes in the price of cotton, rice, wheat, and maize for the

years 1964-84 are presented.¹ Changes in value added by crop and by farm size are computed in Appendix K. Income-group-specific consumer price indices are presented in Appendix L. Equations 10 and 11, showing the short-run effects of direct and total intervention on real incomes of landless households are presented in Table 5-1. The estimations of Equations 8 and 9 for rural households with different farm sizes are presented in Tables 5-2 (instantaneous effect), 5-3 (short-run effect), and 5-4 (long-run effect). All the results are presented in terms of percentage change from the actual level of real incomes. Period averages are shown in Table 5-5.

Analysis of Results for Landless Households. Overall, landless households have greatly benefited from price intervention. This is clearly shown in Table 5-1.

Except in 1960-62, in 1970, and in 1985, their real income was higher than what it would have been if there had been no direct government price intervention. In 1960-62 and 1970, domestic prices of wheat and maize were higher than border prices (measured at the official exchange rate) in absolute value,

¹Distributional effects of sugarcane price policy have not been computed for landholding households because, given high marginal costs, values added are negative for most years during the period 1960-70, and this would bias the measurement of the overall welfare impact of the policies on their real income. Because sugarcane rather than cotton is the typical crop in Upper Egypt, the results presented in Tables 5-2 to 5-4 can be considered representative of the welfare impact of agricultural price policy on a typical rural farm household of a given farm size. For landless households, because the price of sugar is included in the CPI, the distributional impact of sugarcane price policy is taken into account.

Table 5.1.
EFFECT OF AGRICULTURAL PRICING POLICIES
ON THE REAL INCOME OF LANDLESS HOUSEHOLDS.

	Direct Effect	Total Effect
1960	-5.0%	.5%
1961	-4.9%	.2%
1962	-1.8%	6.1%
1963	9.6%	14.8%
1964	11.0%	17.9%
1965	5.8%	8.6%
1966	2.2%	4.4%
1967	.1%	-2.8%
1968	2.9%	6.6%
1969	.6%	5.1%
1970	-5.3%	.9%
1971	-.3%	7.9%
1972	.7%	8.7%
1973	6.3%	1.1%
1974	47.2%	54.9%
1975	31.7%	48.6%
1976	15.7%	41.0%
1977	.2%	14.8%
1978	.5%	14.7%
1979	12.9%	20.1%
1980	31.0%	36.9%
1981	30.2%	48.0%
1982	21.6%	38.6%
1983	4.3%	17.9%
1984	2.1%	24.9%
1985	-7.2%	19.7%
PERIOD AVERAGES:		
1960-72	1.2%	6.1%
1973-79	16.4%	27.9%
1980-85	13.7%	31.0%

SOURCE: Computed from rural consumer price indices (Table L.2.).

NOTE: The figures are to be interpreted in the following way:
A value of, say, 10% indicates that, with interventions on prices of cotton, rice, wheat, maize and sugarcane, real incomes are 10% HIGHER than what they would have been if prices had been at their border price equivalent with the exchange rate measured at official (direct effect) or at equilibrium (total effect).
A value of -10% indicates that real incomes would be 10% LOWER.

Table 5.2.

EFFECT OF AGRICULTURAL PRICING POLICIES ON REAL INCOMES OF RURAL LANDHOLDING HOUSEHOLDS.

INSTANTANEOUS EFFECT ON REAL INCOME.

Feddans:	-----DIRECT EFFECT-----					-----TOTAL EFFECT-----				
	0-1	1-3	3-5	>5	AVERAGE	0-1	1-3	3-5	>5	AVERAGE
1964	-20.6%	-27.9%	-31.8%	-33.5%	-29.1%	-32.1%	-40.9%	-47.0%	-49.9%	-43.3%
1965	-29.9%	-35.4%	-38.7%	-39.4%	-36.3%	-42.4%	-49.2%	-53.7%	-56.1%	-50.8%
1966	-18.0%	-27.7%	-33.4%	-32.7%	-29.1%	-33.7%	-44.1%	-50.6%	-52.4%	-46.2%
1967	-23.7%	-36.3%	-42.1%	-41.3%	-37.7%	-27.3%	-40.7%	-46.3%	-46.2%	-42.0%
1968	-22.2%	-31.0%	-35.5%	-35.5%	-32.2%	-37.0%	-48.3%	-54.3%	-55.5%	-50.3%
1969	-26.1%	-38.5%	-44.3%	-43.1%	-39.9%	-39.1%	-49.6%	-55.1%	-56.2%	-51.3%
1970	-26.4%	-37.5%	-43.6%	-40.6%	-38.9%	-40.3%	-47.7%	-53.0%	-53.3%	-49.4%
1971	-26.0%	-32.1%	-35.6%	-34.8%	-33.0%	-42.9%	-49.2%	-54.3%	-55.9%	-51.2%
1972	-17.2%	-24.0%	-28.3%	-27.5%	-25.1%	-32.0%	-40.7%	-47.3%	-48.2%	-43.0%
1973	-33.9%	-44.2%	-50.8%	-51.0%	-46.1%	-33.0%	-47.5%	-55.6%	-54.8%	-49.8%
1974	-9.4%	-31.0%	-44.8%	-50.3%	-35.6%	-22.9%	-53.3%	-68.1%	-69.8%	-58.3%
1975	-35.5%	-56.3%	-67.4%	-68.1%	-60.1%	-39.2%	-56.7%	-67.5%	-69.2%	-60.6%
1976	-34.1%	-48.6%	-57.1%	-57.0%	-51.3%	-46.6%	-54.6%	-61.4%	-64.6%	-57.3%
1977	-13.3%	-36.3%	-46.0%	-43.9%	-38.6%	-34.9%	-50.1%	-58.0%	-59.0%	-52.6%
1978	2.6%	-8.8%	-14.3%	-13.8%	-10.0%	-33.8%	-46.9%	-54.6%	-55.9%	-49.4%
1979	-26.1%	-36.2%	-42.2%	-44.2%	-38.2%	-36.4%	-50.7%	-58.6%	-59.9%	-53.4%
1980	-10.1%	-27.5%	-41.8%	-43.4%	-32.5%	-14.6%	-32.6%	-47.2%	-49.0%	-37.8%
1981	-33.1%	-34.2%	-37.6%	-42.5%	-36.1%	-43.3%	-48.0%	-54.4%	-58.7%	-50.9%
1982	-28.2%	-36.6%	-40.6%	-44.2%	-37.9%	-40.1%	-49.4%	-55.1%	-59.2%	-51.5%
1983	8.9%	-23.1%	-36.9%	-34.5%	-26.2%	-12.2%	-34.4%	-45.3%	-46.4%	-37.3%
1984	-15.0%	-25.8%	-31.3%	-30.7%	-26.9%	-42.6%	-51.2%	-57.0%	-59.4%	-53.2%
1985	14.9%	2.7%	-.9%	.9%	2.9%	-37.0%	-47.5%	-54.0%	-56.4%	-49.6%

SOURCE: Computed from data in appendices K and L.

NOTE: A value of, say, 10% (-10%) indicates that real incomes would have been 10% higher (lower) than their actual levels if price interventions for cotton, rice, wheat, maize and sugar had been removed and domestic prices of outputs and inputs had been equal to their border price, with the exchange rate measured at the official rate (direct effect) or at the equilibrium rate (total effect).

Table 5.3.

EFFECT OF AGRICULTURAL PRICING POLICIES ON REAL INCOMES OF RURAL LANDHOLDING HOUSEHOLDS.

SHORT RUN EFFECT ON REAL INCOME

Feddans:	-----DIRECT EFFECT-----					-----TOTAL EFFECT-----				
	0-1	1-3	3-5	>5	AVERAGE	0-1	1-3	3-5	>5	AVERAGE
1964	-20.6%	-27.9%	-31.8%	-33.5%	-29.1%	-32.1%	-40.9%	-47.0%	-49.9%	-43.3%
1965	-27.4%	-33.8%	-37.8%	-38.5%	-35.0%	-39.5%	-47.5%	-52.8%	-55.2%	-49.4%
1966	-16.4%	-26.0%	-31.9%	-31.2%	-27.5%	-30.2%	-41.8%	-49.1%	-50.9%	-44.2%
1967	-23.9%	-35.5%	-41.0%	-40.3%	-36.8%	-25.7%	-39.3%	-45.1%	-45.0%	-40.7%
1968	-27.7%	-33.2%	-36.3%	-36.3%	-33.9%	-37.6%	-48.0%	-53.7%	-55.0%	-49.9%
1969	-25.9%	-37.9%	-43.5%	-42.4%	-39.2%	-37.9%	-48.6%	-54.3%	-55.4%	-50.4%
1970	-27.3%	-37.0%	-42.8%	-39.8%	-38.3%	-39.6%	-46.8%	-52.1%	-52.4%	-48.5%
1971	-29.2%	-32.9%	-35.0%	-34.4%	-33.4%	-43.1%	-48.7%	-53.5%	-55.2%	-50.6%
1972	-18.0%	-22.9%	-26.2%	-25.6%	-23.8%	-30.4%	-39.0%	-45.9%	-46.8%	-41.5%
1973	-33.8%	-43.0%	-49.2%	-49.5%	-44.9%	-31.9%	-46.4%	-54.7%	-53.8%	-48.7%
1974	-19.1%	-32.0%	-41.2%	-47.8%	-35.1%	-24.9%	-53.6%	-68.1%	-69.8%	-58.5%
1975	-43.1%	-60.6%	-70.6%	-71.0%	-64.0%	-36.8%	-54.7%	-66.0%	-67.8%	-58.8%
1976	-38.7%	-50.8%	-58.5%	-58.4%	-53.2%	-44.0%	-52.4%	-59.8%	-63.1%	-55.3%
1977	-11.3%	-34.7%	-44.8%	-42.7%	-37.2%	-32.1%	-48.6%	-57.1%	-58.1%	-51.3%
1978	-6.9%	-11.0%	-12.6%	-12.7%	-11.1%	-34.2%	-46.2%	-53.6%	-55.0%	-48.6%
1979	-27.1%	-35.8%	-41.0%	-43.2%	-37.5%	-35.2%	-49.6%	-57.6%	-58.9%	-52.3%
1980	-16.0%	-28.4%	-40.7%	-42.5%	-32.8%	-13.9%	-31.1%	-45.8%	-47.6%	-36.4%
1981	-37.5%	-35.3%	-36.9%	-42.1%	-36.8%	-42.1%	-46.5%	-53.0%	-57.5%	-49.5%
1982	-24.8%	-33.8%	-38.5%	-42.0%	-35.4%	-34.2%	-45.2%	-52.1%	-56.4%	-47.8%
1983	19.7%	-16.9%	-32.8%	-30.0%	-20.7%	-2.8%	-28.7%	-41.7%	-42.7%	-32.4%
1984	-16.0%	-25.6%	-30.4%	-30.0%	-26.5%	-41.7%	-50.0%	-55.9%	-58.3%	-52.0%
1985	13.8%	3.8%	1.1%	2.8%	4.1%	-33.8%	-45.0%	-52.2%	-54.6%	-47.4%

SOURCE: Computed from data in appendices K and L.

NOTE: A value of, say, 10% (-10%) indicates that real incomes would have been 10% higher (lower) than their actual levels if price interventions for cotton, rice, wheat, maize and sugar had been removed and domestic prices of outputs and inputs had been equal to their border price, with the exchange rate measured at the official rate (direct effect) or at the equilibrium rate (total effect).

Table 5.4.

EFFECT OF AGRICULTURAL PRICING POLICIES ON REAL INCOMES OF RURAL LANDHOLDING HOUSEHOLDS.

LONG RUN EFFECT ON REAL INCOME

Feddans:	-----DIRECT EFFECT-----					-----TOTAL EFFECT-----				
	0-1	1-3	3-5	>5	AVERAGE	0-1	1-3	3-5	>5	AVERAGE
1964	-20.6%	-27.9%	-31.8%	-33.5%	-29.1%	-32.1%	-40.9%	-47.0%	-49.9%	-43.3%
1965	-27.4%	-33.8%	-37.8%	-38.5%	-35.0%	-38.9%	-47.1%	-52.6%	-54.9%	-49.1%
1966	-16.3%	-25.7%	-31.6%	-30.9%	-27.2%	-29.4%	-41.0%	-48.6%	-50.4%	-43.5%
1967	-23.7%	-35.2%	-40.8%	-40.0%	-36.5%	-24.8%	-38.5%	-44.5%	-44.4%	-40.0%
1968	-27.5%	-32.9%	-36.1%	-36.0%	-33.7%	-36.5%	-47.2%	-53.1%	-54.4%	-49.1%
1969	-25.0%	-37.4%	-43.2%	-41.9%	-38.8%	-37.2%	-48.1%	-53.9%	-55.0%	-50.0%
1970	-27.0%	-36.8%	-42.6%	-39.6%	-38.1%	-38.9%	-46.3%	-51.8%	-52.1%	-48.1%
1971	-28.9%	-32.7%	-34.7%	-34.1%	-33.1%	-42.4%	-48.1%	-53.1%	-54.8%	-50.1%
1972	-17.8%	-22.7%	-25.9%	-25.2%	-23.5%	-29.6%	-38.5%	-45.5%	-46.4%	-41.0%
1973	-33.3%	-42.5%	-48.7%	-49.0%	-44.3%	-31.2%	-45.9%	-54.3%	-53.4%	-48.3%
1974	-18.9%	-31.8%	-41.0%	-47.6%	-34.9%	-23.8%	-53.0%	-67.7%	-69.5%	-58.0%
1975	-43.0%	-61.2%	-71.2%	-71.5%	-64.6%	-36.6%	-54.5%	-65.9%	-67.7%	-58.7%
1976	-38.3%	-51.1%	-59.0%	-58.7%	-53.5%	-43.9%	-52.1%	-59.5%	-62.8%	-55.1%
1977	-9.5%	-33.7%	-44.0%	-41.8%	-36.3%	-31.8%	-48.3%	-56.9%	-57.9%	-51.1%
1978	-6.5%	-10.5%	-12.0%	-12.1%	-10.6%	-33.7%	-45.7%	-53.2%	-54.6%	-48.2%
1979	-25.9%	-34.7%	-40.0%	-42.2%	-36.4%	-34.5%	-49.1%	-57.3%	-58.5%	-51.9%
1980	-15.9%	-28.3%	-40.6%	-42.4%	-32.7%	-13.4%	-30.6%	-45.4%	-47.3%	-36.0%
1981	-37.1%	-35.1%	-36.6%	-41.8%	-36.5%	-41.8%	-46.1%	-52.7%	-57.2%	-49.1%
1982	-24.5%	-33.8%	-38.6%	-42.1%	-35.4%	-33.8%	-44.8%	-51.7%	-56.0%	-47.4%
1983	20.3%	-16.3%	-32.4%	-29.6%	-20.2%	-2.1%	-27.9%	-41.1%	-42.0%	-31.6%
1984	-15.8%	-25.1%	-29.9%	-29.6%	-26.0%	-41.4%	-49.5%	-55.5%	-57.9%	-51.6%
1985	14.0%	4.2%	1.5%	3.2%	4.5%	-33.5%	-44.5%	-51.8%	-54.2%	-46.9%

SOURCE: Computed from data in appendices K and L.

NOTE: A value of, say, 10% (-10%) indicates that real incomes would have been 10% higher (lower) than their actual levels if price interventions for cotton, rice, wheat, maize and sugar had been removed and domestic prices of outputs and inputs had been equal to their border price, with the exchange rate measured at the official rate (direct effect) or at the equilibrium rate (total effect).

Table 5.5.

EFFECT OF AGRICULTURAL PRICING POLICIES ON REAL INCOMES OF FARM HOUSEHOLDS.

Farm Size, in fed.	-----DIRECT EFFECT-----					-----TOTAL EFFECT-----				
	0-1	1-3	3-5	>5	AVERAGE	0-1	1-3	3-5	>5	AVERAGE
Period:	1. INSTANTANEOUS EFFECT ON INCOME.									
1964-1972	-23.4%	-32.3%	-37.0%	-36.5%	-33.5%	-36.3%	-45.6%	-51.3%	-52.6%	-47.5%
1973-1979	-21.4%	-37.3%	-46.1%	-46.9%	-40.0%	-35.2%	-51.4%	-60.5%	-61.9%	-54.5%
1980-1985	-10.4%	-24.1%	-31.5%	-32.4%	-26.1%	-31.6%	-43.8%	-52.2%	-54.9%	-46.7%
	2. SHORT RUN EFFECT ON INCOME.									
1964-1972	-24.0%	-31.9%	-36.3%	-35.8%	-33.0%	-35.1%	-44.5%	-50.4%	-51.8%	-46.5%
1973-1979	-25.7%	-38.3%	-45.4%	-46.5%	-40.4%	-34.1%	-50.2%	-59.6%	-60.9%	-53.4%
1980-1985	-10.1%	-22.7%	-29.7%	-30.6%	-24.7%	-28.1%	-41.1%	-50.1%	-52.8%	-44.2%
	3. CUMULATIVE EFFECT ON INCOME.									
1964-1972	-23.8%	-31.7%	-36.0%	-35.5%	-32.8%	-34.4%	-44.0%	-50.0%	-51.4%	-46.0%
1973-1979	-25.1%	-37.9%	-45.1%	-46.1%	-40.1%	-33.7%	-49.8%	-59.3%	-60.6%	-53.0%
1980-1985	-9.8%	-22.4%	-29.5%	-30.4%	-24.4%	-27.7%	-40.6%	-49.7%	-52.4%	-43.8%

SOURCE: Tables 5.2.-5.4.

NOTE: A value of, say, 10% (-10%) indicates that real incomes would have been 10% higher (lower) than their actual levels if price interventions for cotton, rice, wheat, maize and sugar had been removed and domestic prices of outputs and inputs had been equal to their border price, with the exchange rate measured at the official rate (direct effect) or at the equilibrium rate (total effect).

although the domestic price of rice was lower. In 1985, the change in the domestic price of wheat with respect to the previous year outpaced the change in the border price equivalent for the consumer. Because the weight of wheat products in the consumer price index of the landless is high, the landless experienced a fall in their real income in the short run. But the years cited are exceptional. During most of the period, agricultural price intervention led to welfare gains for the landless that were highest in periods of sharp increases of world prices and when there was a lag in the adjustment of domestic prices by the government, as occurred in 1974-76 and in 1979-81.

For landless rural households, exchange rate and trade policies have accentuated the welfare gains, or dampened the losses, obtained or incurred through direct price intervention.

Analysis of Results for Farm Households. Price intervention had a depressive impact on real incomes of farmers throughout the period. Whether there were welfare losses depends on whether one considers the immediate, the short-run, or the long-run impact of price policies. The magnitude of the loss increases considerably if one includes the long-run effects. On the basis of the results of Tables 5-2 to 5-4, one can conclude that there was a strong bias against agriculture implicit in the price policies of the government toward producers of major crops.

The general conclusion of a bias against agriculture must be mitigated by reviewing the limitations of the approach used in this chapter. First, these results include only the effects of price

policies related to cotton, rice, wheat, and maize. Crops such as berseem, vegetables, and fruits, for which there are no price controls for producers, would have reduced total producer losses if they had been included. The data in Table 5-6, taken from the 1976 Farm Management Survey, show the relative importance of those latter products in the cropping pattern of the Nile Delta (see Crouch, Siam, and Gad 1982). The figures refer to the ratio of area planted in each crop to total managed area, by farm size. The data do not indicate the cropping pattern of the country as a

Table 5-6
RATIO OF AREA PLANTED BY CROP TO TOTAL AREA
(by farm size, 1976)

Commodity	Farm size (in feddans)					All
	< 1	1-3	3-5	5-10	> 10	
Wheat	.20	.22	.24	.18	.17	.21
Maize	.08	.22	.18	.14	.09	.17
Rice	.53	.40	.41	.36	.46	.42
Cotton	.24	.33	.27	.40	.32	.32
SS berseem	.24	.31	.22	.38	.29	.29
LS berseem	.41	.37	.31	.31	.23	.33
Others*	.15	.11	.28	.14	.26	.17

NOTES: *Others = potatoes, tomatoes, onions, and fruits.
SS = short season; LS = long season.

SOURCE: Crouch, Siam, and Gad (1982), p. 45.

whole, because they exclude sugarcane, grown in Upper Egypt, and overestimate the importance of rice, grown mainly in the Delta.

A second limitation of the data is that in computing the effects of removing price intervention on real farm incomes, we have made no allowance for changes in wage income resulting from the changes in derived demand for labor consequent on the output changes engendered by the noninterventionist price policy. We have made no allowance either, in computing cumulative effects, for income changes resulting from a reallocation of factors that are fixed in the short run but mobile over longer periods. In other words, we have not taken into account the endogenous changes in the other components of farm income in Equation 1 resulting from changes.

Despite these limitations, our approach reveals important insights into the income effects of price policy. That is, it shows differences in the effects, as examined by period and by farm size.

As shown by the period averages in Table 5-5, the negative impact on farm incomes of price policy was significant during the 1960s because of low producer prices and because of the procurement policy for cotton, rice and wheat. Exchange rate overvaluation and discriminatory trade policies against agriculture reinforced the effect of direct intervention. From 1973 to 1979, even though producer prices increased and procurement quotas decreased, the negative impact on incomes was more pronounced than during the

1960s because of high world prices for traded agricultural products. By contrast, farmers were less affected by indirect intervention than during the 1960s. Finally, from 1980 to 1985, welfare losses were cut substantially because of both higher producer prices and lower world prices.

Significant differences in welfare losses may be found among farms of different sizes. These differences are attributable to differences in cropping pattern. Correcting for differences in yields among farms of different sizes gives a distribution of value added by farm size that is very different for each crop, as shown in Table 5-7. Income from maize, used mainly for animals, is earned primarily on small and medium farms.² Income from cotton, rice, and wheat is generated mainly on medium-sized farms and, to a lesser extent, on large farms. On balance, small farms (of less than 1 feddan) are less affected by price intervention because they grow relatively more maize and less cotton and rice than larger farms. Because maize is the least controlled crop, and cotton and rice are the most controlled, this has a distributional impact on real income of farmers. Given that larger farms, especially farms of 5 feddans and more, produce more potatoes, tomatoes, onions, and fruits than smaller ones, including the value added generated by those activities in our calculations would have modified the distributional impact of price policies by reducing the extent

²Small and medium farms account for approximately 75 percent of the holdings in Egypt. See Table H-2 in Appendix H.

Table 5-7
VALUE ADDED GENERATED BY FARMS OF A GIVEN SIZE
(in percentage of total value added)

Commodity	Farm size (in feddans)				All
	0-1	1-3	3-5	>5	
Cotton	10	34	31	25	100
Rice	4	31	38	27	100
Wheat	10	41	25	24	100
Maize	30	40	15	15	100

SOURCE: Table K-3, Appendix K.

of welfare losses of large farms over time as the area devoted to those crops increased.³

Referring to the conflict between efficiency and equity objectives of price policy in agriculture until 1973, Hansen and Nashashibi (1975) have noted that

The introduction of international prices for efficiency reasons would have had serious consequences for income distribution among farmers. The government would probably not have been able to handle this problem by any other means (direct subsidies, for instance). It is in the light of these circumstances, together with the low response elasticities for most crops, that we should appraise the government's policies in regard to relative domestic agricultural prices. Also, its additional measures of direct and indirect intervention with acreage were probably less taken with a view to efficiency than as an emergency response to compelling demands for an expansion of exports. (pp. 196-97)

After 1973, the government effected major policy changes because of increases in the international prices of agricultural outputs and inputs. Indeed, the government gave direct subsidies for fertilizer to farmers. It also increased producer prices for cotton, rice, and wheat and reduced procurement quotas for the latter crop.⁴ These policy changes, however, increased the burden for producers. Only after 1980, when international prices fell, were real income losses reduced.

³See the second section of chapter 1.

⁴See Tables 2-3 and 2-4.

Influence of the Protection Policy for Livestock Products on Farm Incomes. It is interesting to compare our results with those of von Braun and de Haen (1983), who examined welfare losses of producers resulting from price policy affecting major crops, including the five crops examined here and adding pulses (beans and lentils), which are of lesser importance in terms of aggregate welfare. Von Braun and de Haen also take into account the effects of price policy on fertilizer and pesticides, but their coverage had an important difference from the present study; their welfare calculations included the livestock sector--meat, dairy products, and feed ("feed" comprised maize, cottonseed cake, rice and wheat brans, and concentrated feed mix, but not berseem).

Von Braun and de Haen's methodology was also different in that it followed Bale and Lutz (1979). Those authors computed welfare gains and losses of producers (G_p) as

$$G_p = Q (P_p - P_w) - NSL_p$$

where NSL_p , the net social loss in production is defined as

$$NSL_p = 1/2 (Q_w - Q) (P_w - P_p)$$

and the variables are

- Q = production at prevailing prices
- Q_w = production at border prices
- P_p = prevailing producer price
- P_w = border price equivalent.

In the von Braun and de Haen model, prices are expressed in real terms, in 1975 Egyptian pounds, and border prices are corrected to take into account the overvaluation of the exchange rate. However, border prices of tradables are valued at the black market

exchange rate, which is not an equilibrium rate, and are not corrected for the impact of nonagricultural trade policies. In addition, their model does not make allowance for cumulative output effects. Therefore, it is best to compare their results with ours concerning the short-run effects on real incomes of total price intervention on an average farm, in Table 5-3.

In terms of absolute magnitudes, the von Braun and de Haen (1983, chapter 7, Table 27) computations for cotton, rice, wheat, and maize for 1965-80 yield, in general, greater welfare losses than do our computations. This can be attributed to differences in methodology and in the calculation of border prices. But, in terms of the contribution of individual crop price and subsidy policies to the net social loss of the sector, the two sets of computations are comparable. The components of the total loss of the sector in von Braun and de Haen are shown in Table 5-8. Both the present results and those of von Braun and de Haen indicate that the bulk of the welfare loss of the sector comes from taxation of cotton, followed by taxation of rice and, to a lesser extent, wheat and maize. Sugarcane was taxed during most years, but sometimes subsidized.

Von Braun and de Haen add an important dimension to our understanding of the impact of price policy in Egyptian agriculture. Table 5-8 shows the increasing influence on farm incomes after 1974 of protection of the livestock sector. The effects of protection measures for livestock have corrected the effects of crop taxation by preventing real incomes from decreasing further.

Table 5-8
COMPONENTS OF THE TOTAL WELFARE LOSSES BY PRODUCERS

(in percentages of total loss)

Year	Wheat	Maize	Rice	Beans & Lentils	Meat Milk & Feed	Sugar	Cotton
1965	6.1	11.2	18.0	3.7	-1.2	6.0	55.7
1966	6.9	12.9	20.9	5.6	-1.9	-.1	55.5
1967	8.7	11.4	33.6	1.8	-9.8	-3.9	58.0
1968	3.6	10.6	34.0	2.3	2.7	-3.4	50.2
1969	3.1	8.3	24.3	2.5	2.5	1.4	57.6
1970	5.0	12.0	17.0	2.4	-3.8	3.4	63.7
1971	5.4	7.8	14.5	2.1	2.9	-2.6	69.7
1972	4.7	8.9	13.2	2.6	4.3	.3	65.5
1973	10.8	11.3	17.4	5.4	2.7	8.3	44.0
1974	7.2	7.7	35.1	1.3	-7.2	16.7	39.0
1975	7.8	8.8	40.6	1.6	-10.4	11.7	39.6
1976	10.0	11.4	35.2	2.6	-23.0	7.0	56.4
1977	4.3	2.0	19.7	3.1	-25.0	.6	95.0
1978	7.1	6.2	43.6	1.9	-58.0	-5.3	104.2
1979	18.0	20.2	40.0	3.4	-54.1	-1.9	74.2
1980	19.3	4.1	37.4	2.5	-73.0	24.2	85.4

SOURCE: Von Braun and de Haen (1983), table 28.

NOTE: Rows add up approximately to 100, which equals the total welfare loss of the agricultural sector.

It is interesting to note that the burden on the real income of producers was not reduced primarily by streamlining price distortions in crop production at the level of output markets. The composition of the burden on the sector changed, partly because of increased subsidies on inputs (so that implicit net taxation of crops was reduced), and partly because livestock production was increasingly protected. Moreover, in the late 1970s, the food subsidy scheme was expanded to rural areas, and this has increased the transfer of income to rural areas, both farm and nonfarm. Increasing producer prices have added to that increased transfer.

INCOME EFFECTS FOR URBAN HOUSEHOLDS

Real incomes of urban households are affected by agricultural price intervention in the short run through a change in their consumer price index. Therefore, the direct effect and total effect of intervention can be computed as

$$y_D = (CPI_U' / CPI_U) - 1 \quad (12)$$

$$y_T = (CPI_U^* / CPI_U) - 1 \quad (13)$$

Urban households are divided here into three categories according to the distribution of urban income, as measured by the 1974-75 Household Budget Survey. Low income urban households are defined as those having consumption expenditures between £E 75 and 100 in 1974-75, middle income urban households have expenditures

between £E 300 and 350, and high income households have expenditures between £E 1,000 and 1,400.

Three group-specific consumer price indices have been constructed for each urban household category (poor, middle, and rich). They are presented in Appendix L. They are, respectively, an urban consumer price index at prevailing prices (CPI_U), an urban consumer price index correcting for the effect of direct price intervention on agricultural commodities (CPI_U'), and an urban consumer price index correcting for the effect of total price intervention (CPI_U^*).

The estimation of Equations 12 and 13 is presented in Tables 5-9 to 5-12. Each table shows the direct and total effects of price intervention on cotton, rice, wheat, maize, and sugarcane on the real income of urban groups. Table 5-12 shows the effects on the real income of an average urban household (i.e., on average household income in 1974-75).

The results show that urban households have benefited greatly from price intervention. With the exception of 1960-61 and 1968-70, real urban incomes have been higher throughout the period than they would have been if there had been no direct government intervention on prices.⁵ If there had been trade liberalization

⁵In 1960-61 and in 1968-70, the consumer price of wheat was higher than the equivalent border price measured at the official exchange rate.

Table 5.9.
INSTANTANEOUS DISTRIBUTIONAL EFFECT OF AGRICULTURAL PRICING POLICIES
ON THE REAL INCOME OF URBAN HOUSEHOLDS:
LOW INCOME HOUSEHOLDS.

Year	DIRECT EFFECT	TOTAL EFFECT
1960	-6.1%	29.2%
1961	-8.5%	21.2%
1962	2.7%	25.3%
1963	15.2%	31.1%
1964	22.2%	43.4%
1965	3.9%	20.7%
1966	1.3%	18.0%
1967	2.6%	-.4%
1968	-2.1%	11.8%
1969	-3.2%	12.4%
1970	-6.4%	14.0%
1971	1.7%	27.8%
1972	1.5%	23.5%
1973	8.6%	-.7%
1974	81.2%	95.8%
1975	53.7%	85.3%
1976	34.4%	95.6%
1977	20.2%	68.7%
1978	26.7%	92.0%
1979	40.6%	61.0%
1980	84.6%	99.1%
1981	74.3%	120.1%
1982	65.9%	116.7%
1983	43.3%	95.2%
1984	37.8%	128.0%
1985	13.5%	128.2%
PERIOD AVERAGES:		
1960-72	1.9%	21.4%
1973-79	37.9%	71.1%
1980-85	53.2%	114.6%

SOURCE: Computed from urban consumer price indices (Table L.4.).

- NOTES:
1. DIRECT EFFECT = Instantaneous change in real income of urban households due to direct price interventions on agricultural commodities.
 2. TOTAL EFFECT = Instantaneous change in real income of urban households due to total price interventions on agricultural commodities.
 3. Low Income = Household expenditures between 75 and 100 LE in 1974/75.

Table 5.10.
INSTANTANEOUS DISTRIBUTIONAL EFFECT OF AGRICULTURAL PRICING POLICIES
ON THE REAL INCOME OF URBAN HOUSEHOLDS:
MIDDLE INCOME HOUSEHOLDS.

Year	DIRECT EFFECT	TOTAL EFFECT
1960	-5.2%	22.9%
1961	-7.3%	16.8%
1962	2.3%	21.5%
1963	13.1%	25.8%
1964	18.9%	36.1%
1965	3.3%	16.3%
1966	1.1%	13.4%
1967	2.2%	-1.4%
1968	-1.7%	8.5%
1969	-2.7%	9.0%
1970	-5.3%	10.6%
1971	1.4%	21.8%
1972	1.2%	18.8%
1973	7.2%	-1.5%
1974	68.5%	81.0%
1975	45.4%	73.1%
1976	29.3%	81.8%
1977	17.2%	58.6%
1978	22.5%	77.2%
1979	34.2%	51.5%
1980	71.3%	83.7%
1981	64.2%	104.0%
1982	56.5%	100.3%
1983	37.6%	83.1%
1984	32.6%	111.4%
1985	11.9%	114.4%
PERIOD AVERAGES:		
1960-72	1.6%	16.9%
1973-79	32.0%	60.2%
1980-85	45.7%	99.5%

SOURCE: Computed from urban consumer price indices (Table L.4.).

- NOTES:
1. DIRECT EFFECT = Instantaneous change in real income of urban households due to direct price interventions on agricultural commodities.
 2. TOTAL EFFECT = Instantaneous change in real income of urban households due to total price interventions on agricultural commodities.
 3. Middle Income = Household expenditures between 300 and 350 LE in 1974/75.

Table 5.11.
INSTANTANEOUS DISTRIBUTIONAL EFFECT OF AGRICULTURAL PRICING POLICIES
ON THE REAL INCOME OF URBAN HOUSEHOLDS:
HIGH INCOME HOUSEHOLDS.

Year	DIRECT EFFECT	TOTAL EFFECT
1960	-2.5%	13.1%
1961	-3.5%	11.1%
1962	1.1%	14.0%
1963	6.3%	12.9%
1964	8.9%	18.1%
1965	1.6%	7.4%
1966	.5%	4.7%
1967	1.0%	-3.5%
1968	-.8%	3.0%
1969	-1.2%	3.7%
1970	-2.4%	5.9%
1971	.7%	11.1%
1972	.6%	10.5%
1973	3.3%	-4.1%
1974	31.6%	39.0%
1975	20.7%	39.3%
1976	13.4%	47.7%
1977	7.8%	35.7%
1978	9.9%	44.9%
1979	14.9%	25.9%
1980	30.9%	38.2%
1981	29.5%	54.1%
1982	25.5%	52.4%
1983	17.1%	47.7%
1984	14.5%	68.6%
1985	5.7%	83.3%
PERIOD AVERAGES:		
1960-72	.8%	8.6%
1973-79	14.5%	32.6%
1980-85	20.5%	57.4%

SOURCE: Computed from urban consumer price indices (Table L.4.).

- NOTES:
1. DIRECT EFFECT = Instantaneous change in real income of urban households due to direct price interventions on agricultural commodities.
 2. TOTAL EFFECT = Instantaneous change in real income of urban households due to total price interventions on agricultural commodities.
 3. High Income = Household expenditures between 1000 and 1400 LE in 1974/75.

Table 5.12.
INSTANTANEOUS DISTRIBUTIONAL EFFECT OF AGRICULTURAL PRICING POLICIES
ON THE REAL INCOME OF URBAN HOUSEHOLDS:
AVERAGE INCOME HOUSEHOLD.

Year	DIRECT EFFECT	TOTAL EFFECT
1960	-3.7%	16.9%
1961	-5.2%	13.1%
1962	1.7%	17.2%
1963	9.4%	18.6%
1964	13.5%	26.0%
1965	2.4%	11.2%
1966	.8%	8.3%
1967	1.6%	-2.6%
1968	-1.2%	5.2%
1969	-1.9%	5.8%
1970	-3.7%	7.6%
1971	1.0%	15.5%
1972	.9%	13.9%
1973	5.0%	-2.9%
1974	48.3%	57.9%
1975	31.8%	54.3%
1976	20.6%	62.6%
1977	12.1%	45.4%
1978	15.5%	58.4%
1979	23.5%	37.1%
1980	48.8%	58.3%
1981	45.4%	76.6%
1982	39.6%	73.7%
1983	26.6%	63.4%
1984	22.7%	87.0%
1985	8.6%	96.6%
PERIOD AVERAGES:		
1960-72	1.2%	12.1%
1973-79	22.4%	44.7%
1980-85	31.9%	75.9%

SOURCE: Computed from urban consumer price indices (Table L.4.).

- NOTES:
1. DIRECT EFFECT = Instantaneous change in real income of urban households due to direct price interventions on agricultural commodities.
 2. TOTAL EFFECT = Instantaneous change in real income of urban households due to total price interventions on agricultural commodities.
 3. Change in real income for an AVERAGE urban household (i.e. with average pattern of yearly expenditures in 1974/75).

jointly with price liberalization, urban consumers would have gained during the entire period, as shown by the results for the total effects. Gains were highest in periods of sharp increases of world prices, specifically in 1974-76 and in 1979-81, because the government adjusted consumer prices of food items with a considerable lag and by a much smaller proportional amount than the increase in world prices. In fact, after the food riots of 1977, consumer prices of wheat fell in real terms (in 1978-80, when world prices increased sharply).

According to our calculations, low-income urban households have benefited more from government price policy than have high-income households. The welfare gains are a function of the share of food items in the consumer budget. This share is high in Egypt compared to other countries at similar levels of income per capita. The share of wheat products (flour, bread) alone is 13 percent for poor households, but only 4 percent for rich households. This explains to a large extent why low-income groups gain relatively more than high-income groups. Of course, the budget share of subsidized food items itself is a function of the price policy of the government. Because wheat prices have remained low relative to other consumer goods, the budget share of wheat has increased over time. Our calculations do not capture this effect, because we assumed budget shares as constant throughout the period.

Chapter 6

CONSUMPTION EFFECTS OF PRICE INTERVENTION

This chapter discusses the effects of price intervention on aggregate consumption and treats the distributional impact of the food subsidy system in detail.

EFFECTS ON AGGREGATE CONSUMPTION

Measuring the effects on aggregate consumption of removing price intervention enables us to examine the impact of intervention on consumer welfare for the country as a whole. The effect on aggregate consumption of removing total price intervention is measured here as the change in consumption in year t resulting from a change in the consumer price of the crop in the same year. It is assumed that consumers react instantaneously to the price change. Substitution effects in consumption are not taken into account because of the lack of adequate estimates of cross-price elasticities of demand at this aggregate level.

More formally, the effects of total price intervention on consumption in period t are given by

$$dC_i^t = e_{ii} NRP_i^t C_i^{ot} \quad (1)$$

where

- dC_i = change in consumption due to change in own-price of crop i
- e_{ii} = own-price elasticity of consumption of crop i
- NRP_i^t = nominal rate of protection of crop i
- C_i^{ot} = level of consumption of crop i at distorted consumer prices.

Estimates of own-price elasticities of demand, shown in Table 6-1, are from the following sources. Elasticities for rice, wheat, maize, and sugar are from Alderman and von Braun (1984). The elasticities are weighted sums of elasticities for urban and rural population, with weights equal to the share of each population in total quantity consumed. The estimates for wheat, maize, and sugar are lower than those estimated with a linear expenditure system (LES), using pooled cross-sectional household survey data by von Braun (see van Braun and de Haen 1983).¹ The value of the elasticity of demand for cotton is not based on an estimation result; it is an informed guess. The LES estimated value reported by von Braun for all nonfood items ranged from $-.86$ to -1.55 depending on the population group. It was not used here because it seemed too high for domestic cotton consumption.

The results presented in Table 6-2 indicate that in the aggregate, consumption levels of cotton and cereals would have been lower, and sugar higher, if direct and indirect price intervention had been removed. Negative numbers imply that consumption would be lower if total intervention was removed, and positive numbers indicate that consumption would be higher. Consumption of cotton refers to lint, rice to milled rice, and sugar to refined sugar. The data on consumption levels are from Appendix Table E-7. Nominal

¹The original source is J. von Braun, "A Demand System for Egypt: Estimation Results and Scenario Analysis for Alternative Food Price Policies," mimeo, University of Goettingen, December 1981.

rates of protection measured at the consumer level are taken from Table 3-5.

In the aggregate, consumers of cotton and cereals were protected by direct and indirect price intervention, but consumers of sugar were taxed. There were differences across commodities and among periods, as shown in Table 6-3.

Table 6-1
SHORT-RUN DEMAND ELASTICITIES

		Change in Price				
		COTTON	RICE	WHEAT	MAIZE	SUGAR
	COTTON	-0.20	0	0	0	0
Change in Demand	RICE	0	-0.15	0	0	0
	WHEAT	0	0	-0.30	0	0
	MAIZE	0	0	0	-0.35	0
	SUGAR	0	0	0	0	-0.10

SOURCE: Alderman and von Braun (1984).

Welfare losses for consumers of sugar were substantially reduced from 1973 to 1979, when world prices of sugar increased dramatically, compared to the period 1965-72. The level of protection of consumers of cotton has remained fairly stable during the 1960s and 1970s, but fell in the early 1980s as the government increased the selling price of cotton to domestic mills (see

Appendix Table D-1). Average consumer prices of maize have also increased faster than border prices during the 1980s, which explains why consumer welfare gains were smaller than in previous periods.² Although consumer prices of bleached rice did not increase much, in nominal terms, from 1981 to 1984, the sharp increase in the world price in 1981 was mainly responsible for the high 1980-85 average. The most striking effects are those for wheat. From 1965 to 1972, protection of consumers was relatively modest, and consumption on average was about 8 percent above its noninterventionist level. But after 1973, the percentage more than doubled compared with the previous period. Domestic prices remained stable in nominal terms (and fell, in real terms, during some years) while world prices increased. It should be noted that in 1985, GASC, the government agency handling wheat, substantially increased the consumer price to £E 97.20 (compared with £E 37.60 in 1984).

The average effects shown in Table 6-3 are, of course, very sensitive to the value of the elasticities. The elasticities for wheat and maize used for the computations are high. Using the LES estimates of von Braun and de Haen (1983, p. 81)--that is, -0.13 for both wheat and maize--would yield much smaller aggregate

²As shown in Appendix Table D-4, the free market price of white maize is mainly responsible for this trend.

Table 6.2.

SHORT RUN EFFECTS OF TOTAL PRICE INTERVENTIONS ON CONSUMPTION.

Year	COTTON		RICE		WHEAT		MAIZE		SUGAR	
	(Tons)	(Percent)	(Tons)	(Percent)	(Tons)	(Percent)	(Tons)	(Percent)	(Tons)	(Percent)
1965	-16,000	-9.73%	-71,547	-8.25%	-368,790	-11.01%	-304,067	-13.35%	27,447	5.25%
1966	-6,550	-9.49%	-54,341	-6.39%	-398,692	-10.66%	-162,889	-6.41%	44,411	6.17%
1967	-9,332	-9.57%	-19,366	-1.71%	-131,966	-3.32%	346,883	14.68%	78,348	11.51%
1968	-12,935	-9.62%	-64,902	-5.44%	-264,411	-6.95%	-107,620	-4.43%	44,225	6.70%
1969	-26,877	-11.05%	-65,855	-7.00%	-196,990	-6.73%	-166,920	-6.93%	18,199	2.63%
1970	-20,683	-11.54%	-60,458	-5.54%	-162,785	-5.92%	-97,203	-3.94%	20,037	2.90%
1971	-16,181	-12.37%	-66,836	-5.65%	-485,558	-11.73%	-218,108	-9.16%	5,614	.79%
1972	-20,857	-11.87%	-67,885	-5.45%	-323,436	-9.80%	-113,945	-4.55%	-14,320	-1.73%
1973	-22,789	-12.27%	-77,744	-6.31%	-160,299	-4.40%	147,385	5.73%	18,836	2.45%
1974	-22,408	-13.34%	-166,165	-12.14%	-1,120,165	-22.00%	-341,312	-11.27%	-31,008	-3.87%
1975	-21,824	-12.84%	-178,432	-11.75%	-1,204,272	-21.03%	-379,681	-11.87%	-21,195	-2.20%
1976	-23,912	-11.93%	-140,000	-10.53%	-1,261,496	-21.57%	-631,035	-18.00%	-2,084	-.20%
1977	-38,784	-13.52%	-107,329	-8.26%	-1,158,983	-19.18%	-361,255	-10.90%	35,086	3.44%
1978	-39,532	-11.56%	-136,463	-9.54%	-1,604,540	-22.75%	-193,070	-5.01%	37,287	3.01%
1979	-44,030	-12.11%	-148,877	-9.38%	-1,118,070	-21.98%	-73,744	-2.15%	-20,712	-1.84%
1980	-35,733	-11.28%	-135,340	-8.97%	-1,145,543	-25.79%	-237,527	-6.21%	-60,515	-5.16%
1981	-30,177	-11.07%	-154,488	-10.94%	-1,627,608	-24.51%	-880,429	-19.15%	-36,440	-3.68%
1982	-19,979	-9.05%	-184,457	-11.40%	-1,890,164	-24.71%	-877,045	-19.23%	7,624	.75%
1983	-15,510	-9.06%	-168,497	-10.39%	-2,101,473	-23.71%	-587,205	-11.42%	2,492	.24%
1984	-25,619	-12.62%	-149,406	-10.43%	-2,368,442	-25.49%	-1,072,223	-20.31%	5,262	.49%
1985	-35,910	-12.92%	-160,407	-10.47%	-1,713,205	-21.13%	-1,162,107	-20.88%	3,122	.28%

NOTES: 1. For the computations, the sugar consumption level for 1982-85 was computed as 1981 level X growth rate of 3%

2. Consumption refers to cotton lint, milled rice, and refined sugar.

SOURCES: computed from tables 6.1. (elasticities), E.7. (consumption) and 3.5. (NRP measured at consumption point).

consumption effects: -3.4 percent in 1965-72, -8.99 percent in 1973-79, and -9.22 percent in 1980-85 for wheat; and -1.27 percent in 1965-72, -2.31 percent in 1973-79, and -3.89 percent in 1980-85 for maize.

Table 6-3
EFFECTS OF TOTAL PRICE INTERVENTION ON CONSUMPTION

(Period averages; percentage change of actual average consumption)

Period	Commodity				
	Cotton	Rice	Wheat	Maize	Sugar
1965-72	-10.66	-5.68	-8.26	-4.26	4.28
1973-79	-12.51	-9.70	-18.99	-7.64	0.11
1980-85	-8.85	-8.69	-20.70	-12.72	1.23

SOURCE: Table 6-2.

Adding substitution effects to the computations would also modify the results, but probably not by much. At this level of aggregation, there is no substitution in demand between cotton and food, or between cereals and sugar, as the available empirical studies demonstrate. Cross-price elasticities of demand are positive at a more disaggregated level, for example between wheat and maize. Alderman and von Braun (1984, p. 80) found significant substitution effects between various types of breads and flours,

between noodles and rice, and between flour and maize.³ The cross-elasticity between the price of wheat flour noodles and demand for maize is about 1.4 in rural areas. The cross-elasticity between the price of wheat flour and demand for rice is around 0.45. Price effects for maize were only significant in rural areas, but the problem of supply simultaneity may have biased the estimates.

DISTRIBUTIONAL IMPACT OF THE FOOD SUBSIDY SYSTEM

It has been established at a more disaggregated level of analysis that the food subsidy system has had a profound impact on income distribution (see, e.g., Abdel-Fadil 1980; Adbel-Khalek and Tignor 1982; Hansen and Radwan 1982). Food subsidies have reduced inequalities in consumption, as shown by the change in the Gini coefficients between 1965 and 1975 in Table 6-4. Causality between a lower Gini coefficient and increased availability of subsidized commodities cannot be determined with certainty, but it is likely that the subsidy system has had an equalizing effect. Alderman and von Braun (1984, p. 28) found that the Gini coefficient of per capita food expenditures in 1981-82 was 0.37 for the urban population and 0.35 for the rural population. When transfers from government distribution are excluded, they show a slight move away from equality, becoming 0.39 and 0.37, respectively. Although there may be problems of comparison with the figures in Table 6-4,

³See also H. Alderman and J. von Braun, Egypt: Implications of Alternative Food Subsidy Policies in the 1980s, Report to the Ford Foundation, April 1985.

we may infer from the data that (1) over time, equality in consumption has increased from the 1960s to the 1970s, then worsened in the 1980s, and (2) the gap between rural and urban population has been reduced and was much smaller in 1982 than in 1965 or 1975.

Table 6-4
INEQUALITY IN CONSUMPTION EXPENDITURES,
URBAN AND RURAL HOUSEHOLDS

(Gini coefficient, 1964-65 and 1974-75)

Expenditures	Urban		Rural	
	1964-65	1974-75	1964-65	1974-75
Total	0.23	0.28	0.18	0.19
Food	0.20	0.20	0.12	0.14
Items included in study:				
1. Subsidized/not rationed				
Wheat flour	0.11	0.06	0.06	0.06
Bread	0.07	0.02	0.20	0.21
2. Subsidized/rationed				
Sugar	0.06	0.11	0.04	0.04
Rice	0.08	0.07	0.13	0.11
3. Neither subsidized nor rationed				
Wheat	0.04	0.11	0.11	0.17
Maize	0.08	0.07	0.10	0.26

SOURCE: CAPMAS Household Expenditure Surveys. Gini coefficients from S. Ismail, B. D. Gardner, and D. Abdou, "The Distribution of Consumption of Basic Food Commodities in the Urban and Rural Areas of Egypt," Department of Agricultural Economics, University of California, Davis.

The most detailed analysis of the impact of the food subsidy system on the welfare of Egyptian households was carried out by IFPRI, based on a survey undertaken in 1981-82 (Alderman and von Braun 1984). No reliable evidence on prices and quantities in various market tiers was available before, so it is difficult to trace the effects of consumer price intervention over time. The IFPRI survey established important facts about the distributional effects of the food subsidy and ration system. At the beginning of the 1980s, average subsidies per capita per year amounted to fE 29.6 in urban areas and to fE 19.7 in rural areas.⁴

The absolute amount of subsidies received was more or less constant as income increased, both in urban and rural areas. About half of the difference in subsidization level between urban and rural areas was caused by the greater quantities of bread available in the cities.

Having access to rationed goods has provided households with significant income transfers not only from the ration system but from other government-controlled food channels. Most households (93 percent) have a ration card, and 95 percent of households have regular access to the four rationed goods (rice, sugar, tea, and oil). Households purchase additional quantities of those goods on the free market. For example, 80 percent of households purchase

⁴This includes all explicit and implicit subsidies on government-supplied flour and bread, on the commodities of the basic ration, the additional ration, purchases from cooperatives, and frozen meat.

sugar from nonrationed sources. Thus, the ration system is mainly a system of transfer of income.

As for bread, because estimated income elasticities are slightly positive, income transfers linked to flour and bread increase as income does. Grain prices are low in part because of import subsidies (wheat) and export taxes (rice). Together with the gains of farmers linked to livestock protection, the overall effect of the subsidy and price system is to equalize incomes and to bias the system toward the rural population.⁵

At the beginning of the 1980s, price intervention, in total, had a progressive effect on the distribution of income, especially for small landholders who were net buyers of cereals (see Tables 6-5 and 6-6). The food distribution system directly controlled by the government, however, has had a regressive effect on incomes. Increased meat consumption in high-income groups basically establishes the progressiveness of price policy for income distribution: the net sum of consumer gains decreases by 4 percent if income decreases by 10 percent. Transfers from the ration system decline as income increases, but transfers from purchases at cooperatives (sugar, tea, oil, and rice) and subsidized bakeries and flour shops increase. The richer households gain more in the aggregate than the poor. A 10-percent increase in income yields

⁵In addition, in rural areas, producer losses in the maize market are compensated for by the implicit producer gains from depressed feed maize prices to the extent that domestically produced maize is fed to animals.

Table 6-5
ON-FARM CONSUMPTION OF FARM'S OWN PRODUCTION
BY FARM SIZE, 1981-82

(in percentage of own production)

Commodity	Size of farm (in feddans)				
	0-1	1-3	3-5	>5	All
Cotton ^a	0	0	0	0	0
Sugarcane ^b	0	0	0	0	0
Wheat ^c	79.5	65.4	62.3	39.6	59.7
Maize ^c	68.5	62.9	63.9	49.1	62.4
Rice ^c	29.2	21.9	26.2	22.8	24.1

^aAssumes that all cotton produced is marketed.

^bAssumes that all sugarcane produced is sold to sugar mills, although there is evidence that some cane is consumed fresh on the farm (less than 10 percent in Minya Governorate. See IFAD, Minya Agricultural Development Project, Project File Working Papers, January 1983).

^cData from the 1981-82 IFPRI Survey (see Alderman and von Braun 1984, Table 25, p. 54). Figures in Table 6-5 overestimate marketing because it includes human consumption only and not cereals used as animal feed.

a 0.42-percent increase in income transfer incorporated in the directly managed distribution system.

The overall effects of the food price and subsidy policy at the beginning of the 1980s show a rural bias, whereas subsidies transferred by government-controlled food marketing show a moderate urban bias. Over time, as the food price and subsidy system was

extended to rural areas, it contributed to redressing the urban bias implicit in government policies during the 1960s and 1970s. On the whole, it has had an equalizing effect. Today, the inhabitants of big cities (greater Cairo and Alexandria) are not more subsidized by the system than people in small cities, and small villages are not less subsidized than large villages. The net transfers received by people living in remote areas of the country are somewhat smaller than those received by people in more accessible areas. This is largely an effect of the prices on the open market, although the government system balances a good deal of this comparative disadvantage. Large households and households with a large proportion of small children are less supported by the system. The income transfer accrued by nonagricultural wage earning households was significantly higher than the transfer accrued by those that did not earn wages.

Table 6-6
PRODUCTION, SALE, AND CONSUMPTION OF CEREALS BY FARM SIZE, 1981-82

(In kg/person/year, wheat grain equivalent)

Activity	Size of farm (in feddans)			
	0-1	1-3	3-5	>5

WHEAT				
Production (wheat)	30.1	87.5	96.4	210.6
Consumption subsidized flour & bread	120.1	67.0	51.3	40.5
Sales to market	3.7	18.9	21.7	86.5
Human consumption	232.3	203.0	184.4	183.0
	----- net buyers -----		----- net sellers -----	

MAIZE				
Production (white)	41.2	78.1	63.4	84.4
Purchase of subsidized (yellow)	2.5	3.3	1.8	8.2
Sales to market	3.0	3.8	6.0	18.2
Human consumption	53.1	71.5	57.2	55.4
	net buyers		---- self-sufficient ---	net sellers

RICE				
Production	10.9	70.9	144.0	214.0
Purchase:				
Ration	6.5	5.8	4.8	4.3
add.rat.	0.7	0.8	0.2	0.8
Sales	6.5	48.3	93.8	136.5
Consumption	24.9	37.4	52.3	63.7
	net buyer		----- net sellers -----	

SOURCE: Alderman and von Braun (1984).

Chapter 7

EFFECTS OF PRICE INTERVENTION ON FOREIGN EXCHANGE EARNINGS

This chapter assesses the effects of changes in prices of agricultural outputs and inputs on Egypt's foreign exchange earnings.

EFFECTS OF CHANGES IN PRICES OF AGRICULTURAL PRODUCTS

Let us examine first the short-run effects on foreign exchange earnings of removing total price intervention in markets for agricultural outputs.

The change in foreign exchange earnings resulting from removing all price intervention on agricultural outputs is defined as the change in the volume of net exports of the commodity multiplied by its border price evaluated at the equilibrium exchange rate, expressed in U.S. dollars. It is equal to the amount of foreign exchange earned by an increase in exports or saved by a decrease in imports. Net exports are defined as production minus consumption of the product. The change in net exports is the algebraic sum of the change in output and the change in consumption of the product.

The short-run impact on production of removing total price intervention on crop i has two components. The first is the effect of changes in the own price of crop i , lagged one year (because

price changes are announced after planting).¹ The second component is the cross-price effects measuring the short-run impact of removing total price intervention on crop *i* on the output of crop *j*.²

The short-run impact on consumption of removing total price intervention on crop *i* also has two components, but cross-price consumption effects are not taken into account because of the lack of adequate estimates of cross-price elasticities for consumption. Own-price consumption effects, computed in chapter 6, measure the change in consumption resulting from a change in the consumer price of the crop in the same period, because consumers adapt their purchases to price changes in the short run. More formally, the short-run change in foreign exchange earnings (expressed in U.S. dollars) in period *t* resulting from removing total price intervention is computed in this section as follows:

$$dFX_i^t = dFXX_i^t + dFXC_i^t \quad (1)$$

¹The results shown in Tables 7-1 to 7-4 are equivalent to the results in Appendix Table J-3, because the same own-price elasticities are used. The small differences between the results in the two sets of tables are caused by rounding-off errors.

²This is not comparable to the cross-price effects described in Tables J-1 to J-4, because these tables measure the reverse--namely, the short-run impact of removing price intervention of crop *j* on the output of crop *i*.

with

$$dFXX_i^t = (P_{it}^w v_i^t e_{ji} ERP_i^{t-1} X_i^{ot}) + \text{SUM}_j (P_{jt}^w v_i^t e_{ji} ERP_i^{t-1} X_j^{ot}) \quad (2)$$

and

$$dFXC_i^t = P_{ti}^{wc} E_{ii} NRP_i^t C_i^{ot} \quad (3)$$

where

- $dFXX_{it}$ = change in foreign exchange earnings caused by changes in production resulting from price changes in crop i
- $dFXC_i^t$ = change in foreign exchange earnings caused by changes in consumption resulting from price changes in crop i
- dX_j = change in output of crop j (for all j including j=i) caused by a change in price of crop i
- dC_i = own-price-induced change in consumption caused by change in price of crop i
- P_{ti}^w = border price of crop i at farmgate (evaluated at equilibrium exchange rate) expressed in US\$
- P_{ti}^{wc} = border price of crop i at consumption point (evaluated at equilibrium ER) expressed in US\$
- v_i^t = ratio of value added to price of crop i
- e_{ji} = supply elasticity of crop j with respect to price of crop i (for all j including j=i)
- E_{ii} = demand elasticity of crop i with respect to own-price
- NRP_i^t = nominal rate of protection of crop i (border price measured at consumption point)
- ERP_i^{t-1} = effective rate of protection of crop i lagged one period
- X_i^{ot} = level of output of crop i at actual producer prices
- C_i^{ot} = level of consumption of crop i at actual consumer prices.

The computation of Equation 1 for the five crops uses data from the following sources. Border-price equivalents are from Tables C-7 to C-11 (at farmgate) and D-7 to D-11 (at consumption point). They were converted to U.S. dollars at the equilibrium

exchange rate. Nominal rates of protection at the consumer level are from Table 3-5. Effective rates of protection (short run) are computed from the data in Appendix F. Ratios of value added to price were constructed with the data in Appendix F and Appendix C.³ Production and consumption data are taken from Appendix Tables E-1 and E-7. Merchandise imports and exports in U.S. dollars are from Table G-3. Finally, the supply and demand elasticities are from chapters 4 and 6. The short-run supply elasticities used here are derived from Table 4-1. They are obtained by multiplying the long-run elasticities by the coefficient of adjustment. The short-run own-price demand elasticities are those of Table 6-1.

The results of the computations are shown in Tables 7-1 to 7-5, showing separately, for each crop, the own-price effect on the production of the crop, the cross-price effects on the production of competing crops (except for sugarcane, because cross-price elasticities are zero), the own-price effect on the consumption of the crop, and the sum of those effects, expressed in foreign currency and as a percentage of total exports (for exportables) or imports (for importables). Table 7-6 presents the combined effects on foreign exchange, expressed in U.S. dollars and as a percentage of total exports, of a removal of total price intervention on all five crops.

³The ratio of value added to price used for the calculations is computed at prevailing domestic prices. It would increase considerably (up to an average of .90 to .95) if computed at border prices.

Table 7.1. FOREIGN EXCHANGE EFFECTS OF REMOVAL OF TOTAL PRICE INTERVENTIONS ON COTTON.

	Output Effects (in Tons).				Consumption Effects (in Tons).
	Own- Price	Cross- Price	Cross- Price	Cross- Price	Own- Price
	Cotton	Cotton/ Rice	Cotton/ Wheat	Cotton/ Maize	Cotton
1965	199,805	-196,428	112,885	-321,079	-16,000
1966	173,278	-207,352	144,046	-393,564	-6,550
1967	170,948	-286,087	124,318	-348,392	-9,332
1968	180,694	-325,469	144,871	-363,122	-12,935
1969	199,356	-264,997	98,799	-349,512	-26,877
1970	204,960	-297,380	147,528	-393,419	-20,683
1971	212,892	-295,086	175,721	-390,796	-16,181
1972	240,497	-308,074	168,315	-429,979	-20,857
1973	191,409	-233,844	171,996	-395,278	-22,789
1974	203,646	-282,515	206,040	-520,064	-22,408
1975	186,889	-338,563	230,126	-547,383	-21,824
1976	188,377	-303,523	185,037	-562,249	-23,912
1977	208,977	-297,775	159,919	-480,556	-38,784
1978	263,992	-349,608	208,314	-583,669	-39,532
1979	247,405	-306,110	160,808	-473,269	-44,030
1980	240,053	-290,839	175,261	-585,588	-35,733
1981	205,491	-249,049	169,291	-501,692	-30,177
1982	171,377	-266,882	133,025	-490,726	-19,979
1983	129,956	-229,918	123,797	-447,893	-15,510
1984	130,672	-203,841	117,327	-466,738	-25,619
1985	-116,664	278,589	109,744	273,112	-35,910

	Foreign Exchange Effects (in Millions of US\$)			Foreign Exchange Effects (in Percent of Total Exports):		
	Own- Price	Cross- Price	Total	Own- Price	Cross- Price	Total
1965	86.88	-41.63	45.24	15.32%	-7.34%	7.98%
1966	63.18	-45.84	17.33	10.58%	-7.68%	2.90%
1967	92.17	-56.37	35.80	15.49%	-9.47%	6.02%
1968	76.07	-70.85	5.22	11.46%	-10.67%	.79%
1969	111.03	-58.94	52.09	15.11%	-8.02%	7.09%
1970	106.53	-50.10	56.43	13.04%	-6.13%	6.91%
1971	106.89	-45.33	61.57	12.56%	-5.33%	7.23%
1972	125.44	-50.44	74.99	15.43%	-6.20%	9.22%
1973	207.55	-74.10	133.45	20.76%	-7.41%	13.35%
1974	277.57	-247.30	30.28	16.60%	-14.79%	1.81%
1975	235.67	-252.34	-16.66	15.04%	-16.10%	-1.06%
1976	212.84	-189.59	23.25	13.23%	-11.78%	1.45%
1977	359.66	-126.28	233.38	18.22%	-6.40%	11.82%
1978	285.26	-174.34	110.92	14.71%	-8.99%	5.72%
1979	335.11	-129.16	205.94	13.82%	-5.33%	8.50%
1980	304.18	-177.22	126.96	7.89%	-4.60%	3.29%
1981	260.06	-202.83	57.23	6.50%	-5.07%	1.43%
1982	161.31	-220.66	-59.35	4.02%	-5.49%	-1.48%
1983	127.50	-130.98	-3.48	3.45%	-3.55%	-.09%
1984	198.41	-144.52	53.89	5.13%	-3.74%	1.39%
1985	-14.77	154.53	139.76	-.39%	4.03%	3.64%

Table 7.2. FOREIGN EXCHANGE EFFECTS OF REMOVAL OF TOTAL PRICE INTERVENTIONS ON RICE.

	Output Effects (in Tons).				Consumption Effects (in Tons).
	Own- Price	Cross- Price	Cross- Price	Cross- Price	Own- Price
	Rice	Rice/ Cotton	Rice/ Wheat	Rice/ Maize	Rice
1965	264,649	-175,271	101,068	211,748	-71,547
1966	241,661	-131,486	111,562	224,521	-54,341
1967	315,888	-122,896	91,219	188,298	-19,366
1968	280,745	-101,481	83,042	153,320	-64,902
1969	327,581	-160,452	81,161	211,487	-65,855
1970	317,582	-142,512	104,697	205,657	-60,458
1971	274,062	-128,735	108,452	177,661	-66,836
1972	273,556	-139,040	99,318	186,888	-67,885
1973	231,538	-123,395	113,170	191,577	-77,744
1974	263,867	-123,839	127,882	237,762	-166,165
1975	384,944	-138,350	173,876	304,644	-178,432
1976	353,154	-142,705	143,069	320,217	-140,000
1977	338,080	-154,478	120,655	267,066	-107,329
1978	280,714	-138,010	111,152	229,399	-136,463
1979	328,044	-172,623	114,519	248,259	-148,877
1980	317,918	-170,847	127,310	313,327	-135,340
1981	274,800	-147,626	124,131	270,964	-154,488
1982	338,413	-141,488	112,092	304,586	-184,457
1983	324,566	-119,444	116,133	309,490	-168,497
1984	248,342	-103,652	94,989	278,340	-149,406
1985	75,103	-47,533	307,461	358,889	-160,407

Foreign Exchange Effects
(in Millions of US\$)

Foreign Exchange Effects
(in Percent of Total Exports)

	Own- Price	Cross- Price	Total	Own- Price	Cross- Price	Total
1965	44.27	-36.55	7.72	7.81%	-6.45%	1.36%
1966	40.52	-17.72	22.80	6.79%	-2.97%	3.82%
1967	46.50	-34.96	11.54	7.82%	-5.88%	1.94%
1968	60.51	-18.19	42.32	9.11%	-2.74%	6.37%
1969	60.97	-42.23	18.74	8.30%	-5.75%	2.55%
1970	41.27	-35.52	5.75	5.05%	-4.35%	.70%
1971	34.88	-30.14	4.74	4.10%	-3.54%	.56%
1972	36.01	-35.19	.81	4.43%	-4.33%	.10%
1973	64.78	-63.81	.98	6.48%	-6.38%	.10%
1974	316.47	-45.19	271.27	18.93%	-2.70%	16.22%
1975	336.36	-33.21	303.14	21.47%	-2.12%	19.35%
1976	187.65	-29.13	158.52	11.66%	-1.81%	9.85%
1977	115.47	-112.39	3.08	5.85%	-5.69%	.16%
1978	140.91	-49.06	91.85	7.27%	-2.53%	4.74%
1979	152.85	-111.06	41.78	6.31%	-4.58%	1.72%
1980	158.53	-57.98	100.55	4.11%	-1.50%	2.61%
1981	197.22	-24.40	172.82	4.93%	-.61%	4.32%
1982	256.25	9.64	265.89	6.38%	.24%	6.62%
1983	173.52	-6.94	166.59	4.70%	-.19%	4.51%
1984	120.16	-13.37	106.80	3.11%	-.35%	2.76%
1985	75.79	85.03	160.83	1.98%	2.22%	4.19%

Table 7.3. FOREIGN EXCHANGE EFFECTS OF REMOVAL OF TOTAL PRICE INTERVENTIONS ON WHEAT.

	Output Effects (in Tons).				Consumption Effects (in Tons).
	Own- Price	Cross- Price	Cross- Price	Cross- Price	Own- Price
	Wheat	Wheat/ Cotton	Wheat/ Rice	Wheat/ Maize	Wheat
1965	207,786	-52,404	52,355	204,190	-368,790
1966	178,003	-30,510	37,102	168,027	-398,692
1967	124,451	-24,384	41,469	120,495	-131,966
1968	138,900	-24,685	45,185	120,285	-264,411
1969	97,160	-27,934	37,735	118,751	-196,990
1970	118,128	-23,384	34,479	108,837	-162,785
1971	13,353	-2,305	3,247	10,260	-485,558
1972	163,558	-33,299	43,348	144,356	-323,436
1973	158,146	-25,077	31,134	125,569	-160,299
1974	64,058	-9,021	12,718	55,862	-1,120,165
1975	348,370	-40,312	74,213	286,290	-1,204,272
1976	230,372	-33,418	54,718	241,846	-1,261,496
1977	249,039	-46,370	67,147	258,554	-1,158,983
1978	172,038	-31,065	41,808	166,537	-1,604,540
1979	176,052	-38,594	48,527	179,012	-1,118,070
1980	164,013	-32,009	39,411	189,332	-1,145,543
1981	243,625	-42,136	51,897	249,439	-1,627,608
1982	249,180	-45,741	72,388	317,585	-1,890,164
1983	325,471	-48,683	87,527	406,833	-2,101,473
1984	229,379	-36,401	57,705	315,259	-2,368,442
1985	157,609	-70,523	81,545	433,577	-1,713,205

	Foreign Exchange Effects (in Millions of US\$)			Foreign Exchange Effects (in Percent of Total Imports)		
	Own- Price	Cross- Price	Total	Own- Price	Cross- Price	Total
1965	43.75	4.66	48.42	4.56%	.49%	5.05%
1966	41.07	7.52	48.60	4.31%	.79%	5.10%
1967	19.43	3.80	23.23	2.03%	.40%	2.43%
1968	26.56	7.75	34.31	3.13%	.91%	4.04%
1969	18.73	3.44	22.18	1.95%	.36%	2.31%
1970	16.45	2.10	18.56	1.38%	.18%	1.56%
1971	34.91	.18	35.08	2.81%	.01%	2.82%
1972	35.12	1.67	36.79	2.73%	.13%	2.86%
1973	31.60	.91	32.52	2.01%	.06%	2.07%
1974	314.31	10.82	325.13	9.81%	.34%	10.15%
1975	320.14	60.56	380.70	7.41%	1.40%	8.81%
1976	251.25	40.27	291.52	5.97%	.96%	6.93%
1977	194.61	5.89	200.50	4.34%	.13%	4.47%
1978	259.10	17.14	276.24	4.92%	.33%	5.24%
1979	145.18	1.29	146.47	2.18%	.02%	2.20%
1980	274.52	23.68	298.20	3.63%	.31%	3.94%
1981	463.02	53.81	516.83	5.26%	.61%	5.87%
1982	519.38	85.65	605.03	6.05%	1.00%	7.04%
1983	473.26	66.89	540.15	5.67%	.80%	6.47%
1984	516.60	56.77	573.36	5.07%	.56%	5.63%
1985	394.03	29.33	423.36	4.25%	.32%	4.57%

Table 7.4. FOREIGN EXCHANGE EFFECTS OF REMOVAL OF TOTAL PRICE INTERVENTIONS ON MAIZE.

	Output Effects (in Tons).				Consumption Effects (in Tons).
	Own- Price	Cross- Price	Cross- Price	Cross- Price	Own- Price
	Maize	Maize/ Cotton	Maize/ Rice	Maize/ Wheat	Maize
1965	209,516	-66,036	48,281	90,466	-304,067
1966	237,572	-52,977	47,146	106,789	-162,889
1967	148,487	-36,902	45,928	65,073	346,883
1968	16,626	-4,190	5,613	8,146	-107,620
1969	184,627	-53,337	52,727	64,096	-166,920
1970	163,070	-43,028	46,429	75,099	-97,203
1971	149,773	-41,325	42,599	82,709	-218,108
1972	202,997	-57,507	54,785	97,591	-113,945
1973	133,224	-32,675	29,687	71,194	147,385
1974	17,135	-3,398	3,506	8,337	-341,312
1975	66,583	-11,514	15,512	34,378	-379,681
1976	242,871	-41,214	49,386	98,164	-631,035
1977	319,535	-70,378	74,581	130,593	-361,255
1978	47,617	-10,908	10,743	20,872	-193,070
1979	168,217	-44,538	40,983	70,196	-73,744
1980	110,603	-22,964	20,691	40,654	-237,527
1981	99,938	-20,733	18,687	41,416	-880,429
1982	396,372	-70,110	81,198	131,960	-877,045
1983	365,343	-53,689	70,642	124,017	-587,205
1984	26,832	-3,805	4,414	8,284	-1,072,223
1985	318,882	-51,868	59,973	115,917	-1,162,107

	Foreign Exchange Effects (in Millions of US\$)			Foreign Exchange Effects (in Percent of Total Imports)		
	Own- Price	Cross- Price	Total	Own- Price	Cross- Price	Total
1965	40.73	-10.05	30.68	4.25%	-1.05%	3.20%
1966	29.69	-3.09	26.60	3.12%	-.32%	2.79%
1967	-14.01	-5.65	-19.66	-1.47%	-.59%	-2.06%
1968	8.56	.07	8.63	1.01%	.01%	1.02%
1969	25.71	-8.88	16.84	2.67%	-.92%	1.75%
1970	18.47	-7.66	10.81	1.55%	-.64%	.91%
1971	28.13	-6.34	21.78	2.26%	-.51%	1.75%
1972	24.02	-10.73	13.30	1.87%	-.83%	1.03%
1973	-.45	-12.75	-13.19	-.03%	-.81%	-.84%
1974	68.32	1.31	69.63	2.13%	.04%	2.17%
1975	82.25	5.63	87.88	1.90%	.13%	2.03%
1976	166.51	1.52	168.03	3.96%	.04%	3.99%
1977	104.00	-41.08	62.92	2.32%	-.92%	1.40%
1978	36.43	-1.49	34.93	.69%	-.03%	.66%
1979	27.20	-18.66	8.53	.41%	-.28%	.13%
1980	66.73	-4.40	62.33	.88%	-.06%	.82%
1981	256.53	.52	257.06	2.92%	.01%	2.92%
1982	321.64	22.45	344.09	3.74%	.26%	4.01%
1983	160.05	10.05	170.10	1.92%	.12%	2.04%
1984	239.85	-.70	239.16	2.36%	-.01%	2.35%
1985	246.39	-11.17	235.22	2.66%	-.12%	2.54%

Table 7.5. FOREIGN EXCHANGE EFFECTS OF REMOVAL OF TOTAL PRICE INTERVENTIONS ON SUGARCANE.

	Output Effects (in Tons).		Consumption Effects (in Tons).	
	Own-Price		Own-Price	
	Sugarcane		Sugar	
1965	175,963		27,447	
1966	N/A		44,411	
1967	N/A		78,348	
1968	N/A		44,225	
1969	N/A		18,199	
1970	N/A		20,037	
1971	-931,253		5,614	
1972	114,645		-14,320	
1973	381,486		18,836	
1974	-181,653		-31,008	
1975	574,043		-21,195	
1976	518,141		-2,084	
1977	306,533		35,086	
1978	-493,208		37,287	
1979	-419,829		-20,712	
1980	274,646		-60,515	
1981	628,603		-36,440	
1982	380,103		7,624	
1983	-203,667		2,492	
1984	-353,720		5,262	
1985	-1,585,055		3,122	
Foreign Exchange Effects				
	Millions of US\$		Percent of Total Imports	
1965	-3.15		-.33%	
1966	-4.17		-.44%	
1967	-7.65		-.80%	
1968	-4.28		-.50%	
1969	-2.27		-.24%	
1970	-2.81		-.24%	
1971	-5.30		-.43%	
1972	4.42		.34%	
1973	-2.38		-.15%	
1974	11.57		.36%	
1975	34.93		.81%	
1976	11.72		.28%	
1977	-5.02		-.11%	
1978	-14.82		-.28%	
1979	-2.09		-.03%	
1980	61.66		.81%	
1981	40.81		.46%	
1982	3.99		.05%	
1983	-3.82		-.05%	
1984	-4.70		-.05%	
1985	-13.89		-.15%	

NOTE: N/A where border prices are negative.

Analysis of Results. The overall results of Table 7-6 indicate that if total price intervention had been removed, the annual improvement in the foreign exchange position of the country would have averaged 22.75 percent of the value of total exports. The improvement would have been substantial except for years in which world prices were much above their historical trend. These results were obtained with the elasticities in Tables 4-1 and 6-1. We noted in chapter 6 that demand elasticities for cereals were high. If lower demand elasticities for wheat and maize (0.13 for each) are used, increased earnings average less than 20 percent of total exports.

Still, even with lower response in demand, it appears that the combined impact of removing intervention on all five crops at the same time would have been substantial, especially during the 1974-75 period. However, these results are valid only for years in which changes in nominal and effective rates of protection were moderate. Price changes in many instances are not marginal changes, because they sometimes exceed 100 percent, and in those instances the computations become meaningless.⁴ Between 1973 and 1974, for example, world prices of rice, wheat, maize, and sugar increased by 229 percent, 185 percent, 90 percent, and 163 percent, respectively, yielding increases in border-price equivalents for producers of 98 percent, 160 percent, 68 percent, and 498 percent, respectively.

⁴The same comment applies, of course, to the results in chapters 4 and 6.

Table 7.6. FOREIGN EXCHANGE EFFECTS OF TOTAL PRICE INTERVENTIONS.

	--(in Millions of US\$)--			--(in Percent of Exports)--		
	Own- Price	Cross- Price	Total	Own- Price	Cross- Price	Total
1965	212.48	-83.57	128.91	37.47%	-14.74%	22.74%
1966	170.30	-59.14	111.16	28.53%	-9.91%	18.62%
1967	136.43	-93.18	43.25	22.93%	-15.66%	7.27%
1968	167.42	-81.22	86.21	25.21%	-12.23%	12.98%
1969	214.18	-106.61	107.57	29.14%	-14.50%	14.64%
1970	179.91	-91.17	88.74	22.02%	-11.16%	10.86%
1971	199.51	-81.64	117.87	23.44%	-9.59%	13.85%
1972	225.01	-94.69	130.32	27.68%	-11.65%	16.03%
1973	301.11	-149.74	151.37	30.11%	-14.97%	15.14%
1974	988.24	-280.36	707.87	59.11%	-16.77%	42.34%
1975	1,009.35	-219.36	789.99	64.41%	-14.00%	50.41%
1976	829.96	-176.93	653.04	51.58%	-11.00%	40.59%
1977	768.71	-273.85	494.86	38.94%	-13.87%	25.07%
1978	706.86	-207.75	499.11	36.45%	-10.71%	25.74%
1979	658.24	-257.60	400.63	27.16%	-10.63%	16.53%
1980	865.62	-215.92	649.70	22.46%	-5.60%	16.86%
1981	1,217.65	-172.90	1044.75	30.45%	-4.32%	26.13%
1982	1,262.57	-102.91	1159.65	31.43%	-2.56%	28.87%
1983	930.51	-60.97	869.54	25.20%	-1.65%	23.55%
1984	1,070.32	-101.81	968.51	27.70%	-2.63%	25.06%
1985	687.55	257.73	945.28	17.92%	6.72%	24.64%

SOURCES for Tables 7.1.-7.6.

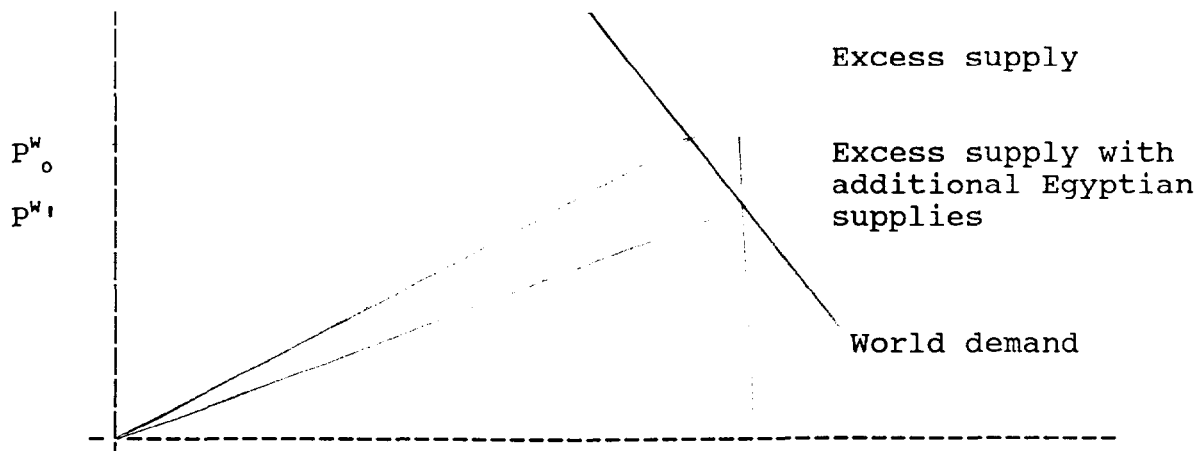
- 1) Border prices (producer and consumer) at E* from Appendices C and D (LE/ton).
Converted to US\$ at equilibrium exchange rate.
- 2) Value added/Farmgate price from Appendix F.
- 3) ERP* (Effective Rate of Protection for short run for total intervention
= (VA - VA*) / VA*, from Appendix F.
- 4) NRP* (Nominal Rate of Protection at consumption point), from table 3.5.
- 5) Production (in tons) from Table E.1.
- 6) Consumption (in Tons) from Table E.7. Raw Cotton converted to lint;
Paddy converted to milled rice; Sugarcane converted to refined sugar.
- 7) Exports (FOB) and Imports (CIF), in US\$ million, from Table 1.7.
- 8) Supply and Demand Elasticities from Tables 4.1. and 6.1.

NOTE: Figures refer to the short run effects of total price interventions for cotton, rice, wheat, maize and sugar on foreign exchange earnings. Cross-price effects do not include substitution in consumption.

Foreign Exchange Effects of Cotton Price Policy. The computations for cotton assume that Egypt faces a perfectly elastic demand for its cotton exports. But because Egypt has some monopoly power in the world market for extra-long-staple cotton, the FOB price is not the appropriate reference price for calculating the border-price equivalent. Liberalizing cotton prices would increase output, reduce domestic consumption, and increase exports, thereby increasing foreign exchange earnings. But, if the demand elasticity facing Egypt is less than infinity, the world price will fall (see Figure 7-1).

The true change in foreign exchange earnings therefore would be $P_w'(dX + dC)$, where P_w' is the price facing Egypt at the expanded level of exports. The gain in foreign exchange would be overstated by using P_w^0 (the FOB price), and the effective rate of protection used in the computations also would be biased upward, because P_w^0 is taken as invariant in the reference price.

Figure 7-1
WORLD MARKET FOR COTTON



The extent to which foreign exchange gains are overstated depends on the excess demand elasticity for Egyptian cotton. The excess demand elasticity is a function of Egypt's share of the world market, of the supply elasticity in the rest of the world, and of the demand elasticity for Egyptian cotton. The share of Egypt in the world market was 43 percent for extra-long-staple cotton in 1970-77. Monke and Taylor (1982) have estimated world demand elasticity for Egyptian cotton as low in the short run (-0.27) but as increasing in the long run (-1.69).⁵ They conclude that markets for different staple lengths are not independent but rather are a single market, because the premiums for different varieties are relatively constant over time, which explains partly the low value of the elasticity.

In conclusion, the results shown in Table 7-1 are overstated. If price liberalization were to raise excess supply of Egyptian cotton by, say, 45 percent, then the world price would be expected to decline by 30 percent, assuming an excess demand elasticity of -1.5. A first order correction would be to reduce the foreign exchange gains by this amount. In general, the correction required would be

⁵Monke and Taylor (1982) gave data for 1960-80 for long-staple and extra-long-staple cotton; quoted in Chutikamoltham (1985), "Cotton Pricing in Egypt." Chutikamoltham's review of studies estimating world demand for Egyptian cotton indicates that the long-run demand elasticity estimated by various authors is in the -1.24 to -1.77 range. Monke and Taylor (1982) was the only study reviewed that estimated the short-run elasticity of demand for cotton.

$$dFX'_c = dFX^0_c \left(1 - \frac{((dX+dC)/E_0) * 100}{e_x} \right)$$

where e_x is the excess demand elasticity for cotton.

Foreign Exchange Effects of Food Aid. Liberalizing wheat prices (assuming that the exchange rate is at its equilibrium value and that there are no trade distortions), as the results in Table 7-3 show, would sharply increase domestic output and decrease domestic consumption of wheat. In such a scenario, the demand for wheat imports would be sharply reduced as a result of both supply and demand effects. Because food aid shipments to Egypt were high during the 1960-85 period, we must ask how food aid would respond if prices were liberalized.⁶ Let us consider three possible cases.

Case 1: If all the adjustment took place in the form of reduced commercial imports, the change in foreign exchange caused by removing total wheat price intervention would be as measured in Table 7-3--namely, $dFX_w = P^w (dX + dC)$, where P^w is the average import price paid by Egypt, dX is the change in production, and dC is the change in consumption.

Case 2: With reduced need for imports, donors may reduce their aid flows. This would lead to an adjustment in commercial imports, so that the effect now would be $dFX_w = P^w (dX + dC + AID_0 - AID_1)$, where $AID_0 - AID_1$ is the difference between

⁶See Appendix O presenting the history of food aid during this period.

preliberalization and postliberalization levels of food aid.

Case 3: As a result of removing intervention, the domestic price of wheat to consumers would rise, leaving some consumers with lower real incomes.⁷ Donors, in this scenario, are assumed to respond to the need for support of low-income households to compensate for the rise in consumer prices. In this case, the level of food aid would increase. The result then would be $dFX_w = P^w (dX + dC + AID_0 - AID_1)$, but in this case, $AID_0 < AID_1$. This case could arise as part of a negotiated package with donors in which Egypt would agree to remove or reduce distortions in the wheat market in exchange for increased wheat aid shipments.

In the absence of knowledge about the policy reaction of donors, the results of Table 7-3 assume no change in aid flows (Case 1) to calculate the foreign exchange impact of wheat price liberalization.⁸

EFFECTS OF CHANGES IN AGRICULTURAL INPUT PRICES

Several traded agricultural inputs, such as fertilizer, pesticides, fuel, and machinery, are used in producing the five crops considered in this study. Their import (or export in the case of petroleum derivatives) is generally under government

⁷The true effect will depend on the incidence of the subsidy cost.

⁸Case 1 (as well as Case 3) assume that there still would be no rationing of wheat (bread)--that is, a continuation of the policy pursued so far.

control. As described in chapter 2, these inputs are largely allocated administratively and, in some cases, at prices highly subsidized to producers. Table 7-7 presents selected data on the amount of input subsidies paid by the government.

At these subsidized prices there is rationing, so producers are not on their input demand curves. Consequently, removing price intervention on the demand side would not necessarily cause the quantity traded (imported or exported) to vary greatly, and it is not clear whether it would necessarily decrease or increase. Thus, the foreign exchange effects of removing intervention on agricultural input prices are uncertain and not likely to be large, and therefore they have not been included in this study.

As an illustration of the general situation in agricultural input markets, let us take the case of fertilizer, described diagrammatically in Figure 7-2.

Table 7-7
SUBSIDIES ON AGRICULTURAL INPUTS

(in millions of Egyptian pounds)

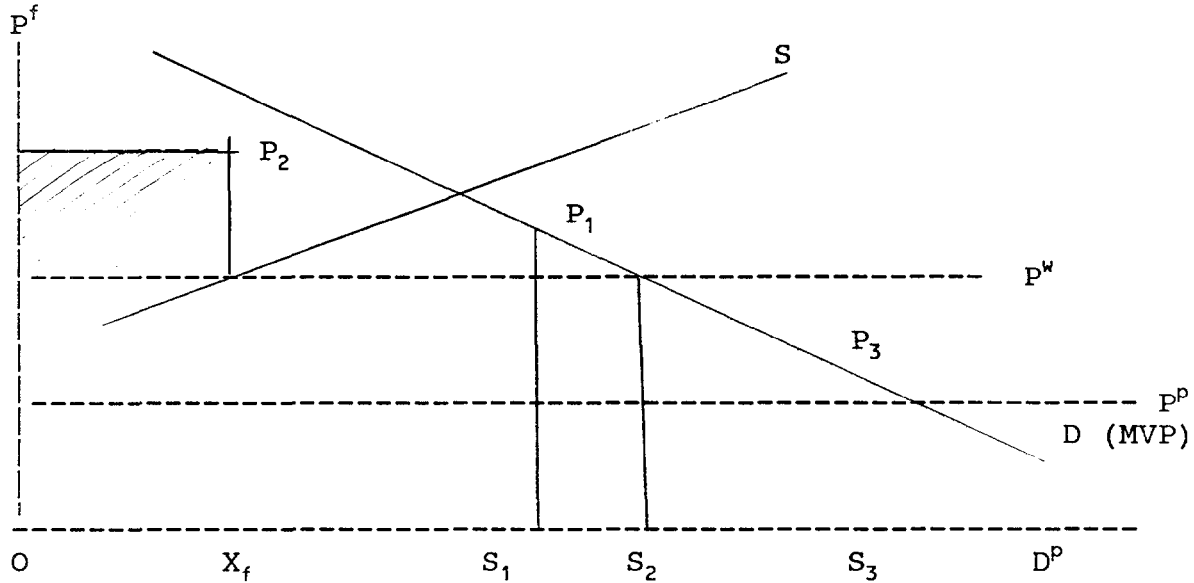
Year	Total ^a	Fertilizer ^b	Pesticide ^c
1965	-2	-1.7	n.a.
1966	-1	-1.0	n.a.
1967	-3	-3.1	n.a.
1968	-6	-6.4	n.a.
1969	-4	-4.1	n.a.
1970	-3	-8.8	11.6
1971	-4	-13.0	11.6
1972	12	0.8	11.7
1973	13	0.2	12.6
1974	12	0.3	11.5
1975	81.5	69.8	27.6
1976	34.2	32.9	20.0
1977	34.7	13.7	25.0
1978	38.3	n.a.	n.a.
1979	101.1	n.a.	n.a.
1980	119.1	n.a.	n.a.
1981	227.9	n.a.	n.a.
1982	159.1	n.a.	n.a.
1983	142.2	n.a.	n.a.
1984	135.2	n.a.	n.a.

^aData for 1965-74 are total agricultural input subsidies in the government budget, from von Braun and de Haen (1983), p. 28. Data for 1975-81 are subsidies paid by the Agricultural Stabilization Fund (for fertilizers and pesticides), from World Bank (1983a), p. 140; data from 1983-84 from World Bank (1986a); 1984 data are preliminary.

^bSubsidies on locally produced and imported fertilizers are from Cuddihy (1980), pp. 60, 152.

^cSubsidies on pesticides for cotton are from Cuddihy (1980), p. 152.

Figure 7-2
THE MARKET FOR FERTILIZER IN EGYPT



Domestic production of fertilizer, X_f , plus imports equals the total quantity supplied. If total supply is, say, S_2 , then world price $P^w = MVP$ (marginal value product), and there is excess demand at the subsidized producer price P^p . Internal reallocation of fertilizer through the black market will raise the effective producer price until it reaches P^w , corresponding to quantity S_2 . The average price paid by farmers then will be between P^w and P^p . The fertilizer subsidy $P^w - P^p$ is simply a transfer to farmers who have access to the input at price P^p . Removing intervention (i.e., eliminating the subsidy) would not lead to foreign exchange savings for the country because expenditures on imported fertilizer in U.S. dollars would still be $P^w(S_2 - X_f)$.

The only reason to expect a change in foreign exchange earnings or expenditures on fertilizer would be if imports were currently such that at the total quantity supplied, the MVP was not equal to P^w . Let us examine two possible cases: First, suppose that imports were $(S_1 - X_f)$. Then $P^w < MVP$, and there would be a shortage of fertilizer. Removing controls would lead to a rise in imports by an amount $S_2 - S_1$, as demand for fertilizer expanded until $P^w = MVP$. Second, the reverse would be the case if imports were $(S_3 - X_f)$.

In fact, a change in foreign exchange earnings can arise only if the current level of imports is such that there is excess demand at P^w so that at S_1 the effective price on the black market exceeds the world price (e.g., $P_1 > P^w$), or if there is excess supply (wastage) at S_3 where $P_3 < P^w$.⁹ One would expect political pressure from farmers to lead to a level of imports close to $(S_2 - X_f)$. Any divergence from that level will create pressure to increase or decrease imports. Therefore, on the demand side, the foreign exchange impact is likely to be small.

The discussion has centered so far on the effects of movements along the MVP for inputs. The economic reasoning would not change if the derived demand schedule for fertilizer shifted to the right

⁹Empirical observation suggests that Egyptian farmers currently use excessive quantities of fertilizer at prices that are below international equivalents. If subsidies were removed, it is likely that waste would be reduced. Yields could increase through improved cropping practices, as suggested by extension advice. See International Fund for Agricultural Development (1986).

as crop output increased as a result of crop price liberalization.¹⁰

On the supply side, because fertilizer production is currently subsidized (protected), removing subsidies or tariffs would mean that producers would face the world price P^w .¹¹ If the current system of protection was such that producers are off the supply curve at P_2 , say, then again there would be no necessary change in output and hence, in imports and in foreign exchange costs.

¹⁰Grant Scobie, in comments on an earlier draft, suggested using the input coefficients in Appendix F to estimate the effects of crop price liberalization on the demand for inputs, given the output changes computed in chapter 4.

¹¹The Egyptian government agreed in 1987 not to increase the nominal value of input subsidies in the context of the Agricultural Production and Credit Project (Project 263-0202) financed by USAID.

Chapter 8

EFFECTS OF PRICE INTERVENTION ON THE GOVERNMENT BUDGET

This chapter treats the budgetary effects of pricing for export crops and for import substitutes.

BUDGETARY EFFECTS OF PRICING POLICY FOR EXPORT CROPS

Cotton Pricing Policy. The evolution of government taxes and subsidies related to cotton production for the period 1960-85 is shown in Table 8-1. Only budgetary revenues and expenditures relating to seed cotton processed into lint are accounted for, excluding the industrial transformation of lint into yarn.

The bulk of budgetary revenues are derived from cotton exports. The government imposes an implicit export tax that is equal, per unit, to the difference between the border-price equivalent, converted at the official exchange rate, and the price received by farmers.¹

The protection of the textile industry also has budgetary implications. Taxes or subsidies on cotton sales to the domestic ginning industry, measured per unit by the difference between the selling price to the industry and the price paid to farmers, have fluctuated in accordance with the policy objectives of the

¹The seed-cotton equivalent of lint is as follows: one ton of seed cotton produces 0.356 ton of lint. See Appendix C, Table C-7.

Table 8.1. TAXES AND SUBSIDIES ON COTTON, in LE per Ton.

Year	EXPORT TAX ON COTTON.	TAX (+) or SUBSIDY (-)
	(LE/ton)	ON DOMESTIC USE OF COTTON. (LE/ton)
1960	28.96	25.58
1961	29.80	28.51
1962	21.52	26.86
1963	47.47	24.32
1964	30.39	-22.25
1965	49.84	13.87
1966	39.50	13.87
1967	94.37	7.61
1968	36.14	-4.50
1969	54.58	-7.29
1970	53.80	-7.59
1971	54.61	-15.79
1972	47.19	-27.85
1973	199.02	-6.00
1974	250.55	-2.96
1975	199.04	-11.09
1976	112.53	4.10
1977	209.60	3.12
1978	64.32	3.63
1979	320.51	.50
1980	314.11	.51
1981	243.39	.96
1982	104.25	1.02
1983	87.85	1.23
1984	206.95	1.52
1985	128.16	2.33

SOURCES: Same as Table 8.2.

- NOTES: (1) Export tax measured by the difference between the border price equivalent at official exchange rate and the procurement price.
(2) Tax/Subsidy on domestic use measured by the difference between selling price to domestic ginning mills (lint converted to seed-cotton equivalent) and the procurement price of raw cotton.

government.² From these taxes (or subsidies), one should subtract (or add) the operating costs of the mills, which are highly subsidized.³ Input subsidies in the ginning process in 1980 amounted to between £E 75 and £E 95 per ton of lint depending on the technology of the firm, or approximately 11 percent of the selling price of cotton to the mill, according to a survey of five ginning companies in Daqahlia governorate (Khedr and Kheir-el-din 1982).

To these taxes or subsidies one could add the subsidies paid by the government on pesticide, which is entirely imported (80 percent of it goes to cotton).⁴ However, given the externalities involved in pesticide spraying, these subsidies constitute an intervention of the government in the pricing process that increases efficiency, and thus they have not been counted as net costs.

The hypothetical budgetary effect of removing price intervention for cotton that is exported or sold domestically is shown in Table 8-2, in percentage of total government revenues and of total government deficit. The short-run effect of direct price

²The agricultural cooperatives, acting as agents for the Principal Bank for the Development of Agricultural Credit, collect raw cotton from farmers and sell it to government-owned ginning mills. The selling price to the ginning industry is given in Table D-1.

³See column 8 of Table C-7 in Appendix C.

⁴See Table 7-7. See also the second section of chapter 2.

Table 8.2. BUDGETARY EFFECTS OF COTTON PRICE POLICY.

Year	REVENUES FROM EXPORTS		TAXES (+) or SUBSIDIES (-) RELATED TO DOMESTIC PRODUCTION		NET EFFECT ON GOVERNMENT BUDGET		
	mill. LE	percent of revenue	mill. LE	percent of expenditures	in mill. LE	in percentage of: revenue	deficit
1960	37.98	8.54%	1.75	-.44%	39.73	8.93%	-84.53%
1961	27.71	5.13%	2.11	-.30%	29.83	5.52%	18.64%
1962	16.98	2.33%	14.66	-1.88%	31.65	4.35%	60.86%
1963	48.20	10.52%	7.24	-1.02%	55.43	12.10%	22.00%
1964	27.87	5.29%	-11.55	1.29%	16.32	3.10%	4.42%
1965	51.77	8.66%	6.41	-.71%	58.18	9.73%	18.89%
1966	43.26	6.55%	2.69	-.26%	45.95	6.96%	12.69%
1967	88.11	11.70%	2.09	-.21%	90.19	11.98%	41.37%
1968	30.06	4.68%	-1.70	.19%	28.36	4.41%	11.30%
1969	43.46	6.44%	-4.98	.57%	38.47	5.70%	18.77%
1970	48.43	6.46%	-3.83	.40%	44.60	5.95%	21.65%
1971	57.35	6.60%	-5.81	.55%	51.54	5.93%	26.57%
1972	43.78	4.85%	-13.77	1.13%	30.01	3.32%	9.53%
1973	168.26	16.53%	-3.13	.22%	165.13	16.22%	42.78%
1974	183.30	15.48%	-1.40	.07%	181.90	15.36%	20.46%
1975	116.05	7.61%	-5.30	.18%	110.75	7.27%	7.43%
1976	58.56	2.91%	2.31	-.07%	60.87	3.02%	4.81%
1977	95.01	3.45%	2.52	-.06%	97.53	3.54%	6.90%
1978	26.93	.81%	3.49	-.06%	30.43	.92%	1.35%
1979	148.01	4.02%	.51	-.01%	148.52	4.03%	4.35%
1980	162.32	2.20%	.46	.00%	162.78	2.21%	5.96%
1981	136.12	1.64%	.73	-.01%	136.86	1.64%	2.68%
1982	61.54	.63%	.63	.00%	62.17	.64%	1.30%
1983	51.62	.50%	.59	.00%	52.21	.50%	.94%
1984	98.95	.87%	.86	.00%	99.81	.88%	1.30%
1985	47.94	.41%	1.82	-.01%	49.76	.42%	.60%

SOURCES: Computed from data from tables 1.8. (budget), C.1.(procurement price), C.7.(border price at official exch. rate), D.1. (selling price to mill adjusted to farmgate), E.1. (production) and E.3. (exports).

- NOTES: (1) Border price equivalent (at Eo) minus procurement price, multiplied by the quantity of exports in tons.
(2) Same as (1) in percentage of total government revenues.
(3) Selling price to domestic ginning mills minus procurement price, multiplied by domestic consumption (in tons).
(4) Same as (3) in percentage of total government expenditures
(A negative sign indicates that taxes are negative expenditures).
(5) Columns (1) + (3).
(6) and (7) Same as (5) in percentage of government revenue and deficit.

intervention is calculated, leaving out the effect of exchange rate policy.⁵

There are two distinct phases of the budgetary impact of cotton price policy. Price intervention provided the government with substantial export revenues until 1974. After that year, the government increased prices to farmers, and cotton exports declined as domestic consumption increased. This led to a decline in cotton revenues. The sale of cotton to the domestic cotton industry has produced small amounts of budget revenue (shown in Table 8-2 as negative, when expressed as percentages of total expenditures) except in 1964 and 1968-75, when it involved expenditures for the government. As mentioned above, these results do not include the cost of protection of the textile industry.

The policy of the government regarding cotton prices during the 1960s was to stabilize both the selling price to the local spinning industry and the buying price from farmers. The government absorbed the fluctuations in export prices. However, there was always a trade-off between the objectives of protecting the domestic industry, enhancing consumer welfare, and maximizing government revenues. During the 1960s, the volume of cotton exports hovered around 300,000 tons of lint. In the early 1960s, farmers received more for lint than the export prices and less than

⁵To get an estimate of total price intervention on the budget, one would need to find out how exchange rate overvaluation has affected cotton exports and to analyze the budgetary implications in the cotton sector of liberalizing the exchange rate.

prices paid to domestic spinners. In the second half of the 1960s, they received less than the export price and almost as much as paid to the domestic spinning industry. Therefore, in the early 1960s, the export price was lower than the domestic price, and the domestic industry was disprotected. The effect of such price differentials (in fact, they constituted a tax on inputs) was to reduce the degree of protection granted to the industry (Ikram 1980, pp. 264-65). But protection increased after 1965. From 1965-66 onward, the export price was consistently higher than the sale price to domestic spinners. The rationale of the policy was to prevent a sharp rise in the cost of living, because cloth is an important wage good. The burden is borne not by the government but by the farmer, who receives much less than the export price for his cotton.

From 1971-72 on, although producer prices were slightly raised, farmers received somewhat more than the domestic selling price but much less than the export price. This, however, did not increase government revenues. Because of shrinking exports,⁶ the

⁶Cotton Exports (Lint, in metric tons):

1960/61	344,500	1967/68	254,900	1974/75	191,200
1961/62	244,000	1968/69	236,700	1975/76	168,700
1962/63	296,300	1969/70	318,500	1976/77	131,900
1963/64	298,700	1970/71	304,200	1977/78	144,300
1964/65	339,200	1971/72	297,400	1978/79	153,100
1965/66	342,900	1972/73	302,000	1979/80	156,600
1966/67	310,800	1973/74	261,000		

SOURCE: Cotton World Statistics, International Cotton Advisory Committee.

highest share of the income transfer from producers is no longer a contribution to the general budget, as it was until 1974. Instead, it covers an implicit subsidy of domestic consumers.

Rice Pricing Policy. Rice is the second most important agricultural export of Egypt, but it is also an important food item. Therefore, there is a trade-off between the objectives of maximizing government revenues and consumer welfare in rice pricing policy. Approximately 50 percent of paddy production has been procured by the government during the 1970s and 1980s at a price that corresponds roughly to the free market price. These procured quantities are then milled and bleached in government-owned mills and sold either abroad or domestically. Rice is sold at a subsidized price and rationed in fixed monthly quotas at government outlets. Additional quantities are available to consumers on the free market at higher prices.

The government earns revenues from the difference between the buying price from farmers and the export price, implicitly imposing an export tax on milled rice. It incurs expenditures through the subsidized rice program. This is shown, per unit of paddy equivalent, in Table 8-3.⁷ The budgetary impact of government exports and domestic distribution of rice is shown in Table 8-4 as a percentage of total budget revenues (export tax), expenditures (subsidy), and deficit. Consumer subsidy expenditures for the 1960s

⁷Prices for milled rice have been converted to paddy equivalent and adjusted at the farmgate. Milling and marketing costs are from Table D-2.

TABLE 8.3. TAXES AND SUBSIDIES ON RICE, in LE per Ton.

Year	EXPORT TAX ON RICE.	CONSUMER SUBSIDY ON
	(LE/ton)	RATIONED RICE. (LE/ton)
1960	7.00	
1961	9.90	
1962	18.69	
1963	23.34	
1964	29.45	
1965	31.06	
1966	27.51	
1967	28.49	
1968	40.87	
1969	31.50	
1970	15.20	-53.60
1971	11.40	-52.10
1972	13.00	-49.12
1973	52.20	-50.61
1974	243.70	-49.58
1975	183.60	-42.09
1976	87.10	-44.03
1977	39.60	-47.01
1978	51.90	-46.34
1979	145.10	-85.30
1980	152.55	-89.18
1981	213.39	-79.18
1982	222.36	-69.18
1983	107.77	-54.18
1984	66.81	-69.18
1985	41.90	-88.13

SOURCES: Same as Table 8.4.

- NOTES: (1) Export tax is the difference between the border price equivalent at the official exchange rate, in paddy equivalent, and the procurement price of paddy. Average farmgate prices used for 1960-69.
- (2) Subsidy is the difference between the procurement price of paddy and the price of rationed rice sold by GASC (in paddy equivalent). Data for 1960-69 not available.

TABLE 8.4. BUDGETARY EFFECTS OF RICE PRICE POLICY.

Year	EXPORT REVENUES		CONSUMER SUBSIDIES ON RATIONED RICE.		NET EFFECT ON THE BUDGET.		
	mill. LE	percent of revenue	mill. LE	percent of expenditures	mill. LE	percent of: revenue deficit	
1960	2.92	.66%					
1961	2.20	.41%					
1962	4.01	.55%					
1963	13.24	2.89%					
1964	23.15	4.39%					
1965	15.31	2.56%					
1966	11.28	1.71%					
1967	16.79	2.23%					
1968	32.89	5.11%					
1969	36.31	5.38%					
1970	14.85	1.98%	-6.75	.90%	8.10	1.08%	3.93%
1971	8.76	1.01%	-15.23	1.75%	-6.48	-.75%	-3.34%
1972	8.40	.93%	-15.63	1.73%	-7.23	-.80%	-2.29%
1973	22.78	2.24%	-22.09	2.17%	.69	.07%	.18%
1974	49.56	4.19%	-30.50	2.58%	19.06	1.61%	2.14%
1975	28.58	1.88%	-39.95	2.62%	-11.37	-.75%	-.76%
1976	27.44	1.36%	-31.50	1.56%	-4.06	-.20%	-.32%
1977	13.18	.48%	-31.30	1.14%	-18.12	-.66%	-1.28%
1978	11.24	.34%	-38.36	1.16%	-27.12	-.82%	-1.20%
1979	20.55	.56%	-82.88	2.25%	-62.33	-1.69%	-1.83%
1980	20.25	.28%	-89.64	1.22%	-70.37	-.96%	-2.58%
1981	27.56	.33%	-81.98	.99%	-54.07	-.65%	-1.06%
1982	5.64	.06%	-73.78	.76%	-71.78	-.74%	-1.50%
1983	2.25	.02%	-59.51	.57%	-58.41	-.56%	-1.06%
1984	6.48	.06%	-78.27	.69%	-74.02	-.65%	-.96%
1985	1.00	.01%	-102.71	.87%	N/A	N/A	N/A

SOURCES: Computed from tables 1.8. (budget), C.2. (procurement price and quota), C.8. (border price at official exch. rate), E.1. (production) and E.3. (exports), and from World Bank report 4498-EGT (rationed price of bleached rice), and von Braun/de Haen, p.84 table 36 (quantity of rationed rice sold).

EXPLANATION OF COLUMNS:

- (1) Border price equivalent (at E₀) minus procurement price, multiplied by total rice exports (in tons).
 - (2) Same as (1) in percentage of total government revenue.
 - (3) Procurement price minus rationed price, multiplied by quantity rationed (in tons). Expenditures for 1981-85 were estimated by assuming that rationed quantities increased at an annual rate of 3 percent.
 - (4) Same as (3) in percentage of total government expenditures.
 - (5) Columns (1) + (3).
 - (6),(7) Same as (5) in percentage of total government revenue and deficit.
- All relevant figures have been converted to paddy equivalent.
Average farmgate prices of paddy are used for 1960-64.
Data on consumer subsidies for 1960-69 not available.

are not reported because data on subsidized price and rationed quantities are not available. In any case, the amount of subsidy involved during that period was minimal, unlike during the post-1970 period (Alderman, von Braun, and Sakr 1982). Procurement prices for the 1960-69 period are not available, and average farmgate prices have been used to compute export taxes.⁸ Therefore, this may underestimate the magnitude of the tax for this period.

BUDGETARY EFFECTS OF PRICING POLICY FOR IMPORT SUBSTITUTES

Wheat Pricing Policy. Wheat, the main import substitute in Egypt, is sold to consumers in the form of flour and bread at subsidized prices in unlimited quantities. The wheat subsidy program, of modest proportions before 1973, reached 15 percent of total government expenditures in 1974 and has continued to put enormous pressure on the government budget.

Government expenditures related to wheat price policy have two components. First, the government buys part of the domestic wheat output at fixed prices and sells it to consumers at subsidized prices. On a per-ton basis, the net subsidy involved was considerable starting in 1974-75 (see first column of Table 8-5). Quantities procured are small, however, so the impact on government expenditures is also small (Table 8-6).

⁸See Appendix C, Table C-2.

Table 8.5. TAXES AND SUBSIDIES ON WHEAT, in LE per Ton.

	(1) SUBSIDY ON DOMESTIC PURCHASES OF WHEAT.	(2) SUBSIDY ON IMPORTED WHEAT.
1965	3.43	
1966	-.30	
1967	-.17	
1968	.78	
1969	-.20	
1970	-4.72	
1971	-4.06	-.60
1972	-4.41	.30
1973	-3.77	-43.00
1974	-13.41	-69.30
1975	-20.96	-49.50
1976	-18.52	-32.30
1977	-20.06	-16.10
1978	-27.54	-27.30
1979	-40.68	-99.90
1980	-55.26	-124.30
1981	-38.70	-99.80
1982	-38.70	-103.20
1983	-52.00	-86.40
1984	-82.40	-93.70
1985	-22.80	-23.00

SOURCES: Same as table 8.7.

NOTES: (1) The subsidy (-) on domestic purchases of wheat is measured as the difference between the subsidized consumer price and the procurement price paid to farmer. In 1965 and 1968, this difference was positive, implying a tax (+). Data not available before 1965.

(2) The subsidy (-) on imported wheat is the difference between the subsidized consumer price and the average import price paid by GASC. Data before 1971 not available.

Table 8.6. BUDGETARY EFFECTS OF WHEAT PRICE POLICY:
SUBSIDY COST OF DOMESTIC PURCHASES OF WHEAT.

	LE million	Percent of total government expenditures
1965	.78	-.09%
1966	-.08	.01%
1967	-.04	.00%
1968	.22	-.02%
1969	-.03	.00%
1970	-.86	.09%
1971	-1.16	.11%
1972	-1.06	.09%
1973	-1.06	.08%
1974	-4.80	.23%
1975	-7.97	.26%
1976	-5.55	.17%
1977	-2.76	.07%
1978	-3.46	.06%
1979	-11.70	.16%
1980	-6.85	.07%
1981	-5.25	.04%
1982	-3.12	.02%
1983	-8.30	.05%
1984	-8.97	.05%
1985	-2.99	.01%

NOTES: (1) (Consumer price - procurement price) x percent of wheat procured
x total wheat production. Data before 1965 not available.

There was no procurement in 1984 and 1985.

(2) Same as (1) in percentage of total government expenditures

(A negative sign indicates that taxes are negative expenditures).

SOURCES: Same as Table 8.7.

By far the most costly component of the subsidy program is the sale of imported wheat at subsidized prices. Before 1973, the government was able to generate revenues from the sale of imported grains. From 1973 to 1980, subsidies have increased on a per-ton basis (see second column of Table 8-5).⁹

To measure the magnitude of the budgetary impact of the wheat program, we must make assumptions about the average price per ton of aid shipments, because a large proportion of wheat imports come in the form of food aid. Four possible estimates are presented in Table 8-7. The first is computed under the assumption that all wheat imports, commercial and concessional, are valued at the CIF price converted at the official exchange rate. For the second estimate, commercial imports are valued at the CIF price converted at the official exchange rate, and food aid imports are assumed obtained at no cost. The third estimate values all imports at the CIF price converted at the official exchange rate, but the price of imports obtained on a concessional basis is weighted by a so-called grant element that takes into account a grace period and interest rates during the repayment period.¹⁰ Finally, a fourth estimate of budgetary costs values imports of wheat and flour at

⁹Subsidies on imported wheat in Table 8-5 represent the difference between the price at which GASC sells wheat to consumers and the average import price reported by GASC (see World Bank 1983a, p. 142).

¹⁰The grant element is estimated at 0.60 for the period 1960-73 and at 0.66 for the period 1974-85. These estimates are from Huddleston (1984).

Table 8.7. BUDGETARY EFFECTS OF WHEAT PRICE POLICY:
 SUBSIDY COST OF PURCHASES OF IMPORTED WHEAT
 WITH FOUR ESTIMATES OF THE COST OF FOOD AID.

Year	----- CASE 1. -----			----- CASE 2. -----			----- CASE 3. -----			----- CASE 4. -----		
	LE million	percent of: expend.	deficit	LE million	percent of: expend.	deficit	LE million	percent of: expend.	deficit	LE million	percent of: expend.	deficit
1960	.18	-.04%	-.38%	.01	.00%	-.03%	-11.06	2.78%	23.52%	N/A	N/A	N/A
1961	2.09	-.30%	1.31%	.00	.00%	.00%	-13.74	1.96%	-8.58%	N/A	N/A	N/A
1962	-3.39	.43%	-6.52%	.00	.00%	.00%	-16.26	2.09%	-31.28%	N/A	N/A	N/A
1963	-27.20	3.83%	-10.80%	-2.91	.41%	-1.15%	-5.62	.79%	-2.23%	N/A	N/A	N/A
1964	-34.40	3.84%	-9.32%	.00	.00%	.00%	3.60	-.40%	.97%	N/A	N/A	N/A
1965	-13.63	1.50%	-4.42%	-3.49	.38%	-1.13%	-15.33	1.69%	-4.98%	N/A	N/A	N/A
1966	-11.74	1.15%	-3.24%	-4.51	.44%	-1.25%	-16.43	1.61%	-4.54%	N/A	N/A	N/A
1967	-16.31	1.68%	-7.48%	-15.70	1.62%	-7.20%	-16.50	1.70%	-7.57%	N/A	N/A	N/A
1968	-6.15	.69%	-2.45%	-6.14	.69%	-2.45%	-6.16	.69%	-2.45%	N/A	N/A	N/A
1969	-3.02	.34%	-1.47%	-2.76	.31%	-1.35%	-4.25	.48%	-2.07%	N/A	N/A	N/A
1970	.75	-.08%	.37%	.67	-.07%	.33%	-.92	.10%	-.45%	N/A	N/A	N/A
1971	-14.77	1.39%	-7.62%	-12.08	1.14%	-6.23%	-15.56	1.46%	-8.02%	4.46	-.42%	2.30%
1972	-10.05	.83%	-3.19%	-8.27	.68%	-2.62%	-10.67	.88%	-3.39%	4.45	-.37%	1.41%
1973	-21.39	1.52%	-5.54%	-13.42	.96%	-3.48%	-16.71	1.19%	-4.33%	-64.07	4.56%	-16.60%
1974	-252.85	12.20%	-28.44%	-167.21	8.07%	-18.81%	-128.87	6.22%	-14.50%	-170.45	8.22%	-19.17%
1975	-212.23	7.04%	-14.23%	-152.77	5.07%	-10.25%	-128.68	4.27%	-8.63%	-146.04	4.84%	-9.79%
1976	-166.19	5.07%	-13.14%	-99.67	3.04%	-7.88%	-77.81	2.37%	-6.15%	-86.42	2.63%	-6.83%
1977	-131.90	3.16%	-9.33%	-54.78	1.31%	-3.87%	-38.98	.94%	-2.76%	-40.53	.97%	-2.87%
1978	-205.78	3.70%	-9.13%	-125.04	2.25%	-5.55%	-96.44	1.73%	-4.28%	-87.89	1.58%	-3.90%
1979	-199.37	2.81%	-5.84%	-61.60	.87%	-1.80%	-1.00	.01%	-.03%	-300.40	4.23%	-8.80%
1980	-355.51	3.52%	-13.02%	-144.21	1.43%	-5.28%	-31.45	.31%	-1.15%	-321.81	3.19%	-11.78%
1981	-672.14	5.00%	-13.14%	-446.99	3.33%	-8.74%	-337.93	2.51%	-6.61%	-497.72	3.70%	-9.73%
1982	-794.60	5.47%	-16.61%	-570.05	3.92%	-11.92%	-461.60	3.18%	-9.65%	-559.26	3.85%	-11.69%
1983	-750.76	4.72%	-13.56%	-584.76	3.68%	-10.56%	-510.24	3.21%	-9.22%	-491.27	3.09%	-8.87%
1984	-898.32	4.73%	-11.69%	-760.95	4.01%	-9.90%	-695.72	3.66%	-9.06%	-607.90	3.20%	-7.91%
1985	-446.53	2.22%	-5.36%	-378.50	1.88%	-4.54%	-374.62	1.86%	-4.50%	-167.19	.83%	-2.01%

Government sells to mills at subsidized price and buys at CIF price,
 but estimates of budgetary impact vary depending on valuation of food aid.

CASE 1: Food aid imports also purchased at CIF price.

CASE 2: Food aid imports are obtained at no cost.

CASE 3: Food aid imports are valued at weighted CIF prices, where the
 weight is the grant element of aid (from B. Huddleston, IFPRI report).

The grant element is .60 for years 1960-73 and .66 for 1974-85.

Commercial shipments are valued at CIF prices.

CASE 4: Imports of wheat and flour are valued at average
 import prices reported by GASC for wheat and flour, respectively.

SOURCES: 1. Food aid, from Scobie, IFPRI Research Report No.29, p.68-69.

Data for 1980-85 food aid from USDA.

(Assumes that food aid is only PL480 shipments).

2. Quantity of imports from Table E.5.

3. Domestic selling prices from GASC.

4. Average import price (case 4) from GASC.

5. Border price equivalents at official exchange rate

(cases 1, 2, and 3) are from table C.9.

average import prices (in local currency, converted at the official exchange rate) reported by GASC, the importing agency, for wheat and flour, respectively. This probably represents the "true" cost of wheat and flour imports to the government budget, although the average yearly prices published by GASC do not accurately reflect the discount obtained on concessional imports.

Maize Pricing Policy. The objective of the government maize program is to provide incentive to livestock production. Yellow maize for feed is imported by the government and sold to farmers at a subsidized price. In 1981, about 20 percent of the maize went to private poultry breeders, and an equal percentage went to public sector poultry. The remainder was fed to cattle destined for slaughter or went to breeding farms (Alderman, von Braun, and Sakr 1983, pp. 31-32).

Table 8-8 shows the cost of the maize program for the government. The first column of the table shows the subsidy per ton, which has increased considerably since the early 1970s. The other columns show total maize expenditures in millions of Egyptian pounds and as a percentage of total government expenditures and deficit. Although outlays on imported maize have increased because of increased import volumes and increased subsidies per ton, the impact of this program on the budget has never been considerable.

Table 8-8
GOVERNMENT EXPENDITURES ON IMPORTED MAIZE

Year	Subsidy on imported maize		Total subsidy cost paid by GASC	
	in fE per ton	in fE million	Percentage of total government expenditures	Percentage of total government deficit
1974	-37.80	-14.68	.71	-1.65
1975	-25.80	-10.77	.36	-.72
1976	-20.40	-9.36	.29	-.74
1977	-9.30	-5.49	.13	-.39
1978	33.00	24.42	-.44	1.08
1979	-53.50	-26.42	.37	-.77
1980	-55.30	-32.97	.33	-1.21
1981	-84.60	-109.08	.81	-2.13
1982	-62.00	-75.27	.52	-1.57
1983	-65.05	-106.36	.67	-1.92
1984	-79.50	-125.77	.66	-1.64
1985	-65.60	-122.41	.61	-1.47

SOURCES: Computed from Table D-6 (GASC consumer ration price), World Bank (1986a; GASC average import price), Table E-5 (imports), and Table G-2 (government accounts).

NOTES: Column 1: Difference between average import price and consumer ration price.

Column 2: Column 1 multiplied by import volume.

Column 3: Same as column 2 in percent of government expenditures (negative sign indicates that a tax is a negative expenditure).

Column 4: Same as column 2 in percent of deficit.

Sugar Pricing Policy. Sugar for domestic consumption is produced locally and imported, but sugar is not an import substitute in the classic sense of the word. Although Egypt became a net importer in 1973, it continues to export some refined sugar. Consumers are supplied with rationed sugar at subsidized prices. Additional sugar consumed by Egyptian households comes from the open market, in which the government intervenes by selling additional nonrationed quantities at higher than subsidized prices. Consumer gains from the subsidized distribution therefore are offset by open market sugar prices, which are frequently higher than world prices.

The cost of the government's sugar operations has fluctuated considerably, depending on world prices. The data is fragmentary and is available only for the period 1971-81. The government, acting through GASC (the public agency in charge of sugar distribution) incurs expenditures from the sale of rationed sugar but receives revenues from the sale of nonrationed sugar during periods of low international prices. The net effect on the budget of GASC sugar operations as a percentage of total government expenditures and deficit is shown in Table 8-9.

Table 8-9
BUDGETARY EFFECTS OF SUGAR PRICE POLICY

Year	Rationed Sugar Subsidies on Rationed sugar (fE million)	Profits on Nonrationed Sugar (fE million)	Budgetary effect of both operations, percentage of	
			Total expenditures	Total deficit
1970	n.a.	18.0	n.a.	n.a.
1971	-8.0	6.4	.15	-.82
1972	-6.0	22.6	-1.36	5.27
1973	-19.0	36.0	-1.21	4.40
1974	-68.9	0.0	3.32	-7.75
1975	-20.8	0.0	.69	-1.40
1976	-6.1	8.6	-.08	.20
1977	0.0	26.1	-.63	1.85
1978	0.0	0.0	.00	.00
1979	-6.5	0.0	.09	-.19
1980	-224.0	0.0	2.22	-8.20
1981	-132.0	n.a.	n.a.	n.a.

SOURCE: GASC. Budgetary effect computed with data from Table G-2.

Chapter 9

TRANSFER OF RESOURCES BETWEEN AGRICULTURE AND THE REST OF THE ECONOMY

This chapter discusses price policy as it relates to resource transfers between agriculture and other sectors of the economy and examines the question of expenditure bias against agriculture in Egyptian public policy.

PRICE POLICY AND TRANSFER OF RESOURCES

Government intervention affecting agriculture has resulted in large resource transfers between agriculture and other sectors of the Egyptian economy during the 1960-85 period. Price-policy-related flows of funds are the consequence of price intervention, direct or indirect, in agricultural output and input markets. In addition, government policy, including investment policy in agriculture, has directly induced other transfers not related to price policy. Here, we seek to measure the magnitude of the flows.

We first estimate, in nominal terms, price-policy-related transfers caused by direct and total price intervention on cotton, rice, wheat, maize, and sugarcane. For crop i , the transfer caused by direct price intervention is calculated as

$$(P_i - P_i') Q_i \quad (1)$$

and the transfer caused by total price intervention as

$$(P_i - P_i^*) Q_i \quad (2)$$

where

- P_i = the prevailing producer price
- P_i' = the producer price in the absence of direct intervention
- P_i^* = the producer price in the absence of total intervention
- Q_i = the level of output with intervention.

Table 9-1 presents the results for all five crops examined in this study. It shows that intervention on output prices has resulted in a substantial transfer of resources out of agriculture during most of the period except in some years.

Total transfers caused by output price intervention on these five crops (i.e., the sum of individual transfers in Table 9-1) have been substantial, especially when world prices for those products were high, as seen in the first two columns of Table 9-2. Transfers caused by direct and total price intervention on agricultural inputs, estimated in columns 3 and 4 of Table 9-2, were more modest. Input subsidies resulted in negative flows for agriculture (i.e., resource flows out of agriculture) from 1965 to 1971, but the flows became positive after 1971 and increased significantly over time. The data on direct transfers refer only to fertilizer and pesticides and are derived from government

TABLE 9.1.
PRICE POLICY RELATED TRANSFERS FROM AGRICULTURE IN NOMINAL TERMS (LE million).
Price Interventions on Cotton, Rice, Wheat, Maize and Sugarcane.

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL
1960	-39.96	-148.58	-37.18	-69.04	-34.27	-51.90	3.13	-17.52		10.58
1961	-29.92	-96.25	-28.57	-54.52	-30.65	-43.93	-1.08	-18.74		
1962	-28.73	-78.20	-56.93	-104.36	-40.08	-57.13	-3.31	-16.36		
1963	-62.32	-101.21	-81.46	-114.41	-53.64	-63.21	-16.52	-26.06	-8.21	-20.04
1964	-43.64	-94.13	-84.21	-125.59	-21.44	-35.28	-13.40	-27.10	5.19	-5.53
1965	-74.81	-136.10	-47.19	-84.19	-7.88	-18.34	-20.70	-37.59		
1966	-50.92	-105.56	-42.49	-77.61	-2.90	-15.50	-4.92	-24.16		
1967	-114.00	-109.65	-53.54	-62.23	.90	1.58	5.86	6.90		
1968	-43.74	-95.98	-74.91	-161.52	-.35	-11.42	-8.38	-24.58		
1969	-80.78	-162.22	-103.05	-136.12	1.95	-8.10	-2.86	-22.50		15.52
1970	-75.54	-176.40	-90.43	-91.02	14.68	.48	.36	-24.06		8.95
1971	-77.43	-194.88	-38.47	-82.53	-.20	-22.65	-6.42	-35.66		-1.70
1972	-67.11	-164.67	-28.83	-77.57	-.22	-17.24	2.97	-20.29	4.68	-24.17
1973	-272.26	-225.06	-27.00	-95.47	-8.05	-1.23	-3.16	6.22	-2.60	6.63
1974	-301.66	-350.14	-98.81	-607.28	-117.84	-136.42	-14.86	-32.52	-125.64	-147.16
1975	-211.18	-311.23	-575.64	-584.75	-70.29	-109.49	-75.48	-119.32	-64.26	-107.66
1976	-121.99	-332.60	-399.28	-405.57	-48.12	-122.10	-99.79	-218.16	19.80	-47.62
1977	-264.09	-570.24	-182.03	-205.87	-11.13	-59.48	20.68	-53.48	58.09	10.24
1978	-88.82	-383.82	-55.34	-344.21	-8.02	-84.36	-1.20	-114.73	69.56	9.50
1979	-475.63	-657.63	-127.91	-471.92	-41.21	-68.30	-31.99	-67.13	-21.83	-58.37
1980	-442.27	-528.75	-308.12	-408.28	-124.66	-149.45	-75.01	-111.95	-302.53	-348.04
1981	-322.73	-587.25	-287.44	-674.65	-180.72	-283.73	-346.66	-521.11	-80.22	-176.82
1982	-126.24	-355.39	-407.62	-774.50	-203.18	-329.02	-228.59	-429.24	68.34	4.63
1983	-93.92	-342.32	-458.49	-494.83	-83.94	-202.24	106.79	-49.85	93.55	20.69
1984	-217.09	-806.14	-182.04	-484.41	-61.19	-262.80	-57.53	-485.56	157.45	58.80
1985	-148.16	-1225.36	65.07	-577.79	-1.36	-343.15	191.10	-299.06		99.68

NOTES: 1. Transfers due to sugarcane price policy not available for those years in which border price equivalents are negative.

2. Minus sign (-) indicates transfers out of agriculture.

Plus sign (+) indicates transfers into agriculture.

SOURCES: Price and output data from Appendices C and E.

TABLE 9.2.
PRICE POLICY RELATED TRANSFERS FROM AGRICULTURE IN NOMINAL TERMS (LE million).
Price Interventions in Output and Input Markets.

	TRANSFERS DUE TO INTERVENTIONS ON OUTPUT PRICES.		TRANSFERS DUE TO INPUT PRICE INTERVENTIONS.		TOTAL PRICE POLICY RELATED TRANSFERS.	
	(1) DIRECT	(2) TOTAL	(3) DIRECT	(4) TOTAL	(5) DIRECT	(6) TOTAL
1960	-108.28	-276.46				
1961	-90.23	-213.43				
1962	-129.05	-256.04				
1963	-222.15	-324.92				
1964	-157.50	-287.64				
1965	-150.58	-276.23	-2.00	-2.54	-152.58	-278.77
1966	-101.22	-222.83	-1.00	-1.30	-102.22	-224.13
1967	-160.78	-163.40	-3.00	-2.98	-163.78	-166.38
1968	-127.38	-293.50	-6.00	-7.68	-133.38	-301.17
1969	-184.74	-313.42	-4.00	-5.25	-188.74	-318.67
1970	-150.93	-282.05	-3.00	-4.21	-153.93	-286.26
1971	-122.52	-337.42	-4.00	-5.78	-126.52	-343.19
1972	-88.51	-303.94	12.00	16.37	-76.51	-287.57
1973	-313.07	-308.92	13.00	11.70	-300.07	-297.22
1974	-658.80	-1273.53	12.00	13.17	-646.80	-1260.36
1975	-996.84	-1232.45	81.50	101.44	-915.34	-1131.01
1976	-649.38	-1126.05	34.20	54.10	-615.18	-1071.95
1977	-378.49	-878.83	34.70	53.38	-343.79	-825.45
1978	-83.82	-917.62	38.30	65.18	-45.52	-852.44
1979	-698.57	-1323.35	101.90	120.98	-596.67	-1202.37
1980	-1252.59	-1546.47	119.10	130.29	-1133.49	-1416.18
1981	-1217.77	-2243.55	227.90	298.11	-989.87	-1945.44
1982	-897.29	-1883.52	159.10	217.76	-738.19	-1665.76
1983	-436.00	-1068.55	142.30	204.62	-293.70	-863.93
1984	-360.39	-1980.11	135.20	243.70	-225.19	-1736.41
1985	106.65	-2345.67	135.20	303.58	241.85	-2042.09

- SOURCES: 1. Transfers due to output price interventions, from Table 9.1.
2. Transfers due to direct input price interventions, from Agricultural Stabilization Fund (see table 7.7). 1985 estimated. Data includes fertilizer and pesticides.
3. Transfers due to total input price interventions = direct transfers, corrected for exchange rate overvaluation.

NOTES: Input price intervention data for 1960-64 not available.
Minus sign (-) indicates transfers out of agriculture.
Plus sign (+) indicates transfers into agriculture.

budget figures. They do not take into account input price intervention that is difficult to allocate on a crop-by-crop basis, such as subsidies on water, research and extension, and credit. No input price data were available before 1965. Total transfers are calculated by adjusting the data on direct transfers by E^*/E_0 (ratio of equilibrium to official exchange rate) to correct for the influences of the overvalued exchange rate and of trade policy distortions.¹

On balance, despite increasing volumes of input subsidies, resource flows caused by both output and input price intervention were negative for agriculture until 1984. This is seen in columns 5 and 6 of Table 9-2. In 1985, although sector-specific price intervention resulted in net positive flows into agriculture, economy-wide policies canceled this positive effect, and the flows turned negative.

Measured in real terms, price-policy-related transfers show a changing pattern over time. In Table 9-3, for crop i , direct transfers in real terms are calculated as

$$(P_i * Q_i / CPI) - (P'_i * Q_i / CPI') \quad (3)$$

and total transfers in real terms as

$$(P_i * Q_i / CPI) - (P^*_i * Q_i / CPI^*) \quad (4)$$

where the price indices are those computed in Appendix L:

¹Given the importance of subsidized inputs for agriculture, an attempt was made to estimate transfers using value added data instead of price data. The results are presented in Appendix P.

CPI = the rural consumer price index
CPI' = the rural consumer price index without direct
price intervention
CPI* = the rural consumer price index without
total price intervention.

In Table 9-4, transfers caused by direct input price intervention are deflated by CPI, and transfers caused by total input price intervention by CPI*. The sums of all real transfers are presented in columns 5 and 6.

Measured as a percentage of agricultural GDP and of total GDP, price-policy-related transfers out of agriculture are significant. Table 9-5 shows direct and total transfers in nominal and real terms from Tables 9-2 and 9-4 expressed as percentages of agricultural GDP and of total GDP.

Resource flows out of agriculture were on average 20.20 percent of agricultural GDP (5.01 percent of total GDP) for transfers caused by direct intervention during the 1965-72 period. They jumped to an average of 31.26 percent of agricultural GDP (8.39 percent of GDP) for the 1973-79 period and fell to 13.88 percent of agricultural GDP (2.62 percent of GDP) in 1980-85. Transfers caused by total price intervention were much higher, but they followed the same trend.

TABLE 9.3.
PRICE POLICY RELATED TRANSFERS FROM AGRICULTURE IN REAL TERMS (LE million).
Price Interventions on Cotton, Rice, Wheat, Maize and Sugarcane.

	COTTON		RICE		WHEAT		MAIZE		SUGARCANE	
	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL	DIRECT	TOTAL
1960	-117.68	-396.39	-97.33	-179.36	-89.71	-134.82	3.52	-49.24		26.46
1961	-86.68	-251.77	-74.54	-139.93	-79.95	-112.75	-6.77	-50.26		
1962	-78.27	-179.81	-147.59	-256.89	-103.92	-140.62	-10.10	-35.13		
1963	-123.90	-201.10	-192.56	-263.07	-126.81	-145.34	-31.17	-49.27	-16.70	-42.46
1964	-70.18	-164.17	-188.70	-271.73	-40.77	-65.96	-20.32	-44.75	14.13	-8.40
1965	-149.06	-285.68	-99.60	-181.58	-13.71	-37.08	-39.82	-77.61		
1966	-102.10	-222.44	-87.53	-164.19	-4.37	-32.32	-7.55	-50.35		
1967	-248.32	-258.08	-116.58	-146.20	2.24	.15	13.30	9.73		
1968	-87.70	-196.85	-158.70	-342.48	1.92	-21.00	-14.53	-47.98		
1969	-167.78	-328.45	-216.22	-278.73	4.78	-14.76	-4.79	-42.85		33.21
1970	-178.30	-376.51	-204.15	-194.18	27.82	.58	-5.35	-51.81		18.87
1971	-160.88	-372.67	-79.82	-157.90	-.92	-40.17	-13.88	-64.54		-1.83
1972	-129.16	-288.02	-55.62	-137.51	.33	-26.10	7.04	-28.26	9.50	-42.55
1973	-439.35	-393.99	-39.23	-167.18	-7.13	-1.71	5.10	11.67	-1.84	11.83
1974	-251.95	-279.49	-73.88	-597.65	-91.26	-100.85	66.36	57.77	-117.95	-132.27
1975	-201.77	-262.61	-670.21	-594.83	-52.00	-72.80	-45.99	-66.40	-61.69	-94.48
1976	-122.60	-285.48	-495.24	-401.67	-47.44	-100.61	-104.38	-183.98	35.34	-29.61
1977	-322.45	-589.83	-222.02	-209.34	-13.89	-53.99	24.39	-33.42	70.44	19.70
1978	-79.26	-283.71	-49.45	-265.09	-7.02	-57.90	-.72	-73.12	62.58	14.36
1979	-384.23	-498.49	-98.67	-379.67	-25.24	-41.17	-7.13	-25.93	-11.55	-38.15
1980	-237.33	-273.89	-184.50	-240.21	-59.83	-69.41	20.96	8.09	-201.19	-222.30
1981	-129.17	-225.44	-147.59	-333.00	-87.17	-122.01	-171.45	-227.04	-30.68	-71.41
1982	-30.60	-115.23	-206.77	-354.73	-102.61	-146.38	-93.90	-160.12	52.19	22.98
1983	-47.36	-148.45	-260.92	-237.47	-45.20	-90.85	71.45	15.58	56.75	21.76
1984	-112.91	-321.35	-94.98	-191.72	-31.55	-99.09	-28.34	-164.72	83.48	40.29
1985	-87.63	-426.07	19.04	-191.52	-8.71	-111.12	70.94	-64.45		52.69

SOURCES: 1) Price and output data from Appendices C and E.

2) Rural consumer price indices (CPI, CPI', CPI*) from Table L.2.

NOTES: 1) Real direct transfers = $(Pa.Qa / CPI) - (P'a.Qa / CPI')$.

2) Real total transfers = $(Pa.Qa / CPI) - (P*a.Qa / CPI*)$.

3) Transfers due to sugarcane price policy not available for some years.
because border price equivalents are negative.

TABLE 9.4.
PRICE POLICY RELATED TRANSFERS FROM AGRICULTURE IN REAL TERMS (LE million).
Price Interventions in Output and Input Markets.

	TRANSFERS DUE TO INTERVENTIONS ON OUTPUT PRICES.		TRANSFERS DUE TO INPUT PRICE INTERVENTIONS.		TOTAL PRICE POLICY RELATED TRANSFERS.	
	(1) DIRECT	(2) TOTAL	(3) DIRECT	(4) TOTAL	(5) DIRECT	(6) TOTAL
1960	-301.20	-733.352				
1961	-247.93	-554.716				
1962	-339.88	-612.453				
1963	-491.15	-701.239				
1964	-305.84	-555.005				
1965	-302.19	-581.949	-4.56	-5.58	-306.75	-587.53
1966	-201.54	-469.296	-2.14	-2.76	-203.68	-472.06
1967	-349.35	-394.398	-6.57	-6.76	-355.93	-401.15
1968	-259.02	-608.318	-13.40	-16.56	-272.42	-624.88
1969	-384.01	-631.573	-8.51	-10.90	-392.52	-642.47
1970	-359.98	-603.052	-6.36	-8.95	-366.34	-612.00
1971	-255.51	-637.104	-8.21	-11.41	-263.71	-648.52
1972	-167.90	-522.442	23.69	30.55	-144.21	-491.89
1973	-482.45	-539.374	22.91	20.54	-459.54	-518.84
1974	-468.69	-1052.48	18.34	13.78	-450.35	-1038.70
1975	-1031.67	-1091.11	125.92	110.82	-905.75	-980.29
1976	-734.32	-1001.34	49.28	58.97	-685.04	-942.37
1977	-463.54	-866.881	42.10	58.33	-421.43	-808.55
1978	-73.86	-665.465	34.45	52.82	-39.41	-612.64
1979	-526.82	-983.415	101.90	103.48	-424.92	-879.94
1980	-661.89	-797.731	107.74	89.87	-554.15	-707.86
1981	-566.06	-978.894	178.09	168.34	-387.97	-810.55
1982	-381.68	-753.478	107.03	113.43	-274.65	-640.05
1983	-225.28	-439.423	84.86	107.49	-140.42	-331.93
1984	-184.29	-736.594	71.65	109.09	-112.64	-627.51
1985	-6.36	-740.467	60.70	116.48	54.34	-623.99

SOURCES: 1. Real transfers due to output price interventions, from Table 9.3.
2. Real transfers due to input price interventions, from Table 9.2.,
deflated by CPI (direct) and CPI* (total).
Input price intervention data for 1960-64 not available.

TABLE 9.5.
PRICE POLICY RELATED TRANSFERS FROM AGRICULTURE
as a percentage of GDP and agricultural GDP.

	TRANSFERS IN NOMINAL TERMS				TRANSFERS IN REAL TERMS			
	in percent of		in percent of		in percent of		in percent of	
	Agricultural GDP.		Total GDP.		Agricultural GDP.		Total GDP.	
	DIRECT TRANSFERS	TOTAL TRANSFERS	DIRECT TRANSFERS	TOTAL TRANSFERS	DIRECT TRANSFERS	TOTAL TRANSFERS	DIRECT TRANSFERS	TOTAL TRANSFERS
1965	-24.93%	-45.55%	-6.52%	-11.91%	N/A	N/A	-4.90%	-9.38%
1966	-16.80%	-36.83%	-4.13%	-9.06%	N/A	N/A	N/A	N/A
1967	-26.75%	-27.17%	-6.49%	-6.59%	N/A	N/A	N/A	N/A
1968	-20.70%	-46.74%	-5.10%	-11.52%	N/A	N/A	N/A	N/A
1969	-27.42%	-46.30%	-6.66%	-11.24%	N/A	N/A	N/A	N/A
1970	-19.74%	-36.70%	-5.03%	-9.36%	N/A	N/A	-4.97%	-8.30%
1971	-16.34%	-44.33%	-3.90%	-10.59%	N/A	N/A	-3.46%	-8.50%
1972	-8.96%	-33.66%	-2.26%	-8.48%	N/A	N/A	-1.85%	-6.32%
1973	-28.24%	-27.98%	-7.88%	-7.81%	N/A	N/A	-5.66%	-6.39%
1974	-50.53%	-98.47%	-14.91%	-29.05%	-20.46%	-47.19%	-5.60%	-12.91%
1975	-62.35%	-77.04%	-17.54%	-21.68%	-38.77%	-41.96%	-10.33%	-11.18%
1976	-35.27%	-61.46%	-9.14%	-15.94%	-28.92%	-39.78%	-6.82%	-9.38%
1977	-16.87%	-40.50%	-4.12%	-9.89%	-18.30%	-35.12%	-3.87%	-7.43%
1978	-1.99%	-37.29%	-.46%	-8.70%	-1.62%	-25.20%	-.33%	-5.11%
1979	-23.58%	-47.52%	-4.70%	-9.46%	-16.80%	-34.78%	-3.34%	-6.93%
1980	-34.08%	-42.58%	-6.54%	-8.18%	-20.80%	-26.57%	-3.86%	-4.93%
1981	-26.45%	-51.98%	-4.91%	-9.64%	-14.70%	-30.72%	-2.51%	-5.25%
1982	-16.96%	-38.27%	-3.17%	-7.16%	-10.10%	-23.55%	-1.67%	-3.90%
1983	-5.70%	-16.75%	-1.07%	-3.14%	-5.06%	-11.96%	-.81%	-1.92%
1984	-3.67%	-28.32%	-.69%	-5.34%	-3.96%	-22.05%	-.62%	-3.47%
1985	3.56%	-30.05%	.67%	-5.67%	1.91%	-21.93%	.30%	-3.45%
PERIOD AVERAGES:								
1965-72	-20.20%	-39.66%	-5.01%	-9.85%	N/A	N/A	N/A	N/A
1973-79	-31.26%	-55.75%	-8.39%	-14.65%	N/A	N/A	-5.05%	-8.82%
1980-85	-13.88%	-34.66%	-2.62%	-6.52%	-8.79%	-22.80%	-1.41%	-3.63%

SOURCES: 1) Nominal transfers from Table 9.2.(C).

2) Real transfers from Table 9.4.(C).

3) GDP and agricultural GDP from Tables 1.3. and 1.6.

NOTE: Minus sign (-) indicates transfers out of agriculture.

Plus sign (+) indicates transfers into agriculture.

BIAS IN PUBLIC POLICY AGAINST AGRICULTURE

Government Investment and Recurrent Expenditures in Agriculture. Government investment expenditures and current expenditures in agriculture are presented in Table 9-6. The first three columns of the table show data on public investment in agriculture, disaggregated by type of investment. The data originate from the ministries directly concerned with those investments. The first column refers to public investment in land reclamation, the second column to investment in irrigation and drainage.² Data for 1962 actually refer to the period 1960-61 to 1962-63 and include investments in irrigation related to the construction of the Aswan High Dam. They do not include the investment cost of the dam itself, however. The third column refers to data on investment expenditures by the Ministry of Agriculture and covers investment expenditures in research and extension and "other investments which aim at increasing yields" (unspecified). Column 5 in Table 9-6 presents recurrent budget expenditures related to the agricultural sector, provided by the Ministry of Finance.

²Investment data from the Ministry of Irrigation is divided into (1) public drainage, (2) horizontal expansion, (3) irrigation program, (4) covered drainage, and (5) transformation of basin irrigation to permanent irrigation. The data in column 2 of Table 9-6 include those five categories and exclude investment on the High Dam, because the latter also benefits other sectors of the economy.

TABLE 9.6.

GOVERNMENT INVESTMENT AND CURRENT EXPENDITURES IN AGRICULTURE.
in LE million.

	PUBLIC INVESTMENT EXPENDITURES.				CURRENT	TOTAL
	(1)	(2)	(3)	(4)	EXPENDITURES.	(6)
1960	N/A	N/A	N/A	38.20	10.30	48.50
1961	N/A	N/A	5.06	5.06	10.90	15.96
1962	N/A	132.00	5.85	137.85	26.50	164.35
1963	N/A	N/A	6.84	6.84	20.80	27.64
1964	N/A	17.60	7.43	25.03	23.80	48.83
1965	N/A	21.20	8.29	29.49	25.00	54.49
1966	43.70	18.50	9.90	72.10	28.20	100.30
1967	43.60	23.40	6.53	73.53	28.80	102.33
1968	32.70	17.30	3.62	53.62	31.50	85.12
1969	30.20	23.90	5.41	59.51	35.80	95.31
1970	25.90	23.00	8.01	56.91	27.30	84.21
1971	23.20	19.00	8.57	50.77	38.50	89.27
1972	31.20	26.70	2.42	60.32	36.40	96.72
1973	23.80	15.00	12.26	51.06	34.80	85.86
1974	20.50	19.00	11.16	50.66	39.70	90.36
1975	28.60	33.60	21.29	83.49	47.30	130.79
1976	27.30	47.50	12.54	87.34	61.00	148.34
1977	29.10	56.00	26.03	111.13	62.00	173.13
1978	13.90	99.30	33.96	147.16	84.00	231.16
1979	77.10	143.00	51.70	271.80	98.00	369.80
1980	56.30	113.30	47.00	216.60	114.00	330.60
1981	87.40	170.50	47.00	304.90	171.00	475.90
1982	116.30	127.80	66.90	311.00	206.00	517.00
1983	96.60	157.10	86.00	339.70	233.00	572.70
1984	125.70	183.40	121.50	430.60	278.00	708.60
1985	112.60	188.50	144.40	445.50	320.00	765.50

SOURCES:

Column (1) Ministry of Land Reclamation. Data refers to Investment in Land Reclamation.

Column (2) Ministry of Irrigation. Data refers to Investment in Irrigation and Drainage.

Column (3) Ministry of Agriculture. Data refers to Investment in Research, Extension, and so-called Yield-increasing Technology.

Column (4) = (1) + (2) + (3).

Column (5) World Bank, report No.1815 for 1960-75, report No.4498 for 1976-81, and report No.6195 for 1982-84. 1985 estimated. Data are from Ministry of Finance (Current expenditures in the agricultural sector).

Column (6) = (4) + (5).

Resource Transfers in and out of Agriculture. The data from Tables 9-1 to 9-6 now enable us to examine total resource transfers caused by price policy and investment policy in agriculture. This government intervention in agriculture is summarized in Tables 9-7 and 9-8 by showing nominal and real transfers resulting from government price policy and nonprice (investment) policy as a percentage of agricultural GDP. Transfers caused by input price intervention (columns 3 and 4 of Table 9-2) were not included in the computations for Tables 9-7 and 9-8 to avoid double counting, because these government expenditures are already included in current expenditures (column 5 of Table 9-6).

The data in Tables 9-7 and 9-8 indicate that even with investment expenditures taken into account, there was an outflow of resources from the agricultural sector to the rest of the economy throughout the 1960-82 period. After 1982, there was a net inflow of resources into the sector not accounting for the negative impact of exchange rate and trade policies. Taking into account exchange rate policy and trade policy (total price intervention), which generally discriminate against agriculture, the outflow averaged 35.14 percent of agricultural GDP from 1960 to 1985. The outflow increased to 46 percent from 1973 to 1979, largely because of particularly high outflows in 1974 and 1975 caused by a jump in world prices. From 1983 to 1985, the outflow fell to approximately 14 percent annually.

TABLE 9.7.
RESOURCE TRANSFERS DUE TO INVESTMENT POLICY AND PRICE POLICY IN AGRICULTURE.
in nominal terms.

	----- in LE million -----		----- in Percent of Agricultural GDP -----	
	Transfers due to Direct Price Interventions, Investment and Current Government Expenditures.	Transfers due to Total Price Interventions, Investment and Current Government Expenditures.	Transfers due to Direct Price Interventions, Investment and Current Government Expenditures.	Transfers due to Total Price Interventions, Investment and Current Government Expenditures.
1960	-59.78	-227.96	-14.84%	-56.61%
1961	-74.27	-197.47	-19.86%	-52.80%
1962	35.30	-91.69	7.66%	-19.89%
1963	-194.51	-297.28	-40.44%	-61.81%
1964	-108.67	-238.81	-19.54%	-42.95%
1965	-98.09	-224.28	-16.03%	-36.65%
1966	-1.92	-123.83	-.32%	-20.35%
1967	-61.45	-64.05	-10.04%	-10.46%
1968	-48.26	-216.06	-7.49%	-33.53%
1969	-93.43	-223.35	-13.57%	-32.45%
1970	-69.73	-202.05	-8.94%	-25.91%
1971	-37.25	-253.92	-4.81%	-32.80%
1972	20.20	-190.86	2.36%	-22.34%
1973	-214.22	-211.36	-20.16%	-19.89%
1974	-556.44	-1170.00	-43.47%	-91.41%
1975	-784.55	-1000.22	-53.44%	-68.13%
1976	-466.84	-923.61	-26.77%	-52.96%
1977	-170.65	-652.32	-8.37%	-32.01%
1978	185.64	-621.28	8.12%	-27.18%
1979	-226.87	-832.57	-8.97%	-32.91%
1980	-802.89	-1085.58	-24.14%	-32.64%
1981	-513.97	-1469.54	-13.73%	-39.26%
1982	-221.19	-1148.76	-5.08%	-26.39%
1983	279.00	-291.23	5.41%	-5.65%
1984	483.41	-1027.81	7.88%	-16.76%
1985	1007.35	-1276.59	15.80%	-20.03%

SOURCES: Column (1): Sum of column (6) of table 9.6. and column (1) of table 9.2.
Column (2): Sum of column (6) of table 9.6. and column (2) of table 9.2.
Column (3): Same as (1) in percent of agricultural GDP.
Column (4): Same as (2) in percent of agricultural GDP.

TABLE 9.8.
RESOURCE TRANSFERS DUE TO INVESTMENT POLICY AND PRICE POLICY IN AGRICULTURE.
in real terms.

----- in LE million -----

	Transfers due to Direct Price Interventions, Investment and Current Government Expenditures.	Transfers due to Total Price Interventions, Investment and Current Government Expenditures.
1960	-178.82	-681.91
1961	-219.98	-584.93
1962	109.14	-283.53
1963	-589.62	-901.13
1964	-293.38	-644.74
1965	-238.14	-544.51
1966	-4.46	-287.64
1967	-143.47	-149.54
1968	-98.36	-440.34
1969	-183.36	-438.35
1970	-133.82	-387.79
1971	-69.35	-472.71
1972	36.93	-348.85
1973	-377.57	-372.53
1974	-872.54	-1834.63
1975	-1133.77	-1445.44
1976	-619.50	-1225.64
1977	-205.42	-785.19
1978	202.83	-678.79
1979	-226.87	-832.57
1980	-678.81	-917.82
1981	-401.41	-1147.71
1982	-152.73	-793.24
1983	174.40	-182.04
1984	226.48	-481.53
1985	400.41	-507.43

SOURCES: Column (1): Sum of column (6) of table 9.6. and column (1) of table 9.2.
divided by CPI (from table B.1). 1979 = 100.

Column (2): Sum of column (6) of table 9.6. and column (2) of table 9.2.
divided by CPI (from table B.1).

Public Investment and Expenditure Bias. To examine whether public investment policy was biased in favor or against agriculture, and to test whether the effects of public investment tend to reinforce or counteract the effects of price policy, we computed two coefficients.

Basic data on GDP, gross fixed investment, and government expenditures in agriculture and in the economy as a whole are presented in Table 9-9. Column 9 of Table 9-9 is a measure of GDP in agriculture in the absence of direct intervention.

The two coefficients of bias in investment and current expenditures are shown in Table 9-10. The coefficient of public investment bias (GIB) is defined as

$$GIB = \frac{GI_{ag} / GI}{GDP_{ag}^{NI} / GDP}$$

comparing the share of agriculture in public investment to the share of agriculture in GDP. A value of $GIB = 1$ would indicate that public investment policy is neutral with regard to economic sectors.

Table 9-10 shows that throughout the 1965-85 period, except in 1967, the GIB coefficient was below one, indicating a consistent and pronounced bias in investment policy against the agricultural sector. The GIB was greater than one in 1967 because of increased investment in agriculture (land reclamation) at a time of decreased overall government investment.

TABLE 9.9.

GROSS DOMESTIC PRODUCT, GROSS FIXED INVESTMENT AND GOVERNMENT EXPENDITURES
IN AGRICULTURE AND IN THE ECONOMY AS A WHOLE (LE million, current prices).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	GIag.	GI	CGEag.	CGE	GEag.	GE	GDPag.	NDTA	GDPagNI	GDP
1960	38.2	N/A	10.3	N/A	48.5	N/A	403.0	-59.8	343.2	1443.0
1961	5.1	N/A	10.9	N/A	16.0	N/A	374.0	-74.3	299.7	1461.0
1962	137.8	N/A	26.5	N/A	164.3	N/A	461.0	35.3	496.3	1513.0
1963	6.8	N/A	20.8	436.5	27.6	N/A	481.0	-194.5	286.5	1679.0
1964	25.0	N/A	23.8	527.2	48.8	N/A	556.0	-108.7	447.3	1881.0
1965	29.5	349.6	25.0	611.6	54.5	961.2	612.0	-98.1	513.9	2340.0
1966	72.1	329.4	28.2	721.6	100.3	1051.0	609.0	-1.9	607.1	2474.0
1967	73.5	266.0	28.8	700.2	102.3	966.2	612.0	-61.4	550.6	2523.0
1968	53.6	290.9	31.5	610.5	85.1	901.4	644.0	-48.3	595.7	2615.0
1969	59.5	312.9	35.8	561.9	95.3	874.8	688.0	-93.4	594.6	2834.0
1970	56.9	314.5	27.3	604.4	84.2	918.9	780.0	-69.7	710.3	3058.0
1971	50.8	325.0	38.5	661.4	89.3	986.4	774.0	-37.3	736.7	3241.0
1972	60.3	337.3	36.4	730.2	96.7	1067.5	854.0	20.2	874.2	3390.0
1973	51.1	424.4	34.8	764.8	85.9	1189.2	1062.0	-214.2	847.8	3644.0
1974	50.7	597.0	39.7	949.0	90.4	1546.0	1280.0	-556.4	723.6	4339.0
1975	83.5	900.0	47.3	1352.0	130.8	2252.0	1468.0	-784.6	683.4	5218.0
1976	87.3	979.9	61.0	1670.0	148.3	2649.9	1744.0	-466.8	1277.2	6727.0
1977	111.1	1548.9	62.0	1701.0	173.1	3249.9	2038.0	-170.7	1867.3	8344.0
1978	147.2	2311.4	84.0	2037.0	231.2	4348.4	2286.0	185.6	2471.6	9795.0
1979	271.8	2547.0	98.0	2495.0	369.8	5042.0	2530.0	-226.9	2303.1	12705.0
1980	216.6	3675.6	114.0	3792.0	330.6	7467.6	3326.0	-802.9	2523.1	17320.0
1981	305.2	4670.6	171.0	5089.0	476.2	9759.6	3743.0	-514.0	3229.0	20171.0
1982	311.0	5947.0	206.0	6177.0	517.0	12124.0	4353.0	-221.2	4131.8	23259.0
1983	339.7	6913.0	233.0	7609.0	572.7	14522.0	5157.0	279.0	5436.0	27488.0
1984	430.6	7783.0	278.0	8881.0	708.6	16664.0	6131.0	483.4	6614.4	32627.0
1985	445.5	8718.0	320.0	10234.0	765.5	18952.0	6375.0	1007.4	7382.4	36039.0

- SOURCES: Column 1. Gross fixed investment in Agriculture from Table 9.6. column (4).
Column 2. Total gross fixed investment from World Bank, 1965-73: report 1815-EGT, p.25, and 1974-81: report 4498-EGT, p.143, and 1982-85 (estimates): report 6195-EGT, p.90.
Column 3. Current govt expenditures in agriculture: table 9.6. column (5).
Column 4. Total current govt expenditures from World Bank, 1963-73: report 1815-EGT, p.57, and 1974-78 report 4498-EGT, p.137, and 1979-84 (estimates): report 6195-EGT, p.99.
Column 5. Government expenditures in agriculture = sum of columns (1) + (3).
Column 6. Total government expenditures = sum of columns (2) and (4).
Column 7. GDP in agriculture from World Bank, 1960 and 1966-73, report 1815-EGT, p.23. (Min.Planning); 1961-65, same report, p.85 (Ag. Value Added, Min.Agric.); 1974-80, report 4498-EGT, p.124; 1981-84, report 6195-EGT, p.86; 1985 estimated.
Column 8. NDTA = Net direct transfers to agriculture, from table 9.7. column (1).
Column 9. GDP in agriculture in the absence of direct interventions = sum of columns (7) and (8).
Column 10. GDP at current prices: 1960 and 1965-73, from World Bank Report 1815-EGT, p.22. 1961-64, Gross National Product from Scobie, IFPRI Report No.29, p.67. 1974-80, from World Bank Report 4498-EGT, p.124, and 1981-84 Report 6195-EGT, p.86.

TABLE 9.10.

BIAS IN GOVERNMENT EXPENDITURES ON AGRICULTURE.

	Government Investment Bias Index	Government Expenditures Bias Index
1965	.38	.26
1966	.89	.39
1967	1.27	.49
1968	.81	.41
1969	.91	.52
1970	.78	.39
1971	.69	.40
1972	.69	.35
1973	.52	.31
1974	.51	.35
1975	.71	.44
1976	.47	.29
1977	.32	.24
1978	.25	.21
1979	.59	.40
1980	.40	.30
1981	.41	.30
1982	.29	.24
1983	.25	.20
1984	.27	.21
1985	.25	.20

SOURCES: Same as table 9.8.
Data for 1960-64 not available.

NOTE: The indices are defined as

$$\text{GIB} = \text{Government Investment Bias Index} = \frac{\text{GI Ag.} / \text{GI}}{\text{GDP Ag. (NI)} / \text{GDP}}$$

$$\text{GEB} = \text{Government Expenditures Bias Index} = \frac{\text{GE Ag.} / \text{GE}}{\text{GDP Ag. (NI)} / \text{GDP}}$$

where GI is government investment, GI Ag. is government investment in agriculture, GE is government expenditures, GE Ag. is government expenditures in agriculture, GDP is gross domestic product, and GDP Ag.(NI) is Agricultural GDP in the absence of direct price interventions.

The coefficient of government expenditure bias (GEB) is defined, similarly, as

$$\text{GEB} = \frac{\text{GE}_{\text{ag}} / \text{GE}}{\text{GDP}_{\text{ag}}^{\text{NI}} / \text{GDP}}$$

and compares the share of agriculture in total government expenditures to the share of agriculture in GDP.

Table 9-10 indicates the presence of an important bias against agriculture in terms of public expenditures, both recurrent and investment. During the period 1965-85, the bias was generally consistent averaging 0.33. In recent years, the expenditure bias has increased, mainly as a result of a positive resource flow into agriculture (see Table 9-7, column 1) and thus an increased GDP Ag. (NI).

The GIB and GEB coefficients give a general indication of the pronounced bias against agriculture of public policy in Egypt. However, the concept of government investment and expenditure bias itself is a controversial one in the sense that GNP in agriculture is not necessarily an appropriate basis of comparison. Agriculture is inherently a private sector activity and one would expect the bulk of investment and expenditure to come from the private sector, unlike in sectors such as utilities or transport. Moreover, the need for government investment in agriculture would vary over time. The reason for the presence of an increasing bias from 1967 to 1985 may simply be that massive investments related to the construction

of the Aswan High Dam were undertaken in the early 1960s. Besides, many investments in road construction, health care, education, etc. which have undoubtedly benefitted agriculture were not accounted for in the calculations of table 9.10. Therefore, even though the coefficients are meant to measure, on an annual basis, how neutral with respect to economic sectors public policy has been, this neutrality itself is not necessarily an indication that the government discriminates against a particular sector. However imperfect the measures may be, the data in the chapter dispel the notion that agriculture would have benefitted from public investment and expenditures vis-a-vis other sectors as a counterweight to the suppression of price incentives for tradables.

Remarks on General Equilibrium Effects. We have now completed our analysis of the effects of the price regime on output, consumption, rural and urban incomes, the budget and foreign exchange earnings. A partial equilibrium, comparative static method was used to determine what the level of the latter variables would have been in the absence of government interventions. The point of the analysis was to provide for each year of the period studied a non-intervention benchmark value against which to compare levels obtained under actual price intervention levels.

The main shortcoming of the method used in this section is that it considers only imperfectly the dynamic interactions in

supply between price and nonprice variables. The long run impact that non-intervention prices would have had on output levels via their impact on private investment in fixed factors was, however, taken into account in the calculations of chapter 4 to the extent that a trend variable had been included in the system estimation of the supply elasticities.³

Another issue related to methodology is whether a general equilibrium model would not be a more appropriate framework to examine such effects given that important interactions between tradable and non-tradable sectors and macroeconomic constraints have significantly influenced the outcome of policy decisions. Indeed, several authors have argued that, in the Egyptian case, only a general equilibrium model can approximate the effects of price distortions present in the economy.⁴ It was clearly outside the scope of this study to estimate a dynamic, long run general equilibrium model of the Mundlak (1979) vintage. An analysis of the effects of agricultural price policy using a computable general equilibrium model for the period 1979-84 (Dethier, 1985) shows that increases in domestic prices have little impact on agricultural growth in the short run and only have a positive impact in the long run if there is technological change.

The study by Dethier (1985) shows that, in a general equilibrium framework, price increases lead to a transfer of income

³ Esfahani (1987).

⁴ von Braun/de Haen (1983), Scobie (1983) and Alderman/von Braun (1984) among others.

from urban to rural areas, eroding the real incomes of urban households. Because of the sluggish response of domestic output in the short run, an increase in agricultural prices leads to increased food imports. Increases in agricultural supply originate in short run increases in factor use and/or changes in factor mix, in increased capacity resulting from investment in that sector or in shifts in the production function due to induced technological change. In the short run, only hired labor can respond to higher product prices. But the share of labor in agricultural value added is small, as noted in chapter 3, and this limits the short run possibilities of increases in production because the capital stock is fixed. Production gains in agriculture have therefore to come from increased capital formation and/or from technological change. However, increases in domestic prices of agricultural products have long run implications which are not favorable to agricultural growth. When nominal investment increases, an increase in the price of agriculture brought about by government policy or by market forces leads to decreased investment in real terms in that sector because 65 percent of investment goods in agriculture come from agriculture itself.⁵ The consequence of low levels of real investment is a lack of responsiveness of output in the long run unless there is technological change.

One can argue that, over time, the share of agricultural capital coming from the agricultural sector itself would decline

⁵ capital coefficients matrix estimated for 1979. Dethier (1985), p.175.

with technological progress. Similarly, productivity gains would have resulted from investments in technology by the private sector if price policy had not discriminate against agriculture.

The general equilibrium model results in Dethier (1985) also show that the low supply response in the agricultural tradable sector leads to increased food dependency. Imports of food rise in response to the demand resulting from the strong income effect of growth in other sectors of the economy, in particular in non-tradable sectors. The rate of growth of food imports is higher when the government fixes the domestic price of agricultural import substitutes than when market forces, i.e. world prices, determine the equilibrium price. Food imports are encouraged by the capacity to borrow abroad. If there is a foreign exchange constraint, a real devaluation brought about by policy changes reduces real incomes and has a regressive impact on the distribution of income. With flexible prices in agriculture, urban households lose in nominal and in real terms, but farm households gain in nominal terms although the gain may be eroded by the inflationary impact of agricultural price increases.

Chapter 10

DETERMINANTS OF PRICE INTERVENTION

In this chapter, the discussion focuses on world prices and the international context of Egyptian government price intervention for the main commodities and on the relationship between intervention and variability of prices, output, and consumption.

GOVERNMENT INTERVENTION AND WORLD PRICES

To examine the main determinants of government price intervention, we performed a regression analysis of factors influencing prices. Border prices (producer and consumer) in real terms, import capacity, and food aid were independent variables. Four dependent variables for each crop were farmgate price (P_f), consumer price (P_c), nominal protection coefficient at the producer level (NPC_p), and the nominal protection coefficient at the consumer level (NPC_c). We used the sample of 1960-84 price data. Domestic variables were expressed in domestic currency at constant 1979 prices, using the nonagricultural price index as the deflator. Foreign variables were expressed in constant 1979 U.S. dollars, deflated by the U.S. Wholesale Price Index. The regression equations for five crops are described in Appendix N. Equations were estimated using Ordinary Least Squares, with both linear and log-linear specifications. Where we found sufficient evidence of

autocorrelation among the residuals, we used a first order autoregressive correlation (Cochrane-Orcutt). Results are presented in Table 10-1.

The results are helpful in clarifying the issue of the relation between "external" variables, over which the government has no direct control, and government behavior itself. Our hypothesis was that pricing policy is responsive to changes in world prices.

Determinants of Wheat Price Policy. Regression results indicate that a 10-percent increase in the border price of wheat translates into a 1.4-percent increase in the farmgate price. The foreign variable is likely to be biased, because it does not capture the simultaneous process of reserve adjustment and foreign exchange allocation to wheat imports.¹

An increase in import capacity and an increase in food aid both result, unexpectedly, in an increased farmgate price.² These results seem to indicate the presence of multicollinearity because

¹The simultaneity bias is discussed in Scobie (1981), Appendix 3. See also Grant Scobie and Alberto Valdes, "Modelacion de Politica Gubernamental: El Caso de las Importaciones de Alimentos, Politica de Precios y la Balanza de Pagos en Egipto," Cuadernos de Economia 19 (December 1982).

²Import capacity in period t is defined as export revenues at t plus reserves at t-1, deflated by the U.S. WPI. Food aid is measured in metric tons.

Table 10.1. LOGARITHMIC REGRESSIONS FOR PRICE INTERVENTIONS.

Period			Constant	PF/PNA	PC/PNA	Import Capacity	Wheat Food Aid (metric tons)	R ²	D.W.
WHEAT:	60-84	PF/PNA	2.66	.14 (1.7)		.089 (1.2)	.032 (2.05)	.54	1.44
	60-84	NPC-producer	2.66	-.86 (10.3)		.089 (1.2)	.032 (2.05)	.89	1.44
	60-84	PC/PNA	9.0		.15 (1.38)	-.76 (6.9)	-.015 (.68)	.74	1.6
	60-84	NPC-consumer	9.0		-.84 (7.4)	-.77 (6.9)	-.015 (.7)	.9	1.6
COTTON:	60-84	PF/PNA	4.5	.17 (2.18)		-.0054 (.04)		.79	2.3
	60-84	NPC-producer	4.5	-.83 (10.6)		-.54 (.04)		.85	2.3
	60-84	PC/PNA	4.7		.21 (1.8)	.09 (.58)		.69	2.06
	60-84	NPC-consumer	4.7		-.79 (7.1)	.099 (.59)		.83	2.1
RICE:	60-84	PF/PNA	4.2	.05 (.77)				.85	1.44
	60-84	NPC-producer	4.2	-.95 (14.7)				.93	1.4
	65-84	PC/PNA	-.63		.11 (1.4)			.44	.88
	65-84	NPC-consumer	-.63		-.88 (10.8)			.93	.88
MAIZE:	60-84	PF/PNA	-1.3	.3 (1.8)				.65	1.6
	60-84	NPC-producer	-1.3	-.69 (4.14)				.44	1.6
	60-84	PC/PNA	2.4		.43 (4.5)			.53	1.6
	60-84	NPC-consumer	2.4		-.57 (6)			.67	1.6
SUGAR:	60-84	PF/PNA	-2.1	.06 (.86)				.83	1.98
	60-84	PC/PNA	4.6		.15 (3.5)			.68	1.7

NOTES: (1) NPC = Nominal Protection Coefficient
(2) PF/PNA = Farmgate Price/Non-Agricultural Price Index.
(3) PC/PNA = Consumer Price/Non-Agricultural Price Index.
(4) For sugarcane and sugar, world price is used instead of border price.
(5) T-Statistic in parenthesis under coefficient.

SOURCE: Appendix N.

the correlation between independent variables is high.³

A 10-percent increase in the border price results in an increase in the nominal protection coefficient (i.e., in taxation of producers of 8.6 percent). Although increases in the border price do result in increases in the farmgate price, the increase in the border price is greater than that in the farmgate price, thus lowering the farmgate-price/border-price ratio.

On the consumer side, we found that a 10-percent increase in the border-price equivalent results only in a 1.5-percent increase in the consumer price. A 10-percent increase in import capacity reduces the consumer price by 7.6 percent. Food aid is not significant in explaining changes in real consumer prices.⁴ An increase in the border price, however, increases the overall subsidy to consumers, reflecting the policy of insulating consumers.

We compared our results with those of Scobie (1981), who developed a much more extensive model of the wheat market in Egypt. Scobie found that as the capacity to import rises, the producer price of wheat falls, thus reducing the incentive for import-substituting production. A rise in import capacity, he found, also results in a higher real subsidy to domestic consumers.

³CORR (border price, import capacity) = .67 and CORR (border price, food aid) = .36.

⁴On the consumer side, there is also a problem of multicollinearity, as shown by the T statistic for the border price at the consumer level. See Appendix N.

Scobie saw food aid flows as highly responsive to the world price of wheat: a 10-percent increase in the world price of wheat reduces aid shipments by 6.5 percent. Scobie claimed that food aid does not make any net addition to total supplies but rather is converted to income by an offsetting reduction in commercial wheat imports.

Like our single-equation results, Scobie's model results indicate that an increase in the world price of wheat results in increased consumer and producer prices of wheat, but with a greater increase in the consumer price than in the producer price. Scobie found consumers to be slightly less insulated from world prices, however: a 10-percent increase in the world price yields a 5-percent increase in the consumer price (evaluated at sample mean).

Determinants of Cotton Price Policy. A 10-percent increase in the border price of cotton yields a 1.7-percent increase in the farmgate price in our regression analysis. When the NPC_p is taken as dependent variable, a 10-percent increase in the border price is accompanied by an increase in taxation of producers of 8.3 percent. Thus, increased rents caused by higher prices are almost fully extracted by the government's trading agency. Scobie (1981) also found that rents from higher world cotton prices were almost fully extracted by the government. But his results indicate that an increase in import capacity increases the cotton export tax by lowering the real producer price.

The same increase in border price results in a 2.1-percent increase in the price paid by the industry using cotton as an input

and in an increase of 7.9 percent in the subsidy to the industry.

Exports of cotton seem to be more related to domestic objectives than to foreign exchange needs. We found the import capacity of the country an insignificant variable in explaining changes in producer prices of cotton. This is partly a problem of multicollinearity, because the correlation between import capacity and the border price is 0.55 (on the producer side) and 0.6 (on the consumer side).

Determinants of Rice Price Policy. A 10-percent rise in the border price produces a 9.5-percent decrease in the nominal protection coefficient for producer prices (i.e., an increase in taxation) and an 8.8-percent decrease in the nominal protection coefficient for consumer prices (i.e., an increase in subsidization of consumers).⁵ The regressions for rice indicate that government policy has been highly unresponsive to world price trends in setting producer and consumer prices for rice.

Determinants of Maize Price Policy. To examine producer price policy for maize, we used the border price of maize and the farmgate price of wheat (wheat straw competing with maize in its

⁵Border prices (producer and consumer) are the only independent variables used in the rice regressions. They are regressed on domestic prices (producer and consumer) and the nominal protection coefficients. In the regressions with consumer prices, the sample period is 1965-84. All the regressions exhibit a high degree of autocorrelation, indicating that the functions are misspecified and that the border price alone is not sufficient to explain pricing policy. In the regressions in which the producer price or the consumer price was the dependent variable, after correcting for autocorrelation, the border price became nonsignificant.

use as animal fodder) as independent variables. The farmgate price of wheat was found to explain more of the variation in domestic maize prices than the world maize price. The two independent variables are highly correlated. A 10-percent increase in the farmgate price of wheat results in a 10-percent increase in the farmgate price of maize. We found that the world maize price, run in a regression with domestic wheat prices, was not a significant variable because of multicollinearity.

A 10-percent increase in the border price yields an increase of 6.9 percent in the implicit taxation of maize producers. Consumer prices of maize increase by 4.3 percent when world prices increase by 10 percent. The subsidy to consumers increases by 5.7 percent. Of the five crops, maize reflects the highest influence of world prices on consumer prices.

Determinants of Sugarcane Price Policy. Because border prices for sugarcane are negative for many years, we used the world price (in U.S. dollars and deflated by the U.S. WPI) in lieu of the border price. As expected, there is no noticeable correlation between the world price of sugar and the farmgate price of sugarcane, reflecting the government policy of shielding producers from world price fluctuations.

We did find, however, a significant relation between the world price and the consumer price, albeit a small one. A 10-percent increase in world sugar prices yields a 1.5-percent increase in domestic consumer prices.

GOVERNMENT INTERVENTION AND PRICE VARIABILITY

The Egyptian government uses price instruments to achieve several objectives. One of the declared objectives is to insulate the economy from exogenous price shocks, protecting consumer purchasing power and preventing the effects of excessive variability in agricultural output from being transmitted to consumers. Here, we first examine the variability of prices, comparing domestic and world prices, to determine whether policy intervention has successfully reduced domestic producer and consumer price fluctuations. We then examine fluctuations in output and consumption levels.

Price Fluctuations. In real terms, producer prices of the five crops analyzed have been lower but much more stable than their border-price equivalents during the period 1960-85. Most striking is the stability of producer prices during the 1974 grain price shock and the stability of producer prices of sugarcane during the 1970s despite large fluctuations in world prices. The graphs in chapter 3 (Figures 3-1 to 3-10) show the differences in fluctuations of domestic (producer and consumer) prices and border prices.⁶

Domestic consumer prices, like producer prices, have been generally more stable than their border-price equivalents. In

⁶The figures in chapter 3 graph the evolution over the 1960-85 period of domestic producer and consumer prices and of border-price equivalents at the official exchange rate and at the equilibrium exchange rate, deflated by the nonagricultural price index, P_{NA} , for the five crops.

fact, domestic consumer prices for rice and wheat actually declined in real terms during periods of world price hikes (see Figures 3-4 and 3-6). Producer prices, in contrast, increased gradually during these periods, as government procurement prices were raised (see Table 2-3).

The variance of producer and consumer domestic and world prices in real terms is presented in Table 10-2. For all five crops, real producer prices have a smaller variance than do real border prices at official exchange rate. Real consumer prices also have a smaller variance than do real border prices at the official rate. The differences in the variances are quite significant. Domestic producer and consumer prices thus have been significantly more stable than their border-price equivalents when the latter are measured at the official exchange rate.

Border-price equivalents have a smaller variance valued at the official exchange rate than valued at the equilibrium exchange rate. The only exception to this is cotton, which shows a greater variance at the official exchange rate. The only difference between P'_p/P_{NA} and P^*_p/P_{NA} is E^*/E_0 , because both variables have the same denominator.⁷ Also, whereas the difference between

⁷The equilibrium rate, E^* , has a slightly higher variance (0.022, with a mean of 0.58) than the official rate, E_0 (variance = 0.017, with a mean of 0.48).

Table 10.2.

MEASURES OF VARIABILITY OF REAL PRODUCER AND CONSUMER PRICES.

	PRODUCER PRICES IN REAL TERMS.						CONSUMER PRICES IN REAL TERMS.					
	-----Variance-----			-----"Z"-----			-----Variance-----			-----"Z"-----		
	Pp	P'p	P*p	Pp	P'p	P*p	Pc	P'c	P*c	Pc	P'c	P*c
COTTON	.23	1.28	1.28	.07	1.23	1.13	2.08	11.36	10.66	.92	10.00	9.23
RICE	.03	.70	.76	.01	.60	.71	.02	.84	.92	.01	.77	.91
WHEAT	.01	.11	.12	.01	.09	.11	.01	.10	.11	.003	.09	.11
MAIZE	.05	.08	.10	.04	.06	.08	.02	.07	.09	.01	.07	.10
SUGAR	.0007	.017	.018	.0004	.023	.024	.14	1.07	1.18	.08	1.04	1.11

	-----Mean-----			---Coeff. of Variation---			-----Mean-----			---Coeff. of Variation---		
	Pp	P'p	P*p	Pp	P'p	P*p	Pc	P'c	P*c	Pc	P'c	P*c
COTTON	2.31	3.65	4.34	.21	.31	.26	6.82	10.69	12.75	.21	.32	.26
RICE	.57	1.35	1.62	.33	.62	.54	.77	1.84	2.13	.20	.50	.45
WHEAT	.64	.81	.94	.15	.41	.37	.42	.73	.86	.26	.44	.39
MAIZE	.72	.80	.92	.31	.36	.34	.71	.86	.99	.18	.32	.31
SUGAR	.10	.11	.14	.28	1.15	.96	1.84	1.32	1.53	.20	.79	.71

SOURCES: computed from data in appendices B, C and D.

NOTES: (1) All prices are deflated by PNA (1979 = 100) and divided by 100.
 (2) Producer prices for 1960 - 1985, except sugarcane (1972-1985).
 (3) Consumer prices for 1960 - 1985, except rice (1965-1985) and maize (1970-1985).

$\text{Var} (P'_p/P_{NA})$ and $\text{Var} (P^*_p/P_{NA})$ is minimal, the difference between either of these and $\text{Var} (P_p/P_{NA})$ is quite large. The same applies to real consumer prices.

It seems that direct price intervention plays a much more important role in preventing the transmission of world price variability to domestic prices than does indirect intervention (exchange rate and trade policies).

The variance of real consumer prices cannot be compared directly to that of real producer prices in the case of processed crops (cotton, wheat, and sugarcane) because prices apply to commodities at different stages of processing. It should be noted, also, that time series on producer and consumer prices for all crops except wheat cover different periods (see notes in Table 10-2). To assist comparison, the coefficient of variation (the standard deviation over the mean) has been computed for real producer and consumer prices in Table 10-2.

For all crops except wheat, the coefficient of variation of P_c/P_{NA} is smaller than P_p/P_{NA} , indicating that consumer prices were kept more stable than producer prices. The coefficients of variation for wheat indicate a greater variation of consumer prices than of producer prices, in real terms. Yet, in the case of wheat, while consumer prices were more variable than producer prices, the difference, as noted earlier, is caused by a decrease in the real consumer wheat price.

Differences in variance can be misleading, because the variance measures the average distance from the mean of a variable.

In principle, a government is more concerned about annual fluctuations in price than about deviations from the mean. Therefore, we use an alternative metric to the variance, the "Z statistic," which measures yearly fluctuations. It is defined as

$$Z = \frac{\text{SUM } (X_t - X_{t-1})^2}{n - 1}$$

where t = year of sample period, and n = number of observations on variable X . The Z statistic compares each price at time t to the previous year's price. Because E^* has a higher variance than E_0 despite a large devaluation in E_0 in 1979, our computed Z statistics reflect similar differences in prices than those we obtained by calculating the variance. Moreover, because Z for the variable (P^*/P_{NA}) is greater than Z for (P'_p/P_{NA}) , this confirms that E^* fluctuated more than E_0 on a yearly basis and that it exhibited a larger deviation from the mean (higher variance).

Fluctuations in Output and Consumption Levels. The relation between government price intervention and fluctuations in output of traded crops is complex. In the case of nontraded crops, output shocks will cause changes in consumer prices or in stocks, or rationing must occur. In the case of traded crops, adjustments in trade flows will clear markets. We examine here the relations between output, consumption, and consumer prices for the five tradeable crops under study.

The government has attempted to maintain stable consumer prices in the face of output shocks. The correlation coefficients between output per capita and the consumer price are low for all five crops. When regressing real consumer prices on output per capita, we find that the standard errors of the slope of the regression indicate that the hypothesis that the slope is equal to zero cannot be rejected. This is shown in Table 10-3, where the variance and mean of output and consumption for each crop are also indicated.

As to the relation between output and consumption, also given in Table 10-3, maize recorded the highest correlation between output and consumption per capita. This reflects an increasing consumption of meat and a high demand for livestock feed. This demand has been partially met by imports of yellow maize. Imported maize has a moderating influence on prices because of the increased supply and because of the subsidized price at which it is sold. For wheat, the lack of a statistically significant correlation between output and consumption reflects the importance of import policy for that crop: output shocks have had little bearing on consumption.

There are two distinct groups of commodities to notice when we examine the variance of output and consumption on a per capita basis. Output of cotton and rice has been much more variable than consumption. But for wheat, maize, and sugar, consumption has been much more variable than output. These last three commodities all experienced significant increases in consumption beginning in the

Table 10.3.
FLUCTUATIONS IN OUTPUT AND CONSUMPTION PER CAPITA.

(Qd/L = A + B Qs/L)	-----Output and Consumption Per Capita-----				
	Cotton	Rice	Wheat	Maize	Sugar
Correlation Coefficient =	.01	.21	.07	.54	.44
Slope (B) =	-.07	.29	-1.5	2.3	1.1
Standard Error of (B) =	.27	.24	2.25	.90	.58

(Pc/Pna = A + B Qs/L)	---Output Per Capita and Real Consumer Price---				
	Cotton	Rice	Wheat	Maize	Sugar
Correlation Coefficient =	.21	0	.24	.15	0
Slope (B) =	-.08	0	.01	.02	0
Standard Error of (B) =	.70	.01	.01	.02	.01

Variance and Mean of Output and Consumption Per Capita.

	Cotton	Rice	Wheat	Maize	Sugar
Variance Qs/L =	78.81	122.33	32.19	20.76	446.63
Mean Qs/L =	37.4	63.2	47.7	72.7	195.9
Variance Qd/L =	32.94	50.09	980.66	203.04	1206.43
Mean Qd/L =	14.4	51	132.5	85.2	205.7

- NOTES: (1) Qs = Output.
 (2) Qd = Consumption.
 (3) L = Population.
 (4) Pc = Consumer price.
 (5) All output and consumption correlations are for years 1960-85 except sugar: 1960-81.
 (6) Output and price correlations for cotton, wheat and sugar: 1960-84; those for maize and rice: 1965-84.

- SOURCES: (1) Output and consumption from Appendix E.
 (2) Population from Table 1.1.

1970s. The huge variances for wheat and sugar consumption reflect the skyrocketing consumption of those crops. The Egyptian government has tried not to use consumer prices to balance domestic supply and demand. Rather, trade instruments (levels of imports and exports) have changed, reflecting output variations. For rice, increased consumption has resulted in a reduction of exports. For wheat, sugar, and maize, increased consumption has meant more imports and, at times, balance of payments problems. Rationing on the consumer side has also been used to moderate maize and sugar imports.

Chapter 11
CONCLUSIONS.

This concluding chapter presents a political-economic analysis of direct and indirect government price intervention, summarizing the interest-group and policy factors that have shaped Egyptian agriculture in the period 1960-85. In addition, the final section analyzes the reform attempts of the past decade.

A POLITICAL-ECONOMIC INTERPRETATION

The political economy of agricultural prices in Egypt has two distinct dimensions: a sector-specific dimension and a macro-economic dimension tied to exchange rate and trade policy, and to the food subsidy issue. Both dimensions will be examined in turn in this section, which summarizes the main conclusions and interprets them in a historical perspective. The previous analysis reveals fairly weak links between consumer price policy and producer price policy, which may translate into only marginal supply effects, at least in the short run.

The taxation of producers' output over the period 1960-85 has led to a lower level of profitability for agricultural tradables than would have been the case with liberalized prices, and hence to a dichotomy between low growth rates for tradables and high growth for non-tradables, in particular for the berseem/livestock subsector. The taxation of the agricultural sector as a whole was partially compensated by the subsidization of inputs, mainly water,

pesticides for cotton and fertilizer. The protection of meat and dairy has also reduced taxation (Table 5.8). During the 1970s gains in real farm incomes have come mainly from the production of non-tradables. Rural wage incomes have experienced large increases as a result of labor shortages. During the 1980s, rural classes were able to benefit from policies more favorable to their interests. The subsidies on inputs after 1974 have reduced the taxation of agriculture on a crop-by-crop basis.

The second dimension corresponds to the subsidization of food ("cheap food policy") which has led in the 1970s to growing import requirements and, when macroeconomic (budgetary and balance of payments) constraints were binding, to repeated reform attempts. Reform efforts, however, have constantly been thwarted for political reasons by the groups that would be losers in a reform of the system and that are politically important to the regime. Economic pressure has led policy-makers to alter policies, but for mainly political reasons, major policy reforms, overdue since more than a decade, were never achieved. That postponement of adjustments was possible until the mid-1980s is largely the consequence of the financial support from bilateral and multilateral donors from which Egypt has benefitted.

Over the period 1960-85, the relative power of rural groups has slowly changed. In the 1960s, the government's policies had a strong urban, import substitution bias. As agricultural growth and rural incomes declined, the political hostility of the rural classes toward the regime grew. The government responded not by

liberalizing agricultural markets, but by reorienting the politicization of the allocation of resources. Input subsidies compensated for procurement of major crops at low prices. Subsidized inputs, in short supply, were diverted towards profitable crops. Farmers were able to evade controls without great risks of being penalized. Food subsidies were extended to rural areas in the late 1970s reaching landless and poor households more than during the late 1960s and early 1970s. The government, however, has made no concessions to rural groups in terms of exchange rate and trade policy. While the rural middle class has been able to influence direct interventions in specific markets (sectoral policy), it has had no influence on the conduct of macroeconomic policy and, therefore, on the level of total price interventions.

The Political Economy of Direct Interventions. After 1973, stability became a particularly important objective of government policy when international commodity prices fluctuated widely. The government, more accommodating than during the 1960s toward the rural middle class, started a more liberal agricultural price policy raising producer prices closer to international levels and subsidizing inputs.

A continuation of the food subsidy policy toward consumers was also necessary for political reasons. The weak performance of the cereals subsector, high population growth and high income growth in the late 1970s led to an increase in imports

of most basic food items. The food subsidy system did not originate in a policy decision taken in 1973, but it was then that the massive fiscal expenditures required to finance the system began. Unwilling to embark on radical reforms, the government found itself burdened by a heavy heritage. The system of prices had to evolve from existing agricultural and consumer price policies that were in effect a long time before when development objectives were different. These policies included transfers of income from producers to (mostly urban) consumers, i.e. implicit food subsidies, to finance the cheap food policy and export taxes on cotton and rice to finance the industrialization strategy of the government.

We have seen in chapter 2 that agricultural policy in Egypt has two main objectives. The first one is to provide adequate basic foods to all population groups, including the poorest. The second is to become self-sufficient in all food commodities, except wheat which has been traditionally imported. The political importance of those policy goals cannot be underemphasized. The desire for political stability, on the one hand, and the desire for external independence of the country on the other have guided policy in Egypt since 1952 and go a long way toward explaining why policy-makers have been so reluctant to change the system in the direction of increased efficiency.

In hindsight, it appears that there was an inherent conflict between these two policy objectives and that the government has still not been able to resolve this dilemma. Stabilizing the

consumer price of subsidized and rationed commodities was an objective that was attainable, given the instruments at the disposal of the government during the 1960s by increasing taxation of the agricultural sector and, thus, by reducing budgeted subsidy expenditures. However, since it was politically necessary for the government both to increase agricultural output in the name of self-sufficiency and to obtain the political backing of rural classes, a decrease in taxation of the sector was necessary, leaving an increase in explicit food subsidies as the only possible outcome. After 1974, in the euphoria of Infitah, the government inaugurated its "new" agricultural price policy which consisted in raising producer prices and financing explicitly consumer subsidies, leading to rising budgetary expenditures.

The income loss in farm production has been reduced, as shown in chapter 5. This reduction is the result of changes in procurement policies, adjustment of prices and value added ratios, policy changes in agricultural trade (in particular, cereals import policy), and of rising prices in non-tradable markets. The burden on the income of farm producers was not reduced mainly by streamlining price distortions in agriculture. The composition of the burden on the sector changed, partly because of increased subsidies on inputs, so that implicit net taxation of crops was reduced, and partly because livestock production was increasingly protected.

The taxation-cum-subsidization of agriculture created major inefficiencies in the form of black markets for inputs, diversion

of subsidized inputs to profitable crops and policy-generated rents unrelated to productive activities for a few farmers, as is the case with fertilizers or with credit for tractors. By protecting certain sectors (livestock and berseem) and taxing others (cotton), the government was coopting rural interests but also creating additional distortions in the allocation of resources.

The political influence of producers on sector-specific policies depends to a large extent on the strength of their connections, more than on political associations. In Egypt, these associations are public or parapublic and have been manipulated by private individuals. The strength of the association depends on the positive inducements they can offer and on coercion. Coercion was exercised during the 1960s in various forms. During the 1970s, rural elites were freer to use public institutions to further their private aims. Public goods provided by local cooperatives and village banks were appropriated by the rural elites. Springborg (1982) in his monograph on Sayed Marei, who "reigned" over agricultural policy over most of the period until the late 1970s, vividly demonstrates the role of shilla (clientelism), family and kinship, and regional ties in the appropriation and reorientation of public resources to serve private interests.

On the output level of traditional crops, the impact of this mode of resource allocation has been felt strongly. The index of gross agricultural output has fallen consistently since 1974. Since 1980/81, agricultural output has stagnated. The production of industrial crops -- cotton, rice, and sugarcane -- was lower than

it was in 1979/80. Wheat is below its level of 1977/78. During the past 15 years, demand for agricultural products has grown very rapidly, so that the agricultural trade deficit has worsened. The agricultural trade balance recorded a deficit of 2.6 billion US\$ in 1984/85, not counting imported inputs.

Cotton has ceased to be Egypt's main export. Cotton production, which had increased substantially after 1978 to reach a peak of 530,000 tons in 1980/81, declined to only 398,000 tons in 1983/84. The fall in output was a combination of both yield and area decreases and reflected the rapid rise in costs of production, particularly labor, relative to procurement prices. In response, the government raised cotton prices by about 28% in late 1984. The area planted went up by about 10%, and production rose to 447,000 tons for 1984/85.

Cereal production had shown a positive response to the government's renewed efforts to improve varieties and to improved producer incentives in the early 1980s. But from 1983 to 1985 it experienced a fall. Wheat production fell from over 2 million tons in 1981/82 to 1.8 m. tons in 1983/84 and 1984/85. The government raised the average wheat procurement price by about 20% in 1984. Wheat consumption, by contrast, is estimated to be increasing 5% annually and the official subsidy on wheat and wheat products is estimated to have been at least 1.2 billion US\$ in 1983.

Incentives to rice producers have not lagged as far behind the costs of production as cotton and wheat. However, although rice yields have increased through the introduction of an integrated HYV

program, output has remained stagnant at about 2.2.-2.4 million tons because of acreage decreases. Maize production has experienced steady increases in both area and yields, through the introduction of HYVs. In addition this trend reflects the higher profitability of maize relative to other summer crops because of its use as a feed for livestock. Use of maize for feed has grown rapidly and maize availability is reported to be a constraint to livestock production. In 1986, however, maize production fell sharply.

The livestock and fruits and vegetables sub-sectors, which are less controlled, continue to be the most dynamic because of their generally higher profitability.¹ Overall, for the period 1980-85, the evolution of the profitability of agriculture has largely followed the expected pattern. The relative profitability of major controlled crops (cotton, wheat and sugarcane) has deteriorated. The relative profitability of other important field crops (maize and rice) has remained unchanged. The relative profitability of berseem, onions, and fruits and vegetables has improved. Trends in output and cropping pattern reflect these changes in relative profitability.

¹ Among other field crops, beans production has shown an impressive increase of over 45% between 1981 and 1985, in part due to an important research and extension program (the Vicia Fava Nile Valley Project) and also because procurement prices have kept better pace with costs than wheat, the other major winter crop.

Consumer Subsidies and the Political Economy of Indirect Interventions. During the 1960s, the objective of food policy was not for the government to obtain food cheaply, or else it would have bought inexpensive wheat on the world market. But this would have required foreign exchange needed for the investment program. The goal of the policy was rather to secure deliveries from Egyptian farmers, hence the compulsory delivery and fixed price system. Food subsidies and rationing were guided by social equity considerations in the context of Nasser's planned economy. As the degree of self-sufficiency in food products decreased, Egypt moved to an explicit food subsidy scheme. This was the only option available to the government, unless the latter were to modify its overall policy objectives. A major change in consumer price policy would have had to occur for Egypt not to have drifted toward an explicit subsidy scheme. Until 1973, consumers were subsidized by implicitly taxing producers. After 1973, consumer subsidies were financed directly out of the government budget. Government expenditures on subsidies increased sharply in 1974 and 1979. Prior to 1975, direct subsidies were included in the various sections of the budget. In 1975, a Special Fund for Subsidies was established.

During the 1970s, the agricultural sector financed low consumer prices less and the general taxpayer financed it more. This was facilitated first by high levels of foreign assistance and of food aid, then by the increase in government revenues due to the high growth rates experienced in the economy at the end of the

decade. The sharp increase in subsidy costs is due mainly to world price increases in 1973-74, and much less to an increased volume of imports. The government did not want to transmit this increase in world prices to consumers, because it would have jeopardized the opening up of the economy (Infitah). During the 1970s, insulating domestic producers and consumers from world-wide inflation was one of the main objectives of the policy. The other objective of the new agricultural policy was to increase government procurement prices and reduce controls in order to improve agricultural performance in the medium term, generate more foreign exchange from agricultural exports and reduce the increasing food import bill.

A policy of heavy subsidization of food, although it achieves its objective of supplying food at low prices to the vast majority, makes the fiscal system dependent on fluctuations in world prices and on other exogenous influences over which it has little control. The government of Egypt has successfully stabilized prices since 1973 as chapter 10 shows, but at a high macroeconomic cost. It has lead to an increased allocation of foreign exchange to food imports and to severe problems of deficit financing.

Food price policy overall has only partly achieved its welfare objective: price policy for food has had a progressive effect on the distribution of income but food distribution directly controlled by the government has had a regressive effect. Increased meat consumption in high-income groups has basically established the progressiveness of price policy for income distribution: the net sum of consumer gains decreases by 4 percent as income levels

decrease by 10 percent (Alderman and von Braun, 1984). We have seen that transfers from rations decline as income increases, but transfers from purchases at cooperatives and subsidized bakeries and flour shops increase. The richer households gain more in the aggregate than the poor. A 10 percent increase in income yields a 0.42 percent increase in income transfer incorporated in the directly managed distribution system.

There has also been an important change in the bias implied in food policy, largely for reasons of political support. The overall effects of the food price and subsidy policy around 1980 show a rural bias, whereas subsidies transferred by government-controlled food marketing show a moderate urban bias. The overall effect of the subsidy and price system is to equalize incomes and to bias the system towards the rural population. The inhabitants of big cities (greater Cairo and Alexandria) were not more subsidized by the system than people in villages. This finding is surprising given the "riot syndrome" that one detects in policy-making circles after the food riots of 1977. Net transfers received by people living in remote areas of the country are somewhat smaller than those received by people in more accessible areas, but this is largely an effect of the prices on the open market, although the government system balances a good deal of this comparative disadvantage. The income transfer accrued by non-agricultural wage earning households was significantly higher than the transfer accrued by those that do not earn wages.

It should also be mentioned that, ideologically, during the

Sadat and Mubarak years, the dominant influence of food security ('Amn el-geza'i) on agricultural strategic thinking is probably in large part due to the favorable attitude towards such a policy of a wide constituency. Food security and self-sufficiency is a unifying theme, capable of grouping Nasserists, fundamentalists, the Wafd Nationalists, and official party supporters and of blurring political differences.

Food aid flows to Egypt, in particular from the United States, have been considerable and have reduced balance of payments pressures. PL 480 wheat shipments to Egypt rose rapidly from \$2.6 million in 1974 to \$287 million in 1981. Since 1981, the value of food aid to Egypt has slightly declined. Since world wheat prices have also declined, the actual tonnage of wheat sent to Egypt under the PL 480 program has remained roughly the same. Over \$2.5 billion has been obligated to Egypt under PL 480 Title 1 from 1973 to 1986. Since 1981, the program has only included wheat and wheat flour (Dethier and Funk, 1987).

Commercial shipments on concessional terms have replaced PL 480 shipments. Since the early 1980s, competition in world markets has increased and the US has been fighting with the European Community for the Egyptian market. The US share of Egypt's agricultural imports averaged nearly 40 percent during 1974-76. But by 1983 it had declined to 28 percent. In 1983, the US tried to break the EEC stranglehold on the Egyptian market with 600,000 metric tons of highly subsidized wheat flour and sales of wheat under the Blended Credit program. As a result, US exports of wheat

flour rose to about 1.5 million tons in 1983, against 657,000 tons the previous year, while France's exports of wheat flour fell. But overall, US exports to Egypt continued to decline until 1985 as EEC exports have increased. Egypt has benefitted from the fierce US-European grain competition. As a direct result of it, the price has been steadily falling for the seven million tons of wheat and flour Egypt imports every year. The falling price, however, also makes it more attractive to give up local production.

The overall evolution of macroeconomic policies during the 1960-85 period have resulted from the interaction between the economic development model deliberately pursued by the State and from the opportunities and constraints present in the domestic and international economy. The groups in control of the State and the ideology of policymakers have shaped development strategy. Both have changed significantly during the Nasser and Sadat/Mubarak regimes. The rural classes have never had any major influence on development policy. The latter was the work of government policymakers and ideologues with an urban bias, careful however not to lose the support of rural classes. As a result of their lack of involvement in economy-wide policy, rural classes passively watched the State transfer considerable sums to public coffers through the mechanisms of unfavorable exchange rate and trade policies.

Essential also to an understanding of the changes in development policy is the role played by international donors which, since the late 1970s, have put pressure on the government to operate policy reforms in view of the increasingly unsustainable

macroeconomic situation in the country. This situation was characterized by massive foreign and domestic borrowing required to finance the fiscal deficits due to food subsidies. As the public sector dominates economic activity ², there is a strong link between the budget and monetary growth. The expansionary effect of the budget on money supply has tended to generate and sustain strong inflationary pressures in the economy. Foreign borrowing and the use of reserves have been an important mechanism of adjustment. The expansion of money supply linked to deficit financing has led to an excess supply of money balances and an excess demand for domestic and imported goods. The deficit has increased the rate of inflation, and the excess demand for foreign currency has increased its price on the free market. Another effect of the food subsidy system was to transmit much of the instability in the foreign exchange sector to the import of industrial inputs and capital goods, because the political commitment to food imports is such that, if the supply of foreign exchange falls, no adjustment takes place in the allocation for food imports.³ Thus the full social opportunity cost of foreign exchange used in acquiring imported food has not been reflected in explicit subsidy costs.

² Total budgetary expenditures exceed half of GDP; budgetary revenues are about one-third; and the overall fiscal deficit exceeds one-fifth of GDP.

³ The only foreign exchange "saving" associated with food imports are due to the fact that Egypt, now the second or third largest importer of wheat in the world depending on the year, benefits from the competition between major grain exporters and obtains substantial concessional terms on its wheat imports.

RECENT REFORM ATTEMPTS.

The economic history of Egypt in the past ten years has been a history of hesitant attempts to reform the economic system. The policies, aimed at reducing the pressure associated with the deficits, when they have been implemented in a sustained way, have reduced inflation, slowed down the depreciation of the Egyptian pound and halted the decrease in foreign assets. Food subsidies are only one contributing item of the deficit, even though it is the major one, and cuts in other expenditures also reduce the effects on inflation, the exchange rate, and the balance of payments in the short run.⁴ Aware of this fact, the government has avoided making drastic changes in the food subsidy system during the 1980s, because widespread riots had followed such an attempt in 1977.

Faced with growing budgetary and balance of payments problems, the government attempted a major change in consumer price policy in January 1977 by presenting a budget in which subsidies were cut by 35 percent. But, following mass disturbances, the government rescinded the budget cuts and continued the same policy. In fact, the government even reduced the subsidized price of wheat in the following years. The domestic selling price of wheat by GASC was reduced from 30 LE/ton in 1977 to 24.7 LE/ton in 1978 and 1979, and 22.3 in 1980, while the average GASC import price increased from 75.2 LE/ton in 1977 to 90.8 in 1978, 95.4 in 1979 and 117.3 LE/ton

⁴ Price distortions in agriculture are less important than in other sectors of the economy. Policy changes in other areas, specifically in energy pricing, would probably have more impact on the macroeconomy than policy changes in agriculture.

in 1980. As the GASC import price continued to increase to 198 LE/ton in 1981, the selling price to mills was increased in 1981 to 41.3 LE/ton.

During the period 1977-79 the Egyptian pound was gradually devalued to 50% of its previous value. All imports were phased in at the new official exchange rate, although essential food imports remained at the parallel rate until January 1, 1979. The increased cost of paying for imports at a higher exchange rate were equivalent to higher subsidy costs. A fund was established in 1977 to ease the effect on domestic prices of commodities imported at the parallel rate: 124m. in 1978, and 140m. in 1979 going to the GASC, which can be considered as additional subsidies.

Following a decline in oil revenues from their 1980/81 peak, the overall fiscal deficit reached 25% of GDP in fiscal year 1981/82. A large part of the deficit was financed through borrowings from the banking sector. The budget deficit narrowed in 1982/83, falling to 21% of GDP, thanks in part to a decline in expenditures on consumer subsidies aided by low import prices. Banking sector financing of the budget deficit fell from 8% of GDP in 1981/82 to 5% of GDP in 1982/83.

The 1983/84 budget sought to further improve the fiscal situation and the overall deficit fell slightly to 20% of GDP. Revenues were increased, and expenditures were curbed by restraining both current and investment outlays, and by reducing subsidies by implementing a substantial increase in the price of bread.

Following the national elections in May 1984, the Government decided to delay presenting the 1984/85 budget to Parliament until September in order to allow the new Cabinet and Parliament sufficient time to discuss the new budget. The budget was approved by the Parliament in October 1984. Major policy initiatives included a partial increase in the price of bread and increases in the price of selected public enterprise commodities. The overall and net fiscal deficits were projected at 16% of GDP and 4% of GDP respectively. But the outcome was much worse: the overall deficit was 24% of GDP and bank borrowing was 10% of GDP.⁵

The Government presented an ambitious budget to the People's Assembly for 1985/86. The budget was based on measures to reduce the deficit to 14% of GDP and bank borrowing to only 3% of GDP. The revenue measures were designed to raise an additional LE 1.5 billion, of which LE 600 million from raising energy prices. The goal for expenditure measures was to decrease the nominal cost of Government by 5% by restraining the growth of the wage bill and reducing subsidy expenditures. Only a small portion of these measures were implemented. Only the electricity and gasoline prices were raised as planned. There was some effort to reduce the access to subsidised goods, particularly maize, and the supply of some other consumption goods were diverted to the private sector.

In March 1986, the Government introduced a package of measures to the People's Assembly that included some of the ones originally

⁵ World Bank (1986).

planned and some new ones.⁶ Expenditures were to be reduced by 5% for public investment and current expenditures, except wages, pensions and debt service. The fiscal measures were designed to avoid affecting lower income groups. In 1985, the price charged to mills by GASC, the government agency handling wheat, substantially increased to 97.20 LE (compared to 37.60 LE in 1984). However, the impact of the measures actually implemented in 1985/86 was small. Some of the March 1986 measures, such as the custom duty reforms, were not implemented until early in 1986/87. The budget deficit ended up close to 22% of GDP and bank borrowing over 9% of GDP. The 1986/87 deficits could reach the same levels as in 1985/86 without additional measures, due to the impact of the fall in the price of oil on the budget, the inelastic nature of the revenues and the growth of expenditures not constrained by these measures. The World Bank and the International Monetary Fund considered that the nature of the measures taken would not bring about major improvements in efficiency.

In the agricultural sector, progress was achieved in reducing sector-specific distortions. This was a reflection of the change

⁶ Most of the revenue increase was to come from a variety of taxes and elimination of custom duties exemptions, from raising tariffs on luxury goods and from using a higher exchange rate (LE 0.83/\$ rather than LE 0.70/\$) for valuing imports for custom duties. In addition to these, the Government introduced a series of measures to ease the balance of payments deficit. The Government issued dollar bonds with an attractive interest rate. Non-Egyptians were allowed to buy residences in Egypt. Foreign exchange expenditures were to be cut by reducing the foreign exchange component of public investment by 10%. The balance of payments measures were meant to yield US \$1.3 billion.

in the philosophy of the government concerning the role that prices should have in agriculture. The Minister of Agriculture under President Mubarak, Youssef Wally, made the following statement in February 1982. "The agricultural pricing policy resulted in distributing the income in a way which was against the interest of the agricultural sector. Preferential pricing policies resulted in low prices for the farmers, and reduced their real incomes in favor of other sectors as well as the urban population. The next phase will witness a change in the way the State regards agriculture, designing pricing policies that aim at redressing the distribution of income in the rural sector in order to narrow the internal gap between the rural and urban communities." (Wally, 1982).

By 1986/87, these policies were being slowly implemented. With the important exception of cotton, rice and sugarcane, most price-related controls have been dismantled. Procurement quotas and price controls for wheat and for the five other affected crops (beans, lentils, sesame, onions and peanuts) have been eliminated. A gradual removal of the PBDAC subsidy on imported maize was completed in mid-1988. Jointly with a removal of price controls over privately imported maize in 1986, this has led to a surge in private imports of maize in 1987 and in 1988. The abolition in 1986 of the interministerial Import Rationalization Committee removed the major constraint to imports of feed and meat. But the change in the foreign exchange system that took place in 1987 limited the availability of letters of credit for private importers of those products.

In the markets for the three major industrial crops, however, there has been no progress. Prices paid for rice and for cotton are still controlled and below their border price equivalent. The government is clearly reluctant to introduce price policy reforms for cotton, rice and sugar because they would have severe implications for the public sector enterprises that process these crops and for employment in the regions where they are grown and processed. At the end of 1988, the Ministry of Supply was still controlling private milling of over-quota rice (which is prohibited for five months per year), stocks held by private farmers and transportation of rice. An overhaul of the price policy for these three major agricultural tradables, in order to be effective, would have to take place jointly with reforms in public enterprise wage and employment policies and with legislative changes allowing for a greater participation of the private sector.

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