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The Political Economy of Agricultural Pricing Policy

Trade, Exchange Rate, and Agricultural Pricing Policies in Morocco

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ABSTRACT

Morocco, a North African country with a population of about 23 million, has had a dualistic agricultural sector during most of the 20th century. One subsector is comprised of many small subsistence farms that grow chiefly wheat and barley; the other subsector is made up of large irrigated holdings that produce fruits and vegetables for export.

Like many of the other developing countries examined in this comparative studies project, Morocco concentrated on building its industrial capabilities in the years following independence in 1956. That meant, in other words, that consumers generally benefited from government intervention in agricultural prices, and that farm producers in general suffered the penalty of lower prices for their products. The subsistence subsector, however, was penalized more heavily by intervention than the export subsector.

By 1973, at the time of the first oil shock, Morocco's coastal cities and new industries were continuing to grow, and there was an ongoing shift of population from rural areas to the cities. A steep rate of inflation, accompanied by political turmoil, then made it more necessary than ever for the government to intervene to keep consumer prices as low as possible. Morocco was able to subsidize consumer food prices relatively painlessly at that time because of rising revenues from its exports of phosphates. (The country has about three-fourths of the world's phosphate reserves).

The year 1973 also marked the appearance of a more positive attitude toward agricultural producers. While the farm sector's output prices continued to be penalized by an overvalued exchange rate (a form of indirect intervention, some effort was made to counterbalance the exchange rate's ill effects through direct intervention. High world

prices for most commodities, including farm products, had made food self-sufficiency a more appealing goal.

In the early 1980s, as the world suffered recession, Morocco's export revenues declined. Subsidization of consumer food prices then became more difficult for the government. Although an initial attempt in 1981 to limit consumer subsidies by raising food prices resulted in serious riots, the country's food prices were gradually brought into line with market realities. Morocco's farms saw their prices improve further during the first half of the 1980s, and by 1984 the overall farm price penalty caused by the overvalued exchange rate had fallen to 8 percent, the lowest figure for the entire 1960-84 period.

This study also reports on the effects of government intervention in agricultural prices on such important variables as farm production, food consumption, and exchange rate earnings.

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LIST OF ACRONYMS AND ABBREVIATIONS

APS	Sugar Industry Association (Association Professionelle du Sucre)
CNCA	National Agricultural Credit Bank (Caisse Nationale de Crédit Agricole)
CPI	Consumer price index
DD	Customs duty (Droit de Douane)
Dh	Dirham
DRC	Domestic resource cost coefficient
EEC	European Economic Community
EER	Equilibrium exchange rate
EPR	Effective protection rate
FDIC	Constitutional Institutions Defense Front (Front pour la Défense des Institutions Constitutionelles)
FF	French Franc
GDP	Gross domestic product
Ha	Hectare
LSI	Large-scale irrigation
MARA	Ministry of Agriculture and Agrarian Reform (Ministère de l'Agriculture et de la Réforme Agraire)
MCI	Ministry of Trade and Industry (Ministère de Commerce et d'Industrie)
MF	Moroccan Franc
mt	Metric Tons
MUV	Manufacturer's Unit Value
NA	Non-Agricultural
N/A	Not Available
NPR	Nominal protection rate
OCIB	Cherifian Wheat Industry Office (Office Chérifien Interprofessionel des Blés)
OCIC	Cherifian Cereals Industry Office (Office Chérifien Interprofessionel des Céréales)
OER	Official exchange rate
ONICL	National Cereals and Pulses Industry Office (Office National Interprofessionel des Céréales et des Légumineuses)
ONTS	National Tea and Sugar Office (Office National du Thé et du Sucre)
ORMVA	Regional Agricultural Development Office (Office Régional de la Mise en Valeur Agricole)
PPP	Purchasing power parity exchange rate
Q1 (Qx)	Quintal (Quintaux, Fr. plural)
QR	Quantitative restriction
SMSI	Small- and medium-scale irrigation

LIST OF ACRONYMS AND ABBREVIATIONS, cont.

TIC	Domestic consumption tax (Taxe intérieure de consommation)
TPS	Goods and services tax (Taxe sur les produits et services)
TSI	Special imports tax (Taxe spéciale d'importation)
UNFP	National Peoples' Forces Union (Union Nationale des Forces Populaires)
WPI	Wholesale price index

CHAPTER ONE

OVERVIEW OF THE MOROCCAN ECONOMY AND ITS AGRICULTURAL SECTOR

Introduction

The roots of the Kingdom of Morocco's agricultural policies can be traced back to the protectorate period, which lasted from 1912 to independence in 1956. Economic patterns established by the French, who controlled most of the country, exerted a strong influence on the evolution of contemporary Moroccan society.[1] By 1930, French settlers owned 1 million hectares of the best agricultural land in the country (representing about 20 percent of cultivated area today), where they established large-scale, modern, mostly irrigated farms producing largely for markets in France. Policies of this period laid the foundation for a dualistic agricultural sector and an export orientation towards France, both of which have persisted to the present.

More recently, certain exogenous developments, including persistent drought, the rapid rise in energy prices, the tightening of Morocco's traditional export markets, and the softening of the phosphate market, coupled with the added fiscal burden engendered by military hostilities incurred since the recovery of the Saharan provinces, have led to a drastic degradation of the country's

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[1] While colonial government under the French protectorate ended in 1956, the Spanish protectorate in the northern part of the country lasted until 1959. Spain occupied the northern rim of Morocco, including much of the Rif Mountains, excepting an international zone declared around Tangier at the Straits of Gibraltar. It also controlled all land south of the Draa river into the Spanish Sahara as far as Mauritania. Today, Spain continues to control the Canary Islands, some 350 kilometers off the coast of Morocco, and two enclaves along Morocco's northern coast, Ceuta and Melilla. The bulk of Morocco, however, especially its agriculturally useful land, was under the colonial rule of the French protectorate, whose impact will be focused on in this paper.

fundamental economic accounts.[2] Since 1984, agricultural policy in Morocco has undergone significant changes as part of the government's medium-term sectoral adjustment reform program. (The program has been supported by two Agricultural Sector Adjustment Loans from the World Bank totalling $375 million). Most significantly, the bias against producers is being reduced as the country moves toward a trade policy of ad valorem tariffs with output price protection accorded to producers of strategic commodities. In addition, rainfall has been generous, resulting in impressive increases in agricultural output. An evaluation of the effect of these latest developments on Moroccan agriculture, however, is beyond the scope of the present study.

In the face of these economic constraints, the government of Morocco has attempted to accomplish a set of development goals while moderating among competing political interests. Yet political and economic crises over the last fifteen years have forced the government to make concessions to various interest groups. Meanwhile, political constraints have prevented the passage of comprehensive reforms which might improve agricultural productivity. This paper traces the evolution of agricultural policy in response to these developments over a twenty-five year period, from 1960 to 1984, corresponding roughly to Morocco's post-independence period.[3,4]

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2 For an analysis of macroeconomic and industrial sector policy management, see Brendan Horton, "Economic Policy Reform and Analysis: A Case Study of Morocco," World Bank, Economic Development Institute (forthcoming).

3 This report draws heavily on: (1) Kingdom of Morocco, Ministry of Agriculture and Agrarian Reform and Associates for International Resources and Development (MARA/AIRD), La Politique de Prix et d'Incitations dans le Secteur Agricole, (2 vols.), January 1986, and (2) World Bank/EMPA2, Kingdom of Morocco: Agricultural Prices and Incentives Study, (2 vols.), Report No. 6045-MOR, May 15, 1986.

Four commodities are the focus of this analysis: soft wheat, hard wheat, barley, and sugar beets. Cereals occupy a major role in the Moroccan agricultural economy, covering over 70 percent of cultivated land area.[5] Imports of soft wheat and sugar have comprised over 40 percent of agricultural import value and almost 10 percent of total import value over the last ten years. Along with edible oils, these commodities are considered by the government to be the most strategic, as evidenced by the degree of pricing policy intervention vis-a-vis consumers: almost three-quarters of the total consumer subsidy bill (equal to 10 percent of government expenditures and 2 percent of GDP in recent years, according to the World Bank) has been spent on soft wheat flour and sugar. Sugar beet is the raw material for an agro-industrial sector supported by an elaborate range of government financial policies.[6]

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[4] Though independence was gained from the French in 1956, data were available to the authors only as of 1960.

[5] Barley covers 40 percent, hard wheat 23 percent, and soft wheat 10 percent of cultivated land. Policies which focus on one cereal have an indirect effect on the others through production substitution effects.

[6] Cane is also grown in Morocco, though it is of limited importance. The reader is advised that exclusion of export commodities, oilseeds, pulses, and livestock may bias the analysis in this paper. For example, government intervention in domestic and international marketing of citrus and other fruits, vegetables, and pulses may well have served to decrease actual agricultural export earnings from levels which would have obtained in the absence of intervention. Second, vegetable oilseeds have been imported into Morocco to satisfy demand for feed cakes for the livestock sector, with the ensuing edible oils considered more as a by-product, despite the fact that Morocco does not appear to have a comparative advantage in oilseed crushing and vegetable oil refining. The domestic production of vegetable oilseeds has not been encouraged. In addition, the subsidy to consumers of vegetable oils has led to stagnation in domestic olive oil production. Third, the needs of the livestock sector interact on the input side with primary outputs and by-products from the cereals and sugar subsectors. The effect of government policy in the livestock sector on barley and sugar beet production and vice-versa is of undetermined direction and magnitude. The lack of comprehensive time-series data on these commodities, however, precludes their consideration in this study.

The next section gives a brief description of the physical and economic setting of Morocco. This is followed by a chronological discussion of the economic and socio-political developments of the country in Chapter 2. Chapter 3 presents measures of the degree and direction of government pricing, trade, and exchange rate interventions in Moroccan agriculture. Chapter 4 analyses the effects of these interventions on agricultural output, consumption, foreign exchange, and the government budget. The final chapter evaluates whether government policy objectives were accomplished by its intervention. Data sources and adjustments are discussed in detail in the annexes, with additional data tables presented in the statistical appendix.

Physical Setting

Morocco is located at the northwestern corner of Africa. A 3,500 kilometer coastline on the Mediterranean Sea and the Atlantic Ocean bounds the country on the north and west, while the eastern border is shared with Algeria and Mauritania. The country covers 725,000 km^2, almost 40 percent of which is in the Saharan region. A well-developed system of roads and railways links the major production and consumption centers. Eight modern ports provide access to international trade routes and rich fishing reserves.

Four mountain ranges divide the country between a fertile agricultural plain in the northwest and arid regions to the south and east. Agriculture is largely confined to the plains bounded by the Atlas range running south-northwest and the rocky and generally arid Rif Mountains along the Mediterranean coast. Herding is practiced extensively in regions which lack the rainfall to support crops, while more intensive livestock production is concentrated around urban consumption centers. In addition to considerable and

diverse agricultural potential, the country contains the world's largest reserves of high-grade phosphate.

Population

The 1982 national census estimated Morocco's total population at 20.4 million people, including a foreign component of nearly 62,000 (see Table 1). Based on an annual growth rate of 2.6 percent,[7] the 1987 population is thus estimated at about 23 million. Nearly 60 percent of the population is under the age of 21. The census also indicates that the urban population grew by over 4 percent and currently constitutes nearly 45 percent of the total population. Urban concentrations are high, with nearly 25 percent of the urban population residing in Casablanca (about 2.5 million inhabitants) and 50 percent in nine other major metropolitan areas. In contrast, rural population growth rates have averaged only 1.5 percent per annum over the same period, indicating a considerable demographic shift from the rural sector to the major cities along the coast.

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[7] Estimated by interpolation from the 1971 to the 1982 census.

TABLE 1: POPULATION ('000)

YEAR	TOTAL POPULATION	URBAN	SHARE	RURAL	SHARE
1960	11626	3411	29.3%	8215	70.7%
1961	11947	3516	29.4%	8432	70.6%
1962	12277	3622	29.5%	8648	70.4%
1963	12616	3727	29.5%	8865	70.3%
1964	12965	3832	29.6%	9082	70.0%
1965	13323	3937	29.6%	9299	69.8%
1966	13637	4043	29.6%	9515	69.8%
1967	13958	4148	29.7%	9732	69.7%
1968	14287	4464	31.2%	9791	68.5%
1969	14624	4779	32.7%	9851	67.4%
1970	14968	5095	34.0%	9910	66.2%
1971	15379	5410	35.2%	9969	64.8%
1972	15704	5600	35.7%	10104	64.3%
1973	16309	5995	36.8%	10314	63.2%
1974	16800	6299	37.5%	10501	62.5%
1975	17305	6619	38.2%	10686	61.8%
1976	17826	6957	39.0%	10869	61.0%
1977	18359	7310	39.8%	11049	60.2%
1978	18906	7670	40.6%	11236	59.4%
1979	19470	8049	41.3%	11421	58.7%
1980	20050	8444	42.1%	11606	57.9%
1981	20646	8855	42.9%	11791	57.1%
1982	20419	8730	42.8%	11689	57.2%
1983	20890	8991	43.0%	11899	57.0%
1984	21465	9323	43.4%	12142	56.6%
Annual Growth rates:					
1960-71	2.55%	4.11%		1.83%	
1972-84	2.63%	4.35%		1.50%	
1960-84	2.66%	4.74%		1.52%	

Source: Moroccan Statistical Yearbook

Notes: Censuses were taken in 1960 and 1982, with a 10% sample survey conducted in 1971. Figures in other years represent interpolations (extrapolations).

In 1960 the agricultural sector provided employment for an estimated 1.8 million persons or about 62 percent of the active labor force, while industry and services provided 12 and 22 percent respectively of total employment. By 1971 the share of employment in agriculture had declined to about 55 percent and by 1984 its share was about 40 percent. Other sectors' share in total employment grew correspondingly more rapidly, by 3.1 percent for services to 25 percent of total employment and by 4.4 percent for industry to 16 percent of total employment.

Unemployment is a growing problem, especially in urban areas. Official estimates in 1985 put formal unemployment at 20 percent of the labor force of 6 million persons. In rural areas, declining agricultural profitability and seasonal underemployment have exacerbated the flow of immigrants to the cities. Emigration to the European Economic Community (EEC) and the Middle East has been a traditional response to relative labor market conditions. In addition to alleviating unemployment, wage remittances from this source have traditionally provided Morocco with important foreign exchange earnings. Emigration stabilized, however, in the late 1970s in response to the recession in Europe.[8]

The Economy

Morocco's economy has undergone rapid changes since independence. Growth of Gross Domestic Product (GDP) has fluctuated widely. It grew at nearly 5 percent per annum in 1969 constant prices through 1973, then slowed to about 2-3 percent in the following decade (see Table 2). From 1982 to 1984, real GDP grew at only 2.3 percent per annum and per capita incomes stagnated. Although Morocco is classified as a middle-income country, with GDP per capita of about

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[8] See World Bank, Morocco: Basic Economic Report (2 vols.), Report No. 3289-MOR, December 30, 1980.

$540 (in 1985 dollars),[9] nearly 35 percent of the population (of which 23 percent reside in the rural areas) was estimated in 1984 to lie below the absolute poverty level.[10]

An important feature of Morocco's economic development has been the role of the public sector. Public consumption remained around 12 percent of GDP during the 1960s while private consumption declined slightly from about 80 percent to 75 percent over the period. Both investment and domestic savings increased somewhat as a percentage of GDP during this same time.[11] The following decade witnessed great changes in these basic balances. Public consumption increased dramatically to as much as 22 percent of GDP in 1976 and 1981. Even though private consumption declined from 77 percent in 1960 to as low as 67 percent in 1977 and 1979, the excess demand of public consumption and investment programs in the face of limited savings spilled over into the trade sector. Imports grew significantly from 22 percent of GDP in 1970 to over 30 percent in the 1975-84 period, while exports remained a fixed proportion of GDP.

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9 World Bank, World Development Report 1987 (New York: Oxford University Press, 1987).

10 Little exists in the way of income distribution data on Morocco. Household expenditure survey data is available from a survey done in 1970-71; data from the most recent 1984-85 expenditure survey was not available for this study. This estimate is provided in World Bank, Morocco: Compensatory Programs for Reducing Food Subsidies, Report No. 6172-MOR, April 1986. This report assumes that the pattern of expenditure distribution in rural and urban areas remained constant from 1971 to 1984, though the distribution was already becoming more skewed during the 1960s. The report defines "absolute poverty levels" in 1984 as 2376 Dh (current 1984) income per person in urban areas and 1533 Dh (current 1984) income per person in rural areas.

11 In the early years of independence after 1956, while savings actually exceeded investments there was no concomitant increase in consumption. This was due to a large extent to the repatriation of capital by the departing colonial settlers, precluding expenditure on domestic consumption.

TABLE 2: COMPOSITION OF GDP

YEAR	GDP in million current Dh	GDP in million constant Dh (1969=100)	GDP Per capita constant Dh (1969=100)	.....RESOURCES & EXPENDITURES AS SHARE OF GDP..... Private Cons.	Public Cons.	Imports	Exports	Investm.	Savings
1960	10309	12619	1068	77%	12%	23%	24%	10%	11%
1961	10251	12118	1014	81%	13%	25%	22%	9%	6%
1962	12042	13635	1111	80%	12%	21%	18%	11%	8%
1963	13447	14298	1133	79%	13%	20%	18%	12%	7%
1964	14161	14482	1117	78%	13%	19%	19%	10%	10%
1965	14920	14758	1108	78%	12%	17%	18%	10%	12%
1966	14556	14541	1066	78%	13%	20%	19%	10%	10%
1967	15416	15518	1112	77%	12%	20%	18%	13%	11%
1968	16555	17053	1194	77%	13%	20%	18%	13%	11%
1969	18479	18479	1284	75%	12%	19%	18%	14%	13%
1970	20021	19350	1293	73%	12%	22%	18%	18%	15%
1971	22091	20433	1329	73%	12%	20%	17%	18%	15%
1972	23845	20831	1333	73%	12%	19%	19%	15%	15%
1973	25838	21678	1329	73%	12%	22%	21%	17%	16%
1974	33[illegible]0	22889	1382	68%	12%	28%	28%	20%	20%
1975	36411	24619	1428	69%	16%	33%	22%	25%	15%
1976	42255	27281	1530	68%	22%	37%	18%	29%	10%
1977	49761	28934	1576	67%	21%	37%	17%	33%	12%
1978	55154	29580	1585	68%	21%	30%	16%	25%	12%
1979	62043	[illegible]	[illegible]	67%	21%	30%	17%	24%	12%
1980	70161	32127	1702	68%	20%	29%	[illegible]	[illegible]	[illegible]
1981	76737	31712	1636	71%	22%	36%	21%	22%	7%
1982	90088	33876	1659	72%	21%	35%	20%	23%	8%
1983	94589	34637	1665	69%	20%	32%	23%	21%	11%
1984	105847	35461	1661	70%	18%	36%	25%	23%	12%
Annual Growth rates:									
1960-84		4.93%	2.94%						
1974-84		4.15%	1.65%						

Note: Savings calculated as residual, equal to domestic investment - net inflows (Imports - Exports).

As suggested above in the discussion of labor composition, the structure of the economy has shifted increasingly towards manufacturing while the share of agriculture over the last twenty years has followed usual trends for middle-income countries. As shown in Table 3, agriculture's contribution to value added has fallen, as have its relative shares in imports and exports. This is due as much to a deceleration of growth in the agricultural sector as to the expansion of other sectors.

TABLE 3: SHARE OF AGRICULTURE IN GDP AND TRADE SECTORS (million current Dh)

YEAR	TOTAL GDP	AGRICULTURE SECTOR GDP*	AGRIC. share of GDP	IMPORTS	AGRIC. IMPORTS	AGRIC. share of total %	EXPORTS	AGRIC. EXPORTS	AGRIC. share of total %
1960	10309	2415	23.4%	2087	631	30.2%	1793	972	54.2%
1961	10252	2099	20.5%	2288	789	32.4%	1732	884	51.0%
1962	12042	2784	23.1%	2151	749	34.8%	1763	951	53.9%
1963	13447	3161	23.5%	2243	714	31.8%	1943	1123	57.8%
1964	14161	3211	22.7%	2328	899	38.6%	2186	1219	55.8%
1965	14920	3498	23.4%	2291	990	43.2%	2176	1190	54.7%
1966	14556	3057	21.0%	2418	669	27.7%	2168	1225	56.5%
1967	15416	3351	21.7%	2620	722	27.6%	2146	1203	56.1%
1968	16565	3712	22.4%	2790	651	23.3%	2278	1303	57.2%
1969	18479	3552	19.3%	2844	459	16.1%	2456	1423	58.0%
1970	20021	3992	19.9%	3411	640	18.4%	2470	1416	57.3%
1971	22001	4811	21.9%	3638	806	22.8%	2526	1359	53.8%
1972	23345	4962	21.3%	3677	730	20.4%	2953	1643	55.6%
1973	25825	5339	20.8%	4684	1271	27.1%	3746	2123	56.7%
1974	33540	8928	20.7%	8292	2288	27.8%	7440	2022	27.2%
1975	36411	8517	17.9%	10394	3015	29.0%	8238	1699	27.2%
1976	42358	8155	19.3%	11555	2236	19.4%	5579	2080	37.3%
1977	49761	8153	16.4%	14402	2363	16.4%	5860	1932	33.0%
1978	55154	10435	18.9%	12361	2365	19.1%	6261	2226	35.6%
1979	62043	11116	17.9%	14528	2675	18.7%	7622	2500	32.8%
1980	70161	12721	18.1%	16793	3264	19.4%	9645	2998	31.0%
1981	75737	11422	14.6%	22455	5151	22.9%	12002	3377	28.1%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	94635	16130	17.0%	25581	4440	17.3%	14724	4098	27.8%
1984	104807	17547	16.7%	34396	6949	20.2%	19110	4743	24.8%
1985	119658	21996	18.4%	38675	6638	17.2%	21740	6069	27.9%

Source: Moroccan Statistical Yearbook

An added element in the recent evolution of the sector has been the widening of the food production gap and its consequences for the agricultural trade balance. Food production in recent years has not kept pace with demand which has increased due to rapid population growth, income growth, urbanization, and declining real food prices resulting from government market interventions for the benefit of urban consumers. This has resulted in a food gap necessitating substantial increases in food imports. As for exports, in the 1960s the agricultural sector contributed over 50 percent of total export earnings, but the share of agricultural exports, primarily citrus, fresh vegetables, processed produce, and canned fish, in total exports declined at a rate of 4 percent per annum over the entire period of study, 1960 to 1984. In contrast, manufacturing's share of exports grew at an annual rate of 6.8 percent over the same period. As a result, the overall share of agricultural exports in total exports declined to 28 percent in 1984.

Another major sector in the economy is industry, which accounts for nearly 18 percent of GDP. The key subsectors in industry are food processing (nearly 44 percent), textile production (16 percent) and chemical industries (8 percent). Small- and medium-scale enterprises employing under 50 persons dominate an important handicrafts sector which contributed about one-third of manufacturing value-added in the 1970s. The mining sector is critical to the Moroccan economy as a major source of public revenue. In the early 1980s it accounted for almost 3 percent of GDP but 30 percent of export earnings. Phosphate rock is the most important of a broad range of mineral resources that include iron ore, manganese, lead ore, zinc, cobalt and copper. With about three-quarters of the world's proven reserves, Morocco is the world's largest exporter of phosphates. Morocco has minimal energy resources and is heavily dependent on crude oil imports, which are refined domestically, to meet its energy requirements. Production of local energy is based on hydro-electric power and coal but covers only 20 percent of total consumption. Energy production accounts for four percent of GDP.

Although it is too early to make a definitive statement, it appears that Morocco's economy improved as the 1980s progressed. GDP grew 4.8 percent in 1985, whereas it grew by only 2.2 percent in 1983 and 1984. Furthermore, exports increased in volume, value, and diversity. Imports, however, continued to rise, and the full price adjustments subsequent to devaluation were not passed on to consumers. Taxation of agricultural producers eased in 1984. The government's medium-term sectoral adjustment reform program has led to significant changes in Moroccan government agricultural policy, reducing the bias against agricultural producers. Moreover, good rains returned, leading to impressive cereals harvests in 1985, 1986, and 1988.

Resource Constraints and Use

Water is the main constraint facing Moroccan agriculture. Rainfall varies annually by as much as 35-40 percent, leading to large fluctuations in agricultural output.[12] Average annual rainfall declines and variability increases as one moves from north to south and west to east. In the absence of irrigation, crop varieties and the length of the growing season can be severely limited. Yet Morocco is endowed with the most extensive river system in North Africa, providing inter alia water resources to the country's modern irrigation systems which cover nearly 10 percent of the total cultivated area.

The estimated amount of water available for agriculture is 9 billion cubic meters, allowing for a potential of 1.2 - 1.4 million hectares, or 17 percent of total arable land, to be irrigated. At present, areas under irrigated cultivation cover about 760,000 hectares, or 60 percent of

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[12] For example, cereals production can vary by as much as 60 percent from the long-term average as a result of rainfall variability:

Cereals Production as a (%) of 1960-84 Average	Years in which each Respective Level of Production Occurred
40 - 50	1961
51 - 60	1966, 1981
61 - 70	
71 - 80	1973, 1977
81 - 90	1967, 1983
91 - 100	1964, 1965, 1975, 1984
101 - 110	1962, 1963, 1969, 1970, 1979
111 - 120	1974, 1978, 1980
121 - 130	1972, 1982
131 - 140	1971
141 - 150	1976
> 150	1968

potential.[13] 38 percent of the total irrigated land surface is cultivated in cereals, 11 percent in sugar beet, 7 percent in sugar cane and cotton, 9 percent in vegetables, 14 percent in forage crops and 16 percent in fruit trees. Large scale, modern irrigation systems (LSI), which are located in the large plains and valleys northwest of the Atlas Mountains, provide water to slightly more than half of the total irrigated surface area. LSI area is managed by a number of Regional Agricultural Development Offices (Offices Régionaux de la Mise en Valeur Agricole, ORMVA), whose mandate is to oversee technical and agronomic management of the perimeters. As such, the ORMVA determine cropping patterns which theoretically must be followed by farmers in order to receive water and other inputs.

Moroccan soils are generally shallow, susceptible to water and wind erosion and poor in nutritive elements. Only about 10-15 percent of the total land area of over 70 million hectares is considered to have potential agricultural value. There are approximately 7.5 million hectares of arable cropland in Morocco, of which nearly 5.5 million are cultivated. Rainfed agriculture occupies approximately 3.8 million hectares, with an additional 0.9 million hectares of fallow, while irrigated agriculture accounts for nearly 0.8 million hectares. Pasture lands are estimated at 1.8 million hectares and expansion of crop agriculture is said to be mainly at the expense of pasture. Forests (5 million hectares) and grazing lands (11 million hectares) account for

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[13] Of this total, 400-450,000 hectares are under "large-scale irrigation" (LSI). The remaining estimated 300,000 hectares are cultivated with "small- and medium-scale irrigation" (SMSI). The extent of actual SMSI and its potential is not well known. Cultivation practices range from small (circa 100 hectares or less), seasonal, traditional flood recession polders to medium (about 500 hectares or greater) perimeters with forage-well sprinkler irrigation systems.

another quarter of the total land area while two-thirds of the country is deemed agriculturally unsuitable desert and mountainous terrain.

The cultivated land falls into several zones based on the amount and variability of rainfall and on differences in soil fertility. The zone which receives less than 200 millimeters (mm) of rain per year (bour défavorable) can only support minimal agricultural production without irrigation. It accounts for about one-quarter of the agriculturally useful land area and is dominated by migratory grazing along with olive, date palm, and oilseed production. In the area which receives 200-300 mm of rainfall per annum, barley and broad bean cultivation, along with pastoral practices, dominate. Areas which receive 300-400 mm of rainfall per annum are classified as semi-arid (bour intérmédiare) -- again accounting for about one-quarter of total agricultural land -- and are dominated by barley and hard wheat production. Areas receiving 400-600 mm of rain per annum comprise the most favorable zones for rainfed agriculture (bour favorable). These zones, representing about 35 percent of total agricultural land area, are concentrated in the northwest, where the principal crops are soft wheat, maize, sugar beet, citrus and vegetables.

Land Holdings and Technology

According to the data available from the most recent agricultural census (1973-74), three-quarters of the cultivated land in Morocco is privately owned. Of this, nearly 85 percent is said to be owner cultivated while the remainder is cultivated through sharecropping arrangements. This figure has, however, been disputed as being a significant underestimate of sharecropping in the country. Furthermore, in view of the increased pressures on land, and the traditional inheritance laws, it is likely that sharecropping has increased in the past decade. "Collectively owned land," about 14 percent of total cultivated

land, refers to tracts owned jointly by the tribal community, and used principally as grazing grounds. Crown lands account for about 6 percent of total cultivated land, while land deeded to religious foundations for revenue generation accounts for about 5.5 percent.

The distribution of land holdings in Morocco is highly uneven. At the time of the 1973-74 agricultural census, 23 percent of the farmers did not own any land, but worked as tenants on plots owned by absentee landlords. Another 57 percent of Morocco's farmers had land holdings of five hectares or less, amounting to about 25 percent of the agricultural land. In contrast, 10 percent of the land is owned by 0.1 percent of the farm population in average holdings of 250 hectares. Furthermore, land holdings are highly fragmented, with 1.9 million farms divided into 11.6 million parcels which average 0.64 hectares. The unevenness of the distribution of land holdings and the severe fragmentation of the holdings has important effects on the choice of and access to agricultural technology. Average land holdings tend to be slightly larger and less fragmented in irrigated zones, where agrarian reform has been heavily promoted by the ORMVA.

TABLE 4: LAND DISTRIBUTION IN MOROCCO

FARM SIZE (hectares)	.....All Types of Ownership..... Number of Farms ('000)	(%)	.....Area..... ('000 ha)	(%)	..Private Lands. Number of Farms ('000)	(%)
0	450	23.3	0	.0	..	..
0 - 5	1090	56.5	1776	24.5	927	74.7
5 - 10	220	11.4	1508	20.8	179	14.4
10 - 20	114	5.9	1530	21.1	96	7.7
20 - 50	44	2.3	1218	16.8	32	2.6
50 -100	8	.4	515	7.1	6	.5
100+	3	.1	703	9.7	2	.2
TOTAL	1929	100.0	7250	100.0	1241	100.0

Source: Agricultural Census, 1973-74

Production technologies vary along two broad spectra of water source and farm size. In general, small farms in rainfed areas use animal traction and little or no modern inputs. Small farms in high-rainfed and irrigated zones make limited use of high-yielding seed varieties and fertilizer in conjunction with animal traction, while large farms in the high rainfed and irrigated zones practice mechanized cultivation and harvesting along with extensive use of selected seeds and fertilizers. 45-50 percent of total fertilizer consumption is concentrated in the irrigated subsector, 35-40 percent in the high rainfall zones, and 15-20 percent in the low and medium rainfed zones. In farms of less than 5 hectares, only 16 percent of the surfaces are fertilized, whereas in farms of 50-100 hectares, 64 percent of the surface area is fertilized.[14]

In sum, Morocco is endowed with a wealth of natural resources, access to which is markedly skewed. Though agriculture contributes less than 20 percent to GDP, it still provides employment to as much as 40 percent of the population. However, earnings in the rural sector have presumably declined relative to those in the urban sector and abroad, causing a demographic shift in favor of the latter. Arresting this trend is a major concern of the Moroccan Government today.

Production by Crop

The basic commodities that are analyzed in this working paper are the three main cereals -- barley, soft and hard wheat -- and sugar beets. Barley is the traditional domestically grown food crop. It covers half of the cultivated cereals acreage and accounts for 40-50 percent of total grains production, acting as a stock adjustment cereal as it moves in and out of human

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[14] For a more detailed discussion see World Bank/EMPA2, Memorandum on Fertilizer Demand and Pricing, Report No. 4526-MOR, June 1983.

food or animal feed supply, depending upon the climatic circumstances. After a drought when cereals production is down, herd size is diminished and more barley is available for human consumption. In good years, however, when there is an abundance of all grains, human consumption shifts to the preferred grain, wheat, leaving added quantities of barley to the livestock sector. Since the 1960s no barley has been exported, even in surplus years, and imports have been sporadic. It can thus represent the "tradable but non-traded food grain."

Wheat is included for several reasons. Soft wheat is the product which benefits from government intervention in both trade and pricing policies. It was initially introduced by the colonial administration for export to the French metropolis and has since independence been consumed mainly by the urban population. Despite rapid increases in soft wheat production in recent years, imports continue to provide two-thirds of total soft wheat requirements. Thus it is the principal "traded food crop." Soft wheat competes most with hard wheat, which is traditionally the preferred grain, both by producers for its reputed hardiness and by consumers for its taste.

Sugar beet is the predominant sugar crop. The crop was introduced in 1963 as an import substitution crop and output has expanded rapidly since then. It is included for analysis here because it is the primary beneficiary of most of the government interventions in the agricultural sector: output price support, input subsidies, services and investment resources. Sugar alone is estimated to benefit from one-third of the fertilizer subsidies, and about 10-15 percent of the irrigation investments.

Cereals

Traditional agriculture in Morocco is based on cultivation of cereals and pulses. Of the nearly 5.5 million hectares cultivated annually, over

three-fourths are cultivated to cereals. The principal cereals -- barley, hard and soft wheat (and to a lesser extent maize, sorghum, and other feed grains) -- are grown in all agriculturally useful regions, yet five provinces alone (Rabat-Kénitra, Fes-Meknes, Marrakech, Settat and Safi) represent two-thirds of national grain output. In recent years soft wheat output has increased significantly. Though soft wheat is reputedly more sensitive to drought than hard wheat, the largest expansion of soft wheat over the past decade has in fact taken place principally in irrigated areas and in the higher rainfall regions. The cultivation of wheats predominates in the regions of Rabat-Kénitra and Fes-Meknes, while barley cultivation is concentrated near Marrakech. Cereals are typically grown in rotations or associations with other crops, such as pulses, under rainfed conditions. Average yields remain low: about 1.0 ton/hectare for the wheats and 0.6 ton/hectare for barley (see Table 5).[15]

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[15] Irrigation is not widely practiced for cereals. About 15 percent of soft wheat acreage and less than 6 percent of hard wheat and barley area is cultivated under irrigated conditions. The area under irrigation produces about 35 percent of total soft wheat output, 9 percent of total hard wheat output, and 5 percent of total barley output. Yields are twice as high under irrigated conditions as under rainfed conditions. See annex Table V.15 for cereals production data (1976 through 1984) disaggregated between irrigated and rainfed cultivation.

TABLE 5: CEREALS PRODUCTION

YEAR	Area ('000 ha) HARD WHEAT	SOFT WHEAT	BARLEY	Yields (tons/ha) HARD WHEAT	SOFT WHEAT	BARLEY	Production ('000 tons) HARD WHEAT	SOFT WHEAT	BARLEY
1961	1330	510	1772	.46	.42	.37	612	219	656
1962	*330	468	1306	1.08	1.07	1.25	1349	476	1633
1963	1306	486	2239	.85	.81	.90	1161	401	2017
1964	1245	410	1988	.98	.97	.81	1157	398	1610
1965	1463	480	1890	.96	.96	.87	1390	428	1645
1966	1426	490	2083	.80	.63	.34	855	290	702
1967	1564	472	2076	.75	.71	.73	1173	335	1518
1968	1400	530	2110	1.36	1.28	1.52	1900	680	3210
1969	1475	470	2047	.77	.72	1.00	1130	339	2040
1970	1438	454	1890	.99	.84	1.03	1418	383	1953
1971	1517	389	1998	1.08	1.41	1.29	1642	547	2572
1972	1508	446	1933	1.09	1.07	1.28	1631	530	2486
1973	1478	582	2016	.80	.70	.62	1182	392	1255
1974	1389	529	1973	.99	.88	1.21	1380	473	2387
1975	1238	458	1819	.97	.82	.87	1204	371	1526
1976	1454	468	2117	1.14	1.15	1.35	1652	537	2860
1977	1382	527	2216	.74	.47	.58	1026	252	1345
1978	1297	457	2389	1.11	.95	.97	1441	436	2328
1979	1157	490	2168	1.12	1.00	.87	1307	490	1886
1980	1289	446	2150	1.05	1.08	1.03	1351	480	2210
1981	1186	481	2228	.52	.59	.47	610	282	1039
1982	1107	579	2047	1.27	1.34	1.14	1406	777	2324
1983	1286	690	2161	.96	1.06	.57	1239	732	1228
1984	1128	733	2128	1.04	1.12	.66	1171	818	1406

Source: National Cereals and Pulses Office
Note: "Year" refers to annual production campaigns which begin in September of the previous year and continue through August of the next. Thus "1961" refers to the campaign of 1960-61.

In Morocco, there are two distinct marketing channels for cereals. Soft wheat is the only grain which is marketed predominantly through the National Cereals and Pulses Office (Office National Interprofessionel des Céréales et Legumineuses, ONICL), the official cereals purchasing agency. The other three grains are sold primarily on the parallel market. Grains are usually sold by producers at local weekly markets (souks) where they are bulked for transhipment to consumption points. The percentage of "marketed surplus" out of total cereals production is not known, although Ministry of Agriculture sources suggest that nearly 60 percent of output is consumed on-farm, a figure which may be over-estimated. Only about 15 percent of total cereals production is brought to official collection points and sold at the official producer price (see annex Table II.1 for actual figures), although this masks substantial variation among crops. About half of total soft wheat production is sold to ONICL, whereas a far smaller proportion of hard wheat (11 percent, from 1960 to 1984; 5 percent,

from 1974 to 1984) and barley (4 percent, 1960 to 1984) production is captured by the official market.

These sales vary significantly from year to year as a function of the size of the harvest and the ensuing relative prices on the official and parallel markets. In 1981, for example, when total cereal production was only 46 percent of the previous year's levels, only 17 percent of total soft wheat production and negligible amounts of hard wheat, and barley were sold to ONICL.[16]

Official producer prices for cereals are set annually at the beginning of the planting season by an Interministerial Pricing Committee, chaired by the Ministry of Economic Affairs.[17] Prices are set on a cost-plus basis and are pan-territorial. Soft wheat producer prices are guaranteed and obligatory (prix taxé), while prices for hard wheat and barley are minimum support prices (prix de soutien). All prices are set according to grain quality. They are paid to producers at primary collection points, and therefore also cover the farmer's cost of transport between the farmgate and collection center.

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16 One would expect that farmers had shifted to the parallel market to capture higher prices. Yet annex Table II.1 indicates that the average parallel market price of soft wheat was only 111 Dh/ql in 1981, compared with an official price of 135 Dh/ql. One possible explanation for this seemingly aberrant phenomenon is that in times of fiscal distress the official purchasing agency may be less able to defend its purchase price, resulting in fraudulent marketing practices in the official market vis-à-vis farmers. In such a case, the price actually offered in the official market may be less favorable than the parallel market price, adjustments made for transportation.

17 Prices are set on the basis of proposals made by the technical ministries, parastatals, and industry representatives. Consumer interests are represented by the Ministry of the Interior and producers by the Ministry of Agriculture and Agrarian Reform (MARA), while the final arbitrage involves the Ministry of Finance to insure that the agreed prices do not strain the Government's budget. Where agricultural commodities are inputs into agro-industry, such as sugar beet and cane and vegetable oilseeds, the Ministry of Trade and Industry is also involved in the deliberations of the committee.

Only officially recognized traders and state cooperatives are authorized to procure, store, and transport soft wheat on behalf of ONICL. Millers, for instance, may not buy soft wheat directly from farmers or in rural markets. Once procured and stored, ONICL pays official storage margins for the cost of storing soft wheat. Disposal from the storage point is also administered by ONICL, which issues purchase authorizations to specific mills according to planned allocation levels.

Morocco was actually a net exporter of cereals during three seasons in the 1960s (see Table 6). Since the late 1960s, Morocco has become a large net importer of food grains, especially of soft wheat. From 1960 to 1973, domestic production of all four cereals provided 88 percent of total grains availability. From 1974 to 1984, only 68 percent of total availability was provided by domestic production. The decrease was particularly due to shifts with regard to two grains. First, there was an enormous increase in demand for soft wheat, such that in the latter period, production only provided 25 percent of total soft wheat needs. Second, Morocco went from being a net exporter of maize during the 1960s to being a net importer, as industrial poultry production accelerated.

TABLE 6 CEREALS TRADE IN MOROCCO ('000 tons)

YEAR	Soft Wheat.. Imports	Exports	Hard Wheat.. Imports	Exports	Barley.... Imports	Exports	Maize .... Imports	Exports	TOTAL IMPORTS	TOTAL EXPORTS
1960	257.9	5.0		40.5	67.3	22.5		53.3	325.1	121.3
1961	496.5			22.1	313.1				809.7	22.1
1962	225.2			64.0		114.9		61.2	725.2	240.1
1963	87.2					113.6	4.0	101.8	91.2	215.4
1964	338.5	.5		.3		15.7	5.0	50.6	344.5	67.1
1965	304.8	.5				5.0	5.0	24.1	309.8	29.5
1966	854.3		40.7		26.7		17.5	2.6	939.3	2.6
1967	906.5				5.6		6.1		918.1	
1968	75.8	.4		2.0		14.0		9.4	76.8	25.7
1969	181.2	.1				189.6		26.1	161.2	215.8
1970	570.2	.1	3.1			53.0	10.0		583.3	53.1
1971	570.6		6.0		5.5		10.7		592.8	
1972	472.6				44.7		20.3		537.8	
1973	983.1				19.1		33.2		1035.5	
1974	1032.7				68.8		41.5		1162.9	
1975	1164.8		48.0		13.9				1226.6	
1976	924.3		74.7						999.1	
1977	1697.3		40.1		42.6		80.7		1860.8	
1978	1413.6				10.6		80.9		1505.2	
1979	1537.3				10.[illegible]		90.3		1637.9	
1980	1821.0		80.0		124.4		145.6		2171.0	
1981	2244.1		36.[illegible]		243.0		196.3		2721.8	
1982	1356.8				9.7		141.5		1509.0	
[illegible]	[illegible]				[illegible]		[illegible]		2257.8	
1984	2097.1				98.0		105.8		2300.9	

Source: National Cereals and Pulses Office

Each year ONICL estimates the supplemental grain to be imported, based in part on the availability of foreign exchange. Imports are executed by local, private sector representatives of large international grain companies on competitive bids and import licenses issued by ONICL. Once on shore, imports become the property of ONICL. Flour millers who require additional grain (beyond that which is procured from domestic ONICL sources) must request an allocation of grain from ONICL which in turn authorizes the mill to purchase a designated quantity from a designated importer. Millers are required to pay the importer the domestic grain price. They are thus indifferent ceteris paribus on price grounds between domestically procured and imported grain. When the domestic price is above the world price, the difference between the landed cost plus margin and the domestic price is reimbursed to ONICL by the importer, and vice-versa in the case of domestic prices which are below the CIF price.

However, while the mills are indifferent between imported and domestically procured grain, the Government is not. As prices drop on the international market and especially as Morocco benefits from concessional grain

trade, thereby reducing even further the average unit import value of grain (particularly soft wheat), grain purchased from abroad becomes cheaper than grain purchased from domestic farmers. Thus, the incentive is to increase imports, thereby generating greater revenues from the variable import levy, at the expense of increasing the share of procurement out of total domestic production. This incentive to import is reinforced by the overvalued Dirham, which has made cereals imports cheaper at the official exchange rate than they would be at an equilibrium rate of exchange.

ONICL is required to reimburse the mills for the difference between the financial cost of flour, calculated as the official grain price plus a fixed milling margin, and the subsidized price at which flour is sold to bakers. This transfer is supposed to be financed from ONICL's receipts from the variable import levy and a minor parafiscal marketing tax. In fact, in the early 1980s the subsidy bill exceeded ONICL's revenue and large transfers from the treasury's Stabilization Fund (Caisse de Compensation) were required. As Morocco's fiscal crisis grew, these payments were made with increasing delays and ONICL became seriously indebted towards various actors in the cereals sector.[18]

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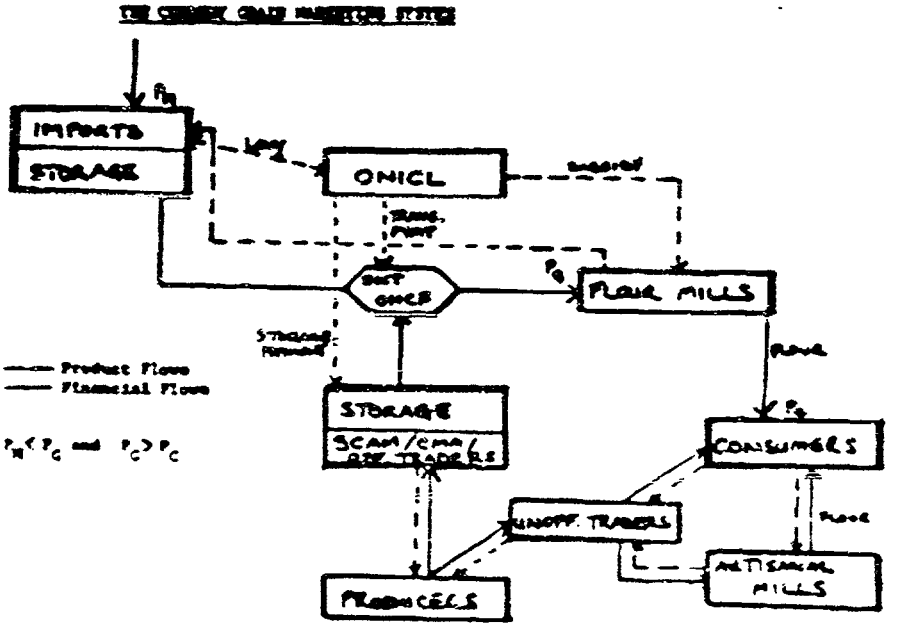
[18] As border prices continued to fall in the mid-1980s under pressure from exporting countries, soft wheat imports again began to generate revenue for the Government.

Organization of the Grains Sector in Morocco



Source: World Bank, Kingdom of Morocco: Agricultural Prices and Incentives Study, Report No. 6045-MOR.

Sugar

With a per capita consumption of nearly 30 kgs per annum,[19] sugar is a major source of calories in the Moroccan diet. It has also become a politically sensitive commodity. Until the early 1960s, Morocco was entirely dependent on imports and suffered fully the fluctuations in world prices.[20] In an effort to reduce such dependence and cut foreign exchange outflows, the Government opted for an import substitution Sugar Plan, with the objective of Morocco reaching full self-sufficiency in sugar over a 20-year period. Sugar beet production was introduced into the Gharb in 1963 (see Table 7). After 1967, sugar beet area increased by 10 percent per annum from about 12,000 hectares to 60,000 hectares in the early 1980s. Expansion in area cultivated has slowed down considerably in recent years. Production is concentrated in the irrigated offices of the Gharb, Loukkos, Moulouya, Doukkala and Tadla. Production technologies use selected imported seeds and employ high doses of fertilizers and insecticides. Most of the work, except for harvesting, is mechanized. Yields average about 38-40 tons of sugar beet per hectare, with an average sugar content of 16.5 percent. This average hides large productivity differences between regions, and between rainfed and irrigated production areas. Whereas farmers attain 60-70 tons per hectare in Doukkala and nearly 40-45 tons in Tadla under irrigated conditions, yields average only 30-35 tons per hectare in the Gharb and Moulouya under irrigation and 25-30 tons per hectare in the Gharb and Loukkos under rainfed conditions. Largely as a result of these productivity

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19 This compares with a world average of 21 kg per capita and a developing country average of 12 kg per capita.

20 This refers to recent Moroccan history. In the sixteenth century, Morocco was actually a net exporter of cane sugar.

differences, sugar beet production under irrigated conditions, which represents only two-thirds of total acreage, produces about 80 percent of total sugar beet output.

Sugar cane was introduced only in 1974 and by 1984 nearly 15,000 hectares were under cultivation, principally in the Gharb and Moulouya. Cane was introduced in the Loukkos in 1984. Total production has reached about 800,000 tons per annum, with an average recoverable sugar content of 10.5 percent. Sugar cane currently accounts for about 10 percent of national raw sugar production. Yields vary by climatic conditions and by region. For instance, while the Gharb has recorded yields of 70-90 tons per hectare, Moulouya yields are about 50-60 tons per hectare. In addition, in particularly cold years (as in 1976 and 1981), cane is subjected to frost, further reducing yields. In this report only sugar beet is studied, although data for cane are presented in the following table for the purposes of comparison.

Cultivation of both beet and cane is carefully overseen by the ORMVA in irrigated and rainfed areas, providing farmers with access to irrigation water as well as advances on inputs (seeds, fertilizer, insecticides, mechanized services) and services.

TABLE 7: SUGAR BEET AND CANE PRODUCTION

	SUGAR BEET						SUGAR CANE		
	Rainfed production			Irrigated production			Irrigated production		
YEAR	'000 ha	t/ha	'000 t	'000 ha	t/ha	'000 t	'000 ha	t/ha	'000 t
1963	6.2	11.7	71.9						
1964	9.1	19.8	180.8						
1965	9.6	18.1	173.1						
1966	11.4	20.5	234.5	4.4	30.1	131.4			
1967	11.7	7.1	83.6	9.7	34.1	330.7			
1968	15.9	24.6	394.5	10.7	34.5	367.3			
1969	23.8	16.1	383.8	12.8	39.2	495.9			
1970	26.4	16.5	434.1	20.8	33.3	693.0			
1971	27.4	26.6	730.2	23.8	35.6	846.0			
1972	31.5	21.5	677.7	31.7	31.9	1011.0			
1973	21.0	20.6	431.6	29.4	35.6	1047.0	1	80.5	9.1
1974	25.7	29.1	747.6	32.3	37.3	1204.3	.4	57.3	25.1
1975	29.9	17.8	531.2	32.4	39.0	1263.2	1.1	59.4	63.0
1976	31.4	25.9	812.4	38.5	35.2	1360.6	1.9	41.1	77.8
1977	31.6	10.1	320.0	31.3	36.4	1138.8	3.5	50.7	177.4
1978	26.8	31.2	834.4	34.0	43.4	1474.3	4.5	75.6	338.9
1979	38.9	22.7	787.3	39.1	41.1	1607.7	4.0	72.9	293.5
1980	21.4	22.5	481.8	49.5	34.3	1711.7	4.0	93.3	375.2
1981	22.7	13.7	310.2	45.5	39.7	1804.5	7.2	88.9	622.4
1982	23.3	25.5	548.6	36.2	48.7	1764.7	7.7	57.3	517.4
1983	21.6	23.8	510.0	48.0	43.3	2079.1	3.8	77.7	782.8
1984	18.8	36.5	611.8	39.7	48.2	1914.0	11.7	64.0	749.0

Source: Ministry of Agriculture and Agrarian Reform
Note: Beet area refers to seeded acreage, while cane refers to harvested area.

An agreement between the Ministries of Trade and Industry (MCI) and Agriculture (MARA) ensures that total sugar crop output will be purchased at an official producer price by the sugar refineries. Sugar prices are set annually by the Interministerial Pricing Committee on the basis of proposals from and discussions between MARA, the sugar companies, other concerned ministries (Finance, Interior), and various other agencies. Prices are calculated according to the production costs of average producers. Due to the large productivity differences between various regions, producers in the more suitable production areas have thus tended to benefit from large rents. The producer price for beet is paid at farm gate, with the cost of transportation of the crop to the sugar mills negotiated between the ORMVA, the mills, and the National Transport Office, and paid for by the mills. Domestic beet is processed either at integrated refineries which produce white granulated sugar directly, or at raw sugar mills which produce raw beet sugar to be refined subsequently by domestic refineries. One refinery, COSUMAR, also processes imported raw sugar and produces the quasi-totality of sugar loaf (pain de sucre) produced in Morocco.

Raw sugar output is sold to refiners at a fixed "transfer" price (prix de péréquation) set by the Stabilization Fund to cover all costs of production, including the cost of the raw material which is valued at the domestic beet or cane producer price, a margin for returns to capital, and a consumption excise tax. The sugar refineries and integrated sugar mills sell granulated sugar to wholesalers at a fixed wholesale price, and are compensated for the difference between the transfer price and the wholesale price. The price varies from mill to mill, with an inverse correlation observed between capacity use rates and transfer prices. Since 1963 when the first mills were established, transfers have always been made to the mills, rather than vice versa. In other

words, costs of production have been systematically higher than the fixed transfer price. Compensation by the Stabilization Fund, however, is often delayed several months (or even years) which, as in the cereals subsector, causes financial stress in the system.

There are two major forms in which sugar is sold to consumers in Morocco. The traditional product is the sugar loaf, a commodity for which no international trade exists. It is produced by a double refining process, essentially from imported raw sugar. The other principal sugar product is granulated sugar produced from imported and domestic raw sugar. Costs of production of sugar loaf are 50-75 percent higher than those of efficient granular sugar production. Consumption has been shifted away from sugar loaf and toward granulated sugar in recent years as the ratio of official consumer prices between loaf and granulated sugar has risen from 1.09 (1969) to 1.47 (1984).

Morocco has been, and over the medium term will continue to be, a large net importer of sugar. While sugar self-sufficiency has increased dramatically in the past two decades, the country continues to import about 35-45 percent of its annual requirements, almost exclusively in the form of raw sugar. White (refined) sugar was imported for a brief period in the mid-1970s. The National Tea and Sugar Office (ONTS) determines the level of imports. A variable levy system controls the domestic price of imported sugar, with the difference between the border price and the domestic transfer price paid to the Stabilization Fund through ONTS by COSUMAR when the border price is less than the domestic transfer price. When the border price is greater than the domestic transfer price, the Stabilization Fund compensates COSUMAR for the difference.

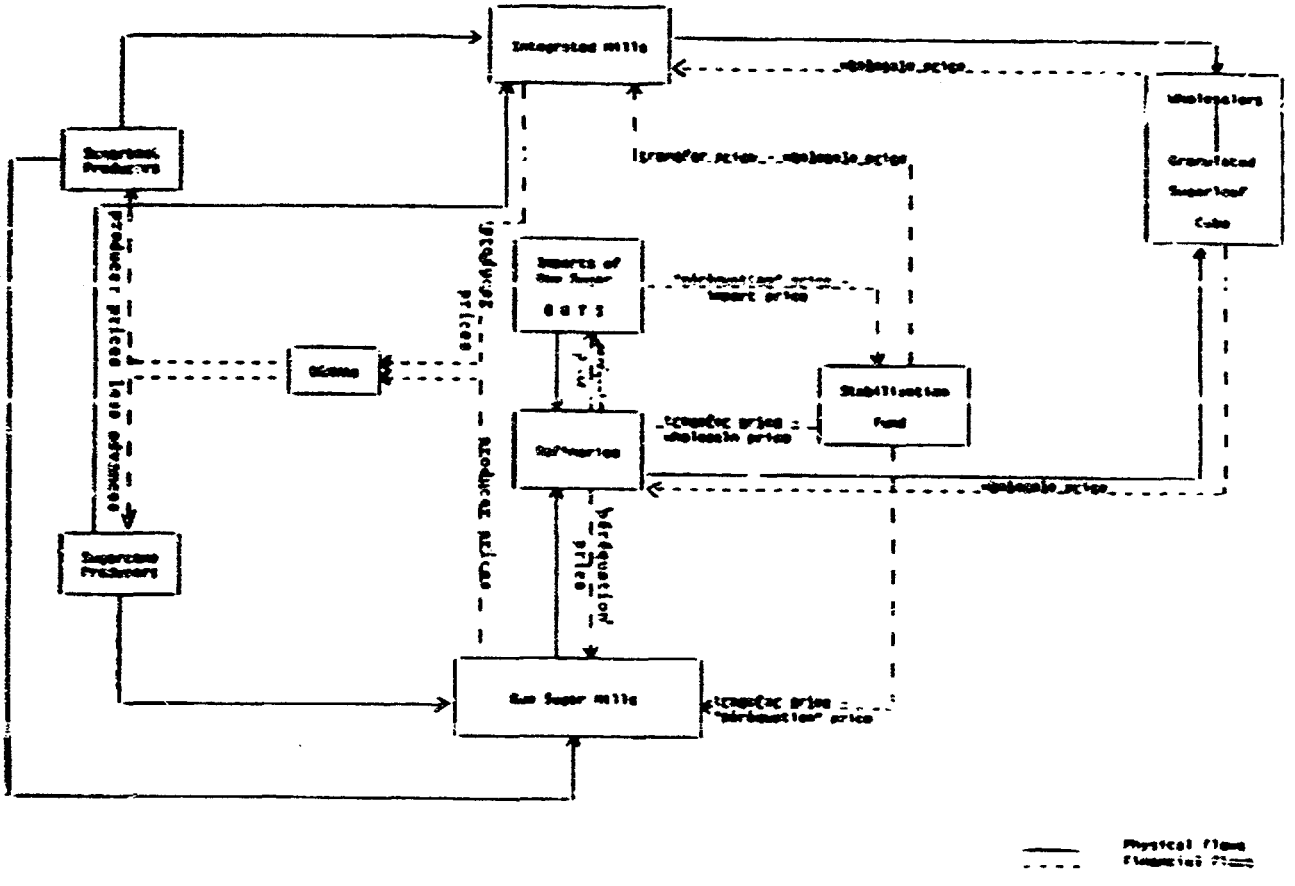
TABLE 8: SUGAR IMPORTS IN MOROCCO ('000 mt)

YEAR	REFINED Quantity	RAW Quantity	TOTAL IMPORTS (REF equiv)
1960	..	276.9	268.0
1961	..	255.0	242.2
1962	..	299.7	284.7
1963	..	280.0	266.0
1964	..	324.3	308.1
1965	..	351.5	333.9
1966	..	330.5	314.0
1967	..	300.7	285.6
1968	..	254.1	241.4
1969	..	293.0	278.3
1970	..	252.6	239.9
1971	..	226.3	215.0
1972	..	160.6	152.6
1973	..	295.7	280.9
1974	..	281.7	266.7
1975	..	246.4	234.1
1976	..	251.8	239.2
1977	112.0	225.0	325.8
1978	46.0	229.0	263.5
1979	50.0	183.1	223.9
1980	24.0	283.2	293.0
1981	23.0	252.6	263.0
1982	6.0	252.0	245.4
1983	..	249.0	236.6
1984	..	293.8	279.1

Source: Sugar Industry Association and Foreign Trade Statistics

Notes: Raw sugar imports are expressed in refined equivalents at 95% of tonnage.
.. Denotes no imports.

Organization of the Sugar Sector in Morocco



Source: World Bank, Kingdom of Morocco: Agricultural Prices and Incentives Study, Report No. 6045-MOR.

CHAPTER TWO

THE POLITICAL ECONOMIC HISTORY OF INTERVENTION IN MOROCCAN AGRICULTURE[21]

Morocco's economic interventions have favored industry over agriculture, irrigated agriculture over rainfed agriculture, and consumers over agricultural producers. This can be seen as the legacy of several important political factors that have shaped the patterns of control over the country's resources. This chapter describes the history of Moroccan political development that has underlain the formation of economic policies vis-à-vis the agricultural sector.

The central political institution of Morocco is the monarchy, currently ruled by His Majesty Hassan II, who assumed power as King and Prime Minister in 1961 after the death of his father, King Mohammed V. The monarch's active involvement in political life is guaranteed by his wide powers of appointment, as expressed in the constitution. During his 27-year tenure, King Hassan II has had to balance demands from a variety of interest groups. In so doing, he has successfully arbitrated political conflict among competing urban

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[21] For political insights this chapter draws heavily on a number of sources, including Alain Claisse, "Makhzen Traditions and Administrative Channels;" Rkia El-Mossadeq, "Political Parties and Power-Sharing;" and I. William Zartman, "King Hassan's New Morocco," all in I. W. Zartman, ed., The Political Economy of Morocco, (New York: Praeger, 1987); George Joffe, "Morocco: monarchy, legitimacy and succession," Third World Quarterly, 10 (1) (January 1988). 201-228; Rhys Payne, "Food Deficits and Political Legitimacy: The Case of Morocco" in Commins, Lofchie, and Payne, eds., Africa's Agrarian Crisis: The Roots of Famine, (Boulder: Lynne Rienner Publishers Inc., 1986), pp. 153-172; Remy Leveau, Le Fellah Marocain, Defenseur du Trone, (Paris: Presses de la Fondation Nationale des Sciences Politiques, 1985); Mark A. Tessler, "Morocco: Institutional Pluralism and Dominance" in I. W. Zartman, ed., Political Elites in Arab North Africa, (New York: Longman, 1982), pp.35-87; and "Morocco: History," The Middle East and North Africa (London, 1987).

and rural interests that has, at times, threatened the viability of his tenure and, therefore, the stability of Morocco's political system. In addition to the monarchy, the Government of Morocco also includes a number of political parties, with popularly elected representatives who sit in Parliament. The parties span most of the political spectrum and have participated to varying degrees in the Government since independence.

The evolution of Moroccan political and economic developments and the government policy responses which have affected the agricultural sector have been divided in this study into four periods, as summarized in Table 9. Morocco passed through a relatively brief open period after independence in 1956, which ended with a more restrictive regime holding sway briefly during the early 1960s. The mid-1960s through 1973 marked the Moroccan economy's most open phase. From 1974 through 1980 Morocco was exposed to the exogenous shocks of the international commodity markets, which led the economy into one of its most restrictive periods. By 1981 Morocco was forced to confront its economic disequilibria. The Kingdom has been attempting to recover from the crisis since the early 1980s, a period marked by increasing economic liberalization.

These periods correspond to several "phases" of government, as defined elsewhere.[22] From the colonial period through 1973, Morocco was in Phase I, identified by the existence of some government intervention designed to increase food self-sufficiency and promote certain crops. With the onset of the phosphate boom in 1974, Morocco passed into Phase II, with increasing complexity of interventions, designed in particular to protect consumers from the effects of both rising world prices and rising domestic producer prices. With the onset

of stabilization negotiations with international creditors in 1980,[23] Morocco entered a turning point in its history of economic interventions (Phase III), lasting through 1984, or the end of the study period.

[23] Morocco entered its first medium-term stabilization program with the International Monetary Fund in the form of an Extended Fund Facility, which was scheduled to run from 1980 through 1983.

TABLE 1: PHASES OF GOVERNMENT EFFORT 7100

PERIOD	Political Developments	Economic Developments	Effect on Macroeconomy	Effect on Agricultural Sector
I. Pre-Independence (-1955)	French Protectorate (1912-56) with cooperation of rural & urban elites institutionalized in order to balance against nationalism Favored status of rural elite with French colonial Administrators King Mohammed V assumes throne & leads Morocco into post-colonial period	Dualistic economic policies favoring French settlers	Development of mining, manufacturing sectors Positive external balances	Distinction betw rainfed/irrigated agriculture Distinction between export-oriented and traditional agriculture
II. Post-Independence (1956-1963)	Dominance of urban-based, nationalist Istiqlal party Creation of rural cooperatives by Istiqlal, antagonizing rural elite, 1958 Accession to throne King Hassan II, 1961 Abortive Berber rebellion in Rif against central government, 1961 Establishment of constitutional monarchy, 1962	Efforts to minimize economic dislocation following independence Increased flexibility in tariff policy Delinking of currency from French franc Objectives of rapid growth, self-sufficiency & emphasis on indust.devel. Export-oriented agriculture Drought in 1961 Increase in consumer price subsidies (especially sugar)	Increasingly negative external balances as development, military expenditures increased Tight trade controls Consumer price pressures, 1st price riots (sugar)	To be developed as source of surplus for transfer to other sectors of the economy Continued development of irrigated agriculture Development of "Sugar Plan" w/rapid industrialization
III. Stabilization/Expansion (1963-1972)	Strengthening of political opposition Realignment of monarchy alliance, replacing Istiqlal & other urban parties with rural elite State of emergency, 1965 Two attempted coups by military, 1971 and 1972	Partial removal of sugar consumer subsidy, 1963 Drought in 1964 Reduction in imports, 1965-69 Legislation of pricing regulation, 1971	Inconvertibility of Dirham in 1964 Decline in trade deficit Decline in rate of inflation Intensification of Dirham overvaluation 1972-73	Large public investments in modern agric sector, w/diversification of rainfed/irrigated dichotomy Begin official intervention in agric pricing policies; divergence of offic and parallel prices markets Subsidization of modern agric inputs Expansion in agric output, esp. irrig
IV. Phosphate Boom and Fiscal Crisis (1973-1980)	Continued political opposition & violence, 1973-74 Green March into Sahara, 1975 Political opposition agrees to participate in Government, 1976, 1977 Increasing demands for wage hikes as inflation grows	Emphasis on import substitution via industrialization Surge in government spending due to world phosphate market boom which does not abate post-boom Increase in military expenditures Intensification of consumer price subsidies	Increased trade protectionism Increasing disequilibria post-phosphate boom, in trade, budget, balance of payments Mounting inflation International borrowing initiated to relieve disequilibria	Reversal from positive to negative agric balance of trade ratios Continuation of agricultural production policies Beginning of general producer price subsidies for soft wheat and sugar beet
V. Economic Deterioration/ Stabilization and Structural Adjustment (1981-1984)	Food riots in reaction to announced price hikes, 1981 Gestures of conciliation toward political opposition, 1982 Parliament suspended in attempt to subdue rural opposition during increasingly difficult economic times, 1981 Urban food riots, 1984	Drought in 1981 Beginning of stabilization/structural adjustment program More subsectorially balanced strategy Renewed emphasis on agriculture and labor-intensive industrial activities	Increasing debt service ratio Still increasing overvaluation of Dirham Devaluation of Dirham, 1984 Moderate trade liberalization Agreement to phase out consumer and fertilizer subsidies negotiated w/ IMF	Continuation of dualistic agricultural pricing policies

Summary of Economic Objectives and Policy Tools

Since independence, Morocco has pursued a goal of rapid economic growth through industrial import substitution, the establishment of processing industries, modernization in the agricultural sector, and expansion of its raw material production. The most prominent feature of Morocco's global objectives has been their continuity. During the early post-independence period, the emphasis of objectives shifted towards greater self-sufficiency through import substitution. The initial goals for self-sufficiency were based on the belief that greater value-added could be captured through local processing and thus save foreign exchange, while after 1974 the objective was driven by concerns over the volatility of world prices and the consequent fluctuations in foreign exchange earnings resulting from dependency on world commodity markets. Export promotion and diversification were always mentioned, however, as additional ways to decrease fluctuations in foreign exchange earnings.

In the early 1970s the Government also acknowledged the need to redistribute the fruits of economic growth equitably. Social sectors (housing, education, health) received an increasing share of budgetary expenditures at the same time that attempts were made to reduce disparities in income by reforming policy measures concerned with taxation, job creation, land redistribution, and the development of rainfed agriculture within the confines of protective trade policy and an interventionist policy with respect to prices. Wage stability and its corollary, price stability, also became increasingly important as objectives after the mid-1970s in the belief that wage-price policy was more effective than exchange rate policy in strengthening the competitive position of Morocco's developing industrial sector. The emphasis on equity in comparison with goals considered more directly productive, however was small. Employment generation

has also been added as an objective in recent plans, but there is little concrete evidence as to the integration of this goal into the overall policy framework.

To implement these objectives Morocco has resorted to a number of policy tools. Among these are trade, investment, price, exchange rate, and wage policies. Morocco's system of tariff and non-tariff protection was built to (a) promote rapid growth of GDP by encouraging investment through low customs duties on imported capital goods; (b) reduce economic dependence on other countries through import substitution by means of trade protection on finished goods; (c) generate revenue; and (d) avoid sharp changes in domestic prices due to international price movements.

In the agricultural sector the greatest emphasis has been placed on supply shift policies. Heavy capital transfers through massive investments and free services were seen as the most effective manner of increasing production and generating growth in incomes and employment without inducing price rises. Droughts and international commodity price shocks further encouraged the use of these policy tools. Little faith was placed until recently in the role of output price policy in inducing supply increases. Rather, administered prices were seen as one means for maintaining low food prices in order to improve the purchasing power of the population while ensuring adequate incentives to producers.

Pre-Independence History of Morocco

Many of the origins of Moroccan policies toward the agricultural sector can be found in pre-independence patterns of administration. By the nineteenth century, prior to the French and Spanish Protectorate era, Morocco was the domain of 1) a series of Sultans, from which King Hassan II is descended, whose primary source of power was as the spiritual and political leaders of the region, and 2) a number of marabouts, the muslim Berber leaders who controlled

the many tribal factions in Morocco. Those parts of the country which submitted directly to the Sultan's authority were known in Arabic as the bled el-makhzan, or "land of the government."[24] Beyond these lay the tribal lands known to the Arabs as the bled es-siba, or "land of dissidence," which slipped in and out again of the makhzan's jurisdiction. Critical, then, was the role of the caids and pachas, the rural notables who were the Sultan's link to the countryside. Their cooperation legitimized the authority of the Sultan's makhzan over the bled es-siba and helped to extract tax revenues from the Berber tribes for the Sultan.

By the mid-nineteenth century, however, Morocco began to open up to European economic interests. A "protege" system of partnerships between local notables and foreigners, mainly in the area of livestock raising, exempted Moroccans and their partners from local property laws, thus eliminating the threat of royal expropriation of wealth.[25] This was a prototype for the colonial patterns of resource management to come.

Under the French Protectorate the character of local authority in rural areas was drastically altered. The caids and pachas lost their autonomy as they became dependent bureaucrats of the pervasive colonial administration.[26] Although the presence of the French undermined the rural notables' power, the latter were relied upon as intermediaries and were rewarded for their cooperation with a moderate degree of personal enrichment and education. A further objective

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[24] Interestingly, the word makhzan literally means "treasury," though it came to be synonymous with "government."

[25] See Zahya Daoud, "Agrarian Capitalism and the Moroccan Crisis," MERIP Reports, #99, September 1981, p. 28.

[26] "...(T)hree times as many Frenchmen were employed to govern Morocco as Englishmen were used to rule India with forty times the population." From Douglas Porch, The Conquest of Morocco (New York: Fromm International Publishing Corporation, 1986), p. 298.

of French administrative policy was to keep Arabs and Berbers apart, favoring the rural Berber elite in order to counteract the rising nationalism of the urban Arab elite.

Istiqlal, the Arab nationalist party, was formed in 1943 in support of a platform which called for an independent constitutional form of government to be installed under the control of Sultan Mohammed ibn Youssef. The Istiqlal platform, however, did not have the support of conservative Berber tribesmen of Morocco, most likely because of their favored status with the French under the Protectorate. Clashes between the Sultan and Berbers finally led to the temporary exile of Mohammed ibn Youssef in August 1953. In November 1955, as negotiations were being finalized in preparation for independence from France the following year, he was allowed to return to Morocco, was recognized once more as the legitimate Sultan, and led Morocco into its post-colonial period.

The Protectorate era witnessed important structural changes with regard to the position of the state vis-à-vis economic resource management. While under the Sultan's rule formal taxation of the region's economic base had been kept to a minimum, exploitation of Moroccan resources for exportation of agricultural produce and repatriation of rents to France became primary objectives of the colonial government.

Settlers' access to land was facilitated by the institution and encouragement of subdivision of communal holdings and their sale. In addition, government-owned land, communal lands and pasture were variously purchased or appropriated and resold to European settler farmers. Much of the best land in the agriculturally "useful" zones of Morocco -- the Chaouia, Doukkala, Gharb, and pockets in the Souss and Oujda -- were farmed by settlers. The area owned by settlers rose from about 73,000 hectares in 1913 to over 1,000,000 hectares

in 1953, with an average of 110-170 hectares per farm. Whereas settlers represented less than 2 percent of the rural population in 1953, they owned nearly 10 percent of the cultivated land. Moroccan farmers, on the other hand, owned on average 17 hectares of essentially marginal land.

As early as the late 1920s these pressures on land were translated into increased dislocation of the Moroccan farming population with rapid rural-urban migration and the establishment of "bidonvilles" around Rabat and Casablanca. The significance of these trends was not entirely lost on the Protectorate Government, which in 1945 sought to arrest the trend by guaranteeing a minimum of inalienable property of 8 hectares per farm to Moroccan farmers.

In addition to outright appropriation of productive resources, a diversity of instruments was used to implement the Europeanization of Moroccan agriculture. Most important among these was the tertib, an agricultural land tax whose incidence fell primarily on the Moroccan subsistence agriculturalist. Similarly, a differentiated credit system allowed Europeans to invest in and expand their share of the agricultural sector, while Moroccans were provided with minimal financing. Finally, an elaborate system of price supports and preferential access to high-priced metropolitan markets was provided principally to European farmers while Moroccans tended to dispose of their production on the lower priced domestic or fluctuating world market.

The promotion of specific crops by the colonial administration was determined as a function of demand for agricultural imports in France. In the early part of the Protectorate, the agricultural focus was on cereal production, especially soft wheat.[27] Yet by the early 1930s, collapsing international

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[27] See A. Driouchi, "Le déficit des céréales au Maroc," Thèse de IIIème cycle, Université Hassan II, Rabat, 1975.

agricultural product prices suddenly plunged much of the colonial farming community deeply into debt. Formerly guaranteed markets overseas were closed; settlers often could not afford to harvest their crops or pay the laborers now dependent on them. The Moroccan Wheat Bank was created in 1933 to help facilitate wheat harvests and stabilize wheat prices.[28] The Seventh North African Conference in 1934, involving French colonial governments in the region, was largely occupied with questions of wheat marketing. It was agreed to develop a system of price insurance administered by paying a minimum price to farmers before the harvest, and to give customs duty exemptions to farmers requiring them. This period saw the inauguration of a number of organizations designed to stabilize the domestic cereals market in favor of settler producers, namely the Cherifien Wheat Office (OCIB), which later became the Cherifien Cereals Office (OCIC), both forerunners of the present day National Cereals and Pulses Office (ONICL).

On the eve of the Second World War, France demanded textile materials and edible oils. In response, Moroccan cotton and linseed production was increased and the cultivation of sunflowers was introduced. It was not until the end of the 1940s, however, that the French national standard of living was sufficiently high to require increased imports of fruits and vegetables and it was from this period on that the growth in the production of Moroccan tomatoes and citrus products accelerated.[29] Yet in contrast, Morocco remained a major

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[28] A. Berrada, "Le crédit agricole au Maroc 1917-1977," Editions de la faculté des sciences juridiques économiques et sociales de Rabat, 1979.

[29] See W. Swearingen, Moroccan Mirages: Agrarian Dreams and Deceptions, 1912-1986 (Princeton, NJ: Princeton University Press, 1987), for a detailed account of the settlers' drive to pattern Moroccan horticultural development after Californian successes.

importer of sugar, mostly from France, throughout the Protectorate period as French sugar producers argued against promoting sugar production in a nearby colonial client despite agricultural research results which suggested that sugar beet yields as high as 8 tons per hectare could be achieved in Morocco, as compared with European yields of 4-5 tons per hectare.

Post-Independence: Dominance of Istiqlal (1956 - 1962)

Immediately after independence, national politics were dominated by an alliance between the King (as Sultan Mohammed ibn Youssef was proclaimed in July 1957) and Istiqlal. The urban-based nationalists who comprised Istiqlal were determined to modernize the country and utilize its full economic potential. The state was to take a leading role in the country's economic development and planning was viewed as an essential determinant of successful modernization. Istiqlal also supported the vision of a "Great Morocco" whose borders would be expanded to encompass historical spheres of economic influence, extending into southwest Algeria, the Spanish territories of northwest Africa and Mauritania, and as far as the French Sudan (Republic of Mali today).

Already by 1959, however, Istiqlal was plagued by internal dissension, which prevented it from successfully challenging the monarch's authority. Its popular support diminished, partly because it showed little sensitivity to patterns of rural politics. It proclaimed significant agrarian reforms, for example, that were to liberate the countryside's productive potential. The tribal system, based on the relationships of local dependency and clientelism which had flourished during both the pre-colonial and colonial periods, was to be replaced by communal organizations. Caids and pachas who had constituted the rural administration's backbone under colonial rule were to be replaced by nationalist party cadres. The system of land tenure was to be

reorganized so that efficient production units could form the basis of modern techniques.

Istiqlal's plans for the rural sector backfired, as their proposed reforms directly threatened the privileged position of rural notables. The urban nationalists' insensitivity to enduring agrarian structures in Morocco was met by social unrest in many rural areas, as in the 1961 rebellion in the Rif Mountains. King Hassan II, ascending to the throne upon his father's death in 1961, reiterated his Government's support for the rural elite and many Istiqlal reform proposals were abandoned. The intermediary roles of rural notables were restored and members of the rural elite were again assured positions in the local administration. The communes, initially installed by Istiqlal to form the basis of an efficient production system, were delimited so as not to affect the role of local elites. The promotion of economic reform and modernization by an urban-based technocracy had given way to political realities. The rural elite, in return, became one of the Government's most important sources of support. Thus, as during the Protectorate period, the rural elite were relied upon as a counterweight to urban-based opposition groups.

The transfer of political power to the Moroccans in 1956 did not entail any major change in economic policy from those pursued under the French Protectorate. The Moroccan Government tried to avoid any actions which would result in a loss of international confidence. Domestically, the Government had to assure French farmers and businessmen that their investments and other interests were safe. Consequently, Morocco retained a tight monetary and trade relationship with France through its membership in the French franc zone. The cereals price support system put in place by the French in the 1930s was not changed substantially during the initial years of independence. Moroccan

agricultural exports continued to benefit from protected French markets -- which expanded substantially when France became a member of the Common Market -- through the preservation of duty-free quotas.

Policies such as the tertib remained in place although exemption levels were increased by one-third. An estimated 1.3 million hectares cultivated by small farmers (50 percent of crop land) avoided tax liability through these higher levels. The 5 percent proportional tax was replaced by a progressive schedule ranging from 2 to 10 percent and variable by crop. Of the one million hectares farmed by Europeans in 1956, three-quarters were privately owned, with the remainder known as "official" colonized lands. It was not until 1963 that the Government announced that it would take over all official colonial lands, and 1966 before control of these 250,000 hectares actually passed to the Moroccan Government. No formal proclamation concerning privately-owned colonial lands, beyond the fact that they would eventually be expropriated, was made until 1973.

Despite substantial capital outflows by departing settlers, Morocco's balance of payments remained generally stable as the outflows were matched by inflows of official bilateral assistance from the United States and France. Furthermore, the balance of trade remained positive with expansion in the export sector. The currency, tied to the French franc and thereby benefitting from overdraft possibilities, remained convertible.

Within this framework of favorable external balances, the Moroccan Government initiated some institutional changes in its trade regime that would lead to greater flexibility in official policy. In 1957, the uniform tariff of 17 percent on all imports was replaced by a range of tariffs and product differentiation. The objectives of this change were to protect domestic industries, to increase revenue, and to insulate domestic markets from

fluctuations in international prices. The tariffs were graduated from a maximum of 10 percent on raw material inputs to 20 percent for semi-finished goods and to 35 percent for finished goods. Luxury items could be levied a 50 percent tariff. The new system allowed duty rates to be changed frequently to reflect differences between items deemed necessary for economic development (i.e., raw materials and capital equipment), luxury goods, and goods competing with domestic infant industries. As a result of changes in rates and the growing volume of imports, revenues from duties and taxes on imports doubled between 1957 and 1963.

In 1958, Morocco moved away from its close monetary relationship with France. When France devalued its franc (FF) by 18 percent, Morocco chose not to follow. The Moroccan franc (MF) stayed fixed vis-a-vis the dollar (420 MF/$1) while it moved to a new par of 1 MF/1.175 FF. The Moroccan franc remained fully convertible. To avoid capital flight, the Government assessed a 10 percent tax on all capital transfers to other parts of the French franc zone. The second step towards monetary autonomy came in 1959 when the Central Bank (Banque du Maroc) was established and controls were further tightened on capital flows to franc and subsequently non-franc zone countries. Finally, in October 1959, the Moroccan Dirham (Dh) was established as the new unit of currency. The Dirham, convertible but subject to controls, was fixed against the French franc.

With the establishment of the Moroccan Dirham, the system of mutual overdraft facilities with the French franc area was discontinued. This situation could have posed a problem for Morocco, with inadequate gold and foreign exchange reserves at independence. However, Morocco's trade account continued to be favorable through 1960, official bilateral assistance continued, and Moroccan reserves were built to a level corresponding to 50 percent of annual imports by 1960.

Seeking to assert control over the main sectors of the economy with minimal dislocation, the Government's development efforts were channelled towards the completion of basic infrastructure and the diversification of the Moroccan economy through an industrialization drive. The Government established the following objectives in agricultural development: development of natural resources, particularly water resources for irrigation; modernization and integration of agriculture with the overall economy; higher employment levels in the rural sector in order to reduce migration to urban centers; self-sufficiency, particularly in sugar and dairy products, which accounted for a large share of Morocco's imports; and growth in the export market to generate foreign exchange earnings for Morocco's fledgling industrial sector.

Stabilization/Expansion:

Alliance with the Rural Sector (1963 - 1972)

Under the impetus of a new constitution in 1962 guaranteeing political freedoms, a number of new parties were founded in the early 1960s. None, however, was able to gain control over national politics. Istiqlal split in two, with its more radical faction reorganizing as the Union Nationale des Forces Populaires (UNFP). King Hassan II's supporters established the Front pour la Défense des Institutions Constitutionnelles (FDIC). Elections in 1963, however, failed to confirm a majority in the Chamber of Representatives for the FDIC. Political repression of the opposition began to be felt, particularly after an alleged coup attempt in July 1963.

There were repeated efforts in the 1960s to attract the opposition parties back into mainstream political participation. The FDIC itself split into two factions, the Parti Socialiste Démocratique and the Mouvement Populaire. By mid-1965, however, the weakness of the legislature combined with popular agitation protesting unemployment and inflation led to strikes in Casablanca and the proclamation of a state of emergency, under which Hassan II assumed full legislative and executive power. Elections were postponed until calm could be restored.

From 1960 to 1965 current government expenditures rose continuously, largely due to development efforts and military hostilities in 1963 between Algeria and Morocco over the Sahara. Current revenue, mostly derived from public monopolies and border taxes, increased more slowly than expenditures. The tertib, declared to be incompatible with equitable agrarian and fiscal development and abolished in 1961, was replaced with a direct tax which yielded less than 1 percent of total government revenue. By 1965, the budgetary deficit reached 767 million Dirhams or 5 percent of GNP (see Table 10), creating a fiscal crisis.

TABLE 10: GOVERNMENT FINANCE DATA

YEAR	BUDGET DEFICIT AMOUNT (10e6 Dh)	(%) Budget	(%) GDP	.....Deficit Financing.... (%) Domestic	(%) Foreign	(%) Cash bal	Annual Rate of Money Expansn	Annual Rate of Consumer Price Inflation
1960	N/A							1.0%
1961	N/A						5%	1.8%
1962	N/A						16%	5.0%
1963	N/A						7%	5.8%
1964	N/A						2%	4.0%
1965	-767	29%	5%	31%	62%	7%	7%	3.3%
1966	-422	17%	3%	58%	40%	5%	-1%	-.9%
1967	-709	22%	5%	67%	34%	0%	9%	-.7%
1968	-567	17%	3%	81%	19%	0%	15%	.3%
1969	-834	21%	5%	81%	19%	0%	11%	2.9%
1970	-628	14%	3%	44%	54%	1%	8%	1.5%
1971	-654	14%	3%	14%	49%	37%	13%	4.2%
1972	-930	18%	4%	56%	32%	12%	18%	2.8%
1973	-466	8%	2%	102%	0%	-2%	17%	4.0%
1974	-1411	14%	4%	55%	13%	32%	29%	15.9%
1975	-2870	23%	8%	51%	47%	2%	20%	8.0%
1976	-6894	42%	18%	32%	65%	3%	18%	8.6%
1977	-7571	38%	15%	29%	69%	2%	20%	12.5%
1978	-5640	30%	10%	45%	60%	-4%	18%	9.7%
1979	-5670	27%	9%	50%	66%	2%	14%	8.4%
1980	-7018	29%	10%	49%	56%	-5%	11%	9.4%
1981	-10485	34%	14%	39%	68%	-7%	16%	12.5%
1982	-10434	30%	12%	31%	62%	7%	2%	10.6%
1983	-7527	22%	8%	N/A	N/A	N/A	17%	6.1%
1984	N/A	N/A	N/A	N/A	N/A	N/A	9%	12.7%

Source: Moroccan Statistical Yearbook

Numerous events eroded Morocco's favorable balance of payments situation by 1964. Trade deficits resulted from several factors: the pressures of the population absorbed from the Spanish Protectorate, ambitious development programs, the severe 1961 drought, and the military costs of the 1963 hostilities. Furthermore, agreements concluded in 1960 requiring the removal of French and American military installations by 1963 terminated other sources of revenue. Food imports grew rapidly. Soft wheat imports, for example, doubled in volume during this period. Agricultural exports, which typically accounted for about 60 percent of export earnings, declined as a result of drought in 1961 and again in 1965. The continued capital outflows after independence and the added pressures of the drought and war led to a drop in Morocco's net reserves to $75 million in 1964, or coverage for less than two months of imports.

The rapid decline in foreign exchange reserves led the Government to adopt a series of measures to curb imports and restrict unofficial flows of the Dirham. Tourist allowances were cut and income transfers by foreign

technical personnel were controlled. More importantly, all imports were suspended subject to specific authorization. Later in the year a ban was placed on a list of specific luxury items and goods competing with domestic industries. The Dirham finally became inconvertible in 1964. Quantitative import restrictions were introduced the following year and, in addition, the Government introduced selective increases in general import duties. These drastic measures brought temporary relief to Morocco's balance of payments.

Sugar imports also accounted for an increasing share of total imports after independence. To offset pressures on the strained balance of payments situation and as part of its industrialization strategy, the Moroccan Government created a "Sugar Plan," or import substitution scheme, involving the domestic production and processing of sugar. The first sugar refinery was constructed in the Gharb at Sidi Slimane in 1963 to process domestic sugar beet production from the same area. The National Tea and Sugar Office (ONTS), established in 1961, took charge of distributing refined sugar, fixing prices at all levels of production by mid-1963.

At the end of the first Plan (1960-64), Morocco's balance of payments deficit had grown as a result of capital outflows, rapidly rising imports, and stagnating exports. The 1965-67 Plan applied a wide range of import substitution and foreign exchange conservation objectives through measures aimed at establishing self-sufficiency in the agricultural sector, production security, and domestic processing of agricultural goods. In 1965 the Government implemented quantitative restrictions, increased import deposit requirements, and implemented other import restrictions to halt the erosion of foreign exchange reserves. As a result, imports declined in real terms between 1965 and 1967

while exports grew by nearly 20 percent. Domestic inflation was controlled, and consumer prices remained stable between 1965 and 1966.

The prospect of renewed budgetary deficits in 1965 prompted the Government to adjust the consumer price of sugar. Sugar prices had previously been stabilized, and for a number of years the Stabilization Fund had actually generated surpluses on this account. As world raw sugar prices increased in 1964, however, a substantial subsidy was required to maintain the domestic price. During the first few months of 1964, the subsidy charge to the treasury was running at an annual rate of 120 million Dirhams, or about one-fifth of the budget deficit. To curb this growing drain on the budget, the Government called for the elimination of the sugar subsidy. The retail price was increased in several stages by a total of 85 percent in the space of one year. Urban consumers and students rioted and led the Government to roll back the consumer price somewhat. The quick official reaction on sugar issue reflected the Moroccan Government's sensitivity to urban consumer pressures, especially as concerned prices of the essential foodstuffs.

With political unrest continuing well into 1968, particularly among students and trade unions (both urban-based groups), limited nationalization and land reform efforts were initiated, the latter directed toward redistribution of lands owned by the former colonial administration. There was a gradual return to full political activity in 1969, and a national referendum on a new constitution was held in July 1970.

Through 1973, the level of imports fluctuated, although the situation was a relative improvement from earlier periods. The value of foodstuffs imports generally declined as a result of good harvests. Exports rose steadily through 1973. Despite the strong demand for imports following from ambitious plan

targets, trade liberalization, and increased export earnings, Morocco's balance of payments remained relatively stable due to several factors, including the rising value of worker remittances, which rose from a net outflow of $13.7 million to an inflow of over $[illegible]6 million in 1973.

As for agricultural development, the 1968-77 Development Plan sought to reinvigorate the rural sector. Forty-three percent of the Plan's resources was allocated to agriculture, up from 27 percent under the previous plan period. Primary objectives included the expansion of large-scale irrigation, the extension of credit to large- and medium-scale farmers, the promotion of Morocco's agricultural exports, the redistribution of land to poor farmers, and the training of engineers and technicians. Two-thirds of the Plan's resources for agriculture were allocated to the construction of dam and irrigation systems. As a result, irrigated perimeters expanded by nearly 18,000 hectares per annum until 225,000 hectares were under large-scale irrigation by 1972. The rainfed sector, characterized by traditional modes of production, was largely neglected under the Plan. Only one-fifth, or 1.25 million hectares, of rainfed areas received assistance under the Plan.

The Regional Agricultural Development Offices (ORMVA) were created at this time as semi-autonomous administrative units. Replacing the National Irrigation Office set up by the French colonial government, the ORMVA became responsible for the management of the irrigation networks and for the provision of extension, input, and marketing services to farmers. The ORMVA were also responsible in the irrigated areas for the administration of land reform. Irrigation investments and irrigation subsidies generally benefitted industrial crops, primarily sugar, for two principal reasons. First, these expensive investments were directed to highly productive and valuable cash crops. Sugar

beets were both an import substitution and an industrial crop. Secondly, the ORMVA marketed sugar beets that had no market other than public sugar mills, and they could thus recover service costs and input advances by deducting them from farmers earnings.

In the early 1970s the Government again suffered political setbacks. For years the support of high-ranking military officers had been relied on to counterbalance political opposition. In return, the military, with rural elite heavily represented therein, saw in the alliance a way to prevent the urban elite's domination over the rural sector. However, in 1971 and 1972, two attempted coups severely shook the alliance between the Government and the military.

In 1971 comprehensive new legislation permitted the Moroccan Government to regulate prices of goods and services at all stages of production, processing, and distribution. The legislation was prompted by public pressure to ensure that basic foodstuffs would be available at "affordable" prices in order to maintain living standards, combat inflation, control profit margins (particularly those of monopolies and quasi-monopolies), and encourage production or the adoption of certain technologies.

While producer prices were adjusted annually as of 1971, consumer prices were changed at longer, less regular intervals. This often had enormous consequences for the state treasury, as the tendency was for the real gap between the two prices to grow over time. In the interest of equity, strategic commodities were subject to a policy of pan-territorial producer and consumer price setting, implying that some transportation costs were subsidized. Similarly, nominal prices were held constant over the course of a year, implying that storage costs were also largely paid by the Government.

Policy regarding input prices, public services, and farmers' obligations was created on an ad hoc basis throughout the 1960s. Farmers in irrigated areas received access to irrigation, water delivery, and other services free of charge until 1969. In that year, the Government promulgated the Agricultural Investment Code (Code des Investissements Agricoles) to clarify its role in agricultural development. The state formally took charge of infrastructural development, agricultural research, soil management, and crop and livestock improvements that were beyond the 'financial or technical capabilities of the private sector.' Farmers, on the other hand, were required to contribute up to 40 percent of the capital cost of the irrigation network and to pay a flat minimum water charge and a variable use rate per cubic meter. Exemptions and the fact that capital contributions were fixed in current Dirhams and not as a percentage of costs resulted in less than a 10 percent recovery of actual costs in irrigation investments and water services.

Fiscal balance was maintained despite the growing demand on resources generated by the Plan. The budgetary deficit, which stood at about 25 percent of government expenditures or 5 percent of GDP in 1965-67, declined to 14 percent of government expenditures or 3 percent of GDP in 1971 (see Table 10 above). After 1971, however, the Government switched from financing the deficit by domestic borrowing to expanding its money supply, which increased between 13 and 18 percent annually during 1971-73. The wholesale price index grew 45 percent between 1972 and 1974, while consumer prices rose only 24 percent over the same three years due to increases in consumer subsidies. Under conditions of expanding production, low inflation, and trade liberalization from 1967 to 1971, the nominal exchange rate maintained a steady 17-20 percent overvaluation relative to its equilibrium value (see Table 11). Just prior to the boom in

phosphate prices and economic growth, the Dirham began to appreciate until it was overvalued by as much as 39 percent in 1973.

TABLE 11: OFFICIAL AND EQUILIBRIUM EXCHANGE RATES (Dh/$)

YEAR	Official Exchange Rate (E_o) (i)	Equilibrium Exchange Rate (E_e) (ii)	ii/i
1960	5.06	5.93	17%
1961	5.06	6.01	19%
1962	5.06	5.97	18%
1963	5.06	5.91	17%
1964	5.06	5.93	17%
1965	5.06	5.93	17%
1966	5.06	5.97	18%
1967	5.06	5.94	17%
1968	5.06	5.99	18%
1969	5.06	6.09	20%
1970	5.06	6.12	21%
1971	5.05	6.23	23%
1972	4.60	6.01	31%
1973	4.11	5.71	39%
1974	4.37	5.36	23%
1975	4.05	5.08	25%
1976	4.42	5.19	17%
1977	4.50	5.44	21%
1978	4.17	5.88	41%
1979	3.90	5.98	53%
1980	3.94	5.76	46%
1981	5.17	6.01	16%
1982	6.02	6.85	14%
1983	7.11	8.26	16%
1984	8.81	9.50	8%

Source: Annex Table I.6
Notes: E_e represents 5-year moving average of equilibrium exchange rate.
Comparison column (ii/i) represents $(E_e - E_o)/E_o$

Phosphate Boom & Fiscal Crisis (1973 - 1981)

The military coups of 1971 and 1972 called into question the armed forces' loyalty to the Government. To broaden the basis of its support, attempts were made after each threat to appease opposition groups. Moroccanization and land reform efforts were redoubled, strong measures were taken against

dissidents, and central control was reasserted over the Moroccan polity. A new constitution was passed in 1972, which is still in force today. By 1974 a reinvigoration of political parties took hold, opening a new era in Moroccan politics.

The Moroccan economy was particularly strong during the first part of this period. A boom in the international phosphate market led to a 26 percent real increase in GDP from 1973 to 1976 (see Table 12). The budget deficit reached its nadir in 1973, declining to only 8 percent of budget and 2 percent of GDP. King Hassan II took advantage of this confluence of economic and political strengths to rally his country around the most successful endeavor of his reign to date. Striking a posture of strong national unity, Moroccans rallied around their King in what was known as "The Green March," a peaceful march by some 350,000 unarmed civilians into the Spanish Sahara to reclaim the "southern provinces" for Morocco, in reaction to United Nations and World Court findings in favor of self-determination after withdrawal of Spanish rule from the region.

However, a combination of political and economic pressures created ever more compromising fiscal situations for the Government. The costs of Morocco's prolonged war in the Sahara mounted and at the same time the value of phosphates crashed (see Table 12). The surge in value of phosphate exports, which had averaged 24 percent of the total value of Moroccan exports over the period 1960 to 1973, was short-lived. It peaked at 55 percent in 1974 and 1975 and sank back to an average of 28 percent over the period 1978 to 1984.

TABLE 13: PHOSPHATES AS PERCENTAGE OF TOTAL EXPORTS

YEAR	INDEX OF REAL GDP (1973=100)	VALUE OF EXPORTS (millions curr Dh) TOTAL	PHOSPHATES	PHOSPH/ TOTAL	INT'L PHOSPH PRICE ($/ton)
1960	57	1793	424	23.6%	13.0
1961	59	1732	411	23.7%	13.0
1962	65	1733	436	24.7%	11.5
1963	66	1943	461	23.7%	11.5
1964	67	2136	578	26.4%	12.5
1965	68	2176	553	26.4%	14.0
1966	67	2168	534	24.6%	13.0
1967	72	2146	546	25.4%	12.0
1968	79	2278	544	23.9%	11.5
1969	85	2455	551	22.4%	11.3
1970	89	2470	572	23.2%	11.0
1971	94	2526	588	23.3%	11.3
1972	97	2953	673	22.8%	11.5
1973	100	3748	788	21.0%	13.8
1974	108	7440	4075	54.8%	52.8
1975	114	6238	3431	55.0%	68.0
1976	126	5579	2191	39.3%	35.8
1977	133	5860	2111	36.0%	30.7
1978	135	6251	2024	32.5%	29.0
1979	143	7622	2214	29.0%	33 0
1980	148	9645	3013	31.2%	46.7
1981	146	12002	3827	31.9%	49.5
1982	156	12440	3401	27.3%	42.4
1983	150	14724	2932	19.9%	36.9
1984	164	19110	4619	24.2%	38.3

Sources: GDP, Table 2; Exports, Table 3
Phosphates Exports, International Monetary Fund, International Financial Statistics, 1986
Phosphate rock prices (FAS Morocco), World Bank, Commodity Price Outlook, 1986

Recalling trends highlighted in Table 2, public sector consumption had risen by 1975 from an earlier average of 12 percent of GDP to as much as 22 percent, due inter alia to rising military costs as well as increased food subsidies. Exports, as much as 28 percent of GDP in 1974 at the height of the phosphates boom sank back to 16-18 percent by the late 1970s. With export earnings covering only half of imports, the trade deficit worsened, reaching nearly 8 billion Dh in 1980 with a somewhat larger deficit on the current account. The external deficit was largely financed through external borrowing. From 1975 onwards, Morocco expanded its medium- and long-term external borrowing.

relying on commercial lenders. By 1980 the disbursed portion of the outstanding external debt stood at over 45 percent of GDP with a 33 percent debt service ratio. Imports, averaging 20 percent in the 1960s, shot up to 34 percent of GDP from 1975 to 1984.

The resulting economic crisis provoked protectionist responses from the Government. The liberalization programs of the previous period were severely curtailed in favor of policies promoting domestic industry and import substitution crops over export goods. Quantitative restrictions, which had been in effect from 1965 through 1969, were reintroduced between 1978 and 1981-82. In addition, import deposit requirements, which had been discontinued in 1969, were also reintroduced in 1978. These payments increased in severity such that between 1978 and 1981 they represented about 5-7 percent of gross import values.

Pricing policies became increasingly important. The 1973 oil shock and the 1974-76 commodity boom increased sharply the value of Morocco's main imports -- wheat, sugar, and fertilizer. The Government subsequently sought to insulate domestic markets from world price fluctuations. While real domestic producer prices for soft wheat had remained more or less constant between 1969 and 1976, they were increased steadily from 1976 to 1980. Real sugar beet prices were kept fairly constant throughout the period. On the other hand, real domestic consumer flour prices declined significantly and rapidly after 1976. By 1979-80 the real price of bread wheat flour was only three-fourths of its 1969-70 price. Real consumer prices for sugar were only half of their 1969 levels a decade later. These subsidies were financed in large part by variable levies on imports of the same commodities.

One implication of an increasingly open position by the Government vis-a-vis political opposition was a growing obligation to appease the rising,

vocal demands of dissident factions of the population. For example, in 1980 talks held with labor representatives resulted in the announcement of a 20 percent increase in the minimum wage The wage increases, decreases in rents, and the diminishing of certain income tax obligations of low-income families were seen as necessary compensatory government actions in order to counteract potentially negative reactions to consumer price increases which became necessary in the same year as budgetary constraints became increasingly evident.

There were no noticeable shifts during this period in the Government's stated objectives vis-à-vis the agricultural sector. The 1973-77 Plan and the transitional 1978-80 Plan allocated 25-30 percent of public sector resources to agriculture. The share of other productive sectors declined roughly 15 percent while infrastructural projects received 20 percent of plan resources. The remaining funds were diverted to services including administration. Agricultural infrastructure, principally irrigation projects, took the lion's share of resources. In the two plans, the CRMVA absorbed 65-70 percent of all public resources allocated to agriculture. Land under irrigation expanded approximately 24,000 hectares per annum from 1973 to 1977, reaching a total of 100,000 hectares. Under the 1978-80 Plan, which sought to complete on-going projects, 28,000 additional hectares per year were brought under irrigation.

The Government began significant intervention in service and input pricing during this period. The Interministerial Pricing Committee monitored the activities of the private input importers and distributors until international fertilizer prices increased 150 percent in 1974, at which point the Government intervened to protect producers from the price rise. A parastatal fertilizer agency, FERTIMA, was created in 1974 and was granted a monopoly on imports. Furthermore, domestic prices were controlled through a subsidy program

which reimbursed producers for the difference between real costs and administratively set reference prices. All margins for transport, handling, blending, bagging, storage, and distribution were also fixed. These measures crowded out the private sector. Although the fertilizer price regulation was intended as a temporary measure in response to the sharp rise in world prices, the system remained in place following the decline of prices in 1976. As demand for fertilizers and the real cost of fertilizers increased, the subsidy burden grew. The subsidy did fall from 95.7 million current Dh in 1973-74 to 49.4 million current Dh in 1977 as a result of falling world prices, but as world prices and demand for subsidized fertilizer continued to rise the subsidy increased to 220.7 million current Dh in 1980-81.

The fertilizer subsidy covered 40-60 percent of real unit costs in 1980-84, and the use of fertilizer increased significantly. Fertilizer consumption grew by 17,000 nutrient tons per annum. However, given the dualism of Morocco's agricultural sector, the main beneficiaries of the subsidy program were the larger, irrigated farmers. Irrigated crops, such as sugar crops, citrus, vegetables, and cotton, represented less than 10 percent of total acreage yet accounted for 50 percent of total fertilizer input in 1978-79.[30]

The Government also established a national seed company (SONACOS) in 1974 and assigned to it the task of stabilizing the price and supply of selected seeds. However, these seeds never represented a large percent of seeded area or budgetary outlays. The institutional rigidities in the agricultural sector were exacerbated by the National Transport Office, a quasi-monopoly which set transport rates and issued authorizations for long-distance transport. Other

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30 See World Bank, Memorandum on Fertilizer Demand and Pricing, Report No. 4526-MOR, June 1983.

distortions included investment budget subsidies to the ORMVA which financed the development, operation, and maintenance of irrigation systems. These subsidies amounted to nearly 1 billion Dh in the 1980s.

The agricultural sector stagnated during the late 1970s and early 1980s. The only quantitative achievements during this period were in the production of sugar crops. Beet output grew 5-10 percent per annum while sugar cane production, introduced in 1973, reached 375,000 tons by 1980. Domestic production of sugar rose to 60 percent of annual consumption in the 1980s, while cereals fell from near self-sufficiency at independence to 60 percent of annual consumption, as seen in Table 13. The decrease was particularly due to shifts with regard to two grains: (a) the enormous increase in demand for soft wheat, and (b) the change in status from being a net exporter of maize during the 1960s to being a net importer.

TABLE 13: SELF-SUFFICIENCY RATES FOR CEREALS AND SUGAR

YEAR	Soft Wheat	Hard Wheat	Barley	Maize	Total Cereals	Sugar
1961	31%	104%	68%	100%	68%	
1962	68%	105%	108%	114%	100%	
1963	82%	100%	106%	122%	103%	4%
1964	54%	100%	101%	111%	93%	7%
1965	58%	100%	100%	106%	93%	7%
1966	26%	95%	96%	94%	69%	14%
1967	27%	100%	100%	98%	79%	17%
1968	89%	100%	100%	102%	99%	33%
1969	65%	100%	110%	106%	101%	30%
1970	40%	100%	103%	97%	88%	39%
1971	49%	100%	100%	97%	90%	50%
1972	53%	100%	98%	95%	90%	50%
1973	29%	100%	99%	87%	76%	42%
1974	31%	100%	96%	90%	80%	50%
1975	24%	98%	99%	100%	74%	52%
1976	37%	96%	100%	100%	85%	56%
1977	13%	96%	97%	69%	60%	40%
1978	24%	100%	100%	83%	75%	57%
1979	24%	100%	99%	78%	71%	61%
1980	21%	94%	95%	70%	67%	53%
1981	11%	94%	61%	31%	43%	57%
1982	36%	100%	100%	63%	76%	60%
1983	26%	100%	99%	58%	60%	64%
1984	28%	100%	93%	71%	61%	60%

Sources: National Cereals and Pulses Office and the Ministry of Agriculture and Agrarian Reform

Notes: Calculated as (Domestic Production)/(Production + Net Imports). A ratio greater than 100% indicates country was net exporter. Sugar rates calculated on the basis of refined sugar equivalent.

A major reason for these trends was the relative price shifts that took place in producer prices for soft wheat, hard wheat, barley, and sugar beets, and of consumer prices for soft wheat flour, hard wheat flour, barley flour, and white sugar, as shown in Table 14. Soft wheat and sugar beet prices are official producer prices in this table, while those for the other two grains are actual market prices. Price are presented in real Dirhams, reflecting an adjustment for changes in the domestic non-agricultural price index. As can be seen, stickiness in the official prices meant that producer prices declined in real terms during the 1960s for all four commodities. By the early 1980s, on the other hand, cereals producer prices had increased somewhat in real terms but

the sugar beet price had yet to regain its 1960s level. More important, real consumer prices for soft wheat products decreased continuously over the entire period, whereas those for hard wheat and barley products increased after the 1960s. Sugar prices varied, but were lower during the 1970s and 1980s than they had been during the 1960s.

TABLE 14: REAL PREVAILING DOMESTIC PRODUCER AND CONSUMER PRICES (Dh/ql, 1969=100) (a)

	PRODUCER PRICES OF:				CONSUMER PRICES OF:			
YEAR	SOFT WHEAT (b)	HARD WHEAT (c)	BARLEY (d)	SUGAR BEET (e)	SOFT WHT FLOUR (f)	HARD WHT FLOUR (g)	BARLEY FLOUR (h)	SUGAR (i)
1960	47.3	55.6	30.8		83.1	83.4	58.6	
1961	48.5	59.9	36.1		91.5	88.9	66.7	
1962	46.6	67.1	47.4		78.4	98.2	84.1	134.9
1963	45.9	51.9	29.4	7.5	74.0	78.1	56.2	142.5
1964	46.1	50.6	28.0	7.2	71.3	78.2	53.7	196.0
1965	47.4	55.5	32.8	7.0	68.8	82.4	60.8	215.7
1966	47.9	57.0	37.2	7.2	69.5	85.2	68.7	218.1
1967	48.4	73.9	55.6	7.3	70.2	108.0	97.8	219.9
1968	48.2	66.8	45.9	7.2	69.9	98.4	82.4	219.0
1969	40.0	39.6	19.4	6.0	58.0	60.4	39.1	191.9
1970	39.0	41.9	22.5	5.9	56.6	63.4	43.7	177.2
1971	40.9	45.0	28.3	5.7	63.7	67.7	52.9	164.3
1972	39.6	42.5	27.3	5.5	61.7	64.2	51.4	134.8
1973	40.0	43.6	33.1	5.6	59.6	65.6	60.6	131.8
1974	43.3	51.5	45.6	5.5	63.2	76.0	79.6	122.0
1975	42.4	62.3	42.9	6.8	62.0	90.9	75.9	119.3
1976	40.8	68.3	44.0	6.5	59.7	99.2	78.1	113.1
1977	51.9	52.4	31.9	5.9	53.6	78.0	59.2	99.9
1978	48.4	61.5	45.1	6.6	49.9	90.4	80.1	93.7
1979	55.6	58.8	41.2	6.1	46.5	84.2	74.1	90.1
1980	60.5	55.2	38.1	6.5	47.4	82.0	69.2	97.6
1981	58.7	64.4	44.4	5.9	52.0	94.4	79.1	123.5
1982	56.7	79.3	58.8	6.3	48.4	114.6	102.0	124.6
1983	54.9	83.1	66.4	6.1	50.8	93.1	87.1	124.0
1984	57.0	67.8	48.8	6.6	49.2	100.2	87.6	126.9

Notes:
(a) Nominal prices deflated by non-agricultural price index; see Annex IV
(b) Official producer price; see annex Table II.1
(c) Parallel market price; see annex Table II.1
(d) Parallel market price; see annex Table II.1
(e) Official producer price; see annex Table III.1
(f) Weighted average of official wholesale prices for ordinary flour (80%) and deluxe flour (20%); see annex Table II.8
(g) Market price of grain plus (handling charge minus losses) at an assumed milling ratio of 82%; see annex Table II.8
(h) Same as (f), except with milling ratio of 70%; see annex Table II.8
(i) Weighted average of official wholesale prices for sugar loaf and granulated sugar, weighted according to shares in total consumption; see annex Table III.4

As of 1980, the combination of costly, capital-intensive investments, military hostilities, growing producer and consumer subsidies, and drought and stagnation in the agricultural sector created a fiscal crisis for Morocco. This had a number of significant consequences. First, the parastatals' funding and their ability to implement policy were seriously undermined. For example, the stated objective of driving a wedge between consumer and producer soft wheat prices could not be managed financially. Subsidized consumer prices consequently began to depress prices of local grain substitutes (hard wheat and barley) relative to imports. The combined effect of the Government's inability to defend domestic producer prices and the overvalued Dirham shifted incentives in favor of imported over domestically produced foodstuffs. Secondly, public and private sector agencies developed a large net cross-indebtedness. The Government financed these deficits through an expansion of the money supply. The money supply grew by 29 percent in 1974 and by an average of 21 percent per annum thereafter until the end of the decade. Domestic inflation rates accelerated significantly; both consumer and wholesale price indices rose at an annual rate of 10 percent per annum between 1973 and 1980. The Dirham was overvalued by as much as 50 percent in the late 1970s relative to its equilibrium exchange rate, further deepening economic imbalances.

Economic Deterioration/Stabilization and Structural Adjustment: 1981 to the present

Deteriorating economic conditions and the 1981-85 Development Plan marked the beginning of another period. A drought in 1981 severely reduced agricultural output and necessitated larger imports of foodstuffs at a time when the second oil price shock and an appreciating dollar had already increased outlays for imports. Subsidies and the Western Sahara conflict continued to

drain public resources. Real GDP grew at a disappointing 2.3 percent from 1982 to 1984 while real GDP per capita remained stagnant.

The 1981-85 Plan sought to re-establish domestic and external equilibria while promoting the social and economic development of the country. The principal objectives were still self-sufficiency in food production, the promotion of exports, the development of local processing facilities, and the reduction of regional disparities, but the Plan did mark a shift of policy towards a more balanced subsectoral approach. The share of planned investments for small-scale irrigation and rainfed projects was increased from less than 15 percent in the previous plans to nearly 27 percent in the 1981-85 Plan. Funding for large-scale irrigation, which was traditionally allotted 55 to 70 percent of public resources, declined to 40 percent. Construction of new irrigation schemes was curtailed, and emphasis was placed on the completion of existing irrigation projects commanded by existing dams. Despite the significant reallocation of resources at the planning level, however, by 1985 actual expenditures for large-scale irrigation exceeded plan allocations, whereas investment in rainfed and small-scale irrigation agriculture was below plan targets.

Official price policy remained dualistic. The Government persisted in its efforts to delink domestic prices of strategic agricultural commodities from international prices and producer prices from subsidized consumer prices. Over the 1980-84 period, producer prices were increased annually. Official cereal prices for all three commodities (prix taxé and prix de soutien) rose by 20-22 percent, while sugar beet prices were increased nearly 30 percent. These nominal increases did not reflect real prices increases, however, for the consumer price index rose almost by 50 percent over the same period.

The large current account deficits which registered 1.6 billion Dh in 1980 worsened to 1.8 billion in 1981. The Government's initial response was to resist devaluation and to increase protectionism. The prevailing view was that the majority of Morocco's traded goods were not responsive to price movements and that a differentiated wage-price policy could effect movements in real factor prices without changes in the exchange rate. Furthermore, it was feared that in the short-run a devaluation would worsen Morocco's balance of payments situation, with an even larger debt-service burden in Dirhams not being immediately compensated by an increase in exports.[31] In addition, the Government continued to borrow heavily, mostly on hard commercial terms with short maturities. The debt service ratio climbed to 42 percent in 1982.

By early 1981, the fiscal crisis became untenable. External borrowing capacity disappeared as debt service ratios were projected to climb. Despite slight adjustments in 1980-81, in 1982 the Dirham continued to be overvalued by over 35 percent relative to its equilibrium value. Furthermore, the appreciation of the US dollar increased the cost of most Moroccan imports (i.e., energy, grain) while phosphate prices, which were also denominated in dollars, steadily declined from $49.50/ton in 1981 to $34.00/ton in 1985. The domestic inflation rate accelerated to 12.5 percent in 1980-81.

The Government responded to these fiscal pressures by undertaking a series of stabilization and structural adjustment programs, beginning in 1980-81. The broad outlines of the package were: (a) a devaluation of the Dirham

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[31] In fact, the demand for several of Morocco's traditional exports, particularly in the agricultural sector, is probably not price-elastic but depends rather on preferential trade agreements with partners. Thus, for example, a devaluation will not increase demand in Europe for Moroccan citrus, which must observe EEC quotas and tariff regulations.

of roughly 25 percent; (b) a corresponding reduction in the average tariff level to achieve 25 percent effective protection on average by 1990; (c) a cutback in expenditures, especially through the reduction of subsidies and a freeze in administration, to contain the deficit to 7 percent of GDP. Implementation of the package hinged on the rescheduling of Morocco's external debt.

The first steps in this program included an increase in petroleum prices in early 1981. Rises in the price of staple food items and fertilizer were delayed until the 1980-81 harvest was completed. The harvest was the worst one in a decade, and the announcement in May of steep increases in the consumer prices of sugar and flour (40 percent), cooking oil (27.5 percent), milk (14.3 percent) and butter (76.2 percent) sparked intense civil unrest. Riots erupted in Casablanca and Oujda and an estimated 600 people were killed. One week later the Government reduced the price increases by one-half.

Another attempt to reduce the costs of subsidies by raising retail prices was made in 1983. After two years of relatively stable prices, luxury flour prices rose 35 percent, sugar loaf prices 17 percent, cooking prices oil 30 percent, and butter prices 66 percent. A 20 percent increase in the official minimum wage was announced at the same time which appeared to be successful in moderating opposition to the price increases. Flour, edible oils, and granulated sugar nonetheless continued to carry significant consumer subsidies. The Government made further adjustments to consumer prices in September 1985 and agreed with the international donor community to phase out consumer and fertilizer subsidies over time.

The Dirham was devalued by 17 percent in 1982 and by 6 percent over the next two years. The protective trade barriers began to be slowly dismantled. The impact of the austerity program was to reduce imports by nearly

12 percent between 1981 and 1983 while increasing exports in value and volume. The public debt due in 1983 and 1984 was rescheduled and new loan were secured from international agencies.[32]

Although it is too early to make a definitive statement, it appears that Morocco's economy improved as the 1980s progressed. GDP grew 4.8 percent in 1985, whereas it grew by only 2.2 percent in 1983 and 1984. Furthermore, exports increased in volume, value, and diversity. Imports, however, continued to rise, and the full price adjustments subsequent to devaluation were not passed on to consumers. Taxation of agricultural producers eased in 1984. The government's medium-term sectoral adjustment reform program has led to significant changes in Moroccan government agricultural policy, reducing the bias against agricultural producers. Moreover, good rains returned, leading to impressive cereals harvests in 1985, 1986, and 1988.

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32 Projected debt service ratios for Morocco prior to rescheduling were estimated at 45.8 percent in 1983 and 50.1 percent in 1984.

CHAPTER THREE

MEASURES OF INTERVENTIONS IN MOROCCAN AGRICULTURE

In order to assess the direct effects of government output price interventions, prevailing domestic producer and consumer prices are compared to the prices that would have reigned in the absence of government intervention. These, by definition, are the border prices, adjusted to collection center or to consumption point.[33]

The prevailing domestic prices received by Moroccan producers of soft wheat, hard wheat, barley, and sugar beets and their border price equivalents at both official and equilibrium exchange rates are deflated by indices of non-agricultural prices over the 1960 to 1984 period. The same correction is made to the prevailing domestic prices paid by Moroccan consumers of soft wheat flour, hard wheat flour, barley flour, and sugar. Two non-agricultural price indices are used. The first is an unadjusted deflator of the non-agricultural GDP (NA).[34] It is used to deflate prevailing domestic prices and border prices estimated in Dirhams at the official exchange rate. The second index is calculated by disaggregating the non-tradable and tradable components of the non-agricultural GDP deflator and correcting the latter for the effects

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[33] Price quotations from the following reference markets were used to derive Moroccan cereals border prices: for soft wheat, US hard red winter wheat #2, ordinary protein, FOB US Gulf; for hard wheat, US durum wheat, FOB Minneapolis; for barley, Canadian barley, FOB St. Lawrence. In the case of sugar, the border prices used reflect actual landed unit values in Casablanca.

[34] See annex IV for details of the calculations.

of trade and exchange rate policy (NA*). This second index is used to deflate border prices converted into Dirhams at the equilibrium exchange rate.

Several indicators are developed with these prices. These measure the direct, indirect, and total intervention effects on output prices, and the combined effect of direct intervention on output and input prices. "Direct" intervention is that which results from pricing policies which cause the observed domestic price to differ from the border price, converted into Dirhams at the nominal exchange rate, which would obtain in the absence of pricing policy intervention. Direct nominal protection may be positive (negative), i.e. producers may receive more (less) and/or consumers may pay less (more) than the non-intervention price if the government subsidizes (taxes) a particular activity.

Governments may also intervene in the pricing of agricultural inputs through a range of taxation, subsidization, and trade policies. The rate of effective protection compares total value added (output price minus the value of tradable inputs), calculated in domestic prices, with total value added which would be generated by a particular activity in the absence of government intervention, as measured in border prices. If domestic value added exceeds value added in border prices, then the domestic production activity is said to benefit from a positive rate of effective protection. While consumer behavior responds to relative levels of output prices (nominal protection), producer behavior is likely to be more responsive to the combined effect of output and input price intervention (effective protection).

Indirect intervention is caused by exchange rate policies which result in the nominal or official exchange rate being under- or overvalued in relation to its equilibrium in the absence of trade and exchange rate policy

interventions. An overvalued exchange rate, for instance, causes imports to appear cheaper in domestic currency than they would be at an equilibrium exchange rate, the result being to subsidize consumption and negatively affect production. The rate of total nominal protection is the combined effect of direct and indirect interventions on domestic producer and consumer prices.

Direct Price Intervention Effects

The ratios in Table 15 are nominal rates of protection of the agricultural goods.[35] When the ratio is positive, domestic prevailing agricultural producer are relatively more remunerated (positively protected) than would have been the case had border price equivalents applied at the official exchange rate. Alternatively, in cases where the ratio is negative, domestic relative prices are less than would be indicated by world prices of the same commodities producers are said to be negatively protected, or taxed. The inverse reasoning holds for consumer price ratios of agricultural commodities. Positive ratios indicate that the consumer is being taxed relative to the border prices which would have prevailed in the absence of government intervention, whereas negative ratios indicate the consumer is paying less than the equivalent border price, i.e. is being subsidized.

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[35] The calculation is $P_{AI}/P_{NA}-P_{AI}'/P_{NA}$ P_{AI}'/P_{NA}, where P_{AI} is the prevailing domestic producer or consumer price; P_{AI}' is the border price equivalent producer or consumer price converted into Dirhams at the official exchange rate; and P_{NA} is the unadjusted non-agricultural price index.

TABLE 15: EFFECT OF DIRECT PRICE INTERVENTIONS

YEAR	.....PRODUCER PRICE RATIOS..... Soft Wheat	Hard Wheat	Barley	Sugar Beet	.....CONSUMER PRICE RATIOS..... Soft Wht Flour	Hard Wht Flour	Barley Flour	Sugar
1960	-20%	-31%	-31%	N/A	5%	-17%	-11%	N/A
1961	-15%	-46%	-23%	N/A	6%	-39%	-5%	N/A
1962	-19%	-21%	-13%	N/A	1%	-11%	6%	48%
1963	-11%	-29%	-44%	47%	5%	-18%	-27%	49%
1964	-10%	-6%	-49%	-37%	3%	8%	-32%	38%
1965	-6%	6%	-41%	-50%	1%	20%	-25%	35%
1966	-13%	3%	-43%	23%	-7%	18%	-28%	116%
1967	-7%	18%	3%	77%	0%	32%	24%	149%
1968	-7%	11%	6%	129%	0%	25%	29%	169%
1969	-4%	-11%	-49%	97%	3%	3%	-29%	152%
1970	-12%	-12%	-41%	66%	-5%	2%	-22%	136%
1971	2%	7%	-45%	31%	18%	23%	-29%	101%
1972	-14%	-12%	-37%	-23%	0%	2%	-19%	31%
1973	-53%	-62%	-33%	-31%	-47%	-56%	-15%	20%
1974	-43%	-48%	-30%	-75%	-29%	-41%	-10%	-42%
1975	-30%	-23%	-19%	-81%	-24%	-13%	-1%	-62%
1976	-21%	34%	16%	-81%	-15%	49%	40%	-62%
1977	27%	18%	-25%	-17%	-3%	34%	-5%	-5%
1978	15%	37%	33%	80%	-12%	53%	60%	16%
1979	11%	5%	-8%	125%	-21%	19%	13%	21%
1980	24%	-20%	-29%	-37%	-28%	-9%	-12%	-25%
1981	16%	4%	-14%	-70%	-24%	17%	6%	-37%
1982	19%	48%	17%	-24%	-25%	63%	39%	6%
1983	-6%	-8%	-44%	13%	-35%	4%	-29%	18%
1984	-11%	-11%	-16%	14%	-43%	1%	3%	19%

Source: Based on prevailing domestic prices (annex Table V.1) and border prices at the official exchange rate (annex Table V.3) and the unadjusted non-agricultural price index (annex Table IV.1).

Note: A positive ratio signifies that the domestic price is greater than the border price (producers are subsidized, consumers taxed), whereas a negative ratio signifies the opposite (producers are taxed, consumers subsidized).

Table 15 indicates that domestic producer prices were taxed by and large relative to border prices through the mid-1970s. Only domestic sugar beet prices were subsidized from 1966 to 1971 as part of the Sugar Plan to promote import substitution. While nominal protection thereafter turned positive for wheats until 1983, barley protection remained negative for the bulk of the period. This was due more to the fact that ONIGL began in 1970 to restrict exports of barley, forcing prices to adjust downward during periods of excess supply, rather than through any active price intervention in the barley market per se. With the exception of the periods 1964-65, 1972-77 and 1980-82 when

world sugar prices rose without the parallel adjustment to domestic producer prices of sugar, protection to sugar producers has been very positive.

Consumer soft wheat flour prices tracked international prices in the 1960s, while consumers of hard wheat flour were taxed after 1964 and consumers of barley flour were taxed through most of the decade. Sugar consumers were taxed until 1973, paying more than 100 percent over the border price from 1966 to 1971 as domestic consumer prices remained fixed in the face of declining world prices. After 1973, however, the story was dramatically different. The domestic consumer prices of soft wheat flour and sugar have shown a consistent decline relative to international prices. Soft wheat flour prices remained constant in nominal Dirhams over long stretches with the result that direct price intervention ratios have been consistently negative since 1973. Consumer prices for sugar were broadly subsidized from 1974 to 1981 with a two-year hiatus in 1978-79. Taxation of the sugar consumers recommenced in 1982 as world prices declined sharply. From the mid-1960s hard wheat consumer prices rose relative to subsidized soft wheat flour. The direct price intervention effects on barley consumer prices appear to track the domestic climatic variations although a gain from the mid-1970s in domestic prevailing prices relative to border prices is noticed.

Rates of Effective Protection and Comparative Advantage

For farmers who enjoy access to improved inputs, the appropriate measure of incentives is not the rate of nominal protection, which merely compares domestic prices to prices that would have prevailed in a free-trade

setting, but rather the rate of effective protection which also takes account of government interventions in input pricing.[36]

In Morocco, it has been argued that production incentives could be extended to agriculture as effectively through subsidizing major inputs as by raising producer prices. In addition, it was held that increases in producer prices would ipso facto lead to increases in consumer prices and wages and thus render the country's diversification program into industry uncompetitive vis à vis imports. Thus, in order of importance, Morocco has subsidized to varying degrees irrigation infrastructure (capital costs), water delivery (operations and maintenance), chemical fertilizers, agricultural credit, mechanized equipment acquisition, selected seeds, research and extension, and certain forms of transport for specified products. Despite the breadth of the input subsidization program, access to and use of these inputs is highly uneven by different farm types and crops. Various case studies have demonstrated that disproportionate benefits tend to be captured by larger, generally irrigated or high rainfall zone farmers practicing commercial agriculture.

Direct distortions on inputs apply principally to fertilizer, irrigation investments, and, to a lesser extent, to water delivery network operations and maintenance costs, and perhaps machinery services. Fertilizer subsidies have averaged about 50 percent of production or import costs in the

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[36] The calculation is: $((P_{Ai} - a_{ij}P_j)/(P_{Ai}' - a_{ij}'P_j')) - 1$, where P_{Ai} is the prevailing domestic producer price, $a_{ij}P_j$ is the value of intermediate inputs in domestic prices as paid by the producer (including relevant taxes and/or subsidies), P_{Ai}' is the border equivalent producer price converted into Dirhams at the official exchange rate, and $a_{ij}'P_j'$ is the value of intermediate inputs at border prices converted into Dirhams at the official exchange rate. The formula thus compares domestic value-added with international value-added. As with the nominal rate of protection, a positive rate indicates that the producer is being positively protected, while a negative rate indicates that the producer is being taxed.

last decade. Although consumption has risen rapidly, by about 8.5 percent per annum in the last decade, its use is highly uneven. While sugar crops (and high-valued export crops) use the recommended dosage, average fertilizer use on cereals and other rainfed crops is significantly below recommended doses.

Sugar beet production, in fact, benefits from a wide range of government incentives and services. Production technologies are fairly homogeneous, relying on selected seeds, chemical fertilizers and pesticides, and tractor mechanization. In addition, about two-thirds of sugar beet area is irrigated, which represents a major transfer of resources to the sugar beet producers. Irrigation investment costs are recovered by about 25-30 percent while operations and maintenance costs are recovered by about 50 percent.[37] For irrigated sugar beet, the subsidy element of irrigation thus ranges from 13 (Tadla) to as high as 68 (Moulouya) percent of the total production cost per hectare but with a weighted average of about 22 percent.

Cereals, on the other hand, are produced using very little in the way of improved inputs. The bulk of production, 90 percent, is produced under rainfed conditions, with most of it located outside the purview of the ORMVA, who have encouraged the use of improved inputs to a greater extent than have the dryland extension agents. Cost of production survey data have not yet been collected in Morocco, meaning that estimates of the actual distribution of production techniques in rainfed areas are unavailable.

Another measure to be considered here is the domestic resource cost coefficient (DRC) which evaluates the comparative advantage which a country may have in the production of a particular commodity using a given technique. The

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37 MARA/AIRD, Politique de Prix ..., op.cit.

DRC indicates whether a production activity makes efficient use of domestic factors of production (land, labor, capital) in relation to the amount of value-added generated by the activity, when outputs, inputs, and factors are valued in economic prices.[38] If economic efficiency is an overriding objective, a country would not want to use its commercial policy to protect a production activity in which it does not have a comparative advantage.

The estimates of rates of protection and comparative advantage presented in Table 16 are taken from two different sources.[39] Both studies relied heavily on publicly available secondary data and suffer as a consequence from some lack of precision. Furthermore, direct comparability may also suffer since the two studies used different price series. The principal reasons for the differences between the 1970-80 and 1985 results derive from: (a) the devaluation of the Dirham since 1982; (b) the decline of some international commodity prices; (c) the abolition of all direct taxes on agricultural incomes and border taxes on agricultural inputs since 1982; and (d) the use of observed market prices (1984-85) as opposed to official fixed and support prices (1970-80) in evaluating effective protection and comparative advantage. The findings are

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[38] The DRC is calculated by dividing the (total economic value of domestic factors of production used to produce one unit of commodity i) by (the border price of commodity i minus the economic value of tradable inputs used in the production of one unit of commodity i), or the international value-added. A DRC of less than 1.00 indicates that more value is generated in value-added by the production of commodity i than is expended in domestic resources for its production. In this case, a country is said to have a comparative advantage in its production. In contrast, a DRC of greater than 1.00 indicates that more is expended in domestic resources than the value-added generated by the activity. In the latter case, a country is said to have a comparative disadvantage in the production of that commodity.

[39] The first is a World Bank desk study for the period 1970-1980, World Bank, EMPA2, Study of Agricultural Prices and Incentives, April 1984 and the second is the more detailed study for 1984-85, MARA/AIRD, Politique de Prix ..., op.cit.

sufficiently robust and accurate, however, to indicate broad trends in the incentives regime, as well as relative orders of magnitude and rankings for major crops in Morocco.

TABLE 16 NOMINAL AND EFFECTIVE PROTECTION AND COMPARATIVE ADVANTAGE OF PRINCIPAL CROPS

	1970			1975			1980			1984-85		
	NPR_O	EPR	DRC	NPR_O	EPR	DRC	NPR_O	EPR	DRC	NPR_O	EPR	DRC
RAINFED TECHNIQUES												
SOFT WHEAT												
traditional technique										-13%	-14%	56
semi-intensive techniques	-6%	-2%	77	-23%	-17%	70	8%	31%	1.04	-10%	-9%	71
intensive techniques	-4%	8%	53	-23%	-12%	55	29%	42%	96	-13%	-13%	49
HARD WHEAT												
traditional technique	-8%	-5%	76	-6%	-5%	74	26%	42%	99	-11%	-11%	55
semi-intensive techniques	-3%	3%	48	0	7%	52	37%	47%	88	-11%	-11%	49
intensive techniques										-11%	-9%	53
BARLEY												
traditional technique	-19%	-18%	61	-15%	-12%	67	49%	50%	92	-18%	-19%	61
semi-intensive techniques	-11%	-12%	70	-9%	-7%	84	51%	52%	99	-18%	-20%	45
SUGAR BEET												
rainfed intensive										27%	59%	1.61
IRRIGATED TECHNIQUES												
SOFT WHEAT												
irrigated										-11%	-7%	.45
HARD WHEAT												
irrigated										-4%	8%	47
SUGAR BEET												
irrigated	31%	83%	2.54	-35%	-11%	60	10%	172%	3.32	15%	70%	2.01
SUGAR CANE												
irrigated	30%	56%	2.01	-38%	-16%	74	10%	103%	2.54	31%	78%	1.25

Source: World Bank, EMPAS Study of Agricultural Prices and Incentives, Apr. 1984 and MARA/AIPD, Politique de Prix [sic] ... op. cit. as reported in World Bank, Kingdom of Morocco: Agricultural Prices and Incentives Study, Report No. 6045-MOR, Apr. 1986

Notes: NPR_O Nominal protection rate, or direct intervention effect on y
EPR Effective protection rate
DRC Domestic resource cost coefficient

The following trends in the incentives structure appear: (a) average protection to agriculture increased slightly over the decade 1970-1980 as a result of exchange rate and world market price movements and as a result of increasing subsidization of inputs, and (b) within the sector, differential incentives were given to the irrigated, especially the sugar (import substitution) sector, over the rainfed cereals subsector which uses more traditional technologies. Finally by 1984, despite successive devaluations beginning in 1981-82, benefits from the devaluation do not appear to have been

transmitted to producers and protection appears to have declined for most crops, except sugar.

Another striking feature of the incentives framework over the past fifteen years is that protection afforded to crops is generally inversely related to the country's comparative advantage in producing the crop. Crops in which Morocco has a comparative advantage are typically not protected and are, furthermore, penalized relative to other crops and other sectors of the economy. Overall, rainfed cereals production received negative effective protection (EPRs range from -20 percent to null) despite Morocco's strong comparative advantage in cereals production over the entire period (DRCs 0.5 to 1.0). Furthermore, since rainfed farmers employ fewer improved subsidized inputs and technologies, nominal and effective protection rates are closely related and the key factor which determines protection levels is the output price received by producers. Yet sugar beet and cane have benefitted from strong effective protection ranging from 60 to 170 percent, with the exception of 1975 when world sugar prices increased dramatically (EPRs declined to about -20 percent), despite the fact that on average, sugar crop production has made inefficient use of domestic resources. DRCs for sugar beet and cane, once again excepting 1975, have been consistently above unity.[40]

Nominal and effective rates of protection to cereals, particularly those produced using rainfed techniques, were virtually the same in most years. This indicates that the production of cereals does not benefit especially from

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[40] The 1986 World Bank prices and incentives study (op.cit., No. 6045-MOR) indicates, however, that interregional farm-level and refining level variation was extensive. Use of the national average DRC thus masks the fact that some regions (for example, Doukkala) do in fact have a comparative advantage in sugar production, given their relatively high levels of productivity.

subsidized inputs. Yet, as indicated above, the production of rainfed cereals comprises the bulk of agricultural activity in Morocco. Effective protection policy thus appears to contradict the objective of distributional equity in the agricultural sector. On the other hand, effective rates of protection for sugar beet and cane were a good deal higher than the nominal rates, which indicates that the production of sugar commodities has benefitted from government input price interventions, despite their high DRCs. The other important consumer commodity, soft wheat, does not receive much effective protection, even under irrigated conditions.[41]

Indirect Price Intervention Effects

Overvaluation of the Dirham at the official exchange rate, which results in a lower Dirham price of imported goods than would be the case if the border price were converted at the equilibrium exchange rate, implicitly reduces protection to producers and increases subsidization of consumers. The effect on producer and consumer prices of such 'indirect' intervention via exchange rate policy is isolated below in Table 17. Prevailing domestic producer and consumer prices are corrected for the overvaluation of the official exchange rate relative to the equilibrium exchange rate.[42] Since all of the agricultural commodities considered here are tradables, the comparison of the prevailing to the exchange rate-corrected prices appears as a pure index. The data indicate that Moroccan agriculture suffered consistently for the entire period under study by, on

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[41] This, despite the fact that irrigated soft wheat producers also benefit from input subsidies, is largely due to the fact that domestic producer output prices were largely below their border equivalents, thus pulling down the effective protection rates.

[42] For estimation of the equilibrium exchange rate, see annex I. For the prevailing domestic prices adjusted for indirect price intervention effects, see annex Table V.5.

average, 15 percent. The handicap was at its peak in 1978 to 1980, by as much as 30 percent. Only after 1981 when Morocco began to devalue the Dirham as part of its structural adjustment program did the penalization of agriculture due to an overvalued exchange rate progressively decline such that by 1984 the divergence due to the exchange rate was at its lowest point ever (8 percent).

TABLE 17: INDIRECT PRICE INTERVENTION EFFECTS

YEAR	Producer & Consumer Prices All Commodities
1960	-11%
1961	-11%
1962	-11%
1963	-11%
1964	-11%
1965	-10%
1966	-12%
1967	-11%
1968	-12%
1969	-14%
1970	-14%
1971	-16%
1972	-17%
1973	-19%
1974	-14%
1975	-16%
1976	-15%
1977	-18%
1978	-25%
1979	-29%
1980	-26%
1981	-15%
1982	-15%
1983	-16%
1984	-8%

Source: Annex Tables V.1 and V.5

Note: Calculated as
$((P_{Ai}/P_{NA})-(P_{Ai} \times (E^*/E^o)/P_{NA^*}))$
divided by
$(P_{Ai} \times (E^*/E^o)/P_{NA^*})$

P_{Ai} = prevailing price of agricultural commodity i
P_{NA} = non-adjusted non-agricultural GDP deflator
P_{NA^*} = trade and exchange rate policy-adjusted non-agricultural GDP deflator
E^* = equilibrium exchange rate
E^o = official exchange rate

Total Price Intervention Effects

The divergence of prevailing domestic prices (annex Table V.1) from the prices that would have prevailed in the absence of direct and indirect interventions (annex Table V.6) is estimated in this section. The calculations are made by comparing prevailing domestic prices with border prices, converted into Dirhams at the equilibrium exchange rate.[43] The ratios presented in Table 18 are thus net nominal rates of protection. The graphs which follow the table compare the effects of direct and total intervention, the difference between the two schedules representing the effect of indirect (exchange rate) intervention, which (as explained above) was fairly constant until 1978.[44]

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[43] The calculation is $(P_{Ai}/P_{NA}-P_{Ai}^*/P_{NA}^*)/(P_{Ai}^*/P_{NA}^*)$, where P_{Ai} is the prevailing domestic producer or consumer price; P_{Ai}^* is the border price equivalent producer or consumer price converted into Dirhams at the equilibrium exchange rate; P_{NA} is the unadjusted non-agricultural price index; and P_{NA}^* is the trade and exchange rate policy-adjusted non-agricultural price index.

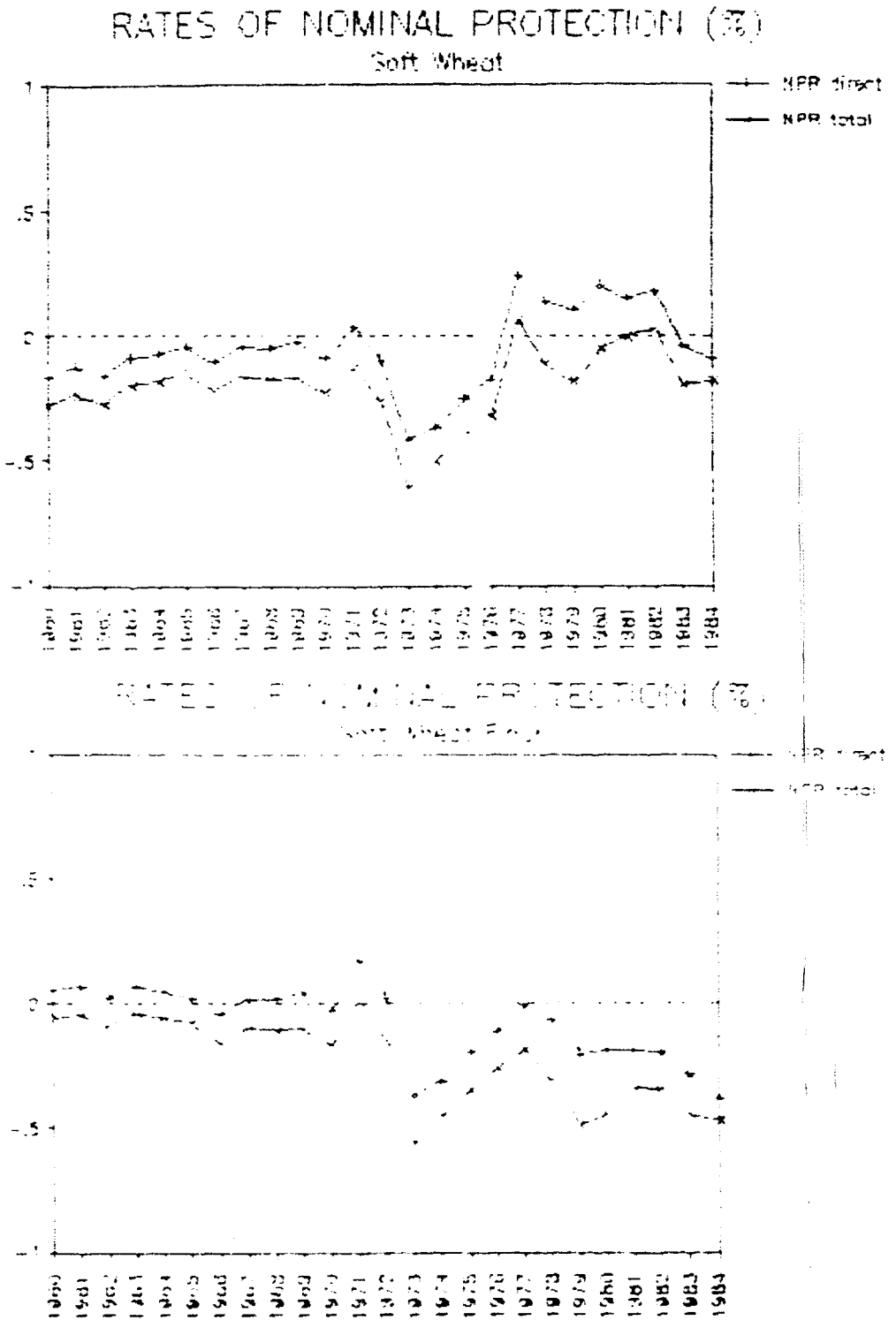
[44] For the purpose of graphical presentation, the nominal rate of protection due to direct intervention (NPR_D) was derived by netting the indirect effect (NPR_I) from the total effect (NPR_T).

TABLE 18 EFFECT OF TOTAL PRICE INTERVENTIONS

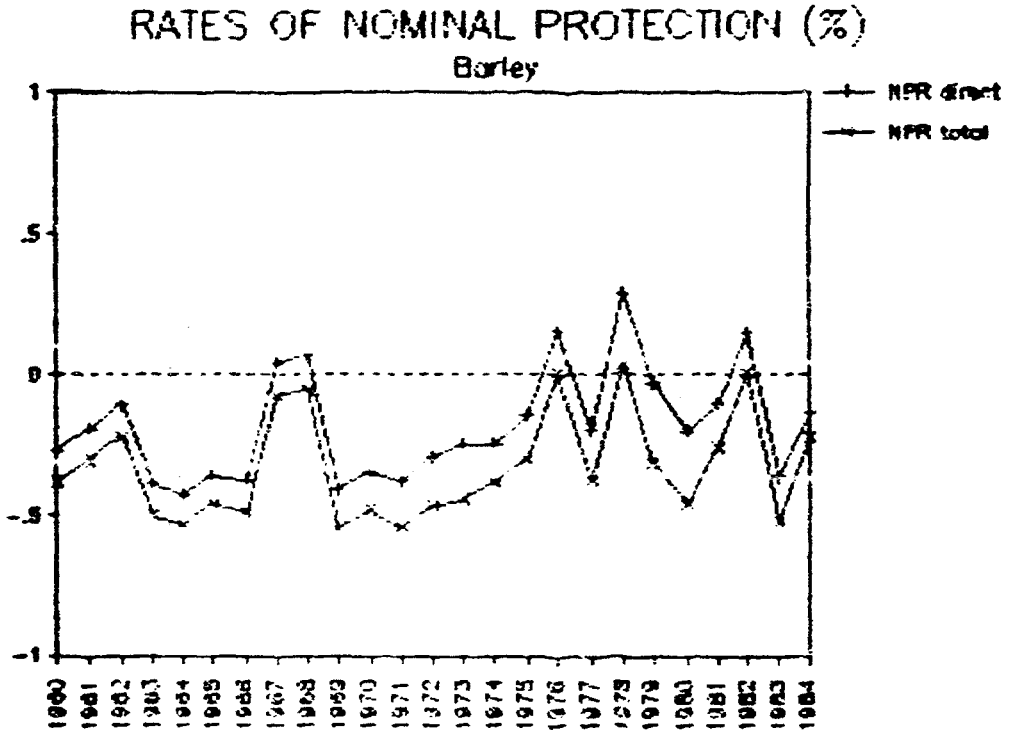
	PRODUCER PRICE RATIOS				CONSUMER PRICE RATIOS			
YEAR	Soft Wheat	Hard Wheat	Barley	Sugar Beet	Soft Wht Flour	Hard Wht Flour	Barley Flour	Sugar
1960	-28%	-38%	-34%	N/A	-6%	-25%	-19%	N/A
1961	-24%	-52%	-31%	N/A	-5%	-45%	-12%	N/A
1962	-28%	-30%	-22%	N/A	-9%	-21%	-5%	33%
1963	-20%	-36%	50%	18%	-4%	-26%	-34%	39%
1964	-18%	-15%	-54%	-46%	-6%	-2%	-39%	27%
1965	-15%	-4%	-46%	-57%	-8%	10%	-31%	25%
1966	-22%	-8%	-49%	-2%	-16%	6%	-11%	100%
1967	-16%	6%	-7%	38%	-10%	19%	12%	133%
1968	-17%	-2%	-6%	69%	-11%	11%	16%	151%
1969	-17%	-23%	-55%	42%	-10%	-10%	-38%	130%
1970	-23%	-23%	-48%	23%	-17%	-10%	-31%	117%
1971	-13%	-7%	-54%	-4%	1%	5%	-40%	79%
1972	-27%	-25%	-46%	-42%	-15%	-13%	-31%	16%
1973	-61%	-69%	-44%	-51%	-57%	-64%	-30%	3%
1974	-50%	-55%	-38%	-79%	-45%	-48%	-25%	-48%
1975	-40%	-34%	-30%	-84%	-35%	-26%	-31%	-67%
1976	-32%	15%	1%	-84%	-26%	29%	5%	-67%
1977	6%	-1%	-37%	-37%	-19%	13%	-9%	-18%
1978	-11%	5%	3%	4%	-32%	19%	25%	-4%
1979	-18%	-23%	-32%	9%	-44%	-12%	15%	1%
1980	-5%	-39%	-45%	56%	-45%	-30%	-25%	-40%
1981	0%	-11%	-25%	-75%	-34%	0%	-13%	-46%
1982	3%	27%	1%	-39%	-35%	41%	20%	-6%
1983	-20%	-22%	-52%	-2%	-45%	-11%	-39%	3%
1984	-10%	-11%	-22%	1%	-17%	-7%	-14%	11%

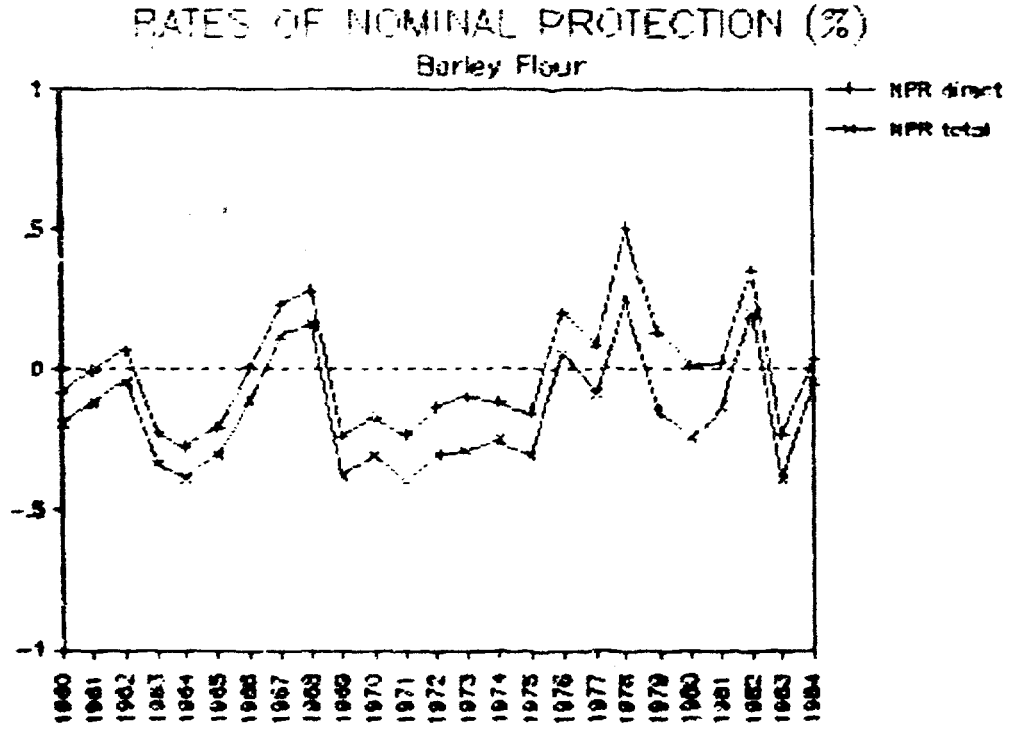
Sources: Domestic prices from annex Table V.6, border prices from annex Table V.6, unadjusted tonnage to tons: IMF deflator (MA) and trade and exchange rate adjusted tonnage to tons: IMF deflator (MAe) from annex Table IV.1.

Graphs Table 18 - Soft Wheat

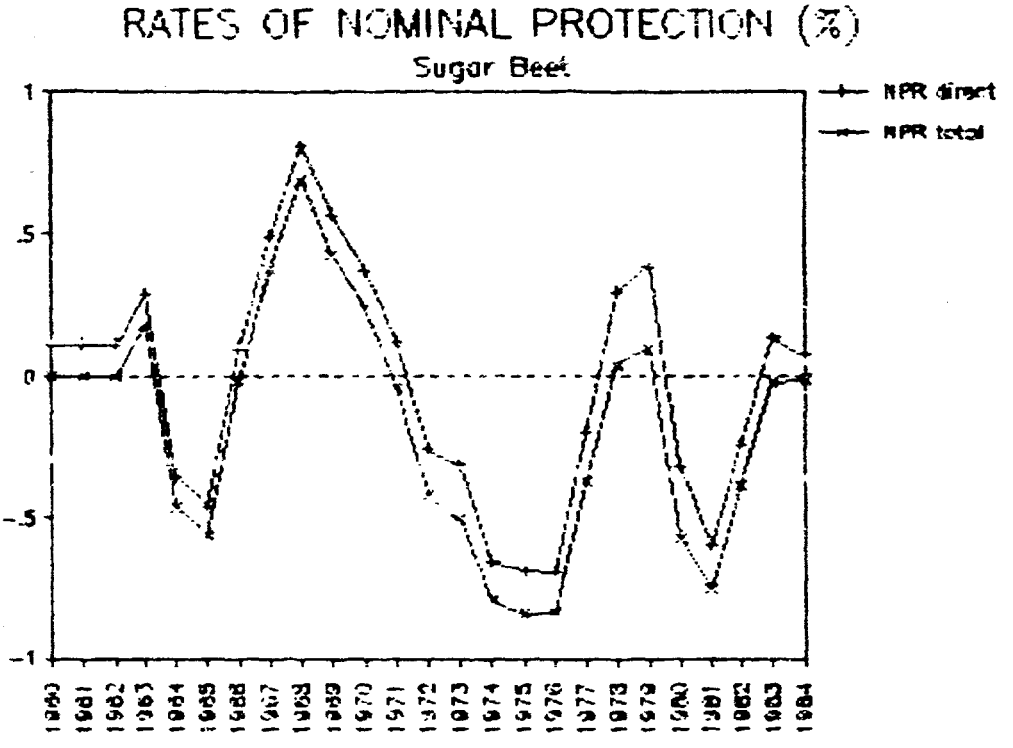


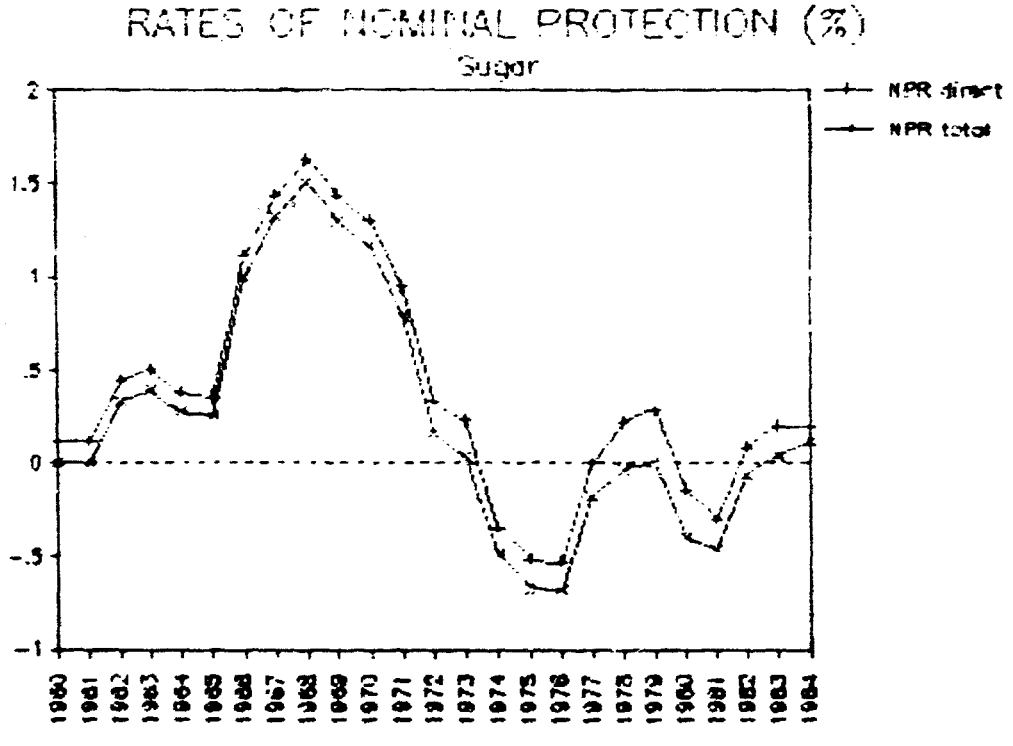
Graphs Table 18 - Barley





Graphs Table 18 - Sugar





The predominant feature of the comparison of prevailing prices to prices which would have prevailed in the absence of direct and indirect policy interventions is that the indirect exchange rate effects have had an additional disincentive effect, as evidenced particularly from the large negative rates of protection to grains (total intervention effect). The patterns of protection afforded to domestic sugar producers continue to show the volatility of international prices. Sugar producers received negative nominal protection in most years except those years of sharp declines in the world prices. This suggests that deliberate domestic price setting policy was not, on the whole, sufficient to compensate for the indirect effects.

The pattern of consumer prices broadly follows that observed with direct intervention effects only. However, the additional effect of the overvalued Dirham was that the subsidization of soft wheat flour actually began as early as 1960, rather than 1973 as suggested by Table 15, because of indirect consumer subsidies due to exchange rate policy. In the case of sugar consumer prices, which shifted from being taxed during the 1960s to being subsidized since 1974, the additional effect of exchange rate policy was to reduce total taxation in the earlier period and increase total subsidies in the later period.

In sum, it would appear that the effect of Morocco's emphasis on industrialization-led growth has been a strong penalization of agricultural producers. The effect of direct intervention on cereals output prices has largely been negative, with the exception of the period 1977 to 1982 (though this is less consistent in the case of barley). The effect of indirect intervention across the board has been to reduce total (or net) nominal rates of protection, in some instances (cereals) to negative rates when direct intervention alone seemed to imply positive protection. Thus, though Morocco has consistently held high the objectives

of food security and self-sufficiency, it has failed to translate these into positive protection for cereals producers. Sugar beet producers have suffered from widely fluctuating positive and negative nominal protection. This was due, however, to international, not domestic, market price variation. Only in the case of effective protection have sugar producers benefitted significantly from subsidies on input prices, despite the fact that on average the two sugar commodities, beet and cane, do not make efficient use of domestic resources.

Consumers of agricultural commodities, on the other hand, have benefitted strongly from price interventions by the state. To some extent, this ties in with the primary policy goal of industrialization by keeping Moroccan wages competitive with those in other industrializing nations.

CHAPTER FOUR

EFFECTS OF INTERVENTIONS ON MOROCCAN AGRICULTURE

Effects on Agricultural Output

The effect of divergences in domestic prices from their non-intervention levels is to reallocate resources from levels of use which would have prevailed in the absence of intervention. The effects of price policies on output are estimated by multiplying actual production in year t by the short-run and long-run own-price and cross-price elasticities of supply and the direct and total price intervention effects (Tables 15 and 18), lagged by one year.

There are few existing estimates of supply elasticities in Morocco. Those used here were estimated in a World Bank study.[45] They derive from an econometric model of the grains subsector estimated from aggregate data. The specification is Nerlovian with a cobweb expectations model. Long-run elasticity estimates are obtained using the short-run estimates divided by (1-a), where a is the coefficient corresponding to the lagged output in the short run model.

$$\log S_{jt} = K + a\log S_{jt-1} + \sum_{j=1} b\log P_{jt-1} + c\log W_t + d\log P_{ft} + e\log MM_t;$$

where S_{jt} is the output of grain j:

P_j is the price of grains 1,...,m;

W is the agricultural wage rate;

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[45] "Simulation of the Moroccan Grain Markets; An Econometric Dynamic Model," Annexes V and VI, in World Bank, Kingdom of Morocco: Agricultural Prices and Incentives Study, Report No. 6045-MOR, May 1986 and Abel Mateus, "Towards Structural Adjustment in Moroccan Agriculture: Cereals" (World Bank, mimeo.), April 1985 which is the background piece to the above model.

P_f is the price index for fertilizers; and,

MM is an index of precipitation.

The results have a high R^2 and the Durbin-Watson statistic is close to 2.0 for each regression. F statistics are also high for own-price elasticity estimates and for the coefficient of the lagged output a. The results indicate that weather is an important factor explaining cereals' variability in Morocco. This is a factor to be noted again when the results of the non-intervention production levels are discussed below. While fertilizer prices appear as a significant factor in the short-term in the case of soft wheat, the other input price index (wages) is not significant, perhaps due to the wide use of family labor which is not well represented by the nominal daily wage. The resulting matrix of short-run supply elasticities, on which symmetry conditions are imposed, is presented below.

TABLE 19: SHORT-RUN PRICE ELASTICITIES OF SUPPLY

	..... PRICE OF:			
QUANTITY OF:	Soft Wheat	Hard Wheat	Barley	Sugar
Soft Wheat	.69	-.08	-.05	N/A
Hard Wheat		.52	-.10	N/A
Barley			.76	N/A
Sugar				.15

The signs of the elasticities are as expected, although the strength of the barley own-price elasticity may be surprising. The signs of the cross-price elasticities are also as expected, with competition most marked between hard wheat and barley (-0.10). Competition between soft wheat and barley

is the weakest of the sets of cross-price effects (-0.05), since soft wheat has more stringent water requirements than barley, which has a higher moisture stress level. However, the absolute magnitude of cross-price effects is lower than was anticipated.

There are no cross-price elasticities estimates for sugar beets and cereals. For these crops, competition for resources would operate principally in irrigated areas and to a lesser extent in the better rainfed areas. In fact, in Morocco cereals and sugar beet are part of various four- and five-year crop rotation patterns of sugar beet, wheat, sugar cane, forage and vegetables practiced in irrigated areas. In these circumstances, sugar beets and soft wheat would be considered complements, while in other potential rotations, where soft wheat has a lead role, the two crops would be considered substitutes. It is most likely that irrigated sugar beet would be replaced by citrus and vegetables, cotton (in the Tadla area, but not in the more humid Gharb) and soft wheat, maize

or soy beans.[46]

Long-run price elasticities of supply are derived from the short-run supply specification through the short run elasticity (b) and lagged output coefficients (a).[47] The estimates indicate an adjustment coefficient of about 0.6, such that long-term own price elasticities are estimated at 1.62 for barley, and 1.6 and 1.24 for soft and hard wheat respectively. The long-term supply elasticity for sugar beet is estimated at 0.37.

The incremental output which would have obtained in the absence of government price intervention, presented in Table 20, is calculated as a function of short- and long-run own-price and cross-price elasticities from Table 19, the degree of government intervention between prevailing domestic prices and border prices at the official exchange rate (in the case of the short-run direct intervention effect) and at the equilibrium exchange rate (short-run and long-run total intervention effects) in year t-1, and actual output levels in year t. For sugar beet only, similar calculations were also run to estimate short-

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[46] That citrus and vegetables do not play a larger role is due to at least two factors. One is the constraint of external demand for Moroccan exports. The future of Moroccan (and indeed all Mediterranean basin) agricultural exports to the European Economic Community (EEC), the largest market for Moroccan horticultural exports, has been threatened by the expansion of the EEC to include Spain, Portugal, and Greece. A second factor regards domestic market organization. Until recently, the export of Moroccan horticultural products was the monopoly of one agency, the Export Marketing Office (Office de Commercialisation d'Exportations, OCE). The 1986 MARA/AIRD study indicated that the margins between CIF and FOB prices on the one hand, and FOB and producer prices on the other, have increased steadily over time, as OCE overhead has mounted. As producers received an ever decreasing share of the CIF price, this may have served to reduce output from non-intervention levels. Thus, it is mistaken to suppose the counterfactual that a decrease in intervention in the ma for sugar beets would automatically have led to an increase in the p ion of exportables.

[47] Given the Nerlovian supply regression specification described above, the long run elasticity would be (b/1-a).

run and long-run total intervention effects based on the degree of intervention between domestic and international value-added.

TABLE 20: OUTPUT EFFECTS

YEAR	ACTUAL OUTPUT ('000 mt) Soft Wheat	Hard Wheat	Barley	Sugar Beets	INCREMENTAL NON-INTERVENTION OUTPUT (%) Soft Wheat SRD	SRT	LRT	Hard Wheat SRD	SRT	LRT	Barley SRD	SRT	LRT	Sugar Beet SRDa	SRTa	SRTb	LRTa	LRTb
1960	322	745	1157															
1961	219	612	856		10%	14%	36%	11%	14%	24%	20%	25%	42%					
1962	478	1349	1633		0%	11%	20%	22%	22%	35%	13%	17%	43%					
1963	401	1161	2017	72	11%	18%	38%	0%	11%	27%	7%	13%	32%					
1964	398	1157	1610	182	3%	8%	21%	10%	12%	30%	31%	34%	54%	-7%	-9%		-7%	
1965	428	1390	1646	173	0%	3%	22%	-3%	1%	2%	35%	39%	57%	0%	7%		17%	
1966	290	855	702	284	3%	8%	19%	-8%	-4%	-10%	35%	35%	80%	7%	0%		21%	
1967	222	1175	1518	414	7%	12%	30%	-7%	-8%	-7%	38%	38%	90%	-3%	0%		1%	
1968	850	1900	3210	682	4%	11%	27%	-11%	-12%	-19%	-1%	0%	14%	-15%	-8%		-14%	
1969	339	1130	2040	980	0%	12%	24%	-8%	-11%	-6%	-4%	3%	8%	-14%	-11%		-11%	
1970	363	1418	1953	1127	0%	7%	17%	1%	9%	15%	37%	40%	94%	-15%	-8%		-18%	
1971	547	1642	2572	1578	0%	11%	28%	1%	5%	15%	30%	34%	84%	-10%	-8%	-4%	-8%	-11%
1972	530	1631	2466	1884	-4%	0%	14%	-4%	-2%	-5%	38%	41%	102%	-8%	1%	0%	2%	-1%
1973	392	1182	1255	1470	2%	14%	25%	1%	6%	16%	27%	35%	82%	3%	8%	8%	16%	11%
1974	473	1360	2387	1952	30%	34%	85%	25%	27%	88%	17%	25%	61%	9%	8%	8%	14%	13%
1975	47[illegible]	[illegible]	[illegible]	1744	7%	28%	70%	10%	21%	51%	15%	22%	54%	11%	12%	8%	22%	19%
1976	537	1652	2880	2173	18%	24%	58%	0%	11%	28%	11%	11%	27%	12%	13%	8%	21%	20%
1977	252	1038	1346	1459	18%	23%	58%	-13%	-11%	-28%	-10%	-1%	-1%	12%	13%	8%	21%	21%
1978	434	1441	2326	2309	-18%	-8%	-16%	-10%	-4%	-7%	23%	29%	73%	3%	6%	8%	14%	9%
1979	490	1307	1886	2373	-6%	8%	21%	-15%	-8%	-6%	-21%	-2%	-6%	-12%	-1%	-8%	-2%	-9%
1980	480	1331	2210	2143	-8%	0%	22%	-2%	7%	18%	7%	22%	53%	-14%	-1%	-8%	-4%	-15%
1981	282	611	1039	2115	-19%	-2%	-5%	7%	15%	38%	22%	32%	78%	5%	9%	8%	21%	14%
1982	777	1408	2334	2214	-12%	-2%	-5%	-3%	3%	7%	12%	19%	47%	11%	11%	7%	18%	18%
1983	732	1299	1728	2589	-9%	0%	0%	-22%	-14%	-34%	-7%	2%	6%	4%	8%	8%	14%	8%
1984	818	1171	1405	2926	1%	9%	25%	-1%	5%	11%	33%	38%	93%	-2%	0%	-8%	1%	-21%

Sources: Direct price interventions (Table 15), direct and indirect price interventions (Table 18), total effect of intervention on value-added in sugar beet production (annex Table V.10), and short-run elasticities of supply (Table 19)

Notes: % Incremental Non-intervention Output calculated as (Incremental - Actual Output) / (Actual Output)
SRD - Short-run direct output effects
SRT - Short-run total output effects
LRT - Long-run total output effects
a - Using sugar beet output elasticity with respect to price.
b - Using sugar beet output elasticity with respect to value added.

Results indicate that production of all cereals would have increased for much of the period under a non-intervention scenario, taking account only of direct price interventions. Long-run output effects parallel the short-run changes in production, with the anticipated increases (or decreases) being accentuated in view of the larger long-run supply elasticities. Soft wheat in particular would have witnessed an increase in production from 1960 through 1977. Production would have increased by 3-11 percent through 1973 and by 18-30 percent for the price boom period from 1974 through 1977. Since 1979, with declining world prices, production would have declined by as much as 19 percent. Hard wheat output would have followed a more varied pattern: increasing by as

much as 21 percent through 1964 but declining marginally from 1965 through 1969. After 1973, there would have been large swings in hard wheat production, increasing during the 1974-75 boom years when production would have increased by 19-25 percent if higher world prices had been passed on to producers, and falling an average of 8 percent below actual production levels from 1977 to 1984. Barley production in this counterfactual case would have shown a dramatic increase. On average, production would have risen by about 20 to 30 percent.

It must be cautioned that in the case of all cereal crops, which are cultivated primarily in rainfed areas, the predicted production increases would depend on a "normal" rainfall pattern. Due to the severe droughts in 1961 and 1981 for instance, the near 30 percent increases in barley production predicted for 1961 and 1981, respectively, could not have been realized, irrespective of the prevailing price ratios.

Direct output effects for sugar are evaluated using the producer price in the absence of interventions and not on the basis of value-added. At the prices which would have prevailed in the absence of direct intervention, production would have followed the wide swings in world prices. Had producers been exposed to international sugar prices, Morocco would have produced sugar at lower levels until 1973. Thereafter, a see-saw pattern emerges with a 12 percent increase in production during the world price boom of 1975-1977, followed by another total decline of production with the drop in lagged world prices in

1978-79.[48]

In addition to direct price interventions, the indirect effects due to exchange rate interventions also affect the allocation of resources. Results indicate that the total effect is that soft wheat production would have been higher by nearly 10 percent through 1973 and about 25 percent higher during the 1974-77 period (short-run total effect). Output since 1978 would not have differed greatly from current production levels, given the relatively low total negative protection on the soft wheat producer price. Barley production would have increased by an average of 25 percent over the base case, with increases of 15-40 percent predicted for the 1960-67 period. By contrast, hard wheat output on average would have approximated current output levels, increasing by only 4 percent for the 1960-84 period.

It is perhaps tautological to state that, given positive output-price elasticities, an increase in producer prices to non-intervention levels

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[48] Actual sugar production in Morocco in fact increased despite stagnant real sugar beet producer prices (see annex Table III.1). Several explanations are offered for this phenomenon. First, the increase in output is a function of the rapidly increasing importance of irrigated sugar beet production. Second is the fact that sugar is produced exclusively within ORMVA zones and thus forms part of an obligatory crop rotation pattern. While this pattern is not always respected, it does give participant farmers access to seasonal inputs (principally fertilizers and water) and credit. Thus, declared plantings may differ from actual plantings. Various supply elasticity estimates for sugar beets have thus come up with insignificant price elasticity coefficients. A 1984 study by the Food Strategy study group at MARA has estimated a supply function for sugar beets for the 1965-1980 period as a function of beet prices, production costs, rainfall and acreage. The resulting own-price elasticity estimate for beet is 0.50. See Groupe d'Etude de la Stratégie Alimentaire, Etude de la Strategie Alimentaire Marocaine: Analyse de la Situation Actuelle et Projections, Projet de Rapport de Synthèse, Rabat, January 1984. This estimate is rather higher than the output price elasticity figure of 0.15 used in the World Bank's Agricultural Prices and Incentives Study, although not implausible given that beet is an annual crop. Third is the phenomenon described in the previous chapter, i.e. that producers have benefitted from high effective protection to which they may be more responsive than they are to output price protection alone.

would have resulted in increases in output over actual levels of production. The question to be asked is why the Moroccan Government maintained an overvalued Dirham, which resulted in negative price incentives and therefore reduced level of agricultural output relative to what would have been the case had the Dirham been set at an equilibrium rate, in the face of its professed objectives of food self-sufficiency.

One part of the answer may lie in a misunderstanding of the seemingly "costless" strategy of Dirham overvaluation. The dual penalization of the agricultural sector due to negative domestic producer price incentives and an increasingly overvalued Dirham intensified as the commodity boom (1973) set in. Mounting fiscal pressures also became a growing concern to policy makers at that time. It will be recalled that by 1976 the budget deficit had leapt to 42 percent of the budget and a full 16 percent of GDP. Imports of cereals were artificially cheapened by the overvalued Dirham so that, when faced with the choice of importing to satisfy domestic demand or procuring domestically from producers to whom ever increasing official nominal prices were being paid, the structure of incentives viewed at an official exchange rate led Morocco to rely increasingly on the international market for supply.[49]

Effects on Consumption

In order to assess the effects of pricing policies on consumption, quantities consumed of cereals and sugar were derived from production and trade

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[49] The same logic should hold for sugar imports as well. However, these did not change significantly over the 25-year period. It is theorized that this may reflect differences in the structure of capital ownership between cereals and sugar subsectors.

data. Domestic grain production data were first adjusted for seed retention and losses, estimated at 15 percent of gross production. Net imports (corrected for exports) were added to derive total gross availabilities. In the absence of reliable data, no interannual stock adjustments were possible. These gross availability data were subsequently converted to flour equivalents using the milling reduction ratios, as presented in the cereals annex. In addition, barley consumption was set at 50 percent of total domestic production.[50] Sugar consumption was expressed in raw sugar equivalent quantities. Domestic beet production was converted to its sugar equivalent, assuming a 16.5 percent sugar content level and corrected for an industrial sugar loss factor of 1.5 percent.[51] Cane production, with a net sugar content of 9 percent, was also included in total domestic production. Imports, principally in the form of raw sugar, were added to domestic production to estimate total consumption.

The last available household consumption survey in Morocco dates from 1971. Few quantitative studies of Moroccan consumption patterns exist.[52] The Food Strategy study estimated individual demand functions for each major consumption item. However, the results are not consistent and were rejected for

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50 This parameter is at best an informed guess. Even assuming the parameter is correct for any given year, there is little reason to expect it to remain stable interannually. In good production years, barley is consumed in the form of meat. This switching between food and feed uses for barley is most likely a key stabilizing feature of traditional agriculture. Insufficient modelling of this feature is also one of the weaknesses of the Mateus model.

51 Moroccan sugar industry norms.

52 A household budget survey of expenditure patterns across 14,500 households was carried out by the Direction des Statistiques of the Ministry of Planning in 1984-85, but results were not available in time to be used here. The first non-governmental analysis of this new data to date is presented in Karim Laraki, "Food Consumption and Food Subsidies in Morocco: Justifications for Policy Reform" (Ph.D. thesis, Cornell University, 1988), which was published too late for consideration by this working paper.

this study. The demand elasticities used here were estimated with data from the 1971 survey and a pooling of aggregate time series (1959-84) and cross-section data expanded from the 1961 and 1971 surveys, using Stone's Linear Expenditure System specification.[53] It is specified as a log-additive utility function with minimum consumption levels for each commodity group, set at 90 percent of observed consumption. Nine groups of commodities are defined: soft wheat, hard wheat, barley, maize, sugar, fruits and vegetables, edible oils, livestock products and all other goods. The system does not, however, allow for inferior goods in the sense that all goods are potential substitutes.

$$P_{it}{}^{c}X_{it}{}^{D} = P_{it}{}^{c}g_i + b_i(c_t - \sum_{i=1} P_{it}{}^{c}g_i) \text{ for } i=1,\ldots,m$$

where $P_{it}{}^{c}$ = consumer price of good i, time t

$X_{it}{}^{D}$ = demand for good i

g_i = "minimum subsistence" consumption level for i, and

c_t = consumer's expenditure in time t.

Compensated own-price elasticities indicate that soft wheat and barley are quite elastic in demand. Sugar, with few substitutes on the other hand, is relatively inelastic in demand. The derived cross-price elasticities are asymmetric. Furthermore, from the homogeneity of degree zero condition imposed in derivation, all other goods not entering this study have been grouped

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53 See World Bank, Compensatory Programs for Reducing Food Subsidies, (2 vols.), Report No. 6172-MOR, April 1986.

as the residual good category.[54] The matrix of price elasticities of demand are presented in Table 21. No long-term demand elasticities are available and only short-term elasticities are used in this study.

TABLE 21: COMPENSATED PRICE ELASTICITIES OF DEMAND

	PRICE OF:				
QUANTITY OF:	Soft Wheat Flour	Hard Wheat Flour	Barley Flour	Sugar	Other Goods
Soft Wheat Flour	-.700	.056	.020	.013	.612
Hard Wheat Flour	.032	-.575	.017	.011	.515
Barley Flour	.042	.062	-.796	.015	.577
Sugar	.014	.020	.007	-.258	.217
All other	.612	.437	.752	.219	-2.020

Source: World Bank, Compensatory Programs for Reducing Food Subsidies, Report No. 6172-MOR, April 1986.

The incremental consumption which would have obtained in the absence of government price intervention, presented in Table 22, is calculated as a function of compensated own-price and cross-price elasticities from Table 21, the degree of government intervention between prevailing domestic prices and border prices at the official exchange rate in year t, and actual consumption levels in year t.

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[54] The indirect intervention effect (Table 17) was used to simulate the effects on "all other goods". This assumption introduces a bias into the argument in so far as it assumes "all other goods" to be tradables whereas the consumer basket contains about 50 percent in non-tradable services and goods. An alternative hypothesis might have employed the P_{NA}/P_{NA}^{*} wedge. The bias here on the other hand would suggest that "all other goods" are composed of non-agricultural goods whereas other consumer items clearly contain edible oils, meats and fish, dairy products, fruits and vegetables, and other agricultural commodities. The first assumption was retained for the study where it was felt that the bias is less marked.

TABLE 22: CONSUMPTION EFFECTS

YEAR	ACTUAL CONSUMPTION ('000 mt) Soft Wheat Flour	Hard Wheat Flour	Barley Flour	Sugar	INCREMENTAL NON-INTERVENTION CONSUMPTION (%) Soft Wheat Flour SRD	SRT	Hard Wheat Flour SRD	SRT	Barley Flour SRD	SRT	Sugar SRD	SRT
1960	400	486	280	177	4%	5%	-1%	-4%	-6%	-6%	0%	3%
1961	539	408	255	285	6%	8%	-22%	-23%	-4%	1%	1%	3%
1962	479	888	448	300	1%	1%	-7%	-8%	-4%	-3%	1%	2%
1963	335	826	280	290	3%	3%	-11%	-6%	-22%	-16%	1%	1%
1964	824	857	472	351	1%	3%	0%	3%	-27%	-24%	1%	1%
1965	888	999	487	377	-1%	0%	12%	11%	-22%	-19%	0%	0%
1966	884	829	218	304	-7%	-6%	10%	6%	-28%	-28%	3%	3%
1967	906	817	464	251	-4%	-4%	16%	12%	15%	14%	3%	3%
1968	478	1304	980	379	-4%	-4%	12%	11%	14%	16%	4%	4%
1969	367	788	541	421	0%	1%	2%	1%	-23%	-22%	3%	3%
1970	838	991	883	416	-4%	-4%	0%	1%	-14%	-16%	3%	3%
1971	787	1149	787	455	10%	10%	12%	12%	-27%	-22%	3%	3%
1972	701	1337	749	405	0%	1%	1%	2%	-18%	-12%	2%	2%
1973	1000	824	380	511	-30%	-24%	-31%	-28%	-7%	-4%	2%	2%
1974	1080	992	741	588	-28%	-20%	-22%	-18%	-7%	-5%	-4%	-4%
1975	1122	873	471	512	-13%	-12%	-2%	-4%	2%	-11%	-11%	-11%
1976	1049	1213	851	574	-13%	-10%	20%	20%	32%	14%	-17%	-14%
1977	1455	735	415	570	-4%	-3%	20%	17%	-4%	3%	-2%	-1%
1978	1366	1004	808	642	-12%	-4%	20%	24%	48%	28%	2%	4%
1979	1486	911	585	857	-23%	-18%	11%	10%	10%	10%	2%	3%
1980	1894	998	701	880	-19%	-13%	-4%	-2%	-6%	2%	-4%	-4%
1981	1687	457	384	839	-17%	-14%	11%	10%	5%	2%	-10%	-8%
1982	1583	850	898	840	-22%	-18%	20%	22%	28%	28%	0%	1%
1983	2099	883	309	868	-24%	-20%	4%	4%	-22%	-18%	2%	2%
1984	2122	816	482	732	-30%	-28%	2%	2%	4%	4%	2%	2%

Sources: Direct price interventions (Table 15), compensated demand elasticities (Table 21)

Notes: Actual Consumption = (Production - seed retention - losses) + (Net imports).
Soft Wheat Flour = ((Grain production * .85) * (M-X)) * (grain-to-flour milling ratio of 78%, representing 20% total consumption in the form of luxury flour (68%) and 80% total consumption in the form of ordinary flour (78%)).
Hard Wheat Flour = ((Grain production * .85) * (M-X)) * (82% milling ratio)
Barley Flour = ((Grain production * .85) * (M-X)) * (70% milling ratio) * (90% assumed to be available for human consumption net of total production)
Sugar = ((Beet production * 14.5% sugar recovery ratio) + (Cane production * 9% sugar recovery ratio) + M)
where M = imports, X = exports, SRD = short-run direct consumption effects, and SRT = short-run total consumption effects.

Two broad periods can be discerned. Prior to 1973, the consumption of soft wheat and hard wheat flour would not have differed greatly from actual consumption levels (direct and total effects). Barley consumption in all but a few of these years would have been far below actual levels, in some years by as much as almost 30 percent. This suggests that Moroccan cereals trade was not very efficient at alleviating situations of excess supply which pushed prices below their border price equivalents during most of the 1960s, particularly in the case of barley. Sugar consumers were the most penalized during this period. A restrictive trade policy kept domestic sugar consumer prices well above their border price equivalents, with the result here that average sugar consumption

would have been as much as 41 percent above actual consumption levels (short-run total effect).

After 1973, however, the Government of Morocco began to intervene much more through consumer subsidy policies. It will be recalled that this coincided with a period of extreme political instability. At the same time, with phosphate exports doing well on the international market, the Government could afford to undertake interventions which would appease the populace. Most striking is the effect on consumption of soft wheat flour, which would have been sharply reduced in the absence of consumer subsidies. Consumption of both hard wheat and barley flour, on the other hand, would have been sharply higher.

Interestingly, sugar consumption in equilibrium would have been less than actual consumption in only two short periods, between 1974 and 1977 and again in 1980-81, when the world price of sugar rose. In the other years, consumption would have risen above actual levels by a few percentage points. Thus though the Government's sugar policy has received a lot of unfavorable attention from international donor agencies in recent years, the aggregate effect on the consumer side has not been to encourage significant "over-consumption" compared with non-intervention levels.

Effects on Foreign Exchange

The changes in production and consumption discussed above would have resulted in gains or losses of foreign exchange to Morocco. The value of the net surplus (deficit) of production over consumption value, measured in border prices, is calculated to assess the effect on net foreign exchange earnings of the direct and indirect pricing policy interventions. Intervention has cost the Moroccan Government both in terms of foregone production and of higher-than-anticipated levels of consumption.

Incremental consumption quantities, estimated in the previous section, are converted into their traded equivalent forms using the physical conversion coefficients discussed in the cereals and sugar annexes. Incremental demand for flour is thus expressed in grain equivalents, while sugar production and demand are expressed in raw sugar equivalents. Reasons for these transformations are twofold. First, incremental physical output and demand can be thus be compared directly. Secondly, the net gains or losses can be valued by their CIF or FOB prices. While Morocco is currently a net importer of all of the commodities studied, the non-intervention scenarios indicate that Morocco has the potential to become a net exporter of barley.[55] Changes in net barley production are therefore valued at FOB prices. Changes in production and consumption of all other commodities are valued at CIF prices. Table 23 presents the physical incremental changes in demand and supply and their foreign exchange value.

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55 If any commodity showed consistently positive net (adjusted for base case net imports) production surpluses above and beyond domestic consumption on a 3-year moving average, Morocco was considered to be a potential net exporter in that commodity and FOB prices were applied. If, on the other hand, net output gains moved about parity, or showed consistent net losses, CIF prices were used.

TABLE 28: TOTAL FOREIGN EXCHANGE SAVINGS OR COSTS

YEAR	.....SHORT RUN.... SHARE OF TOTAL EXPORTS	SHARE OF TOTAL IMPORTS	.....LONG RUN..... SHARE OF TOTAL EXPORTS	SHARE OF TOTAL IMPORTS
1960				
1961	8%	7%	16%	14%
1962	11%	9%	31%	26%
1963	7%	6%	19%	16%
1964	4%	4%	18%	19%
1965	2%	2%	17%	18%
1966	-11%	-10%	-4%	-4%
1967	-12%	-10%	-1%	-1%
1968	-20%	-18%	-19%	-18%
1969	-14%	-13%	-14%	-13%
1970	-6%	-4%	5%	4%
1971	2%	2%	[illegible]	[illegible]
1972	7%	7%	22%	21%
1973	21%	20%	34%	32%
1974	36%	36%	58%	57%
1975	52%	35%	70%	47%
1976	56%	27%	73%	36%
1977	5%	2%	6%	3%
1978	2%	1%	8%	5%
1979	1%	1%	-2%	-1%
1980	17%	11%	19%	12%
1981	22%	13%	29%	17%
1982	6%	3%	12%	7%
1983	5%	3%	3%	2%
1984	7%	5%	7%	5%

Sources: Net incremental output (short-run, long-run) from Table 20, net incremental consumption from Table 22 and expressed in grain or beet equivalents. The net quantities are then valued at FOB (barley) or CIF (other) prices.

Notes: A positive figure indicates a net savings of foreign exchange would have occurred under a non-intervention scenario, while a negative figure indicates a net loss of foreign exchange would have occurred.
Share Total Exports = Annual total net savings/cost expressed as percentage of total export value
Share Total Imports = Annual total net savings/cost expressed as percentage of total import value

Results of the calculations suggest that in the long-run under equilibrium conditions Morocco would have gained foreign exchange over the entire period. The most important savings would have been realized because of a major decline in soft wheat consumption, especially after 1973. Long-run gains from

non-intervention are more important than short-term gains due to the higher supply elasticities.

Effect of Interventions on Government Budget

The structure of Morocco's revenue sources[56] reveals the importance of indirect taxes (turnover and consumption excise taxes) and customs duties (duties and special import taxes) which together account for 65 percent of total revenue (1985). The share of customs duties which are ad valorem rose over the 1970-84 period with the progressive increases in the special import tax. Meanwhile, the share of receipts from sales taxes and specific consumption excise taxes continued to decline. In 1984-85, direct taxes represented only one-quarter of total revenues with the remainder coming from stamp taxes, levies and contributions from government monopolies.

Agriculture contributes little in the form of direct taxes. Until 1983, Morocco had an agricultural income tax based on assessed land productivity. The rate ranged from 8 to 20 percent, with exemptions to incomes below 1400 Dh. The absolute amount collected from this tax was minimal, however, and never represented more than 1 percent of total revenue. In 1977, this tax yielded 52 million Dh from approximately 210,000 farmers with incomes in excess of 1400 Dh. In the early 1980s under the combined effect of delays in adjustments to the assessed land productivity and the consecutive droughts, the yield from this tax declined to less than 0.5 percent of total revenue. In 1984, in a popular gesture, the tax was suspended until the year 2000. There is also a tax on

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56 For more detailed discussions of Morocco's tax structure see also World Bank, Morocco: Economic and Social Development Report, Washington, D.C. 1981 and World Bank, Morocco: Industrial Incentives and Export Promotion. Washington, D.C. 1984.

"undeveloped land" at 1.5 to 2.5 percent of assessed value, although it has not been enforced.

Certain imported agricultural goods and inputs are subjected to border taxes. Of these, sugar, edible oils and dairy products are subject to ad valorem customs duties ranging from 7.2 to 22 percent in addition to the special import tax and a 10 percent stamp duty. Until 1982, agricultural equipment was subject to tariffs of 6.5 percent on tractors and 15 percent on all other agricultural equipment. In 1982, all taxes on agricultural equipment were abolished. Fertilizer, seed and cereal imports are not taxed at the border. Consumption excise taxes are also levied on sugar, tobacco, coffee, tea and wine. These excise taxes were not included in the budget analysis since they do not have an effect on production incentives for sugar and wine, and Morocco does not produce the other commodities.

TABLE 24: SECTORAL EFFECTS OF PRICING POLICIES: REVENUES
(Million constant Dh, 1969=100)

YEAR	DIRECT TAXES Agricultural Income tax	CUSTOMS DUTIES Agricultural Equipment	TOTAL REVENUES FROM AGRICULTURE
1960	N/A	N/A	N/A
1961	N/A	N/A	N/A
1962	N/A	N/A	N/A
1963	N/A	N/A	N/A
1964	N/A	N/A	N/A
1965	N/A	N/A	N/A
1966	N/A	N/A	N/A
1967	N/A	5.1	N/A
1968	N/A	11.5	N/A
1969	N/A	11.9	N/A
1970	45.4	9.2	54.6
1971	51.1	10.6	61.7
1972	44.8	7.9	52.7
1973	35.5	9.5	45.0
1974	46.4	13.2	59.6
1975	28.4	17.6	46.0
1976	35.4	15.6	51.0
1977	30.2	22.3	52.5
1978	36.5	15.0	51.4
1979	43.0	17.7	60.7
1980	22.0	12.0	34.0
1981	22.7	12.2	34.9
1982	6.8	29.4	36.2
1983	1.8	.0	1.8
1984	.0	.0	.0

Notes: N/A means data were unavailable.
Agricultural income tax data from World Bank sources.
Customs duties are estimated from average tariff rates by commodity and Office de Changes commodity-specific import data.

The cumulative receipts from the sector are above shown in Table 24. Direct tax and customs duty revenue accounted for 2-5 percent of total revenue, declining steadily from 5 percent in 1974-75 to 2 percent in 1983-84. It can

be concluded that the Government has not sought to raise revenue directly from the sector.

Current expenditures to the sector are in the form of subsidies on production input costs. Among the most important of the producer subsidies are those for irrigation network capital and recurrent costs, fertilizer, and credit (see Table 25). There are major subsidies on the capital costs of irrigation network. As stated in the 1969 Investment Code, the Government takes charge of 60 percent of the investment costs while farmers are expected to pay the remainder. However, due to exemptions and non-recovery of the costs, less than 20 percent of the costs are actually recovered. Water charges are also not fully collected. In addition, irrigation authorities provide commercial services to farmers in their zone for which no cost recovery exists.[57] Disaggregated data of these subsidies by major crop are not published. These were estimated on a per hectare basis for the crops studied in this report. Fertilizer subsidies were instituted in the mid-1970s. By 1984, with the increased use of fertilizer in the country and rising world market prices, the annual fertilizer subsidy bill increased to over 100 million (constant 1969) Dh. Agricultural credit is provided by the CNCA at preferential rates. An interest rate differential on short and medium/long term loans equal to 1-2 percent was considered an indirect subsidy to the sector. With increased use of credit, the implicit credit subsidy reached almost 20 million (constant 1969) Dh in 1984.

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[57] See World Bank, EMPA2, Agricultural Sector Adjustment Loan; Technical Support Volume, Report No.4032-MOR, Washington, D.C. 1985.

TABLE 25: BUDGETARY EFFECTS OF PRICING POLICIES: PRODUCER SUBSIDIES (million constant Dh, 1969=100)

YEAR	Fertilizer	.....Irrigation..... Oper/Maint (b)	Capital (c)	Agric. Credit	TOTAL PRODUCER SUBSIDIES
1960	.0	N/A	N/A	N/A	N/A
1961	.0	N/A	N/A	N/A	N/A
1962	.0	N/A	N/A	N/A	N/A
1963	.0	N/A	N/A	-1.7	N/A
1964	.0	N/A	N/A	-1.3	N/A
1965	.0	N/A	N/A	-3.4	N/A
1966	.0	N/A	N/A	-3.8	N/A
1967	.0	N/A	-194.3	-3.2	N/A
1968	.0	N/A	-232.8	-4.1	N/A
1969	.0	N/A	-259.0	-5.0	N/A
1970	.0	-62.8	-300.6	-5.0	-368.4
1971	.0	-67.3	-325.1	-8.3	-400.7
1972	.0	-71.7	-322.8	-8.2	-402.7
1973	.0	-76.8	-361.9	-7.9	-446.6
1974	-65.3	-70.4	-345.3	-6.8	-487.7
1975	-89.0	-79.1	-409.7	-7.0	-584.9
1976	-33.3	-85.5	-444.4	-13.8	-577.0
1977	-28.7	-88.4	-401.2	-12.4	-530.7
1978	-32.9	-88.0	-422.6	-11.9	-555.4
1979	-43.9	-84.9	-412.7	-10.9	-552.4
1980	-7.6	-98.4	-503.2	-10.6	-619.9
1981	-91.2	-103.3	-519.5	-10.2	-724.2
1982	-88.9	-124.1	-520.4	-16.2	-749.6
1983	-76.5	-128.2	-531.0	-19.5	-755.1
1984	-112.1	-134.3	-503.5	-17.5	-767.3

Notes: (a) N/A means data were unavailable.

(b) Irrigation Operations and Maintenance (O+M) prorated on a per hectare and not per cubic meter basis, thus is biased against cereals.

(c) Prorated per hectare.

Consumer food subsidies are another major expenditure item in the public budget (Table 26).[58] Three commodities -- sugar, cereals and edible oils -- account for the bulk of the total consumer subsidy expenditure. The subsidy on dairy products (essentially milk and butter) was abolished in 1984. Sugar consumer prices yielded revenues on a year-to-year basis until 1974. In 1974, sugar, edible oil and cereal subsidization began in earnest and increased with growing consumption subject to variations due to world prices. It will be noted that from the total cereals subsidy bill are deducted the variable levy on imports and the parafiscal marketing tax, with only the net treasury outlays mentioned here. Most recently, with the decline in world wheat market prices, the Government of Morocco actually is drawing revenue (i.e. net flow is positive) from the import levy, though exact figures are not available.

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58 They are presented here for the purpose of comparison only. There is no direct evidence to suggest that agricultural producers either benefit directly from or are negatively affected by them.

TABLE 28: BUDGETARY EFFECTS OF PRICING POLICIES:
CONSUMER SUBSIDIES (million constant Dh, 1969=100)

YEAR	Sugar	Dairy Products	Edible Oils	Cereals (Flour)	TOTAL CONSUMER SUBSIDIES
1960	N/A	.0	.0	N/A	N/A
1961	-2.7	.0	.0	-6.7	-9.5
1962	16.9	.0	.0	-5.5	11.3
1963	-43.8	.0	.0	-2.2	-46.0
1964	-69.5	.0	.0	-8.0	-77.5
1965	31.6	.0	.0	-17.1	14.4
1966	6.7	.0	.0	-51.8	-45.2
1967	66.4	.0	.0	-32.6	33.8
1968	48.3	.0	.0	-24.1	24.2
1969	53.1	.0	.0	-13.5	39.6
1970	24.8	.0	.0	-19.6	25.2
1971	-45.2	.0	.0	20.9	-24.3
1972	-37.7	.0	.0	-11.4	-49.0
1973	-53.7	1.7	.0	-345.0	-397.0
1974	-312.6	4.8	-179.8	-153.5	-641.2
1975	-632.2	-9.5	-135.2	-156.2	-933.1
1976	-296.7	-9.9	-36.8	-135.3	-480.7
1977	-180.3	-17.0	-93.0	-93.0	-383.4
1978	-147.3	-28.7	-102.3	-3.2	-281.5
1979	-179.9	-28.9	-147.3	-35.0	-391.0
1980	-214.2	-30.8	-116.0	-186.8	-547.7
1981	-366.4	-43.1	-104.5	-268.6	-782.5
1982	-144.8	-62.9	-86.1	-396.0	-689.8
1983	-98.9	-39.8	-96.6	-319.7	-553.9
1984	-98.8	.0	-272.2	-436.7	-807.6

Notes: N/A means data were unavailable.
Consumer subsidies are presented net of variable import levy and marketing tax.

Budgetary data indicate that over the entire period in question, expenditures to agriculture in the form of recurrent costs and producer subsidies far exceeded revenues derived from the sector. In fact, agricultural revenues as a ratio of expenditures paid to agriculture declined dramatically over the 25-year period.[59] Explicit net expenditures represented 10-13 percent of agricultural GDP, 8 percent of total government revenue, and a significant proportion of the budget deficit from 1970 to 1984, as presented below.

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[59] Throughout the 1981-84 period, for instance, fertilizer subsidies to producers alone exceeded all tax receipts from agriculture.

TABLE 27: SUMMARY BUDGETARY EFFECTS OF PRICING POLICIES

(million constant Dh, 1980=100)

YEAR	TOTAL REVENUES FROM AGRICULTURE	TOTAL PRODUCER SUBSIDIES	NET REVENUES FROM AGRICULTURE	.....NET REVENUES AS SHARE OF.... Agricultural GDP	Total Government Revenues	Total Budget Deficit
1960	N/A	N/A	N/A	N/A	N/A	N/A
1961	N/A	N/A	N/A	N/A	N/A	N/A
1962	N/A	N/A	N/A	N/A	N/A	N/A
1963	N/A	N/A	N/A	N/A	N/A	N/A
1964	N/A	N/A	N/A	N/A	N/A	N/A
1965	N/A	N/A	N/A	N/A	N/A	N/A
1966	N/A	N/A	N/A	N/A	N/A	N/A
1967	N/A	N/A	N/A	N/A	N/A	N/A
1968	N/A	N/A	N/A	N/A	N/A	N/A
1969	N/A	N/A	N/A	N/A	N/A	N/A
1970	54.6	-388.4	-313.8	-8%	-6%	-62%
1971	61.7	-400.7	-339.0	-8%	-6%	-56%
1972	52.7	-402.7	-349.9	-8%	-6%	-42%
1973	45.0	-446.6	-401.6	-9%	-6%	-102%
1974	59.6	-487.7	-428.1	-8%	-7%	-44%
1975	46.0	-584.9	-538.9	-12%	-8%	-28%
1976	51.0	-577.0	-526.0	-10%	-9%	-12%
1977	52.6	-530.7	-478.2	-10%	-7%	-11%
1978	51.4	-555.4	-504.0	-9%	-7%	-17%
1979	60.7	-552.4	-491.8	-9%	-6%	-17%
1980	34.0	-619.9	-585.9	-10%	-7%	-18%
1981	34.9	-724.2	-689.3	-15%	-8%	-16%
1982	26.2	-749.6	-713.4	-12%	-8%	-18%
1983	1.8	-755.1	-753.3	-13%	-8%	-27%
1984	.0	-767.3	-767.3	-13%	N/A	N/A

Sources: Taken from Tables 24 and 25.
Note: N/A means data were unavailable.
A positive figure reflects revenue generated by the Government from the sector, whereas a negative figure reflects expenditures made in favor of the sector.

Transfer of Resources between Agriculture and the Rest of the Economy

In addition to explicit transfers in the form of investment and current expenditures that can be traced in the public accounts, an estimate was made of the hidden transfers resulting from production biases of the price intervention effects and is presented in Table 28.

Since 1960, Morocco has pursued a series of broad development plans which give the general orientation and orders of magnitudes of planned public investments. As with many countries however, each plan is implemented by a

series of annual capital investment (budget d'équipement) and current expenditure budgets (budget de fonctionnement) which revise and update the plan document. The annual budget is voted each year by the parliament in a Loi de Finance. Planned allocation of funds (crédits ouverts) are disbursed according to expenditure programs (programme d'emploi) prepared by each administrative service. The actual disbursement of funds against the allocated amounts (crédit d'engagement and then émission effective) follows control and approval of the expenditure. Public expenditure data thus needs to be interpreted with great care as the planned and actual allocations can differ significantly from each other from year to year.

The investment budget includes the capital investment and equipment costs of the irrigated perimeters. In addition, tertiary rural roads which are used exclusively by the agricultural sector are included in investment expenditures. The latter, however, do not account for important transfers to the sector. The recurrent expenditure budget to Agriculture and its annex services covers primarily staff salaries and operating expenses (supplies, communications, fuel, etc.). Irrigation operations and maintenance subsidies are also included in this line item. In the last 15 years, recurrent expenditures to agriculture have been fairly stable, representing between 5 and 7 percent of total recurrent expenditures. Other important expenditures to the agricultural sector are the fertilizer and credit subsidies. The former is paid directly to the fertilizer parastatal FERTIMA against the national phosphate company's payments to the treasury, and does not appear on the Stabilization Fund accounts.

TABLE 28: TRANSFERS OF RESOURCES BETWEEN AGRICULTURE AND THE REST OF THE ECONOMY (millions constant Sh, 1969=100) (a)

YEAR	TOTAL TRANSFERS TO AGRIC (b) (1)	...TRANSFERS OUT OF AGRICULTURE... EXPLICIT TRANSFERS OUT OF AGRIC (c) (2)	IMPLICIT TRANSFERS OUT OF AGRIC (d) (3)	TOTAL TRANSFERS OUT OF AGRICULTURE (4)=2+3	NET TRANSFERS OUT OF AGRICULTURE TOTAL (5)=4-1	As proportion of: Total GDP	Agric GDP
1969							
1970	-301.4	.0	301.3	301.3	-.2	0%	0%
1971	-288.7	.0	441.9	441.9	153.2	1%	8%
1972	-294.3	.0	582.5	582.5	288.1	2%	11%
1973	-379.7	.0	427.9	427.9	48.2	0%	2%
1974	-485.6	.0	376.8	376.8	-88.8	-0%	-2%
1975	-301.5	.0	220.1	220.1	-81.4	-1%	-3%
1976	-457.9	.0	87.1	87.1	-370.8	-3%	-12%
1977	-319.2	.0	159.8	159.8	-159.4	-1%	-4%
1978	-341.6	.0	366.9	366.9	25.3	0%	1%
1979	-300.3	54.6	465.8	520.4	220.1	1%	5%
1980	-449.9	81.7	805.6	787.3	337.4	2%	8%
1981	-381.8	82.7	705.2	819.0	437.1	2%	10%
1982	-459.1	46.0	1300.4	1346.4	888.2	4%	20%
1983	-650.2	30.6	1449.1	1479.8	829.5	4%	17%
1984	-478.5	46.0	967.6	988.5	305.0	1%	7%
1985	-803.0	32.0	374.6	406.6	-397.4	-1%	-7%
1986	-881.3	82.6	137.8	140.3	-741.0	-4%	-13%
1987	-740.6	82.4	81.9	164.3	-606.5	-2%	-11%
1988	-884.2	80.7	448.8	509.5	-324.7	-1%	-4%
1989	-727.1	34.0	965.5	999.5	272.4	1%	4%
1990	-488.8	34.4	282.2	327.1	-1466.7	-2%	-14%
1991	-1111.0	11.2	111.0	122.2	-1111.0	-4%	-22%
1992	-1130.1	1.8	265.2	267.1	-749.1	-2%	-13%
1993	-998.2	.0	276.2	276.2	-722.1	-2%	-12%

Notes: (a) A positive figure indicates a tax on or transfer out of the sector while a negative figure denotes a subsidy or transfer to the sector.
(b) Includes irrigation capital subsidies, irrigation operation and maintenance subsidies, tertiary roads, recurrent expenditures in the agricultural sector, and total producer subsidies.
(c) From Table ...
(d) "Implicit" transfers are changes in the producer surplus, calculated from Table 20 (output effects), and annex Tables V.1 and V.6 (prevailing domestic prices and total non-intervention prices at equilibrium exchange rate). See annex Table V.14 for derivation.

Table 28 indicates that from 1969 through 1975 when world commodity prices were high and domestic subsidies were low, resources were extracted from the agricultural sector. Until 1974, these represented as much as 4 percent of total GDP and 21 percent of agricultural GDP. The source of the bulk of this resource transfer came from losses in producer surplus resulting from the fact that the increases in world prices were not transmitted to domestic producers. After 1974, when domestic input subsidization began on a large scale in response to the world price rise, this trend was reversed with increasing transfers going to the sector by 1976. The transfers to the sector amounted to on average 3 percent of total GDP and about 16 percent of agricultural GDP. These transfers to the agricultural sector have been particularly important since 1981.

Bias in Government Investment and Expenditures

Estimates were also made to assess whether the share of public sector investments and recurrent expenditures made by the Government on behalf of the agricultural sector have reflected the contribution of the sector to total GDP. Agricultural GDP was corrected for all direct and indirect price interventions in order to derive what agricultural GDP would have been in the absence of intervention. The share of investments made on behalf of agriculture from 1970 to 1984 was compared with the share of non-intervention agricultural GDP relative to total GDP. When this government investment bias ratio (GIB) equals 1.00, no discernable bias in investment patterns is indicated, whereas when the ratio is greater than 1.00, a positive bias in favor of agriculture is shown and vice-versa. The share of recurrent expenditures going to agriculture can be evaluated in the same way. The results of these estimates are presented in Table 29 and the accompanying graph on the following pages.

The figures indicate that there was a steady decline in the share of Moroccan public investment programs going to agriculture throughout the 1970s. While the government investment bias ratio was 1.0 to 1.4 from 1970 to 1972, suggesting that agriculture benefitted from a larger than expected share of public investment resources, by 1980 the ratio was 0.68. However, as Morocco's stabilization and sectoral adjustment programs got underway, the negative investment bias had lessened, with GIB ratios of .9 in 1984. This was due to reductions in total investment, however, rather than increases in allocations to the agricultural sector. In fact, investments in agriculture were held fixed from 1982 to 1984.

On the other hand, there is a distinct rising trend over the fourteen-year period in the share of recurrent expenditures to agriculture

relative to total expenditures (see Table 29). Between 1970 and 1984, the government expenditure bias (GEB) increased steadily, from 0.20 to 0.37 in the early 1970s to 0.7 just ten years later. This is the direct result of increases in irrigation operation/ maintenance, fertilizer, and credit subsidies.

TABLE 29: GOVERNMENT INVESTMENT and EXPENDITURE BIAS (million constant Sh)

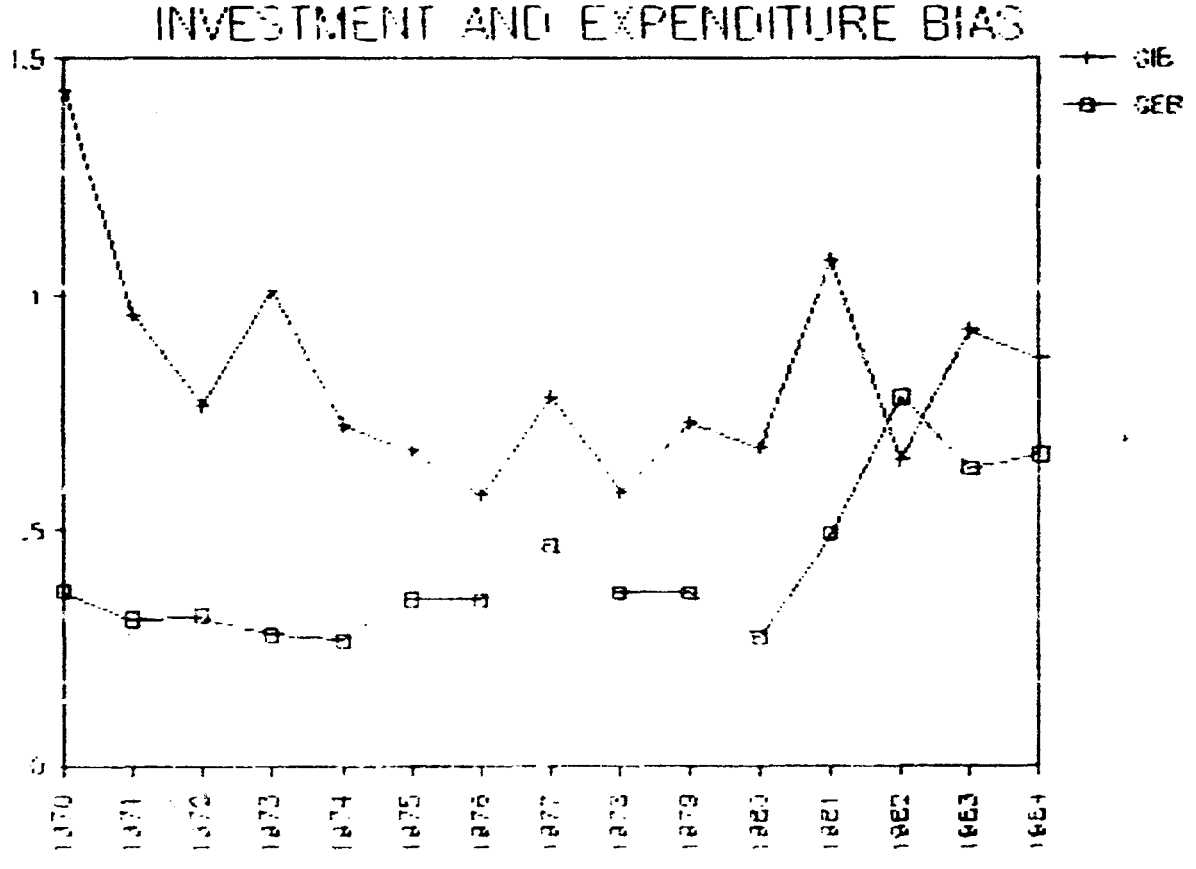
YEAR	TOTAL GDP (1)	AGRIC GDP with INTERVENTN (2)	NET TRANSFERS OUT OF AGRIC (3)	NON-INTERVENTN AGRIC GDP (4)=2-3	INVESTMENT EXPENDITURES TOTAL (5)	INVESTMENT EXPENDITURES AGRIC (6)	RECURRENT EXPENDITURES TOTAL (7)	RECURRENT EXPENDITURES AGRIC (8)	BIAS RATIOS CIB (9)	BIAS RATIOS CEB (10)
1960	12419	2909	0	2909		0	0	0		
1961	12118	2481	0	2481		301	N/A	0		
1962	13885	3188	188	3000		289	N/A	0		
1963	14788	3381	288	3093		283	N/A	2		
1964	14488	3385	0	3385		217	2341	188		
1965	14788	3489	0	3489		231	3075	140		
1966	14641	3384	-81	3472		288	N/A	4		
1967	15818	3577	-181	3758		288	N/A	3		
1968	17088	3874	-188	3914		215	N/A	4		
1969	18479	3972	38	3897		217	N/A	5		
1970	19880	3888	38	3878	1287	217	3489	188	1.48	.87
1971	20488	4448	487	4888	1048	288	3888	188	.78	.88
1972	20681	4447	487	4878	1388	178	3848	188	1.88	.88
1973	21678	4834	888	5481	1883	287	3978	282	.72	.87
1974	23889	4738	1888	5738	1888	281	4188	288	.88	.84
1975	24819	4488	888	4711	2887	288	4784	211	.57	.84
1976	27281	5388	-577	4878	4488	288	4829	388	.28	.48
1977	28884	4741	-741	4888	5712	814	4441	217	.88	.47
1978	28888	5898	-888	4881	4887	288	5827	211	.75	.87
1979	38888	5884	-888	5229	4182	888	5382	281	1.87	.88
1988	32227	6888	288	6853	3588	188	6886	287	.88	.88
1981	34715	6782	1888	5882	1124	178	6891	218	.88	.78
1982	33876	6118	-1388	4784	4482	488	7888	847	.88	.78
1983	34837	5881	-748	5187	2822	388	7882	782	.82	.88
1984	35481	5982	-722	5248	2851	385	6488	638	.87	.88

Notes: Column (1) equals column (1) from Table 28.
Column (2) equals columns (3) and (4) from Table 28.
Column (8) equals columns (3) and (4) from Table 28.

CIB (Government Investment Bias) = [(6)/(5)] / [(4)/(1)]

CEB (Government Expenditure Bias) = [(8)/(7)] / [(4)/(1)]

Graph Table 29



CHAPTER FIVE

IMPLICATIONS OF INTERVENTIONS FOR STABILITY AND GROWTH IN THE AGRICULTURAL SECTOR

The newly independent Moroccan Government inherited a dualistic society in which both urban and rural elites were well organized, each with special interests to appease if the Government was to remain in power. At the same time the Government of Morocco also inherited a dualistic agricultural sector in which different benefits were accorded to various interests in the rainfed and irrigated subsectors. While the Government has been relatively successful in overcoming obstacles in the political arena, it has not been as skillful in overcoming the dualist structure of the Moroccan agricultural sector and raising its productivity.

This final chapter first examines Morocco's record in achieving its objectives of stability of producer prices and consumption quantities. It then evaluates the implications for growth in the agricultural sector of unanticipated policy effects, inter alia the limited effectiveness of producer subsidies in the face of negative total price incentives and the changing patterns of consumer demand as a result of consumer subsidy policies on producer incentives.

Stability in the Agricultural Sector

Price Stability

Domestic and border price series were compared in order to evaluate the degree to which Moroccan policy makers have or have not effectively stabilized domestic producer and consumer prices vis-à-vis prices on the international markets. Three series of producer and consumer prices are compared: 1) the ratio of the prevailing domestic producer and consumer prices

to the unadjusted non-agricultural GDP deflator (P_P/P_{NA} and P_C/P_{NA}, taken from annex Table V.1), 2) the ratio of the border producer and consumer prices converted into Dirhams at the official exchange rate to the unadjusted non-agricultural GDP deflator (P'_P/P_{NA} and P'_C/P_{NA}, from annex Table V.3), and 3) the ratio of the border producer and consumer prices converted into Dirhams at the equilibrium exchange rate to the trade and foreign exchange policy-adjusted non-agricultural GDP deflator ($P'_P(E^*/E_O)/P_{NA}^*$ and $P'_C(E^*/E_O)/P_{NA}^*$, from annex Table V.6).[60]

Table 30 summarizes variances and Z statistics for eight commodities (soft wheat, hard wheat, barley, and sugar beet for producers; soft wheat flour, hard wheat flour, barley flour, and white sugar for consumers). Analysis of price variability over the entire study period may produce somewhat biased measures, given the surge in international prices during the commodity boom period (1973 to 1975). When the twenty-five year period is divided into pre-commodity boom (1960 to 1972) and post-commodity boom (1976 to 1984) periods, a sharp distinction in patterns of consumer price variability is noted.

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[60] Two measures of stability were calculated. The variance of the price series is a measure of the average distance of yearly price observations from the mean price observed. An alternative measure is the Z statistic which is a measure of the volatility of price changes from one year to the next, over time. For any price variable P, Z is calculated as

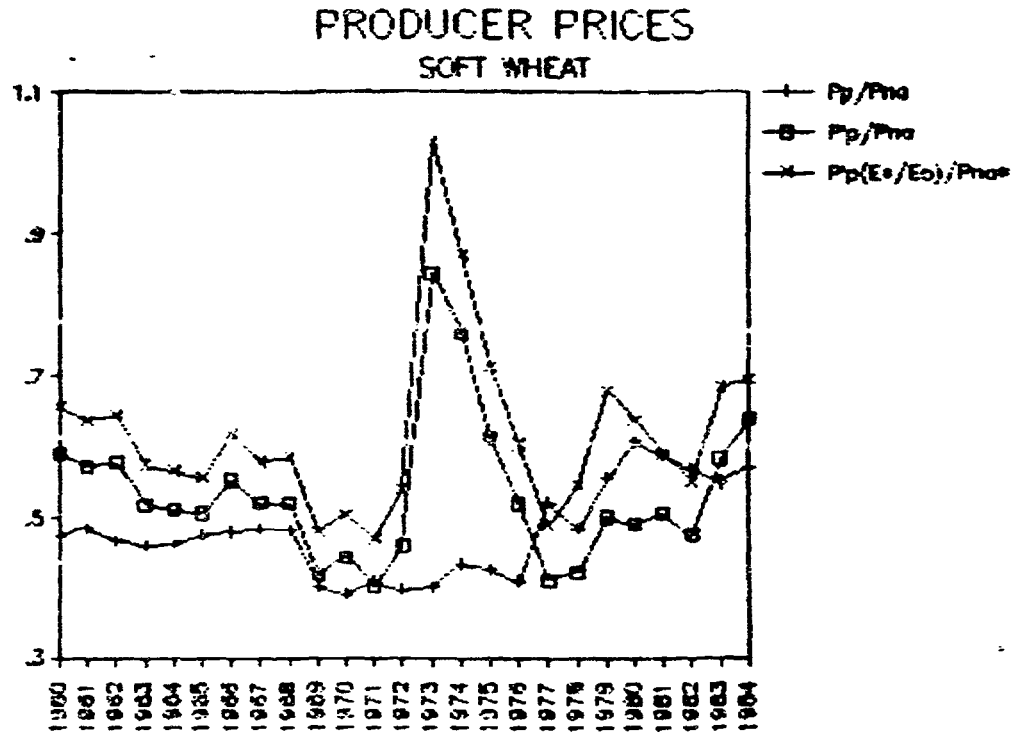
$$Z_x = \frac{(P_t - P_{t-1})^2}{N - 1}$$

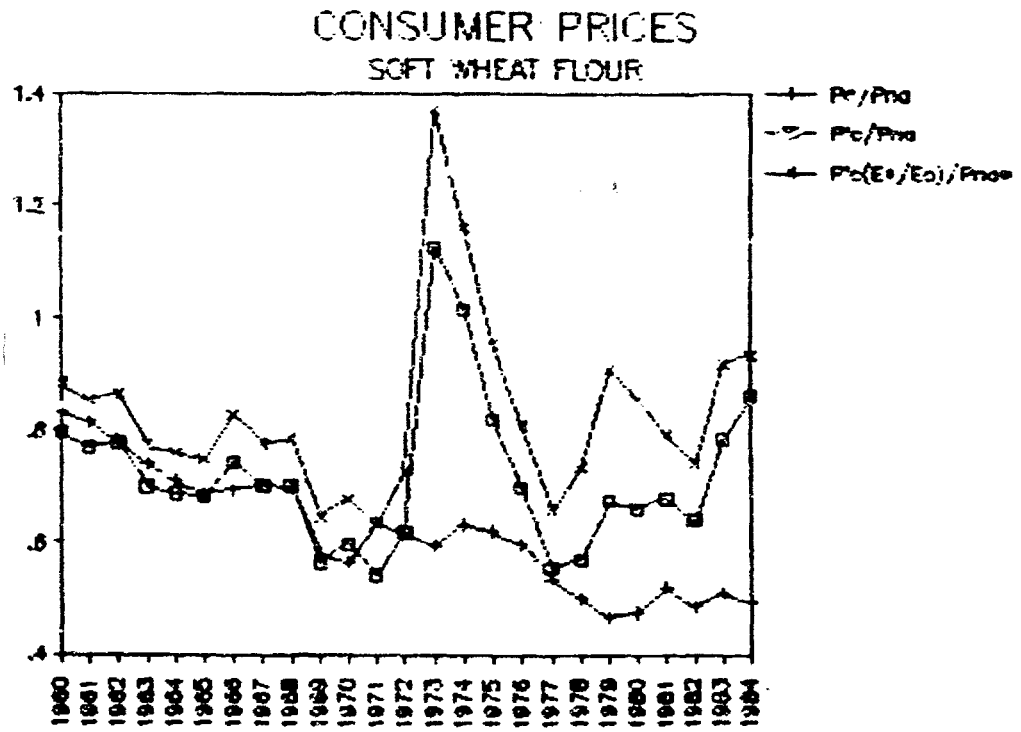
for the sum of t, from $(t_0 + 1)$ through $(t_0 + N)$, where t_0 equals the starting year of the sample period and N equals the number of observations.

TABLE 30: PRICE VARIABILITY ANALYSIS

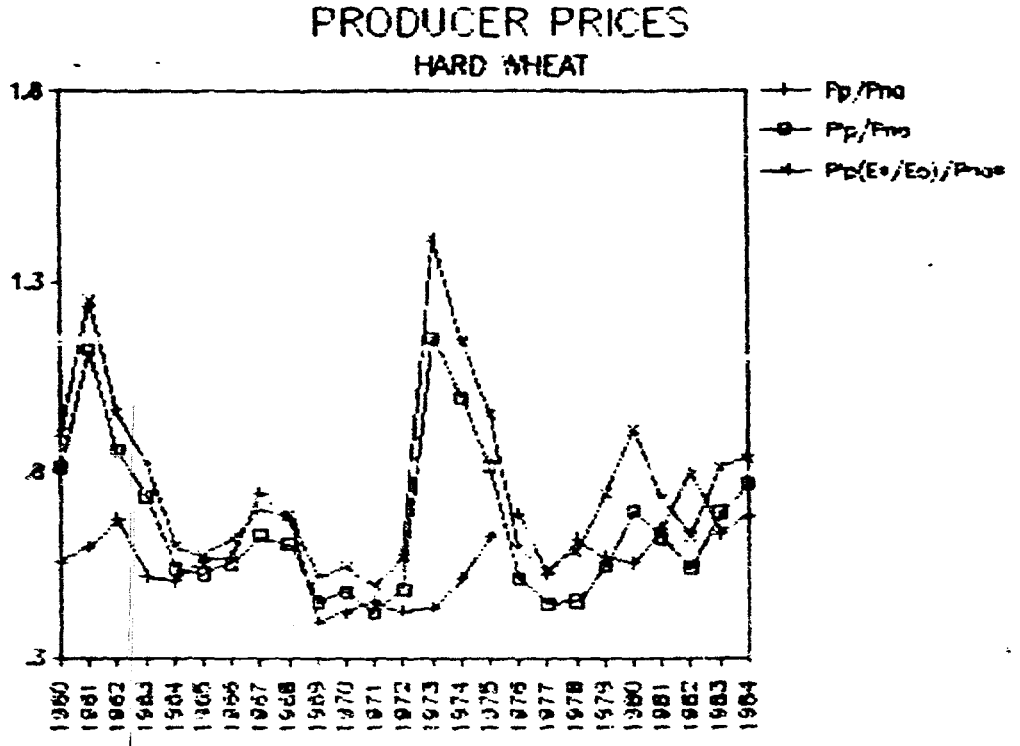
		VARIANCES			Z STATISTICS		
		P_P/P_{MA}	P^*_P/P_{MA}	$P^*_P(E^*/E_0)/P_{MA}$	P_P/P_{MA}	P^*_P/P_{MA}	$P^*_P(E^*/E_0)/P_{MA}$
		P_C/P_{MA}	P^*_C/P_{MA}	$P^*_C(E^*/E_0)/P_{MA}$	P_C/P_{MA}	P^*_C/P_{MA}	$P^*_C(E^*/E_0)/P_{MA}$
(1960-1984)	SOFT WHEAT	.00414	.01084	.01498	.00140	.00386	.01895
	HARD WHEAT	.00069	.04266	.05718	.01232	.04084	.06122
	BARLEY	.00976	.00730	.00911	.01388	.00838	.01257
	SUGAR BEET	.00004	.00815	.01134	.00038	.00863	.00878
	SOFT WHEAT FLOUR	.00194	.01362	.02386	.00182	.00840	.02988
	HARD WHEAT FLOUR	.00085	.00912	.04516	.00088	.00838	.10389
	BARLEY FLOUR	.00806	.01498	.01886	.00442	.01578	.02259
	WHITE SUGAR	.18890	.41244	.57094	.00286	.34871	.46143
(1960-1972)	SOFT WHEAT	.00137	.00871	.00982	.00078	.00211	.00255
	HARD WHEAT	.01136	.00994	.04782	.01302	.00982	.02435
	BARLEY	.01077	.00515	.00724	.01548	.00825	.00949
	SUGAR BEET	.00006	.00104	.00129	.00002	.00113	.00142
	SOFT WHEAT FLOUR	.00869	[illegible]61	.00645	.00221	.00474	.00449
	HARD WHEAT FLOUR	.02202	[illegible]428	.07888	.02429	.04287	.05305
	BARLEY FLOUR	[illegible]	[illegible]	[illegible]	.00935	.01281	.01423
	WHITE SUGAR	.12027	.08293	.07382	.04386	.04060	[illegible]
(1976-1984)	SOFT WHEAT	.00866	.00518	.00809	.00288	.00535	.00885
	HARD WHEAT	.00683	.01276	.01683	.01233	.00046	.00291
	BARLEY	.00805	.00961	.01221	.01584	.00887	.02795
	SUGAR BEET	.00001	.01004	.01346	.00008	.01272	.01889
	SOFT WHEAT FLOUR	.00158	.00918	.00835	.00139	.00482	.01496
	HARD WHEAT FLOUR	.01238	.02118	.02744	.02242	.03865	.05383
	BARLEY FLOUR	.01548	.01981	.02178	.03910	.02010	.03753
	WHITE SUGAR	.02249	.50485	.67718	.01247	.65877	.98064

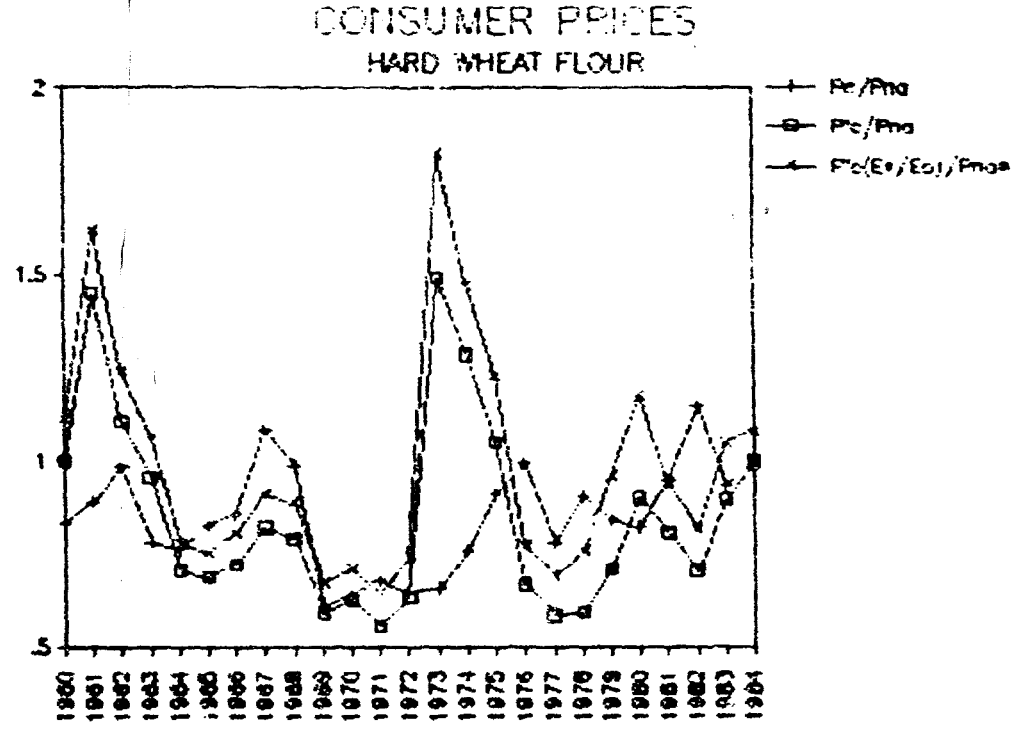
Graphs Table 30 - Soft Wheat



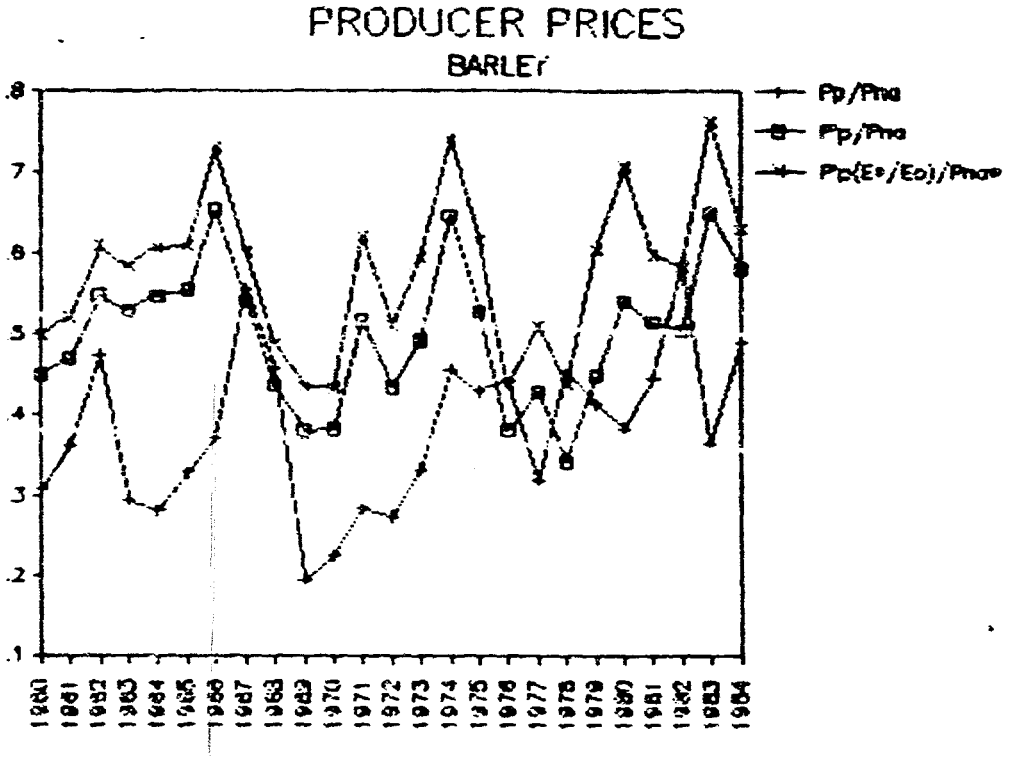


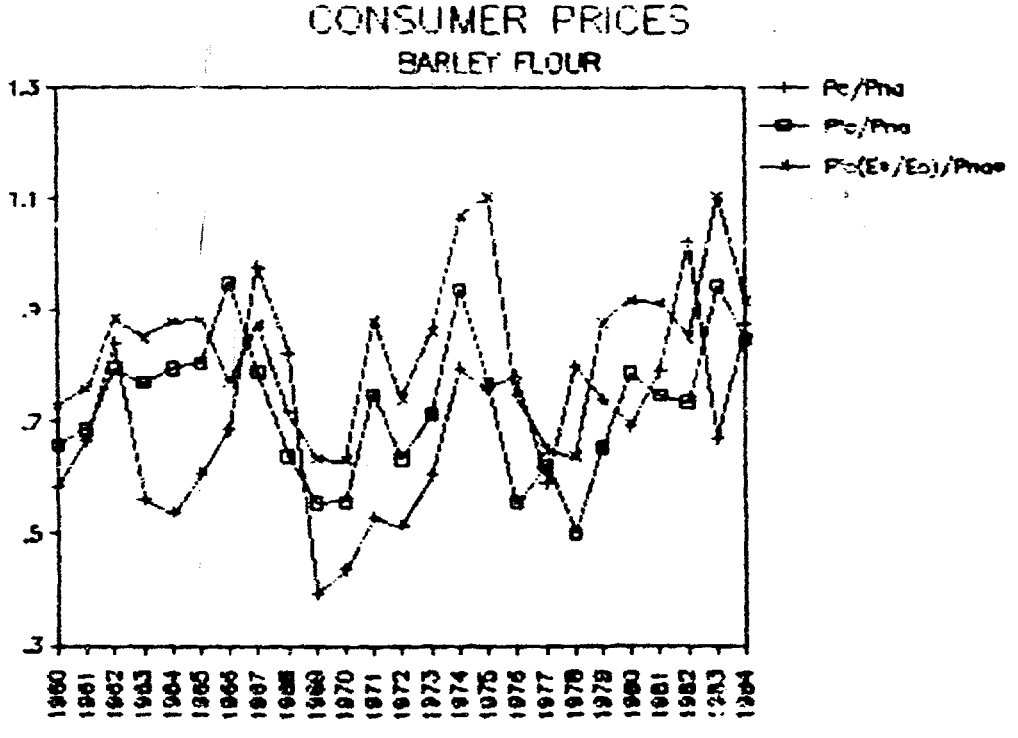
Graphs Table 30 - Hard Wheat



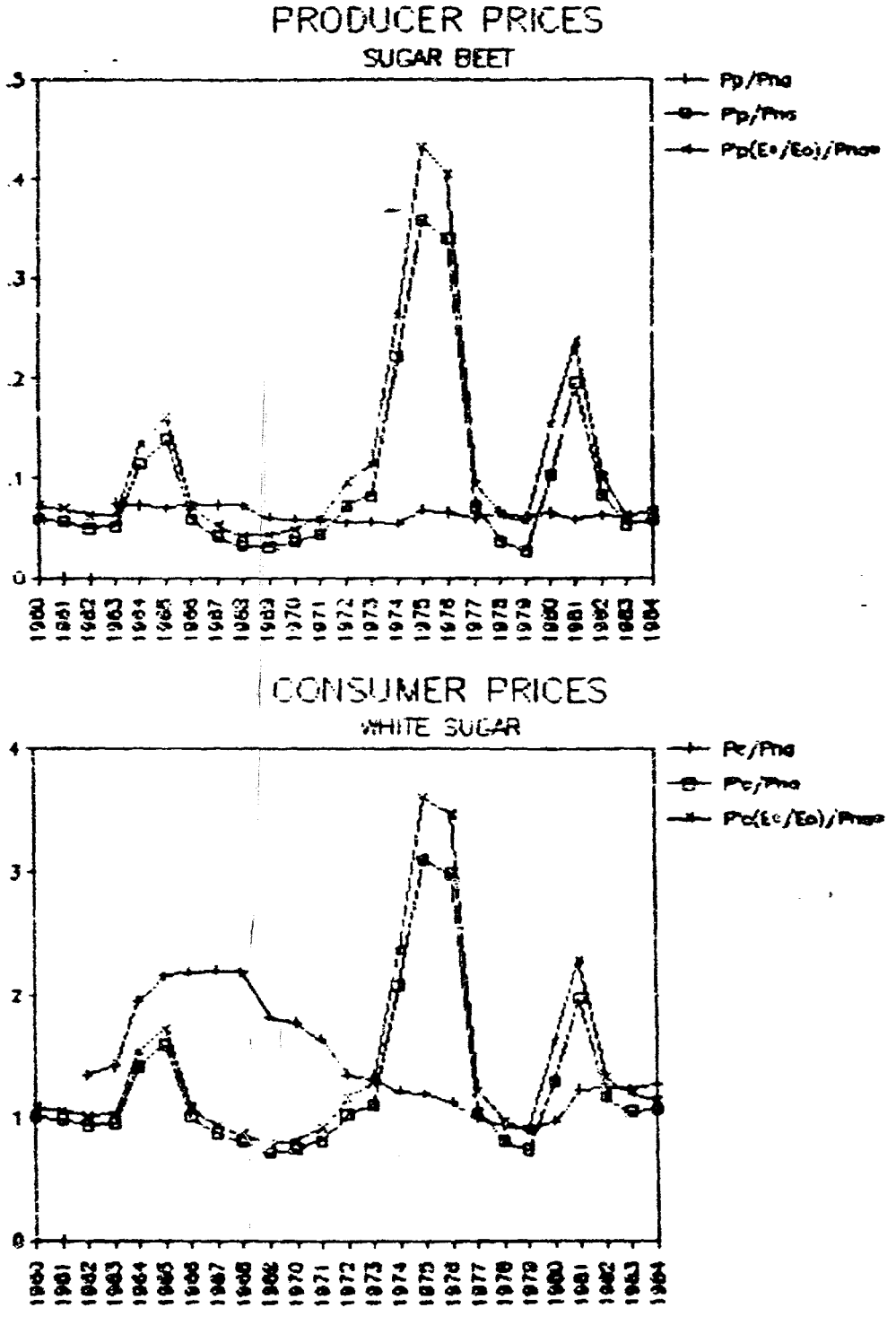


Graphs Table 30 - Barley





Graphs Table 30 - Sugar



In the pre-boom period (1960 to 1972), the prevailing consumer price series for soft wheat flour, barley flour, and white sugar are somewhat more variable than their border price series (domestic price variances are greater than international price variances), converted into Dirhams at both the official and equilibrium exchange rates. Producer prices during the early period, on the other hand, were more variable on the international market than on the domestic market, except in the case of barley. This is somewhat surprising given that export bans were not in effect until after 1970. One would expect the use of trade policy from 1960 to 1970 to result in more stable domestic producer prices.

The observations in the pre-boom period are in sharp contrast to those from the post-boom period (1976 to 1984), when greater stability of both domestic producer and consumer prices with respect to international prices was achieved. Thus Morocco can be said to have achieved its objective of domestic price stability in the face of instable international commodity markets since the commodity boom of the early 1970s.

Output and Consumption Stability

In addition to minimizing the transmission to the domestic economy of exogenous price instability, the Government of Morocco also sought to mitigate the effects of domestic output variability on the quantities of key commodities available to consumers. This can be achieved either indirectly through the use of trade policy or directly through domestic price policy. For example, in the case of a domestic production shortfall, Moroccan policy makers may choose 1) to increase imports in order to maintain domestic consumer price stability, 2) to allow the domestic price to rise, or 3) to introduce some form of rationing

to allocate scarce supply.[61] Consumers, of course, have other recourses than simply to purchase commodity X at a higher price. If substitutes exist, consumers can switch to other goods. In Morocco substitutions are regularly made between hard and soft wheat flours and, to a lesser extent, hard wheat and barley flours. However, chapter 4 indicates that cross-price demand elasticities among cereal flours in Morocco range from only 0.02 to 0.06 percent. For refined sugar, there is no other commercially available substitute.

It should also be noted that an emphasis on domestic consumer price stability will not necessarily benefit producers. In fact, unless the government can effectively delink domestic producer and consumer grain markets, the effect of consumer price management may well be a decrease in producer welfare. For example, in order to maintain low prices for consumers, an increase in imports in response to a domestic production shortfall may decrease producer prices and thus have a negative effect on total producer income.

Output per capita (Q_D/L), consumption per capita (Q_S/L), and the prevailing domestic consumer price ratio, P_C/P_{NA}, were compared in order to assess the degree to which consumption stability was achieved by policy intervention in spite of output variability. Analysis of correlation coefficients, presented in Table 32, measures the degree to which 1) output and consumption per capita, and 2) consumption per capita and the prevailing domestic consumer price ratio, tracked each other.

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61 However, unless the parallel consumer market comprises a minor percentage of total transactions (which is not the case in the Moroccan grain market, except for soft wheat flour), a rationing policy will not prevent consumer prices on the parallel market from rising even if the stated policy is to maintain stability in the official market price of the rationed commodity to consumers.

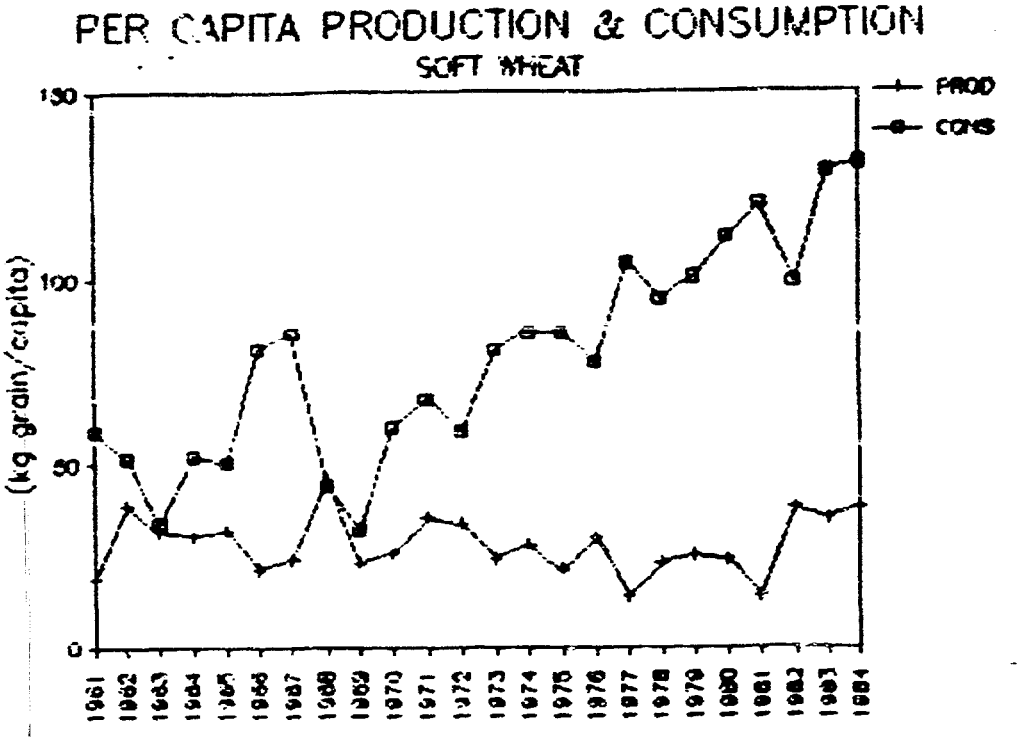
TABLE 31: PER CAPITA PRODUCTION & CONSUMPTION QUANTITIES AND PREVAILING DOMESTIC CONSUMER PRICE RATIO

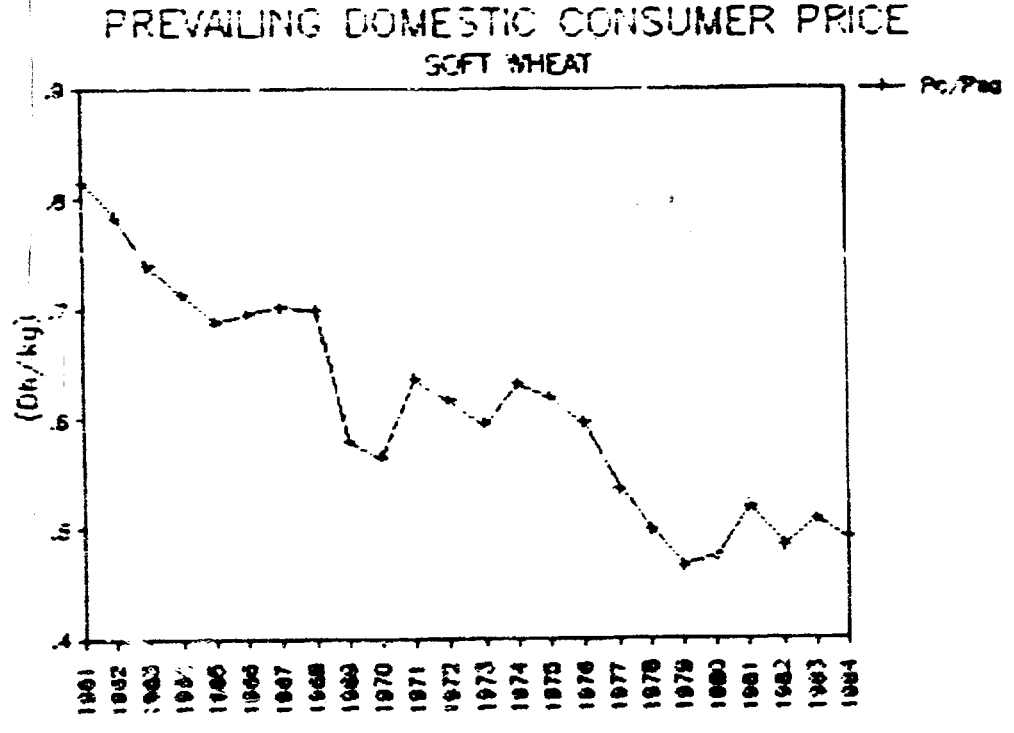
YEAR	HARD WHEAT PROD	HARD WHEAT CONS	HARD WHEAT CONS PRICE	SOFT WHEAT PROD	SOFT WHEAT CONS	SOFT WHEAT CONS PRICE	TOTAL WHEAT PROD	TOTAL WHEAT CONS	BARLEY PROD	BARLEY CONS	BARLEY CONS PRICE	SUGAR PROD	SUGAR CONS	SUGAR CONS PRICE
1961	52.6	42.4	.80	18.8	58.8	.82	71.5	101.6	56.4	37.4	.67			
1962	109.9	88.2	.98	38.8	51.3	.78	148.7	139.5	132.0	71.8	.54			
1963	92.0	76.2	.78	31.8	38.9	.74	123.8	112.1	139.9	63.4	.55	.6	21.9	1.42
1964	98.2	75.9	.76	30.7	59.2	.71	119.9	135.1	134.2	82.2	.54	1.9	25.7	1.98
1965	104.3	88.7	.82	25.1	80.2	.68	126.5	138.9	128.5	82.3	.61	1.8	26.9	2.15
1966	82.7	85.3	.85	21.3	80.7	.70	84.0	127.0	81.5	72.9	.69	3.7	28.7	2.38
1967	86.0	71.3	1.08	24.0	85.3	.70	109.0	135.6	108.8	46.4	.68	4.1	24.6	2.20
1968	138.0	113.9	.98	46.5	44.1	.70	178.5	157.1	224.7	95.9	.82	8.3	25.2	2.19
1969	77.3	85.7	.80	28.2	32.1	.88	100.5	97.8	139.5	82.8	.59	8.3	27.3	1.82
1970	84.7	80.7	.85	26.6	59.8	.87	120.3	140.6	130.5	88.7	.44	10.4	25.4	1.77
1971	106.8	97.1	.88	35.6	67.4	.84	142.3	158.3	167.2	71.3	.88	14.1	28.1	1.64
1972	103.9	86.3	.84	33.7	59.8	.82	137.6	147.1	157.0	88.2	.71	14.8	24.5	1.38
1973	72.5	81.6	.88	24.0	80.7	.88	96.5	142.3	77.0	88.3	.61	12.5	29.8	1.32
1974	82.1	86.8	.78	28.2	86.4	.88	110.3	155.2	142.1	65.0	.80	15.1	32.0	1.22
1975	88.6	81.6	.91	21.4	86.5	.82	91.0	147.6	91.6	39.3	.78	14.6	28.1	1.19
1976	92.7	83.0	.98	30.1	77.4	.88	122.8	160.4	160.4	48.2	.78	17.1	30.6	1.18
1977	86.4	80.1	.78	13.7	104.1	.84	76.2	184.2	78.3	82.3	.89	11.7	29.5	1.00
1978	76.2	84.8	.98	28.1	94.4	.80	99.3	188.2	128.0	82.6	.80	18.2	32.2	.94
1979	87.1	87.1	.84	35.2	100.3	.46	82.3	187.4	96.9	41.4	.74	18.0	29.6	.90
1980	68.4	80.4	.82	23.0	111.2	.47	90.3	171.6	110.2	49.9	.69	16.6	31.2	.88
1981	20.5	27.0	.64	13.7	120.3	.82	42.2	147.3	80.3	27.3	.78	16.5	29.3	1.28
1982	88.9	88.5	1.15	38.1	98.8	.48	126.3	187.3	114.3	48.8	1.02	17.7	29.7	1.28
1983	59.6	80.6	.98	35.2	129.0	.51	94.8	178.6	84.0	28.3	.67	20.1	31.5	1.24
1984	84.9	46.6	1.00	38.3	130.9	.48	48.2	177.4	48.9	30.9	.98	19.2	32.4	1.27
MEANS 1960-84		79.4	88.0		29.2	78.6		107.6	146.8	114.2	48.1		12.1	28.3
1960-72		92.5	78.4		30.1	56.2		122.6	134.6	131.3	55.6		6.8	25.7
1976-84		83.5	55.3		25.8	107.4		90.3	162.7	94.8	41.8		17.3	30.6
VARIANCES 1960-84		514.4	350.5		55.5	813.8		836.2	451.7	1614.6	261.6		24.2	6.2
1960-72		473.7	330.7		61.2	283.7		857.4	486.7	2196.3	322.8		28.4	9.2
1976-84		294.5	227.9		88.7	299.5		508.6	120.9	1286.2	204.2		5.7	1.5
Z-STATS 1960-84		843.1	580.5		134.4	335.4		1614.2	488.0	3674.6	804.3		7.5	5.1
1960-72		7197.8	792.7		164.4	439.4		2214.9	874.4	3855.[illegible]	[illegible]		5.2	5.3
1976-84		695.6	508.4		154.4	345.4		1448.0	208.9	3108.2	492.8		11.7	3.3

Sources: Figures drived from production series (Tables 5 and 7), consumption series (Table 22), and population (Table 1). For derivation of prevailing domestic consumer prices, see annex Table V.1.

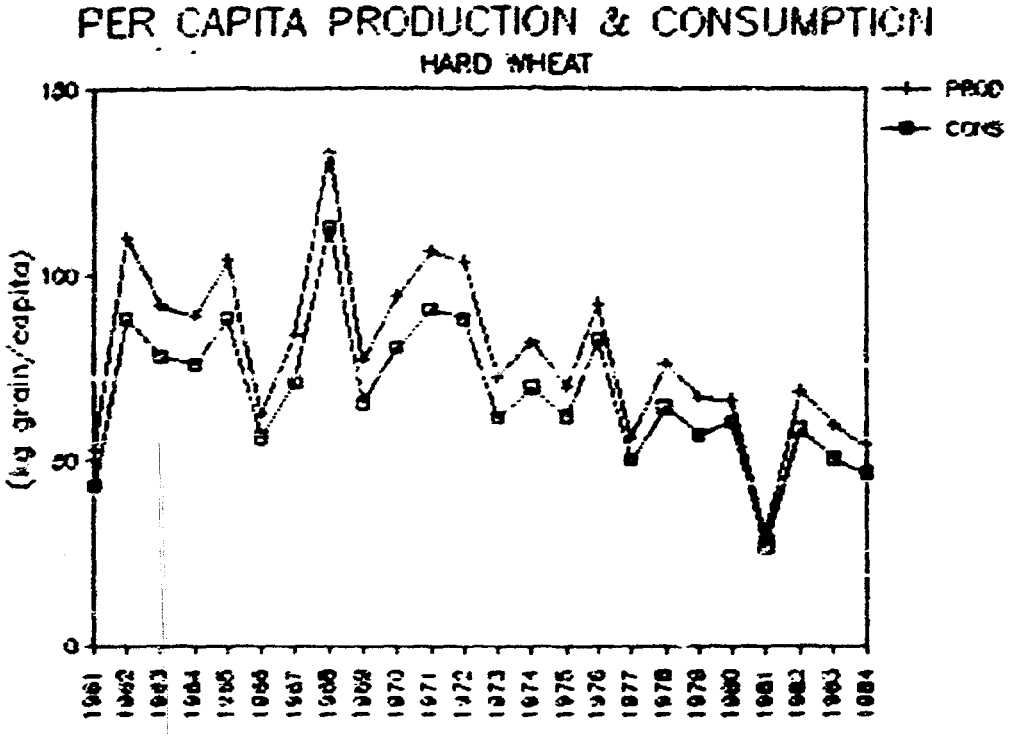
Notes: Cereals quantities are kg of grain (produced, consumed) per capita. Sugar quantities are kg refined sugar per capita. Prices are real (Dirhams/kilogram, 1980=100.

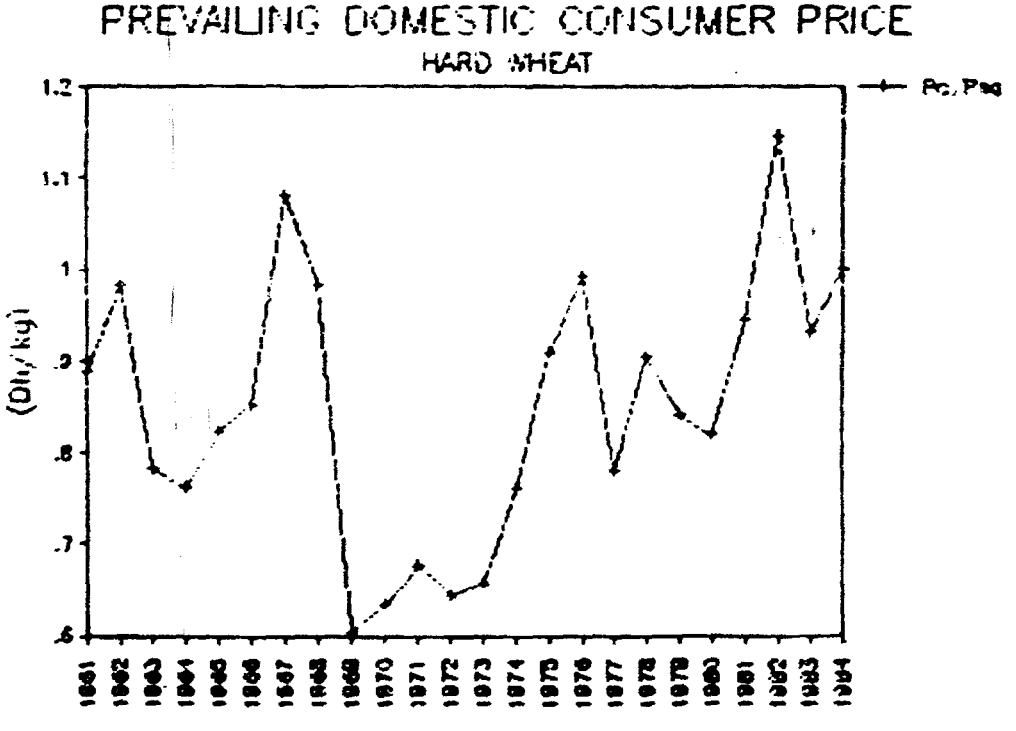
Graphs Table 31 - Soft Wheat



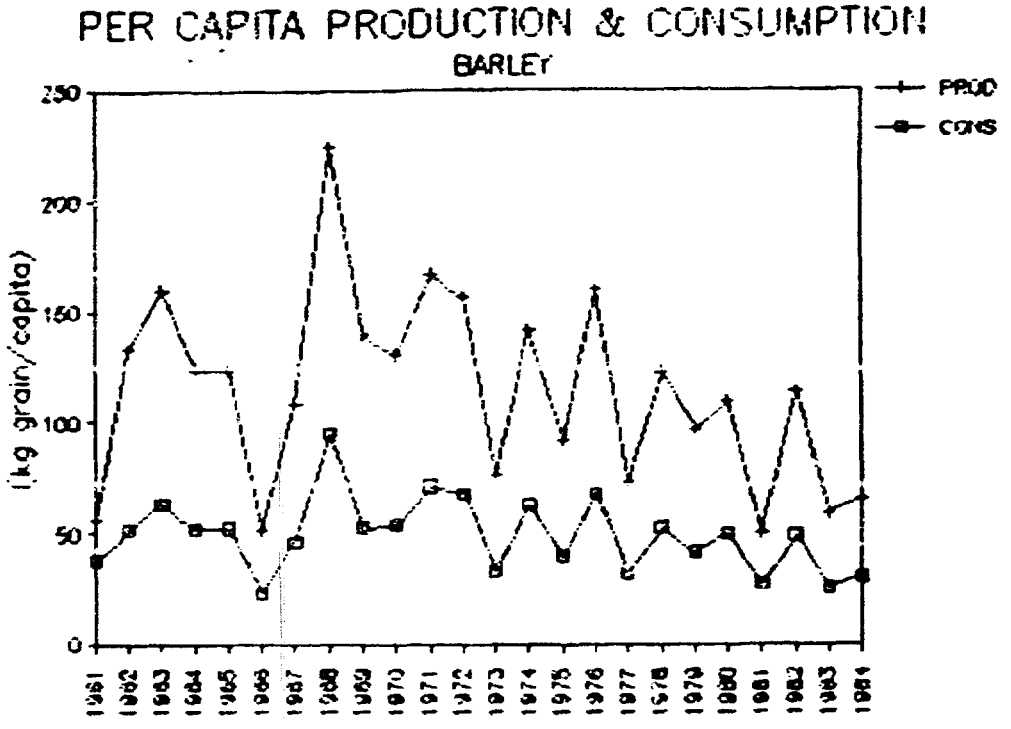


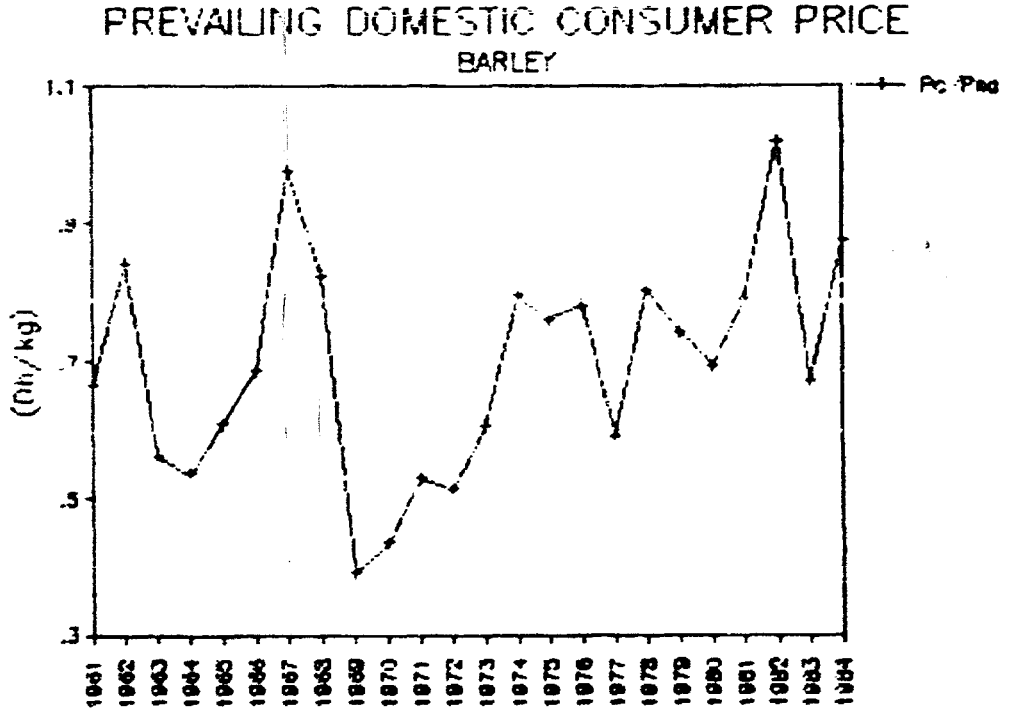
Graphs Table 31 - Hard Wheat





Graphs Table 31 - Barley

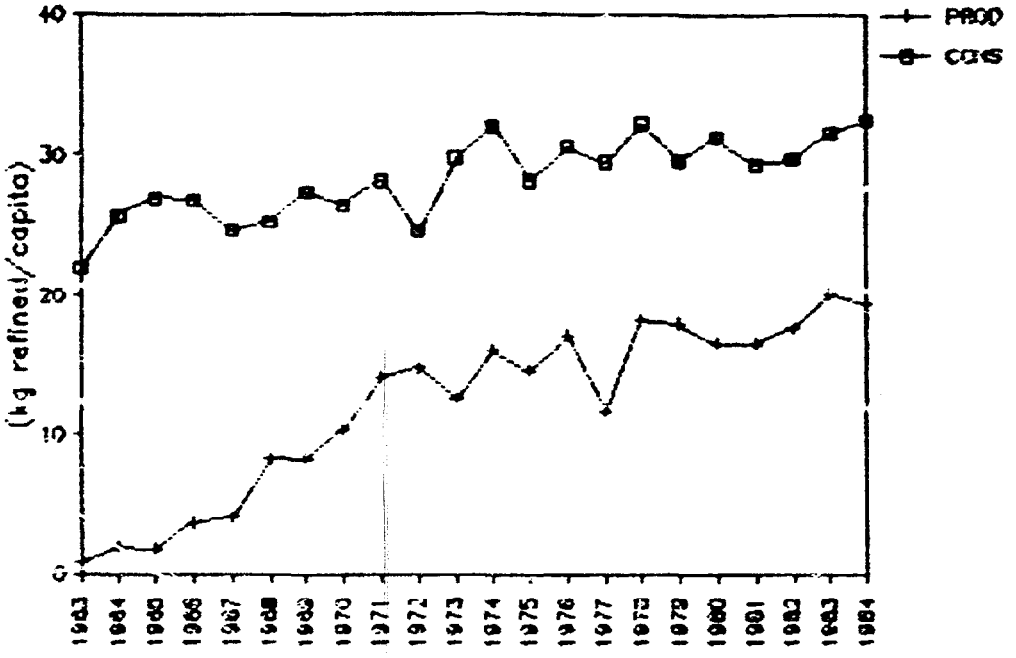




Graphs Table 31 - Sugar

PER CAPITA PRODUCTION & CONSUMPTION

SUGAR



PREVAILING DOMESTIC CONSUMER PRICE

SUGAR

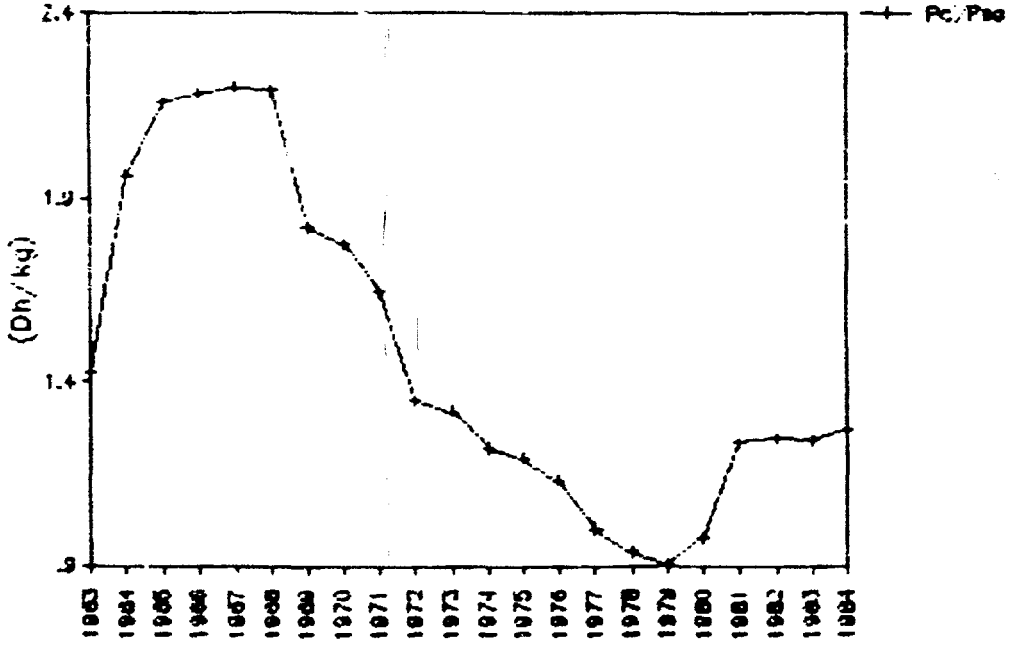


TABLE 32: CORRELATION ANALYSIS OF PER CAPITA PRODUCTION, CONSUMPTION, AND IMPORTS AND PREVAILING DOMESTIC CONSUMER PRICES

X : Y	HARD WHEAT	SOFT WHEAT	TOTAL WHEAT	BARLEY	SUGAR
Q_S/L : Q_D/L	.995	-.231	.026	.982	.702
$_S/L$: Q_M/L			-.758		
Q_D/L : P_C/P_{WA}	-.172	-.724		-.086	-.651

Notes: Q_S/L = quantity supplied per capita
Q_D/L = quantity demanded per capita
Q_M/L = quantity imported per capita
P_C/P_{WA} = prevailing domestic consumer price ratio

Analysis of correlation coefficients indicates almost perfect positive correlation between output and consumption per capita of hard wheat and barley. This is not surprising given the minimal role which trade policy has played with regard to demand management of these two crops. Sugar per capita production and consumption patterns are somewhat less positively correlated, resulting from the fact that the production series virtually starts from zero at the beginning of the period, while imports (and thus total availability for consumption) existed from the beginning of the period. In the case of soft wheat, however, there is a weak negative correlation between the two quantity

series.[62] In years of production decline, consumption has actually increased. This indicates that soft wheat trade policy has not been managed with consumption expansion, rather than stability, in mind. Thus, while not articulated as a specific strategy of Moroccan policy making, it would appear that management of demand via consumption stability (sugar, hard wheat, barley) or even expansion (soft wheat) has been achieved by the Moroccan Government.

The rise in soft wheat consumption is explained by the fact that policy makers in Morocco have attempted not to expand per capita soft wheat consumption per se but rather to replace soft wheat for hard wheat consumption. As explained earlier, soft wheat is cheaper on the international market and of late has been available to Morocco at extremely favorable prices under concessional trade arrangements with France and particularly with the United States. Thus, it may be more informative to consider output and consumption of hard and soft wheat together. Combined figures indicate a steady increase in per capita wheat consumption over the entire study period of 1.7 percent per year, while total wheat production stagnated.[63]

The sign of the correlation coefficients between quantity consumed per capita and the real domestic consumer price is negative, as expected. Also as

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[62] In order to test the possibility that import policy may be implemented with a lag, a correlation coefficient was also estimated between production per capita in time t and consumption per capita in time t+1. The hypothesis is that the introduction of a one-year lag in the consumption per capita series would correct the negative correlation between production and consumption. The coefficient thus re-estimated is -.218, or still negative and only slightly less than the original coefficient of -.231.

[63] In 1985 and 1986 record cereals harvests were achieved at levels which were 36 and 98 percent, respectively for each year, above their average level from 1961 to 1984. It is too early to say to what extent the abundant rains and the increasingly positive producer pricing policy environment each contributed to these results.

expected, the relationship is particularly strong for soft wheat (-.724) and sugar (-.651), the two commodities in whose consumer pricing the government most actively intervenes.

Growth in the Agricultural Sector

Despite the articulation of a number of pro-agricultural sector policy objectives and the fact that producer prices, particularly since the mid-1970s, have been quite stable relative to prices on international markets, the agricultural sector in general and the cereals and sugar subsectors in particular have not performed well.

All measures of agricultural sector prosperity in Morocco turn a corner during the 1973 to 1975 period. As will be recalled from chapter 2, three factors stand out as catalysts. First, there were the attempted coups d'etat of 1971 and 1972, which threatened the viability of the Government. Certain groups in Moroccan society, particularly urban workers, university students, and the opposition political parties instituted to represent them, grew increasingly vocal in their demands for new entitlements.[64] Second, the phosphate boom occurred almost immediately thereafter in 1973, providing a new injection of public financial resources. Third, external sources of financing became increasingly available from an international banking community flooded with petrodollars and seeking credit-worthy nations, such as the phosphate-rich Morocco, to whom to recycle its liquidity. The combination of rising demand for public investment and expenditure programs and newly available sources of funding

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64 See A. K. Sen, Poverty and Famines: An Essay on Entitlement and Deprivation (Oxford: Oxford University Press, 1981), for his discussion of the various means through which an individual can command the right to food.

led to the inauguration of subsidies to consumers of strategic agricultural commodities, among which were soft wheat flour and granulated sugar.

The Emergence of Unanticipated Effects

Yet, as has been seen, the unanticipated economic effect of the politically-motivated consumer subsidy policy has been to raise demand for subsidized commodities beyond domestic production levels. Increased agricultural imports have been the result, and an increasingly overvalued official exchange rate was maintained to help "pay" for them (Table 17).[65] Also, Morocco's debt burden escalated rapidly, both overall and in terms of its composition in favor

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65 The allocation of ever greater resources to a program of consumer subsidies can result in the demand for imported food growing increasingly inelastic over time, as the affected commodities comprise an increasingly important share of the total household food bill. Thus, in time a reduction in subsidies, particularly for key agricultural commodities, will have a limited effect on the food import bill. For a discussion of a similar case in Egypt, see Grant Scobie, Food Subsidies in Egypt: Their Impact on Foreign Exchange and Trade, Research Report No. 40 (Washington: International Food Policy Research Institute, 1983).

of foreign creditors.[66] In an effort to stem the tide of rising imports, a program of improved producer incentives had to be instituted to try to induce increased domestic output. Yet that has not been forthcoming. Why?

Reasons for the poor performance of key agricultural commodities (soft wheat, sugar) in spite of positive producer incentives in the post-phosphate boom are several. While aggregate transfers may have been in favor of the sector, these input subsidies only benefitted a subset of producers. Total output price interventions, affecting all producers, were negative, on the other hand, for

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[66] Morocco's total outstanding debt increased five-fold from 1974 to 1983, measured in constant Dirhams. In 1974 the debt burden was split 60-40 between foreign and domestic creditors; by 1983, those shares had become 80-20. Over that period, the composition of debt outstanding among foreign creditors shifted as follows:

Year	International Development Institutions	Foreign Governments	Foreign Bank Loans/Advances	Supplier Credits	Other Foreign
1974	5.9%	86.4%	2.3%	2.7%	1.8%
1975	8.8%	82.0%	7.7%	1.5%	.0%
1976	6.4%	59.6%	30.6%	1.0%	2.4%
1977	6.9%	55.4%	26.5%	4.3%	7.0%
1978	8.8%	51.6%	30.0%	3.8%	5.8%
1979	9.7%	48.4%	32.2%	3.2%	6.5%
1980	8.6%	55.3%	28.6%	1.1%	6.4%
1981	6.5%	59.8%	22.1%	.6%	11.0%
1982	10.8%	60.3%	27.8%	1.0%	.1%
1983	12.5%	54.4%	28.8%	.6%	3.6%

Source: International Monetary Fund, Government Financial Statistics, 1985

The importance of foreign bank loans and advances rose from an insignificant proportion in 1973 to account for nearly one-third of the total foreign debt portfolio. The share of financing originating from international development institutions rose as well, but by a much smaller amount.

most of the post-boom period. Furthermore, climate remains a key variable regulating output levels, despite investments in irrigation.[67]

There is also some indication that producer incentives have not been designed to make the most efficient use of government resources. Certain commodities and production techniques have been supported which were not in line with Moroccan agricultural comparative advantage. For example, it would appear from a comparison of soft wheat and hard wheat domestic resource coefficients that Morocco has no demonstrated comparative advantage in the production of the former. Yet the official producer pricing system only guarantees an official purchase price for soft wheat. Comparative advantage in sugar beet production in Morocco is penalized by inefficient milling and refining costs which results in domestic resource cost coefficients for sugar which are greater than 1.00.

Perhaps most importantly, though consumer and producer markets are usually thought of as distinct, most governments, and Morocco is no exception, cannot afford the resources to adequately sever the two. In the absence of total market separation, subsidies to consumers can have a negative effect on producer price incentives. In Morocco, the consumer subsidy on soft wheat flour may increase demand for soft wheat and at the same time reduce demand for its more expensive substitute, hard wheat, at least among urban consumers. The reduction in demand for hard wheat may result in a lower parallel market producer price, which the financially strapped cereals marketing office may no longer be able to defend.[68]

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[67] See World Bank, "Simulation of the Moroccan Grain Markets: An Econometric Dynamic Model," in Agricultural Prices and Incentives Study.

[68] This has received little attention in Morocco. The aggregate parallel market price data presented in this paper are generally above the official prix de soutien. A more disaggregated analysis by producing region would be required to test this hypothesis.

This in turn would have a depressive effect on hard wheat production which would serve to exacerbate the problem of inadequate cereals supply and push up further the cereals import bill.

Thus, while unanticipated by the Moroccan Government in the mid-1970s as it sought to placate the demands of certain dissatisfied groups in the urban society by subsidizing a basket of their key consumer goods, a chain of economic events was set in motion. As food prices eased on the international market by 1975, thus potentially lowering the value of Morocco's food import bill, so, too, did Morocco's phosphate export revenues fall off. Yet the quantities imported (particularly cereals) continued to rise. By 1981, the need for debt rescheduling, stand-by financing arrangements and structural adjustments had imposed themselves on the Moroccan economy, and thus on its polity as well.

Implications for Political Stability

Since the turmoil of the early 1970s, efforts have also been made to assure solidarity of the urban masses. While these groups have been successfully

excluded from effective participation in the elites' alliance system, efforts have been made to keep them from provoking upheavals and pronouncing demands that could upset the fragile balance kept between the urban and the local bourgeoisie. This has translated into a steadily increasing subsidy to consumers of food and other basic goods. Yet this in turn draws heavily on the state's budget, calling into question the long-term viability of the strategy.

Investments in agriculture have primarily been made in areas where traditional social structures had already been affected by the colonial system. This may explain why Morocco's investment policy has mainly benefitted the modern, irrigated sector and neglected the traditional, rainfed sector. Irrigation projects have mostly benefitted modern, large-scale farms, once almost exclusively owned by Europeans, but increasingly Moroccanized since independence. Investments in this sector have benefitted wealthy, influential farmers who, in turn, could assure their loyalty to the political system.

While the Moroccan Government has been reluctant to interfere with traditional social structures in rural areas, it has also recognized the political importance of distributing land to landless rural workers in part in an attempt to stem the tide of rural-to-urban migration. In addition to the Moroccanization of industry, the distribution of land acquired from European settlers was also stepped up in the mid-1970s. King Hassan II, the largest landowner in the country, made available some 6,000 hectares (an estimated 15 percent) of his own land for redistribution. Nevertheless, transfer of land by legislation only accounted for a small fraction of the formerly European-owned properties. At least two-thirds of the estates were sold to wealthy Moroccans outside the official regulations. While different urban-based parties have repeatedly argued for the redistribution of privately owned large properties,

organizations such as the Moroccan Farmers Union have successfully prevented the Government from proceeding with such actions.

The consequence of Morocco's agricultural policy, favoring modern, large-scale farmers, has been to increase the disparities between rich and poor in rural areas. While modern production techniques and input subsidies have benefitted the modern, large-scale producer, numerous small- scale producers have been put out of work. An annual population growth rate of nearly 3 percent puts further pressure on the land in the traditional sector. As indicated in the beginning of this report, this situation has provoked an enormous rural exodus. The urban population has drastically increased from roughly 29 percent in 1960 to almost 45 percent in the early 1980s (Table 1). Rural-to-urban migration is the main cause of Morocco's rapidly growing shanty towns and increasing unemployment. The massive presence of poor or unemployed in Morocco's cities puts renewed pressure on the Government to keep consumer food prices low.

Thus it has been seen that the Morocco's agricultural policy has been forced into a vicious circle. Reforms which could help to increase agricultural production in the traditional sector and thus stop the rural exodus are precluded for political reasons. This leads to an ever increasing number of urban poor which in turn forces the Government to bias its price policies in favor of consumers and against producers.

The future for Moroccan agricultural development will depend on the ability of the Government of Morocco to extend real economic entitlements to the rural population. Over the last thirty-two years the political system has evolved to allow a much greater degree of political participation in the shaping of the country. One of the remaining challenges for Morocco is to develop an economic system wherein the fruits of Morocco's agricultural potential can be realized in as equitable a manner as possible.

ANNEX CHAPTERS

ANNEX FOREWORD

NOTE ON DATA AVAILABILITY

As in many developing countries, the base of agricultural data in Morocco is thin. The most recent agricultural census was published in 1973. The last household expenditure survey to be analyzed in time for consideration by this study was carried out in 1970-71. At that, patterns of household expenditures are the only proxies available of household consumption patterns. Analysis of income distribution is similarly hampered.

Other data simply do not exist. For commodities whose prices are set by the Interministerial Pricing Committee, only official prices are readily available. Parallel market data for cereals, for example, are extremely sparse. In the case of soft wheat, parallel market prices have only been tracked by ONICL since 1977, although they are available for the other grains over a longer period. Regional coverage is thin, and there is no attempt to weight parallel market prices by quantities sold in the market. Estimates of both effective producer and consumer prices (which should be a weighted average of official and observed) suffer as a result. Total marketed surplus of cereals is not known, rather what is known is the quantity marketed through the ONICL system which, as has been discussed in annex 2, covers soft wheat much more comprehensively than the other grains.

Input use data is also quite weak. While input availabilities may be known with a good deal of accuracy, as most are traded and the quantities imported are therefore recorded by the customs authorities, the rate of use of inputs by crop is practically unknown. Regional use is tracked somewhat, at least in the irrigated areas. The 1984-85 AIRD/MARA study therefore attempted to disaggregate

fertilizer usage in irrigated perimeters by crop, only to find that technical norms on usage rates per hectare are the only guides available to ORMVA and MARA planners. Input use in rainfed areas is even less well understood, as extension efforts in these areas are organized by agencies more poorly funded than the ORMVAs.

There are also definitional issues which confuse the analysis Frequently, data on cereals production confuses soft and hard wheat into one category. Barley disposal cannot be distinguished between human and animal consumption purposes, due to the lack of information.

These are some of the problems inhibiting a more in-depth analysis of Moroccan agriculture in the subsectors which are treated in this study. Production, marketing, and consumption data are even weaker in other subsectors -- livestock, edible oils, horticulture -- which were excluded from consideration by this study as a result.

ANNEX ONE

ESTIMATION OF THE EQUILIBRIUM EXCHANGE RATE

In order to measure the indirect effect of exchange rate disequilibria on agricultural prices, production, consumption, etc., an equilibrium exchange rate is calculated. The equilibrium exchange rate differs from the official exchange rate (E_o) because of policy interventions which prevent the latter from adjusting for 1) differences in relative prices between countries, 2) current account imbalances, and 3) trade restrictions.

There are several alternative rates which can be calculated to make these adjustments. The first yields a Purchasing Power Parity (PPP) rate, which simply corrects for differences in rates of inflation between Morocco and its trading partners. The preferred calculation, correcting for the effects of trade policies and external imbalances, yields the equilibrium exchange rate (EER). It is estimated here using the elasticities approach.

Purchasing Power Parity exchange rates (PPP) were estimated for the Dirham against the United States dollar (US $) and the French franc (FF), two of the main trading partners and currencies of Morocco. No single currency can safely be selected as the reference currency if the trade shares vis à vis that country change over the period in question. For instance, in 1960 France accounted for 45 percent of Morocco's total trade (see Table I.1). By 1970, the share had declined to 33.5 percent and by 1984, to 19 percent. By contrast, the share of US trade in Morocco's total trade has been more constant between 5 and 10 percent for the entire period. While this does not make the United States a dominant trading partner, much of Morocco's trade is denominated in US

dollars. Phosphates for instance, which accounted for one-quarter of export earnings in the 1960s and 30-55 percent of total export earnings between 1974 and 1981, are denominated in US dollars.[69] Similarly, major imports, energy products, and many major food commodities (for example, wheat) are also denominated in US dollars.

TABLE I.1: DIRECTION OF MOROCCAN TRADE

YEAR	(%) of Total Trade with: France	USA	Other
1960	45.3	6.1	48.6
1965	41.1	6.9	52.0
1970	33.5	7.3	59.2
1975	27.0	5.1	67.9
1980	23.4	4.4	72.2
1984	19.0	4.5	76.5

Source: International Monetary Fund, Direction of Trade Statistics

Since individual comparisons with Morocco's principal trading partners give appreciably different results over the 1960-84 period as Morocco's trading relationship shifted away from France toward a more diversified trading pattern, a composite PPP exchange rate is estimated. The composite is a Dirham/US dollar (Dh/$) rate. It is calculated by multiplying the official exchange rate (E_o) by a weighted ratio of foreign to domestic inflation, where the weight is each foreign country's respective trade share with Morocco. The residual of Morocco's trade with other countries besides France and the United States is weighted by the US dollar-based index of unit value of manufactured

69 Data are from IMF, International Financial Statistics Yearbook, Washington, 1985.

goods exports (MUV) of 'developed market economies'.[70] The trade-weighted composite PPP is thus:

$$PPP = E_o * \frac{((XR * WPI_F * w_F) + (WPI_{US} * w_{US}) + (MUV * (1-w_F-w_{US}))}{CPI_M}$$

where E_o is the official exchange rate, expressed in Dh/$; XR is an index of the $/FF cross rate;[71] $WPI_{F, US}$ are the French and United States Wholesale Price Indices; $w_{F, US}$ are the shares of France and the United States in Morocco's total trade; CPI_M is the Moroccan Consumer Price Index.

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70 United Nations, Monthly Bulletin of Statistics.

71 The need to include the trading partners' cross exchange rate stems from the fact that even though price levels might be changing rapidly as observed from the WPI of the individual countries, the countries' exchange rates may be altered simultaneously to compensate for these price level changes. Therefore, omission of an index of the actual cross exchange rates would lead to a bias in the PPP exchange rate. Inclusion of the index, however, leads to instances in certain years (1973, 1975, 1983, 1984) when this trade-weighted PPP rate is greater (less) than the simple weighted average of the three individual PPP rates, indicating that the dollar has significantly devalued (revalued) relative to the French franc with respect to the base year 1960. Such shifts indeed occured in other years as well but were of a lesser magnitude.

TABLE I.2: PURCHASING POWER PARITY EXCHANGE RATES

YEAR	NOMINAL EXCHANGE RATES Dh/$	NOMINAL EXCHANGE RATES Dh/FF	PURCH. POWER PARITY EXCHANGE RATES Dh/$	PURCH. POWER PARITY EXCHANGE RATES Dh/FF	PURCH. POWER PARITY EXCHANGE RATES MUV($)	TRADE WGTD PPP RATE Dh/$	PPP OVERVALUATION INDEX (PPP/nominal rate) Dh/$	PPP OVERVALUATION INDEX (PPP/nominal rate) Dh/FF	PPP OVERVALUATION INDEX (PPP/nominal rate) MUV($) (1980=100)	TRADE WGTD PPP INDEX Dh/$
1980	5.08	1.02	5.08	1.02	5.08	F 08	100	100	100	100
1981	5.08	1.02	4.98	1.04	5.08	5.08	98	101	100	100
1982	5.08	1.02	4.74	.99	4.90	4.89	93	97	97	97
1983	5.08	1.02	4.68	.97	4.66	4.84	92	94	90	92
1984	5.08	1.02	4.59	.98	4.67	4.87	90	94	88	95
1985	5.08	1.02	4.25	.94	4.35	4.48	84	91	85	88
1986	5.08	1.02	4.63	.97	4.55	4.84	88	95	90	92
1987	5.08	1.02	4.66	.97	4.63	4.88	88	95	92	93
1988	5.08	1.02	4.57	.95	4.59	4.83	90	93	91	91
1989	5.08	.97	4.61	.97	4.89	4.72	91	100	96	93
1990	5.08	.91	4.71	.97	4.92	4.86	93	106	97	96
1991	5.08	.91	4.86	.96	4.97	4.84	92	104	98	96
1992	4.80	.91	4.27	.95	4.74	4.70	89	105	103	102
1993	4.11	.92	4.15	1.08	4.72	4.85	101	115	115	118
1994	4.37	.91	4.58	1.17	5.28	5.38	104	129	121	123
1995	4.96	.96	4.24	1.08	5.04	5.08	106	112	124	125
1996	4.42	.92	4.46	1.08	5.13	5.07	101	111	116	115
1997	4.50	.92	4.29	.96	5.11	4.96	96	104	113	110
1998	4.17	.92	3.90	.91	4.96	4.71	94	99	119	113
1999	3.90	.92	3.79	.96	4.84	4.72	97	104	124	121
1980	3.94	.93	3.99	.96	4.90	5.02	101	108	125	128
1981	5.17	.96	5.12	.97	5.75	5.49	99	102	111	106
1982	6.02	.92	5.44	.94	5.88	5.58	91	102	98	93
1983	7.11	.93	6.16	1.00	6.47	6.11	87	107	91	86
1984	8.81	1.01	6.93	1.08	6.99	6.67	79	107	79	76

Note: PPP Overvaluation Index is expressed as (PPP rate/Nominal Exchange Rate)*100.

Table I.2 indicates that, as the Moroccan economy expanded during the period 1963 through the early 1970s and both the trade deficit and Morocco's rate of inflation declined, the Dirham actually became undervalued by as much as 12 percent. With the heating up of the Moroccan economy in the early 1970s, overvaluation of the Dirham began and was not corrected until the Dirham was devalued in 1981.

The free trade equilibrium exchange rate (EER) is the nominal exchange rate (Eo) corrected for current account imbalances and trade policy distortions. It has been defined in this study as that rate which clears the current account at a "sustainable" level of deficit by correcting for trade policy measures, changes in the terms-of-trade, and other exogenous shocks (for example, changes in workers' remittances). The "sustainable" deficit in the case of Morocco has been defined as 5 percent of GNP, a figure somewhat stricter than the IMF targets of 6-7 percent. The "unsustainable" portion of the deficit is

defined as the difference between the 3-year moving average of actual deficits and the sustainable deficit. The elasticities of the supply and demand for foreign exchange, or the supply of exports and demand for imports, are assumed to be 1.0 and 2.0, respectively, and are maintained constant over the period.

Demand for tradables is conditioned in Morocco by trade taxes, subsidies on imported items, and quantitative restrictions (QRs).[72] Imports fall into two principal groups: those subject to duties and taxes and those goods which enter duty and tax free (exonéré). Among the latter group are also classified those items entering under temporary admission (admission temporaire, A.T.) regimes for eventual re-export. The exonerated commodities represented about 10-15 percent of total import value in the 1960s, but with the pressures of consumer subsidies, increasingly larger values have been imported duty- and tax-free since the mid-1970s. In 1982, for instance, wheat (27 percent), fertilizer (5 percent), ships (9 percent) and A.T. imports (30 percent) represented nearly three-fourths of duty- and tax-exempt imports. The remaining imports are subject to import duties (Droit de Douane, DD) and taxes (Taxe Speciale d'Importation, TSI). The import duty is variable with a dutiable range of 10 to 50 percent. Whereas the import duty has averaged about 10-15 percent over the last 25 years, the special import tax has increased progressively from 2.5 percent from 1957 to 1973, to 5 percent between 1973 and 1976, 8 percent in 1977, 12 percent in 1978 and finally 15 percent in mid-1979. The TSI rate was reduced to 10 percent in 1984 within the context of Morocco's compensated devaluation program. These imports are also subject to consumption excise taxes

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72 For a discussion of the tariff and non-tariff protection system in Morocco see also World Bank, Industrial Incentives and Export Promotion, Washington, 1984, pp.76-80.

(Taxe Interieur de Consommation, TIC) and a turnover tax (Taxe sur les Produits et Services, TPS). Since excise taxes are usually specific, their average incidence has declined over time. TPS rates on the other hand are highly variable ranging from 6.38 percent up to a maximum of 60 percent, with the bulk of goods and services subject to the normal 17 and 11.25 percent rates. It is estimated that two-thirds of the TPS is on goods and one-third is on non-tradable services.

Comparing the gross tax receipts from imports subject to duties and taxes to the total import bill yields a gross average tariff rate for Moroccan imports (t_m).[73] This rate, when positive, has the effect of raising the price of and thus reducing the demand for imports. However, the gross border taxes are compensated by the subsidy programs on imported commodities such as wheat flour, sugar, edible oils, fertilizer, agricultural equipment, petroleum and cement. The effect of the subsidies is to reduce the price of and thus increase the demand for these commodities. Tax and duty rates on imports thus need to be adjusted downward accordingly. The annual cumulative subsidy payments by the Stabilization Fund and ONICL were deducted from gross receipts to yield the net average tariff rate for the year. Average net tariff rates were about 10-12 percent through 1972, but declined in 1973 to only 6 percent, and then increased progressively until the end of the decade to as much 29 percent. These findings reflect two phenomena -- changes in gross tariff protection and the huge increases in subsidies, starting in the 1974-1976 period. In the early 1980s,

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[73] It is interesting to note that the incidence of the border taxes for various commodity groups -- or their effective exchange rates -- differs significantly from the average tariff rate. For instance, as the value of imported commodities exempted from taxes and of those imported under the temporary admissions regime rises, the maintenance of the average tariff implies a severe increase in the tariff rate on the "residual" dutiable imports.

average net protection stabilized around 20 percent, and in the first 9 months of 1984 declined to 10 percent with the reduction of the TPS.

Quantitative restrictions have been used in two major periods in the 1960 to 1985 period: during the stabilization plan of 1965-68 and in 1978-81. In addition, there have been import deposit requirements in Morocco, ranging from 2 to 7 percent of gross import value. Exchange rate adjustments employing the net average import tariff (t_m) may therefore introduce a downward bias to the true equilibrium exchange rate.

Thus, the implicit import tariff equivalent (t^i_m) is calculated to take account of the effect of QRs (see Table I.3 below). A coefficient representing the ratio of the domestic prices of a representative basket of tradables (P^d_T) to the world price of tradables (P^f_T) is estimated. An index of Moroccan tradable sectors' GDP (agriculture, mining, manufacturing, and trade) is used as the domestic price basket of tradables (P^d_T). An index of unit import values is used as the foreign price basket of imports (P^f_T). The ratio P^d_T/P^f_T is compared with the net average import tariff, t_m, to determine the implicit tariff equivalent (t^i_m) for each year in the period. When P^d_T/P^f_T equals 1.00, domestic and foreign tradables prices are equal and there is no bias for or against trade. When P^d_T/P^f_T is less than 1.00, domestic prices of tradables are less than foreign prices of tradables and there is said to be an anti-trade bias introduced by commercial policy. When P^d_T/P^f_T is greater than 1.00, trade is said to be encouraged by domestic commercial policy.

The base year in which no QRs were in effect was assumed to be 1960. Thus indices of P^d_T and P^f_T are calculated with 1960 as their base, and it is assumed that no adjustment to the net average import tariff rate t_m, estimated at 9.8 percent, is necessary in this year. The net average import tariff rates

in subsequent years are corrected for P^d_T/P^f_T in the following manner. When the explicit net average import tariff (t_m) exceeds the coefficient of tradable prices (P^d_T/P^f_T), the actual tariff rate is greater than the implicit anti-import bias and explicit tariff rates are binding. When the coefficient of tradable prices is greater than the explicit import tariff, it is assumed that the anti-trade bias overrides the actual tariff rate and represents the implicit equivalent tariff on imports (t^i_m). As seen in Table I.3, the latter is true in only four years during the period, first in 1969 just after QRs were first employed, and again in 1971 to 1973.

TABLE I.3: ESTIMATE OF THE IMPLICIT IMPORT TARIFF EQUIVALENT

YEAR	TRADABLE GDP DEFLATOR (P^d_T)	UNIT IMPORT VALUES (P^f_T)	TRBL GDP/ UNIT IMPORT VALUE (P^d_T/P^f_T)	NET EXPLICIT IMPORT TARIFF (t_m)	IMPLICIT IMPORT TARIFF EQUIV (t'_m)
1960	100.00	100.00	1.000	1.098	1.098
1961	100.56	104.34	.964	1.098	1.098
1962	106.36	102.56	1.037	1.096	1.096
1963	112.44	104.67	1.074	1.093	1.093
1964	116.53	117.24	.994	1.089	1.089
1965	106.00	129.81	.817	1.074	1.074
1966	105.50	114.13	.924	1.098	1.098
1967	117.93	107.79	1.094	1.080	1.094
1968	112.59	108.57	1.037	1.107	1.107
1969	126.71	111.23	1.139	1.115	1.139
1970	122.20	119.13	1.110	1.117	1.117
1971	141.75	121.47	1.167	1.117	1.167
1972	148.03	129.59	1.127	1.115	1.127
1973	161.46	141.82	1.138	1.058	1.138
1974	238.88	217.80	1.097	1.112	1.112
1975	238.73	225.14	1.060	1.131	1.131
1976	236.44	233.70	1.012	1.174	1.174
1977	251.47	243.60	1.032	1.221	1.221
1978	270.42	253.29	1.027	1.275	1.275
1979	296.55	284.55	1.049	1.287	1.287
1980	331.10	351.72	.941	1.241	1.241
1981	377.35	424.47	.889	1.203	1.203
1982	425.52	458.73	.928	1.212	1.212
1983	434.46	494.33	.879	1.216	1.216
1984	477.90	601.22	.795	1.106	1.106

Notes: The tradable GDP sectors are Agriculture, Mining, Manufacturing and Trade. Unit import values from World Bank/EPD data series.

Export taxes (t_x) apply almost exclusively on mining products. In 1984, for instance, of the total revenue from export duties nearly 75 percent was from the mineral export tax (Taxe d'Exportation sur les Minerais), 25 percent from the statistical export tax (Taxe de Statistique sur les Exportations) and only about 1 percent from other export taxes (Taxe de Sortie des autres Produits). Export taxes have been stable over the 1960-84 period and represent only 1-2 percent of export values in Morocco. Explict export taxes were used in the estimation of the EER.

The free trade equilibrium exchange rate is presented in Table I.4. Figures in the summary Table I.6 indicate that the Dirham was in general overvalued by as much as 50 percent (during Morocco's fiscal crisis period) over the 25-year period (average, 23%). The table also reflects the effect of devaluations since 1981. By 1984, the Dirham was less than 10 percent overvalued. Table I.5 gives the range of EER estimates, with parametric variation of the elasticity assumptions. Over the range of elasticity assumptions the EER appears quite stable.

TABLE I.4: EQUILIBRIUM EXCHANGE RATE

Year	Actual Current Account Deficit	3yr avg of Actual Deficit	Sustainable Deficit as % of GNP	Unsustainable Residual of Current Acct Deficit (dD_0)	Nominal Exchange Rate (Dh/$)	Import tariff equiv. (t'_m)	Export tax (t_x)	Equilibrium Exchange Rate (EER)	3-yr avg average EER
1960	216	383	-899	0	5.061	9.8%	1.8%	6.08	5.98
1961	-326	140	-997	0	5.061	9.8%	1.8%	5.98	5.91
1962	-450	-190	-543	0	5.061	9.8%	1.8%	5.89	5.97
1963	-643	-376	-596	0	5.061	9.8%	1.8%	5.90	5.91
1964	-121	-305	-681	0	5.061	8.9%	1.8%	5.99	5.93
1965	20	-148	-709	0	5.061	7.4%	1.8%	5.90	5.93
1966	-258	-120	-727	0	5.061	9.8%	1.8%	6.01	5.97
1967	-340	-196	-748	0	5.061	9.4%	1.8%	5.91	5.94
1968	-290	-299	-775	0	5.061	10.7%	1.8%	6.05	5.99
1969	-65	-235	-841	0	5.061	13.9%	1.8%	6.20	6.09
1970	-628	-328	-918	0	5.061	11.7%	1.8%	6.01	6.12
1971	-[illegible]	-551	-1008	0	5.050	16.7%	1.8%	6.28	6.23
1972	214	-226	-1089	0	4.598	12.7%	1.8%	5.65	6.01
1973	433	115	-1163	0	4.107	13.9%	1.8%	5.10	5.71
1974	1037	561	-1375	0	4.370	11.2%	2.5%	5.34	5.36
1975	-2213	-[illegible]	-1583	0	4.053	13.1%	2.4%	4.81	5.08
1976	-6983	-2990	-1872	-518	4.419	17.4%	1.8%	5.41	5.19
1977	-8224	-5477	-2142	-3335	4.503	22.1%	1.5%	6.10	5.44
1978	-6618	-6412	-2456	-4157	4.167	27.5%	1.4%	6.14	5.88
1979	-5968	-6603	-2783	-3821	3.899	28.7%	1.2%	5.70	5.98
1980	-5568	-5718	-3123	-2595	3.937	24.1%	1.7%	5.44	5.78
1981	-9630	-7065	-3482	-3573	5.172	20.3%	1.6%	6.91	6.01
1982	-1.437	-8878	-3850	-4929	6.023	21.2%	1.4%	8.20	6.85
1983	-8[illegible]20	-9136	-4257	-4779	7.111	21.6%	1.0%	9.67	8.26
1984	-8[illegible]16	-8828	-4839	-3989	8.811	10.6%	.8%	10.64	9.50

Source: International Monetary Fund, International Financial Statistics

TABLE I.6: SENSITIVITY OF THE EQUILIBRIUM EXCHANGE RATE TO ELASTICITY ASSUMPTIONS

	Equilibrium exchange rate when eS = 1.0 and eD =				Equilibrium exchange rate when eD = 2.0 and eS =			
YEAR	3.0	2.5	2.0	1.5	2.0	1.5	1.0	.5
1960	6.55	6.32	6.08	5.85	6.17	6.12	6.08	6.04
1961	6.33	6.13	5.93	5.73	5.99	5.96	5.93	5.90
1962	6.28	6.09	5.89	5.70	5.95	5.92	5.89	5.86
1963	6.29	6.09	5.90	5.71	5.96	5.93	5.90	5.87
1964	6.41	6.20	5.99	5.78	6.07	6.03	5.99	5.95
1965	6.28	6.09	5.90	5.72	5.99	5.95	5.90	5.86
1966	6.44	6.22	6.01	5.79	6.07	6.04	6.01	5.97
1967	6.30	6.11	5.91	5.72	5.98	5.95	5.91	5.88
1968	6.50	6.27	6.06	5.82	6.13	6.09	6.06	6.00
1969	6.88	6.59	6.30	6.01	6.37	6.34	6.30	6.26
1970	6.46	6.24	6.01	5.79	6.07	6.04	6.01	5.99
1971	7.01	6.69	6.38	6.06	6.43	6.40	6.38	6.35
1972	6.15	5.90	5.65	5.40	5.71	5.68	5.65	5.62
1973	5.58	5.34	5.10	4.87	5.15	5.13	5.10	5.08
1974	5.77	5.55	5.34	5.12	5.45	5.39	5.34	5.28
1975	5.17	4.99	4.81	4.63	4.86	4.84	4.81	4.79
1976	5.84	5.64	5.41	5.19	5.44	5.42	5.41	5.40
1977	6.63	6.36	6.10	5.84	6.12	6.11	6.10	6.09
1978	6.76	6.46	6.14	5.83	6.16	6.15	6.14	6.13
1979	6.30	6.00	5.70	5.39	5.71	5.71	5.70	5.69
1980	5.99	5.72	5.44	5.16	5.47	5.45	5.44	5.42
1981	7.53	7.22	6.91	6.60	6.94	6.93	6.91	6.89
1982	8.93	8.56	8.20	7.83	8.23	8.21	8.20	8.18
1983	10.58	10.13	9.67	9.22	9.71	9.69	9.67	9.66
1984	11.24	10.84	10.64	10.33	10.67	10.65	10.64	10.62

TABLE I.6.: SUMMARY OF DIRHAM/US DOLLAR EXCHANGE RATES

	Nominal Exchange Rate (Eo)	Purchasing Power Parity Rate (PPP)		Free Trade Equilibrium Exchange Rate (E^*)		Free Trade Equilibrium Exchange Rate (E^*) (3 yr avg avg)	
YEAR	(i)	(ii)	ii/i	(iii)	iii/i	(iv)	iv/i
1960	5.06	5.06	0%	6.08	20%	5.93	17%
1961	5.06	5.06	0%	5.98	17%	6.01	19%
1962	5.06	4.89	-3%	5.89	16%	5.97	18%
1963	5.06	4.84	-4%	5.90	17%	5.91	17%
1964	5.06	4.57	-10%	5.99	18%	5.92	17%
1965	5.06	4.46	-12%	5.90	17%	5.93	17%
1966	5.06	4.64	-8%	6.01	19%	5.97	18%
1967	5.06	4.68	-7%	5.91	17%	5.94	17%
1968	5.06	4.64	-8%	6.05	19%	5.99	18%
1969	5.06	4.72	-7%	6.10	24%	6.09	20%
1970	5.06	4.86	-4%	6.01	19%	6.12	21%
1971	5.06	4.84	-4%	6.38	26%	6.23	23%
1972	4.80	4.70	2%	5.65	23%	6.01	31%
1973	4.11	4.65	13%	5.10	24%	5.71	39%
1974	4.37	5.36	23%	5.34	22%	5.36	23%
1975	4.06	5.06	25%	4.81	19%	5.08	25%
1976	4.42	5.07	15%	5.41	22%	5.19	17%
1977	4.50	4.96	10%	6.10	35%	5.44	21%
1978	4.17	4.71	13%	6.14	47%	5.88	41%
1979	3.90	4.72	21%	5.70	46%	5.98	53%
1980	3.94	4.82	23%	5.44	38%	5.76	46%
1981	5.17	5.49	6%	6.91	34%	6.01	16%
1982	6.02	5.53	-8%	8.20	36%	6.85	14%
1983	7.11	6.11	-14%	9.67	36%	8.26	16%
1984	8.81	6.67	-24%	10.64	21%	9.50	8%

Notes: The comparison columns are calculated as in $(E_* - Eo)/Eo$.
Column (iv) is a three-year moving average of column (iii), and is the exchange rate vector which has been used for border price adjustments in this working paper.

ANNEX TWO

ESTIMATION OF CEREALS PRICES

Domestic prices: Producers

Several methods can be used to determine the farmgate price for cereals. One approach, presented in columns (4, 8 and 12) is to use an "average" national price, weighted by the share of the two major alternative marketing channels. The average annual price received by producers is thus weighted by the quantities passing through the public and private marketing channels.[74] This applies more strongly to soft wheat prices. The other, which better reflects hard wheat and barley prices, is presented in columns (3, 7 and 11). It considers sales to ONICL at the official prices as the sales in surplus areas and private market sales as those in deficit zones and uses only the deficit area prices. Non-official price data are collected by ONICL and published as unweighted, monthly, regional averages for 19 centers. The prices recorded are an unweighted "average" of urban wholesale market (Halle aux grains) and rural village market (souk) prices.

Parallel market price data are available for 1959-60 through the present for hard wheat, barley and maize; however, such price data for soft wheat are available only from 1977-78 through the present.[75] The government does not

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[74] Home consumption is valued at the non-official market price. Data on on-farm consumption are not available in Morocco.

[75] The price year corresponds to ONICL's marketing year which was July through June until 1982-83 and June through May thereafter.

collect data on soft wheat market prices on the assertion that the reigning price is the "unique" official producer price. Unpublished data for eight regions, which represent over three-fourths of national production, are analyzed for the period from 1977-78 through the present. Annual averages for these monthly regional prices are calculated. Finally, these average annual prices are weighted by the production weight calculated as each region's contribution to total national production for each of the cereals. These data are presented as the unofficial, free-market prices.

TABLE II.1: PRODUCER PRICES: SOFT, HARD WHEAT and BARLEY

	SOFT WHEAT				HARD WHEAT				BARLEY			
YEAR	Official Price (Dh/q.) 1	(%) off.mkt prod. 2	Market Price (Dh/q.) 3	Wgtd Avg Price 4	Official Price (Dh/q.) 5	(%) off.mkt prod. 6	Market Price (Dh/q.) 7	Wgtd Avg Price 8	Official Price (Dh/q.) 9	(%) off.mkt prod. 10	Market Price (Dh/q.) 11	Wgtd Avg Price 12
1960	33.00				39.00		38.83		23.00		21.49	
1961	34.50	.31			40.00	.20	42.63	42.10	23.00	.02	25.67	25.82
1962	34.50	.48			40.00	.24	49.65	47.33	23.00	.11	35.08	33.73
1963	36.00	.49			40.00	.19	40.66	40.53	23.00	.08	23.06	23.06
1964	37.50	.39			41.50	.16	41.22	41.26	24.00	.05	22.88	22.89
1965	40.00	.40			44.00	.21	46.80	46.22	26.00	.05	27.63	27.55
1966	40.00	.23			44.00	.14	47.53	47.04	26.00	.05	31.01	30.76
1967	40.00	.27			44.00	.11	61.14	59.25	26.00	.06	45.99	44.79
1968	40.00	.63			44.00	.20	55.48	53.18	27.00	.08	38.09	37.20
1969	40.00	.58			44.00	.15	39.57	40.23	27.00	.06	19.44	19.89
1970	40.00	.58			44.00	.18	43.02	43.20	28.00	.02	23.05	23.15
1971	43.00	.45			47.00	.14	47.39	47.34	28.00	.01	29.76	29.74
1972	43.00	.46			47.00	.10	46.10	46.19	29.00	.01	29.64	29.63
1973	46.00	.36			49.00	.04	48.67	48.88	29.00	.01	37.27	37.19
1974	60.00	.45			63.00	.06	71.44	71.02	40.00	.02	63.20	62.74
1975	60.00	.19			63.00	.03	88.11	87.36	40.00	.01	60.61	60.40
1976	60.00	.19			63.00	.04	100.31	98.82	40.00	.02	64.71	64.22
1977	85.00	.12			85.00	.06	85.73	85.69	65.00	.02	52.21	52.47
1978	85.00	.36	76.04	79.27	85.00	.08	108.17	106.32	45.00	.03	79.30	78.87
1979	105.00	.33	75.43	86.19	105.00	.10	107.28	107.06	60.00	.04	77.83	77.92
1980	125.00	.44	87.41	108.96	125.00	.12	114.11	115.42	90.00	.06	78.81	79.46
1981	135.00	.17	110.92	115.01	135.00	.01	148.21	148.08	95.00	.02	102.09	101.97
1982	140.00	.62	111.90	129.32	140.00	.04	195.87	193.64	100.00	.08	145.24	141.82
1983	140.00	.46	101.45	120.34	140.00	.05	160.84	159.80	100.00	.03	92.77	92.96
1984	150.00	.37	111.11	125.50	150.00	.03	178.50	177.65	110.00	.02	128.49	128.12
1985	180.00	N/A	132.56	N/A	180.00	N/A	217.70	N/A	130.00	N/A	144.02	N/A

Border Price Equivalents: Producers

Border price data are available from ONICL for the major traded cereals. The data series is complete for soft wheat which is the only grain imported in significant quantities every year.[76] On the other hand, hard wheat and barley

[76] The equivalent US quality for Moroccan bread wheat is Hard Red Winter #2, ordinary protein.

border price series are incomplete. Morocco has imported hard wheat in small quantities, about 40-80,000 mt, in only six years over the 1960-84 period. Similarly, barley was imported only periodically to counter drought induced shortfalls through 1970-71 and consistently, though in highly varying quantities, after 1970-71. For hard wheat and barley, border prices for the years when Morocco did not actually import these grains are estimated from world price quotations adjusted for shipping and insurance. Hard wheat prices are yearly average prices FOB Minneapolis as reported by the USDA. Barley prices on the other hand are for Canadian barley FOB St. Lawrence. These prices use the "end-of-year" convention of reporting through 1973, and "average year" convention thereafter. Canadian to United States dollar exchange rates are annual average quotes from the Bank of Nova Scotia.

Finally, landed CIF prices are adjusted to include port and financial charges, transport and handling charges and losses up to the collection centers where comparisons with actual domestic producer prices can be made. Tables II.2-II.7 present the border price series for all three grains, each converted into Dirhams at the border using the official exchange rate and then using the equilibrium exchange rate.

Comparisons of world prices at the official exchange rate may lead to some differences from the actual landed prices due to inter alia the difference between the average official exchange rate and the import exchange rate calculated retroactively from weighted imports. In Morocco's case, the exchange rate is unified and no systematic bias is evident. However, differences appear due to the timing of the import contract as compared to the exchange rate movements. For instance, over the 1977-1982 period for which import data are available by shipment, the average difference between the yearly average OER and

the effective exchange rate to the cereals marketing board was -2.2 percent with a range of -9.3 to +3.4 percent.

Port charges include losses of 2 percent, handling and transport within the port zone of 25 kilometers. In addition, importers incur a number of financial and service costs related to importing the grain. These charges represent about 9 percent of the CIF value for guarantee deposits (garanti du poid), letter of credit costs and guarantees (commission d'accréditif et d'irrévocabilité), bank commissions (confirmation bancaire et caution) and the importer firms' overhead margins. In addition imported grain pre-financing was estimated at one month at commercial credit terms inclusive of taxes. Finally, imported grain incurs storage costs for approximately 15 days. Besides these ad valorem costs, imports carry specific costs related to weighing, unloading, and handling. These specific costs were obtained for 1984 and adjusted for prior years with the consumer price index. These data, which were obtained from ONICL and a major grain importer in Morocco, represent par values for the typical costs. Actual costs may however vary from shipment to shipment due to port congestion and other unforseen difficulties.

Imported grains are shipped to the flour mills upon demand by the mill and subject to prior authorization by ONICL. Transport costs are borne by ONICL using the Office National des Transports (ONT) or the Office National des Chemins de Fer (ONCF) capacity. The average distance of grain transport, whether imported or local, is about 175 kms. The base transport rate in 1984 was 0.316 Dh/tkm with upward adjustments depending on bulk, road condition or distance transported. The 1984 transport rate was adjusted for prior years by the consumer price index. In addition to the transport cost, 2.5 percent losses and handling costs for loading and unloading are imputed to imported grains. The

total cost thus corresponds to the pricing point of domestic grains delivered to a local wholesale grain market (halle au grains).

Table 11.3: BUYER'S PRICE EQUIVALENTS FOR CEREALS: EAST MIDLAND at OLD (Rs/t)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (£/mt)																									
...Freight																									
...Insurance																									
CIF Price (£/mt)	59.90	66.03	67.19	63.26	64.55	66.36	72.13	66.90	67.19	64.58	70.75	66.87	85.41	190.41	190.70	177.46	137.17	115.29	137.66	191.10	202.18	177.25	153.26	166.22	157.41
Official Exchange Rate	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.55	6.60	6.11	6.13	6.05	6.42	6.50	6.17	3.90	3.91	5.17	6.02	7.11	8.01
CIF Price (Rs/mt)	328.00	324.09	329.90	319.99	326.62	335.60	364.90	338.51	339.90	326.77	358.00	327.59	392.09	882.29	868.32	698.22	686.29	518.81	573.79	765.60	796.59	916.38	913.61	1181.87	1339.23
POST CHARGES																									
...Lessons (21 on CIF)	6.58	6.48	6.60	6.40	6.53	6.71	7.30	6.77	6.80	6.54	7.16	6.55	7.84	15.65	17.37	13.96	12.13	10.58	11.48	14.91	15.93	18.33	18.33	23.64	26.78
...Handling	1.39	1.22	1.39	1.36	1.41	1.46	1.45	1.44	1.44	1.48	1.50	1.37	1.62	1.69	1.96	2.12	2.38	2.58	2.83	3.07	3.36	3.78	4.48	4.96	5.40
...Transport	2.75	2.68	2.99	3.11	3.24	3.36	3.32	3.29	3.30	3.44	3.44	3.39	3.72	3.87	4.49	4.85	5.26	5.92	6.50	7.04	7.76	8.67	9.58	10.16	11.46
...Rent, services (a)	7.90	8.04	8.45	8.93	9.50	9.60	9.52	9.45	9.60	9.76	9.00	10.30	10.69	11.12	12.09	13.92	15.11	17.01	18.65	20.22	22.11	24.88	27.51	29.18	32.95
...Commissions (b)	20.93	20.52	20.92	20.16	20.74	20.54	22.12	20.73	20.92	20.76	21.50	20.83	24.53	48.87	74.01	61.04	53.35	45.65	50.09	65.61	70.18	80.64	80.66	104.80	117.83
...Storage (15 days)	6.75	6.56	6.68	7.06	7.35	7.59	7.52	7.47	7.69	7.71	7.81	7.14	8.45	8.79	10.10	11.00	11.94	13.44	14.74	15.90	17.98	19.66	21.79	23.84	26.09
...Financing (30 days)	6.19	6.08	6.28	6.61	6.12	6.25	6.66	6.27	6.28	6.12	6.31	5.63	6.93	9.06	10.99	8.00	7.69	6.84	7.28	9.19	10.04	11.55	11.55	14.09	16.07
LANDED PRICE AT PORT	384.36	381.60	386.33	374.93	387.31	390.16	430.80	400.90	402.69	388.53	423.84	390.69	466.75	582.04	1002.56	818.36	716.83	626.33	685.71	881.04	943.31	1065.90	1090.17	1191.20	1376.80
TRANSPORT TO COLLECTION POINT: Average 175 Kms																									
...Transport	10.62	10.00	15.62	16.53	17.19	17.76	17.61	17.48	17.53	18.04	18.38	19.05	19.27	20.37	23.04	25.74	22.95	21.45	24.49	27.47	66.90	46.02	50.09	33.90	44.85
...Losses (2.5 % at ex port)	9.66	9.56	10.41	9.68	9.68	9.95	10.73	10.42	10.47	9.71	10.66	9.77	11.62	13.56	25.06	20.36	17.85	15.51	17.14	22.05	23.58	27.16	27.25	34.78	39.66
...Handling	1.39	1.22	1.39	1.36	1.41	1.46	1.45	1.44	1.44	1.48	1.50	1.37	1.62	1.69	1.96	2.12	2.38	2.58	2.83	3.07	3.36	3.78	4.48	4.96	5.40
PRICE AT COLLECTION CENTRE	417.04	407.24	417.75	406.61	415.60	427.33	460.62	429.92	431.71	417.37	454.17	421.87	497.76	941.25	1053.61	867.52	762.13	669.87	744.18	944.36	1011.16	1160.86	1172.49	1284.59	1466.33

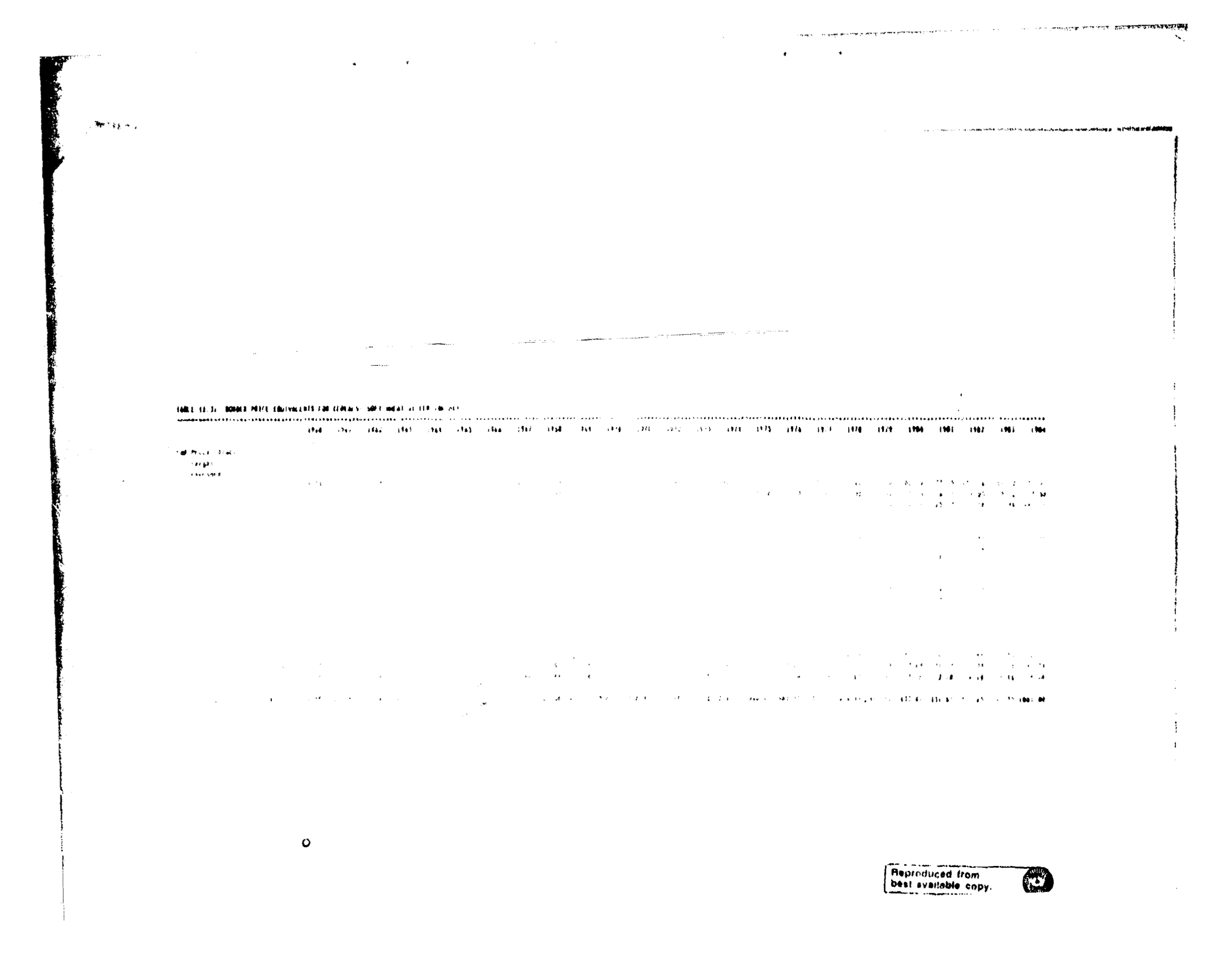

TABLE II.6: DOLLAR PRICE EQUIVALENTS FOR CEREALS: WHEAT CIF EC ($/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/mt)	83.04	130.00	94.00	81.00	81.00	81.00		74.00	72.00	67.00	66.00	67.00	87.00	230.00	264.00				134.00	187.00			156.00	177.00	163.00
...freight	3.78	4.00	3.56	4.00	4.20	4.00		4.56	5.46	4.10	7.00	3.56	4.10	11.20	10.20				3.10	12.44			10.50	12.50	12.50
...insurance	6.36	6.36	6.87	6.37	3.26	3.20		3.92	3.77	3.51	5.63	3.22	4.11	12.56	12.51				7.44	9.97			8.12	9.46	8.70
CAF Price ($/mt)	93.04	141.04	103.17	91.37	88.46	88.00	72.13	82.22	79.17	69.61	78.63	68.57	90.41	243.76	262.71	232.64	134.64	120.02	148.16	209.37	293.83	221.41	178.62	198.98	184.20
Official Exchange Rate	5.00	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.05	6.60	6.11	6.37	6.03	6.02	6.50	6.47	5.98	5.94	5.47	6.02	7.18	8.01
CAF Price (UA/mt)	460.04	663.06	516.95	460.36	366.41	348.51	364.90	416.01	406.60	351.19	387.05	346.75	415.86	1004.65	1148.04	962.20	595.10	567.10	617.01	916.54	1157.70	1142.60	1051.18	1016.71	1423.06
FOOD CHARGES																									
...Losses (2% of CIF)	9.71	13.26	10.34	9.20	6.93	6.97	7.30	8.32	8.61	7.02	7.76	6.93	8.32	21.68	22.96	18.84	11.90	11.34	12.36	16.35	23.15	22.85	21.02	20.70	32.47
...Handling	1.20	1.22	1.20	1.16	1.11	1.16	1.05	1.04	1.04	1.00	1.30	1.37	1.62	1.69	1.96	2.12	2.30	2.30	2.03	3.07	3.36	3.20	0.30	0.00	5.00
...Transport	2.75	3.00	2.90	3.11	3.26	3.31	3.32	3.29	3.30	3.00	3.00	3.59	3.72	3.87	4.09	4.05	5.26	5.32	6.50	7.05	7.70	8.67	9.50	10.16	11.46
...Misc. services (a)	7.90	8.05	8.03	8.03	9.20	9.00	9.32	9.05	9.00	9.76	9.00	10.30	10.60	11.12	12.09	11.02	15.11	17.01	18.65	20.22	22.41	26.00	27.51	29.10	32.90
...Commissions (b)	46.51	50.15	45.99	46.06	36.10	36.67	32.02	36.61	35.25	30.90	34.13	30.09	36.60	95.60	101.03	82.91	53.32	49.90	54.37	71.86	100.00	100.55	92.50	126.69	162.06
...Storage (13 days)	6.25	6.56	6.60	7.06	7.15	7.59	7.32	7.67	7.49	7.31	7.01	6.16	8.45	8.39	10.10	11.00	11.94	13.44	14.74	15.90	17.40	19.06	21.74	23.96	26.00
...Financing (30 days)	5.00	8.15	6.51	5.03	4.16	4.19	4.40	5.24	5.05	4.42	4.89	4.36	5.24	13.66	14.47	11.67	7.50	7.15	7.70	10.29	14.59	14.00	13.24	12.03	20.46
LANDED PRICE ($/mt)	534.50	761.45	598.45	540.02	609.40	617.56	630.00	687.02	670.63	613.09	657.26	601.00	690.50	1204.26	1316.02	1007.71	761.49	624.65	735.03	964.30	1367.07	1332.19	1240.00	1452.47	1894.04
TRANSPORT TO COLLECTION POINT: Average 175 km.																									
...by road	14.62	14.88	15.62	16.53	17.19	17.76	17.61	17.48	17.53	18.04	18.20	19.05	19.77	20.57	23.04	25.74	27.95	31.45	34.49	37.60	40.90	46.62	50.89	53.90	60.65
...Loading (2.5 % of export)	11.36	10.04	14.97	13.52	10.24	10.51	10.27	12.20	11.77	10.40	11.43	10.29	12.26	31.01	32.90	27.19	17.54	16.06	18.38	24.03	33.70	33.03	31.02	41.56	47.37
...Handling	1.20	1.22	1.20	1.16	1.11	1.16	1.05	1.04	1.04	1.00	1.30	1.37	1.62	1.69	1.96	2.12	2.30	2.30	2.03	3.07	3.36	3.20	0.30	0.00	5.00
PRICE AT COLLECTION POINT	561.68	774.39	630.52	572.23	638.13	647.10	660.62	718.93	701.36	643.01	688.07	642.56	724.15	1293.52	1374.71	1067.75	799.28	725.55	790.73	1025.04	1425.03	1420.63	1327.07	1751.09	2007.03

TABLE CC 5. BORDER PRICE EQUIVALENTS FOR CEREALS: HARD WHEAT at FOB (DM/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (DM/mt)	83 00	130 00	94 00	83 00	61 00	61 00		76 00	72 00	62 00	66 00	62 00	82 00	230 00	240 00				134 00	187 00			156 00	177 00	163 50
Freight	3 70	4 00	3 30	4 40	4 20	4 40		4 30	3 10	4 10	7 00	3 30	4 10	13 20	10 20				7 10	12 40			10 30	12 50	12 50
Insurance	6 36	6 24	4 87	4 37	3 26	3 20		3 92	3 77	3 31	3 65	3 27	4 31	12 56	12 51				7 04	9 97			8 32	9 40	8 70
CIF Price (DM/mt)	91 04	131 06	102 17	91 77	68 46	68 88	72 13	82 22	79 17	69 41	76 65	68 57	90 41	263 76	262 71	132 64	136 64	126 02	148 14	209 37	293 83	221 01	174 62	198 90	184 70
Equilibrium Exchange Rate	5 93	5 91	5 97	5 91	5 93	5 93	5 97	5 94	5 99	6 09	6 11	6 23	6 01	5 71	5 26	5 00	5 19	5 44	5 68	5 90	5 76	6 01	6 05	6 26	6 50
CIF Price (DM/mt)	539 84	774 45	609 93	542 36	405 97	408 46	430 62	488 36	474 23	422 68	467 10	427 16	543 33	1506 07	1400 13	1101 81	698 78	685 55	871 15	1252 03	1692 46	1328 27	1096 11	1643 58	1750 61
PORT CHARGES																									
...Losses (2% of CIF)	10 80	15 49	12 20	10 85	8 12	8 17	8 61	9 77	9 48	8 45	9 30	8 54	10 87	30 12	28 16	23 64	13 98	13 71	17 42	25 04	33 85	26 57	23 92	32 87	35 01
Handling	1 20	1 22	1 20	1 36	1 41	1 44	1 45	1 14	1 44	1 40	1 50	1 57	1 62	1 69	1 96	2 12	2 30	2 50	2 83	3 07	3 36	3 70	4 10	4 44	5 00
..Transport	2 75	2 80	2 94	3 11	3 24	3 34	3 32	3 29	3 30	3 40	3 44	3 59	3 72	3 87	4 49	4 85	5 26	5 92	6 58	7 84	7 70	8 67	9 58	10 16	11 46
...Misc. services (a)	7 90	8 04	8 45	8 93	9 30	9 40	9 52	9 45	9 48	9 76	9 90	10 30	10 69	11 12	12 09	13 92	15 11	17 01	18 65	20 22	22 11	24 00	27 51	29 10	32 90
..Commissions (b)	47 51	68 15	53 67	47 73	35 73	35 94	37 89	42 98	41 73	37 20	41 20	37 59	47 81	132 53	123 92	104 00	61 49	60 33	76 66	110 10	148 94	116 89	105 26	144 63	154 05
..Storage (15 days)	6 25	6 36	6 68	7 04	7 35	7 58	7 57	7 47	7 49	7 21	7 81	8 14	8 45	8 79	10 18	11 00	11 94	13 46	14 74	15 90	17 48	19 66	21 74	23 06	25 00
Financing (30 days)	6 00	9 26	7 69	6 83	5 12	5 15	5 43	6 15	5 98	5 33	5 91	5 38	6 85	18 98	17 76	14 89	8 80	8 64	10 98	15 78	21 33	16 74	15 07	20 71	22 56
LANDED PRICE EX PORT	623 95	886 27	702 83	628 23	476 22	479 71	504 35	568 90	553 13	496 08	548 30	502 26	633 34	1713 17	1607 46	1356 22	817 67	807 18	1010 93	1449 35	1967 23	1565 46	1402 39	1900 59	2037 69
TRANSPORT TO COLLECTION POINT	Average 175 km																								
...Transport	14 62	14 80	15 62	16 52	17 15	17 76	17 61	17 48	17 53	18 04	18 20	19 05	19 77	20 57	23 84	25 74	27 95	31 45	34 49	37 40	48 90	46 02	50 09	53 90	60 05
..Losses (2 5 % of ex port)	15 58	22 16	17 57	15 71	11 91	11 99	12 61	14 22	13 83	12 40	13 71	12 56	15 83	42 83	40 19	33 91	20 44	20 18	25 27	36 23	48 40	38 64	35 00	47 71	50 93
..Handling	1 20	1 22	1 20	1 36	1 41	1 46	1 45	1 44	1 44	1 40	1 50	1 57	1 62	1 69	1 96	2 12	2 30	2 50	2 83	3 07	3 36	3 70	4 10	4 44	5 00
PRICE AT COLLECTION CENTER	654 45	924 53	737 21	661 82	506 71	510 93	536 01	602 03	585 93	527 92	581 71	535 43	670 57	1778 26	1673 44	1417 98	868 37	861 40	1061 73	1526 05	2060 37	1633 90	1493 56	2016 72	2153 87

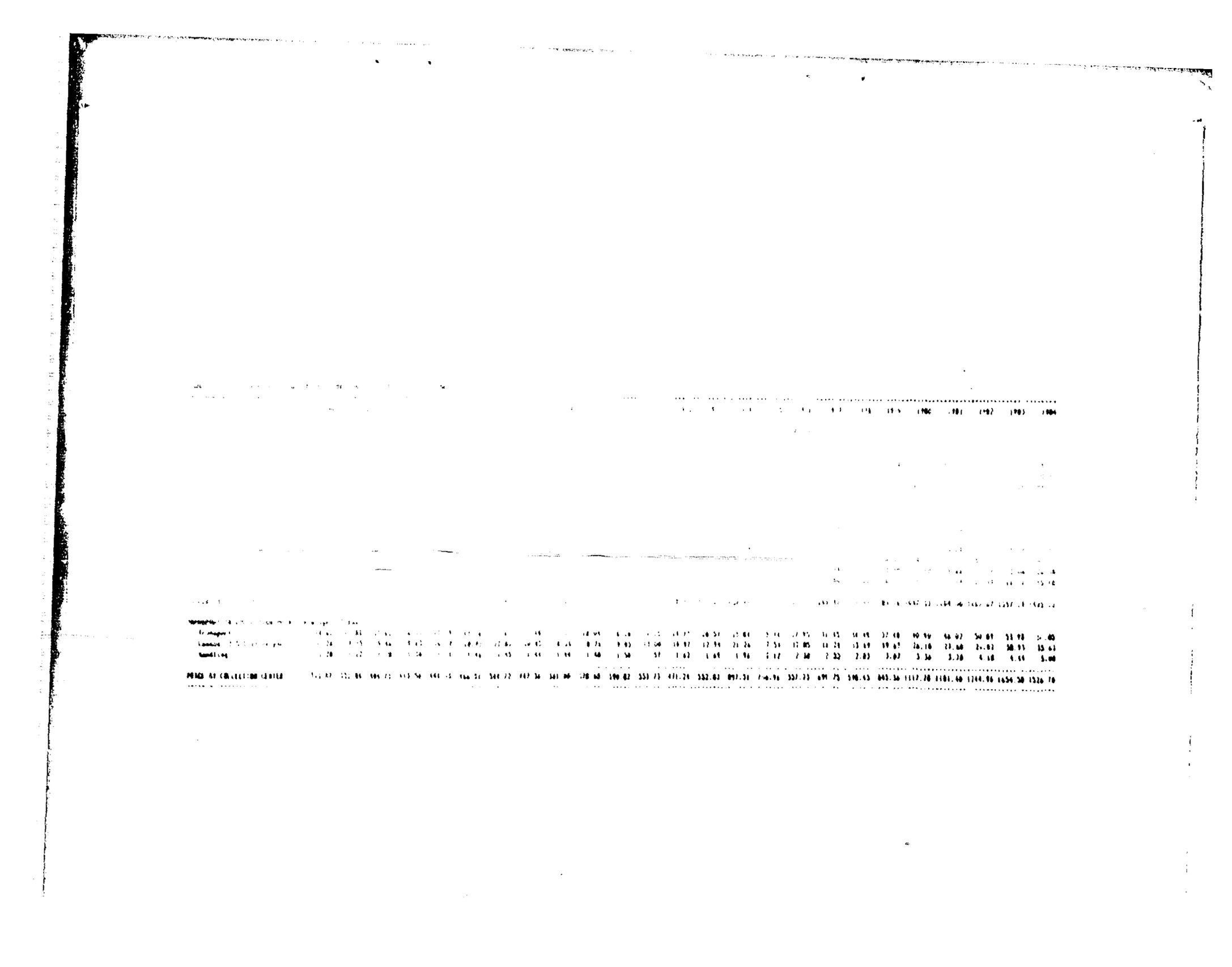

TABLE 11.1: BORDER PRICE EQUIVALENTS FOR CEREALS, BARLEY ,($US /t)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (t/mt)			51.00	51.00	62.00	65.00			49.00	51.00	56.00						87.00								
...Transit			1.50	4.00	5.20	6.60			1.00	0.10	2.00						5.20								
...Insurance			1.02	1.07	1.31	1.40			2.62	2.76	2.85						4.47								
CIF Price (t/mt)	60.02	51.42	63.32	64.47	69.51	73.00	86.69	89.90	55.02	57.86	59.85	87.79	80.39	104.86	167.61	147.56	96.81	121.67	100.01	109.40	225.76	186.71	162.74	187.96	136.73
Equatorian Exchange Rate	5.91	5.91	5.97	5.91	5.91	5.91	5.97	5.94	5.99	6.09	6.12	6.23	6.01	5.71	5.36	5.00	5.19	5.44	5.00	5.98	5.76	6.01	6.85	8.26	9.30
CIF Price (Eb/mt)	354.76	303.89	377.99	381.02	412.19	433.36	517.00	535.21	329.57	352.34	366.28	546.62	483.14	618.17	898.53	737.60	502.44	658.62	655.10	1010.10	1301.26	1086.13	1116.77	1545.13	1298.94
PORT CHARGES																									
...Lighterage (2% of CIF)	5.76	6.00	7.56	7.62	8.24	8.67	10.34	8.10	6.59	7.05	7.33	10.93	9.66	12.36	17.97	14.99	10.05	13.17	12.70	20.22	26.01	21.72	22.34	30.90	25.90
...Handling	1.20	1.22	1.20	1.16	1.11	1.46	1.05	1.44	1.44	1.48	1.50	1.57	1.62	1.61	1.96	2.12	2.50	2.50	3.03	3.07	3.36	3.78	4.18	4.44	5.00
...Arrangart	2.75	2.00	2.94	3.01	3.24	3.38	3.22	3.29	3.30	3.40	3.40	3.59	3.22	3.07	4.49	4.05	5.26	5.92	6.36	7.05	7.70	8.67	9.58	10.16	11.46
...Dues, services (a)	7.90	8.04	8.45	8.15	9.50	9.60	9.52	9.45	9.00	9.76	9.00	10.50	10.69	11.17	12.09	13.92	15.11	17.01	18.63	20.22	22.11	24.00	27.51	29.18	32.90
...Commissions (b)	25.06	26.70	15.26	33.51	36.27	38.16	45.50	46.54	29.00	31.01	32.23	48.10	42.53	53.76	79.07	65.97	44.22	53.96	55.09	88.90	114.42	95.50	98.19	135.97	114.31
...Storage (15 days)	6.25	6.56	6.68	7.04	7.35	7.59	7.52	7.47	7.49	7.71	7.81	8.14	8.05	8.71	10.18	11.00	11.99	13.01	14.74	15.90	17.00	19.66	21.74	23.06	26.00
...Financing (30 days)	3.59	3.03	4.76	4.00	3.19	5.66	6.31	5.23	4.13	4.44	4.62	6.09	6.09	7.67	11.32	9.03	6.33	8.30	8.00	12.70	16.30	13.69	14.45	19.67	16.37
LANDED PRICE (E-PORT	132.21	150.97	442.01	447.01	481.20	507.62	601.16	606.92	391.02	417.17	432.09	636.13	568.09	709.21	1036.63	871.88	597.66	772.00	754.01	1179.36	1567.78	1276.11	1312.23	1796.30	1536.95
TRANSPORT TO COLLECTION POINT: Average 173 Km.																									
...Arrangart	10.62	11.00	15.62	16.35	17.19	17.76	17.61	17.40	17.53	18.04	18.20	19.05	19.27	20.57	23.04	25.74	27.95	31.05	34.49	37.90	40.90	44.02	50.09	53.98	60.00
...Lighterage (2.5 % at ex port)	0.65	0.57	11.07	11.19	12.00	13.69	15.03	12.17	9.78	10.43	10.83	15.90	14.15	17.73	25.91	21.80	14.94	19.43	18.86	29.90	31.69	31.85	32.81	44.94	38.27
...Handling	1.20	1.22	1.20	1.16	1.11	1.46	1.05	1.44	1.44	1.48	1.50	1.57	1.62	1.61	1.96	2.12	2.50	2.50	3.03	3.07	3.36	3.78	4.18	4.44	5.00
PRICE AS COLLECTION CENTRE	141.46	164.04	470.91	476.50	511.09	539.53	635.20	638.01	417.37	447.13	463.69	673.63	606.43	749.21	1088.14	921.34	642.05	830.07	810.39	1249.31	1389.60	1355.77	1400.11	1784.67	1633.67

Domestic Prices: Consumers

Consumer prices for cereals are estimated at the wholesale level in flour equivalents. There are two major soft wheat flour categories: "ordinary" flour milled at 78 percent reduction ratio and "deluxe" flour with a reduction ratio of 68 percent. The specific quality mix of flour produced is subject to ONICL directives. Official estimates indicate that, currently, ordinary flour constitutes 80 percent of total flour produced with deluxe flour accounting for the bulk of the remainder.

In fact, other flour qualities are also produced in minor amounts. For the purposes of this study we have assumed that only two flour qualities (ordinary and deluxe) exist. For lack of data it is assumed that the 80-20 split between ordinary and luxury flour production has held throughout the period. However, while ONICL seeks to assure that mills produce a minimum of 80 percent of ordinary flour, there is evidence however that the mills are in fact producing only about 60 percent of ordinary flour. Incentives to produce a greater percentage of luxury flour are numerous. The controlled milling margins are inadequate and encourage millers to produce a higher-valued product. The subsidy payment is greater per unit on ordinary flour, however, leading millers to falsely claim a higher percentage of ordinary flour in order to recoup a larger transfer payment. In addition, there is a 12 percent tax on luxury flour, further encouraging false claims of ordinary flour production. Delays in subsidy payments probably induce millers to sell luxury flour at non-controlled prices.

With the exception of the period 1960-65 when deluxe flour prices were not regulated, prices for both flour qualities have been officially set for the past 25 years. Price setting initially had the objective of stabilizing consumer prices without incurring major budgetary outlays, a goal maintained with some

success through 1972-73. Since 1973 however, stabilization gave way to increasing subsidization such that, at present, ordinary flour represents only 60 percent of its real price level of 1973-74. Prevailing official soft wheat flour prices are presented in Table II.8.

Hard wheat and barley are sold almost entirely on the parallel market at unregulated prices. Consumers typically purchase grain and have the grain cleaned and custom milled at small artisanal mills. For these grains' consumer flour prices the wholesale price was adjusted for handling charges and losses to which a milling margin net of by-products was added. The milling margin is the actual milling margin per quintal from 1960-72 (a period when the subsector was essentially in equilibrium) and adjusted by the CPI from 1973 through 1984.[77] A reduction ratio of 82 percent is applied to hard wheat flour. For barley where technical constraints exist on the maximum reduction ratio, a value of 70 percent is used. The consumer flour prices for these grains are also presented in Table II.8.

[77] Adjustments using the WPI yielded insignificant differences. The use of CPI is argued on grounds that hard wheat and barley milling is essentially by small family run artisanal mills.

TABLE II.8: CONSUMER WHOLESALE PRICES FOR FLOUR (Dh/Kg)

YEAR	.....SOFT WHEAT..... Ordinary Flour	Deluxe Flour	Average Flour Price	HARD WHEAT Average Flour Price	BARLEY Average Flour Price
1960	.56	.65	.58	.58	.41
1961	.56	.65	.58	.63	.47
1962	.56	.65	.58	.73	.62
1963	.56	.65	.58	.61	.44
1964	.56	.65	.58	.62	.44
1965	.56	.65	.58	.69	.51
1966	.56	.65	.58	.71	.57
1967	.56	.65	.58	.89	.81
1968	.56	.65	.58	.82	.68
1969	.56	.65	.58	.60	.39
1970	.56	.65	.58	.65	.45
1971	.65	.75	.67	.71	.56
1972	.65	.75	.67	.70	.56
1973	.65	.75	.67	.74	.68
1974	.86	.96	.88	1.05	1.10
1975	.86	.96	.88	1.29	1.07
1976	.86	.96	.88	1.46	1.15
1977	.86	.96	.88	1.28	.97
1978	.86	.96	.88	1.59	1.41
1979	.86	.96	.88	1.59	1.40
1980	.94	1.13	.98	1.69	1.43
1981	1.12	1.50	1.20	2.17	1.82
1982	1.12	1.50	1.20	2.83	2.52
1983	1.12	2.00	1.30	2.37	1.71
1984	1.12	2.00	1.30	2.64	2.30

Border Price Equivalents: Consumers

Morocco has been a significant importer of soft wheat. The process, described in chapter 1 in greater detail, consists essentially of ONICL issuing import licenses to the local representative of large grain companies with the lowest bid for a competitive bid for a certain quantity. Imported grain is delivered to the mills and transformed at competitive milling margins at the prevailing mix of ordinary (reduction ratio of 78 percent) and deluxe (reduction

ratio of 68 percent) flour. Costs are adjusted for transport and handling charges, financial and documentation charges and in-transit losses. The border price equivalents at the wholesale level to consumers are given in Tables II.9 (OER) and II.10 (EER) below.

Imports of hard wheat and barley (especially of human consumption quality) have been sporadic, thus a consistent series has to be reconstructed from comparable quality world market prices as described in the above section on the border price equivalent to cereals producers. The landed prices of these grains are also corrected for handling and transport costs, documentation and financial charges and losses up to delivery to the flour mills. Each grain is assumed to maintain the reduction ratios of 82 percent for hard wheat and 70 percent for barley. Ex-mill delivery costs to the wholesale points are added. The border consumer price equivalents at the wholesale level for hard wheat and barley are given in Tables II.11-II.14 below.

TABLE 11.9: BONNY PRICE EQUIVALENTS FOR FLOWS, SHELL PORTAL at OLD (1980=1)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (1/bbl)																									
...freight																									
...insurance																									
CIF Price (1/bbl)	64.90	64.05	67.19	63.26	64.55	66.38	72.15	66.90	67.19	64.58	70.75	69.87	85.51	190.16	190.70	177.60	151.17	115.29	117.60	191.16	282.10	277.25	152.26	144.22	152.41
Official Exchange Rate	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	4.68	4.41	4.37	4.45	4.42	4.59	4.17	1.90	5.04	5.17	6.02	7.13	8.01
CIF Price (DM/bbl)	328.00	328.10	340.00	320.00	326.60	335.70	363.60	338.50	340.00	326.00	358.00	327.60	432.90	782.60	840.30	698.20	644.30	518.83	571.00	765.60	796.60	916.00	916.60	1101.00	1159.20
PORT CHARGES																									
...Losses (2% of CIF)	6.50	6.60	6.80	6.40	6.53	6.71	7.30	6.77	6.86	6.52	7.16	6.55	7.86	15.65	17.17	13.96	12.13	10.30	11.40	14.91	15.93	18.33	18.33	23.64	26.78
...Handling	1.20	1.22	1.20	1.16	1.21	1.26	1.25	1.24	1.21	1.48	1.30	1.17	1.47	1.59	1.96	2.12	2.30	2.20	2.03	3.07	3.36	3.78	4.10	4.64	5.00
...Transport	2.25	2.00	2.00	1.21	1.20	1.34	1.32	1.29	1.30	1.40	1.44	1.39	1.72	1.87	4.69	4.85	5.26	5.52	6.50	7.04	7.70	8.67	9.58	10.16	11.46
...Govt. services tax	7.50	8.04	8.45	8.01	8.38	8.60	9.52	9.45	9.48	9.76	9.80	10.16	10.69	11.12	12.09	13.92	15.14	17.41	18.45	26.22	22.11	24.00	27.51	29.10	32.90
...Commissions (0)	20.01	20.32	20.92	20.16	20.74	29.50	32.72	29.29	29.92	20.26	31.50	28.83	34.50	68.82	76.91	61.49	53.35	45.45	50.49	65.61	70.10	80.64	80.66	104.00	117.05
...Storage (15 days)	6.25	6.36	6.60	7.06	7.35	7.59	7.52	7.47	7.19	7.71	7.81	8.14	8.65	8.79	10.18	11.90	11.94	13.44	14.74	15.90	17.50	19.66	21.70	23.06	26.00
...Financing (30 days)	4.10	4.00	4.20	4.43	4.12	4.23	4.60	4.27	4.20	4.12	4.51	4.13	4.95	5.06	10.94	8.80	7.64	6.50	7.23	9.39	10.04	11.55	11.53	14.09	15.87
LANDED PRICE EX PORT	386.56	381.61	400.35	379.46	387.20	398.10	434.02	400.97	402.71	388.36	423.81	390.10	464.77	902.15	1002.54	814.20	711.44	620.12	685.72	881.04	965.32	1083.91	1090.16	1391.17	1576.47
TRANSPORT TO FLOWS (BILL)	Average 175 km																								
...Transport	10.62	10.80	15.47	16.53	17.19	17.76	17.51	17.48	17.53	15.04	18.20	19.05	13.77	20.57	23.84	25.26	27.95	31.15	34.49	37.60	40.90	46.02	50.09	53.90	64.85
...Losses (2.5 % in as part)	9.66	9.54	10.01	9.48	9.68	9.95	10.77	10.02	10.07	9.71	10.64	9.77	11.62	22.56	25.06	20.36	17.85	15.51	17.14	22.03	23.30	27.10	27.25	34.78	39.44
...Handling	1.20	1.22	1.20	1.16	1.21	1.26	1.25	1.24	1.21	1.48	1.30	1.17	1.47	1.69	1.96	2.12	2.30	2.20	2.03	3.07	3.36	3.78	4.10	4.64	5.00
PRICE at FLOWS GATE	412.05	407.35	427.27	406.62	415.37	427.36	464.03	429.91	431.45	417.00	454.18	420.08	497.78	947.77	1053.19	862.09	762.14	669.87	740.18	944.34	1031.17	1160.02	1172.69	1488.36	1685.12
...Gathering margin	5.00	5.00	5.00	5.30	5.56	5.50	6.00	6.00	6.00	6.00	6.00	6.25	6.69	6.25	7.02	8.05	9.10	10.15	11.32	13.20	13.61	15.11	16.71	17.72	19.90
Reduction ratio (PS+= /BE)	534.67	528.53	554.49	526.10	538.01	554.99	598.26	556.85	561.27	543.33	589.93	547.06	646.50	1223.10	1360.53	1114.59	988.87	873.05	963.47	1226.46	1313.59	1507.60	1524.61	1925.75	2181.15
Reduction ratio (PS 9+ adj)	613.30	606.25	635.69	605.76	619.22	636.55	686.25	641.00	661.73	623.23	676.74	628.12	741.57	1403.92	1560.61	1279.00	1134.29	1000.79	1103.15	1406.82	1506.76	1729.33	1748.82	2208.95	2501.91
PRICE EX FLOWS GATE	550.44	544.07	570.49	541.61	553.21	571.26	615.06	575.29	577.27	559.31	607.11	563.97	665.51	1259.40	1400.54	1147.43	1017.52	897.70	991.01	1262.33	1352.22	1551.99	1569.45	1982.39	2245.50
...Loading/handling	1.20	1.22	1.20	1.16	1.21	1.26	1.25	1.24	1.21	1.48	1.30	1.17	1.47	1.69	1.96	2.12	2.30	2.20	2.03	3.07	3.36	3.78	4.10	4.64	5.00
...Transport costs	3.84	3.89	3.25	3.43	3.57	3.69	3.66	3.63	3.64	3.75	4.08	3.76	4.11	4.27	4.95	5.33	5.81	6.56	7.17	7.77	8.50	9.56	10.57	11.22	12.47
DELIVERED BONNY POINT (BNTV)	554.44	548.19	575.02	548.42	560.19	576.01	620.97	580.16	582.81	564.54	612.63	568.89	671.24	1265.44	1407.66	1156.90	1026.66	906.07	1001.01	1273.17	1364.08	1565.29	1584.21	1995.64	2262.95

TABLE II.10: DOMESTIC PRICE EQUIVALENTS FOR FLOUR AND WHEAT at LAS (Rs/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/mt)																									
...Freight																									
...Insurance																									
CIF Price ($/mt)	64.90	64.03	67.19	63.24	64.53	66.19	72.13	66.90	67.19	69.38	70.75	84.87	85.41	199.41	198.76	172.00	137.17	115.20	137.60	191.10	202.10	172.25	152.26	166.22	152.01
Equilibrium Exchange Rate	5.93	5.91	5.97	5.91	5.93	5.93	5.97	5.99	5.99	6.09	6.12	6.23	6.41	9.21	9.34	9.60	9.49	9.44	9.80	9.90	9.76	6.02	6.85	8.26	9.30
CIF Price (Rs/mt)	385.33	378.34	401.12	373.75	382.70	393.66	430.62	397.19	402.47	391.79	433.99	504.18	513.31	1837.24	1863.83	1875.29	711.91	627.10	899.09	1145.26	1101.36	1065.22	1042.90	1373.98	1444.10
PORT CHARGES																									
...Lighterage (2% of CIF)	7.71	7.57	8.02	7.47	7.66	7.87	8.61	7.95	8.05	7.83	8.64	8.98	10.27	21.74	21.36	17.52	14.24	12.54	16.18	22.87	22.29	21.31	20.86	27.46	28.88
...Handling	1.20	1.22	1.28	1.16	1.41	1.46	1.45	1.44	1.44	1.46	1.50	1.57	1.62	1.68	1.94	2.12	2.30	2.50	2.83	3.07	3.35	3.28	4.10	4.44	5.40
...Transport	2.75	2.80	2.94	3.11	3.28	3.34	3.12	3.29	3.30	3.48	3.44	3.59	3.72	5.02	4.49	4.03	3.26	3.92	6.56	7.04	7.20	8.67	9.50	10.16	11.44
...Misc. services (a)	7.96	8.04	8.45	8.05	8.58	9.60	9.52	9.45	9.46	9.45	9.88	10.30	10.69	11.12	12.07	13.02	13.11	17.61	18.63	20.22	22.11	24.08	27.51	29.18	32.96
...Commissions (b)	11.91	11.11	11.50	11.09	11.68	11.62	12.89	11.97	11.42	11.61	10.19	11.56	15.17	55.17	55.68	53.73	22.03	23.65	53.19	71.20	100.61	102.48	93.76	91.78	120.03	121.48
...Storage (15 days)	6.25	6.56	6.68	7.06	7.33	7.39	7.32	7.47	7.49	7.71	7.81	8.19	8.45	8.79	10.19	11.00	11.94	13.17	14.76	15.90	17.00	19.66	21.70	23.06	26.49
...Processing (30 days)	4.86	4.77	5.05	4.71	4.82	4.96	5.43	5.01	5.07	4.94	5.46	5.69	6.47	13.78	13.47	11.03	8.97	7.90	10.19	14.41	14.67	13.42	13.14	17.36	18.26
LANDED PRICE EX-PORT	449.91	442.61	468.05	439.29	450.24	467.84	500.15	464.96	472.71	463.67	507.84	579.47	599.70	1243.83	2223.99	1813.29	832.31	741.33	949.38	1327.45	1285.66	1250.76	1231.79	1605.91	1693.61
TRANSPORT TO FLOUR MILL:	Average 175 Km																								
...Transport	14.62	14.80	15.62	14.53	17.19	17.76	17.61	17.48	17.53	18.04	18.28	19.05	19.17	20.57	23.84	25.74	27.95	31.45	34.69	37.96	40.90	46.62	50.89	51.98	59.05
...Losses (2.5 % of ex port)	11.25	11.07	11.72	10.98	11.26	11.52	12.61	11.62	11.81	11.56	12.70	13.91	14.99	31.10	30.57	25.33	20.81	18.54	23.73	33.19	32.09	31.27	30.79	40.14	42.34
...Handling	1.20	1.22	1.28	1.16	1.41	1.46	1.45	1.44	1.44	1.46	1.50	1.57	1.62	1.68	1.94	2.12	2.30	2.50	2.83	3.07	3.35	3.28	4.10	4.44	5.40
PRICE AT FLOUR MILL	476.98	469.70	497.48	466.15	480.10	498.58	531.81	495.34	503.50	494.17	540.31	608.99	636.09	1297.18	1279.34	1866.98	883.43	794.33	1010.04	1401.11	1453.01	1331.81	1317.63	1793.95	1864.66
...Milling margin	5.00	5.00	5.00	5.50	5.50	5.50	6.00	6.00	6.00	6.00	6.00	6.25	6.69	6.73	7.82	9.45	9.18	10.33	11.32	12.38	13.43	15.11	16.71	17.72	19.90
...Extraction ratio (75+/- 2%)	417.92	408.69	444.20	407.25	422.57	419.01	454.89	443.57	451.21	441.75	706.66	668.57	823.02	1671.71	1630.23	1398.11	1149.60	1031.64	1309.95	1842.64	1853.63	1726.83	1716.12	2292.21	2385.62
Extraction ratio (95 %+ only)	700.79	690.20	750.94	694.55	713.62	734.01	797.68	748.58	749.27	735.55	883.40	757.71	944.97	1917.55	1892.91	1580.78	1312.69	1183.36	1502.59	2070.52	2130.29	1980.27	1962.29	2531.61	2679.09
PRICE EX-FLOUR MILL	636.69	626.26	663.15	625.11	640.80	630.71	715.55	664.56	672.67	660.11	721.00	688.40	848.05	1730.08	1698.27	1418.64	1178.03	1061.99	1348.68	1865.33	1918.01	1777.62	1761.65	2272.19	2404.31
...Loading/handling	1.20	1.22	1.28	1.16	1.41	1.46	1.45	1.44	1.44	1.46	1.50	1.57	1.62	1.68	1.94	2.12	2.30	2.50	2.83	3.07	3.35	3.28	4.10	4.44	5.40
...Transport costs	1.84	1.69	1.75	1.61	1.57	1.69	1.86	1.65	1.69	1.75	1.80	1.96	4.11	4.22	4.95	5.15	5.01	4.34	7.17	7.77	8.50	9.36	10.57	11.22	12.64
AVAILABLE DOMESTIC PRICE EQUIV.	640.33	630.91	667.68	627.90	643.84	661.88	720.43	669.67	677.30	663.34	726.30	688.53	853.78	1736.04	1708.48	1426.41	1186.12	1071.11	1358.68	1876.18	1921.87	1790.16	1775.79	2287.84	2421.96

TABLE II.11 BORDER PRICE EQUIVALENTS FOR FLOUR MADE WHEAT at US$ (US$/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/mt)	83.00	120.00	94.00	83.00	61.06	61.00		74.00	72.00	62.00	64.00	67.00	82.00	230.00	240.00				134.00	187.00			156.00	177.00	163.00
...Freight	3.76	4.00	3.30	4.40	4.20	4.40		4.30	3.40	4.10	7.00	3.20	4.10	13.20	10.20				7.10	12.40			10.30	12.50	12.50
...Insurance	4.34	4.26	4.07	4.37	3.26	3.28		3.92	3.77	3.31	3.65	3.27	4.31	12.56	12.51				7.06	9.97			8.32	9.40	8.70
CIF Price ($/mt)	91.04	131.04	102.17	91.77	68.46	68.68	72.13	82.22	79.17	69.41	74.65	68.57	90.41	263.76	262.71	232.64	134.64	126.02	148.16	209.37	293.03	221.01	174.62	198.90	184.20
Official Exchange Rate	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.05	6.60	6.11	6.37	6.05	6.42	6.50	6.17	3.90	3.94	5.17	6.02	7.11	8.81
CIF Price ($m/mt)	460.64	663.06	516.95	464.36	344.41	348.53	364.98	416.01	400.60	351.19	387.85	346.25	415.86	1094.05	1140.04	942.29	595.10	567.10	617.01	816.54	1157.70	1142.60	1051.18	1414.71	1623.66
MOBI CHARGES																									
...Losses (2% of CIF)	9.21	13.26	10.34	9.29	6.93	6.97	7.30	8.32	8.01	7.02	7.76	6.93	8.32	21.60	22.96	18.86	11.99	11.34	.36	16.33	23.15	22.05	21.02	28.29	32.47
...Handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.03	3.07	3.36	3.70	4.10	4.44	5.00
...Transport	2.75	2.80	2.94	3.11	3.24	3.34	3.32	3.29	3.30	3.40	3.44	3.59	3.72	3.87	4.49	4.85	5.26	5.92	4.50	7.04	7.70	8.63	9.50	10.16	11.44
...Misc. services (a)	7.90	8.04	8.45	8.93	9.30	9.40	9.52	9.45	9.40	9.26	9.80	10.30	10.69	11.12	12.09	13.92	15.11	17.01	18.65	20.22	22.11	24.80	23.51	29.10	32.90
...Commission (b)	40.54	58.35	45.49	40.84	30.40	30.67	32.12	36.61	35.25	30.90	34.13	30.47	36.60	95.40	101.03	82.91	52.37	49.90	54.37	71.86	101.00	100.55	92.50	124.49	142.86
...Storage (15 days)	6.23	4.36	6.60	7.06	7.35	7.59	7.52	7.67	7.49	7.31	7.81	8.14	8.45	8.79	10.10	11.00	11.96	13.44	14.74	15.90	17.40	19.66	21.74	23.06	26.00
...Financing (30 days)	5.00	8.35	6.51	5.85	4.36	4.39	4.60	5.24	5.05	4.42	4.89	4.36	5.24	13.66	14.47	11.87	7.50	7.15	7.78	10.29	14.59	11.40	13.24	17.02	20.44
LANDED PRICE EX MOBI	534.30	761.45	598.65	540.82	409.48	412.56	430.80	487.82	470.62	415.09	457.26	411.60	490.50	1240.26	1316.02	1087.31	701.49	674.45	735.03	961.34	1347.97	1337.29	1260.96	1652.17	1894.61
TRANSPORT TO FLOUR MILL-	Average 175 km																								
...Transport	10.62	14.00	15.62	16.53	17.19	17.76	17.61	17.48	17.53	18.04	18.28	19.05	19.77	20.57	23.04	25.76	27.95	31.45	34.19	37.40	40.90	46.02	50.09	58.90	68.03
...Losses (2.5 % of ex port)	13.36	19.04	14.97	13.52	10.24	10.31	10.77	12.20	11.77	10.40	11.43	10.29	12.26	31.01	32.90	27.19	17.54	16.86	18.38	24.02	33.70	33.43	31.52	41.30	47.37
...Handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.03	3.07	3.36	3.70	4.10	4.44	5.00
PRICE at FLOUR MILL	563.48	796.59	630.52	572.23	438.32	442.10	460.62	518.93	501.36	443.01	488.47	442.50	524.15	1293.52	1374.71	1142.75	749.28	725.35	790.73	1025.84	1425.93	1420.63	1327.07	1751.09	2067.03
...Milling margin	5.00	5.00	5.00	5.50	5.50	5.50	6.00	6.00	6.00	6.00	6.00	6.25	6.49	6.75	7.02	8.45	9.10	10.33	11.32	12.20	13.43	15.11	16.71	17.32	19.90
...Production ratio (82%)	693.26	1027.60	814.77	740.67	569.00	573.84	598.23	672.99	650.66	579.25	633.93	575.23	680.31	1667.02	1772.47	1475.90	972.30	943.10	1028.27	1330.93	1845.34	1840.78	1722.00	2260.73	2599.75
PRICE EX FLOUR MILL	693.26	1027.60	814.77	740.67	569.00	573.84	598.23	672.99	650.66	579.25	633.93	575.23	680.31	1667.02	1772.47	1475.90	972.30	943.10	1028.27	1330.93	1845.34	1840.78	1722.00	2260.73	2599.75
...Loading/handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.03	3.07	3.36	3.70	4.10	4.44	5.00
...Transport costs	3.04	3.09	3.23	3.43	3.57	3.69	3.66	3.63	3.64	3.75	3.88	3.96	4.11	4.27	4.95	5.35	5.81	6.54	7.17	7.77	8.50	9.56	10.57	11.22	12.64
WHOLESALE BORDER PRICE EQUIV	697.50	1031.99	819.20	745.47	573.99	578.99	603.34	678.06	655.54	584.40	639.23	580.85	686.04	1672.99	1779.38	1483.37	980.40	952.36	1038.27	1341.77	1857.20	1854.04	1737.55	2284.38	2617.39

TABLE IV.12 BORDER PRICE EQUIVALENTS FOR FLOUR HARD WHEAT at 15% (US$/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/mt)	83.00	120.00	94.00	83.00	61.00	61.00		72.00	72.00	62.00	64.50	62.00	82.00	238.00	240.00				134.00	187.00			156.00	177.00	163.00
freight	3.70	4.80	3.38	4.48	4.28	4.40		4.36	3.48	4.10	7.00	3.99	4.10	13.20	10.20				7.10	12.60			10.30	12.50	12.50
insurance	4.34	6.24	4.87	4.37	3.26	3.26		3.92	3.77	3.31	3.65	3.77	4.31	12.54	12.51				7.04	9.97			8.32	9.48	8.78
CIF Price ($/mt)	91.04	131.04	102.17	91.77	68.46	68.80	72.13	82.22	79.47	69.41	75.65	68.97	90.41	263.76	262.71	232.64	134.64	126.92	148.14	209.37	293.83	221.01	174.62	198.98	184.28
Equilibrium Exchange Rate	5.93	5.91	5.97	5.91	5.93	5.93	5.97	5.93	5.89	6.09	6.17	6.23	6.01	5.41	5.36	5.00	5.19	5.66	5.00	5.90	5.76	6.01	6.05	8.26	9.50
CIF Price (DA/mt)	539.84	774.65	609.83	542.36	405.97	408.46	430.62	488.26	474.23	422.68	467.10	427.16	543.33	1426.07	1408.13	1161.81	698.78	685.55	871.15	1252.03	1692.46	1328.27	1056.11	1643.53	1750.61
PORT CHARGES																									
Losses (2% of CIF)	10.80	15.49	12.20	10.85	8.12	8.17	8.61	9.77	9.48	8.45	9.30	8.56	10.87	30.12	29.16	23.64	13.90	13.71	17.42	25.04	33.85	26.57	23.92	32.87	35.01
Handling	4.20	3.22	3.28	3.36	3.41	3.46	3.45	3.44	3.44	3.40	3.50	3.57	3.62	3.69	3.96	2.12	2.30	2.50	2.83	3.07	3.36	3.70	4.10	4.44	5.00
Transport	2.75	2.00	2.94	3.11	3.24	3.34	3.32	3.29	3.30	3.49	3.44	3.59	3.72	3.87	4.69	4.85	5.26	5.92	6.50	7.04	7.70	8.67	9.50	10.16	11.44
Misc. services (a)	7.90	8.04	8.65	8.93	9.30	9.60	9.52	9.65	9.48	9.76	9.86	10.30	10.59	11.17	12.09	13.92	15.11	17.01	18.65	20.22	22.11	24.00	27.51	29.10	32.90
Commissions (b)	67.51	68.15	53.67	47.73	35.73	35.94	37.09	42.98	41.73	37.26	41.20	37.59	47.81	132.53	123.92	104.00	61.49	60.33	76.64	110.10	148.94	116.89	105.26	144.63	154.05
Storage (15 days)	6.25	6.36	6.68	7.06	7.35	7.59	7.52	7.67	7.69	7.71	7.81	8.14	8.45	8.39	10.18	11.00	11.94	13.44	14.76	15.90	17.60	19.66	21.74	23.66	26.00
Financing (30 days)	6.00	9.76	7.69	6.83	5.12	5.15	5.43	6.15	5.90	5.33	5.91	5.30	6.85	18.98	17.74	14.89	8.80	8.64	10.90	15.70	21.35	16.74	15.07	20.71	22.06
LANDED PRICE CF PORT	623.85	884.27	702.83	628.23	476.22	479.71	504.35	568.90	553.13	496.68	548.30	502.76	633.34	1713.17	1667.46	1356.22	817.67	807.10	1018.93	1449.35	1947.73	1565.46	1403.29	1900.59	2037.09
TRANSPORT TO FLOUR MILL	Average 175 km																								
Transport	14.62	14.00	15.62	16.53	17.19	17.76	17.61	17.48	17.53	18.04	18.20	19.05	19.77	20.57	23.04	25.74	27.95	31.45	34.69	37.48	40.90	46.02	50.89	53.90	60.05
Losses (2.5 % of ex port)	15.58	22.16	17.57	15.71	11.91	11.99	12.61	14.22	13.83	12.40	13.71	12.56	15.83	42.83	40.19	33.91	20.44	20.18	25.47	36.23	48.68	38.64	35.08	47.71	50.93
Handling	4.20	3.22	3.28	3.36	3.41	3.46	3.45	3.44	3.38	3.40	3.50	3.57	3.62	3.69	3.96	2.12	2.30	2.50	2.83	3.07	3.36	3.70	4.10	4.44	5.00
PRICE AT FLOUR MILL	658.65	924.53	737.31	661.82	508.73	510.93	536.01	602.03	585.93	527.92	581.71	535.63	670.57	1778.26	1673.44	1417.98	868.37	861.40	1081.73	1526.05	2040.17	1633.90	1493.54	2014.72	2153.87
Milling margin	5.00	5.00	5.00	5.50	5.50	5.50	6.00	6.00	6.00	6.00	6.00	6.25	6.49	6.75	7.02	8.45	9.18	10.33	11.32	12.28	13.63	15.11	16.71	17.72	19.90
Reduction ratio (0.78)	844.70	1191.70	951.68	855.54	656.71	662.09	694.89	779.53	758.80	684.52	753.58	694.47	868.02	2286.67	2155.47	1828.75	1125.06	1117.60	1401.34	1972.22	2632.82	2114.11	1936.22	2605.69	2786.99
PRICE CF FLOUR MILL	844.70	1191.70	951.68	855.54	656.71	662.09	694.89	779.53	758.80	684.52	753.58	694.47	868.02	2286.67	2155.47	1828.75	1125.06	1117.60	1401.34	1972.22	2632.82	2114.11	1936.22	2605.69	2786.99
Loading/handling	1.20	1.22	1.28	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.83	3.07	3.36	3.70	4.10	4.44	5.00
Transport costs	3.04	3.09	3.25	3.43	3.57	3.69	3.66	3.63	3.64	3.75	3.90	3.96	4.31	4.22	4.95	5.35	5.81	6.56	7.17	7.77	8.50	9.36	10.57	11.22	12.64
WHOLESALE BORDER PRICE EQUIV.	848.44	1196.02	956.21	860.33	661.70	667.24	700.00	784.60	763.91	689.75	758.87	699.99	873.76	2294.43	2162.38	1836.21	1133.16	1126.72	1411.34	1983.07	2644.68	2127.16	1950.87	2621.34	2804.63

TABLE 11.13: BARLEY PRICE EQUIVALENTS FOR FLOUR, BARLEY at OLD (Br/ton)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (Br/ton)			57.00	57.00	61.00	65.00			89.00	91.00	90.00						87.00								
...Freight			3.30	4.00	4.20	4.40			3.00	4.10	7.00						5.20								
...Insurance			3.03	3.07	3.11	3.40			2.62	2.76	2.65						4.61								
CIF Price (Br/ton)	48.02	51.42	63.33	64.47	69.51	73.00	86.60	69.90	93.62	97.86	99.65	85.74	86.19	104.06	167.64	147.56	96.81	171.07	180.01	169.60	225.74	180.72	462.74	187.46	136.75
Official Exchange Rate	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.05	6.60	6.11	6.37	6.65	6.62	6.30	6.17	5.90	5.94	5.17	6.02	7.11	8.84
CIF Price (Kr/ton)	243.00	260.20	320.37	326.22	351.77	369.70	438.20	353.70	278.90	297.75	302.04	433.00	569.00	639.20	1132.60	982.60	622.90	1044.00	1110.00	1000.00	1339.00	934.30	979.70	1330.00	1209.00
POST CHARGES																									
...Losses (2% of CIF)	4.86	5.20	6.41	6.52	7.03	7.40	8.76	7.07	5.57	5.83	6.04	8.66	7.60	8.78	10.65	11.95	8.36	10.90	9.01	11.10	17.79	18.69	19.59	26.60	20.09
...Handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.49	1.44	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.83	3.07	3.36	3.78	4.18	4.44	5.00
...Transport	3.75	3.80	3.94	3.11	3.24	3.36	3.32	3.29	3.50	3.60	3.44	3.59	5.73	3.87	6.49	6.85	5.26	5.92	6.50	7.04	7.70	8.67	9.56	10.16	11.46
...Over. services (a)	7.90	8.04	8.05	8.93	8.56	9.60	9.52	9.45	9.66	9.76	9.80	10.56	10.69	11.12	13.09	13.92	15.11	17.01	18.65	20.22	23.11	26.80	27.51	29.18	32.59
...Commissions (b)	21.38	22.90	28.19	28.71	30.95	32.50	38.56	31.13	24.50	25.76	26.53	38.10	52.94	38.63	64.47	52.30	37.66	63.94	59.64	58.03	76.27	62.22	86.21	117.04	106.00
...Storage (13 days)	6.73	6.34	8.68	7.06	7.35	7.39	7.52	7.47	7.19	7.71	7.81	8.14	8.45	8.79	10.10	11.06	11.94	13.44	14.74	15.90	17.68	19.66	21.71	23.04	26.00
...Financing (30 days)	5.06	5.20	6.04	6.11	6.43	6.66	5.32	6.56	6.51	6.69	6.82	8.46	8.66	9.58	9.23	7.53	5.39	6.86	5.66	8.51	11.23	11.77	12.50	16.76	15.10
LANDED PRICE EX-PORT	296.61	318.01	378.56	386.93	415.63	436.50	512.85	418.00	333.69	356.00	362.00	500.01	636.00	517.64	856.43	701.55	514.12	949.46	967.43	785.26	1047.32	1103.97	1160.87	1557.25	1425.23
TRANSPORT TO FLOUR MILL:	Average 175 km.																								
...Transport	14.62	14.80	15.62	16.53	17.19	17.76	17.61	17.40	17.53	18.04	18.28	19.05	19.77	20.57	23.84	25.76	27.95	31.43	30.69	37.40	40.90	44.02	50.09	53.90	60.00
...Losses (2.5 % at transport)	7.26	7.75	9.46	9.65	10.39	10.91	12.82	10.45	8.34	8.76	9.05	12.72	10.97	12.94	21.26	17.54	12.85	16.24	13.69	19.63	26.18	27.60	29.02	38.93	35.63
...Handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.49	1.44	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.83	3.07	3.36	3.78	4.18	4.44	5.00
PRICE AT FLOUR MILL	313.49	333.84	404.73	414.36	444.63	465.31	544.73	447.34	361.00	378.68	396.83	542.14	478.34	553.83	897.53	746.94	557.22	999.73	998.45	845.35	1117.76	1181.38	1264.97	1654.39	1526.76
...Mailing margin	5.00	5.00	5.00	5.50	5.50	5.50	6.00	6.00	6.00	6.00	6.00	6.25	6.69	6.75	7.82	8.65	9.10	10.33	11.32	12.20	13.65	15.11	16.71	17.72	19.90
...Reduction ratio (70%)	434.99	484.00	385.33	390.66	442.75	474.29	786.75	647.66	524.70	549.55	566.09	783.42	682.60	799.61	1293.35	1079.13	809.15	1414.30	871.09	1225.10	1615.99	1709.27	1802.39	2389.41	2209.36
PRICE AT FLOUR MILL	434.99	484.00	385.33	390.66	442.75	474.29	786.75	647.66	524.70	549.55	566.09	783.42	682.60	799.61	1293.35	1079.13	809.15	1414.30	871.09	1225.10	1615.99	1709.27	1802.39	2389.41	2209.36
...Loading/handling	1.20	1.22	1.20	1.36	1.41	1.46	1.45	1.49	1.44	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.83	3.07	3.36	3.78	4.18	4.44	5.00
...Transport costs	3.04	3.09	3.25	3.61	3.57	3.69	3.66	3.63	3.64	3.75	3.80	3.96	4.11	4.27	4.95	5.35	5.81	6.34	7.17	7.77	8.50	9.36	10.37	11.23	12.64
AVAILABLE WHOLE PRICE EQUIV.	430.23	480.19	389.86	401.43	447.74	479.44	791.86	652.73	529.34	554.78	573.19	788.94	688.21	803.37	1300.36	1086.99	817.26	1423.50	881.10	1236.62	1627.84	1722.61	1811.15	2404.66	2222.31

TABLE 33.14c WORLD PRICE EQUIVALENTS FOR FLOUR: MARKET at ELR (Rs/mt)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (f/at)		57.00	57.00	62.50	65.00			19.00	51.00	50.50						87.00								
..Freight		3.30	4.00	4.20	4.60			3.40	4.10	7.00						5.20								
..Insurance		1.02	1.07	1.31	1.40			1.62	2.76	2.85						4.61								
CAF Price (f/at)	60.63	51.42	61.32	64.07	69.51	73.00	84.00	69.99	55.02	57.85	59.85	95.76	80.19	106.36	167.64	107.56	96.01	121.67	100.01	169.60	225.74	180.72	162.76	181.96	154.75
Equivalence Exchange Rate	5.93	5.91	5.97	5.91	5.95	5.95	5.97	5.96	5.99	6.09	6.12	6.25	6.04	5.71	5.36	5.00	5.29	5.04	5.00	5.90	5.76	6.91	6.05	8.76	9.50
CAF Price (Rs/mt)	284.76	303.85	377.99	381.82	412.19	433.36	363.00	413.21	329.37	352.34	366.20	536.16	483.19	610.17	898.55	962.20	595.10	567.19	655.10	1011.10	1157.70	1242.60	1114.77	1585.12	1298.94
PORT CHARGES																									
...Lessons (2% on CIF)	5.70	6.08	7.56	7.62	8.24	8.67	7.26	8.26	6.59	7.05	7.33	10.68	9.66	12.20	17.93	10.84	11.90	11.34	12.70	20.22	23.15	22.05	22.30	30.96	25.98
...Handling	1.48	1.22	1.78	1.36	1.41	1.46	1.45	1.49	1.54	1.68	1.56	1.37	1.62	1.69	1.96	2.12	2.10	2.58	2.03	3.07	3.36	3.78	4.18	4.44	5.00
...Transport	2.75	3.00	2.91	3.11	3.24	3.36	3.32	3.29	3.36	3.60	3.44	3.59	3.72	3.87	4.49	4.05	5.26	5.97	6.56	7.04	7.76	8.67	9.50	10.16	11.44
...Other services (a)	3.99	6.04	8.65	8.91	9.50	9.66	9.52	9.65	9.40	9.76	9.50	10.56	10.69	11.12	12.09	11.92	15.11	17.01	10.65	26.22	22.13	24.00	27.31	29.10	32.00
Commissions (b)	25.06	26.74	33.26	33.55	36.27	38.15	32.12	36.36	29.00	31.01	32.23	47.01	42.52	53.76	79.07	82.91	52.37	49.53	53.09	88.90	101.80	108.55	98.10	135.97	114.31
..Demurrage (15 days)	6.25	6.36	8.68	7.66	7.15	7.59	7.52	7.67	7.49	7.71	7.86	8.14	8.65	9.29	10.18	11.00	11.94	13.14	14.74	15.98	17.98	19.66	21.74	23.06	26.00
..Financing (60 days)	3.39	3.83	4.76	4.80	5.19	5.46	4.60	5.23	4.15	4.44	4.62	6.73	6.09	7.69	11.32	11.07	7.50	7.13	8.00	12.74	14.59	14.40	14.03	19.07	16.37
LANDED PRICE EX PORT	337.21	358.97	442.93	447.63	483.20	507.62	456.02	486.92	401.02	417.17	433.09	622.17	565.09	709.23	1036.63	1007.71	701.49	674.45	756.01	1179.36	1367.97	1337.10	1312.23	1790.36	1536.95
TRANSPORT TO FLOUR MILL:	Average 473 Km																								
...Transport	14.62	14.00	15.62	16.53	17.19	17.76	17.61	17.48	17.53	18.01	18.28	19.05	19.77	20.57	23.84	25.26	27.95	31.15	34.69	37.48	40.90	46.02	50.07	57.90	64.85
...Losses (2 1 on ex port)	8.43	8.97	11.07	11.19	12.08	12.69	10.77	12.17	9.78	10.43	10.83	15.55	14.13	17.73	25.91	27.19	17.54	16.86	18.86	29.48	33.70	33.45	32.81	44.76	38.27
...Handling	1.20	1.22	1.78	1.36	1.41	1.46	1.45	1.49	1.54	1.68	1.56	1.37	1.62	1.69	1.96	2.12	2.10	2.58	2.03	3.07	3.36	3.78	4.18	4.44	5.00
PRICE AT FLOUR MILL	361.46	384.44	470.91	476.30	513.89	539.53	486.03	518.01	419.73	447.33	463.69	658.14	601.43	749.21	1088.14	1142.75	749.28	725.35	810.59	1249.31	1475.93	1420.63	1406.11	1901.67	1635.07
Milling margin	5.00	5.00	5.00	5.50	5.50	5.50	6.00	6.00	6.00	6.00	6.00	6.75	6.69	6.75	7.02	8.47	9.10	10.33	11.32	12.28	13.01	15.11	16.73	17.72	19.90
Reduction ratio (78%)	523.51	555.77	679.87	688.58	741.99	778.62	666.64	748.59	608.24	647.33	670.99	949.61	868.46	1079.95	1565.66	1649.30	1083.51	1050.47	1170.16	1802.27	2056.23	2051.06	2029.62	2741.99	2364.35
PRICE AT FLOUR MILL	523.51	555.77	679.87	688.58	741.99	778.62	666.64	748.59	608.24	647.33	670.99	949.61	868.46	1079.95	1565.66	1649.30	1083.51	1050.47	1170.16	1802.27	2056.23	2051.06	2029.62	2741.99	2364.35
Loading/handling	1.20	1.22	1.78	1.36	1.41	1.46	1.45	1.49	1.54	1.68	1.56	1.37	1.62	1.69	1.96	2.12	2.10	2.58	2.03	3.07	3.36	3.78	4.18	4.44	5.00
Transport costs	3.04	3.69	3.25	3.43	3.57	3.69	3.66	3.63	3.64	3.75	3.88	3.96	4.11	4.23	4.95	5.15	5.81	6.54	7.17	7.77	8.50	9.56	10.57	11.72	12.64
WHOLESALE BORDER PRICE (Rs/t)	527.75	560.69	684.90	693.37	746.97	783.77	671.76	753.66	613.32	652.76	676.29	954.93	874.19	1085.91	1572.57	1657.04	1091.61	1060.49	1184.16	1813.12	2068.09	2064.41	2038.78	2753.16	2382.00

ANNEX THREE

ESTIMATION OF SUGAR CROP PRICES

Domestic Prices: Producers

Producer prices are set at farmgate in the sense that losses, loading and transport costs are not borne by the farmers but by the sugar mills. The prices announced are base prices for specified minimum sugar content and impurity rates. For instance, beets with a sugar content of over 16.5 percent are thus paid a premium, while lower sugar content or greater impurities are penalized. The formula for sugar beets is:

$$\text{Producer price} = \frac{\text{Base Reference Price} \times (\text{Sugar content} - 3)}{13.5}$$

Unlike cereals producers, Moroccan sugar producers receive the official price since there are no alternative disposal possibilities and since sugar cultivation entitles farmers to inputs and services at credit.

TABLE III.1: SUGAR PRODUCER PRICES

	SUGAR BEET			SUGAR CANE		
YEAR	Producer Price (Dh/mt)	Production ('000 mt beets)	Production ('000 mt raw sugar)	Producer Price (Dh/mt)	Production ('000 mt cane)	Production ('000 mt raw sugar)
1963	59.0	71.9	11.9			
1964	59.0	180.8	29.8			
1965	59.0	173.1	28.6			
1966	60.0	365.9	60.4			
1967	60.0	414.3	68.4			
1968	60.0	861.3	142.2			
1969	60.0	879.7	145.2			
1970	60.0	1127.1	186.0			
1971	60.0	1578.2	260.4			
1972	60.0	1688.7	278.6			
1973	68.0	1478.6	244.0	59.0	9.1	1.0
1974	76.0	1951.9	322.1	59.0	26.1	2.6
1975	98.0	1794.4	296.1	65.0	83.0	6.6
1976	96.0	2174.0	358.7	65.0	77.6	8.1
1977	96.0	1458.8	240.7	65.0	177.4	18.6
1978	115.2	2308.7	380.9	81.3	333.9	35.1
1979	115.2	2375.0	391.9	81.3	293.6	30.6
1980	135.0	2198.3	361.9	95.0	375.2	39.4
1981	135.0	2114.7	348.9	95.0	622.4	65.4
1982	155.0	2313.6	381.7	105.0	517.4	54.3
1983	155.0	2589.1	427.2	105.0	762.8	80.1
1984	175.0	2525.8	416.8	120.0	799.0	83.9

Note: Production converted into theoretical raw sugar equivalent assuming the following sugar contents: 16.5 percent for beet and 10.5 percent for sugar cane. From this theoretical sugar content, the sugar loss factor écart technique) must be subtracted to estimated actual production.

Border Price Equivalents: Producers

Imports are executed by the Office National du Thé et du Sucre (ONTS). Actual landed CIF price data are available from 1960 to the present from ONTS. These prices, once converted to their farmgate (sugar beet) equivalents on the basis of the interventions prevailing in the Moroccan sugar industry.[78] Other key corrections are made for port charges, milling charges and charges for collection and delivery of beet to the mill.

78 For a more detailed description of the Moroccan sugar sector see World Bank/EMENA, Agricultural Prices and Incentives Study, (2 vols.), Report No. 6045-MOR, January 21, 1986.

Port charges include losses of 2 percent, handling, port area transport for 25 kilometers, miscellaneous and financial charges inclusive of service charges. Sugar ex-port is delivered to mills at a distance of on average 100 kilometers from the principal ports. Only the sugar mills and refinery at Tadla are at a distance greater than 100 kilometers. Imported raw sugar was assumed to be refined at 750 Dh/ton in 1984, adjusted by the Moroccan CPI to estimate the refining cost in other years.[79]

Of major significance to this study is the choice of method for converting raw sugar prices at the border into farmgate equivalent sugar beet prices. The issue revolves around an assessment of domestic agro-industrial efficiency. It applies therefore to all analyses of crops which undergo agro-industrial transformation, not merely to the Moroccan case. In many agricultural analyses the issue does not arise because the basic agricultural commodity is a tradable good. In the case of sugar, however, the agricultural products (beet and cane) are not tradable, while the transformed industrial output (raw or refined sugar) is.

Two different methods were evaluated for use in this study. An international reference refining margin can be deducted from the border price for raw sugar in order to derive the equivalent reference price for the raw material, sugar beets. Alternatively, border prices can be converted into domestic beet equivalent prices by applying the average observed milling margin in Morocco which, because of the share of the more expensive transformation into

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[79] Morocco's actual refining costs in 1984 were on the order of 1250 Dh/ton. The additional 60 percent cost is explained by the fact that the main product from the sugar refining process in Morocco is "sugar loaf", a non-traded commodity, which essentially requires two rounds of refining. Refining costs in the integrated mills in Morocco which produce granulated white sugar, on the other hand, are much closer to international norms.

sugar loaf, is significantly above the international margin which is fo granulated sugar only. Depending on which method one applies, Moroccan suga production is (international margin metho) or is not (observed domestic margi method) an efficient joint agricultural/agro-industrial activity. While th domestic refining margin method is discussed below, the international referenc refining method is applied in this study, as the issue of domestic agro industrial efficiency is not under consideration here.

Domestic Refining Margin

Detailed financial accounts for the integrated sugar mills, available fro 1974 through 1984, are analyzed and the net costs of processing, expressed i economic terms (corrected for distortions from border prices and for domesti taxes or subsidies), are estimated for each mill.[80] In addition, average cos data for the three refineries processing domestic raw beet sugar is availabl for the period from 1980 to 1984. An average cost of domestic sugar milling calculated through the raw sugar output stage and weighted by the capacity us rate of each mill, is thus derived from the cost data. For prior years for whic data are not available, the average cost is adjusted by the industrial GD deflator.

This average domestic processing cost is then deducted from the prevailin world price of raw sugar, arrived at Moroccan borders and then delivered to th sugar refinery. The net difference between the raw sugar border price at ex mill and the domestic milling margin is the economic value of the non-trade primary input, sugar beet, at the mill gate. Collection charges includin

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80 Net costs are = (variable costs + fixed costs - primary input valu - by-product value).

loading, trucking and losses of 5 percent are deducted from the value of sugar beet at the mill gate to arrive at the farm gate border price equivalent of beet.

In years of low world sugar prices, this method yields negative value-added and therefore negative residual sugar beet value, suggesting that infinite protection is paid to Moroccan sugar beet producers in those years.

International Reference Refining Margin

Alternatively, instead of applying actual observed sugar milling margins from Morocco the border price equivalent of raw sugar at the farm gate can be derived by using a reference milling margin, representing efficient processing costs (i.e. assumed to be non-distorted) in the international market. Such information is rather difficult to gather. In this study a milling margin of 750 Dh/ton is subtracted from the border raw sugar price adjusted to ex-mill to estimate the mill gate sugar beet equivalent price.[81] Adjustments for collection and losses between mill gate and farm gate are then made as above. Resulting border equivalent producer prices are presented in Tables III.2 (OER) and III.3 (EER) below.

81 Personal communication with the directors of the Moroccan Sugar Industry Association is the source of this reference milling margin for 1984. The margins in other years are derived by deflating the 1984 value by the Moroccan CPI.

TABLE III.7: BORDER PRICE EQUIVALENTS FOR SUGAR DELT at CIF (lb/cwt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
CIF Price (lb/cwt)	87.15	86.71	81.69	90.50	144.79	192.77	141.90	84.73	78.95	81.65	89.60	101.78	161.71	205.66	323.60	490.32	816.60	250.64	198.86	199.84	476.25	672.99	326.62	219.73	196.20
Official exchange rate	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.05	4.60	4.11	4.57	6.05	6.42	6.50	6.17	5.90	5.94	5.17	6.02	7.11	8.04
CIF Price (lb/cwt raw)	441.00	438.90	423.30	458.00	613.70	975.50	528.30	428.80	399.75	413.20	457.50	521.10	744.00	943.00	2267.50	3407.60	5581.40	1178.70	628.60	779.25	1878.62	3800.99	1935.90	1744.00	1738.60
CIF Price (lb/cwt refined)	464.21	467.00	445.79	482.53	856.31	1026.84	556.11	451.37	399.16	434.95	477.26	551.68	783.16	888.21	2387.89	3397.47	5769.89	1240.11	673.21	820.21	1973.08	3664.11	2037.29	1790.53	1819.30
PRICE CHANGES (lb/cwt refined)																									
...Losses (2% of CIF)	9.28	9.35	8.92	9.65	17.13	20.54	11.12	9.03	7.99	8.70	9.55	11.01	15.66	17.76	48.16	15.95	15.49	25.76	17.44	16.60	38.46	73.28	40.74	35.09	36.39
...Handling	1.20	1.27	1.20	1.36	1.91	1.66	1.43	1.44	1.44	1.46	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.85	3.07	3.16	3.78	4.18	4.64	5.40
...Transport	2.75	2.80	2.96	3.11	3.20	3.59	3.32	3.29	3.36	3.40	3.44	3.39	3.22	3.07	4.49	4.85	5.26	5.93	6.30	7.04	7.78	8.67	9.36	10.16	11.46
...Bank. services	13.07	13.30	13.96	14.77	15.37	15.87	15.74	15.62	15.67	16.43	16.33	17.62	17.52	16.56	21.36	25.01	28.98	28.11	30.81	33.43	36.56	41.15	45.68	48.20	54.19
...Financing (30 days)	5.85	5.82	5.62	6.08	10.79	12.94	7.01	5.69	5.01	5.48	6.01	6.95	9.87	11.19	30.34	47.85	47.50	34.37	18.99	18.33	26.86	46.17	25.68	22.61	22.93
LANDED PRICE EX-PORT (lb/cwt refined)	496.37	494.38	478.51	517.50	904.67	1081.00	596.73	496.43	432.58	470.13	518.10	591.85	831.70	[illegible]	[illegible]	3431.24	3725.34	1263.46	748.80	890.49	2084.99	3837.10	2163.67	1915.87	1999.74
DELIVERY TO SUGAR REFINERY:	Average 100 km.																								
...Transport	8.15	8.50	8.93	9.61	9.81	10.15	10.06	9.99	10.02	10.11	10.49	10.80	11.18	11.75	15.62	16.71	15.97	17.97	19.71	21.17	23.37	26.30	29.60	30.84	34.77
...Losses 12.5 % of exports	12.41	12.34	11.96	12.94	25.61	27.02	14.87	12.14	10.81	11.75	12.85	14.84	20.29	23.51	62.85	58.78	98.13	31.59	23.52	22.16	52.12	95.93	54.69	47.99	48.74
...Handling	1.20	1.27	1.20	1.36	1.91	1.66	1.43	1.44	1.44	1.46	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.85	3.07	3.16	3.78	4.18	4.64	5.40
PRICE AT SUGAR MILL (lb/cwt refined)	518.13	516.47	500.69	541.21	942.72	1119.83	621.11	519.02	454.85	493.68	542.90	619.09	865.42	970.46	2597.57	[illegible]	3941.74	1315.68	794.87	937.20	2163.88	3963.15	2236.82	1999.05	2088.26
...Average selling (cents)	180.20	183.38	192.30	203.60	211.93	218.91	217.01	215.42	216.05	222.00	225.25	234.77	243.65	253.49	293.78	317.26	344.54	347.69	335.13	460.90	504.12	567.26	627.22	665.29	730.40
VALUE AT DELIVERY (lb/cwt raw)	338.13	333.09	308.11	337.55	730.79	900.72	404.10	304.04	250.80	271.20	315.64	384.32	621.76	724.59	2290.79	[illegible]	3697.20	967.91	461.74	476.22	1659.73	3395.89	1673.59	1332.76	1388.14
VALUE AT DELIVERY (lb/cwt sweet) (b)	69.03	68.30	64.68	68.95	105.11	130.64	58.59	62.72	54.63	39.34	45.68	55.73	90.16	106.07	133.33	[illegible]	536.09	140.55	81.65	69.05	240.66	492.60	253.62	193.30	184.60
DELIVERY COSTS OF RAW TO MILLS (lb/cwt sweet)																									
...Loading	1.20	1.27	1.20	1.36	1.91	1.66	1.43	1.44	1.44	1.46	1.50	1.57	1.62	1.69	1.96	2.12	2.30	2.50	2.85	3.07	3.16	3.78	4.18	4.64	5.40
...Transport	4.41	4.60	4.71	4.98	5.18	5.35	5.30	5.27	5.29	5.44	5.56	5.76	5.96	6.20	7.18	7.76	8.42	9.00	10.39	11.22	13.07	15.35	16.26	16.11
...Losses	2.45	2.41	2.35	2.65	5.27	[illegible]	2.93	2.44	1.73	1.97	2.33	2.79	4.51	[illegible]	16.67	27.10	26.80	6.33	4.07	3.45	12.03	24.62	11.77	8.20	9.14
FOREIGN EQUIVALENT PRICE (lb/cwt sweet)	60.97	60.10	56.45	60.16	93.67	117.26	60.91	53.80	46.17	30.65	34.20	43.64	78.07	91.93	307.52	386.65	490.57	115.76	64.15	51.26	212.94	450.10	204.14	156.72	154.13

(a) Assuming internationally efficient sugar milling cost.
(b) Sugar content of 96.58 less 2 percents for sugar loss factor

Table III.3: [illegible] at $60 (lbs/ac)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/ton)																									
...freight																									
...insurance																									
CIF Price ($/ton)	87.15	86.75	85.69	90.58	160.79	192.77	104.90	84.71	74.93	81.65	89.66	103.78	161.71	205.46	523.60	690.22	810.40	253.64	198.84	199.84	476.15	672.99	321.02	239.73	196.70
Equilibrium Exchange Rate	5.93	5.91	5.97	5.91	5.93	5.93	5.97	5.91	5.99	6.09	6.12	6.23	6.01	5.71	5.36	5.00	5.19	5.40	5.00	5.90	5.76	6.61	6.05	8.26	9.50
CIF Price ($/ton raw)	516.80	512.32	499.61	533.33	953.60	1143.13	623.27	503.50	446.81	497.25	548.35	646.55	971.00	1175.10	2805.05	4572.32	4765.98	1361.90	1169.10	1195.04	2742.62	4444.67	2701.73	1984.17	1863.00
CIF Price ($/ton refined)	544.00	539.33	525.91	561.50	1003.67	1203.29	656.07	529.79	470.35	523.42	577.21	680.58	1025.01	1234.92	2951.53	4 66.11	4477.14	1433.29	1230.63	1257.94	2886.97	4257.55	2317.61	2084.19	1963.00
PORT CHARGES ($/ton refined)																									
...Losses (2% of CIF)	10.88	10.79	10.52	11.23	20.07	24.1	13.12	10.60	9.41	10.47	11.54	13.61	20.46	24.70	59.07	95.71	88.55	-8.70	24.62	25.16	57.74	85.15	46.15	41.68	39.26
...Handling	1.20	1.22	1.28	1.36	1.41	1.4	1.45	1.44	1.49	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.50	2.58	2.83	3.07	3.16	3.78	4.18	4.44	5.00
...Transport	2.75	2.80	2.94	3.11	3.29	3.56	3.12	2.77	2.60	2.66	2.99	3.59	5.72	3.87	6.49	4.85	5.26	3.93	6.56	7.04	7.38	8.67	9.58	10.16	11.46
...Bank. services	13.62	13.06	14.56	15.19	14.07	16.55	16.40	16.20	16.31	16.01	17.43	17.74	18.47	19.16	22.20	23.90	26.44	19.36	12.13	16.84	18.10	42.87	47.47	50.20	56.69
...Financing (30 days)	6.80	6.80	6.63	7.10	12.63	15.16	8.27	6.68	5.95	6.64	7.27	8.58	12.89	15.56	37.21	59.98	55.78	18.08	15.31	15.85	36.18	53.63	29.20	26.26	24.77
LANDED PRICE (C. PORT ($/ton refined)	579.31	575.01	561.85	601.74	1057.66	1261.87	698.62	568.97	508.95	562.17	618.99	725.66	1088.19	1299.90	3079.47	4946.46	4665.20	1519.04	1312.43	1363.91	3036.25	4931.67	2454.33	2217.22	2099.11
DELIVERY TO RURAL DELIVERY :	Average 100 km.																								
...Transport	9.35	8.50	8.91	9.44	9.83	10.15	10.66	9.99	10.07	10.31	10.44	10.88	11.30	11.75	13.62	14.74	15.97	17.97	19.71	21.37	23.37	26.10	29.40	34.84	34.77
...Losses (2.5 % at ex-port)	14.48	14.38	14.05	15.04	26.41	31.60	17.47	14.20	12.72	14.05	15.45	18.14	27.00	32.50	76.94	123.66	115.13	38.00	32.81	32.16	75.76	117.29	61.36	55.43	52.48
...Handling	1.20	1.27	1.28	1.36	1.41	1.46	1.45	1.44	1.46	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.50	2.58	2.83	3.07	3.16	3.78	4.18	4.44	5.00
PRICE AT RURAL MILL ($/ton refined)	603.35	599.12	586.11	627.58	1094.72	1307.07	727.60	593.69	533.11	588.02	645.39	756.25	1128.07	1345.84	3171.01	5086.93	4758.68	1578.00	1367.78	1421.95	3132.76	4593.04	2548.95	2307.93	2191.35
...Average milling cost(a)	100.20	103.38	102.58	203.68	241.93	218.91	217.41	215.42	216.05	222.46	225.25	234.77	243.63	253.49	293.78	317.26	344.50	387.69	425.13	460.98	504.12	567.26	627.22	665.29	730.98
VALUE OF BYPRODUCTS ($/ton raw)	423.14	415.75	393.51	423.96	843.29	1088.16	510.59	378.27	317.45	365.62	420.14	521.48	876.41	1092.35	2877.22	4769.69	4394.14	1190.31	942.65	960.97	2628.62	4025.78	1921.73	1678.36	1461.15
VALUE OF BYPRODUCTS ($/ton basis rb)	61.34	60.28	57.04	61.47	122.30	157.78	74.04	54.85	45.97	53.02	60.93	75.61	127.00	158.39	417.20	691.60	637.15	172.63	136.6	136.44	381.15	583.71	278.63	185.19	209.40
DELIVERY COSTS OF MILL TO MILLS ($/ton) basis																									
...Loading	1.20	1.22	1.28	1.36	1.41	1.46	1.45	1.44	1.46	1.48	1.50	1.57	1.62	1.69	1.96	2.12	2.50	2.58	2.83	3.07	3.16	3.78	4.18	4.44	5.00
...Transport	4.41	4.48	4.71	4.99	5.18	5.35	5.30	5.22	5.28	5.44	5.51	5.74	5.96	6.20	7.18	7.76	8.42	9.40	10.39	11.27	12.32	13.87	15.33	16.26	18.31
...Losses	1.67	1.81	2.05	1.67	6.00	7.09	3.78	2.74	2.34	2.63	3.03	3.78	6.35	7.92	20.06	34.50	31.06	8.63	6.83	6.82	19.06	29.19	15.93	9.27	10.45
FARMGATE EQUIVALENT PRICE ($/ton basis)	53.68	51.54	48.32	57.04	113.01	143.08	63.50	45.90	36.95	43.45	50.87	64.53	113.15	142.59	387.20	647.05	594.37	151.96	116.62	113.20	346.41	536.90	265.20	155.42	175.21

(a) Assuming intermediate/big efficient sugar milling costs

(b) Sugar content of 12.53 (see 3 panels for sugar cane factor recent technique).

Domestic Prices: Consumers

Consumer prices are reviewed annually by the Interministerial Pricing Committee of the Ministry of Economic Affairs, although, as is seen in Table III.4 below, they are adjusted infrequently.

In 1984 the official wholesale price differential between granulated and loaf sugar was 1.20 Dh/kg. The structural cost difference for this year, however, was only 0.50 Dh/kg. Thus, largely as a response to this artificial price differential -- the granulated to loaf wholesale consumer price ratio reached 1.46 in 1984 -- consumption has tended away from sugar loaf towards granulated and cube sugar. Sugar loaf consumption has declined from 95 percent in the 1960s to less than 60 percent in 1984.

TABLE III.4: SUGAR CONSUMER PRICES (Dh/kg, annual average)

YEAR	SUGAR LOAF (Wholesale)	(%)	GRANULATED (Wholesale)	(%)	Gran/Loaf Consumer Price Ratio	Average Consumer Price
1962	1.00	82.8	.99	17.2	.99	1.00
1963	1.13	83.0	1.08	17.0	.96	1.12
1964	1.62	84.0	1.49	16.0	.92	1.59
1965	1.84	85.3	1.69	14.7	.92	1.82
1966	1.84	86.3	1.69	13.7	.92	1.82
1967	1.84	85.0	1.69	15.0	.92	1.82
1968	1.84	85.3	1.69	14.7	.92	1.82
1969	1.84	85.6	1.69	14.4	.92	1.82
1970	1.84	84.3	1.69	15.7	.92	1.82
1971	1.75	83.0	1.60	17.0	.91	1.73
1972	1.49	82.3	1.34	17.7	.90	1.46
1973	1.62	80.9	1.34	19.1	.88	1.48
1974	1.79	78.0	1.34	22.0	.75	1.69
1975	1.79	76.8	1.34	23.2	.75	1.69
1976	1.79	71.2	1.34	28.8	.75	1.66
1977	1.79	65.3	1.34	34.7	.75	1.63
1978	1.79	68.0	1.34	32.0	.75	1.65
1979	1.85	67.6	1.38	32.4	.75	1.70
1980	2.21	64.9	1.65	35.1	.75	2.02
1981	3.07	65.8	2.40	34.2	.78	2.84
1982	3.31	65.6	2.64	34.4	.80	3.08
1983	3.49	61.7	2.64	38.3	.76	3.16
1984	3.85	58.0	2.64	42.0	.69	3.34

Source: Sugar Industry Association

Border Price Equivalents: Consumers

Unlike the producer border price comparisons which are made for one product, raw sugar, consumer price comparisons need to be made for two commodities: sugar loaf and granulated sugar. However, sugar loaf is not a traded commodity and very few nations produce sugar loaves. Thus the issue of the appropriate reference milling cost for sugar loaves arises. The assumption that was retained for this study ensues from a study by the Moroccan sugar industry. It indicates that loaf production costs are 50 to 75 percent above the cost of an efficient granulated sugar-producing mill. A scalar of 1.75 was assumed for the entire period with production costs weighted by the annual shares of loaf and granulated sugar consumption. The border price equivalents to consumers are presented in Table III.5 (OER) and III.6 (EER).[82]

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82 It should be noted that sugar is imported by the state monopoly, ONTS. Preliminary analyses of import unit costs for the last 15 years have indicated that Morocco buys raw sugar by as much as 10-20 percent above the International Sugar Organization quoted prices delivered in Morocco. The border prices presented in this study are the actual recorded landed unit values.

TABLE III.3a DOUBLE PRICE EQUIVALENTS FOR SUGAR (Nominal Prices at FOB (lb/mt)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price (US$)																									
...Average																									
...Low/High																									
CIF Price (US$/mt)	87.15	86.71	83.69	90.58	160.70	192.77	184.60	84.73	74.91	81.65	89.60	105.76	161.21	285.46	523.60	819.22	810.90	750.64	198.86	199.84	476.15	672.99	321.62	230.71	196.10
Differential over/(under) rate	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	5.05	4.60	4.11	4.37	4.05	4.42	4.50	4.17	3.99	3.94	3.17	4.42	7.11	8.84
CIF Price (lb/mt raw)	461.00	458.96	423.50	458.00	813.70	975.50	520.56	428.80	379.20	413.70	453.60	520.10	744.60	843.00	2287.50	3647.60	3581.46	3120.70	838.60	729.20	1874.60	3480.90	1935.90	1704.80	1728.60
CIF Price (lb/mt refined)	464.31	462.90	445.79	482.51	856.53	1026.84	556.11	451.37	399.16	434.95	477.36	551.60	781.16	888.21	2407.89	3793.67	3769.09	3188.11	872.21	830.21	1973.05	3664.11	2037.79	1794.53	1819.58
POST CHARGES																									
...Losses (2% of CIF)	9.30	9.26	8.92	9.65	17.13	20.54	11.12	9.03	7.98	8.70	9.55	11.03	15.66	17.76	48.16	75.95	75.46	25.34	17.44	16.96	39.46	75.28	40.74	35.89	36.19
...Handling	1.30	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.58	2.83	3.07	3.36	3.78	4.18	4.44	5.40
...Transport	2.75	2.80	2.94	3.11	3.28	3.34	3.32	3.29	3.30	3.40	3.44	3.59	3.72	3.87	4.49	4.85	5.16	5.92	6.30	7.04	7.70	8.67	9.58	10.16	11.40
...Misc. services	13.44	13.40	10.36	15.19	15.01	16.33	16.10	14.07	10.11	16.59	16.00	17.51	18.17	18.90	21.91	25.66	25.70	28.91	31.70	34.38	37.60	42.30	46.78	49.62	38.91
...Financing (30 days)	5.88	5.82	5.62	6.08	10.79	12.94	7.01	5.69	5.03	5.48	6.01	6.95	9.87	11.19	30.34	47.85	47.50	14.97	10.99	10.33	24.86	46.17	25.68	22.61	22.93
LANDED PRICE EX-PORT (lb/mt refined)	496.74	494.76	478.91	519.92	900.90	1081.15	595.10	486.80	432.02	476.59	516.56	593.33	832.21	941.61	2514.75	3951.09	3926.05	1264.26	941.60	891.44	2086.63	3830.31	2164.76	1917.24	1951.29
DELIVERY TO SUGAR REFINERY :	Average 100 Lbs.																								
...Transport	0.55	0.56	0.95	0.61	0.95	10.15	10.66	0.99	10.02	10.21	10.44	10.80	11.30	11.75	13.63	16.71	15.97	17.97	19.25	21.37	23.37	26.30	29.00	30.04	34.77
...Losses (2.5 % of Transport)	12.42	12.37	11.93	12.95	23.67	27.04	14.80	12.17	10.85	11.76	12.86	14.84	20.81	23.54	62.87	98.80	98.15	31.61	23.54	22.29	52.15	95.96	54.12	47.93	48.78
...Handling	1.30	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.58	2.83	3.07	3.36	3.78	4.18	4.44	5.40
PRICE AT SUGAR MILL (lb/mt refined)	560.74	510.83	501.09	534.84	930.77	1120.09	625.57	510.47	455.31	499.15	539.17	619.39	865.93	978.62	2593.20	4067.51	4042.47	1316.42	987.76	938.17	2164.92	3964.35	2253.16	2000.45	2039.84
...Average Milling cost (a)	122.26	163.38	192.38	201.68	211.93	218.91	217.41	213.43	216.45	222.60	225.75	234.77	241.53	253.49	293.78	317.26	344.51	387.69	425.13	460.98	504.12	567.26	627.12	665.29	730.00
VALUE OF SUGAR EX-MILL (lb/mt refined)	438.91	388.21	392.67	345.55	1150.69	1339.00	838.57	725.89	671.75	716.55	764.65	854.16	1107.39	1232.11	2886.98	4384.77	4387.01	1704.11	1412.89	1399.15	2669.04	4531.61	2879.26	2665.73	2769.84
DEDUCTIONS COSTS OF REFINE																									
...Loading/Handling	1.30	1.22	1.20	1.36	1.41	1.46	1.45	1.44	1.44	1.40	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.58	2.83	3.07	3.36	3.78	4.18	4.44	5.40
...Transport	3.84	3.69	3.25	3.61	3.51	3.69	3.66	3.63	3.64	3.73	3.80	3.96	4.11	4.27	4.95	5.33	5.81	6.36	7.17	7.77	8.50	9.56	10.57	11.22	13.60
NET DOUBLE SUGAR PRICE EX-MILL (lb/mt ref)	703.13	704.54	698.20	736.14	1153.68	1344.15	843.68	730.96	676.44	721.78	769.93	859.80	1115.32	1238.03	2893.09	4392.26	4395.12	1713.28	1422.89	1410.06	2680.90	4544.95	2894.12	2680.99	2807.09

(a) Assuming internationally efficient sugar milling costs.

[illegible] Middle East crude equivalents for Saudi Crude oil prices at $18 $/bbl

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
FOB Price ($/bbl)																									
...Foreign																									
...Government																									
CIF Price ($/bbl)	07.15	06.73	05.69	96.50	100.79	102.77	104.60	01.75	74.93	01.65	09.60	101.78	161.71	205.96	523.60	000.22	010.60	250.64	190.06	199.04	176.15	023.99	121.62	239.71	196.20
Equilibrium Exchange Rate	3.93	3.91	3.97	3.91	3.93	3.93	3.97	3.94	3.99	4.09	4.12	4.23	4.01	3.71	3.36	3.00	3.19	3.44	3.00	3.90	3.76	4.01	4.05	4.16	4.30
CIF Price ($/bbl real)	516.00	517.57	499.63	515.31	553.90	1103.13	1115.27	1013.30	940.03	097.25	940.55	946.55	971.00	1175.16	2005.05	4522.52	4295.73	1161.40	1169.50	1195.04	2702.62	0044.67	2201.73	1900.17	1865.90
C&F Price ($/bbl real)	544.00	539.58	525.93	563.30	1003.67	1203.29	1216.07	1021.79	972.45	1023.43	1019.21	1040.50	1023.63	1234.92	2953.53	4760.33	4427.16	1431.24	1230.04	1257.94	2006.97	4257.55	2317.64	2004.19	1962.00
FOB CHANGES																									
...Losses (3% of CIF)	10.00	10.70	10.52	11.27	20.07	20.07	11.12	10.60	9.45	10.07	11.54	13.61	20.66	24.70	59.07	95.71	00.55	20.70	24.02	25.16	37.74	00.15	06.15	01.69	10.24
...Handling	1.20	1.22	1.20	1.36	1.01	1.06	1.05	1.04	1.04	1.00	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.50	2.03	3.07	3.36	3.70	4.10	4.04	5.00
...Transport	2.75	2.00	2.94	3.11	3.24	3.34	3.32	3.29	3.30	3.00	3.44	3.59	3.73	3.07	4.49	4.05	5.36	5.92	6.50	7.04	7.70	0.47	9.50	10.16	11 46
...Misc. Charges	10 02	10.27	10 90	15.05	10.09	12.03	10.00	10.70	10.01	17.30	17.55	10.27	10.96	19.72	22.06	20.60	26.01	30.16	33.06	35.07	39.23	00.19	09 00	54.76	39
...Financing (30 days)	0.05	0.00	0.02	7.10	12.03	15.16	0.77	0.60	5.95	0.00	7.27	0.50	12.09	15.56	37.71	59.90	55.70	10.00	15.31	15.00	36.30	53.65	29.30	26.36	1
LANDED PRICE EX-PORT ($/bbl real)	379.71	575.63	562.20	602.19	1051.55	1264.35	1099.11	1060.59	1009.41	1062.01	1060.50	1126.10	1000.60	1300.47	3079.12	4992.17	4600.04	1520.70	1313.37	1344.93	3034.37	4452.93	2455.71	2210.70	2100.77
DELIVERY TO SAUDI REFINERY :	Average 100 Km.																								
...Transport	0.55	0.50	0.91	0.91	0.03	10.15	10.06	0.99	10.02	10.31	10.41	10.00	11.50	11.75	13.62	16.71	15.97	17.97	19.71	21.57	23.37	26.30	29.00	30.04	34.77
...Losses 12.5 % or so-port)	10 99	10 59	10.06	15.05	26.04	31.61	27.40	10.21	12.70	10.07	15.06	10.15	27.02	32.51	76.90	123.66	115.13	30.02	32.03	33.63	75.70	111.32	61.19	55.07	52.52
...Handling	1.20	1.22	1.20	1.36	1.01	1.06	1.05	1.04	1.04	1.00	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.50	2.03	3.07	3.36	3.70	4.10	4.04	5.00
PRICE AT SAUDI DOCK ($/bbl real)	603.76	599 50	586.55	628.09	1099.20	1307.37	1220.09	1090.10	1033.00	1000.53	1095.91	1156.29	1120.62	1346.42	3171.66	3007.67	0739.06	1570.20	1360.75	1403.00	3133.09	4594.13	2550.10	2309.05	2193.06
...Average Selling cost (a)	190.70	103 30	192.50	203.00	211.03	210.91	217.01	213.62	216.05	222.00	225.25	234.77	243.63	253.99	293.70	313.76	344.54	303.69	420.13	000.90	504.12	563.76	637.33	665.37	700.00
VALUE AT SAUDI EX-WELL ($/bbl real)	703.76	702.92	779.13	031.77	1307.13	1526.00	1405.10	1307.60	1249.05	1210.53	1321.16	1391.06	1364.20	1599.91	3465.36	3604.93	3004.01	1866.97	1791.00	1861.90	3630.02	5161.59	3187.60	2974.74	2901.06
DISTRIBUTION COSTS OF SAUDI																									
...Loading/Handling	1 20	1 22	1.20	1.36	1 01	1.06	1.05	1.04	1.04	1.00	1.50	1.57	1.62	1.69	1.96	2.12	2.36	2.50	2.03	3.07	3.36	3.70	4.10	4.04	5.00
...Transport	3.04	3.09	3.25	3.41	3.57	3.09	3.06	3.03	3.04	3.75	3.00	3.96	4.11	4.27	4.93	5.35	5.01	6.54	7.17	7.77	0.50	9.36	10.32	11.23	12.04
AVERAGE SAUDI PRICE ($/bbl real)	700.70	707 25	703.00	036 51	1312.12	1531.03	950.20	010.07	754.73	016.16	026.46	997.00	1370.01	1605.07	3472.37	3613.39	3092.11	1976.09	1801.00	1870.03	3649.00	5176.94	3192.16	2990.10	2960.11

(a) Assuming reasonably efficient sugar selling costs.

ANNEX FOUR

ESTIMATION OF THE NON-AGRICULTURAL PRICE INDEX

The non-agricultural price index for Morocco was derived from national accounts data disaggregated by sector. For these data, the share of gross domestic product contributed by the agricultural sector was deducted, and the remaining sectors -- mining, manufacturing, construction, utilities, commerce, public administration and defense, and other -- were re-weighted at constant factor prices to estimate a "non-agricultural GDP deflator" (NA). It is this deflator which serves as the non-agricultural price index for comparisons at prevailing domestic prices and at border price equivalents estimated using the official exchange rate. This index is given in column (i) of Table IV.1 below.

For price comparisons which correct for government trade and exchange rate policy interventions ("indirect effects"), the non-agricultural price index was decomposed into its tradable and non-tradable components. The tradable sector consists mainly of mining (essentially the phosphate and derivatives sector) and manufacturing. Construction, utilities, commerce, housing and administration were considered to be non-tradable sectors.

Two adjustments were made to the tradable component of the non-agricultural price index. The first corrects for trade policy distortions by dividing the tradable non-agricultural GDP deflator by the uniform tariff equivalent. The second adjustment corrects for exchange rate distortions by multiplying the adjusted tradable non-agricultural GDP deflator by the ratio of the equilibrium exchange rate to the nominal official exchange rate. The tradable and non-tradable non-agricultural GDP deflators are then weighted by their relative

shares in the aggregated non-agricultural GDP deflator and summed. This adjusted non-agricultural GDP deflator (NA^*), which corrects for both trade and exchange rate policies, is presented in column (ii) of table IV.1. This latter index is applied to price comparisons made using border prices calculated at the equilibrium exchange rate.

TABLE IV.1: THE NON-AGRICULTURAL PRICE INDEX
(Non-agricultural GDP deflator)

	1969=100								1969=100
YEAR	(NA) NON-AGRIC GDP DEFL (i)	TRADABLE NON-AGRIC GDP DEFL	(S) SHARE TRADABLES	NON-TRADABLE NON-AGRIC GDP DEFL	(S) SHARE NONTBLS	UNIFORM TARIFF EQUIV.	NOMINAL EXCHANGE RATE	EQUIL. EXCHANGE RATE	(NA^*) NON-AGRIC GDP DEFL (ii)
1960	69.8	78.1	52.9%	60.4	47.1%	1.098	5.06	5.93	72.6
1961	71.2	79.5	53.5%	61.7	46.5%	1.098	5.06	3.50	73.9
1962	74.0	84.3	51.8%	63.3	48.2%	1.096	5.06	5.97	77.3
1963	78.4	88.0	52.2%	67.9	47.8%	1.093	5.06	5.91	81.5
1964	81.4	91.9	59.0%	70.0	41.0%	1.090	5.06	5.93	85.0
1965	84.3	95.1	51.1%	73.1	48.9%	1.074	5.06	5.93	88.8
1966	83.5	94.0	51.3%	72.3	48.7%	1.098	5.06	5.97	87.0
1967	82.7	93.8	50.7%	71.4	49.3%	1.094	5.06	5.94	86.1
1968	83.1	96.1	50.6%	70.9	49.4%	1.107	5.06	5.99	86.4
1969	100.0	100.0	54.2%	100.0	45.8%	1.139	5.06	6.09	103.0
1970	102.6	102.7	54.1%	102.5	45.9%	1.117	5.06	6.12	107.1
1971	105.2	104.7	54.4%	106.8	45.6%	1.167	5.06	6.23	108.5
1972	108.6	106.7	53.0%	110.8	46.0%	1.127	4.80	6.01	117.9
1973	112.5	109.6	55.7%	116.1	44.3%	1.138	4.11	5.71	126.0
1974	130.7	144.1	56.7%	131.7	43.3%	1.112	4.37	5.36	147.2
1975	141.3	143.0	54.3%	139.4	45.7%	1.131	4.06	5.08	149.8
1976	146.9	145.8	52.9%	148.2	47.1%	1.174	4.42	5.19	148.9
1977	153.6	157.8	52.8%	170.2	47.2%	1.221	4.50	5.44	162.8
1978	175.8	171.0	52.2%	181.0	47.8%	1.275	4.17	5.88	186.4
1979	188.7	186.7	50.4%	190.7	49.6%	1.287	3.90	5.98	206.7
1980	206.6	208.4	50.9%	209.9	49.1%	1.241	3.94	5.78	225.1
1981	230.1	232.9	49.4%	227.3	50.6%	1.203	5.17	8.01	228.3
1982	247.1	249.7	48.0%	247.6	52.0%	1.212	6.02	8.85	239.6
1983	255.0	258.3	47.3%	252.1	52.7%	1.216	7.11	8.26	249.5
1984	263.2	267.1	47.3%	259.8	52.7%	1.106	8.31	9.50	259.8

Notes: (i) Unadjusted
(ii) Corrected for trade & exchange rate policies:
NA^* = (Share TBL * TBL Non-Agric GDP Deflator) / (Uniform Tariff Equiv.) *
(EER/Nominal ER) + (Share NTBL * NTBL Non-Agric GDP Deflator)
where TBL = tradable, NTBL = non-tradable, EER = equil. exchange rate, ER = exchange rate

Annex Five

STATISTICAL APPENDIX

TABLE 9 : PREVAILING DOMESTIC PRICES AND PRICE RATIOS (constant 1964-66 $/MT, 1967=100)

	PREVAILING PRICES					CONSUMER PRICES					PREVAILING PRODUCER PRICES FOB				PREVAILING CONSUMER PRICES FOB				
YEAR	Soft wht/ hard wht (a)	Hard dkr/ hard wht (b)	Soft wht/ hard wht (c)	Barley/ wht (d)	Sugar Beet/cane (e)	Soft wht Flour/wht (f)	Hard wht Flour/wht (g)	Soft Flr/ hard wht (h)	Barley Flour/wht (i)	Sugar/ cane (j)	SOFT WHEAT	HARD WHEAT	BARLEY	SUGAR BEET	SOFT WHEAT FLOUR	HARD WHT WHEAT FLOUR	BARLEY FLOUR	SUGAR	WORLD PRICE INDEX (WPI)
1960	47.3	55.6	85	35.8	n/a	83.1	83.4	1.00	58.6	n/a	33.8	38.8	21.5	n/a	58.8	58.2	48.9	n/a	69.8
1961	48.5	59.9	81	36.1	n/a	84.5	88.9	95	64.7	n/a	34.5	42.6	25.7	n/a	58.8	63.3	47.5	n/a	71.2
1962	46.6	47.1	99	47.4	n/a	78.4	98.2	80	84.1	134.9	34.5	49.1	35.5	n/a	58.8	72.7	62.2	99.8	74.8
1963	45.1	54.9	82	39.6	7.5	74.8	78.3	95	56.2	142.5	36.3	48.1	29.1	5.9	58.8	64.3	44.1	111.7	78.6
1964	44.1	58.6	75	28.8	7.2	71.3	76.2	94	53.7	176.8	37.5	49.1	22.8	5.9	58.8	66.4	44.1	139.3	81.6
1965	47.6	55.5	85	32.5	7.8	68.8	82.4	84	68.8	215.7	40.8	46.8	27.6	5.9	58.8	69.5	51.3	188.9	84.3
1966	47.9	57.8	83	37.2	7.2	69.5	85.2	82	68.7	218.1	40.2	47.5	31.8	6.8	58.8	71.1	57.2	182.8	83.5
1967	48.4	73.9	65	55.6	7.3	78.2	100.0	65	97.8	219.9	40.8	61.1	46.8	6.8	58.8	89.3	80.8	186.8	82.7
1968	48.2	66.8	72	45.9	7.2	69.9	96.4	73	82.4	219.8	40.8	55.5	38.1	6.8	58.8	86.7	68.4	188.9	83.1
1969	48.8	39.6	1.08	19.4	6.8	58.8	68.4	96	39.1	182.9	40.8	39.6	19.4	6.8	58.8	68.4	39.1	184.9	68.8
1970	39.8	44.9	90	22.5	5.3	56.6	64.4	88	42.1	147.1	33.8	42.2	22.1	4.7	58.8	65.5	44.8	149.1	69.1
1971	48.9	45.8	91	28.3	5.7	63.7	67.7	94	52.9	164.3	43.8	47.4	29.8	6.8	67.8	71.2	55.7	172.8	85.2
1972	39.6	42.5	93	27.3	5.5	61.7	64.2	96	52.4	134.8	43.8	46.1	29.6	6.8	67.8	69.8	55.9	144.6	98.6
1973	46.8	43.5	92	33.1	5.6	59.6	65.4	91	64.6	133.8	65.8	68.9	37.3	6.3	67.8	73.8	68.2	148.2	112.5
1974	63.3	58.5	84	45.6	5.5	63.2	76.8	83	79.6	122.8	68.8	73.4	63.2	7.6	87.7	105.4	110.5	149.2	130.3
1975	62.4	62.3	68	62.9	6.8	62.8	98.9	68	75.9	119.3	68.8	88.2	66.6	9.6	87.7	128.5	107.3	148.6	142.3
1976	48.8	68.3	68	44.8	6.5	59.7	79.2	68	78.1	113.5	66.8	100.3	64.2	9.6	87.7	145.8	114.8	146.1	146.9
1977	51.9	52.6	99	31.9	5.9	53.6	78.8	69	59.2	99.9	85.8	85.7	52.2	9.6	87.7	122.6	94.8	143.5	142.6
1978	48.6	61.5	79	45.1	6.6	49.9	98.6	55	80.1	93.7	85.8	108.2	9.3	11.5	87.7	158.9	140.8	144.7	75.8
1979	55.6	56.8	98	41.2	6.1	46.5	84.2	55	74.1	98.1	105.8	104.2	77.8	11.5	87.7	158.9	139.9	174.1	108.7
1980	68.5	55.2	1.24	38.1	6.5	47.4	82.8	58	69.2	97.6	125.8	114.1	78.8	13.5	97.9	169.5	147.8	201.6	206.6
1981	58.7	64.1	91	44.4	5.9	52.8	94.4	55	79.1	123.5	135.8	140.1	102.5	13.5	119.6	217.3	182.8	284.1	238.1
1982	56.7	79.3	71	58.8	6.3	48.4	114.6	42	102.8	124.6	148.8	195.9	165.2	15.5	119.6	303.1	252.1	387.8	247.1
1983	54.9	63.1	87	36.4	6.1	50.8	93.1	55	67.1	124.8	148.8	144.6	97.8	15.5	129.6	237.4	171.1	316.2	252.8
1984	57.8	67.8	86	48.8	6.6	49.2	100.2	49	87.6	126.9	150.8	170.5	129.5	17.5	129.6	263.8	238.5	333.9	263.2

Note: Columns (c) and (h) are ratios of soft wheat to hard wheat producer and consumer prices - (a/b) and (f/g).
All others are prevailing domestic prices deflated by the unadjusted non-agricultural price ratio (NAR) (see annex Table 29).

TABLE V.2: PREVAILING RELATIVE PRICES (Indices, 1963=100)

	PRODUCER PRICE RATIOS					CONSUMER PRICE RATIOS				
YEAR	Soft Wh/ NA	Hard Wh/ NA	Soft Wh/ Hard Wh	Barley/ NA	Sugar Beet/NA	Soft Wht Flour/NA	Hard Wht Flour/NA	S Wh Flr/ H Wh Flr	Barley Flour/NA	Sugar/ NA
1960	103	107	96	105	N/A	112	107	105	106	N/A
1961	106	113	71	123	N/A	110	114	97	119	N/A
1962	102	129	78	161	N/A	106	126	84	150	95
1963	100	100	100	100	100	100	100	100	100	100
1964	100	98	103	95	96	96	97	99	96	128
1965	103	107	97	111	93	93	105	88	109	151
1966	104	110	95	126	96	94	109	86	122	153
1967	105	143	74	189	96	95	138	69	174	154
1968	105	129	81	156	96	94	126	75	146	154
1969	87	76	114	66	90	78	77	101	70	129
1970	85	81	105	76	78	76	81	94	78	124
1971	89	87	102	96	76	86	87	99	94	115
1972	86	92	105	93	73	83	82	101	91	95
1973	87	84	104	113	74	80	84	96	108	92
1974	94	99	95	155	73	85	97	88	142	96
1975	92	120	77	146	90	84	116	72	135	84
1976	89	122	69	150	97	81	127	63	139	79
1977	113	101	112	108	78	72	100	73	105	70
1978	105	119	88	153	87	67	116	58	142	66
1979	121	110	111	140	81	63	108	58	132	63
1980	132	107	124	130	87	64	105	61	123	68
1981	128	124	103	151	78	70	121	58	141	87
1982	123	153	81	200	83	65	147	45	181	97
1983	120	122	98	124	81	69	119	58	119	97
1984	129	131	99	166	88	67	128	52	156	89

TABLE 4.3 RELATIVE PRICES IN THE ARGENTINE BEEF INDUSTRY, 1966-81 (1969=100)

	PRODUCER PRICES					CONSUMER PRICES					PRODUCER MARGIN PRICES FOB				CONSUMER MARGIN PRICES				
YEAR	soft wheat FOB	hard wheat FOB	Soft wheat/ hard wheat	Barley FOB	Sugar beet FOB	Soft wheat Plaza	hard wheat Plaza	Soft wheat/ hard wheat Plaza	Barley Plaza	Sugar FOB	SOFT WHEAT	HARD WHEAT	BARLEY	SUGAR BEET	soft wheat Plaza	hard wheat Plaza	Beef	Cereals	MEAT PRICE INDEX
1966	59.6	88.7	72	64.9	59	79.5	99.9	80	65.8	108.8	61.1	56.3	38.3	64.1	55.5	69.8	62.4	59.2	69.8
1967	57.2	111.9	51	66.9	56	77.8	140.6	55	68.4	99.8	48.7	79.7	33.6	64.6	54.8	101.1	68.5	59.1	71.1
1968	57.7	85.2	68	56.7	49	77.1	110.1	70	69.4	84.4	62.2	64.1	40.5	38.6	57.5	82.9	59.8	69.8	74.8
1969	54.8	73.8	74	52.8	53	78.9	95.1	83	77.8	95.1	68.4	52.2	41.4	49.8	54.8	74.1	64.3	75.8	78.4
1970	52.1	53.9	95	56.6	111.5	68.9	78.5	88	74.6	142.8	61.6	43.8	44.6	93.5	56.1	57.4	54.8	115.6	85.4
1971	58.7	57.6	99	53.2	93.1	74.1	71.1	104	72.1	119.4	67.7	44.7	44.7	77.7	57.4	57.9	57.7	104.6	84.1
1972	55.2	55.2	100	65.3	59	74.6	73.3	102	84.9	100.1	66.1	44.1	54.5	49.9	62.1	56.2	67.1	84.6	84.3
1973	52.8	62.8	83	54.1	61	78.1	80.2	98	78.9	88.4	63.8	50.9	44.7	34.4	58.3	64.8	63.1	73.7	82.7
1974	52.8	68.4	86	63.5	82	78.2	98.9	80	83.7	84.4	65.2	58.1	56.1	24.6	58.3	69.4	63.1	64.4	83
1975	41.8	44.6	94	37.9	38	56.3	58.4	97	55.5	72.2	41.8	44.6	37.9	34.6	56.5	58.4	57.1	77.1	88.8
1976	44.3	47.6	93	38.1	35	59.7	62.3	96	55.8	75.1	45.4	48.6	39.1	34.6	61.3	63.4	62.1	77.8	102.6
1977	41.1	41.1	100	41.1	41.1	55.7	55.7	100	75.8	55.8	42.1	44.1	34.2	41.1	56.9	58	57.4	85.2	85.2
1978	65.8	68.3	96	63.4	72	81.8	83.2	98	83.4	102.1	69.8	72.4	64.1	49.8	84.1	86.4	85.1	111.1	99.1
1979	86.1	115.8	74	69.1	82	113.5	148.8	76	91.1	118.1	94.8	129.4	55.3	91.1	134.5	167.3	148.5	133.8	112.5
1980	75.9	99.1	77	64.1	122.2	108.5	138.3	78	93.1	168.4	85.2	127.5	89.8	88.8	148.1	178.9	163.4	188.4	138.7
1981	64.8	88.8	73	52.6	75.8	91.8	124.9	74	76.9	118.1	88.2	114.3	74.1	58.1	135.1	148.2	138.1	178.1	141.2
1982	54.9	52.6	102	57.9	83.9	69.8	66.7	105	55.6	79.2	74.2	64.9	55.1	49.9	102.6	98.8	94.1	135.1	94.9
1983	48.9	44.3	91	42.8	71	55.6	56.2	95	62.1	84.1	67.3	72.5	48.8	31.1	98.1	95.1	96.1	131.1	83.6
1984	62.1	65.8	94	54.8	74	57.8	59.1	94	58.1	81.8	74.3	79.1	59.8	44.4	88.1	93.8	88	94.1	79.8
1985	58.6	54.4	95	44.8	77	67.5	71	95	63.3	74.7	74.4	82.6	84.1	51.1	111.1	94.1	111.1	111.1	88.1
1986	68.9	69.8	74	54.1	80.3	84.3	89.9	73	75.8	79.8	81.1	74.3	71.8	71.8	134.1	111.1	1.8	144	79.8
1987	58.4	61.7	85	51.3	79.6	68.8	88.6	66	74.9	87.5	71.1	74.1	61.3	58.1	134.1	85.4	111.1	134.1	79.1
1988	47.3	51.7	88	36.6	81.3	64.1	79.3	71	71.6	71.1	71.1	71.1	58.4	38.6	134.1	111.1	8	134.1	74.1
1989	56.1	68.7	81	44.9	54.4	78.4	89.6	87	84.3	85.1	68.4	111.1	61.1	41.1	111.1	134.1	111.1	144	111.8
1990	63.9	76.2	84	58.3	59.9	86.8	99.8	86	84.6	86.7	68.1	108.8	71.1	51.1	111.1	134.1	111.1	144	143.1

Note: Columns (1) and (3) are ratios of equivalent border soft wheat to hard wheat producer and consumer prices; (5) and (7) [illegible]

All others are equivalent border prices, converted into Pesos at the official exchange rate, and deflated by the wholesale non agricultural price index (Col. 10, see annex, Cuadro [illegible]

TABLE V.4: RELATIVE PRICES IN THE ABSENCE OF DIRECT INTERVENTION (indices. 1963=100)

	PRODUCER PRICE RATIOS					CONSUMER PRICE RATIOS				
YEAR	Soft Wh/ NA	Hard Wh/ NA	Soft Wh/ Hard Wh	Barley/ NA	Sugar Beet/NA	Soft Wht Flour/NA	Hard Wht Flour/NA	S Wh Fl/ H Wh Flr	Barley Flour/NA	Sugar/ NA
1960	114	111	103	85	115	114	105	108	85	105
1961	110	153	72	89	110	110	152	72	89	103
1962	111	117	95	104	96	111	116	96	104	99
1963	100	100	100	100	100	100	100	100	100	100
1964	98	74	133	104	224	98	74	133	103	148
1965	98	72	136	105	271	98	72	135	105	167
1966	106	76	141	124	114	106	76	140	123	106
1967	100	86	117	103	80	100	86	116	103	92
1968	100	83	121	82	62	100	83	121	83	85
1969	81	61	132	72	59	81	61	131	72	75
1970	85	65	131	72	69	85	66	130	72	78
1971	77	58	134	98	85	77	58	133	97	85
1972	88	66	134	82	140	88	66	133	82	107
1973	163	158	103	93	160	161	156	103	93	115
1974	146	136	108	123	433	145	135	108	122	218
1975	118	111	106	100	700	117	110	106	100	325
1976	100	70	143	72	662	100	70	142	72	313
1977	79	61	130	81	338	79	61	129	91	199
1978	81	62	132	65	71	81	62	131	65	85
1979	97	74	133	95	53	96	75	129	85	78
1980	94	95	100	103	201	94	95	100	102	136
1981	97	85	115	97	382	97	85	115	97	206
1982	92	74	124	96	161	92	74	124	96	122
1983	112	94	119	123	105	112	94	119	123	110
1984	123	105	118	119	114	123	105	118	110	111

TABLE V.5: INDIRECT PRICE [illegible] EFFECTS (Rb/el, 1957=100)

	PRODUCER PRICES				CONSUMER PRICES				DOMESTIC PRODUCER PRICES + Ex/Co:				DOMESTIC CONSUMER PRICES + Ex/Co:				
YEAR	Soft Wht Wht (a)	Hard Wht Wht (b)	Barley/ Wht (c)	Sugar Beet/Wht (d)	Soft Wht Flour/Wht (e)	Hard Wht Flour/Wht (f)	Barley Flour/Wht (g)	Sugar/ Wht (h)	SOFT WHEAT	HARD WHEAT	BARLEY	SUGAR BEET	SOFT WHEAT FLOUR	HARD WHEAT FLOUR	BARLEY FLOUR	SUGAR	NON-AG. PRICE INDEX (Rbn)
1960	53.3	62.7	36.7	n/a	93.7	94.0	46.1	n/a	38.7	65.5	25.2	n/a	68.0	68.2	47.9	n/a	72.6
1961	59.5	67.6	40.6	n/a	91.7	100.0	75.8	n/a	46.3	69.8	38.8	n/a	67.8	73.9	55.5	n/a	73.9
1962	52.6	75.7	53.5	n/a	88.5	150.9	95.6	122.5	42.7	98.6	49.3	n/a	68.4	85.7	73.6	117.7	77.3
1963	58.5	58.2	33.8	8.4	83.1	86.7	68.1	159.9	42.8	67.5	26.9	6.9	67.7	71.5	58.5	138.4	84.5
1964	51.7	56.8	31.5	8.1	80.0	85.4	60.3	219.8	43.9	68.3	26.7	6.9	68.8	72.6	58.2	185.8	85.8
1965	52.8	61.8	36.5	7.8	76.6	91.7	67.7	240.1	46.9	56.9	32.6	6.9	68.8	84.4	68.1	213.2	88.8
1966	54.2	64.4	42.8	8.1	78.6	96.3	77.6	266.6	47.2	56.8	36.5	7.1	68.4	83.8	67.6	214.6	87.8
1967	56.5	65.2	42.7	9.2	79.1	101.7	100.2	267.7	47.8	71.8	54.8	7.8	68.1	104.9	94.9	213.4	86.3
1968	54.8	76.8	52.2	8.2	79.5	112.8	93.8	269.2	47.3	65.6	45.1	7.1	68.7	96.7	89.8	215.2	86.6
1969	46.7	66.2	22.7	7.8	67.7	78.5	45.7	212.3	38.1	47.6	23.4	7.2	69.8	72.6	67.8	218.8	103.6
1970	45.1	48.6	26.8	6.8	65.5	73.4	58.6	205.1	40.6	52.8	27.9	7.3	70.2	78.6	54.2	219.7	107.1
1971	48.9	53.9	33.9	6.8	76.2	81.8	63.3	196.6	53.8	58.5	36.7	7.4	82.7	87.8	68.7	213.2	100.5
1972	47.7	54.2	32.9	6.7	74.4	77.8	62.8	162.5	56.3	65.3	38.8	7.9	87.7	91.3	73.1	191.6	117.9
1973	49.7	53.9	41.1	7.8	73.9	81.4	75.3	143.5	62.6	67.9	51.8	8.8	93.2	102.6	94.8	206.8	126.8
1974	58.8	59.6	52.7	6.3	73.1	87.9	92.1	144.3	73.7	87.7	77.6	9.3	107.6	129.3	135.6	207.7	147.2
1975	58.2	73.8	58.7	8.8	73.4	107.6	89.9	141.2	75.3	110.5	76.9	12.8	110.8	144.2	134.6	211.5	149.8
1976	67.9	88.1	51.7	7.7	78.1	116.5	91.7	132.7	78.6	117.7	75.9	11.3	102.9	171.0	134.7	194.9	146.9
1977	63.1	63.6	38.8	7.1	65.1	94.7	71.8	121.6	102.7	103.6	63.1	11.6	105.9	154.1	116.9	197.5	162.8
1978	64.7	82.4	68.5	8.8	64.4	121.6	107.2	125.5	128.8	152.7	112.8	16.3	123.8	224.4	198.8	232.6	185.4
1979	77.9	79.6	57.7	8.5	65.8	117.8	103.7	126.2	161.8	164.5	119.3	17.7	134.4	243.6	214.4	260.8	206.7
1980	61.2	74.2	56.2	8.8	63.6	116.1	93.8	131.8	182.8	166.9	115.3	19.7	143.2	247.9	209.2	294.9	225.1
1981	69.4	76.2	52.5	6.9	64.5	111.6	93.5	146.8	157.8	172.3	118.7	15.7	139.1	252.6	211.7	330.4	226.3
1982	66.4	92.9	68.9	7.4	56.7	134.3	119.6	146.8	159.2	222.7	165.1	17.6	136.8	321.9	286.6	350.8	239.6
1983	55.2	74.9	43.2	7.2	60.3	118.5	79.6	147.2	142.6	186.8	107.5	18.0	150.5	275.7	198.7	367.3	249.5
1984	62.3	74.1	53.3	7.3	53.8	109.5	95.7	138.6	141.9	199.5	138.6	18.9	139.8	284.5	248.6	368.1	259.8

Note: Columns (a) through (h) represent prevailing domestic prices (from annex Table V.1), adjusted for the equilibrium-to-official exchange rate ratification by the trade-adjusted non-agricultural price index (Rbn) (see annex Table IV.1).

TABLE 9.6: SELECTIVE PRICES IN THE ABSENCE OF DIRECT AND INDIRECT INTERVENTION (Brval, 1969=100)

YEAR	PRODUCER PRICES: Soft wht/ rice (a)	Hard wht/ rice (b)	Barley/ rice (c)	Sugar Beet/Tonne (d)	CONSUMER PRICES: Soft wht Flour/Tonne (e)	Hard wht Flour/Tonne (f)	Barley Flour/Tonne (g)	Sugar/ rice (h)	PRODUCER BORDER PRICES in EEC: SOFT WHEAT	HARD WHEAT	BARLEY	SUGAR BEET	CONSUMER BORDER PRICES in EEC: SOFT WHT FLOUR	HARD WHT FLOUR	BARLEY FLOUR	SUGAR	NON-AG PRICE INDEX (Brval)
1960	65.7	98.2	69.8	7.3	88.2	111.4	72.7	108.6	67.7	65.4	36.1	5.3	64.8	88.8	52.8	78.8	72.4
1961	63.6	125.1	52.8	7.8	85.4	144.8	75.6	106.5	67.8	92.5	38.4	5.2	63.1	119.6	56.8	78.7	73.5
1962	64.4	95.4	68.9	6.2	86.4	123.7	88.5	101.4	69.7	73.7	47.1	4.8	66.8	95.6	68.4	78.4	77.2
1963	57.4	86.2	58.4	6.4	77.3	105.5	85.8	102.6	66.8	66.2	47.7	5.2	63.8	86.8	69.3	63.7	88.2
1964	56.5	58.6	68.5	13.5	76.8	77.8	87.9	154.4	68.8	58.7	58.4	11.5	64.6	66.2	76.7	136.2	65.4
1965	55.6	57.6	68.8	14.1	74.8	75.2	88.3	172.5	69.4	58.1	58.8	14.3	66.4	66.7	78.6	153.2	88.1
1966	61.6	61.6	73.8	7.3	82.8	80.5	77.2	109.2	58.6	58.6	63.5	6.4	72.8	78.8	67.2	95.8	87.1
1967	57.8	69.9	64.1	5.3	77.7	91.1	87.5	94.6	69.8	68.2	58.8	4.5	67.8	78.5	75.4	88.5	86.7
1968	58.3	67.8	68.6	4.3	78.6	88.5	71.8	87.4	58.4	58.6	42.8	3.7	67.8	76.4	61.3	75.5	86.4
1969	60.2	51.2	62.1	4.7	64.6	67.8	63.3	79.2	69.4	52.8	44.7	4.3	66.5	68.8	65.3	88.6	100.1
1970	58.4	54.3	63.3	4.7	67.8	70.8	63.1	81.8	54.8	58.2	46.4	5.1	72.6	75.9	67.6	87.6	107.1
1971	46.9	49.4	62.8	6.8	63.2	64.5	88.1	91.9	58.9	53.5	67.3	6.5	68.6	70.3	95.5	99.7	108.1
1972	54.8	56.9	58.8	9.6	72.4	74.1	74.2	165.2	63.6	67.1	48.1	11.3	85.4	87.4	87.4	137.8	117.1
1973	103.8	101.1	59.5	11.9	137.1	132.1	86.2	197.5	129.2	177.8	74.9	14.3	172.7	229.4	108.6	168.6	126.1
1974	86.9	113.7	73.9	26.3	115.9	146.9	106.8	235.9	127.9	147.3	108.8	28.7	170.6	244.2	157.3	367.2	147.1
1975	71.2	94.6	61.5	43.2	95.2	122.6	110.3	361.2	106.4	141	92.7	64.7	142.6	183.6	165.2	561.2	149.1
1976	60.1	59.1	73.8	48.5	80.8	77.1	74.3	346.7	88.3	86.8	64..	59.5	118.6	113.3	148.2	509.2	146.5
1977	48.8	52.9	54.8	9.3	65.8	69.2	65.1	121.4	79.4	86.1	83.8	15.2	107.1	112.7	106.8	197.6	142.1
1978	54.5	58.4	63.7	6.3	73.3	76.1	63.9	97.3	91.8	108.2	81.1	11.7	135.8	141.1	118.4	188.4	185.4
1979	67.8	73.8	68.4	5.6	90.7	95.9	87.7	90.7	148.1	152.6	124.9	11.5	187.6	198..	188.3	187.5	206.2
1980	63.7	90.6	78.6	15.4	85.4	117.5	91.9	162.2	143.4	206.8	159.8	34.6	192.2	264.5	206.8	365.8	225.1
1981	58.9	72.2	59.9	13.7	79.1	94.8	91.2	228.7	133.2	163.4	135 .	53.7	179.1	212.7	206.4	517.5	226.1
1982	55.8	62.3	58.4	10.2	74.1	81.4	85.1	139.2	138.8	149.4	146.8	24.5	177.6	195.1	203.9	317.2	239.1
1983	68.3	88.7	76.2	6.2	91.7	105.1	118.5	119.8	178.4	206.5	198.2	15.5	228.8	262.1	275.8	299.8	269.1
1984	69.3	82.9	62.9	6.7	93.2	107.9	91.7	114.8	188.2	215.4	163.5	17.5	242.2	288.5	238.2	296.1	258.1

Note: Columns (a) through (h) represent wholesale border prices to producers and consumers converted into Britains at the equilibrium exchange rate (from annexes 2 and 3), and deflated by the trade-adjusted non-agricultural price index (Brval) (see annex Table 10.1).

TABLE V.7: RELATIVE PRICES IN THE ABSENCE OF ALL INTERVENTION (indices, 1963=100)

	.....PRODUCER PRICE RATIOS.....				.....CONSUMER PRICE RATIOS.....			
YEAR	Soft Wht/ Rye	Hard Wht/ Rye	Barley/ Rye	Sugar Beet/Rye	Soft Wht Flour/Rye	Hard Wht Flour/Rye	Barley Flour/Rye	Sugar/ Rye
1960	114	111	95	114	114	106	86	106
1961	111	154	89	109	110	153	89	104
1962	112	117	104	98	112	117	104	99
1963	100	100	100	100	100	100	100	100
1964	99	75	143	212	98	74	103	150
1965	97	71	104	252	97	71	104	169
1966	107	76	125	114	107	66	91	106
1967	101	86	103	83	101	86	103	92
1968	102	84	83	67	102	84	84	85
1969	84	63	74	66	84	63	74	77
1970	88	67	74	74	88	67	74	80
1971	82	61	106	93	82	61	104	90
1972	94	70	87	150	94	70	87	113
1973	179	174	102	177	177	173	101	124
1974	151	140	126	412	150	139	126	230
1975	124	94	105	676	123	94	130	352
1976	105	63	75	634	105	63	87	338
1977	85	55	87	146	85	55	77	118
1978	95	72	75	99	95	72	75	95
1979	118	91	103	87	117	91	103	88
1980	111	78	121	241	111	78	108	158
1981	102	77	103	372	102	78	107	223
1982	96	77	100	160	96	77	100	130
1983	119	99	130	98	119	100	130	111
1984	121	102	108	106	121	102	108	111

Miscellaneous	20	21	22	23	24	25	261	261	261	261	45	51	36	20	
TOTAL	615	936	550	631	763	776	1000	1140	1256	1200	1136	1256	1576	1647	1857
YIELD (tons/ha)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Traded Inputs (Rs/t)	16.52	19.42	22.33	25.23	28.14	31.04	43.20	45.92	48.64	51.36	45.00	50.20	55.00	60.66	70.20
Domestic Price (Rs/t)	60.00	60.00	60.00	66.00	76.00	96.00	96.00	96.00	115.20	115.20	135.00	135.00	155.00	155.00	175.00

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
TRADED INPUTS (Rs/ha)															
Seed	178	199	220	241	262	283	306	329	350	329	307	427	456	476	495
Fertilizer															
14-28-14	172	202	230	256	277	329	338	353	367	396	396	690	420	500	583
Urea	60	70	80	100	112	132	146	126	159	179	174	186	198	257	315
Plant Protection	9	18	27	36	45	54	75	95	125	142	141	180	225	210	200
Machinery Oper.	14	23	30	36	43	50	61	75	91	142	105	131	157	345	532
Irrigation	115	104	175	293	232	261	261	261	261	261	261	673	1000	1276	1467
Miscellaneous	23	35	37	28	45	42	47	52	57	62	67	72	76	28	
TOTAL	583	696	800	900	1011	1146	1223	1316	1490	1526	1744	2008	2630	3111	3592
YIELD (tons/ha)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Traded Inputs (Rs/t)	15.34	18.31	21.15	23.91	26.60	30.16	32.24	34.57	37.10	40.09	40.55	56.80	69.71	81.87	99.53
Domestic Price (Rs/t)	60.00	60.00	60.00	66.00	76.00	96.00	96.00	96.00	115.20	115.20	135.00	135.00	155.00	155.00	175.00

VALUE ADDED IN DOMESTIC PRICES															
.....RAINFED	45.48	40.58	37.67	40.77	47.86	64.96	52.80	50.00	66.56	63.04	89.56	84.76	99.96	90.30	100.72
.....IRRIGATED	44.66	41.69	38.85	42.69	49.40	65.84	63.76	61.65	78.16	74.31	94.65	88.12	85.79	73.13	80.47
.....WEIGHTED	44.70	41.18	38.38	41.70	48.84	65.58	59.66	58.94	73.93	70.93	93.37	88.00	89.15	76.52	85.38

END

TABLE V.9: CALCULATION OF VALUE-ADDED IN SUGAR BEET PRODUCTION AT BORDER PRICES

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
TRADED INPUTS (Dh/ha)															
Seed	178	210	243	275	308	340	367	394	422	449	476	512	547	583	539
Fertilizer															
10-20-10	126	155	179	206	232	259	276	298	311	329	346	378	409	494	570
Urea	69	79	99	110	125	140	162	185	207	230	252	252	251	291	150
Plant Protection	5	8	11	13	16	19	25	31	37	43	49	69	88	125	162
Machinery Oper.	20	28	36	44	52	60	72	84	95	107	119	130	181	245	309
Miscellaneous	10	11	11	12	12	13	15	17	19	21	23	32	40	70	
TOTAL	403	489	579	660	745	831	918	1005	1091	1178	1265	1391	1536	1627	1730
YIELD (tons/ha)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Traded Inputs (Dh/t)	16.12	19.50	22.97	26.39	29.82	33.20	36.71	40.18	43.66	47.13	50.60	55.62	60.64	65.08	69.32
Domestic Price (Dh/t)	30.87	64.53	113.15	142.59	387.20	647.15	599.57	151.96	116.62	115.28	346.41	536.99	295.20	155.62	175.21

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
TRADED INPUTS (Dh/ha)															
Seed	178	210	243	275	308	340	367	394	422	449	476	512	547	583	539
Fertilizer															
10-20-10	180	210	256	294	332	370	395	420	444	469	494	539	584	613	642
Urea	69	79	99	110	125	140	162	185	207	230	252	252	251	250	150
Plant Protection	6	12	17	23	28	34	45	55	64	76	87	126	164	163	162
Machinery Oper.	13	18	23	27	32	37	45	52	60	67	75	95	114	212	309
Irrigation	366	432	498	563	629	695	950	1205	1461	1716	1971	2466	2960	3614	3000
Miscellaneous	19	20	21	22	23	24	27	30	33	36	39	47	54	27	
TOTAL	826	989	1152	1314	1477	1640	1991	2342	2692	3043	3394	4058	4674	5721	5160
YIELD (tons/ha)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Traded Inputs (Dh/t)	21.74	26.62	30.31	34.59	38.87	43.16	52.39	61.62	70.85	80.08	89.32	106.16	123.00	129.58	136.00
Domestic Price (Dh/t)	30.87	64.53	113.15	142.59	387.20	647.15	599.57	151.96	116.62	115.28	346.41	536.99	295.20	155.62	175.21

VALUE ADDED AT BORDER PRICES															
.....BASIFIED	14.75	40.99	40.80	114.20	357.38	613.91	557.86	111.78	72.96	68.15	295.81	481.28	184.56	90.14	145.89
.....UNBASIFIED	29.13	38.54	82.00	108.00	348.33	645.99	542.38	90.14	45.77	35.20	257.09	430.74	122.20	25.92	29.21
.....DIFFERENCE	11.38	41.56	85.79	114.39	358.88	646.93	548.04	95.04	55.68	45.84	265.68	438.16	134.99	38.61	35.31

TABLE V.10: TOTAL EFFECTS OF INTERVENTION ON VALUE-ADDED IN SUGAR

YEAR	VALUE ADDED at DOMESTIC PRICES (i)	PVA (ii)	VALUE ADDED at WORLD PRICES (iii)	PVA* (iv)	VA(d)/PVA (v)	VA*/PVA* (vi)	((VA(d)/PVA) - (VA*/PVA*)) / (VA*/PVA*) (vii)
1960		69.8		72.6			
1961		71.2		73.9			
1962		74.0		77.3			
1963		78.4		81.5			
1964		81.4		85.0			
1965		84.3		88.8			
1966		83.5		87.0			
1967		82.7		86.1			
1968		83.1		86.4			
1969		100.0		103.0			
1970	44.2	102.6	31.3	107.1	.43	.29	.48
1971	41.2	105.2	41.5	108.5	.39	.38	.02
1972	38.4	108.6	85.8	117.9	.35	.73	-.51
1973	41.7	112.5	110.4	126.0	.37	.88	-.58
1974	48.8	138.7	351.8	147.2	.35	2.39	-.85
1975	65.6	141.3	606.9	149.8	.46	4.05	-.89
1976	59.7	146.9	548.0	146.9	.41	3.73	-.89
1977	58.9	163.6	95.0	162.8	.36	.58	-.38
1978	73.9	175.8	55.6	185.4	.42	.30	.40
1979	70.9	188.7	45.8	206.7	.38	.22	.70
1980	93.4	206.6	265.6	225.1	.45	1.18	-.62
1981	80.8	230.1	438.2	226.3	.35	1.94	-.82
1982	89.2	247.1	137.0	229.6	.36	.57	-.37
1983	76.5	255.0	38.6	249.5	.30	.15	.94
1984	85.4	263.2	55.3	259.8	.32	.21	.52

NOTES: Data to estimate value added prior to 1970 are not available.
Source for column (i) is annex Table V.8.
Source for column (iii) is annex Table V.9.

TABLE V.11: TOTAL CONSUMPTION EFFECTS

	ACTUAL CONSUMPTION ('000mt)				..... INCREMENTAL NON-INTERVENTION CONSUMPTION ('000mt)							
	Soft Wh Flour	Hard Wh Flour	Barley Flour	Sugar	Soft Wh flour ('000mt)	% dif	Hard Wh flour ('000mt)	% dif	Barley flour ('000mt)	% dif	Sugar (raw) ('000mt)	% dif
1960	400	486	360	277	19	5%	-40	-8%	-22	-6%	9	3%
1961	519	408	305	255	33	6%	-91	-20%	3	1%	9	3%
1962	479	898	446	300	7	1%	-53	-6%	22	5%	35	12%
1963	325	810	560	290	17	5%	-73	-9%	-103	-18%	39	13%
1964	514	807	472	351	15	3%	40	5%	-112	-24%	34	10%
1965	508	969	487	377	2	0%	109	11%	-90	-19%	33	9%
1966	836	629	218	384	-46	-6%	56	9%	-5	-2%	109	28%
1967	906	817	454	361	-26	-3%	124	15%	65	14%	131	36%
1968	478	1324	950	379	-15	-2%	147	11%	175	18%	157	41%
1969	357	788	541	421	5	1%	10	1%	-117	-22%	156	37%
1970	680	991	563	416	-24	-4%	7	1%	-98	-16%	140	34%
1971	787	1149	767	455	79	10%	127	11%	-170	-22%	109	24%
1972	701	1137	749	405	8	1%	22	2%	-87	-12%	35	9%
1973	1000	924	380	511	-236	-24%	-202	-25%	-16	-4%	38	7%
1974	1090	962	741	566	-215	-20%	-177	-18%	-40	-5%	-44	-9%
1975	1125	879	476	512	-135	-12%	-39	-4%	-49	-10%	-65	-13%
1976	1049	1213	851	574	-105	-10%	310	26%	123	14%	-83	-14%
1977	1453	755	415	570	-36	-3%	131	17%	20	5%	-4	-1%
1978	1356	1004	696	642	-114	-8%	245	24%	261	38%	28	4%
1979	1495	911	565	697	-233	-16%	87	10%	55	10%	43	7%
1980	1694	993	701	660	-218	-13%	-19	-2%	14	2%	-22	-3%
1981	1887	457	394	639	-260	-14%	46	10%	8	2%	-51	-8%
1982	1533	990	598	640	-274	-18%	312	32%	173	25%	[illegible]	1%
1983	2039	863	369	693	-412	-20%	31	4%	-67	-18%	38	5%
1984	2122	916	452	732	-584	-28%	14	2%	20	4%	41	6%

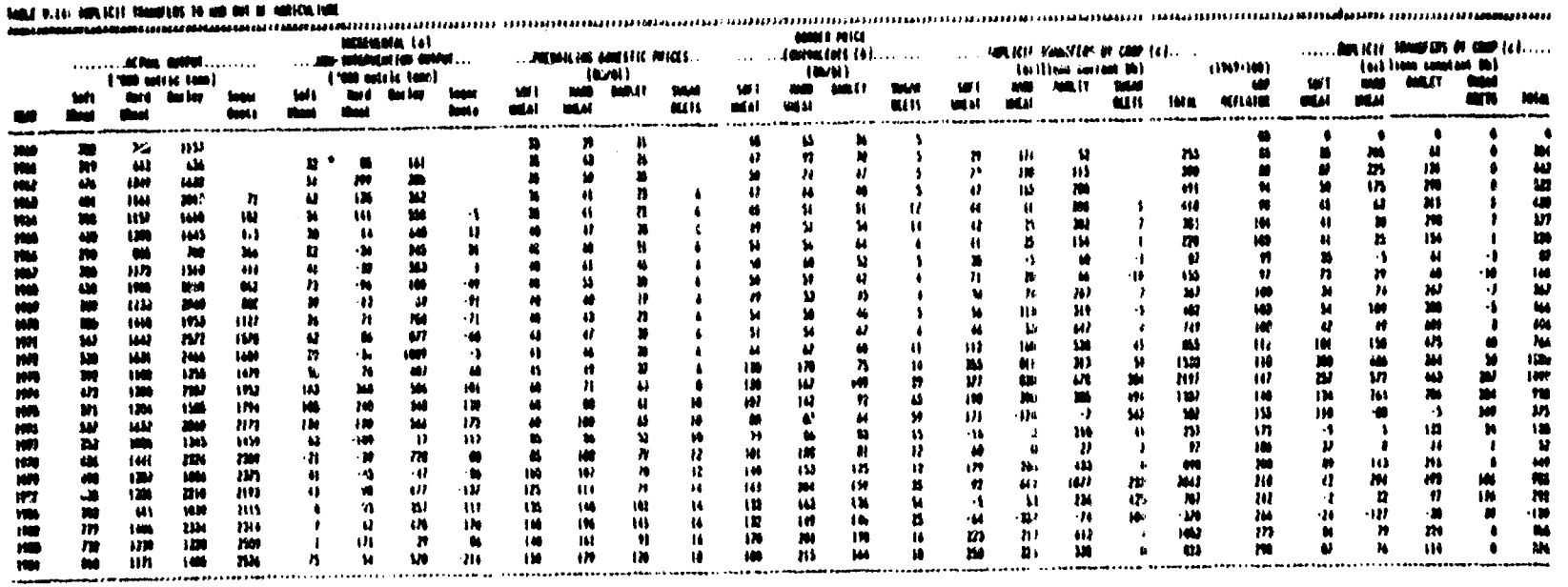

TABLE V.15: CEREALS PRODUCTION IN IRRIGATED VS. RAINFED AREAS (Area in '000 ha, Yields in qx/ha, Production in '000 qx)

SOFT WHEAT: ..... 000Has .....

	Irrigated			Rainfed			Rainfed			Total		
YEAR	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod
1976	46	18.2	839	148	14.3	1987	232	9.8	2265	448	11.5	5371
1977	53	17.4	924	146	12.8	1756	338	7.5	158	537	6.7	2519
1978	58	19.6	1144	176	13.1	2361	222	6.1	992	457	9.5	4356
1979	85	20.9	1767	171	15.8	2567	234	2.6	567	490	10.0	4895
1980	92	17.6	1611	225	5.8	1302	179	16.6	1887	446	10.0	4806
1981	89	22.5	2006	199	3.0	589	193	1.1	222	481	5.9	2817
1982	103	25.8	2650	268	8.1	2167	200	14.2	2947	570	13.6	7772
1983	103	26.4	2701	265	7.8	1717	341	8.5	2900	690	10.6	7318
1984	104	24.4	2573	263	4.8	1251	364	12.8	4659	733	11.2	8182
AVG. 1976-84	82	22.1	1882	204	8.5	1738	257	7.8	1796	542	9.8	5337
% total	15.16		33.86	37.68		32.65	47.41		33.78			

BARLEY: ..... 000Has .....

	Irrigated			Rainfed			Rainfed			Total		
ITEM	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod
1976	96	15.4	1483	140	11.2	1565	1001	13.6	25557	2117	13.5	28604
1977	66	15.3	715	503	9.6	2180	2038	5.2	10536	2316	5.8	13430
1978	49	16.5	810	237	10.6	2516	2103	9.5	19936	2389	9.7	23262
1979	71	15.6	1070	220	10.0	2200	1877	8.3	15575	2168	8.7	18862
1980	78	16.6	1290	298	7.2	2021	1792	10.5	18786	2154	10.3	22097
1981	39	21.0	820	269	2.9	776	1940	4.6	8844	2278	6.2	10290
1982	44	17.0	774	297	8.3	2376	1716	11.8	20186	2043	11.4	23338
1983	36	8.7	309	273	1.6	435	1842	6.3	11533	2151	5.9	12277
1984	42	13.8	580	317	4.5	1411	1766	6.8	12075	2126	6.6	14046
AVG. 1976-84	56	15.6	871	269	6.9	1715	1884	8.4	15894	2180	8.4	18481
% total	2.68		4.78	11.48		9.36	86.18		86.86			

MAIZE AND MILLET: ..... 000Has .....

	Irrigated			Rainfed			Rainfed			Total		
YEAR	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod
1976	82	20.1	1648	251	13.0	3280	1134	10.6	12050	1654	11.4	16510
1977	67	16.4	1100	240	11.2	2700	1005	6.0	6559	1292	7.1	10250
1978	66	17.0	1125	266	12.2	3173	971	10.4	10061	1297	11.1	14589
1979	72	17.5	1262	231	13.5	3111	862	10.1	8696	1167	11.2	13869
1980	80	16.6	1330	312	7.2	2236	837	11.1	9243	1229	10.5	13310
1981	55	17.9	993	254	4.0	1030	857	4.8	4104	1166	5.2	6105
1982	46	19.5	897	271	5.2	1400	790	14.9	11765	1107	12.7	14062
1983	47	18.5	866	233	6.7	1551	1086	10.3	10368	1296	9.6	12305
1984	42	17.0	719	200	4.1	1330	873	11.0	9626	1121	10.6	11713
AVG. 1976-84	60	17.6	1060	251	8.6	2151	960	9.8	9218	1251	9.9	12432
% total	4.88		8.58	20.18		17.38	75.18		74.18			

RICE: ..... 000Has .....

	Irrigated			Rainfed			Rainfed			Total		
YEAR	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod	Area	Yld	Prod
1976	17	17.3	295	65	10.0	650	351	11.4	3979	433	11.4	4925
1977	20	13.3	270	67	8.5	566	358	3.3	1193	425	4.3	1843
1978	17	13.6	226	60	6.0	605	317	10.3	3274	394	9.0	3904
1979	16	12.9	201	64	8.6	549	337	7.0	2366	416	7.5	3116
1980	20	14.2	289	61	6.5	271	330	8.4	2767	411	8.1	3327
1981	23	17.4	398	66	.2	12	273	1.0	688	362	2.5	897
1982	24	15.8	372	68	8.1	546	300	5.0	1530	400	6.2	2469
1983	31	20.3	630	72	2.9	207	331	5.3	1750	434	6.0	2584
1984	41	19.2	787	61	7.9	479	312	6.3	1954	384	6.9	2640
AVG. 1976-84	28	16.2	421	63	6.2	391	324	6.6	2145	406.56	7.0	2956
% total	6.98		11.28	15.48		13.78	79.78		75.18			

Sources: Ministry of Agriculture and Agrarian Reform, Direction of Plant Production and Direction of Planning and Economic Affairs

Notes: Data from the 000Has and on total production are exogenous; non-000Has rainfed sector data are derived as a residual.

ANNEX SIX

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