

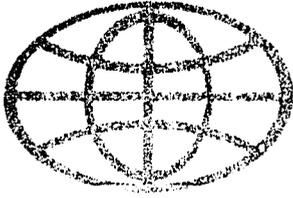
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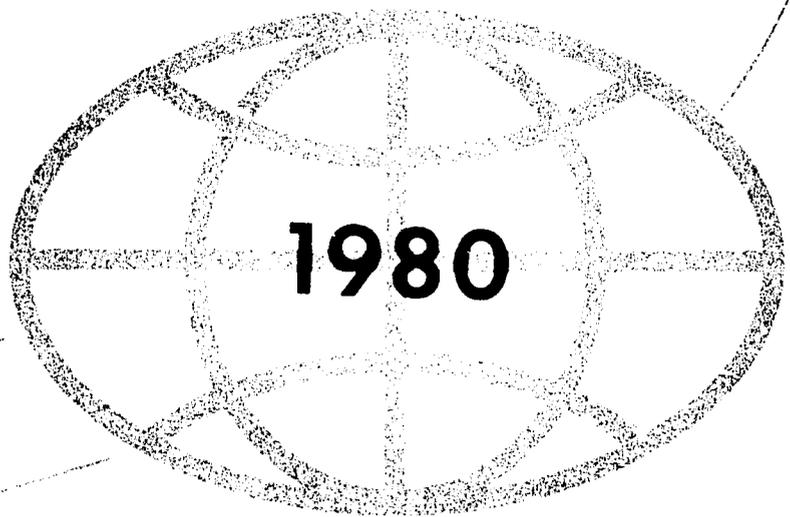
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WORLD DEMAND PROSPECTS FOR COFFEE

IN 1980

WITH EMPHASIS ON TRADE BY
LESS DEVELOPED COUNTRIES



FOREIGN AGRICULTURAL ECONOMIC REPORT NO. 86

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ABSTRACT

Coffee exports account for about 13 percent of total foreign exchange earnings of the coffee producing less developed countries. Multiple linear regression analyses of coffee consumption in the importing countries during 1952-65 indicate that declines in retail price and increases in real consumer incomes at the lower and medium income levels positively influence per capita consumption. In importing countries with relatively high per capita income levels, saturation levels for coffee consumption are increasingly evident; however, shifts in tastes away from alternative beverages and the lowering of domestic consumer tax levels have increased coffee consumption in some countries.

World coffee consumption is projected to increase 2.2 percent yearly. At this rate, projected consumption would increase about 1.1 million metric tons, increasing export earnings for the less developed countries by over \$860 million at 1964-66 prices. If a concentrated effort were made to expand export volume beyond the assumed equilibrium level -- for example, by 12 percent--world coffee prices could be expected to fall 30 percent and coffee export earnings by 22 percent.

Keywords: Coffee, demand, developing areas, exchange, exports, income, prices, projections, T-regression analysis.

Results of the project of which this report is a part have been published as follows by the Economic Research Service, U.S. Department of Agriculture:

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- Vol. II.--Food and Feed Grains: Wheat, Rice, Maize, Barley, and Other Cereals. Foreign Agr. Econ. Rpt. 45, June 1968.
- Vol. III.--Textile Fibers: Cotton, Jute, and other Vegetable Fibers. Foreign Agr. Econ. Rpt. 43, June 1968.
- Vol. IV.--Sugar, Fruits, and Vegetables. Foreign Agr. Econ. Rpt. 44, June 1968.
- Vol. V.--Oilseeds, Oil Nuts, and Animal and Vegetable Oils. Foreign Agr. Econ. Rpt. 47, Aug. 1968.

Japan's Food Demand and 1985 Grain Import Prospects. Foreign Agr. Econ. Rpt. 53, June 1969.

World Demand Prospects for Agricultural Exports of Less Developed Countries in 1980. Foreign Agr. Econ. Rpt. 60, June 1970.

World Demand Prospects for Wheat in 1980 With Emphasis on Trade by the Less Developed Countries. Foreign Agr. Econ. Rpt. 62, July 1970.

Growth in World Demand for Feed Grains: Related to Meat and Livestock Products and Human Consumption of Grains, 1980. Foreign Agr. Econ. Rpt. 63, June 1970.

World Demand Prospects for Cotton in 1980 With Emphasis on Trade by the Less Developed Countries. Foreign Agr. Econ. Rpt. 68, Jan. 1971.

World Demand Prospects in 1980 for Bananas With Emphasis on Trade by Less Developed Countries. Foreign Agr. Econ. Rpt. 69, Feb. 1971.

World Demand Prospects for Grain in 1980 With Emphasis on Trade by the Less Developed Countries. Foreign Agr. Econ. Rpt. 75, Dec. 1971.

A study on agricultural import barriers of developed countries is in preparation. Copies of these reports may be obtained upon request to the Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D. C. 20250.

FOREWORD

Coffee is almost entirely produced in less developed countries and it is of strategic economic importance to many of these countries. During the late 1960's, coffee exports accounted for over 25 percent of the commodity exchange earnings of at least 15 less developed countries. Thus, coffee exports constitute a major source of the foreign exchange earnings essential to development financing.

The primary question considered in this analysis is whether world demand for exported coffee and the resulting flow of exchange earnings to the less developed world can be expected to grow during the 1970's. While significant increases in coffee consumption are evident in some importing countries, a leveling in per capita consumption appears to have been reached in several major markets. As a result, this study indicates that growth prospects for export earnings (at assumed constant 1964-66 prices) are only moderately optimistic--about 2.2 percent annually. A substantial reduction in world coffee stocks during the late 1960's and early 1970's has placed the world coffee economy in a near demand-supply equilibrium. As a result, world coffee supplies in the early 1970's will depend heavily on the present tree population, tree disease, coffee rusts, and vagaries of weather, especially frosts in the coffee growing areas of Brazil.

This study was part of a research project on demand prospects for agricultural products of less developed countries conducted by the Economic Research Service under a participating agency service agreement with the Agency for International Development.

Research on the total project was conducted under the direction of an ERS Technical Advisory Committee with Louis F. Herrmann as Chairman. Arthur B. Mackie and Anthony S. Rojko served as advisors and research leaders.



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SUMMARY

World consumption of imported coffee is projected at slightly more than 3.9 million tons in 1980, or 38 percent more than in 1964-66. If constant 1964-66 world export prices are assumed, foreign exchange earnings from coffee sales would increase about 2.2 percent a year between the middle 1960's and 1980. At this rate, projected consumption would increase about 1.1 million metric tons, increasing export earnings for the less developed countries by over \$860 million at 1964-66 prices.

Growth in imports by developed countries (which account for 91 percent of world coffee imports) is projected at 1.9 percent a year. Higher annual rates are projected for central plan countries (6.3 percent) and less developed countries (3.1 percent), but these are relatively small markets.

Factors influencing coffee consumption in the major importing countries vary widely. In the United Kingdom and Canada (and probably in Australia and New Zealand), where per capita coffee consumption has increased and tea consumption decreased since 1952, changes in taste have apparently been as important as changes in real price or income. In the United States, where per capita consumption has declined since 1952, most of the decline is explained by increased use of instant (soluble) coffees plus the consumption of lower strength coffee. High consumer taxes at the retail level are an apparent restraint on coffee consumption in West Germany.

Aggregated world demand for coffee is price-inelastic. Consequently, if producing countries made a concentrated effort to expand exports beyond the expected equilibrium quantities -- for example, by 12 percent -- world prices could be expected to fall 30 percent and foreign exchange earnings nearly 22 percent.

During 1959-69, the value and volume of coffee exports from producing countries increased nearly 30 percent. Some year-to-year variations resulted from buildups and subsequent drawdowns of stocks in the importing countries. Gains in export earnings by Western Hemisphere producers were small compared with gains in African and Oceania areas, where exports increased almost 80 and 150 percent, respectively. Generally, these gains in export earnings have come from larger volumes rather than from higher unit values.

From 1957 through 1962, world prices for coffee declined; however, market stabilization activities of the 1962 and 1968 International Agreements helped to stabilize price movements. During the remainder of the 1960's, world coffee prices generally stabilized at 1963 levels.

During the late 1950's and throughout most of the 1960's, world coffee production far exceeded consumption. Trees planted in response to high world coffee prices in the early 1950's reached peak production in the early 1960's. Confronted with excessive stock buildups, many major producing countries initiated programs to reduce coffee tree numbers. During the latter half of the 1960's, frosts in Brazil and droughts in major coffee growing areas accelerated a decline in world production. By the late 1960's and early 1970's, world coffee stocks had been sharply reduced. Thus, the world's coffee supply during the 1970's will depend upon the current tree population, diseases, and the vagaries of weather -- particularly frosts in Brazil.

WORLD DEMAND PROSPECTS FOR COFFEE IN 1980
WITH EMPHASIS ON TRADE BY LESS DEVELOPED COUNTRIES

by

Daniel E. Timms
Foreign Demand and Competition Division

I. INTRODUCTION

National development planning in less developed countries (LDC's) depends heavily upon export prospects of primary commodities. Many LDC's depend upon agricultural exports for exchange earnings to finance imports of capital goods. In 1964-66, more than 60 LDC's had agricultural exports accounting for more than 50 percent of total export earnings. Because of heavy dependence upon agricultural exports, fluctuations in export prices cause large variations in export earnings and total economic growth -- especially for countries that depend upon export earnings from only one or two commodities.

LDC's need information on demand prospects for agricultural exports as a basis for planning and carrying out economic development programs. Further growth in export demand for agricultural commodities from LDC's will influence the amount of resources that can be economically used for expanding production of export commodities.

This report is concerned with the future prospects for coffee -- a major export earner in a number of Latin American, African, and Caribbean countries. The specific objective is to estimate the long-term prospects of coffee as an export earner of foreign exchange in LDC's that presently produce or contemplate producing coffee. In ascertaining the prospects for export earnings, major attention is given to demand in importing countries and, to a lesser degree, to supply and demand in producing countries.

Basic Assumptions

For the studies in this series (listed inside the front cover) the world was divided into three major political-economic regions for the analysis of production and trade of selected agricultural commodities. These major regions were further subdivided into 18 subregions as follows:

Developed

United States
Canada

European Community (EC) -- Belgium-Luxembourg, France, West Germany, Italy, and the Netherlands

United Kingdom

Other Western Europe (OWE) -- Austria, Denmark, Finland, Greece, Iceland, Ireland, Malta, Norway, Portugal, Spain, Sweden, and Switzerland

Japan

Australia and New Zealand

South Africa, Republic of

Central Plan

Eastern Europe -- Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and Yugoslavia

USSR

Communist Asia -- Mainland China, Mongolia, North Korea, and North Vietnam

Less Developed

Central America and Mexico -- British Honduras, Caribbean including Cuba, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama

South America -- Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, French Guinea, Guyana, Paraguay, Peru, Surinam, Uruguay, and Venezuela

East and West Africa -- All countries except those in North Africa (listed below) and the Republic of South Africa

North Africa and West Asia -- Algeria, Libya, Morocco, Sudan, Tunisia, Egypt, Bahrein, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Muscat and Oman, Qatar, Saudi Arabia, Syria, Trucial States, Turkey, and Yemen

South Asia -- Afghanistan, Bhutan, Ceylon, India, Nepal, and Pakistan

Southeast Asia -- Burma, Cambodia, Laos, South Vietnam, and Thailand

East Asia and Pacific Islands -- Brunei, Taiwan, Hong Kong, Indonesia, South Korea, Macao, Malaysia, Pacific Islands, Papua, Philippines, and Singapore

Country Groupings Used in Study

Because of data limitations, detailed demand analyses and projections were limited to 17 major developed importing countries. These developed countries were regrouped from the above arrangement on the basis of their socio-logical characteristics and their consumption patterns for coffee and its major substitute -- tea.

These groupings are:

United States

The British Commonwealth Countries and Ireland -- United Kingdom, Canada, Ireland, Australia, and New Zealand

The Scandinavian Countries -- Sweden, Norway, Denmark, and Finland
The European Community plus Switzerland and Austria
(At the time the framework of the research was begun,
Great Britain and Ireland had not voted to join the
European Community. While their joining will have
some as yet unknown effects on the projections of
this study, the data on British coffee consumption
and trends away from tea consumption remain unchanged)

Framework for the Analysis

In estimating long-term demand for coffee, 1964-66 (a 3-year average) was chosen as the base period and 1980 as the terminal point for projections. For projections, it was assumed there would be no major changes from the base period in political situations, trade policies, restrictions on imports, and technological factors such as processing of coffee. Changes in any of these would necessarily alter the results. Projections in this report are based upon imperfect statistical data and are estimates of probable future levels of consumption rather than forecasts of what will actually happen. Nevertheless, these projections may be useful to the LDC's to help them assess the feasibility of getting into coffee production, expanding present production, or diversifying their export earnings base.

The selection of the analysis period used in this study (1952-65) was influenced by two major considerations. First, the analysis periods of the other studies in this series (listed on the inside of the front cover) terminated in 1965. And second, retail coffee price and per capita consumption data for 1952-65 were available from the International Coffee Organization. Comparable data for years after 1965 were not available. Retail price and per capita consumption data for tea, cocoa, and milk were obtained from the Food and Agriculture Organization of the United Nations (FAO). The Organization for Economic Cooperation and Development provided consumer expenditure data and consumer price indexes.

II.--WORLD COFFEE PRODUCTION AND TRADE

Importance of Coffee

Coffee holds a unique position in the world economy. While the value of world coffee production is small compared with that of rice, wheat, oils, livestock products, and sugar, no other commodity has as great a significance to the underdeveloped countries girdling the world's tropical belt (10, p. 1). ^{1/} For 1969/70, the Pan American Coffee Bureau (PACB) estimates that the average share of foreign exchange earnings from coffee sales by producing countries was nearly 13 percent (table 1). Western Hemisphere countries earned over 16 percent of their foreign exchange from coffee exports and African exporting countries earned slightly less than 15 percent. In Asia and Oceania, foreign revenues from coffee sales amounted to only 2.5 percent during 1969/70.

In the Western Hemisphere, Brazil, Colombia, El Salvador, Guatemala, Costa Rica, and Haiti each earned more than one-third of their foreign exchange earnings (1969/70) from coffee sales abroad. Their share of foreign exchange earnings from coffee ranged from 33 to 60 percent. In Africa, Uganda, Ethiopia, Rwanda, and Burundi depended on coffee for one-half to four-fifths of their export earnings, while Kenya, Angola, and the Malagasy Republic earned 20 to 25 percent of their foreign exchange from coffee exports (table 1).

These percentages, however, do not indicate the total importance of the coffee export sector in the development of individual national economies. As described in FAO's World Coffee Economy:

. . . Even where, for example, subsistence farming contributes a large percentage of the gross product, it nevertheless is essentially a static sector from the point of view of economic and social progress. Dynamic development has in most cases originated in the export sector, frequently with crops such as cotton, coffee and cocoa. The coffee producing countries, in particular have been able since the war [World War II] to finance a substantial part of their investment in fixed capital assets from the proceeds of export sales. Coffee has thus played a vital role in the process of economic growth in these countries. (10, p. 3).

Thus, progress in economic growth and development in coffee producing countries depends very heavily on this one crop. Consequently, the prospects of the world's coffee economy can have a social and economic impact on political stability in these countries.

^{1/} Underscored numbers in parentheses refer to items in Selected References at the end of this report.

Table 1 --Value of world coffee exports compared with total exports, 1969/70

Regions and countries	Exports, all commodities	Exports of coffee	Coffee, share of all exports
	----- <u>Million dollars</u> -----		<u>Percent</u>
Western Hemisphere:			
Brazil	2,455.9	895.9	36.5
Colombia	655.8	391.6	60.0
El Salvador	214.9	100.8	46.9
Guatemala	266.5	89.5	33.6
Mexico	1,457.2	86.6	5.9
Costa Rica	206.1	60.8	29.5
Ecuador	195.8	37.5	19.2
Peru	957.1	37.7	3.9
Honduras	204.5	24.2	11.8
Haiti	41.7	16.8	40.3
Dominican Republic	212.0	26.8	12.6
Venezuela	2,949.0	16.4	0.6
Panama	115.5	1.4	1.2
Other Western Hemisphere <u>1/</u>	1,160.5	32.1	2.8
Total Western Hemisphere	11,094.5	1,817.8	16.3
Africa:			
Uganda	226.6	118.5	52.3
Kenya	197.2	50.6	25.7
Tanzania	255.2	41.2	16.1
Ivory Coast	452.3	74.3	16.4
Angola	372.3	77.1	20.7
Ethiopia	119.3	68.7	57.6
Cameroon	227.5	51.0	22.4
Malagasy Republic	137.0	36.4	26.6
Zaire	678.0	46.2	6.8
Burundi	15.7	13.3	84.7
Rwanda	14.0	8.5	60.7
Togo	46.6	7.8	16.7
Central African Republic	36.8	6.4	17.4
Nigeria	1,087.7	1.9	1.7
Various <u>2/</u>	1,051.0	19.1	1.8
Total Africa	4,879.4	720.7	14.8
Asia & Oceania:			
Indonesia	795.5	57.5	7.2
India	1,859.0	28.6	1.5
Papua & New Guinea	62.5	19.5	31.2
Various <u>3/</u>	1,845.0	6.4	0.3
Total Asia & Oceania	4,562.0	111.9	2.5
Total exports	20,535.0	2,650.5	12.9

1/ Bolivia, Guadeloupe, Nicaragua, Paraguay, Trinidad and Tobago, Surinam, and Guyana.

2/ Cape Verde, Congo (Brazzaville), Dahomey, Equatorial Guinea, Gabon, Ghana, Guinea, Liberia, Sao Tome and Principe, Senegal, and Sierra Leone.

3/ Comoro Islands, New Caledonia, New Hebrides, Singapore, South Vietnam, Timor, and Yemen (Aden).

Source: Pan American Coffee Bureau (PACB) Annual Coffee Statistics, 1969 and 1970, New York.

Trends in World Coffee Production

From 1952/53 through 1970/71, yearly world coffee production fluctuated significantly. Production increased from 2.5 million tons in 1952/53 to a peak of 4.9 million tons in 1965/66. ^{2/} Since then, production has trended downwards, registering 3.4 million tons in 1970/71 (table 2). Exportable production -- defined as production during a given marketing year less domestic consumption -- roughly paralleled the growth and decline of world production from 1952/53 through 1970/71. In contrast, net annual exports by producing countries grew steadily at about 2.6 percent -- from 1.9 million tons in 1952/53 to 3.1 million tons in 1970/71. (All growth rates are compound unless specified otherwise). The difference between exportable production and world exports is absorbed by stocks.

The obvious question suggested by the above and the data in table 2 is, "why has there been such a wide disparity between world production and world consumption?"

The most obvious (and generally best known) contributing factor was the massive coffee tree plantings of the early 1950's, resulting from the substantial post-World War II rise in coffee prices. By the early sixties, those trees were in full production and contributed to the massive buildup of coffee stocks. The downturn in production can be partially attributed to a general failure to plant replacement trees plus a campaign by many countries to uproot trees as a desperate means of slowing the buildup of coffee stocks during the mid-1960's (table 2). These factors were complemented in the later 1960's by droughts in many producing areas plus several very damaging frosts in Brazil -- the world's largest coffee producer.

A detailed (quantitative) analysis of determinants of world coffee supply was not within the limited resource scope of this study. Instead of a quantitative supply analysis (and projections), a qualitative discussion of additional factors which influenced coffee production follows.

Agronomic and Economic Factors of Production

Coffee trees bear fruit in 2 to 3 years if planted as seedlings and in 3 to 4 if planted as seeds. Yields increase gradually during the following 7 to 10 years and then decline slowly. Depending upon the variety, climate, and cultivation practices, the productive life of mature trees varies from 15 to 30 years or more. These characteristics of production, coupled with relatively inelastic consumer demand for coffee, underlie some of the basic economic problems of the coffee economy. The adjustment of world production to changes in prices and demand is frequently difficult and often requires several years.

^{2/} All tons in this report are metric.

Table 2 --World supply and distribution of green coffee,
1952/53 through 1970/71

Marketing year	Beginning carryover <u>1/</u>	Production	Total supply	Net exports <u>2/</u>	Domestic distri- bution <u>3/</u>	Ending carryover <u>4/</u>
<u>1,000 metric tons</u>						
1952/53	316	2,491	2,807	1,976	494	337
1953/54	337	2,640	2,976	2,007	579	390
1954/55	390	2,531	2,921	1,753	496	672
1955/56	672	3,021	3,693	2,298	404	991
1956/57	991	2,725	3,716	2,172	647	897
1957/58	897	3,301	4,198	2,240	527	1,431
1958/59	1,431	3,700	5,131	2,339	580	2,212
1959/60	2,212	4,735	6,947	2,541	750	3,656
1960/61	3,656	3,946	7,602	2,653	777	<u>5/3,992</u>
1961/62	3,992	4,323	8,315	2,722	826	<u>6/4,347</u>
1962/63	3,669	4,044	7,713	2,992	841	3,881
1963/64	3,881	4,260	8,141	2,962	846	4,333
1964/65	4,333	3,037	7,370	2,607	884	3,879
1965/66	3,879	4,896	8,775	3,057	922	4,796
1966/67	4,796	3,639	8,434	3,001	968	4,465
1967/68	4,465	4,118	8,569	3,330	<u>5/986</u>	<u>7/3,300</u>
1968/69	3,300	3,636	6,936	3,120	1,050	2,766
1969/70	2,766	<u>8/3,961</u>	6,728	<u>9/3,210</u>	<u>8/1,104</u>	<u>8/2,414</u>
1970/71 <u>10/</u>	2,414	3,488	5,902	3,100	1,086	1,716

1/ Held in producing countries.

2/ For consumption and working stocks in importing countries. Working stocks in importing countries are estimated to average 240,000 tons.

3/ Domestic consumption in producing countries.

4/ In recent years some carryover stocks were not of exportable quality.

5/ Stocks reduced by 180,000 tons which were allocated for industrial use in Brazil.

6/ Stocks reduced by 420,000 tons which were destroyed in Brazil in mid-1961.

7/ Carryover adjusted to conform to special stock survey.

8/ PACB revisions according to latest USDA figures.

9/ PACB estimates.

10/ USDA estimates.

Source: Pan American Coffee Bureau (PACB), 1969 Annual Coffee Statistics, New York (except 1970/71).

Most coffee trees are planted during periods of high world prices. ^{3/} Since 5 to 7 years must elapse before the trees begin to yield substantial crops, the high price cycle is frequently over by the time many of the trees reach peak production. Once the trees begin to bear, the crops are likely to increase each year. While a fall in price does tend to discourage new plantings, production usually increases for some years from the trees which were planted during the high price period. Moreover, the fruit is likely to be harvested despite low prices, because growers are frequently reluctant to go to the expense of uprooting trees which are still yielding. And there is always the possibility that coffee prices may recover. Hence, trees are usually neglected or uprooted only when their yields have fallen to a very low level. In the long run, the trend in the tree population is upward, because new plantings normally exceed tree wastage (10, p. 9).

Agronomic factors which tend to maintain coffee production despite falling returns are reinforced by purely economic considerations. First the investment in land, trees, and buildings for the production of coffee is relatively high. Thus, once trees are bearing fruit, prices have to fall drastically before it pays to uproot them. Second, in many coffee producing areas there are no incentives to shift to alternative crops (if, indeed, there are other crop options).

Botanical Species and Commercial Types of Coffee

The two most important and widely grown species of coffee are arabica and (canephora) robusta. The other major species -- liberica and excelsa -- are diminishing in importance. Liberica is grown only in a few countries and is of minor importance in world trade; excelsa coffees have diminished rapidly in importance because of their high susceptibility to disease.

Arabica coffees are the most important. Their flavor is characteristically softer and milder than that of other species and therefore has greater consumer appeal. Arabicas grow in 58 of the 79 major coffee producing countries. Although they originated in Ethiopia, the arabica types are now found mainly in the Western Hemisphere. In Africa, arabica coffees are grown in Ethiopia, Uganda, Kenya, Tanzania, Zaire, Cameroon, Rwanda, and Burundi; they are also grown to a small extent in India and Hawaii.

Arabica coffees are generally less tolerant of extreme temperatures and climate; therefore, they thrive best in the highland areas. In the tropics, arabica coffees are grown at altitudes of 500 to over 2,000 meters (10, p. 8).

Robusta coffees are grown largely in low areas of Africa and Asia. In most African countries, they constitute over 85 percent of total production. In the Western Hemisphere, cultivation is limited to some islands of the Caribbean and Ecuador (10, p. 8).

^{3/} High prices may also lead to some increase in current yields because of greater use of weeding, pruning, and spraying techniques, and of fertilizers, but the main price effect is delayed until a large number of newly planted trees come into production.

Robusta coffees come from trees which are sturdier than arabica coffee trees. Robusta trees are grown mostly in low, hot country, where the arabica tree does not generally thrive. The fruit of the robusta tree is coarse and has a distinctly pungent flavor. Because of this characteristic flavor, robustas are not as useful as arabicas in blending with other coffees. A major positive characteristic of robusta coffees is their technical superiority for processing into instant (soluble) coffee. Since the early 1950's, world demand for robusta coffees has been positively affected by the growth of the soluble coffee industry. Thus, the economies of the robusta exporting countries will be affected by the longrun aspects of the soluble market.

Desired Soil and Climatic Conditions 4/

Optimum temperatures for coffee cultivation range about the average annual temperature of 65 to 75 degrees F. Rainfall of 70 to 80 inches is required for full production. However, the coffee plant may survive dry spells of several months if sufficient humidity is present. Adequate sunlight is also required. Some shading is frequently considered necessary; however, coffee is also grown without shade.

Soils of disintegrated volcanic rock are ideal and constitute the most favorable environment for coffee cultivation. Thus, gently rising slopes covered by volcanic debris are often sought as locales for coffee plantations. High potash content and sufficient humus are necessary to ensure healthy growth.

Diseases and Pests 5/

Except for Hawaii and Sierra Leone, almost all coffee producing areas have disease problems. The most important of the coffee diseases is leaf rust, or hemileia vastatrix. This disease has caused serious production losses in Ceylon, India, Indochina, and Indonesia and is also of serious concern to many African coffee producing countries. In these infected areas, arabica production is limited to the higher altitudes where the incidence of leaf rust is less severe. Some robusta coffee is inherently resistant to leaf rust.

During the late 1960's, Latin American coffee producers became increasingly concerned about the leaf rust menace. In 1970, some rust was discovered in Brazil. However, the resulting loss in production to date appears to be minor.

American leaf spot, or myceria citricolor, and common leaf spot, or cercospora coffeicola, are of secondary importance. The former affects coffee production in several Latin American countries and the latter occurs in all coffee growing continents. Numerous other diseases have affected coffee production. Some have caused the virtual disappearance of certain varieties of coffee. For example, tracheomycosis, caused by Gibberella xylarioides, has

^{4/} Taken largely from (24, p. 79).

^{5/} Taken largely from (11, p. 441).

destroyed many excelsa coffee producing plantations in the Ivory Coast and in the Central African Republic.

Africa is particularly plagued by a great number of pests which cause serious damage and require adequate control measures. Among these are the coffee berry borer, various trunk and branch borers, and the leaf miner. On the other hand, Latin American coffee producing areas are generally free of the more seriously damaging insects, though the coffee borer (broca) is common in Brazil.

Organization of Production and Marketing

The world's coffee is produced on 3 to 4 million estates and smaller units. Contrary to the common belief that coffee is predominantly an estate crop, an FAO survey showed that it is mainly a smallholder's enterprise. And because of increasing labor costs, the present trend away from large estate production will probably continue (11, p. 438).

Coffee can be produced on small-scale operations (farms) with a minimum of equipment but much hard labor. This method can apparently compete effectively with large-scale methods. For example, in Brazil there are many one-man or family holdings of 2,000 or 3,000 trees, or even less, operating in competition with estates of a million or more trees.

Coffee Marketing

The Latin American marketing chain for coffee frequently stretches from the planter to the planters' agent to the broker and finally to the exporter. Smaller planters, in need of ready cash, frequently sell to local roasting mills or to large planters. These, in turn, may utilize the services of a planters' agent or sell to brokers, exporters, or agents of foreign buyers.

In Brazil, the Brazilian Coffee Institute -- a joint Government-industry organization -- is responsible for carrying out Brazilian coffee policy. It has the authority to regulate coffee movement to port, establish quality standards, set minimum export prices, make purchases, and otherwise enforce Brazilian crop regulations. In Colombia, farmers frequently sell to the National Federation of Coffee Growers, or they are assisted by it in obtaining the best possible price for their coffee. Also, the federation frequently provides warehouse space, financing, and insurance for coffee producers (18, p. 14).

In other countries, there is considerable variety in marketing arrangements. For example, in certain African countries, coffee is sold through quasi-Government marketing boards, cooperative societies, or auctions in the leading port cities.

An additional general function of the regulatory agencies in the major producing countries is to help Governments enforce quotas, develop production controls, and otherwise carry out the mandates of the International Coffee Agreement (18, p. 15).

All the major coffee importing and exporting countries are signers of the International Coffee Agreement. The International Coffee Organization administers the agreement and thereby functions as a world-wide regulatory agency. Through the authority vested in it by the agreement, the organization sets the permitted yearly export level for each major coffee producer. Thus, world export supply and price levels are influenced by the organization via the International Coffee Agreement. Additional information about the organization and agreements is provided in appendix B.

Major World Coffee Producers

South America 6/

South American coffee production increased from an average of 1,691,000 tons in the early 1950's to 1,828,000 tons in the late 1960's, or 7 percent over the earlier period (table 3). In the early 1950's, South American production comprised 63 percent of the world's total production; however, by the late 1960's, this share had declined to less than 48 percent. This decrease is largely attributable to increased coffee production in Africa, frost damage to production in Brazil, and policies restricting production in Latin American countries.

Future trends in South American production will continue to be influenced by the production curtailment practices initiated during the 1960's plus the unpredictable frost damage factor. Presumably, large amounts of capital inputs such as fertilizers could increase production in the immediate future as well as in the long run. However, the cost and logistic problems of such an undertaking leave considerable doubt as to its feasibility or probability.

South America's largest coffee producer -- Brazil -- is also the world's largest (tables 3 and 4). However, Brazil's share of world production has declined significantly. In the early 1950's, Brazil's production comprised 72 percent of South American total production. By the late 1960's, Brazil's production had fallen to 64 percent of South American production and 31 percent of world production.

The decline in Brazil's share of production can be partially attributed to the severe frosts mentioned above plus a decline in average tree production because of age. These factors were reinforced by Brazilian coffee policy considerations. An equilibrium between coffee production and demand was very actively pursued by the Executive Group for the Rationalization of Coffee Production (GERCA) 7/. Between July 1962 and May 1967, about 1.4 billion trees were eradicated, thereby freeing almost 1.5 million hectares of land for other agricultural uses. And GERCA's program included steps to reduce Brazil's overall economic dependence on coffee.

6/ Description of the factors influencing coffee production in the South American area are taken largely from (11), pp. 277-361.

7/ GERCA was created in 1961 to function within the larger framework of the Instituto Brasileiro do Cafe (Brazilian Coffee Institute).

Table 3 --Coffee production and regional and world shares, 1952/53-1955/56 and 1966/67-1969/70 ^{1/}

Region and country	1952/53-1955/56			1966/67-1969/70			1966/67-1969/70 index of production 1952/53-1955/56 = 100
	Tons	Regional share	World share	Tons	Regional share	World share	
	1,000 metric tons	Percent	Percent	1,000 metric tons	Percent	Percent	
World total	2,673.2	--	100.0	3,850.8	--	100.0	144
South America	1,691.3	100.6	63.3	1,828.2	100.0	47.5	108
Brazil	1,215.1	71.8	45.5	1,177.5	64.4	30.6	97
Colombia	403.9	23.9	15.1	479.3	26.2	12.4	119
Other	83.8	4.9	3.1	171.4	9.4	4.5	205
Africa	425.2	100.2	15.9	1,078.1	100.0	28.0	254
Ivory Coast ^{2/}	--	--	--	220.5	20.5	5.7	--
Angola	67.6	15.9	2.5	196.5	18.2	5.1	291
Uganda	55.2	13.0	2.1	177.5	16.5	4.6	322
Ethiopia	48.1	11.3	1.8	113.7	10.5	2.9	236
Malagasy Republic	46.1	10.8	1.7	55.4	5.1	1.4	122
Tanzania	18.2	4.3	0.7	51.8	4.8	1.3	279
Kenya	17.2	4.0	0.6	50.8	4.7	1.3	296
Other	174.0	40.9	6.5	212.5	19.7	5.5	122
Central America	441.2	100.1	16.5	665.5	100.2	17.3	151
Mexico	88.7	20.1	3.3	172.1	25.9	4.5	194
El Salvador	75.3	17.1	2.8	131.4	19.7	3.4	174
Guatemala	67.3	15.3	2.5	105.2	15.8	2.7	156
Costa Rica	29.0	6.6	1.1	78.4	11.9	2.0	270
Honduras	14.9	3.4	0.6	27.3	4.1	0.7	183
Nicaragua	23.4	5.3	0.9	32.0	4.9	0.8	137
Caribbean	109.6	24.8	4.1	92.0	13.6	2.4	84
Haiti	39.7	9.0	1.5	28.7	4.3	0.7	72
Cuba	38.9	8.8	1.5	28.5	4.3	0.7	73
Dominican Republic	31.0	7.0	1.2	34.8	5.2	0.9	112
Other	33.0	7.5	1.2	27.2	4.1	0.7	82
Asia and Oceania	114.4	99.9	4.3	278.9	100.1	7.2	244
Indonesia	62.7	54.8	2.3	116.2	41.7	3.0	185
India	28.2	24.6	1.1	80.3	28.8	2.1	285
Philippines ^{3/}	--	--	--	44.9	16.1	1.2	--
Other	23.5	20.5	0.9	37.7	13.5	1.0	160

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^{1/} Marketing years. Items may not add to totals because of rounding.

^{2/} Part of French West Africa until 1957.

^{3/} Only minor production prior to 1957.

Source: USDA, Foreign Agricultural Service.

-- = not available.

Table A --Distribution of world coffee production, 1963/64-1966/67

Country	Production	Domestic distribution <u>1/</u>	Exportable production	Exports
----- Percent -----				
Brazil	36.0	48.2	32.9	34.1
Colombia	12.0	7.4	13.4	12.4
Ivory Coast	5.5	0.3	7.0	6.1
Angola	4.5	0.4	5.8	5.5
Mexico	4.2	7.5	3.2	3.0
Uganda	3.9	0.1	5.1	5.3
El Salvador	3.0	0.8	3.6	3.6
Indonesia	2.9	2.2	3.2	2.8
Guatemala	2.7	1.4	3.1	3.2
Ethiopia	2.5	2.3	2.5	2.5
Costa Rica	1.6	0.8	1.8	1.8
Zaire	1.5	1.1	1.6	1.5
Cameroon	1.5	0.2	1.9	1.8
Malagasy Rep.	1.4	1.0	1.5	1.6
Ecuador	1.3	1.2	1.3	1.4
Kenya	1.2	0.1	1.5	1.5
Other	14.0	24.8	10.7	11.8
TOTAL <u>2/</u>	99.7	99.8	100.1	99.9
----- Metric tons -----				
Brazil	1,438,500	442,500	996,000	987,840
Colombia	474,000	68,280	405,720	358,260
Ivory Coast	217,080	3,060	214,020	177,480
Angola	180,000	3,420	176,580	160,020
Mexico	167,280	69,000	98,280	85,440
Uganda	156,000	840	155,160	152,940
El Salvador	117,600	7,620	109,980	103,740
Indonesia	116,220	20,400	95,820	82,260
Guatemala	107,100	12,840	94,260	93,720
Ethiopia	97,860	21,300	76,560	71,460
Costa Rica	62,460	7,680	54,780	54,600
Zaire	58,860	10,500	48,360	42,360
Cameroon	58,020	1,740	56,280	53,340
Malagasy Rep.	53,580	9,060	44,520	45,600
Ecuador	50,460	11,160	39,300	40,320
Kenya	48,120	1,200	46,920	43,860
Other	553,260	227,280	325,980	341,580
TOTAL <u>2/</u>	3,956,400	917,880	3,038,520	2,894,820

1/ Domestic distribution (consumption) is the residual of harvested production less exportable production.

2/ Items may not add to totals because of rounding.

Sources: World harvested and exportable production--USDA, Foreign Agr. Serv.; coffee exports--Pan American Coffee Bureau, Annual Coffee Statistics, 1966, 1967, and 1968.

Colombian coffee production ranks second to Brazil's (tables 3 and 4). Unlike Brazil's, Colombia's coffee production increased between the early 1950's and late 1960's from 404,000 tons to 479,000 tons, or 19 percent. Production in 1952-56 was 24 percent of South America's production and 15 percent of world production. During 1966-70, Colombia produced 26 percent of South America's output and 12 percent of world production.

Increased yields and higher than average prices 8/ can be expected to favorably influence the trend in Colombia's production. The National Federation of Coffee Growers has placed major emphasis on efforts to introduce new and improved methods of cultivation to Colombia's coffee farmers.

Most of the balance of South American coffee is produced in Venezuela, Ecuador, and Peru; small amounts are produced in numerous other countries.

Africa 9/

Coffee harvests in Africa increased dramatically from 1952-56 to 1966-70, when production rose from 425,200 tons to over 1 million -- a 121 percent increase. In the early 1950's, African production was only 17 percent of world production. By the late 1960's, African production had increased to 27 percent of world production.

Unlike Brazil, the African region is not plagued by damaging frosts. And with few exceptions, African governments did not actively discourage coffee production during the 1960's, as was done in South America. In fact, planting of new trees during the 1960's will strongly influence African production in the 1970's. Also, most African countries still have ample resources of land and labor for further expansion of coffee production. On the demand side, increased use of robusta coffees for soluble manufacture have enhanced the longrun economic outlook for African coffee producers.

Africa's largest producer -- the Ivory Coast -- is third in world production (tables 3 and 4). From 1957 10/ through 1966-70, coffee production doubled, going from 102,000 to 204,000 tons. During the late 1960's, the Ivory Coast produced 5 percent of world production and nearly 21 percent of African production.

Trends in Ivory Coast production will be favorably influenced by its stock of relatively young trees. Almost 10 percent of the trees are fairly recent plants and about 50 percent are less than 15 years old. Thus, average yields per tree can be expected to increase or at least remain stable; however, conversion of marginal coffee land to alternative uses could result in a decline of total coffee production.

8/ Prices for Colombian "mild coffee" average 15 to 30 percent higher than for nonmild (robusta).

9/ Description of the factors influencing production in the African area are taken largely from (11), pp. 4-180.

10/ Prior to 1957, the Ivory Coast was part of French West Africa.

Angola ranks second to the Ivory Coast and is considered one of the best robusta producers for bean size and flavor. From 1952-56 to 1966-70, Angola's production increased from 67,600 to 196,500 tons, or 176 percent, while Angola's share of world production increased from under 3 to over 5 percent (table 3).

Angola's future production will probably be negatively influenced by a fairly high incidence of "sudden death" (morte subita) and root rot. As a matter of policy, the Angola Agricultural Department is making serious attempts to lessen the country's dependence on coffee.

Uganda ranks third in African production (table 3). Its production increased from 55,000 tons in 1952-56 to 177,500 tons in 1966-70, or 222 percent, while its share of world production increased from 2 to 4 percent. This trend in Ugandan production is not expected to continue. Only a very limited number of trees were planted during the 1960's and only a small amount of new land is available for coffee production. On the other hand, production could be increased somewhat by more intensive application of relatively cheap husbandry practices such as proper weeding and pruning.

Ethiopia's coffee production increased from 48,100 tons in 1952-56 to 113,200 tons in 1966-70, or 136 percent, and its share of world production increased from 2 to 3 percent. The apparent potential for coffee expansion is considerable. Natural conditions such as soil and climate are almost ideal for coffee production and the greater application of simple husbandry practices such as proper tree spacing, weeding, and shading could improve tree yields.

From a practical standpoint, it is difficult to accurately assess Ethiopia's potential as a coffee producer because reliable data on production are difficult to collect in nonforest areas and virtually impossible in the approximately 400,000 hectares of coffee forest.

Coffee production in the Malagasy Republic increased from 46,100 tons in 1952-56 to 55,400 tons in 1966-70, or 22 percent. However, its share of total African production declined from 11 to 5 percent. Future trends in production will be significantly influenced by the Government's plan to increase annual production to 70,000 tons on only one-third the present coffee growing area.

Tanzania's coffee production increased from 18,200 to 51,800 tons between 1952-56 and 1966-70, or 179 percent. It is believed that Tanzanian production could be increased significantly in the near future by better pruning, spraying, and picking practices. However, unless world coffee prices increase, it is doubtful whether the growers will be willing to give their crops this added attention.

Another major African producer -- Kenya -- nearly tripled its harvested production -- from 17,200 to 50,800 tons -- and increased its share of world production from 4 to nearly 5 percent (table 3). Future Kenyan production is expected to reach 78,000 tons by the early 1970's. Large areas of suitable coffee land remain unplanted, largely because of the Government's decision to restrict production during the "coffee-glut" years of the middle 1960's.

Central American Region 11/

For the purposes of this study, the Central American region includes Mexico and the coffee producing countries of the Caribbean. This region includes countries with a wide diversity of coffee production activities. Between 1952-56 and 1966-70, coffee production in the region increased from 441,200 tons to 665,500 tons, or 51 percent, while its share of world production remained essentially stable at about 17 percent (table 3).

Mexico is the leading coffee producer in the Central American region (table 3). From 1952-56 to 1966-70, Mexican production nearly doubled -- from 88,700 to 172,000 tons -- and its share of the region's production increased from 20 to 26 percent (table 3). Future trends in Mexican coffee production are expected to be favored by increased yields. Despite a 5-percent reduction in acreage since 1962, total production has increased.

El Salvador's coffee production ranks second in the Central American region. From 1952-56 to 1966-70, El Salvador's production increased from 75,300 to 131,400 tons, or 74 percent, and its share of the region's production increased from 17 to 20 percent. No significant changes are expected in El Salvador's production. Coffee is presently produced under a relatively efficient system.

Guatemala's coffee harvest increased 56 percent from 1952-56 to 1966-70 -- from 67,300 to 105,200 tons -- and its share of world production increased from 15 to 16 percent. Despite a Government policy encouraging diversification in the coffee areas, intensive cultivation is expected to increase annual production more than 30,000 tons by the early 1970's.

Costa Rica ranks fourth in the Central American region. Between 1952-56 and 1966-70, Costa Rican coffee production increased from 29,000 to 78,400 tons, or 170 percent -- the greatest increase for any country in the region. This trend in Costa Rican production has been increased by two major factors: hectareage increased despite Government policy to reduce production during the middle and late 1960's and yield per hectare increased greatly. It may reach 1,000 kilograms during the 1970's.

The rest of Central America's coffee is produced in Honduras, Nicaragua, and the Caribbean.

Three countries -- Haiti, Cuba, and the Dominican Republic -- produce most of the coffee in the Caribbean. From 1952-56 to 1966-70, Caribbean coffee production declined 17,600 tons, or 16 percent. Prospects for a reversal of this decline appear dim. In Cuba and the Dominican Republic, production is predominantly a smallholder's enterprise and most trees are past their prime.

11/ Description of the factors influencing production in the Central American region are taken largely from (11, pp. 181-276).

Asia and Oceania Region 12/

Coffee production in the Asia and Oceania region increased 144 per cent -- from 114,400 tons in 1952-56 to 278,900 tons in 1966-70 -- and the region's share of world production increased from 4 to 7 percent. This trend is favorably influenced by Philippine production, which began in the mid-1950's, and India's efforts to increase coffee production. Under India's two 5-year plans (1967-72 and 1973-78), coffee production goals are 84,000 and 96,000 tons, respectively. These production goals seem reasonable, since Indian production increased from 28,200 tons in 1952-56 to 80,300 tons in 1966-70. Philippine production is largely a result of a coffee rehabilitation program which was first directed at self-sufficiency and later at providing a coffee surplus for export.

Indonesia is the largest producer in the Asia and Oceania area, followed by India and the Philippines (table 3). Indonesian production increased from 62,700 to 116,200 tons between 1952-56 and 1966-70, or 89 percent. Production is not expected to increase in the near future because coffee estates are suffering from labor shortages and many smallholders are interested in alternative crops.

Concentration of World Coffee Production and Imports

The world's coffee economy is characterized by considerable concentration in production, exports, and consumption. In 1964-66, two countries -- Brazil and Colombia -- produced and exported about 48 percent of the world's coffee supply (table 4). Imported coffee consumption is concentrated in the United States and Western Europe. However, some changes are occurring in the supply as well as the demand structure of the world coffee economy. In recent years, increasing output in African countries -- particularly of robusta coffees -- has reduced Latin America's relative share of world exports. On the demand side, per capita consumption (in green bean equivalent) had declined in the United States while increasing significantly in the British Commonwealth countries and Japan.

Major Exporters

Except for two relatively small coffee producers -- Hawaii and Puerto Rico -- less developed countries are the sole producers of coffee. During the early 1950's, producers in the Western Hemisphere accounted for nearly 80 percent of world coffee exports. The most important of these were Brazil and Colombia, which exported 43.8 and 18.0 percent, respectively (table 5).

Major shifts in relative shares of world exports occurred from the early 1950's through the late 1960's. Latin America now accounts for less than

^{12/} Description of the factors influencing production in the Asia and Oceania area are taken largely from (11, pp. 362-435).

Table 5 --Volume of coffee exports by producing countries and world share, 1952-54 and 1964-66

Region and country	1952-54		1964-66		1964-66 index of exports (1952-54 = 100)
	Volume	World share	Volume	World share	
	1,000 metric tons	Percent	1,000 metric tons	Percent	
Latin America	1,546,433	80.0	1,813,100	63.1	117
North and Central America ..	293,433	15.2	453,113	15.8	154
Costa Rica	24,267	1.3	51,393	1.8	212
Dominican Republic	23,333	1.2	28,110	1.0	121
El Salvador	65,000	3.4	102,063	3.6	157
Guatemala	56,567	2.9	93,593	3.3	165
Haiti	27,367	1.4	23,143	0.8	84
Honduras	9,600	0.5	22,313	0.8	232
Mexico	64,900	3.3	93,080	3.2	145
Nicaragua	18,269	0.9	24,900	0.9	136
Other	4,133	0.2	14,517	0.5	351
South America	1,253,000	64.8	1,359,987	47.3	109
Brazil	846,033	43.8	905,203	31.5	106
Colombia	348,333	18.0	352,217	12.3	101
Ecuador	19,733	1.0	38,637	1.3	195
Peru	3,967	0.2	27,413	1.3	943
Venezuela	34,133	1.8	18,853	0.7	552
Other	801	0.0	7,663	0.3	957
Africa	331,000	17.1	879,853	30.6	266
Angola	54,500	2.8	151,463	5.3	278
Cameroon	10,067	0.5	55,417	1.9	550
Central African Republic ...	4,200	0.2	10,487	0.4	249
Zaire	33,067	1.7	32,157	1.1	97
Ethiopia	33,900	1.8	77,550	2.7	229
Guinea	4,800	0.2	9,007	0.3	188
Ivory Coast	74,233	3.8	190,480	6.6	257
Kenya	14,300	0.7	45,293	1.6	317
Malagasy Republic	39,833	2.1	44,557	1.6	112
Nigeria	433	0.0	4,040	0.1	93
Sierra Leone	1,167	0.1	6,503	0.2	557
Tanzania	18,033	0.9	37,683	1.3	209
Togo	3,000	0.2	13,343	0.5	445
Uganda	37,200	1.9	155,010	5.4	415
Other	2,267	0.1	46,864	1.6	206
Asia and Oceania	56,167	2.9	177,273	6.1	307
Yemen (Aden)	8,200	0.4	4,483	0.2	55
Hong Kong	100	0.0	17,120	0.6	171
India	4,500	0.2	26,813	0.9	596
Indonesia	29,600	1.5	87,020	3.0	294
Singapore	7,733	0.4	20,083	0.7	260
New Caledonia	1,533	0.1	1,587	0.1	103
Other	4,500	0.2	22,167	0.8	493
World	1,933,600	100.0	2,872,226	100.0	149

Source: (9)

two-thirds of the world export market. African gains almost account for the displacement of exports from the Western Hemisphere. On a total export quantity basis, there were gains from 1952-54 through 1964-66 for both Latin America and Africa. However, the increase for the former was only 17 percent, while for the latter it was over 160 percent (table 5).

The major shifts in the relative importance of the African coffee trade over the past 20 years resulted from a rapid increase in production and exports in countries like Angola (from 54,500 tons in 1952-54 to 151,463 tons in 1964-66, or 178 percent), Kenya (from 14,300 tons in 1952-54 to 45,293 tons in 1964-66, or 217 percent), and Uganda (from 37,000 tons in 1952-54 to 155,000 tons in 1964-66, or over 300 percent). In Latin America, numerous smaller producers increased their coffee export levels significantly (table 5). However, the largest producer-exporters -- Brazil and Colombia -- increased their exports only 7 and 1 percent, respectively.

An analytical description of the major trade flows between the major exporting and importing regions is shown in table 6 for 1964-66. In this table, the exporting regions are shown as column headings at the top of the table. The data in this table indicate that world coffee exports are almost entirely (over 99 percent) from the less developed to the developed countries, as indicated by the concentration of numbers in the lower left quadrant.

Trends in Export Earnings

The volume and value of world coffee exports increased about 28 percent, or 2.5 percent per year, from 1959 through 1969. The index value of exports trended upward rather unevenly, with the major share of the increase for this period occurring in 1963-64 and 1968. On the other hand, the index of volume increased rather evenly throughout the period with the exception of a sharp rise during 1963 (table 7).

From 1959 to 1967, there were divergent trends in export earnings of the various exporting countries (table 8). For example, export earnings of Western Hemisphere areas have increased only slightly. In contrast, earnings for African exporters (in constant value) have increased nearly 80 percent (table 8). Generally, these gains in export earnings have come from a larger volume rather than higher unit values (table 9). Unit values for coffee exports declined from 1957 through 1962. Price stabilization activities of the International Coffee Organization (described in app. B) plus reductions in world coffee stock reduced the downturn in world coffee prices. World prices generally stabilized throughout the 1960's (table 9).

Major Markets for Imported Coffee

United States

The United States is the largest world market for imported coffee. Historically, Latin America has been the largest supplier of green coffee for this market. However, since the middle 1950's, Africa has steadily increased its share of the U.S. market. For example, during 1962-69, the African share

Table 6 --World trade in coffee, 1964-66
(Metric tons)

Exporting regions	Developed									Communist			Less developed					World total export			
	United States	Canada	EC	United Kingdom	O.W.E.	Japan	Aus. - N. Zea.	S.Afr., Rep. of	Total Developed	Eastern Europe	U.S.S.R.	Communist Asia	Central Amer. & Mexico	S. America	E. & W. Africa	N. Africa & W. Asia	S. Asia		S. E. Asia	E. Asia & Pac. Is.	
United States		14	2	1	1	2			20											20	
Canada				1					1											1	2
EC			13	4	1				18												2
United Kingdom					1				1							1					19
O.W.E.					1				1												1
Japan																					1
Austral. - N. Zea.	1		2						3											1	1
S. Afr., Rep. of	1								1												3
																		1			2
Total Developed	2	14	17	6	4	2			45							1		1	2		49
Eastern Europe				1	1				2												2
U.S.S.R.											1										1
Com. Asia																					
Total Communist				1	1				2		1										3
C. Amer. & Mex.	246	10	142	5	34	5			443	2											448
S. America	661	36	281	7	233	9			1,235	68	18		4	41		3					1,416
E. & W. Africa	373	14	289	53	56	15			812	14	1	1			4	38			12		868
N. Afr. & W. Asia	2		2	3	1	1			9	2	1				4	35		1			14
S. Asia	4		7	1	2				14	6	7					2					27
S. E. Asia	1								1												3
E. Asia & Pac. Is.	41		25	1	24	1			104	2	1								4	2	126
Total less developed	1,328	60	750	70	350	31			2,618	94	28	1	4	41	4	78		5	29		2,902
World total imports	1,330	74	767	77	355	33			2,665	94	29	1	4	41	4	79		6	31		2,954

The absence of data indicates trade flow of less than 500 metric tons.

Table 7 --Indexes of value and volume of world coffee exports from
producing countries, 1959-70
(1960 = 100)

Area	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
----- <u>Value of coffee exports</u> -----												
World	102	100	97	98	105	126	117	126	119	135	129	124
Central America ..	90	100	90	99	93	116	118	121	104	114	114	117
South America	105	100	97	94	101	111	103	106	101	117	111	101
Africa	103	100	96	107	120	172	152	182	170	191	182	159
Asia & Oceania ...	116	100	133	128	171	179	181	209	269	251	254	256
----- <u>Volume of coffee exports</u> -----												
World	102	100	103	105	118	109	105	118	121	129	128	168
Central America ..	92	100	98	112	106	111	109	115	111	124	119	130
South America	105	100	100	102	113	95	87	100	103	112	112	126
Africa	102	100	103	99	122	133	133	147	142	158	154	218
Asia & Oceania ...	93	100	181	161	206	145	187	202	286	216	245	352

Source: (9).

Table 8 --Value of coffee exports by producing countries, 1959-70

Country	1959	1969	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	1,000 dollars											
North and Central												
America	307,748	341,128	308,530	338,520	318,750	397,890	403,910	412,810	356,350	390,310	388,250	393,940
Costa Rica	40,050	43,930	43,300	48,420	45,970	48,030	46,630	52,640	54,840	55,260	55,830	73,080
Cuba	2,200	3,710	2,670	6,610	420	100	50	40	3,530	8,860	3,500	n.a.
Dominican Rep.	17,510	22,570	14,350	19,890	18,460	30,500	21,100	20,950	17,020	17,930	21,250	25,900
El Salvador	71,280	76,670	70,150	75,670	74,590	92,860	95,550	89,030	98,590	92,220	88,700	111,960
Guatemala	74,250	74,560	67,130	67,120	77,080	71,090	92,180	100,070	61,590	73,420	81,450	97,700
Haiti	16,040	16,580	13,460	20,070	15,960	17,530	19,320	20,720	13,690	14,610	16,500	14,100
Honduras	11,740	11,820	9,030	11,430	14,190	16,920	22,150	19,870	17,740	20,790	18,000	25,800
Mexico	51,060	62,050	63,080	64,110	43,970	86,720	65,610	73,570	54,550	69,040	67,740	n.a.
Nicaragua	13,860	19,220	17,370	15,430	17,540	21,100	26,350	21,760	21,100	22,680	20,560	32,090
Other	9,758	10,018	7,990	9,770	10,570	13,040	14,970	14,160	13,700	15,500	14,520	13,310
South America	1,164,370	1,109,240	1,079,980	1,042,810	1,122,980	1,232,730	1,136,430	1,174,220	1,116,860	1,302,450	1,231,810	1,400,490
Brazil	743,570	712,710	710,390	642,670	748,280	759,700	706,590	763,980	704,730	774,480	812,960	939,900
Colombia	361,250	332,250	307,830	332,020	303,010	394,230	343,900	328,260	322,370	445,770	343,940	n.a.
Ecuador	17,500	21,950	14,250	20,950	18,260	21,190	38,240	32,540	39,830	34,480	26,640	50,700
Peru	15,600	18,490	22,770	24,180	25,560	36,980	29,010	28,500	29,490	35,750	30,130	44,710
Venezuela	24,630	21,970	22,690	18,800	23,360	15,010	13,670	13,490	13,980	8,010	14,240	17,250
Other	1,820	1,870	2,050	4,190	4,510	5,640	5,020	4,150	6,160	4,260	3,900	4,390
Africa	367,140	357,780	342,840	380,940	429,860	616,340	543,380	650,480	609,210	684,780	651,320	787,805
Angola	48,260	43,960	48,670	64,210	66,230	99,510	93,470	106,380	123,370	122,800	122,590	134,980
Cameroon	20,280	18,670	20,750	21,130	26,080	37,720	31,770	44,870	43,890	51,060	45,840	52,430
Central African Republic	3,760	3,460	3,930	4,210	3,170	8,010	4,070	7,280	5,810	4,920	5,420	6,710
Zaire	37,870	30,040	14,000	13,930	17,320	23,570	14,300	22,680	27,500	34,300	28,200	33,900
Equ. Guinea	5,010	8,530	6,730	6,770	5,320	5,290	5,990	6,170	6,120	6,500	6,000	n.a.
Ethiopia	40,580	43,530	37,780	43,430	44,630	63,940	75,810	62,810	56,140	61,400	70,040	n.a.
Guinea	9,090	8,580	8,080	2,890	5,790	2,500	6,000	8,300	1,290	8,230	5,500	n.a.
Ivory Coast	64,900	75,720	82,310	78,350	99,140	128,510	104,880	422,520	102,990	145,320	116,920	155,500

Continued --

Table 8 --Value of coffee exports by producing countries, 1959-70 -- Continued

Country	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	1,000 dollars											
Africa--Continued												
Kenya	29,660	28,780	29,750	29,720	30,890	43,390	39,680	52,690	43,970	35,980	47,270	62,430
Malagasy Rep.	24,180	23,560	22,470	30,060	23,960	24,550	28,900	30,760	32,910	35,660	32,060	39,390
Nigeria	1,810	2,770	190	260	650	2,310	400	4,210	1,010	1,380	2,970	1,980
Sierra Leone	2,760	1,820	1,670	870	1,830	3,810	1,890	5,490	1,840	3,750	4,200	n.a.
Tanzania	16,090	20,510	18,940	18,410	19,150	30,950	24,060	42,400	33,440	n.a.	n.a.	n.a.
Togo	7,240	2,480	5,040	5,490	3,240	10,230	5,530	7,910	3,400	6,490	6,770	9,570
Uganda	52,330	42,240	39,140	56,480	76,110	99,130	85,190	97,410	96,880	100,100	109,190	142,030
Other	3,320	3,030	3,390	4,430	6,570	32,890	21,440	28,600	28,650	66,590	58,750	65,815
Asia and Oceania	59,480	51,490	68,360	66,040	87,840	92,240	93,170	109,690	138,490	129,440	130,840	170,135
Yemen (Aden)	4,160	3,680	3,940	3,190	3,220	4,570	3,890	2,800	1,600	n.a.	1,010	1,150
Hong Kong	110	330	1,610	2,280	2,750	7,250	8,930	10,680	5,450	6,210	10,820	14,160
India	13,130	14,010	20,010	16,550	17,010	28,970	23,460	22,370	24,820	22,090	26,190	29,590
Indonesia	18,880	13,680	13,750	12,510	19,840	26,500	31,670	32,660	43,810	42,970	49,830	64,600
Singapore	15,690	12,860	18,120	20,120	31,350	9,480	9,270	19,930	41,580	33,100	36,170	30,020
New Caledonia	1,010	910	1,170	730	720	1,340	740	1,030	710	690	370	n.a.
New Guinea	1,010	1,590	2,450	3,450	4,510	5,970	8,150	9,760	11,310	16,020	n.a.	22,600
Other	5,490	4,430	7,310	7,210	8,440	8,160	7,060	8,460	8,210	8,360	6,450	7,210
World	1,898,738	1,859,638	1,799,710	1,828,310	1,959,430	2,339,200	2,176,890	2,345,200	2,220,910	2,507,280	2,402,220	2,900,240

Source: (9).

Table 9 --Value per metric ton of coffee exports, by producing countries, 1969-70

Country	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	<u>Dollars</u>											
North and Central America:												
Costa Rica	925	941	833	844	842	941	966	960	829	806	825	1,058
Cuba	730	698	668	762	677	833	833	800	784	777	761	n.a.
Dominican Republic	801	772	714	679	671	887	859	825	787	762	769	992
El Salvador	859	857	810	724	738	849	957	918	807	785	779	1,009
Guatemala	895	933	850	815	785	935	965	916	752	778	904	1,019
Haiti	732	700	670	672	682	852	853	823	764	771	885	904
Honduras	767	762	718	718	694	889	889	864	878	788	757	824
Mexico	678	742	680	678	647	837	815	773	701	696	699	n.a.
Nicaragua	850	883	828	751	729	906	934	937	826	797	774	1,074
South America:												
Brazil	702	706	698	654	639	847	783	756	702	699	725	976
Colombia	939	933	908	843	824	1,025	1,017	983	882	1,128	885	n.a.
Ecuador	739	692	623	636	619	858	804	745	688	696	698	964
Peru	785	702	670	646	638	875	839	805	717	682	703	981
Venezuela	867	884	922	970	986	751	989	748	742	798	746	1,035
Africa:												
Angola	542	504	412	402	480	717	587	680	628	651	615	747
Cameroon	688	612	585	513	554	503	658	661	644	695	672	838
Central African Republic	642	584	541	534	548	640	533	644	636	599	602	789
Zaire	670	514	412	470	366	629	622	630	632	651	578	580
Equatorial Guinea	858	917	765	916	801	829	861	857	854	812	833	n.a.
Ethiopia	897	849	674	690	672	905	921	846	756	762	791	n.a.
Guinea	633	535	421	372	505	658	556	668	568	592	591	n.a.
Ivory Coast	619	513	532	541	545	629	565	675	691	678	656	796
Kenya	1,128	1,018	910	595	826	1,019	1,028	965	865	954	924	1,159
Malagasy Republic	637	586	564	336	535	647	577	674	659	663	647	758
Nigeria	547	584	322	325	411	557	635	574	591	585	579	700
Sierra Leona	549	349	327	360	462	632	486	572	642	585	656	n.a.
Tanzania	807	805	757	706	724	924	847	829	737	753	727	972
Togo	626	585	493	502	521	634	519	598	605	635	613	716
Uganda	582	356	373	425	516	709	540	582	607	659	605	743
Asia and Oceania:												
Hong Kong	917	473	434	390	393	538	514	521	426	396	412	446
India	895	851	626	780	720	917	949	927	717	782	759	1,032
Indonesia	493	332	205	219	260	442	300	342	329	523	478	663
New Caledonia	711	679	619	566	571	641	643	678	676	633	569	n.a.
New Guinea	1,042	1,068	1,065	497	917	868	926	898	872	864	n.a.	876
Singapore	630	470	329	389	446	730	637	609	543	559	529	663
Yemen (Aden)	908	878	841	794	815	907	837	745	982	n.a.	894	1,009

Source: (9).

increased from 21 to 29 percent (table 10). Significant increases in African production plus increased demand for robusta coffee (for soluble coffee manufacture) account for most of this shift to African coffee.

European Community

Rapid growth in European Community coffee importation has been a major factor in the world coffee economy. Although the rate of increase is diminishing, prospects for continued real income growth and reductions in consumer taxes suggest that EC imports will remain an important component of world coffee trade.

Major sources of EC coffee imports are shown in table 11 and appendix table A-3. During 1962-70, Latin American and African shares of the EC market remained fairly stable -- averaging 57 and 35 percent. Brazil and Colombia supply most of the arabica coffees, while Angola, Cameroon, and the Ivory Coast supply the EC with most of its robusta imports.

Scandinavia

Average per capita consumption in Scandinavia in the late 1960's was nearly 11 kilograms -- the highest in the world. Total imports of green bean coffee increased from over 201,000 tons in 1962 to over 262,000 tons in 1969, or 4 percent per year.

Latin American exporters -- particularly Brazilian and Colombian -- dominate this market (table 11). Coffee supply patterns for the Scandinavian countries have been very stable.

United Kingdom

The United Kingdom is one of the world's most promising import markets for coffee. Total imports of green bean coffee increased 50 percent during 1962-69.

Three major coffee growing regions supply three-fourths of the British demand for green coffee: What was then British East Africa (particularly Uganda and, to a lesser extent, Kenya), 48 percent; Brazil, 17 percent; and the Ivory Coast, about 9 percent (24, p. 96). The African countries supplied over 68 percent of green coffee imports in 1966-69 -- an indication of the wide British acceptance of robustas (table 11).

Canada

During 1962-69, Canada's volume of green coffee imports increased only 10,000 tons, or 1.9 percent per year (app. table A-6). Despite this rather slow rate of import growth, Canada ranked eighth among all countries in green coffee imports during 1969 (24, p. 84).

Table 10 --Market share of U.S. coffee imports, 1962-70 1/

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
					<u>Percent</u>				
Latin America	77.8	76.7	71.3	67.5	65.8	65.8	65.0	65.0	61.3
Brazil	37.0	38.8	31.5	26.9	30.6	29.0	33.2	29.2	24.3
Colombia	17.6	16.5	16.2	15.5	12.2	14.2	11.9	12.1	12.4
Costa Rica	1.6	1.2	1.3	1.4	1.0	1.5	1.1	1.3	1.9
Dominican Rep.	1.7	1.5	2.3	1.4	1.6	1.2	1.3	1.5	1.8
Ecuador	1.5	1.2	1.0	2.4	1.9	2.2	1.6	1.8	3.0
El Salvador	3.4	3.2	3.0	3.4	2.7	4.0	2.3	3.0	2.7
Guatemala	3.9	4.5	3.5	4.2	5.1	3.3	2.8	4.1	3.6
Mexico	5.7	3.5	6.5	5.4	4.7	4.7	5.1	5.6	5.2
Peru	1.9	2.1	2.4	2.1	2.0	2.1	2.0	2.2	2.6
Venezuela	1.1	1.3	1.1	1.1	1.2	1.3	0.6	1.4	1.3
Other	2.4	2.9	2.6	3.5	2.7	2.4	3.0	2.9	2.4
Africa	20.8	21.2	26.5	28.9	29.1	27.6	30.1	29.1	32.8
Angola	0.1	4.7	5.4	6.1	5.5	6.9	6.8	6.3	5.3
Caire	2.0	1.9	0.9	0.7	0.2	0.2	1.0	0.8	0.9
Ethiopia	2.7	3.4	4.0	5.4	3.6	4.9	3.8	4.6	5.3
Ivory Coast	n.a.	n.a.	5.2	3.9	5.5	3.2	5.7	4.0	6.1
Kenya	n.a.	6.3	1.3	0.6	0.8	0.5	0.8	0.6	0.9
Malagasy Republic..	0.7	0.8	0.7	1.9	1.0	1.6	1.9	1.6	1.5
Uganda	n.a.	n.a.	4.2	5.2	5.5	4.9	4.7	5.0	4.6
Other	9.3	4.1	4.8	5.2	7.1	5.4	5.3	6.4	8.2
Asia & Oceania	1.4	2.1	2.2	3.7	5.1	6.5	4.8	5.6	5.5
Indonesia	1.2	1.9	1.7	3.0	4.4	5.3	3.9	4.5	4.1
Other	0.1	0.2	0.5	0.7	0.7	1.2	0.9	1.2	1.4
Other 2/	0	0.1	0	0	0	0.1	0.1	0.3	0.4

See footnotes at the end of table.

Continued

Table 10 --Market share of U.S. coffee imports, 1962-70 1/--Continued

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
	<u>Metric tons</u>								
Total	1,475,460	1,435,909	1,375,358	1,281,595	1,330,518	1,293,118	1,538,209	1,234,707	1,206,000
Latin America	1,148,123	1,101,145	980,361	864,575	875,372	851,361	1,000,079	802,014	739,304
Brazil	545,569	556,501	432,795	344,750	406,857	374,457	510,788	360,504	293,832
Colombia	259,934	237,003	222,574	199,193	162,939	183,798	182,989	148,813	149,982
Costa Rica	23,076	17,223	17,576	18,324	13,883	19,446	17,639	16,274	22,477
Dominican Republic	25,064	22,050	31,907	18,583	21,172	15,211	19,756	19,531	21,836
Ecuador	22,153	17,619	13,824	30,151	25,936	28,043	25,004	22,608	35,988
El Salvador	50,805	45,794	41,042	42,964	35,910	51,676	35,200	36,684	32,997
Guatemala	58,050	64,903	47,672	54,397	67,243	42,760	43,490	50,104	43,416
Mexico	84,429	50,844	89,173	69,396	63,055	60,779	78,925	68,956	63,151
Peru	28,048	29,444	32,475	27,254	26,838	26,884	30,601	27,210	31,383
Venezuela	16,283	18,761	15,701	14,203	16,237	17,010	9,522	16,975	15,182
Other	34,712	41,003	35,622	45,360	35,302	31,297	46,165	34,355	29,002
Africa	306,721	303,697	364,256	369,766	387,461	357,269	463,085	359,649	396,249
Angola	89,835	67,436	74,759	77,109	72,691	88,925	105,344	77,639	64,087
Zaire	29,925	26,865	11,711	8,745	2,150	2,498	15,583	9,458	10,432
Ethiopia	39,655	48,969	55,450	69,493	47,525	63,641	57,807	56,622	64,260
Ivory Coast	n.a.	n.a.	71,499	50,440	73,461	41,399	87,472	48,826	73,993
Kenya	n.a.	89,828	17,399	7,090	10,428	6,821	12,714	7,034	10,407
Malagasy Republic	9,883	12,425	10,176	24,295	13,827	20,755	29,801	19,765	18,483
Uganda	n.a.	n.a.	57,715	66,508	73,081	63,333	72,119	61,455	55,513
Other	137,423	58,174	65,547	66,086	94,298	69,897	82,245	78,850	99,074
Asia & Oceania	20,036	29,986	30,154	47,013	67,307	83,214	73,982	69,696	65,765
Indonesia	18,086	27,237	23,505	38,597	58,460	68,017	59,657	55,339	49,324
Other	1,950	2,749	6,649	8,416	8,847	15,197	14,325	14,357	16,348
Other 2/	580	1,081	587	241	378	1,274	1,063	3,348	4,256

n.a. = not available.

1/ Similar tables appear in app. A for the European Community, Scandinavia, United Kingdom, Canada, and Japan.

2/ Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations trade statistics.

Table 11 --Export market shares of the major world coffee
importing markets, 1962-65, 1966-69, and 1970 ^{1/}

Period and area of origin:	U.S.	EC	Scandinavia ^{2/}	UK	Canada	Japan
	<u>Percent</u>					
1962-65:						
Latin America	73.5	56.0	87.4	20.7	67.3	46.2
Africa	24.1	37.8	6.6	70.0	13.5	32.0
Asia & Oceania	2.3	4.1	4.8	3.6	0.5	6.9
Other ^{3/}	--	2.1	1.1	5.7	18.7	15.0
1966-69:						
Latin America	65.4	58.1	87.2	16.2	58.1	53.6
Africa	29.4	34.7	7.5	68.2	25.5	40.3
Asia & Oceania	5.5	4.5	4.4	4.4	1.0	3.2
Other ^{3/}	--	2.8	1.0	11.2	15.5	2.9
1970:						
Latin America	61.3	58.1	84.4	32.0	56.3	58.1
Africa	32.8	35.1	10.7	57.8	28.5	37.1
Asia & Oceania	5.5	3.4	3.7	4.5	0.4	2.6
Other ^{3/}	0.4	3.4	1.2	5.6	14.7	2.2

^{1/} Percentages derived from data in table 10 and app. tables A-3 through A-7.

^{2/} Norway, Sweden, Denmark, and Finland.

^{3/} Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations.

-- = not applicable.

Historically, Latin America has been the major supplier for the Canadian market. However, during 1962-69, African producers more than doubled their share of the market -- from 14 to over 25 percent. Conversely, Latin America's share declined from 67 to 58 percent (table 11).

Japan

The Japanese market for green bean coffee is the world's most dynamic. During 1964-69, imports more than doubled, from 25,000 to over 61,000 tons (app. table A-7). Most of this growth in imports can be attributed to the increase in per capita consumption, particularly by younger people. Also, by the late 1960's, increasing amounts of green coffee imports were being used for manufacturing soluble coffees. Previously, Japan imported most soluble coffees from the United States and West Germany.

As a relatively new coffee market, Japan's import activities are not tied to historical coffee trade channels. During 1962-69, divergent trends appeared in the shares of the Japanese green coffee market held by the major exporting areas and countries. For example, Africa's share increased from 37 percent in 1964 to 56 percent in 1966. Three years later, Africa's share had declined to 31 percent.

III.--CONSUMPTION TRENDS AND DEMAND ANALYSIS

Methodology

Per capita coffee consumption was assumed to be a function of retail coffee prices; retail prices of major coffee substitutes, such as tea, cocoa, and milk; per capita consumer expenditures; and time ("trend factors"). Data on additional coffee substitutes, such as colas, wine, and beer, would have been desirable ^{13/}. However, complete data series (1952 through 1965) on these items were not available. Real prices and real consumer expenditures (deflated to a 1958 base) are used throughout this study. Income (consumer expenditures) and time were found to be highly intercorrelated; consequently, in most cases, time (trend) was eliminated as a variable, so as not to confuse income results. Population was implicitly included by using per capita consumption and income data.

Lagged relationships were not considered in any of the demand analyses. As with most food product studies using annual data, adjustment in consumption following a change in price or income was assumed to have taken place in the same year. That is, price or income changes in previous years, or expected in future years, had little effect (if any) on current consumption.

Time series multiple linear regression was used to generate the coefficients which are used in chapter IV to project expected consumption in 1980.

Consumption data were regressed on all the variables in (1) natural form, (2) first differences--natural, (3) double log, and (4) first difference--double log form. Best results were obtained from regressions on data in the double log form. The results of the most instructive of these analyses are discussed under each country analysis.

Time and resource limitations did not permit extensive statistical analysis of the factors affecting coffee supply. Thus, only the demand side of the Marshallian scissors is analyzed in detail.

Data limitations restricted detailed analyses of coffee consumption to only 17 major coffee importers. These importers, however, consumed 93 percent of world coffee imports in 1952 and nearly 88 percent of world imports in 1964-66 (table 12). The level and growth of coffee consumption varies widely with changes in coffee prices and income among these countries. However, when growth in consumption characteristics of both coffee and tea (a major coffee substitute) are considered jointly, distinct country groupings emerge (table 13). For example, in the British Commonwealth countries, growth in coffee consumption increased rapidly during 1952-67, apparently at the expense of tea consumption. On the other hand, in the EC, Switzerland, Austria, and

^{13/} In a recent study, available only after this study was essentially completed, there is some evidence that rising consumption of soft drinks, particularly among those persons in the younger age groups, may be partly responsible for the decline in U.S. coffee consumption. See "The Downtrend in U.S. Coffee Consumption", by Federick D. Gray, National Food Situation, U.S. Dept. of Ag., NFS 138, Nov. 1971, pages 31-40.

Table 12 --Coffee consumption in 17 selected countries, 1952, 1958, and the base period--1964-66

Region and country	Consumption <u>1/</u>			Per capita consumption			Share of world consumption		
	1952	1958	1964-66	1952	1958	1964-66	1952	1958	1964-66
	---- 1,000 metric tons ----			---- Kilograms ----			----- Percent -----		
United States	1,188.6	1,226.4	1,278.9	7.55	7.05	6.73	61.6	54.9	45.1
British Commonwealth and Ireland ...	91.9	106.8	172.2	0.86	1.27	1.89	4.7	4.8	6.1
England	43.2	44.2	80.8	0.85	0.85	1.65	2.2	2.0	2.8
Canada	44.3	53.7	75.6	3.07	3.15	4.22	2.3	2.4	2.6
Ireland	2/.4	0.4	0.6	n.a.	0.14	0.21	0.02	0.02	0.02
Australia	3.5	7.4	11.7	0.41	0.75	1.32	0.2	0.3	0.4
New Zealand	0.6	1.1	3.5	n.a.	0.50	1.34	0.03	0.05	0.1
Scandinavian countries	114.7	159.3	221.8	6.08	8.04	10.65	5.9	7.1	7.8
Sweden	47.6	64.0	94.1	6.68	8.58	12.00	2.5	2.9	3.3
Denmark	23.3	37.4	50.2	5.40	8.30	10.56	1.2	1.7	1.8
Norway	22.0	26.5	32.6	6.60	7.50	9.25	1.1	1.2	1.1
Finland	21.8	31.4	44.9	5.32	7.17	9.74	1.1	1.4	1.6
EC/S/A <u>3/</u>	395.7	559.3	811.1	2.31	3.09	4.08	20.5	25.0	28.6
West Germany	56.5	159.6	269.3	1.11	2.88	4.48	2.9	7.2	9.5
France	166.3	191.0	224.2	3.92	4.27	4.70	8.6	8.6	7.9
Netherlands	27.0	43.3	76.0	2.60	3.90	6.53	1.4	1.9	2.7
Italy	71.3	80.9	121.1	1.51	1.70	2.56	3.7	3.6	4.3
Belgium-Luxembourg	52.0	52.5	63.6	5.76	5.60	6.49	2.7	2.4	2.2
Switzerland	18.2	23.0	39.8	3.78	4.44	6.70	0.9	1.0	1.4
Austria	4.4	9.0	17.1	0.64	1.28	2.48	0.3	0.4	0.6
Total	1,790.9	2,051.8	2,484.0	n.a.	4.44	4.96	92.8	91.9	87.6
All other importing countries	137.0	181.6	352.3	n.a.	n.a.	n.a.	7.1	8.1	12.4
World totals	1,927.9	2,233.4	2,836.3	n.a.	n.a.	n.a.	100.0	100.0	100.0

n.a. = not available.

1/ Total consumption approximates net imports.

2/ Approximated.

3/ Member countries of the EC plus Switzerland and Austria.

Table 13 --Compound annual changes in selected countries, population, per capita expenditures, and real price, per capita consumption, and total consumption for coffee, tea, and cocoa, 1952-65

Region and country	Population	Per capita consumer expenditures	Coffee 1/			Tea 1/			Cocoa 1/		
			Real price: per kilogram	Per capita consumption	Total consumption	Real price: per kilogram	Per capita consumption	Total consumption	Real price: per kilogram	Per capita consumption	Total consumption
Percent											
United States ..	1.7	2.2	-4.4	-0.4	1.3	3.9	0.3	1.9	-1.4	0.0	1.7
British Commonwealth and Ireland:											
England	0.7	2.5	-1.2	7.4	7.9	-1.1	-0.1	0.5	-1.9	-2.4	-1.8
Canada	2.4	2.1	-4.9	2.6	5.7	-0.4	-2.7	-0.3	0.1	-0.9	1.5
Ireland	-0.2	1.8	n.a.	4.6	4.1	n.a.	n.a.	n.a.	n.a.	6.7	6.4
Australia	2.2	1.7	-2.4	8.7	12.0	-0.6	-1.0	1.1	-4.5	3.3	5.6
New Zealand ..	2.2	1.2	-4.3	16.9	18.5	n.a.	n.a.	n.a.	n.a.	1.0	3.2
Scandinavian countries:											
Sweden	0.6	3.1	-5.3	5.2	5.8	n.a.	n.a.	n.a.	-8.3	0.9	1.9
Denmark	0.7	3.1	-2.1	6.0	6.7	n.a.	n.a.	n.a.	-5.6	3.4	4.1
Norway	0.9	2.4	-4.8	4.1	5.0	n.a.	n.a.	n.a.	-5.3	0.8	1.6
Finland	0.9	3.4	-2.9	4.5	5.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EC/S/A: 2/											
West Germany ..	1.2	6.2	-6.6	11.1	11.1	-4.2	5.1	6.4	-2.0	5.3	6.5
France	1.1	3.6	-3.6	1.2	2.4	-2.6	2.2	4.5	-0.7	1.7	2.9
Netherlands ..	1.3	3.5	-4.9	8.6	10.0	-1.5	-0.2	1.2	-3.2	5.3	6.3
Italy	0.7	5.0	-2.1	4.8	5.4	-2.2	8.8	9.5	-5.8	8.1	8.8
Belgium-Luxembourg 3/:	0.6	2.7	-1.7	0.7	1.2	0.0	0.3	0.4	-0.7	6.1	10.2
Austria	0.3	5.2	-4.3	12.2	12.5	n.a.	n.a.	n.a.	-4.6	5.3	5.3
Switzerland ..	1.7	2.7	-3.5	5.0	6.7	n.a.	n.a.	n.a.	-1.6	2.4	4.1

n.a. = not available.

1/ All commodity growth rates computed by simple linear regression.

2/ Member countries of the EC plus Switzerland and Austria.

3/ In this study, Belgium and Luxembourg are viewed as an entity.

Source: (14, 19, 7 and 5).

the Scandinavian countries, growth in coffee consumption continued to increase but not at the expense of tea consumption, which remained insignificant throughout the period.

Growth in per capita U.S. coffee consumption was negative in green bean equivalent during 1952-65. Consequently, the U.S. share of the world coffee import market declined. Per capita tea consumption, on the other hand, increased slightly during 1952-65. Because of the size of the U.S. coffee market -- the world's largest -- and its other unique characteristics, special attention will be given to it in this report.

The United States

Coffee Consumption

In green bean equivalent, U.S. coffee consumption during 1952 was nearly 62 percent of world consumption (table 12). However, by 1958, U.S. consumption had dropped to 54.9 percent and by 1965, to 47.0 percent. Consumption statistics since 1965 give no evidence of a reversal of this decline in the relative world position of the U.S. market.

Total U.S. coffee consumption, in absolute amounts, increased by 120,900 tons during 1952-65, or at a compound rate of 1.3 percent per year. This rate of growth was 0.4 percent less than population growth (table 14). Consequently, per capita consumption, in green bean equivalent, declined from 7.55 kilos in 1952 to 6.73 kilos in 1965. This decline in the U.S. per capita consumption and the U.S. relative position in total world imported coffee consumption are of particular importance when viewed in historical perspective.

Before the late 1700's, coffee and tea were strongly competitive and of equal importance in the American Colonies. However, the Boston Tea Party of 1773 made English teas, and tea drinking in general, very unpopular in the Colonies. Henceforth, coffee rapidly outdistanced tea as a national drink (18, p. 4).

During the first half of the 20th century, coffee consumption increased sharply. From 1910 through the late 1940's, annual per capita coffee consumption doubled -- from 4 to 8 kilos (18). However, a sharp turning point in coffee consumption occurred in 1950, when coffee prices rose rapidly. At that time, a combination of diminishing levels of world coffee stocks, rising European consumption, stagnating production, and price speculating in the coffee market resulted in a retail price increase of over 40 percent. A 17-percent decline in per capita consumption followed, despite a 7-percent increase in real income in 1950 (10, pp. 7 and 20). This initial decline in per capita coffee consumption in 1950 was further augmented 3 years later by further price increases. The removal of U.S. price controls in March 1953, combined with a frost in some Brazilian producing areas, triggered a new wave of price advances that winter. For example, from November 1953 to April 1954, the wholesale price in New York rose from 58.5 to 87 cents a pound, causing per capita consumption to decline to 6.8 kilos, a level just slightly above prewar consumption (10, pp. 7 and 21).

Table 14 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, United States, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Dollars	Coffee			Tea			Cocoa		
			Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons
1952	157,553	1,500	2.06	7.55	1,188.6	2.82	0.27	42.5	1.71	1.61	254.0
1953	160,184	1,541	2.10	7.55	1,213.8	3.06	.32	51.3	1.63	1.49	238.6
1954	163,026	1,548	2.61	6.82	1,104.0	3.23	.32	52.2	2.06	1.21	196.9
1955	165,931	1,641	2.19	6.91	1,141.0	7.15	.27	44.8	1.91	1.15	190.9
1956	168,903	1,673	2.25	7.00	1,186.8	6.75	.27	45.6	1.70	1.34	226.8
1957	171,984	1,680	2.13	7.09	1,219.8	6.64	.27	46.4	1.64	1.37	235.2
1958	174,882	1,664	1.85	7.05	1,226.4	6.57	.27	47.2	1.76	1.20	209.6
1959	177,830	1,739	1.55	7.18	1,282.2	6.57	.27	48.0	1.79	1.15	205.1
1960	180,684	1,772	1.50	7.14	1,292.4	6.52	.27	48.8	1.74	1.21	218.9
1961	183,756	1,778	1.47	7.23	1,334.4	6.47	.28	51.5	1.54	1.33	245.1
1962	186,656	1,819	1.40	7.23	1,350.6	6.40	.29	54.1	1.51	1.37	254.8
1963	189,417	1,876	1.37	7.05	1,338.6	5.47	.30	56.8	1.53	1.40	264.7
1964	192,120	1,960	1.59	6.91	1,326.1	5.36	.30	57.6	1.70	1.39	266.5
1965	194,572	2,050	1.49	6.73	1,309.5	5.13	.31	60.3	1.44	1.47	285.0
----- Percent -----											
Annual compound change	1.7	2.2	-4.4	-0.4	1.3	3.4	0.3	1.2	-1.4	0	1.7

Sources: (19, 14, 5 and 7).

Table 16 --Consumption of soluble coffee, United States, 1953-67

Year	: Daily soluble coffee : : consumption per person :	: Percent of cups : of all coffee
	<u>Cups</u>	<u>Percent</u>
1953	0.26	10.1
1954	0.30	11.5
1955	0.37	13.9
1956	0.46	17.2
1957	0.50	17.7
1958	0.65	19.2
1959	0.60	20.4
1960	0.56	20.2
1961	0.64	21.5
1962	0.67	21.5
1963	0.65	21.6
1964	0.61	21.0
1965	0.58	20.8
1966	0.63	22.0
1967	0.65	22.9

Source: (24, 1966, p. 126)

While per capita consumption of coffee in green bean equivalent actually declined during 1953-65, actual coffee consumption per capita as measured by number of cups consumed increased. For example, the number of cups of coffee consumed per capita increased steadily from 1953 through 1962 before declining until 1966 (table 16).

Price and Income Analysis

Except during the early 1950's, U.S. consumer response to changes in coffee prices has been very low. That is, while real coffee prices actually declined 4.4 percent during 1952-65 (table 14), per capita consumption in green bean equivalent declined slightly (0.4 percent) rather than increasing. This low consumer response to price changes is also shown by the estimated price elasticities shown in table 17, 1a, 1b, and 1c. These elasticities ranged from -0.14 to -0.18. And no doubt these coefficients would have been lower if the time period had included earlier years. The substantial price increases of 1950 and 1954, together with the commensurate decline in per capita green bean consumption, would have had more effect on the regression equations and the resultant coefficients.

When per capita liquid consumption, rather than green bean equivalent data, was used as the dependent variable for equations 1d and 1e (table 17), the price coefficients were even lower (-0.09 and -0.10). These results suggest

Table 17 --Elasticities computed from regression equations
on per capita coffee consumption, United States, 1952-65

Equation number <u>1/</u>	Function	Coffee price	Income	Cross (tea)	Cross (cocoa)	Trend (time)
1a	1	-0.18	-0.31	--	--	-0.03
1b	1	-0.17	-0.51	--	--	--
1c	1	-0.14	-0.53	-0.01	-0.16	--
1d	1	-0.10	-0.24	--	--	--
1e	1	-0.10	-0.13	-0.07	--	--

1/ Complete statistical support data (standard errors, intercept levels, and so on) for these equations can be found in app. tables A-8.

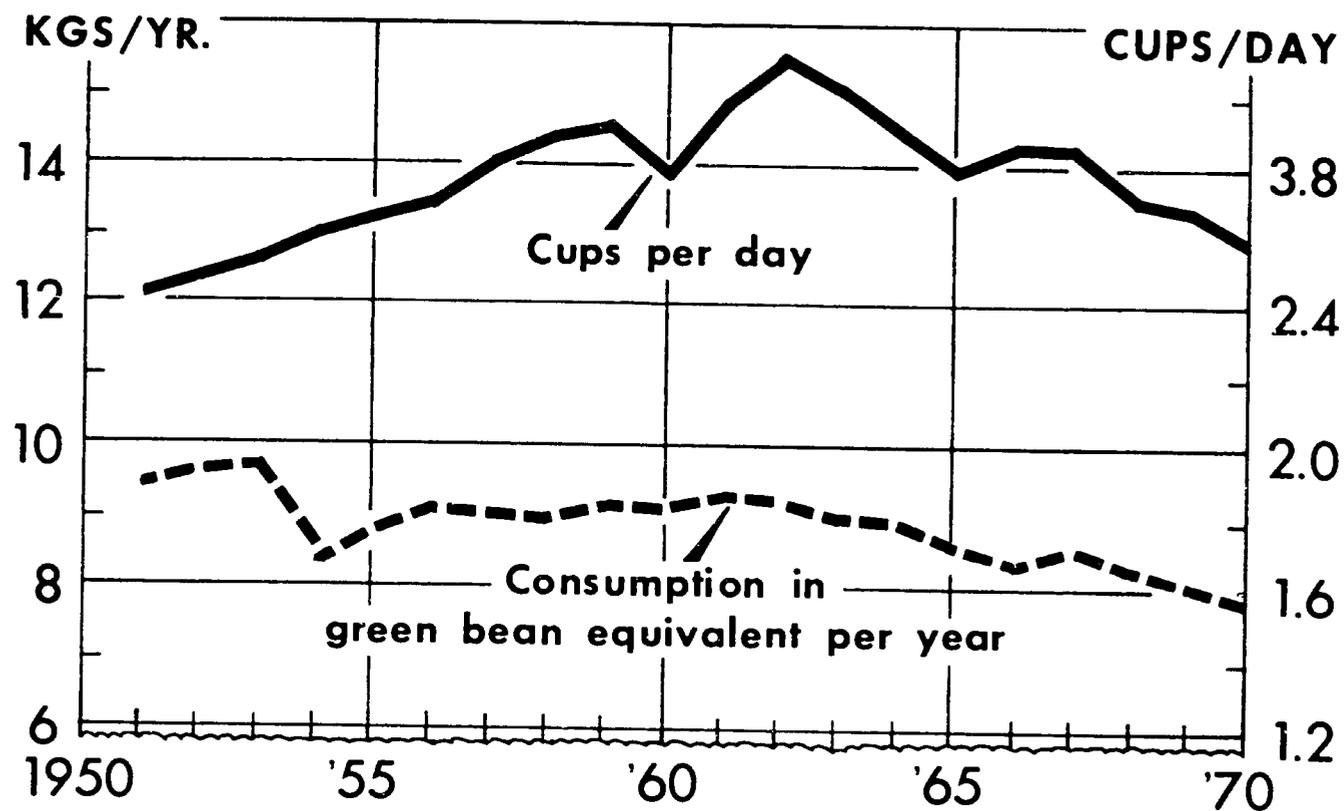
that the interaction of a decline in real coffee price plus an increase in real per capita income, combined with a shift in taste towards a more watery brew and increased use of solubles, have substantially reduced U.S. consumer price sensitivity. Furthermore, consumption may have reached a physical saturation level in both green bean equivalent and liquid cups, as suggested by the data in figure 1 and table 18.

Theoretically, an increase in income ("consumer expenditures" in this study) plus a decrease in real price would be expected to exert a positive influence on consumption of a consumer good. Thus, under these relationships, income coefficients generated by linear regression procedures would be expected to have positive signs, thereby indicating that consumption of the consumer good will increase when income increases. However, the opposite results were obtained. During 1952-65, coffee consumption in green bean equivalent declined 0.4 percent (table 14), while real consumer expenditures increased 2.2 percent and real coffee prices declined 4.4 percent. As could be expected, the resulting income elasticities were negative (1a, 1b, and 1c, table 17). What then is the meaning of these results since, for the projection purposes, these elasticities are of little value? Lovasy stated:

. . . if these negative income coefficients were interpreted as indicating a causal relationship, one would have to conclude that (a) coffee was an inferior good, being gradually replaced by preferred higher priced products as income reached a certain level, and (b) that the resulting reduction in coffee consumption was outweighing the positive income effect on consumption . . . Both of these propositions are contrary to common experience. Coffee is not being replaced by a 'superior' beverage . . . (16, p. 12).

The question arises as to the correctness of the variable chosen for analysis; that is, green bean consumption. To obtain a more logical (positive) income coefficient for projection purposes, linear regressions were run, using per capita liquid coffee consumption as the dependent variable. The results of

PER CAPITA U.S. COFFEE CONSUMPTION BY PERSONS 10 YEARS OLD AND OLDER



SOURCE: PAN AMERICAN COFFEE BUREAU, ANNUAL COFFEE STATISTICS, 1969, PP. A-87 & A-88.

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Figure 1

these analyses generated small but positive income coefficients -- 0.24 and 0.13, the latter being statistically insignificant (1d and 1e, table 17). These results also suggest that the U.S. saturation point for liquid coffee consumption may have been reached, since liquid consumption has apparently declined in recent years (table 18). ^{16/} Further, if more recent data had been included in the analysis, the coefficients would possibly have been smaller, if not negative. Thus, if liquid consumption is used as the dependent variable for projection purposes, income elasticity should be near zero. This would reflect the possible saturation level for coffee consumption as suggested by both the green bean and liquid coffee consumption data in figure 1.

Table 18 --Daily coffee consumption per person 10 years old and older, United States, 1950-67 ^{1/}

Year	Cups
1950	2.38
1951	2.44
1952	n.a.
1953	2.57
1954	2.60
1955	2.67
1956	2.68
1957	2.82
1958	2.87
1959	2.94
1960	2.77
1961	2.97
1962	3.12
1963	3.01
1964	2.90
1965	2.79
1966	2.86
1967	2.84

^{1/} Survey taken on a winter day in each year.

Source: (24, 1969, p. A-88).

^{16/} Increased coffee consumption by teenagers and young adults could, conceivably, offset this decline. However, there is no indication that this will occur in the foreseeable future.

Regression coefficients for coffee substitutes -- tea, cocoa, and milk -- were either weak or had the wrong sign (1c and 1e, table 17). Of these substitutes, tea was the strongest. Lovasy's comments on tea as a coffee substitute in the United States were:

Consumption of tea, perhaps the most kindred beverage, has slowly risen in the late 1940's and the early 1950's; but there was no evidence for an accelerated rise in 1954 when coffee prices rose sharply while the retail price of tea advanced only slightly. In terms of cups, tea consumption remains still only a small fraction of coffee consumption -- less than 0.5 cup per day as compared to 2.85 cups of coffee. The rise in tea consumption in the last five years has been attributed, in the main, to the introduction of 'instant tea' which supposedly is particularly well suited to the preparation of iced tea, a popular drink in the United States. (16, p. 24)

British Commonwealth and Ireland

Coffee Consumption

The Commonwealth countries plus Ireland consumed over 187,000 tons of coffee, or about 6 percent of world consumption in 1965. During 1952-65, consumption more than doubled -- an increase of nearly 7 percent annually (table 12).

Historically, the Commonwealth countries have consumed little coffee relative to tea -- the traditional drink. Following World War II, coffee consumption in most Commonwealth countries was adversely affected by foreign exchange problems. At that time, many West European countries were short of dollars and restricted purchases from the "dollar area" and other "hard" sources. During this period, the Commonwealth countries tried to build sources of supply in areas linked by financial or other ties. This was especially true of the United Kingdom. With large areas of Africa under her control, the United Kingdom encouraged production in these areas via preferential tariffs, bounties, or subsidies. Virtually all European countries have tried to curb imports (and thereby consumption) through tariffs, import licensing, or limitations on the amount of foreign exchange allocated to coffee imports (18, p. 39).

Per capita consumption of coffee has been increasing since 1952 in all Commonwealth countries. This has not been so in Ireland, which maintains strong ties to the traditional drink -- tea. The data on consumption growth in tables 12 and 13 clearly show that there has been a significant shift away from tea in favor of coffee in all these countries except Ireland and New Zealand. The shift from tea consumption to coffee in the United Kingdom has been estimated to be about 1½ percent of the 1966 consumption level, while the annual shift to coffee consumption in the other countries has been about 2½ percent (24, p. 13). The magnitude and importance of the shift away from tea to coffee becomes more apparent in an examination of individual country data. For example, in the United Kingdom, per capita consumption almost doubled during 1952-65, increasing from 0.85 kilos in 1952 to 1.65 kilos in 1965 (table 19). The pattern of growth in tea and coffee consumption is described by Elz:

Table 19 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, United Kingdom, 1952-65

Year	Population: Thousands	Coffee			Tea			Cocoa			
		Per capita consumer expenditures: Lb. sterling	Real price: per pence	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons	Real price: per pence	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons	Real price: per pence	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons
1952	50,737	260.09	180.78	0.85	43.20	142.8	3.9	196.0	108.9	2.03	103.0
1953	50,880	258.79	183.91	.60	30.42	146.0	4.3	226.0	102.6	2.39	121.5
1954	51,066	267.70	192.90	.61	33.64	172.5	4.4	224.0	132.7	2.28	115.3
1955	51,221	277.98	203.48	.67	34.38	203.0	4.2	217.0	128.4	2.01	103.1
1956	51,430	232.99	197.00	.87	44.88	178.6	4.6	235.7	124.3	1.83	94.2
1957	51,657	287.60	193.17	.88	45.34	182.0	4.4	229.6	120.4	2.14	110.5
1958	51,870	295.53	189.60	.85	44.15	173.0	4.5	234.7	116.8	1.85	96.0
1959	52,157	306.41	185.52	1.02	52.99	169.2	4.4	231.7	115.6	1.42	74.1
1960	52,559	319.38	178.97	1.05	55.17	168.7	4.2	223.5	115.6	1.43	75.2
1961	52,941	324.33	173.81	1.11	58.67	161.9	4.5	236.7	112.3	1.54	81.5
1962	53,458	325.07	173.92	1.30	69.29	152.5	4.3	230.6	107.2	1.79	95.4
1963	53,797	334.32	167.31	1.43	76.53	147.1	4.3	230.6	100.7	1.76	94.8
1964	54,213	345.23	172.53	1.46	79.15	142.4	4.2	229.6	85.7	1.63	88.4
1965	54,595	347.02	162.61	1.65	90.08	135.0	4.0	220.5	92.2	1.87	102.2
----- Percent -----											
Annual compound change	0.7	2.5	-1.2	7.4	7.9	-1.1	-0.1	0.5	-1.9	-2.4	-1.8

Sources: (19, 14, 5, 7).

Tea is by far the most popular beverage in the country (the U.K.), accounting for two-thirds of all drinks consumed (excluding water) in 1966. According to the National Drink Survey, English per capita consumption is the highest in the world. Almost everyone is a daily tea drinker, taking an average five to six cups each day, compared with one of coffee.

However, in spite of this rather strong position of tea in the English drinking habits, per capita consumption declined from 4.4 kilograms in 1955-57 to 4.0 kilograms in 1965-67. This decrease coincided with a steady increase in per capita coffee consumption (and to a minor degree fruit juices) and is all the more remarkable as tea retail prices declined continuously while retail coffee prices increased (in undeflated terms). This clearly indicates a shift in consumer preferences. (3, p. 67)

Of particular importance is the acceptance of coffee by U.K. youth. According to K. S. Meir:

. . . the consumption of coffee amongst the 16/24 age group approaches a 50 percent increase over the average for the total population, and for 25/44 age group an increase of around 30 percent over the average is noted. This higher than average quota "young end" of the market is encouraging and important because therein lies a great deal of the future prosperity of the U.K. coffee trade. (20, p. 12)

Canadian per capita consumption has been increasing steadily during the post-World War II period and has more than doubled since before the war (1, p. 201). Prewar consumption data are not available, but data taken since 1952 indicate that the growth rate in consumption has been more than double the rate for population and income (table 20). Most of this increase in consumption appears to have taken place at the expense of tea. Per capita consumption in green bean equivalent is still about one-half the U.S. level and appears to have stabilized at nearly 4 kilos during the middle 1960's. However, at this level, per capita coffee consumption in Canada is the highest among the Commonwealth countries. As the second largest total consumer in the British Commonwealth and Ireland, Canada consumed 78,100 metric tons in 1965, which was nearly 3 percent of world imported consumption and about 34,000 tons more than 1952 (table 12).

Australia's total coffee consumption has been minor -- only 15,000 tons in 1964-66 (table 21). However, during 1952-65, annual growth in Australia's total and per capita consumption (12.0 and 8.7 percent) exceeded that of both the United Kingdom and Canada. And, as in the United Kingdom, the increase in coffee consumption has apparently depressed tea consumption. R. J. Bennett, President of the Australian Tea and Coffee Traders Association, attributes much of this swing to coffee to Australia's rapidly increasing population of European immigrants who are traditionally coffee drinkers. Mr. Bennett has speculated that ". . . it will take the next generation of the new immigrant Australians to show any move away from coffee to our traditional tea-drinking habits." (2, p. 61)

Table 20 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, Canada, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Canadian dollars	Coffee			Tea			Cocoa		
			Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: kilograms	Total consumption: 1,000 metric tons
1952	14,496	1,096	2.40	3.07	44.27	2.58	1.5	20.5	2.88	.90	13.0
1953	14,886	1,139	2.45	3.29	48.76	2.43	1.4	20.6	2.88	1.00	14.8
1954	15,330	1,134	2.96	2.84	43.26	2.45	1.3	20.1	2.99	.89	13.6
1955	15,736	1,188	2.56	3.00	47.08	3.01	1.2	19.1	3.04	.80	12.6
1956	16,123	1,243	2.65	3.09	49.73	2.94	1.3	20.7	2.76	.81	13.0
1957	16,677	1,241	2.33	3.02	50.14	2.80	1.3	20.9	2.45	.83	13.9
1958	17,120	1,241	1.94	3.15	53.68	2.65	1.2	19.8	2.54	.77	13.1
1959	17,522	1,276	1.63	3.48	60.91	2.60	1.2	20.3	2.54	.70	12.3
1960	17,909	1,289	1.58	3.34	59.70	2.60	1.1	19.5	2.42	.73	13.1
1961	18,269	1,301	1.58	3.68	67.14	2.58	1.1	20.1	2.34	.76	13.9
1962	18,600	1,341	1.60	3.97	73.79	2.60	1.0	18.4	2.17	.81	15.0
1963	18,925	1,371	1.55	4.09	77.25	2.56	1.1	20.3	2.25	.86	16.2
1964	19,271	1,427	1.72	3.85	74.82	2.52	1.1	20.3	2.37	.79	15.3
1965	19,604	1,476	1.65	3.98	78.09	2.45	1.0	19.7	2.19	.86	16.9
----- Percent -----											
Annual compound change	2.4	2.1	-4.9	2.6	5.7	-0.4	-2.7	-0.3	0.1	-0.9	1.5

Sources: (19, 14, 5 and 7).

Table 21 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, Australia, 1952-65

Year	Population	Per capita consumer expenditures	Coffee			Tea			Cocoa <u>1/</u>		
			Real price per kilogram	Per capita consumption	Total consumption	Real price per kilogram	Per capita consumption	Total consumption	Real price per kilogram	Per capita consumption	Total consumption
	Thousands	Lb. sterling	Pence	Kilograms	1,000 metric tons	Pence	Kilograms	1,000 metric tons	Pence	Kilograms	1,000 metric tons
1952	8,636	364	275.0	.41	3.54	109	2.9	25.2	202.4	.80	6.9
1953	8,815	349	277.8	.68	4.20	123	2.9	25.7	187.5	.78	6.9
1954	8,987	369	343.9	.41	3.71	196	3.1	27.4	230.3	.93	8.3
1955	9,200	384	286.6	.50	4.60	185	2.7	24.7	203.3	.88	8.1
1956	9,426	385	266.8	.75	7.02	165	2.7	24.9	192.7	1.17	11.0
1957	9,640	381	257.9	.66	6.34	149	2.8	26.6	156.6	.88	8.4
1958	9,842	385	255.7	.75	7.43	158	2.6	26.5	175.6	.98	9.6
1959	10,052	389	238.1	1.00	10.10	152	2.7	26.4	172.9	1.07	10.8
1960	10,315	407	229.3	1.08	11.16	149	2.7	27.4	164.3	1.12	11.5
1961	10,508	406	233.7	.85	8.96	142	2.6	27.7	149.1	1.12	11.5
1962	10,720	407	242.5	1.04	11.12	139	2.6	27.7	136.9	1.07	11.5
1963	10,932	426	242.5	1.03	11.81	137	2.6	28.3	130.7	1.22	13.3
1964	11,144	441	224.9	1.24	13.82	134	2.6	28.4	127.1	1.23	13.7
1965	11,356	451	216.1	1.32	14.99	129	2.6	29.3	120.1	1.22	13.9
----- Percent -----											
Annual compound change	2.2	1.7	-2.4	8.7	12.0	-0.6	-1.0	1.1	-4.5	3.3	5.6

Source: (19, 14, 5 and 7).

Data on Ireland's and New Zealand's coffee consumption and prices are quite limited; therefore, no regression analyses were attempted.

According to the International Coffee Organization (ICO), Ireland imported 438 tons of coffee in 1953 and 644 tons in 1963. Per capita consumption was 0.15 kilos in 1953 and 0.23 in 1963 (13, p. 88).

The ICO analysis suggests that New Zealand may become a fairly important coffee market. In 1953, only 480 tons were imported; however, by 1963, the volume was up to 3,300 tons. Population increased from 2 to 2.5 million, or 24 percent during this time (13, p. 147).

Price and Income Analysis

Real coffee prices in the United Kingdom are approximately equal to those of Canada and Australia but are slightly higher than those of the United States (table 22), primarily because of differences in preferential duties and taxes. For example, the United Kingdom did not impose internal taxes on coffee, but did impose a duty on green coffee originating outside the Commonwealth of 1.5 pence per pound in 1953 and 1 penny in 1963 (13, p. 107). Coffee prices have generally been higher than tea prices, even though a pound of tea yields four times as much liquid as a pound of coffee.

Per capita coffee consumption in the United Kingdom seems strongly influenced by changes in real coffee prices and consumer expenditures. This is suggested by the dramatic growth (7.4 percent per year) in per capita coffee consumption, despite only a slow (1.2 percent) downtrend in real coffee prices and only moderate growth in real consumer expenditures (2.5 percent), as shown in table 19.

The nature of the relationship between price, income, and coffee consumption is indicated by the high elasticities generated by the regression analysis. Price elasticities ranged from -1.52 to -2.15 and income (consumer expenditures) elasticities from 2.23 to 2.40 (equations 2a and 2b, table 23). Thus, when considered jointly, high income plus high price elasticities strongly suggest that the United Kingdom has substantial potential for increased coffee consumption. However, a note of caution is in order. These high elasticities are, at least in part, due to the very low per capita consumption in the early and middle 1950's, when large relative changes in consumption were paralleled by comparatively small relative changes in per capita income (table 19) as consumer expenditures (table 24). Consequently, these elasticities (particularly income) may be somewhat overstated for projection purposes, where subsequent gains in per capita coffee consumption would represent a smaller percentage growth and therefore would yield lower price and income elasticities via regression analysis.

Cross elasticities (including tea) either had wrong signs or were statistically insignificant (2c, table 23).

Table 22 --Real coffee prices per kilogram in British Commonwealth countries compared with these of the United States, 1952-65

Year	United States	United Kingdom	Canada	Australia
	<u>U.S. dollars</u>			
1952	1.91	2.11	2.49	2.57
1953	1.97	2.15	2.53	2.60
1954	2.44	2.25	3.07	3.22
1955	2.05	2.38	2.65	2.68
1956	2.14	2.30	2.74	2.49
1957	2.09	2.26	2.41	2.41
1958	1.87	2.21	2.00	2.39
1959	1.58	2.17	2.13	2.23
1960	1.55	2.09	1.64	2.14
1961	1.53	2.03	1.64	2.19
1962	1.49	2.03	1.66	2.27
1963	1.46	1.95	1.61	2.27
1964	1.73	2.02	1.78	2.10
1965	1.63	1.90	1.71	2.02

Source: Derived from (14).

During 1952-65, real coffee prices in Canada decreased about 4.9 percent per year, while per capita real consumer expenditures increased 2.1 percent. ^{17/} Consumer price and income sensitivities are considerably lower in Canada than in the United Kingdom. During 1952-65, coffee consumption increased only 2.6 percent per year, while real coffee prices decreased 4.9 percent per capita and real consumer expenditures increased 2.1 percent (table 20). The generated price elasticities were low for this period -- ranging from -0.23 to -0.40 (3a, 3b, and 3c, table 23). Thus, any future real price declines (changes) would not be expected to appreciably influence coffee consumption.

During 1952-65, Canadian real consumer expenditure levels were the highest of the Commonwealth plus Ireland group (table 24). Computed income elasticities ranged from 0.79 to 1.77 (table 23). These relatively elastic income coefficients and the relatively low price coefficients suggest that future Canadian coffee consumption will be affected more by income growth than price changes.

^{17/} As in the United Kingdom, Canadian coffee prices are only slightly influenced by tax structure. In 1965, green coffee originating outside the sterling area paid a duty of \$0.05 per pound; there is no internal tax (13, p. 40).

Table 23 --Elasticities computed from regression equations on per capita coffee consumption, British Commonwealth countries, 1952-65

Equation number <u>1/</u>	Country	Function	Coffee: price	Income	Cross: (tea)	Cross: (cocoa)	Trend (time)
2a	United Kingdom	1	-1.52	2.23	--	--	--
2b	United Kingdom	1	-2.15	2.40	--	--	--
2c	United Kingdom	1	1.38	3.25	-1.56	0.45	--
3a	Canada	1	-0.23	0.79	--	--	--
3b	Canada	1	-0.29	1.76	--	--	-0.13
3c	Canada	2	-0.40	1.77	--	--	--
3d	Canada	1	-0.15	0.82	0.45	-0.06	--
4a	Australia	1	-2.10	1.64	--	--	--
4b	Australia	1	-2.50	1.23	0.33	--	--
4c	Australia	1	-2.11	-0.37	0.60	-0.92	--

1/ Complete statistical support data (standard errors, intercept levels, and so on) for these equations are found in app. table A-8.

Table 24 --Real per capita consumer expenditures in British Commonwealth countries compared with the United States, 1952-65

Year	United States	United Kingdom	Canada	Australia
<u>U.S. dollars</u>				
1952	1,500	729	1,137	816
1953	1,541	725	1,181	783
1954	1,548	750	1,176	829
1955	1,641	779	1,232	861
1956	1,673	793	1,289	864
1957	1,680	806	1,287	855
1958	1,664	828	1,287	865
1959	1,739	859	1,324	874
1960	1,772	895	1,336	913
1961	1,778	909	1,349	910
1962	1,819	911	1,391	914
1963	1,876	937	1,422	955
1964	1,960	968	1,480	989
1965	2,050	973	1,530	1,012

Source: (19).

During 1952-65, Australian retail coffee price levels were higher than those of either the United Kingdom or Canada ^{18/} (table 22). Despite these higher price levels, per capita consumption increased at a higher annual rate -- 9 percent -- than in either the United Kingdom or Canada.

At retail, Australian coffee prices declined 2.4 percent per year while real consumer expenditures increased 1.7 percent annually -- less than in either the United Kingdom or Canada (table 21). The generated direct price elasticities for Australian per capita coffee consumption were surprisingly high, ranging from -2.10 to -2.50 (4a and 4b, table 23). However, these coefficients may have picked up some of the "shift-in-taste" phenomenon described by Bennett (2), thereby overstating direct price elasticities. Indirect price elasticities for tea were surprisingly low -- 0.33 and 0.60 -- which suggests a definite decline in tea as the leading beverage in Australia.

The low real income growth in 1952-65 had an apparent positive affect on Australian coffee consumption. Income elasticities ranged from 1.23 to 1.64 (4a and 4b, table 23). Therefore, changes in Australian real income can be expected to have more effect on coffee consumption than price fluctuations.

The Scandinavian Countries

Coffee Consumption

During 1952-65, total Scandinavian coffee consumption nearly doubled, increasing from 115,000 to 222,000 tons. In each of the Scandinavian countries, per capita consumption increased at least 4 percent and total consumption, 5 percent (tables 12 and 13). The Scandinavian share of world imports increased from 6 to 8 percent (table 12).

In 1964, Balassa observed that the Scandinavian countries enjoy the world's highest per capita coffee consumption levels -- 11 to 12 kilograms per adult (1, p. 203). ^{19/} Further, Balassa speculated that only limited growth in per capita consumption could be expected from these high consumption levels.

Tea is a minor beverage in all the Scandinavian countries. Sweden's per capita coffee consumption -- the world's highest -- reached 12 kilos per capita in 1965, which exceeded consumption of the next highest consumer -- Denmark -- by 1½ kilos. Total Swedish consumption in 1965 was nearly 93,000 tons, or double the 1952 level (table 25).

^{18/} Australian import duties and taxes are minor. Australian coffee imports from Papua and New Guinea enter duty-free. In 1963, green coffee originating in other countries was subject to a duty of 4.7 cents per pound. There are no internal taxes (13, p. 135).

^{19/} All persons 15 years old and older.

Table 25 --Population, consumer expenditures, and coffee and cocoa prices and consumption, Sweden, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Kroner	Coffee			Cocoa		
			Price per kilogram Kroner	Per capita consumption Kilograms	Total consumption 1,000 metric tons	Price per kilogram Kroner	Per capita consumption Kilograms	Total consumption 1,000 metric tons
1952.....	7,125	4,070	14.51	6.68	47.58	5.01	0.94	6.7
1953.....	7,171	4,144	15.14	7.14	51.23	4.36	.91	6.5
1954.....	7,213	4,295	19.11	6.66	48.08	6.46	.96	6.9
1955.....	7,262	4,391	15.91	7.26	53.15	6.39	.90	6.6
1956.....	7,315	4,537	16.03	7.92	58.11	4.09	1.07	7.8
1957.....	7,367	4,546	15.16	7.80	57.52	3.23	1.03	7.6
1958.....	7,415	4,754	12.91	8.58	63.99	3.86	.91	6.7
1959.....	7,454	4,899	10.72	9.06	67.95	4.15	.96	7.1
1960.....	7,480	4,965	10.13	9.78	73.30	3.55	.98	7.3
1961.....	7,520	5,236	9.82	10.32	77.85	2.73	1.01	7.6
1962.....	7,562	5,379	9.71	11.04	83.94	2.36	1.06	8.0
1963.....	7,604	5,652	9.17	11.41	86.84	2.27	1.04	7.9
1964.....	7,662	5,892	10.16	11.95	91.56	2.40	1.04	8.0
1965.....	7,734	6,120	9.75	12.00	92.81	2.04	1.03	7.9
----- Percent -----								
Annual com- pound change	0.6	3.1	-5.3	5.2	5.8	-8.3	0.9	1.9

Sources: (19, 14, 7).

Torkel Gauffin, a Swedish coffee expert, describes his country's market thus:

Sweden has, next to the United States, the highest standard of living in the world. Swedish (coffee) importers, as a whole, demand a high cup quality. Sweden has rather strong winters and not especially warm summers which makes coffee a favorite all year round and coffee breaks are being adopted more and more in factories and offices (25, p. 113).

Denmark's total and per capita coffee consumption doubled during 1952-65 (table 26). Consumption was over 10.5 kilos in 1965. 20/

Norway's total annual consumption increased 5 percent during 1952-65. Norwegian coffee consumption, in green bean equivalent, was nearly 35,000 tons in 1965, or 14,000 tons more than in 1952 (table 27).

Per capita consumption reached 9.25 kilos in 1965 -- a compound growth rate of over 4 percent since 1952. However, Norwegian per capita consumption is still at least 1.5 kilos below other Scandinavian countries.

Coffee consumption in Finland has been increasing rapidly since 1952. Total coffee consumption was 40,800 tons in 1965 -- nearly double the 1952 consumption level (table 12).

Price and Income Analysis

Swedish retail coffee prices declined 50 percent from the 1954 peak price of \$3.69 per kilo to \$1.88 in 1965 (table 28). According to the ICO, the real (deflated) price of coffee has declined more than other goods in Sweden (13, p. 98), despite duties and taxes on coffee that have tended to keep retail prices high. 21/

During 1952-65, the yearly percentage decline in real coffee prices equaled the rate of increase in per capita coffee consumption -- 5.2 percent -- while per capita income (real consumer expenditures) increased 3.1 percent annually (tables 25 and 29). The generated direct price regression coefficients were quite low, ranging from -0.25 to -0.28 (5a, 5b, and 5c, table 30). Therefore, any further decline in real coffee price would not be expected to encourage much additional consumption.

20/ Denmark's actual consumption may be understated and, conversely, Sweden's overstated because housewives in the eastern part of Denmark supposedly buy their coffee, along with certain other goods, in nearby Sweden. These coffee "imports" are not included in official Danish consumption statistics (15, p. 40).

21/ In 1953 and in 1963, there was a tariff on green coffee of 3.9 cents per pound and an import tax of 3.1 cents. The tariff and import taxes on roasted coffee amounted to 5.1 and 3.9 cents per pound, respectively. The import tax was eliminated in January 1964. The general sales tax introduced in 1960 was 6.4 percent until July 1965, when it was raised to 10 percent (13, p. 98).

Table 26 --Population, consumer expenditures, and coffee and cocoa prices and consumption, Denmark, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Kroner	Coffee			Cocoa		
			Price per kilogram Kroner	Per capita consumption Kilograms	Total consumption 1,000 metric tons	Price per kilogram Kroner	Per capita consumption Kilograms	Total consumption 1,000 metric tons
1952	4,334	4,644	17.30	5.4	23.28	18.26	0.76	3.3
1953	4,369	4,806	19.15	5.9	25.88	18.02	.79	3.5
1954	4,406	5,120	23.93	5.6	24.81	21.63	.46	2.0
1955	4,439	5,021	21.41	6.4	28.23	24.18	.60	2.7
1956	4,466	5,008	19.42	7.0	31.40	19.79	.67	3.0
1957	4,488	4,954	19.17	7.4	33.06	17.17	.80	3.6
1958	4,515	5,128	19.85	8.3	37.36	19.30	.67	3.0
1959	4,547	5,394	17.80	8.4	38.42	19.61	.64	2.9
1960	4,581	5,707	17.15	9.1	41.87	17.57	.84	3.8
1961	4,612	6,067	16.70	9.5	43.63	16.51	.93	4.3
1962	4,647	6,352	15.83	9.8	45.67	15.70	.98	4.5
1963	4,684	6,271	15.73	11.3	52.95	12.40	.88	4.1
1964	4,720	6,758	16.74	10.3	48.31	10.00	.92	4.3
1965	4,757	6,863	16.07	10.56	50.20	8.96	.95	4.5
----- Percent -----								
Annual com- pound change	0.7	3.1	-2.1	6.0	6.7	-5.6	3.4	4.1

Sources: (19, 14, 7).

Table 27 --Population, consumer expenditures, and coffee and cocoa prices and consumption, Norway, 1952-65

Year	Population	Per capita consumer expenditures	Coffee			Cocoa		
			Price per kilogram	Per capita consumption	Total consumption	Price per kilogram	Per capita consumption	Total consumption
	Thousands	Kroner	Kroner	Kilograms	1,000 metric tons	Kroner	Kilograms	1,000 metric tons
1952.....	3,328	4,379	13.17	6.6	21.96	11.45	1.16	3.9
1953.....	3,362	4,466	17.81	5.5	18.66	11.18	1.11	3.7
1954.....	3,395	4,527	22.46	5.1	17.33	15.35	1.12	3.8
1955.....	3,429	4,672	16.71	6.2	21.23	16.14	.99	3.4
1956.....	3,462	4,778	17.69	6.4	22.13	14.42	1.21	4.2
1957.....	3,494	4,861	18.13	6.8	23.62	14.29	1.06	3.7
1958.....	3,525	4,757	16.12	7.5	26.49	12.90	1.07	3.8
1959.....	3,556	4,904	13.61	7.1	25.12	11.68	1.05	3.7
1960.....	3,584	5,183	12.75	8.1	28.98	11.67	1.11	4.0
1961.....	3,615	5,417	12.30	7.5	26.99	9.68	1.30	4.7
1962.....	3,639	5,491	11.30	8.5	30.97	8.26	1.13	4.1
1963.....	3,667	5,650	10.65	9.1	33.59	7.89	1.15	4.2
1964.....	3,694	5,814	10.73	9.0	33.25	7.44	1.17	4.3
1965.....	3,723	5,935	10.30	9.25	34.55	7.52	1.27	4.7
----- Percent -----								
Annual com- pound change	0.9	2.4	-4.8	4.1	5.0	-5.3	0.8	1.6

Sources: (19, 14, 7).

Table 28 --Real coffee prices per kilogram in the Scandinavian countries compared with the United States, 1952-65

Year	United States	Sweden	Denmark	Norway
	<u>U.S. dollars</u>			
1952	1.91	2.80	2.51	1.84
1953	1.97	2.92	2.77	2.49
1954	2.44	3.69	3.46	3.14
1955	2.05	3.07	3.10	2.34
1956	2.14	3.09	2.81	2.47
1957	2.09	2.93	2.77	2.54
1958	1.87	2.49	2.87	2.25
1959	1.58	2.07	2.58	1.90
1960	1.55	1.96	2.48	1.78
1961	1.53	1.90	2.42	1.72
1962	1.49	1.87	2.29	1.58
1963	1.46	1.77	2.28	1.49
1964	1.73	1.96	2.42	1.50
1965	1.63	1.88	2.33	1.44

Source: Derived from (14).

Increased real consumer expenditures of just over 3 percent have apparently had a substantial influence on consumption. The generated income elasticities ranged from unity to 1.16, which indicates that, other things being equal, coffee consumption will increase as fast, relatively, as real income growth. The net effect of the elastic income coefficients and inelastic price coefficients suggests that future Swedish coffee consumption will be affected more by income than price changes.

During 1952-65, Danish retail coffee prices declined 2 percent per year (table 26). On the other hand, per capita Danish coffee consumption grew 6 percent per year, suggesting a strong consumer price sensitivity. This sensitivity is reflected in the direct price coefficients, which ranged from -0.51 to -0.63 (6a and 6b, table 30).

Real per capita consumer expenditures in Denmark have increased 3.1 percent per year, or about half as fast as per capita coffee consumption, which suggests a relatively strong income response. Consumer expenditure coefficients were quite high, ranging from 1.36 to 1.60, which indicates a strong income "pull" on coffee consumption (6a and 6b, table 30). This is of particular significance in a market with a per capita consumption of 10.56 kilos in 1965 for the total population.

Gross price coefficients were not statistically significant. During 1952-65, consumer response to price changes in Norway were fairly low. That is, while

Table 29 --Real per capita consumer expenditures in the Scandinavian countries compared with the United States, 1952-65

Year	United States	Sweden	Denmark	Norway
U.S. dollars				
1952	1,500	786	672	612
1953	1,541	800	696	625
1954	1,548	829	741	633
1955	1,641	848	727	653
1956	1,673	876	725	668
1957	1,680	878	717	680
1958	1,664	918	743	665
1959	1,739	946	781	686
1960	1,772	958	826	725
1961	1,778	1,011	879	758
1962	1,819	1,038	920	768
1963	1,876	1,091	908	790
1964	1,960	1,137	979	813
1965	2,050	1,181	994	830

Source: (19).

Table 30 --Elasticities computed from regression equations on per capita coffee consumption, Scandinavian countries, 1952-65

Equation number 1/	Country	Function	Coffee price	Income	Cross (tea)	Cross (cocoa)	Trend (time)
5a	Sweden	1	-0.25	1.05	--	-.06	--
5b	Sweden	1	-0.28	1.16	--	--	--
5c	Sweden	1	-0.28	1.01	--	--	0.3
6a	Denmark	1	-0.63	1.60	--	0.18	--
6b	Denmark	1	-0.51	1.36	--	--	--
7a	Norway	1	-0.33	0.84	--	--	--
7b	Norway	1	-0.42	0.82	--	--	--
7c	Norway	1	-0.57	0.99	--	0.21	--
7d	Norway	1	-0.43	0.93	--	0.12	--

1/ Complete statistical support data (standard errors, intercept levels, and so on) for these equations are in app. table A-8.

real coffee prices declined 4.8 percent and real consumer expenditures increased 2.1 percent, coffee consumption in green bean equivalent increased only 4.1 percent (table 27). The generated elasticities were inelastic -- ranging from -0.33 to -0.57 -- which indicates that Norwegians are moderately indifferent to real price changes.

Changes in real income have a positive effect on Norwegian coffee consumption, whose nature is reflected in the relatively elastic income coefficients shown in table 22 -- from 0.82 to unity. Thus, as in Sweden and Denmark, increases in real consumer expenditures could be expected to positively and proportionally affect coffee consumption.

Inadequate Finnish price and consumption data precluded regression analysis. However, the results of a 1966 ICO study (13, p. 79) showed that from 1953 to 1963, the current retail price of coffee increased while the real price declined over 26 percent (Fmk. 897 to 667 per kilo). Despite these high coffee prices, per capita imports increased from 5.6 kilos in 1953 to 9.3 kilos in 1963, or 67 percent.

Regression analysis by the ICO generated a price elasticity of -0.04 and an income elasticity of 0.92. The ICO concluded that demand for Finnish coffee at retail is inelastic with respect to price.

The European Community, Switzerland, and Austria

Coffee Consumption

Traditionally, coffee has been one of the major beverages consumed in the EC, Switzerland, and Austria. Consumption in these countries fell sharply during World War II; however, losses were almost entirely recovered by the late 1950's (18, p. 25). During 1952-65, total coffee consumption in the EC, Switzerland, and Austria (hereafter EC/S/A) more than doubled -- from 360,000 to 831,000 tons (table 12). And this group's share of world coffee imports increased from 20.5 to 29.8 percent.

In this study, coffee consumption in six of the EC/S/A countries is analyzed in detail. Lack of adequate data precluded regression analyses of Belgium-Luxembourg. Consumption response to price and income changes varied widely.

West Germany is the most populous country in the EC/S/A group and the world's second largest coffee importer (table 31). Total consumption increased nearly fivefold during 1952-65 (57,000 to 264,000 tons) and in 1965, total consumption was 10 percent of world imported consumption (table 12). Growth in per capita consumption equaled total consumption growth over the period. Per capita consumption was nearly 4.5 kilos in 1965.

France is the second largest consumer of imported coffee in the EC/S/A and the third largest in the world. In 1965, France consumed over 227,000 tons of green coffee, or over 8 percent of the world's import total (table 12). On the other hand, the rates of increase during 1952-65 in per capita and total consumption in the French market were quite low -- 1.2 and 2.4 percent per year, respectively (table 32).

Table 31 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, West Germany, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Deutsche marks	Coffee			Tea			Cocoa		
			Real price: per kilogram	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons	Real price: per kilogram	Per capita consumption: Kilograms	Total consumption: 1,000 metric tons
1952	50,643	1,679.3	35.33	1.11	56.52	49.79	0.056	2.8	10.22	1.20	60.8
1953	51,189	1,861.0	31.09	1.00	78.56	34.35	.082	4.2	10.05	1.43	73.0
1954	51,880	1,944.3	24.57	1.98	103.18	34.13	.092	4.9	10.87	1.44	74.5
1955	52,382	2,100.4	22.77	2.28	135.03	33.83	.104	5.4	10.37	1.39	72.7
1956	53,003	2,262.2	21.56	2.52	135.00	32.92	.114	6.0	9.67	1.86	98.4
1957	53,656	2,388.8	21.02	2.82	154.03	32.04	.114	6.0	10.01	2.01	108.0
1958	54,292	2,536.5	19.40	2.88	159.55	31.00	.114	6.1	9.77	1.66	90.2
1959	54,876	2,642.9	17.86	3.36	186.60	30.30	.118	6.3	9.64	1.73	95.0
1960	55,433	3,007.2	17.27	3.54	199.37	29.61	.114	6.4	9.41	1.97	109.0
1961	56,175	3,166.3	16.61	3.72	212.37	28.57	.118	6.7	9.14	2.07	116.0
1962	56,933	3,218.0	15.73	4.08	233.87	27.41	.128	7.3	8.88	2.18	134.0
1963	57,587	3,379.2	14.86	4.14	237.51	26.67	.118	6.8	8.58	2.22	128.0
1964	58,267	3,506.3	14.55	4.45	259.29	24.21	.153	8.9	8.35	2.40	140.0
1965	59,012	3,672.8	14.26	4.48	264.37	23.05	.139	8.2	8.00	2.63	155.0
----- Percent -----											
Annual compound change	1.2	6.2	-6.6	11.1	11.1	-4.2	5.1	6.4	-2.0	5.3	6.5

Source: (19, 14, 5 and 7).

Table 32 -- Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, France, 1952-65

Year	Population:	Per capita consumer expenditures:	Coffee			Tea			Cocoa		
			Real price: per kilogram	Per capita consumption:	Total consumption:	Real price: per kilogram	Per capita consumption:	Total consumption:	Real price: per kilogram	Per capita consumption:	Total consumption:
	Thousands	Francs	Francs	Kilograms	1,000 metric tons	Francs	Kilograms	1,000 metric tons	Francs	Kilograms	1,000 metric tons
1952	42,460	2,749.3	11.24	3.92	166.26	30.12	0.029	1.2	7.02	1.07	45.6
1953	42,752	2,861.0	11.24	3.99	163.75	30.60	.033	1.4	7.02	1.13	48.2
1954	43,057	3,019.0	12.34	3.95	169.44	31.22	.034	1.4	7.61	1.15	49.7
1955	43,428	3,164.7	11.52	4.23	182.14	34.10	.028	1.3	9.13	1.00	43.5
1956	43,843	3,392.6	11.06	4.44	194.38	32.35	.037	1.6	9.78	1.17	51.2
1957	44,311	3,639.1	11.24	4.30	190.34	31.49	.039	1.7	8.83	1.40	62.2
1958	44,789	3,593.7	10.35	4.27	190.94	28.30	.035	1.6	8.23	1.20	53.8
1959	45,240	3,620.1	9.58	4.51	203.87	28.21	.035	1.6	8.42	1.10	49.8
1960	45,684	3,768.2	9.20	4.58	208.61	27.45	.035	1.6	8.05	1.15	52.5
1961	46,163	3,921.8	8.88	4.44	204.46	26.84	.037	1.7	7.87	1.31	60.5
1962	46,998	4,107.3	8.44	4.39	205.67	25.38	.041	1.9	7.47	1.38	65.0
1963	47,853	4,294.7	8.06	4.58	218.72	24.80	.038	1.8	7.11	1.37	65.7
1964	48,411	4,452.8	8.11	4.48	217.02	24.03	.040	2.3	7.13	1.31	63.4
1965	48,920	4,576.7	7.79	4.70	227.64	22.73	.041	2.5	7.01	1.29	63.1
----- Percent -----											
Annual compound change	1.1	3.6	-3.6	1.2	2.4	-2.6	2.2	4.5	-0.7	1.7	2.9

Source: (19, 14, 5 and 7).

Both total and per capita coffee consumption in the Netherlands nearly tripled in 1952-65 (table 33). In 1952, total consumption was only 27,000 tons but, with the return of prosperity following World War II, consumption increased to nearly 80,000 tons in 1965.

Coffee consumption in Italy increased from 71,000 tons in 1952 to 132,000 tons in 1965, or 5.4 percent per year (table 34).

Total coffee consumption in Switzerland and Austria in 1965 was only 2 percent of world imported consumption. Total consumption that year for both Switzerland and Austria was 58,000 tons (table 35 and 36). Growth in Austria's total consumption during 1952-65 was 12.5 percent, or nearly double that of Switzerland.

Price and Income Analysis

Real coffee prices in West Germany have declined dramatically -- 6.6 percent per year. However, at DM 16.59 in current (1965) value or DM 14.26 (\$3.41) per kilogram in deflated value, coffee is obviously still a very expensive consumer item. And West German coffee prices remain the highest in the EC/S/A (table 37), primarily because of duties and internal taxes.

In 1952, duties and taxes on green coffee were \$2.10 per pound. During the next 10 years, these were reduced considerably. In 1963, duties on green coffee entering West Germany were only 3.9 cents per pound and the internal tax was \$0.41 plus 4 percent of a per unit value fixed by West German authorities. However, to maintain revenues from coffee taxes, West Germany raised internal taxes to offset lower duties on imports. At more than 50 cents per pound, these coffee taxes (in 1966) were the highest in Europe (13, p. 57).

Consumer response to retail coffee price changes in West Germany has been quite high. That is, while real coffee prices declined 6.6 percent and real per capita consumer expenditures increased over 6 percent during 1952-65, per capita coffee consumption increased over 11 percent. The generated estimate of direct price elasticity (-2.33) is the highest in the EC/S/A (table 38). This level of elasticity suggests that more coffee would be consumed in West Germany if taxes and duties were lowered.

Real per capita consumer expenditures during 1952-65 increased over 6 percent in West Germany, while per capita coffee consumption increased over 11 percent. If viewed independently of other variables, this relationship suggests a relatively high income response. However, this apparent relationship was not reflected by the relatively inelastic income coefficient (0.28) generated by multiple linear regression. This inelasticity suggests that the direct price coefficient may have absorbed some of the income effect. Also, indirect price coefficients for tea and cocoa were quite high -- 0.81 and 1.22 -- which suggests that some of the increased per capita consumer expenditures (income) is being channeled into the purchase of tea and cocoa instead of coffee.

Real coffee prices in France declined 3.6 percent per year during 1952-65 and were considerably lower than West Germany's (table 37). According to the ICO, the average retail coffee price changed very little -- from 9.33 francs per

Table 33 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, Netherlands, 1952-65

Year	Coffee					Tea			Cocoa		
	Population: : Thousands	consumer : Guilders	Real price: : Guilders	Per : Kilograms	Total : 1,000 metric tons	Real price: : Guilders	Per : Kilograms	Total : 1,000 metric tons	Real price: : Guilders	Per : Kilograms	Total : 1,000 metric tons
1952	10,382	1,583	8.94	2.6	26.99	7.65	0.71	7.3	7.09	4.65	48.3
1953	10,493	1,642	8.99	2.7	28.35	7.53	.76	8.0	6.94	6.34	66.6
1954	10,615	1,721	10.52	2.6	27.81	9.89	.79	8.4	7.51	4.80	51.0
1955	10,751	1,810	9.14	2.0	32.18	10.77	.68	7.3	7.55	5.34	57.4
1956	10,888	1,950	8.26	3.8	41.36	9.02	.88	9.6	6.88	6.02	65.6
1957	11,026	1,910	7.80	3.6	39.19	8.26	.72	8.0	6.02	7.04	77.7
1958	11,187	1,881	7.16	3.9	43.27	7.90	.77	8.7	6.00	5.68	63.6
1959	11,348	1,941	6.73	4.5	51.21	7.82	.78	8.9	5.94	6.50	73.7
1960	11,486	2,043	6.10	4.8	55.02	8.54	.78	8.9	6.21	7.38	84.8
1961	11,639	2,131	5.81	5.9	68.80	8.38	.79	9.2	6.00	8.42	93.0
1962	11,806	2,225	5.66	5.4	63.79	8.15	.75	8.9	5.56	8.70	102.7
1963	11,966	2,331	5.45	6.3	75.41	7.79	.73	8.7	5.31	8.60	102.9
1964	12,127	2,471	6.03	6.9	83.68	7.06	.72	8.7	5.04	8.65	104.9
1965	12,292	2,572	5.79	6.5	79.90	6.67	.70	9.0	4.76	9.60	116.0
----- Percent -----											
Annual compound change	1.3	3.5	-4.9	8.6	10.0	-1.5	-0.2	1.2	-3.2	5.6	6.3

Sources: (19, 14, 5, 7).

Table 34 --Population, consumer expenditures, and coffee, tea, and cocoa prices and consumption, Italy, 1952-65

Year	Population: Thousands	Per capita consumer expenditures: Lire	Coffee			Tea			Cocoa		
			Real price: per kilogram	Per capita consumption:	Total consumption: 1,000 metric -- tons --	Real price: per kilogram	Per capita consumption:	Total consumption: 1,000 metric -- tons --	Real price: per kilogram	Per capita consumption:	Total consumption: 1,000 metric tons
1952	47,352	185,721	2,089	1.51	71.28	4,286	0.014	0.7	2,069	0.25	11.7
1953	47,607	199,145	2,075	1.4	66.70	4,155	.017	0.8	2,045	.36	17.1
1954	47,899	198,563	2,378	1.5	69.46	4,037	.020	1.0	2,308	.39	18.6
1955	48,200	205,528	2,213	1.5	72.36	4,128	.022	1.0	2,151	.39	18.8
1956	48,469	212,443	2,278	1.6	75.75	4,045	.028	1.3	1,979	.45	22.0
1957	48,743	220,555	2,255	1.6	77.79	4,010	.022	1.1	1,289	.58	28.2
1958	49,041	245,387	2,187	1.7	80.89	3,883	.027	1.3	1,500	.45	22.0
1959	49,356	252,776	2,161	1.7	84.02	3,898	.029	1.4	1,420	.54	26.6
1960	49,642	263,968	2,101	2.0	99.19	3,822	.030	1.5	1,363	.57	28.1
1961	49,863	282,370	2,022	2.1	105.20	3,752	.033	1.7	1,337	.71	35.6
1962	50,151	302,024	1,904	2.2	111.92	3,570	.039	2.0	1,206	.72	35.9
1963	50,598	325,694	1,746	2.3	116.08	3,414	.036	1.8	1,229	.76	38.5
1964	51,120	329,222	1,710	2.35	120.13	3,218	.045	2.3	1,210	.72	36.7
1965	51,575	335,518	1,676	2.56	132.03	3,119	.050	2.6	1,070	.86	41.1
----- Percent -----											
Annual compound change	0.7	5.0	-2.1	4.8	5.4	-2.2	8.8	9.5	-5.8	8.1	8.8

Source: (19, 14, 5 and 7).

Table 35 --Population, consumer expenditures, and coffee and cocoa prices and consumption, Austria, 1952-65

Year	Population	Per capita consumer expenditures	Coffee			Cocoa		
			Price per kilogram	Per capita consumption	Total consumption	Price per kilogram	Per capita consumption	Total consumption
	Thousands	Schillings	Schillings	Kilograms	1,000 metric tons	Schillings	Kilograms	1,000 metric tons
1952.....	6,949	8,382	100.0	0.64	4.44	46.24	0.84	5.8
1953.....	6,954	8,737	107.2	.63	4.41	46.11	.97	6.8
1954.....	6,969	9,355	108.1	.69	4.83	47.89	.98	6.8
1955.....	6,947	10,436	106.9	.81	5.67	54.71	1.07	7.5
1956.....	6,952	10,915	103.6	1.05	7.30	51.89	1.33	9.2
1957.....	6,966	11,497	101.5	1.19	8.29	48.23	1.44	10.0
1958.....	6,987	11,968	89.0	1.28	8.98	47.00	1.31	9.2
1959.....	7,014	12,547	83.2	1.39	9.81	46.23	1.37	9.6
1960.....	7,048	13,304	77.7	1.72	12.20	45.24	1.47	10.4
1961.....	7,074	14,057	74.5	1.85	13.10	37.26	1.64	11.6
1962.....	7,130	14,427	71.4	1.90	13.47	30.88	1.58	11.2
1963.....	7,172	15,154	67.4	2.13	15.13	31.30	1.47	10.5
1964.....	7,215	15,570	71.4	2.39	17.24	30.25	1.52	11.0
1965.....	7,255	15,902	68.6	2.48	17.99	28.57	1.72	12.5
----- Percent -----								
Annual com- pound change	0.3	5.2	-4.3	12.2	12.5	-4.6	5.3	5.3

Sources: (19, 14, 7).

Table 36 --Population, consumer expenditures, and coffee and cocoa prices and consumption, Switzerland, 1952-65

Year	Population	Per capita consumer expenditures	Coffee			Cocoa		
			Price per kilogram	Per capita consumption	Total consumption	Price per kilogram	Per capita consumption	Total consumption
	Thousands	S. francs	S. francs	Kilograms	1,000 metric tons	S. francs	Kilograms	1,000 metric tons
1952.....	4,815	3,714	9.47	3.78	18.24	6.60	1.59	7.7
1953.....	4,877	3,550	9.96	3.92	19.12	6.67	1.88	9.2
1954.....	4,929	3,571	11.44	3.88	19.13	7.87	2.08	10.2
1955.....	4,980	3,782	10.69	3.61	17.95	8.21	1.85	9.2
1956.....	5,045	3,920	10.24	4.46	22.45	8.13	2.08	10.5
1957.....	5,126	3,955	10.01	4.30	22.02	7.68	2.14	11.0
1958.....	5,199	3,959	9.60	4.44	23.04	7.40	2.12	11.0
1959.....	5,259	4,114	9.07	5.11	26.76	7.88	2.09	11.0
1960.....	5,362	4,235	8.54	5.57	29.86	7.72	2.11	11.3
1961.....	5,496	4,442	8.18	5.92	32.40	7.57	1.99	10.9
1962.....	5,660	4,597	7.76	5.48	30.40	6.64	2.30	13.0
1963.....	5,770	4,739	7.39	6.15	34.54	6.08	2.46	14.2
1964.....	5,874	4,881	7.14	6.33	37.18	5.92	2.40	14.1
1965.....	5,945	4,993	6.85	6.69	39.77	5.72	2.42	14.4
----- Percent -----								
Annual compound change	1.7	3.7	-3.5	5.0	6.7	-1.6	2.4	4.1

Sources: (19, 14, 7).

Table 37 --Real coffee prices per kilogram in the United States, the EC countries, Austria, and Switzerland, 1952-65

Year	United States	West Germany	France	Netherlands	Italy	Austria	Switzerland
	U.S. dollars						
1952	1.91	8.46	2.29	2.37	3.35	3.85	2.20
1953	1.97	7.44	2.29	2.38	3.33	4.13	2.31
1954	2.44	5.88	2.52	2.79	3.81	4.16	2.65
1955	2.05	5.45	2.35	2.42	3.55	4.12	2.48
1956	2.14	5.16	2.25	2.19	3.65	3.99	2.38
1957	2.09	5.03	2.29	2.07	3.61	3.91	2.33
1958	1.87	4.64	2.11	1.90	3.50	3.43	2.23
1959	1.58	4.27	1.95	1.78	3.46	3.20	2.11
1960	1.55	4.13	1.88	1.61	3.37	2.99	1.98
1961	1.53	3.97	1.81	1.54	3.24	2.87	1.90
1962	1.49	3.76	1.72	1.50	3.05	2.75	1.80
1963	1.46	3.56	1.64	1.44	2.80	2.59	1.72
1964	1.73	3.48	1.65	1.60	2.74	2.75	1.65
1965	1.63	3.41	1.59	1.53	2.69	2.54	1.59

Source: Derived from (14).

kilo in 1953 to 10.46 francs in 1964. This can be partially attributed to a reduction of duties and internal coffee taxes. In real terms, the retail price of coffee decreased 28 percent while the overall cost of living increased 51 percent. The difference between the change in current retail price and the real (deflated) retail price of coffee indicates that the real price declined while other consumer prices increased and real consumer expenditures increased 3.6 percent per year. Thus, market conditions were at least moderately favorable for expansion in the French coffee market (13, p. 61). However, the generated direct price coefficients were quite inelastic, ranging from -0.27 to -0.33 (9a, 9b, and 9c, table 38). These low elasticities are probably influenced -- at least covertly -- by the historically very high level of wine consumption in France. That is, a relatively high level of consumption of a universally accepted competing beverage can suppress increased consumption of another beverage.

Consumption response to income was even lower than was the response to direct price. The generated income coefficients ranged from 0.12 to 0.32. The net effect of the inelastic price and income elasticities suggests that only limited future expansion can be expected in the French coffee market.

Coffee consumption in the Netherlands appears to be favorably influenced by a substantial decline in coffee prices and by a taxing rate which is considerably lower than West Germany's. Retail price levels in the Netherlands have been

Table 38 --Elasticities computed from regression equations on per capita coffee consumption, EC countries, Austria, and Switzerland, 1952-65

Equation number ^{1/}	Country	Function	Coffee price	Income	Cross (tea)	Cross (cocoa)	Trend (time)
8a	West Germany	1	-2.33	0.23	0.82	1.13	--
9a	France	1	-0.33	0.32	0.39	--	--
9b	France	1	-0.28	0.13	--	0.24	--
9c	France	1	-0.27	0.12	0.04	0.26	--
10a	Netherlands	1	-0.77	1.32	--	--	--
10b	Netherlands	1	-0.81	1.39	--	0.13	--
11a	Italy	1	-0.26	0.82	--	-0.003	--
11b	Italy	1	-0.26	0.83	--	--	--
11c	Italy	1	-0.18	0.70	-0.31	-0.02	--
12a	Switzerland	1	-1.05	0.46	--	0.58	--
12b	Switzerland	2	-0.40	0.73	--	--	--
13a	Austria	1	-0.41	1.93	--	--	--
13b	Austria	1	-0.44	1.93	--	0.02	--
13c	Austria	2	-0.23	1.38	--	--	-0.04
13d	Austria	1	-0.44	1.93	--	0.02	--

^{1/} Complete statistical support data (standard errors, intercent levels, and so on) for these equations are in app. table A-8.

approximately equal to those in France (table 37). According to the ICO, the Netherlands has not imposed any internal taxes as such on coffee. ^{22/}

During 1952-65, Dutch real coffee prices declined nearly 5 percent, while real income increased 3.5 percent annually. During the same time, per capita consumption increased 8.6 percent per year. The price coefficients generated by multiple linear regression analysis ranged from -0.77 to -0.81 (table 38). Thus, fluctuations in real coffee prices in the Netherlands could be expected to influence coffee consumption.

The real per capita income level in the Netherlands has been lower than that in France or West Germany (table 39). And real annual per capita income growth has been only a moderate 3.5 percent. The nature of this expenditure-income relationship is reflected by the quite high (1.32 to 1.39) income coefficients.

^{22/} In 1953, the Netherlands had a duty of only \$0.04 per pound of green coffee; in 1963, the Netherlands imposed a 2.9 percent ad valorem duty on green coffee from non-EC countries and associated overseas countries. However, this duty applied only to the amount in excess of 85 percent of the preceding year's imports (13, p. 67).

Table 39 --Real per capita consumer expenditures in the EC, Austria, and Switzerland, compared with the United States, 1952-65

Year	United States	West Germany	France	Netherlands	Italy	Austria	Switzerland
	<u>Dollars</u>						
1952	1,500	402	560	419	298	323	815
1953	1,541	445	583	435	319	336	770
1954	1,548	465	615	456	318	360	783
1955	1,641	503	645	480	329	402	839
1956	1,673	541	692	517	340	420	878
1957	1,680	572	742	506	353	443	905
1958	1,664	607	732	498	393	461	919
1959	1,739	633	738	514	405	483	942
1960	1,772	720	768	541	423	512	993
1961	1,778	758	799	565	453	541	1,063
1962	1,819	794	837	589	484	556	1,139
1963	1,876	809	875	618	522	585	1,219
1964	1,960	839	908	654	528	600	1,299
1965	2,050	879	933	681	538	612	1,365

Source: (19).

In summary, the analysis indicates that both price and income are important and positive variables in Dutch coffee consumption. Coefficients for coffee substitutes were not statistically significant.

In real terms, Italian coffee prices declined 2.1 percent per year during 1952-65, while per capita consumption increased 4.8 percent, which, other things being equal, suggests a price-sensitive demand for coffee. However, this relationship, as estimated by the generated price coefficients (11a, 11b, and 11c, table 38), indicates a quite low price elasticity (-0.18 to -0.26). In part, this price inelasticity can be explained by the decline in importance of per capita coffee expenditures. ^{23/} In 1952, per capita expenditures on coffee constituted 1.6 percent of total Italian consumer expenditures ^{24/} but, by 1965, expenditures on coffee had declined to 1.2 percent -- a 25 percent drop.

^{23/} Theoretically, the smaller an item is in the total budget, the less attention it receives. Thus, price fluctuations for this item have less influence on its consumption.

^{24/} Computed by multiplying per capita consumption by real price and dividing by real per capita consumer expenditures per year.

Changes in income (consumer expenditures) had more apparent effect on Italian coffee consumption than real prices. The generated income elasticities ranged from 0.70 to 0.82 (11a, 11b, and 11c, table 38) or, restated, a 10-percent change in real income could be expected to increase Italian coffee consumption by 7 to 8 percent, other things being equal. Therefore, changes in real income will probably influence coffee consumption much more than direct price changes. All elasticities for cross price elasticities had wrong signs.

During 1952-65, real coffee prices declined 4.3 percent in Austria and 3.5 percent in Switzerland (tables 35 and 36). Duties and taxes, as coffee price factors, were comparatively low for these countries. ^{25/} Annual Austrian per capita consumption increased 12.2 percent during 1952-65; Swiss per capita consumption increased 5.0 percent in the same period.

The generated price elasticity for Switzerland was 1, or unity (12a, table 38). Surprisingly, the price elasticity for Austria was less than half that of Switzerland -- 0.44 (13a, 13b, and 13d, table 38).

Yearly growth in real per capita consumer expenditures increased 5.2 percent in Austria, or nearly twice as fast as in Switzerland. The differences in consumer expenditures growth and per capita coffee consumption rates were reflected in the estimated income coefficients. For Austria, the income coefficient was very high at 1.93. For Switzerland, the income coefficients were 0.46 and 0.73; the latter was statistically more significant.

The cross elasticity for Swiss cocoa was quite high (0.58), which suggests its importance as a consumer item.

All regression analyses for each country are summarized in appendix table A-8.

Other Developed and Central Plan Countries

Incomplete data for Japan, Spain, Greece, and the central plan countries precluded an econometric analysis of demand for coffee for these markets. Therefore, projected 1980 consumption levels for these markets will be based largely on limited pre-1965 coffee import data, estimated institutional and socioeconomic trends, and projected population and real income changes from 1965 to 1980.

The Less Developed Coffee Importing Countries

Consumption in the less developed coffee importing countries is expected to increase from 138,000 to 217,000 tons, or an annual growth rate of 3.1 percent, which is only 0.5 percent higher than projected population growth. Thus, population growth is the main factor affecting growth in coffee consumption in the coffee importing LDC's.

^{25/} In Austria, duties and internal taxes together were 20 cents per pound on roasted coffee in 1953, and 43 cents in 1963 (13, p. 73). In Switzerland, the tax on roasted coffee was 16 cents per pound in 1953, and only 10 cents per pound in 1963 (13, p. 101).

IV.--PROJECTED IMPORTED WORLD COFFEE CONSUMPTION IN 1980

Export prospects and foreign exchange earnings from coffee by the LDC's in 1980 are projected on the basis of estimated world imported consumption in 1980. Projections of expected coffee consumption by the importing countries are developed and presented under two major assumptions or "projection sets".

Projection set I assumes constant prices; that is, prices in 1980 would be at 1964-66 levels for coffee and its major substitutes. Continuation of present International Coffee Organization export policies through 1980 is also assumed. ^{26/} Further, these projections assume an absence of major wars and natural disasters that would substantially change the underlying factors of future coffee supply and demand.

Assumptions under projection set II are identical to those under set I except that world coffee prices and the prices of major coffee substitutes decline 30 percent from the 1964-66 level. The 30 percent figure was arbitrarily selected to demonstrate the impact upon projected foreign exchange earnings from coffee if producing countries ignore the coffee agreement and try to export more than the equilibrium level as given in set I.

Methodology

Projected coffee consumption in 1980 for 13 major importing countries ^{27/} is based on coefficients generated by multiple linear regression analysis on time-series consumption data for 1952-65 in chapter III and summarized in table 40. Except for the United States, for which liquid coffee consumption was used, the dependent variable was per capita coffee consumption in green bean equivalent. Independent variables were direct and cross prices, real per capita incomes, and time (trend). Various combinations of these independent variables were analyzed by multiple linear regression to determine which combination best explained the variation in per capita coffee consumption for each country during 1952-65. A more detailed discussion of the variables included on the demand analyses for the 13 major importing countries is in chapter III.

Data and time constraints limited detailed demand analysis (discussed in ch. III) to 17 of the world's largest coffee importing countries. However, the results of the analyses for four countries -- Finland, New Zealand, Belgium-Luxembourg, and Ireland -- were subsequently found to be unacceptable. Consumption estimates for 1980 for these four countries were obtained by assuming that their coffee consumption patterns would parallel one or more of the 13. For example, it was assumed that New Zealand's future per capita coffee consumption growth would parallel Australia's. It was also assumed that future changes in per capita consumption in Belgium-Luxembourg would parallel consumption in the other four EC countries.

^{26/} These are described in appendix B.

^{27/} United States, United Kingdom, Canada, Australia, Sweden, Denmark, Norway, West Germany, France, Netherlands, Italy, Switzerland, and Austria.

Table 40 --Elasticities computed from regression equations on per capita coffee consumption, selected countries 1/

Equation number 2/	Country	Durbin Watson	R ²	Coffee price	Income	Cross (tea)	Cross (cocoa)
1d	United States	1.10	0.79	-0.10**	0.24**	--	--
2a	United Kingdom	1.67	0.96	-1.51***	2.23***	--	--
3a	Canada	0.94	0.90	-0.23***	0.79***	--	--
4b	Australia	2.38	0.92	-2.50***	1.23*	0.33 X	--
5a	Sweden	2.49	0.99	-0.25***	1.05***	--	-0.06**
6b	Denmark	0.80	0.92	-0.51*	1.36***	--	--
7b	Norway	1.46	0.95	-0.42***	0.82***	--	--
8a	West Germany	1.56	0.96	-2.33***	0.23**	0.82***	1.13*
9b	France	1.66	0.96	-0.28***	0.13*	--	0.24***
10a	Netherlands	3.03	0.99	-0.77***	1.32***	--	--
11b	Italy	2.35	0.98	-0.26*	0.82***	--	--
12a	Switzerland	2.71	0.97	-1.05***	0.46**	--	0.58***
13b	Austria	1.72	0.99	-0.44**	1.93***	--	0.02 X

1/ Elasticities computed at mean values--double-log functions.

2/ See app. table A-8 for complete equations.

-- = not applicable.

*** - Significant at 5-percent level.

** - Significant at 10-percent level.

* - Significant at 15-percent level.

X - Not significant at 15-percent level.

Source: Computed from equations in app. table A-8.

Projected consumption for the remainder of the regions and countries is estimated primarily by linear projections of pre-1965 consumption data. Some adjustments for known or estimated trends or changes in institutional and socioeconomic factors were made in these long-term trend data.

The Projection Model

A 3-year average (for 1964-66) was used for the base period which was implicitly assumed to represent an equilibrium point in time.

The projection equation is:

$$Q_p = Q_c (1 + e_1 r_1 + e_2 r_2 + e_3 r_3 + e_4 r_4 + r_5 + r_6)^t$$

Where:

Q_p = Projected coffee consumption in 1980.

Q_c = Coffee consumption in 1964-66.

e_1 = Coffee price (direct price) elasticity.

r_1 = Projected annual coffee price change, 1964-66 to 1980.

e_2 = Cross price elasticity, 1st coffee substitute.

r_2 = Growth rate 1964-66 to 1980, e_2 .

e_3 = Cross price elasticity, 2d coffee substitute.

r_3 = Growth rate 1964-66 to 1980, e_3 .

e_4 = Cross price elasticity, 3d coffee substitute.

r_4 = Growth rate 1964-66 to 1980, e_4 .

r_5 = Growth rate, trend.

r_6 = Growth rate, population.

t = Time span projected -- 15 years.

Selection of Projection Equations

A number of criteria were used in the selection of coefficients for consumption projection equations. Major consideration was given to the reasonableness of the signs of the coefficients; that is, negative signs for the direct price coefficients and positive signs for cross price and income coefficients. In addition, the coefficients had to be statistically significant and the size of the Durbin Watson statistic and the coefficient of determination (R^2) had to be within acceptable ranges. Perhaps the most important criterion was the

overall reasonability of the projected consumption figures. The selection and use of the projection functions must always include the use of reasonability checks, since consumption habits change over a 15-year span as a result of personal and environmental factors, and may cause considerably higher or lower consumption levels to be realized than those which were mathematically projected. Thus, the accepted projections for most countries were selected from the various alternative projections that seemed most reasonable under the particular price assumption. For example, mathematical projections of Danish coffee consumption under projection set I exceeded 19 kilograms (41.9 pounds) per capita. A review of empirical consumption data plus consideration of the possible impact of soluble coffees suggested that a maximum consumption of only 14 kilograms per capita in 1980 would be reasonable.

The reader is reminded that the projected 1980 consumption volumes are projections only and not forecasts of the future. Specifically, the probability that a particular set of projections would materialize depends on the likelihood of the assumptions and the relationships used in making these projections.

World Population and Real Income Growth Assumptions -- 1965-80

Population is a key variant in the growth in demand of most consumer items. Therefore, assumptions regarding population growth are of the utmost importance. Population and income projections used in this study are shown in table 41. Basically, these are United Nations projections with some adjustments based on studies by FAO and Organization for Economic and Cooperative Development and USDA long-term supply and demand studies.

Between 1965 and 1980, population is projected to grow at a compound yearly rate of 1.0 percent in the developed world, 1.8 percent in the central plan area, and 2.6 percent in the less developed coffee importing countries.

According to Magelby and Missiaen (17), by 1980, the less developed sector will have about half the world's population -- up from 46 percent in 1965. By contrast, the developed regions will have only 17 percent -- down from 20 percent in 1965. The central plan share is expected to remain about one-third.

Income is another key variant in growth in demand for most consumer products. With given levels of population, prices, and other factors, the rate of increase in real income largely determines the pattern and level of per capita consumption. The real income projections in table 41 represent consumer expenditures for the developed countries, net material product for the central plan countries, and GNP of the less developed regions.

Yearly income growth from 1965 to 1980 is projected at 3.3 percent for the developed world, 3.4 percent for the central plan countries, and 1.6 percent for the coffee importing LDC's.

Projected 1980 World Imported Coffee Consumption

Projected 1980 world coffee consumption in green bean equivalent is summarized in table 42. Under assumed constant 1964-66 prices (projection set I), world

Table 41 --Population and real income, study countries, 1965, and medium projections for 1980

Region and country	Population <u>1/</u>				Real income per capita <u>2/</u>			
	1965	Projected 1980	Change over 1965	Annual growth rate, 1965-80	1965 <u>1/</u>	Projected 1980 <u>1/</u>	Change over 1965	Annual growth <u>1/</u> rate, 1965-80
	Thousands			Percent	Dollars			Percent
Developed:								
United States	194,572	241,079	46,507	1.4	2,050	3,029	979	2.7
British Commonwealth and Ireland:								
United Kingdom	54,595	60,690	6,095	0.7	973	1,404	431	2.5
Canada	19,604	26,024	6,420	1.9	1,530	2,111	581	2.3
Ireland	2,874	3,355	481	1.0	3/564	896	332	3.2
Australia	11,360	14,576	3,216	1.7	1,012	1,420	408	2.3
New Zealand	2,640	3,640	1,000	2.3	1/1,070	1,391	321	1.8
Subtotal	91,073	108,285	17,212	1.2	1,080	1,560	480	2.5
Scandinavia:								
Sweden	7,734	8,701	967	0.8	1,181	1,830	649	3.0
Denmark	4,757	5,230	473	0.7	994	1,607	613	3.2
Norway	3,723	4,238	515	0.9	830	1,442	612	3.7
Finland	4,612	5,229	617	0.8	1/634	1,017	383	3.3
Subtotal	20,826	23,598	2,572	0.8	954	1,528	574	3.2
European Community S/A: <u>4/</u>								
West Germany	59,012	62,287	3,275	0.4	879	1,486	607	3.6
France	48,920	54,501	5,581	0.7	933	1,607	674	3.7
Netherlands	12,292	14,215	1,923	1.0	681	1,137	456	3.5
Italy	51,575	56,814	5,239	0.7	538	987	449	4.1
Belgium-Luxembourg	9,795	10,568	773	0.5	1/960	1,572	612	3.4
Switzerland	5,945	6,994	1,049	1.1	1,365	1,911	546	2.3
Austria	7,255	7,380	125	0.1	612	1,077	465	3.8
Subtotal	194,794	212,759	17,965	0.6	799	1,364	565	3.6
Other developed:								
Japan	97,960	111,563	13,603	0.8	3/356	992	636	7.2
Spain	31,604	35,893	4,289	0.8	3/309	579	270	4.3
Greece	8,550	9,104	554	0.4	3/415	911	496	5.4
Subtotal	138,114	156,560	18,446	0.8	3/349	893	544	6.5
Total developed	639,379	742,081	102,702	1.0	1,128	1,839	711	3.3

See footnotes at end of table.

Continued

Table 41 --Population and real income, study countries, 1965, and medium projections for 1980 -- Continued

Region and country	Population <u>1/</u>				Real income per income <u>2/</u>			
	1965	Projected 1980	Change over 1965	Annual growth rate, 1965-80	1965 <u>1/</u>	Projected 1980 <u>1/</u>	Change over 1965	Annual growth <u>1/</u> rate, 1965-80
	Thousands		Percent		Dollars		Percent	
Central plan: <u>5/</u>								
Eastern Europe	121,430	138,763	17,333	0.9	702	1,273	571	4.1
USSR	230,600	277,325	46,725	1.3	953	1,802	849	4.4
Communist Asia	795,604	1,077,064	281,460	2.0	108	147	39	2.2
Total central plan	1,147,634	1,493,152	345,518	1.8	340	559	219	3.4
Less developed: <u>6/</u>								
North Africa:								
Algeria	11,871	18,405	6,534	2.9	222	271	49	1.5
Egypt	29,600	46,437	16,837	3.0	159	219	60	2.3
Morocco	13,323	21,944	8,621	3.4	196	225	29	1.0
Sudan	13,540	19,514	5,974	2.5	102	138	36	2.0
Tunisia	4,414	6,178	1,764	2.3	212	277	65	1.8
Latin America:								
Argentina	22,352	28,379	6,027	1.6	718	920	202	1.7
Chile	8,786	12,609	3,823	2.4	485	660	175	2.2
Uruguay	2,715	3,206	491	1.1	573	737	164	1.3
West Asia:								
Israel	2,563	3,411	848	1.9	1,403	2,697	1,294	4.6
Syria	5,356	8,974	3,618	3.5	210	253	43	1.3
Lebanon	2,565	3,882	1,317	2.8	437	580	143	2.0
Total less developed <u>6/</u>	117,085	172,939	55,854	2.6	341	434	93	1.6

1/ (19)

2/ 1958 U.S. dollars.

3/ OECD population and income data, unless indicated otherwise.

4/ EC countries plus Switzerland Austria.

5/ Net material product.

6/ Coffee importing LDC's only.

Table 42 --Projected total 1980 consumption compared with the base period, study countries, 1964-66
(Green bean equivalent)

Regions and countries	Base period (1964-66) consumption	Projected 1980 consumption					
		Projection set I	Projection set II	Relative yearly change from 1964-66		Absolute change from 1964-66	
				Projection set I	Projection set II	Projection set I	Projection set II
		Metric tons		Percent		Metric tons	
Developed:							
United States	1,278,871	1,335,639	1,382,905	0.3	0.6	56,768	104,034
British Commonwealth and Ireland:							
United Kingdom	80,794	194,742	361,291	6.0	9.5	113,948	235,497
Canada	75,608	130,763	141,242	3.7	4.2	55,155	65,634
Ireland	600	720	740	1.2	1.4	120	140
Australia	11,670	22,648	45,563	4.5	9.5	10,978	33,893
New Zealand	3,532	6,852	13,775	4.5	9.5	3,320	10,243
Subtotal	172,204	355,725	517,611	5.0	7.6	183,521	245,407
Scandinavian countries:							
Sweden	94,101	121,814	136,432	1.8	2.5	27,713	42,331
Denmark	50,179	73,220	80,542	2.6	3.2	23,041	30,363
Norway	32,573	58,036	59,332	3.9	4.1	25,463	26,759
Finland	44,930	64,250	64,699	2.4	2.5	19,320	19,769
Subtotal	221,783	317,320	341,005	2.5	2.9	95,537	119,222
EC/S/A: 1/							
West Germany	269,309	323,874	368,398	1.2	2.1	54,565	99,089
France	224,173	267,961	271,927	1.2	1.3	43,788	47,754
Netherlands	75,950	172,122	199,010	5.6	3.3	96,172	123,060
Italy	121,086	220,236	240,156	4.0	4.7	99,150	119,070
Belgium-Luxembourg	63,559	90,572	99,343	2.4	3.0	27,013	35,784
Switzerland	39,770	54,819	64,225	2.2	3.3	15,049	23,455
Austria	17,133	50,177	57,297	7.4	8.6	32,984	40,164
Subtotal	810,980	1,179,701	1,300,356	2.5	3.2	368,721	489,376
Other developed:							
Japan	29,959	69,169	79,544	5.7	6.7	39,210	49,585
Spain	48,482	103,832	119,407	5.2	6.2	55,350	70,925
Greece	10,020	20,040	23,046	4.7	5.7	10,020	13,026
Subtotal	88,461	193,041	221,997	5.3	6.3	104,580	133,536
Total developed	2,572,299	3,381,426	3,763,874	1.9	2.6	809,127	1,191,575

Continued

Table 42 --Projected 1980 consumption compared with the base period, study countries, 1964-66 --Continued
(Green bean equivalent)

Regions and countries	Base period (1964-66) consumption	Projected 1980 consumption						
		Projection set I	Projection set II	Relative yearly change from 1964-66		Absolute change from 1964-66		
				Projection set I	Projection set II	Projection set I	Projection set II	
		Metric tons		Percent		Metric tons		
Central plan:								
Eastern Europe 2/	85,040	220,040	242,040	6.6	7.2	135,000	157,000	
USSR	29,880	78,480	86,328	6.7	7.3	48,600	56,448	
Other central plan	11,316	15,497	17,295	2.1	2.8	4,181	5,979	
Total central plan	126,236	314,017	345,663	6.3	6.9	187,781	219,427	
Less developed:								
North Africa								
Algeria	22,860	39,137	47,726	3.7	5.0	16,277	24,866	
Egypt	3,900	7,177	8,743	4.2	5.5	3,277	4,843	
Morocco	9,060	14,959	18,251	3.4	4.8	5,899	9,191	
Sudan	11,520	19,299	23,541	3.5	4.9	7,779	12,021	
Tunisia	1,860	2,983	3,641	3.2	4.6	1,123	1,781	
Latin America								
Argentina	33,240	48,139	58,833	2.5	3.9	14,899	25,593	
Chile	8,100	13,143	16,039	3.3	4.7	5,043	7,939	
Uruguay	960	1,251	1,531	1.8	3.2	291	571	
West Asia								
Israel	5,880	13,080	14,650	5.5	6.3	7,200	8,770	
Syria	2,640	4,768	5,810	4.0	5.4	2,128	3,170	
Lebanon	3,840	6,527	7,960	3.6	5.0	2,687	4,120	
Other LDC's	33,948	46,492	51,886	2.1	2.8	12,544	17,938	
Total less developed	137,808	216,955	258,611	3.1	4.3	79,147	120,803	
World total	2,836,343	3,912,398	4,368,148	2.2	2.9	1,076,055	1,531,805	

1/ European Community, Switzerland, and Austria.

2/ Includes: Czechoslovakia, East Germany, Hungary, Poland, and Yugoslavia.

coffee imports are projected to increase from 2.8 million tons in 1964-66 to 3.9 million tons in 1980 -- a 2.2 percent annual or 38 percent total increase.

Total coffee consumption in the developed world is projected to increase from 2.6 million tons in 1964-66 to nearly 3.4 million tons in 1980 -- a 1.9-percent annual or 31-percent total increase. In contrast, total consumption in the central plan countries is projected at nearly 2½ times the 1964-66 consumption level, or 314,000 tons. At this level, consumption by the central plan countries is projected to increase 150 percent, or 6.3 percent per year -- nearly 3-1/3 times the annual growth rate of the developed world.

Under projection set I, coffee consumption in the importing LDC's from 1964-66 through 1980 is projected to increase 57 percent -- from 138,000 tons to 217,000 tons, or 2.2 percent per annum. Thus, consumption growth in the coffee importing LDC's is projected to be higher than in the developed countries but less than in the central plan countries.

Projected Changes in World Consumption

Under set I, 1980 consumption in the developed world is expected to be 86 percent of total world imported consumption, or 4 percent less than in 1964-66 (table 43). In contrast, the central plan countries are expected to consume nearly 8 percent of world imports in 1980, or nearly double their 1964-66 share. Consumption by the coffee importing LDC's is expected to be only 0.7 percent more than the 1964-66 share.

Projected 1980 Imported World Coffee Consumption

Projection set I assumes that world coffee prices will remain constant at 1964-66 levels, while projection set II assumes that world coffee prices will decline 30 percent ^{28/} if countries attempt to export more than that needed to meet the projected demand in 1980 under set I.

Under set II, total world coffee imports would be nearly a half million tons or 12 percent more than imports projected under Set I (table 44). However, because of the low elasticity of demand for coffee, world prices would be about 30 percent lower than 1964-66 levels. And, as a consequence, the collective export earnings of the coffee exporting countries would be 22 percent less than they would be under Set I.

For the developed world, the absolute difference between sets I and II is over 382,000 tons, or 11.3 percent -- which essentially equals the relative difference for the total world. In contrast, consumption in the coffee importing LDC's is projected at nearly 42,000 tons, or about 19 percent more under set II than under set I. This projected increase in consumption indicates that price sensitivity for coffee is about 1½ times higher in the importing LDC's than in the developed world.

^{28/} In monetary unit value as opposed to "real" or deflated value.

Table 43 --Shares of world imported coffee consumption,
1964-66 and projected 1980

Regions and countries	1964-66	Projected 1980	
		Set I	Set II
		<u>Percent</u>	
Developed:			
United States	45.1	34.1	31.7
British Commonwealth and Ireland:			
United Kingdom	2.8	5.0	7.2
Canada	2.7	3.3	3.2
Ireland	0.02	0.02	0.02
Australia	0.4	0.6	1.0
New Zealand	0.12	0.17	0.32
Subtotal	6.1	9.1	11.8
Scandinavia:			
Sweden	3.3	3.1	3.1
Denmark	1.8	1.9	1.8
Norway	1.1	1.5	1.4
Finland	1.6	1.6	1.5
Subtotal	7.8	8.1	7.8
European Community S/A: 1/			
West Germany	9.5	8.3	8.4
France	7.9	6.8	6.2
Netherlands	2.7	4.4	4.6
Italy	4.3	5.6	5.5
Belgium-Luxembourg	2.2	2.3	2.3
Switzerland	1.4	1.4	1.5
Austria	0.6	1.3	1.3
Subtotal	28.6	30.2	29.7
Other developed:			
Japan	1.1	1.8	1.8
Spain	1.7	2.7	2.7
Greece	0.4	0.5	0.5
Subtotal	3.1	4.9	5.0
Total developed	90.7	86.4	86.2
Central plan:			
Eastern Europe	3.0	5.6	5.5
USSR	1.05	2.0	2.0
Other central plan	0.4	0.4	0.4
Total central plan	4.45	8.0	7.9

Continued

Table 43 --Shares of world imported coffee consumption,
1964-66 and projected 1980 -- Continued

Regions and countries	1964-66	Projected 1980	
		Set I	Set II
		<u>Percent</u>	
Less developed:			
North Africa:			
Algeria	0.8	1.0	1.1
Egypt	0.14	0.2	0.2
Morocco	0.3	0.4	0.4
Sudan	0.4	0.5	0.5
Tunisia	0.1	0.1	0.1
Latin America:			
Argentina	1.2	1.2	1.4
Chile	0.3	0.3	0.4
Uruguay	0.03	0.03	0.04
West Asia:			
Israel	0.2	0.3	0.3
Syria	0.1	0.1	0.1
Lebanon	0.14	0.2	0.2
Other LDC's	1.2	1.2	1.2
Total less developed	4.9	5.6	5.9
World total	100.0	100.0	100.0

1/ European Community, Switzerland, and Austria.

Table 44 --Projections of total coffee consumption in 1980,
sets I and II compared

Regions and countries	Total consumption		Change from set I to set II	
	Projection set I	Projection set II	Relative change	Absolute change
	Metric tcns		Percent	Metric tons
Developed:				
United States	1,335,639	1,382,905	3.5	47,266
British Commonwealth and Ireland:				
United Kingdom	194,742	316,291	62.4	121,549
Canada	130,763	141,242	8.0	10,479
Ireland	720	740	2.8	20
Australia	22,648	45,563	101.2	22,915
New Zealand	6,852	13,775	101.0	6,923
Subtotal	355,725	515,611	45.5	161,886
Scandinavia:				
Sweden	121,814	136,432	12.0	14,618
Denmark	73,220	80,542	10.0	7,322
Norway	58,036	59,332	2.2	1,296
Finland	64,250	64,699	0.7	449
Subtotal	317,320	341,005	7.5	23,685
European Community S/A: 1/				
West Germany	323,874	368,398	13.7	44,524
France	267,961	271,927	1.5	3,966
Netherlands	172,122	199,010	15.6	26,888
Italy	220,236	240,156	9.0	19,920
Belgium-Luxembourg	90,572	99,343	9.7	8,771
Switzerland	54,819	64,225	17.2	9,406
Austria	50,117	57,297	14.3	7,180
Subtotal	1,179,701	1,300,356	10.2	120,655
Other developed:				
Japan	69,169	79,544	15.0	10,375
Spain	103,832	119,407	15.0	15,575
Greece	20,040	23,046	15.0	3,006
Subtotal	193,041	221,997	15.0	28,956
Total developed	3,381,426	3,763,874	11.3	382,448
Central Plan:				
Eastern Europe	220,040	242,040	10.0	22,000
USSR	78,480	86,328	10.0	7,848
Other central plan	15,497	17,295	11.6	1,798
Total central plan	314,017	345,663	10.1	31,646

Continued --

Table 44 --Projections of total coffee consumption in 1980,
sets I and II compared -- Continued

Regions and countries	Total consumption		Change from set I to set II	
	Projection set I	Projection set II	Relative change	Absolute change
	----- Metric tons -----		Percent	Metric tons
Less developed:				
North Africa:				
Algeria	39,137	47,726	21.9	8,589
Egypt	7,177	8,743	21.8	1,566
Morocco	14,959	18,251	22.0	3,292
Sudan	19,299	23,541	22.0	4,242
Tunisia	2,983	3,641	22.0	658
Latin America:				
Argentina	48,139	58,833	22.2	10,694
Chile	13,143	16,039	22.0	2,896
Uruguay	1,251	1,531	22.4	280
West Asia:				
Israel	13,080	14,650	12.0	1,570
Syria	4,768	5,810	21.9	1,042
Lebanon	6,527	7,960	22.0	1,433
Other LDC's	46,492	51,886	11.6	5,394
Total less developed	216,955	258,611	19.2	41,656
World total	3,912,398	4,368,148	11.6	455,750

1/ European Community, Switzerland, and Austria.

In the central plan countries, consumption would increase only 10 percent, or 31,600 tons higher, under set II. These results are not surprising, since the assumed price elasticity (-0.33) would not be as great at the medium income level as it would be at the low income level in the LDC's.

Projections for Individual Markets

Projections for the individual major import markets analyzed in the study are given in detail below.

United States

Under assumed constant 1964-66 prices (set I), consumption in the United States is projected at over 1.3 million tons in 1980, or 57,000 tons more than in 1964-66; under set II, total consumption is expected to be only slightly higher -- 1,383,000 tons. At these levels, the United States will continue to be the world's most important coffee consumer; however, its relative share of world imports in 1980 (34 percent) is expected to be only half its 1952 share (62 percent).

U.S. per capita consumption is expected to decrease at least 1 kilogram between 1964-66 and 1980 (table 45). This decline appears to be a continuation of the downtrend in U.S. consumption which started in the early 1950's. Thus, while U.S. population growth from 1965 through 1980 is expected to be 1.4 percent annually, growth in total coffee consumption under sets I and II is expected to be only 0.3 and 0.6 percent.

In summary, the United States is expected to continue its decline in relative importance as a world coffee market. Projected 1980 consumption is based on quite low income and price elasticities -- 0.24 and -0.10 (ld, table 40). The Durbin Watson and coefficient of determination statistics were both lower than desired, but these results were accepted in the absence of stronger results.

British Commonwealth and Ireland

During 1964-66 to 1980, projected coffee consumption in the Commonwealth countries and Ireland (BC/I) contrasts directly with the pessimistic view of the U.S. market. And except in Ireland, tea -- the traditional drink of these countries -- is expected to lose much of its market to coffee (that is, a major shift in taste is taking place). By 1980, the BC/I is expected to consume over 9 percent of world imports, or 3 percent more than in 1964-66. Under set II, consumption is expected to be nearly 12 percent (table 43).

Coffee consumption in 1980 is projected to more than double 1964-66 consumption, or to total nearly 356,000 tons yearly -- an annual growth rate of 5 percent. Under set II, total consumption in the BC/I is projected to be over 517,000 tons yearly -- a 7.6-percent annual growth rate during 1964-66 through 1980. Except for central plan countries, these growth rates in total consumption are the highest of any country grouping in this study.

Table 45 -- Projected 1980 per capita consumption compared with the base period, study countries, 1964-66

Regions and countries	1964-66 consumption:	Projected 1980 consumption			
		Set I	Set II	Change from 1964-66	
				Set I	Set II
<u>Kilograms</u>					
Developed:					
United States	6.73	5.54	5.70	-1.2	-1.0
British Commonwealth and Ireland:					
United Kingdom	1.65	3.21	5.21	1.5	3.5
Canada	4.22	5.02	5.43	0.8	1.2
Ireland	0.21	0.21	0.22	0.0	0.01
Australia	1.32	1.55	3.13	0.3	1.7
New Zealand	1.34	1.88	3.78	0.6	2.5
Weighted average	1.89	3.29	4.78	1.4	2.9
Scandinavian:					
Sweden	12.0	14.00	15.68	2.0	3.7
Denmark	10.56	14.00	15.40	3.4	4.8
Norway	9.25	13.69	14.00	4.4	4.7
Finland	9.74	12.29	12.37	2.6	2.7
Weighted average	10.65	13.56	14.57	2.9	3.9
European Community S/A: <u>1/</u>					
West Germany	4.48	5.20	5.91	0.7	1.4
France	4.70	4.92	4.99	0.2	0.3
Netherlands	6.53	12.10	14.00	5.6	7.5
Italy	2.56	3.88	4.23	1.3	1.6
Belgium-Luxembourg	6.49	8.57	9.40	2.1	2.9
Switzerland	6.70	7.84	9.18	1.1	2.5
Austria	2.48	6.79	7.76	4.3	5.3
Weighted average	4.08	5.54	6.11	1.4	2.0
Other developed:					
Japan	0.31	0.62	0.71	0.31	0.40
Spain	1.50	2.89	3.33	1.39	1.83
Greece	1.20	2.20	2.53	1.00	1.33
Weighted average	0.64	1.23	1.42	0.59	0.78

Continued--

Within the BC/I group, the United Kingdom is projected to be the fastest growing coffee market. On a world basis, only Austria's projected annual growth of 7.4 percent will exceed the United Kingdom's. But under set II, the United Kingdom's projected annual growth (9.5 percent) will be the highest in the world (table 42).

In 1964-66, total consumption was only 81,000 tons and per capita consumption was 1.65 kilograms. By 1980, both total and per capita consumption are expected to double under set I and to triple under set II (tables 42 and 45). The United Kingdom's share of world imported consumption is expected to be 5 percent under set I and over 7 percent under set II.

Projected 1980 consumption for the United Kingdom is based on statistically strong and quite high income and price elasticities -- 2.23 and -1.51. Durbin Watson and R^2 statistics are well within desired ranges (table 40).

Total Canadian coffee consumption in 1980 (76,000 tons) is expected to compose nearly 3.3 percent of world imported consumption (table 43), or nearly twice Canada's 1964-66 level. Per capita consumption is expected to increase by 0.8 kilogram.

Elasticities used for projecting Canadian coffee consumption in 1980 are quite low, particularly price (3a, table 40). However, per capita consumption during 1952-65 was much higher in Canada than in the United Kingdom. And since the regression analysis procedure is much more sensitive to relative than absolute changes, the sensitivity to price and income would be expected to be less in Canada, other things being equal. Price and income coefficients are statistically strong, while the Durbin Watson and R^2 are somewhat less than desired (table 40).

During 1964-66 to 1980, Australian coffee consumption is projected to double under set I and to quadruple under set II. However, total consumption under set I (48,000 tons) is not expected to exceed 1 percent of projected imported world consumption in 1980.

Projection elasticities for Australia are admittedly very high, especially direct price at -2.50 (4b, table 40). The cross elasticity of 0.33 suggests that tea prices have some influence on coffee consumption; however, the standard error was large relative to this coefficient.

New Zealand's total and per capita projected consumption levels for 1980 are based on the assumption that New Zealand's future coffee consumption pattern will parallel Australia's. Close cultural, economic, and social ties plus somewhat similar coffee consumption patterns are the bases for this assumed relationship.

In Ireland, tea continues to be the national drink, with virtually no indication of a movement toward coffee consumption. Present coffee consumption levels are expected to remain fairly constant through 1980.

The Scandinavian Countries

Under set I (assumed constant 1964-66 price levels), coffee consumption in Scandinavia is projected at 317,000 tons in 1980, or 95,000 tons more than in 1964-66 -- a 2.5 percent rate of annual growth (table 42). While this increase in consumption is almost 42 percent, Scandinavia's share of world imports is expected to remain at 8 percent (table 44).

Historically, per capita coffee consumption in Scandinavia has been very high. In 1964-66, average consumption exceeded 10 kilograms for the total population. And projected 1980 per capita consumption in all four countries -- taken as a unit -- is expected to increase nearly 3 kilograms under set I and 4 kilograms under set II (table 45).

Sweden's projected 1980 consumption of 122,000 tons nearly equals the total consumption level for Denmark and Finland. Sweden's present and projected consumption is about 3 percent of world imports while the other Scandinavian countries consume less than 2 percent each (table 43).

In general, consumption in the Scandinavian countries is influenced more by income than price. Price elasticities ranged downward from -0.50, while income elasticities ranged upward from 0.82 (5a, 6b, and 7b, table 40). However, consumption projections based on these elasticities for Sweden and Denmark were judged to be excessive and were subsequently adjusted downward to the levels shown in tables 42 and 45.

Projections of 1980 Finnish consumption are based on the assumption that growth in per capita consumption will parallel that in the other Scandinavian countries.

European Community, Switzerland, and Austria

Coffee consumption in the European Community plus Switzerland and Austria (EC/S/A) is projected at nearly 1.2 million tons (table 42), which is 30 percent (table 43) of projected 1980 world imports, or just slightly more than the EC/S/A's 1964-66 share. Under set I, total consumption is expected to be over a third of a million tons more than the 1964-66 consumption level -- an annual growth rate of 2.5 percent; under an assumed 30-percent price decline (set II), consumption is projected at nearly a half million tons more, or an annual growth rate of over 3 percent.

The two largest coffee markets in the EC/S/A group are West Germany and France, which are also the second and third largest in the world. By 1980, West Germany and France are expected to consume over 15 percent of the world's imports. However, these markets are projected to have the lowest annual growth rate in the EC/S/A (1.2 percent), in contrast to the expected growth rates of the Netherlands, Italy, and Austria of 5.6, 4.0, and 7.4.

Except for the Netherlands and Austria, per capita consumption in the EC/S/A is expected to increase only moderately (table 45). Netherlands' per capita consumption in 1980 is projected to nearly double and Austria's to more than triple the 1964-66 level.

Projected consumption levels for individual EC/S/A countries are based on elasticities shown in the lower half of table 40. As evidenced by the variation in the size of the coefficients and the number of variables used, substantial differences exist in coffee demand characteristics among the EC/S/A countries. Coffee price is an apparent major variable affecting consumption in West Germany and quite important in Switzerland, whereas income is the apparent crucial element in the Netherlands (1.32) and Austria (1.93). Gross price (coffee substitute) coefficients are important in West Germany, where a 10-percent price increase for tea or cocoa can be expected to increase coffee consumption nearly 6 percent. Except for the rather high (3.03) Durbin Watson statistic for the Netherlands, the R^2 and Durbin Watson statistics for the EC/S/A countries were highly acceptable.

Other Developed Countries

Aggregated 1980 coffee consumption for Japan, Spain, and Greece is projected to be 193,000 tons (more than double the 1964-66 level), or nearly 5 percent of world coffee imports.

Within this three-country group, Japan is expected to be the most dynamic coffee import market of the future. Historically, Japan has been an almost exclusively tea drinking country. However, in recent years, coffee has not only been accepted but has attained the status of a prestige drink. These factors, plus a projected annual growth of 7.2 percent in real per capita income (table 41), strongly suggest that Japan will become a major coffee market.

Japan's projected consumption is based on an assumed doubling of 1964-66 per capita consumption, which means total consumption is expected to be at least 69,000 tons in 1980. This is nearly 2-1/3 times the 1964-66 consumption level, or a 5.7 percent annual growth rate.

The projected 1980 total consumption level for Spain and Greece is expected to be more than double the 1964-66 level and per capita consumption is expected to nearly double. Projected total consumption for both countries is based on a linear extrapolation of imports from the early 1950's through the middle 1960's.

Less Developed Countries

Projected total and per capita consumption data are summarized in tables 42 and 43. For some countries, such as Uruguay and Tunisia, total imports were not expected to be high enough to effect positive per capita consumption changes from 1964-66 through 1980. Data limitations were as restrictive for the LDC's as for the central plan countries. Again, linear extrapolations of pre-1965 import patterns are the bases for most projections.

The Central Plan Countries

Coffee consumption in the central plan countries is projected to increase from 126,000 tons in 1964-66 to over 314,000 tons in 1980 -- an annual increase of 6.3 percent -- which is the highest rate of projected consumption growth for

any country group (table 42). Under either projection set, the central plan countries' 1980 share of world imported consumption will be 8 percent, or 3.5 percent more than their 1964-66 share (table 43). These projected consumption levels assume a continuation of present import policies for consumer goods. Minor policy changes could significantly change the outlook for coffee imports and subsequent consumption.

These consumption projections were basically extrapolations of pre-1965 import trends with consideration given to projected real income changes.

V.--IMPLICATIONS FOR THE LESS DEVELOPED COFFEE EXPORTING COUNTRIES

The question to which this part of the study is addressed is: Can the less developed coffee exporting countries look to coffee exports as a major source of foreign exchange earnings in 1980? The answer appears to be affirmative. Only moderate growth in coffee exports is expected during the 1970's, with foreign exchange earnings increasing at about 2.2 percent per year from 1965 to 1980. Even so, export earnings in 1980 (valued at 1964-66 world export prices) would be more than \$3.1 billion, compared with less than \$2.3 billion in 1964-66 (table 46). ^{29/} This growth in export earnings will depend heavily upon stable world coffee prices supported administratively by continued agreements or maintenance of near-equilibrium demand-supply conditions.

Table 46 --Projected 1980 export values and volumes under assumed constant 1964-66 world prices

Region	1964-66		1980	
	Metric tons	Dollars	Metric tons	Dollars
			<u>Thousands</u>	
World total	2,836.5	2,268,907	3,912.7	3,129,685
Latin America	1,805.1	1,579,030	2,489.9	2,178,083
Africa	880.0	604,091	1,213.8	833,271
Asia and Oceania	136.9	72,879	188.8	100,528
Other	14.6	12,907	20.1	17,804

Source: Appendix table A-9.

^{29/} A summary of the results of this study were originally published in World Demand Prospects for Agricultural Exports of Less Developed Countries in 1980, U.S. Dept. Agr. Foreign Agr. Econ. Rpt. No. 60, June 1970. In mid-1971, the Food and Agricultural Organization of the United Nations published projections for 1980 which were very similar to the results of the study (6, pp. 217-223).

Expected World Imported Coffee Consumption in 1980

Under the assumption of constant 1964-66 world prices for coffee and its major substitutes (projection set I), world coffee imports in green bean equivalent are projected to be slightly more than 3.9 million tons in 1980, or 38 percent more than in 1964-66 (table 42). The volume of exports to developed countries (which account for about 90 percent of world coffee imports) is expected to grow 1.9 percent per year. Higher rates are expected for exports to the central plan countries (6.3 percent) and the LDC's (3.1 percent), but these are relatively small markets.

In the developed countries, the highest consumption growth rates are expected in Western Europe and Oceania, where per capita consumption is well below 4 kilograms in green bean equivalent. Prospects for increased consumption during the 1970's are particularly strong in the Commonwealth countries and Japan, where per capita coffee consumption is increasing while tea consumption is decreasing. On the other hand, exports to the United States -- the world's largest coffee market -- are expected to increase very slowly, mainly because of improved coffee processing that has increased cup yields per pound of beans, combined with an inelastic demand structure for coffee. In the central plan countries, the low level of per capita consumption and rising levels of income suggests a significant market for coffee. However, this market potential for coffee may materialize very slowly because Russian and Mainland Chinese residents continue to consume tea predominantly.

Determinants of World Coffee Supply

It is difficult to project coffee production with any reasonable degree of accuracy. The world coffee economy of the past has been aptly characterized as a "boom-or-bust" economy. Because coffee trees do not start bearing until 3 to 5 years after planting, production response to increased demand is inevitably delayed. On the other hand, farmers have historically tended to overrespond to high prices by planting more trees than needed. These factors have been largely responsible for the sharp fluctuations in coffee supply.

Following World War II, demand for coffee strengthened and prices rose as demand outstripped supply. As a result, substantial new plantings were made during the late 1940's and early 1950's. A short crop and peak prices in 1954 caused farmers throughout the coffee-growing world to initiate a wave of new plantings in the middle 1950's. By 1959/60, total world exportable production reached 3.7 million tons, whereas world consumption outside the producing countries was only 2.2 million tons. In the face of such surpluses, prices fell sharply and the prospects of any improvement in prices were dim. Coffee growers were in difficulty and the economies of many producing countries were under pressure.

By the middle 1960's, the trees planted in the early 1950's had passed peak production. Several major frosts and leaf rust problems in Brazil plus droughts in several major growing areas augmented the downward trend in world production. As a result, world coffee demand and supply in the early 1970's is reasonably close to equilibrium.

Effects of Alternative Supply Levels on Export Earnings

Set II projections estimate what the effects on export (foreign exchange) earnings might be if producing countries were to expand exports beyond the assumed equilibrium quantities under set I. For example, if exports were expanded about 12 percent, world prices would fall about 30 percent and export earnings would therefore decrease nearly \$700 million, or 22 percent (table 47). This estimate assumes that current estimated income and price elasticities would prevail in 1980. Under these conditions, export earnings would not increase as rapidly as projected under set I and many producers not possessing cost advantages could conceivably be forced out of production.

Table 47 --Projected 1980 coffee export quantities and earnings,
projection sets I and II

Region	: Projection set I		: Projection set II		: Change from set I		
	: Metric :	Dollars	: Metric :	Dollars	: Metric:	Dollars	
	: tons :		: tons :		: tons :		
			<u>Thousands</u>				
World	3,912.7	3,129,686	4,368.4	2,446,347	455.8	-683,339	
Latin America ...	2,489.9	2,178,083	2,780.0	1,702,649	290.0	-475,434	
Africa	1,213.8	833,271	1,355.2	651,161	141.4	-182,110	
Asia and Oceania :	188.8	100,528	210.8	78,618	22.0	-21,910	
Other	20.1	17,804	22.5	13,919	2.3	-3,885	

Source: App. table A-10.

The above projections for 1980 do not envision any major changes from the historical trend in the proportion of processed to unprocessed (green bean) coffee in world exports or major changes in the regional distribution of coffee exports between Africa and Latin America resulting from either changes in tastes or exportable supplies. Any major changes in these factors may, of course, alter the total export earnings or regional distribution of these export earnings from those shown in sets I or II.

Since the completion of the analysis, the interaction of a steady increase in world demand with a general decline in the world's coffee supply has resulted in price levels nearly 30 percent above the more stable levels of the middle 1960's. Consequently, it is possible that world export earnings could reach \$3 billion before 1974. While the current unusually high prices may remain in effect for some time, increased production in response to these prices could bring them to a more normal level by the 1980's. To the extent that supply doesn't respond to current high prices, the projected foreign exchange earnings for 1980 would need to be adjusted to reflect these supply and demand conditions.

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APPENDIX A

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APPENDIX A

Table A-1 --Indexes of value of world coffee exports by producing countries, 1959-70

(1960 = 100)

Country	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
North and Central America	90	100	90	99	93	116	118	121	104	114	114	115
Costa Rica	91	100	99	110	105	109	106	120	125	126	128	166
Cuba	59	100	72	178	11	3	1	1	95	239	94	n.a.
Dominican Republic	78	100	64	88	82	135	94	93	75	79	94	115
El Salvador	93	100	92	99	97	121	125	116	129	120	116	150
Guatemala	100	100	90	90	103	95	124	134	83	99	109	131
Haiti	97	100	81	121	96	106	117	125	83	88	100	85
Honduras	99	100	76	97	120	143	187	168	150	176	152	218
Mexico	82	100	102	103	71	140	106	119	88	111	110	n.a.
Nicaragua	72	100	90	80	91	110	137	113	110	118	107	167
Other	97	100	80	98	106	130	149	141	137	155	145	133
South America	105	100	97	94	101	111	103	106	101	117	111	126
Brazil	104	100	100	90	105	107	99	107	99	109	114	132
Colombia	109	100	93	100	91	119	104	99	97	134	104	n.a.
Ecuador	80	100	65	94	83	96	174	148	177	157	121	226
Peru	84	100	123	131	138	200	157	154	161	193	163	241
Venezuela	112	100	103	87	106	68	62	63	64	37	65	79
Other	97	100	110	224	241	305	268	382	329	228	307	235
Africa	103	100	96	107	120	172	152	182	170	191	182	220
Angola	110	100	111	146	151	226	213	242	281	279	256	307
Cameroon	109	100	111	113	140	202	170	240	235	274	246	280
Central African Republic	109	100	114	122	92	232	118	210	168	142	157	194
Zaire	126	100	47	46	58	79	48	76	92	114	94	n.a.
Equatorial Guinea	59	100	79	79	62	62	70	72	71	76	70	n.a.
Ethiopia	93	100	87	100	103	147	174	144	129	142	161	n.a.
Guinea	106	100	94	34	68	29	70	97	15	96	64	n.a.
Ivory Coast	86	100	109	104	131	170	139	123	136	192	154	199
Kenya	103	100	103	103	107	151	138	183	153	125	164	217
Malagasy Republic	103	100	95	128	101	104	123	131	140	151	136	167
Nigeria	65	100	7	9	24	83	14	152	37	50	100	72
Sierra Leone	152	100	92	48	101	209	104	302	101	206	220	n.a.
Tanzania	78	100	92	88	93	151	117	207	163	n.a.	n.a.	213
Togo	281	100	195	224	130	397	214	307	132	252	262	372
Uganda	124	100	93	134	180	235	202	231	229	237	159	336
Other	110	100	112	146	217	1,086	708	944	946	2,198	1,939	2,172
Asia and Oceania	16	100	133	128	171	179	181	209	269	251	254	330
Yemen (Aden)	113	100	107	87	88	124	106	76	44	52	27	31
Hong Kong	33	100	488	691	833	2,197	2,706	3,236	1,652	1,882	3,279	4,425
India	94	100	142	118	121	207	168	160	184	158	187	211
Indonesia	138	100	101	91	145	194	232	239	320	314	364	472
Singapore	122	100	141	157	244	74	72	155	323	258	281	n.a.
New Caledonia	111	100	129	80	79	147	81	113	78	76	41	n.a.
New Guinea	64	100	154	217	284	376	513	614	711	1,008	n.a.	1,430
Other	124	100	165	163	191	184	159	191	185	189	146	163
World total	102	100	97	98	105	126	117	126	119	135	129	195

n.a. = not available.

Source: (9).

Table A-2 --Indexes of volume of world coffee exports from producing countries, 1959-70

(1960 = 100)

Country	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
North and Central America	92	100	98	112	106	111	109	115	111	124	119	117
Costa Rica	93	100	111	123	117	109	103	118	142	147	148	148
Cuba	57	100	75	164	12	2	1	1	85	215	87	n.a.
Dominican Republic	75	100	67	100	94	115	84	87	76	80	95	89
El Salvador	93	100	97	117	113	122	115	108	136	131	127	124
Guatemala	104	100	99	103	123	95	116	137	103	118	113	116
Haiti	92	100	84	127	99	95	96	103	71	80	79	66
Honduras	99	100	81	103	132	123	160	148	130	170	153	202
Mexico	90	100	111	113	81	124	96	114	93	119	116	n.a.
Nicaragua	75	100	96	94	111	107	130	107	119	131	122	137
Other	99	100	85	101	112	120	159	137	130	149	128	76
South America	105	100	100	102	113	95	87	100	103	112	112	101
Brazil	105	100	101	97	116	89	80	100	100	110	111	95
Colombia	108	100	95	111	103	108	95	94	103	111	109	n.a.
Ecuador	75	100	73	105	94	79	153	140	185	158	122	163
Peru	75	100	29	142	152	160	131	134	157	199	162	173
Venezuela	114	100	100	78	96	81	73	75	76	41	77	67
Other	87	100	120	257	287	278	256	318	276	205	181	192
Africa	102	100	103	99	122	133	133	147	142	158	154	159
Angola	102	100	136	180	158	159	183	179	225	217	210	207
Cameroon	97	100	116	125	144	164	158	223	207	241	224	205
Central African Republic	99	100	123	133	98	212	129	191	155	139	153	106
Zaire	97	100	58	57	81	64	39	62	75	90	84	100
Equatorial Guinea	63	100	95	80	71	69	75	77	77	86	77	144
Ethiopia	88	100	109	122	130	137	172	145	145	158	173	n.a.
Guinea	90	100	120	48	66	24	67	78	14	87	58	n.a.
Ivory Coast	71	100	105	98	123	138	126	123	101	145	121	132
Kenya	93	100	116	110	132	151	137	193	180	134	181	190
Malagasy Republic	94	100	99	139	110	87	125	114	124	134	123	129
Nigeria	71	100	13	17	34	88	13	156	36	50	102	60
Sierra Leone	97	100	99	47	76	116	75	185	56	124	118	n.a.
Tanzania	78	100	98	102	104	131	112	201	178	194	195	177
Togo	2,633	100	233	263	142	368	243	301	128	239	258	305
Uganda	76	100	88	28	124	118	131	141	134	129	152	161
Other	95	100	125	183	243	808	540	811	767	765	700	806
Asia and Oceania	93	100	181	161	206	145	187	202	286	216	245	256
Yemen (Aden)	109	100	112	96	94	120	111	90	39	n.a.	27	28
Hong Kong	18	100	554	873	1,043	2,010	2,594	3,061	1,910	2,340	3,916	4,808
India	89	100	194	129	144	192	150	147	219	172	209	174
Indonesia	92	100	163	142	196	147	255	232	323	199	253	237
Singapore	91	100	211	196	260	48	53	120	280	217	250	n.a.
New Caledonia	107	100	141	96	94	156	86	113	78	81	49	n.a.
New Guinea	65	100	154	232	330	462	591	730	871	1,244	n.a.	1,743
Other	107	100	165	171	181	165	151	177	175	112	141	129
World total	102	100	103	105	118	109	105	118	121	129	128	124

n.a. = not available.

Source: (9).

Table A-3 --Market share and quantity of EC coffee imports, by country of origin, 1962-70

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
----- Percent -----									
Latin America	56.9	56.4	55.4	55.2	55.1	57.5	58.6	60.6	58.1
Brazil	25.4	26.0	23.2	21.8	24.4	25.6	26.4	28.7	28.4
Colombia	9.6	9.9	11.3	11.4	9.0	10.5	11.2	12.5	11.8
Costa Rica	3.7	3.3	3.2	2.6	2.9	2.7	2.9	2.5	2.3
Ecuador	1.1	1.2	1.1	1.5	1.6	1.5	1.4	1.2	0.7
El Salvador	6.5	5.8	6.4	7.3	6.2	6.6	6.5	6.8	6.1
Guatemala	3.2	3.3	3.4	3.5	3.6	3.0	3.8	3.0	2.8
Haiti	2.4	1.9	1.6	1.9	1.5	1.3	1.2	1.1	1.0
Mexico	1.4	1.2	1.2	1.2	1.5	1.2	0.8	0.9	1.1
Nicaragua	1.1	1.2	1.3	1.6	1.6	1.6	1.3	1.6	1.7
Other	2.6	2.5	2.8	2.3	2.8	3.4	3.1	2.8	2.1
Africa	36.9	38.0	37.8	38.4	36.8	34.0	34.9	33.1	35.1
Angola	5.1	5.7	5.3	7.4	5.1	5.4	4.2	4.8	4.1
Cameroon	4.1	3.8	5.1	4.5	4.3	4.3	4.4	4.2	3.6
Zaire	3.3	3.0	3.4	3.9	3.3	4.5	2.9	4.1	4.8
Eq. Customs Union ^{1/}	1.0	0.8	1.6	1.0	1.6	1.4	1.0	1.1	1.6
Ivory Coast	12.8	14.9	11.4	10.5	11.0	8.8	11.5	10.3	11.9
Kenya	n.a.	3.0	3.2	2.8	2.9	2.7	1.6	2.0	2.2
Malagasy Republic	4.6	4.3	3.8	3.0	2.9	2.5	2.8	2.7	2.8
Togo	1.2	0.7	1.6	1.3	1.5	0.7	10.0	1.2	1.2
Other	4.8	1.9	2.2	3.9	4.0	3.9	5.5	2.9	2.9
Asia and Oceania	3.8	3.6	4.6	4.4	5.9	6.1	3.4	2.8	3.4
Indonesia	1.2	1.3	2.3	2.9	3.9	3.7	1.5	1.1	1.7
Other	2.6	2.2	2.4	1.5	2.0	2.5	1.9	1.7	1.7
Other ^{2/}	2.3	2.0	2.0	2.1	2.1	2.4	3.0	3.4	3.4
----- Metric tons -----									
Total	679,477	710,310	759,773	766,762	778,048	805,675	876,111	905,268	902,037
Latin America	386,987	400,348	421,318	423,086	428,850	463,125	513,775	548,487	524,196
Brazil	172,660	184,865	176,006	167,368	189,882	206,524	230,914	260,118	256,481
Colombia	65,092	70,108	85,547	87,594	69,713	84,217	98,395	113,428	106,639
Costa Rica	25,409	23,319	24,246	20,310	22,711	21,818	25,489	22,309	20,443
Ecuador	7,188	8,725	8,280	11,791	12,655	12,236	12,096	11,263	6,722
El Salvador	44,225	41,070	48,984	55,618	48,471	53,498	57,119	61,762	55,151
Guatemala	21,494	23,739	25,977	26,764	27,746	24,382	33,342	27,150	25,652
Haiti	16,543	13,433	12,514	14,714	11,887	10,726	10,612	9,750	9,027
Mexico	9,429	8,448	8,995	8,917	11,554	9,717	6,879	7,836	9,867
Nicaragua	7,405	8,693	9,847	12,620	12,065	12,531	11,573	14,105	15,549
Other	17,542	17,948	20,958	17,390	22,156	27,476	27,356	25,768	18,665
Africa	251,026	270,126	287,403	293,925	286,060	274,302	305,851	300,062	316,915
Angola	34,947	40,441	40,171	56,336	39,913	43,376	36,851	43,729	37,087
Cameroon	27,971	26,790	38,980	34,568	33,616	34,470	38,504	37,783	32,839
Zaire	22,256	20,994	25,950	29,919	25,841	35,903	25,228	36,882	43,306
Eq. Customs Union ^{1/}	6,993	5,761	11,871	8,041	12,454	10,911	9,003	9,670	14,768
Ivory Coast	86,932	106,043	86,990	80,616	85,490	71,225	100,395	93,436	107,513
Kenya	n.a.	21,345	24,706	21,486	22,870	21,707	13,987	17,815	19,702
Malagasy Republic	31,460	30,296	29,420	22,978	22,930	20,349	24,950	24,216	25,586
Togo	8,017	5,081	12,483	9,721	12,053	5,303	8,406	11,007	10,589
Other	32,450	13,375	16,832	30,260	30,893	31,058	48,507	25,524	25,763
Asia and Oceania	26,142	25,472	35,323	33,647	46,055	48,964	29,915	25,661	30,670
Indonesia	8,491	9,558	17,383	22,262	30,212	28,613	13,493	10,407	15,229
Other	17,651	15,914	17,940	11,385	15,843	20,351	16,422	15,254	15,441
Other ^{2/}	15,322	14,364	15,729	16,104	17,083	19,284	26,427	31,023	30,256

n.a. = not available.

^{1/} Gabon, Congo (Brazzaville), Chad, and Central African Republic.^{2/} Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations Trade Statistics.

Table A-4 --Market share and quantity of Scandinavian coffee imports, by country of origin, 1962-70

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
	----- Percent -----								
Latin America	88.1	88.0	87.5	86.2	87.0	86.7	87.2	87.6	84.4
Brazil	69.1	69.6	65.2	63.0	63.9	61.7	61.3	61.7	53.3
Colombia	11.4	10.6	14.0	15.0	14.4	15.1	16.3	16.2	18.1
Costa Rica	1.2	1.5	1.9	1.9	3.2	3.8	3.8	4.0	4.5
El Salvador	1.3	1.1	1.5	1.2	0.9	0.9	0.7	0.9	1.6
Guatemala	2.1	1.7	1.8	2.1	2.4	2.6	2.9	2.8	4.2
Haiti	1.0	0.8	0.7	0.6	0.5	0.4	0.3	0.4	0.4
Mexico	0.1	0.2	0.3	0.1	0.3	0.4	0.3	0.3	0.4
Peru	0.7	1.5	1.2	0.9	0.5	0.2	0.2	0.3	0.2
Other	1.2	1.0	1.0	1.3	0.9	1.6	1.3	1.0	1.2
Africa	6.1	5.6	6.7	8.1	7.8	7.5	7.2	7.2	10.7
Angola	1.2	1.4	0.9	1.2	0.8	0.7	0.5	0.4	0.8
Ethiopia	1.3	1.2	1.0	1.2	0.9	1.0	1.1	1.0	1.6
Kenya	1.7	1.6	2.1	3.2	3.4	3.8	3.1	3.6	4.6
Tanzania	n.a.	0.1	0.6	0.8	0.9	0.6	1.0	0.6	2.4
Uganda	0.4	0.6	0.5	0.9	1.0	1.0	1.2	1.3	1.0
Other	1.4	0.9	1.6	0.9	0.7	0.5	0.3	0.3	0.3
Asia and Oceania	4.9	4.9	4.8	4.8	4.3	4.6	4.6	4.0	3.7
India	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.4
Indonesia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3.1
Other	0.4	0.4	0.4	0.5	0.3	0.8	0.7	0.5	0.3
Other 1/	1.1	1.2	1.1	1.0	1.0	1.1	0.9	1.1	1.2
	----- Metric tons -----								
Total	201,459	216,913	221,809	211,683	231,989	241,715	247,606	262,878	284,212
Latin America	177,514	190,884	194,092	182,390	201,865	209,683	216,096	230,366	239,841
Brazil	139,141	150,946	144,550	133,289	148,239	149,110	151,797	162,326	152,801
Colombia	22,952	23,057	31,150	31,824	33,379	36,512	40,484	42,704	51,474
Costa Rica	2,500	3,326	4,173	4,090	7,350	9,265	9,386	10,394	12,839
El Salvador	2,640	2,483	3,305	2,549	2,055	2,224	1,697	2,262	4,518
Guatemala	4,157	3,710	3,922	4,514	5,641	6,245	7,323	7,387	11,997
Haiti	2,086	1,747	1,548	1,541	1,231	1,027	827	950	1,122
Mexico	250	353	590	245	677	882	869	724	1,022
Peru	1,397	3,002	2,611	1,924	1,184	565	561	862	580
Other	2,498	2,208	2,243	2,756	2,109	3,853	3,270	2,757	3,488
Africa	12,255	12,078	14,814	17,103	18,068	18,509	17,919	18,930	30,341
Angola	2,343	2,994	2,083	2,512	1,934	1,711	1,223	1,150	2,212
Ethiopia	2,722	2,638	2,150	2,445	2,193	2,380	2,825	2,623	4,641
Kenya	3,527	3,565	4,770	6,673	7,893	9,242	7,728	9,440	13,139
Tanzania	n.a.	322	1,225	1,692	2,106	1,539	2,450	1,503	6,713
Uganda	864	1,401	1,144	1,887	2,284	2,345	2,863	3,387	2,900
Other	2,799	2,003	2,243	1,854	1,658	1,292	860	827	736
Asia and Oceania	9,775	10,668	10,616	10,136	10,016	11,061	11,331	10,524	10,622
India	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,117
Indonesia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	8,878
Other	760	904	964	1,046	689	1,818	1,401	1,407	777
Other 1/	2,354	2,595	2,358	2,067	2,167	2,479	2,303	3,024	3,408

n.a. = not available.

1/ Includes exports from nonproducing countries and unallocated imports.

Source: United Nations Trade Statistics.

Table A-5 --Market share and quantity of United Kingdom coffee imports, by country of origin, 1962-70

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
----- Percent -----									
Latin America	25.6	24.2	19.9	11.2	12.5	12.4	14.3	23.8	32.0
Brazil	17.8	16.1	9.4	5.1	6.3	7.1	9.2	18.7	25.2
Colombia	3.9	4.7	7.5	4.0	3.8	2.7	2.2	2.7	3.6
Costa Rica	1.1	1.2	0.8	1.1	0.9	10.0	0.7	0.5	0.5
Guatemala	0.6	0.6	0.2	n.a.	0.2	0.2	0.2	0.8	0.8
Jamaica	0.7	0.4	0.6	0.4	0.3	0.1	0.1	0.1	0.02
Peru	0.6	0.3	0.1	0.3	n.a.	0.2	0.2	0.2	0.3
Trinidad & Tobago	n.a.	0.8	1.2	n.a.	0.2	0.6	1.1	n.a.	n.a.
Other	0.9	0.1	0.1	0.4	0.9	0.6	0.6	0.9	1.7
Africa	68.8	68.9	67.6	76.3	69.4	70.7	66.7	66.8	57.8
Angola	2.9	1.6	10.1	0.9	1.4	0.5	1.9	1.1	3.2
Cameroon	1.7	1.0	3.1	1.3	0.2	n.a.	0.5	n.a.	n.a.
Zaire	2.4	1.2	1.4	0.7	0.2	n.a.	2.3	3.6	2.3
Ethiopia	0.5	0.5	0.3	0.5	0.4	0.4	0.3	0.3	0.3
Ghana	4.0	1.9	4.7	1.3	1.7	1.3	2.8	1.6	2.5
Ivory Coast	2.2	n.a.	6.7	n.a.	0.5	n.a.	4.0	9.5	3.4
Liberia	n.a.	n.a.	n.a.	5.9	1.0	0.3	n.a.	n.a.	n.a.
Nigeria	0.8	0.6	3.4	0.3	3.6	0.8	1.1	0.8	0.9
Sierra Leone	n.a.	1.3	2.2	1.0	2.1	2.9	3.3	1.4	2.0
Tanzania	2.1	3.2	0.8	1.8	3.3	2.6	2.3	2.6	2.5
Uganda	34.7	26.7	13.2	49.2	38.8	49.0	36.3	36.1	32.5
Other	17.7	31.0	21.7	13.4	16.1	12.9	11.9	9.9	8.4
Asia and Oceania	1.3	2.0	7.4	3.1	4.5	4.4	4.6	4.0	4.5
India	0.9	0.6	2.3	0.5	0.5	1.2	0.9	0.2	0.2
Other	0.4	1.4	5.1	2.6	4.0	3.2	3.7	3.8	4.4
Other 1/	4.3	4.8	5.1	9.3	13.5	12.6	14.3	5.4	5.6
----- Metric tons -----									
Total	70,846	78,530	80,394	59,679	83,403	81,470	94,428	105,009	99,796
Latin America	18,148	19,008	16,022	6,689	10,423	10,104	13,541	24,994	31,906
Brazil	12,576	12,641	7,546	3,020	5,237	5,762	8,709	19,603	25,129
Colombia	2,789	3,681	6,040	2,382	3,129	2,239	2,064	2,802	3,566
Costa Rica	811	950	621	634	719	806	669	556	455
Guatemala	395	502	143	n.a.	199	129	155	824	760
Jamaica	528	289	518	260	240	123	87	81	24
Peru	446	223	102	158	n.a.	135	222	222	301
Trinidad & Tobago	n.a.	653	941	n.a.	145	461	1,074	n.a.	n.a.
Other	603	69	111	235	754	449	561	906	1,671
Africa	48,739	54,140	54,320	45,558	57,924	57,564	63,028	70,110	57,626
Angola	2,021	1,274	8,121	563	1,168	393	1,771	1,120	3,182
Cameroon	1,172	813	2,470	751	192	n.a.	504	n.a.	n.a.
Zaire	1,682	907	1,096	403	161	n.a.	2,219	3,746	2,268
Ethiopia	339	366	260	315	315	308	328	272	197
Ghana	2,852	1,475	3,786	803	1,440	1,067	2,682	1,718	2,467
Ivory Coast	1,530	n.a.	5,425	n.a.	454	n.a.	3,749	9,946	3,388
Liberia	n.a.	n.a.	n.a.	3,508	848	270	n.a.	n.a.	n.a.
Nigeria	540	458	2,743	173	2,984	672	1,005	807	921
Sierra Leone	n.a.	1,013	1,781	606	1,762	2,376	3,097	1,494	1,996
Tanzania	1,502	2,531	610	1,074	2,773	2,118	2,165	2,715	2,534
Uganda	24,567	20,938	10,586	29,375	32,399	39,888	34,235	37,868	32,426
Other	12,534	24,365	17,442	7,987	13,428	10,472	11,273	10,418	8,345
Asia and Oceania	916	1,576	5,980	1,872	3,757	3,561	4,368	4,229	4,637
India	642	464	1,875	324	383	943	820	207	187
Other	274	1,112	4,105	1,548	3,374	2,618	3,548	4,022	4,450
Other 1/	3,043	3,806	4,072	5,560	11,299	10,241	13,491	5,676	5,627

n.a. = not available.

1/ Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations Trade Statistics.

Table A-6--Market share and quantity of Canadian coffee imports, by country of origin, 1962-70

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
----- Percent -----									
Latin America	72.8	69.2	66.0	60.9	55.0	53.9	61.2	61.5	56.3
Brazil	38.2	36.8	35.1	29.8	30.3	28.8	32.6	31.5	27.6
Colombia	19.3	16.6	16.3	15.5	11.1	11.9	9.2	8.5	6.8
Costa Rica	1.7	1.7	1.2	2.1	2.0	1.6	2.1	1.9	1.8
El Salvador	2.6	2.8	3.9	3.2	2.8	2.5	3.7	2.6	3.8
Guatemala	2.4	2.7	1.7	2.8	3.1	2.4	2.9	5.5	5.5
Mexico	5.1	4.6	3.7	3.9	3.0	3.3	4.6	5.8	4.1
Other	3.4	4.0	4.1	3.7	2.7	3.5	6.0	5.6	6.8
Africa	9.7	11.8	13.4	18.4	25.2	29.0	23.9	23.8	28.5
Angola	0.3	1.2	0.4	2.4	5.5	8.8	10.9	10.2	13.8
Br. Oac. n.e.s. ^{1/}	8.5	n.a.							
Kenya	n.a.	2.9	3.7	4.5	5.5	6.0	1.9	2.5	3.0
Tanzania	n.a.	2.4	2.6	3.9	5.5	4.6	2.3	1.4	1.3
Uganda	n.a.	4.5	5.6	7.1	8.3	9.4	8.5	7.8	7.9
Other	1.0	0.8	1.5	0.4	0.4	0.3	0.4	2.1	2.5
Asia and Oceania	0.1	0.5	0.7	0.7	1.2	1.7	0.7	0.4	0.4
Other ^{2/}	17.3	18.5	19.2	19.9	18.6	15.3	14.3	14.3	14.7
----- Metric tons -----									
Total	76,242	79,624	77,006	77,675	72,608	83,918	88,080	86,856	81,891
Latin America	55,498	55,130	50,924	47,369	39,927	45,239	53,864	53,430	46,118
Brazil	29,157	29,339	27,040	23,120	21,997	24,179	28,732	27,348	22,596
Colombia	14,727	13,243	12,565	12,022	8,041	10,003	8,074	7,386	5,552
Costa Rica	1,322	1,335	955	1,642	1,486	1,323	1,881	1,691	1,448
El Salvador	1,993	2,206	3,025	2,446	2,053	2,090	3,258	2,287	3,112
Guatemala	1,824	2,176	1,276	2,172	2,240	2,008	2,596	4,747	4,511
Mexico	3,906	3,623	2,892	3,036	2,152	2,731	4,061	5,082	3,358
Other	2,569	3,208	3,171	2,911	1,958	2,905	5,262	4,907	5,541
Africa	7,438	9,396	10,683	14,268	18,302	24,369	21,081	20,727	23,358
Angola	208	969	287	1,869	3,966	7,361	9,583	8,852	11,298
Br. Oac. n.e.s. ^{1/}	6,496	n.a.							
Kenya	n.a.	2,315	2,888	3,476	3,970	5,013	1,661	2,144	2,467
Tanzania	n.a.	1,935	1,977	3,057	3,997	3,835	1,985	1,182	1,134
Uganda	n.a.	3,554	4,350	5,548	6,045	7,874	7,469	6,751	6,442
Other	734	623	1,181	318	324	286	383	1,798	2,039
Asia and Oceania	92	428	561	547	870	1,442	575	372	359
Other ^{2/}	13,218	14,670	14,838	15,491	13,509	12,868	12,560	12,327	12,056

n.a. = not available

^{1/} British overseas African colonies not elsewhere specified.^{2/} Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations Trade Statistics.

Table A-7 --Market share and quantity of Japanese coffee imports, by country of origin, 1962-70

Country	1962	1963	1964	1965	1966	1967	1968	1969	1970
<u>Percent</u>									
Latin America	49.8	50.0	45.4	41.2	37.7	53.4	59.4	61.8	58.1
Brazil	29.5	27.5	27.8	23.1	17.5	30.9	36.6	40.0	37.7
Colombia	15.0	19.0	10.6	9.0	10.7	11.4	10.9	10.7	9.1
El Salvador	n.a.	n.a.	4.7	4.5	1.8	2.6	1.2	0.8	2.2
Guatemala	1.3	1.4	0.9	2.7	2.8	1.6	4.1	3.4	2.0
Mexico	n.a.	n.a.	0.0	0.9	3.2	0.7	0.6	0.6	0.1
Other	4.0	1.9	1.3	1.0	1.7	6.2	6.0	6.3	7.0
Africa	23.7	26.9	36.8	37.6	56.3	40.3	36.0	31.1	37.1
Angola	3.1	1.6	n.a.	0.5	0.1	12.1	1.1	1.7	1.5
Ethiopia	9.7	8.2	5.3	6.6	3.9	4.5	5.2	4.8	2.1
Ivory Coast	n.a.	6.5	6.3	7.5	38.3	18.9	25.9	17.1	14.0
Tanzania	0.9	n.a.	1.2	2.0	2.7	0.6	1.1	1.4	2.0
Uganda	4.8	5.5	19.3	18.2	9.7	0.4	1.2	3.9	13.6
Other	5.2	5.0	4.6	2.9	1.6	3.8	1.5	2.3	2.9
Asia and Oceania	10.9	8.0	4.6	5.1	3.2	4.7	1.7	3.4	2.6
Indonesia	5.4	5.3	2.2	2.2	1.2	2.6	1.4	3.1	1.1
Other	5.6	2.7	2.4	2.9	2.0	2.1	0.3	0.3	1.5
Other 1/	15.6	15.5	13.1	15.9	2.8	1.6	2.9	3.8	2.2
<u>Metric tons</u>									
Total	18,249	20,216	25,133	22,206	47,825	41,548	46,842	61,496	84,391
Latin America	9,088	10,039	11,409	9,142	18,058	22,169	27,834	37,995	49,027
Brazil	5,386	5,551	6,999	5,122	8,381	12,855	17,148	24,601	31,854
Colombia	2,735	3,832	2,661	1,997	5,108	4,741	5,127	6,553	7,661
El Salvador	n.a.	n.a.	1,196	1,003	878	1,064	539	510	1,867
Guatemala	242	280	224	590	1,335	685	1,915	2,109	1,716
Mexico	n.a.	n.a.	7	200	1,523	279	306	369	54
Other	725	376	322	230	833	2,545	2,799	3,853	5,875
Africa	4,326	5,430	9,249	8,370	26,930	16,743	16,870	19,124	30,542
Angola	565	331	n.a.	114	54	5,015	510	1,027	1,258
Ethiopia	1,772	1,654	1,335	1,464	1,858	1,876	2,458	2,948	1,778
Ivory Coast	n.a.	1,315	1,585	1,658	18,326	7,837	12,122	10,503	11,841
Tanzania	156	n.a.	307	435	1,277	250	538	859	1,708
Uganda	879	1,118	4,843	4,046	4,629	178	560	2,403	11,475
Other	954	1,012	1,179	653	786	1,587	682	1,384	2,482
Asia and Oceania	1,995	1,623	1,150	1,137	1,512	1,963	787	2,075	2,971
Indonesia	977	1,077	545	486	568	1,097	662	1,884	952
Other	1,018	546	605	651	944	864	125	191	2,019
Other 1/	2,840	3,124	3,325	3,557	1,327	673	1,351	2,392	1,851

n.a. = not available.

1/ Includes exports from nonproducing countries and unallocated imports.

Source: OECD and United Nations Trade Statistics.

Table A-8 --Summary of multiple linear regression analyses on per capita coffee consumption, selected countries, 1952-65

Country	Durbin Watson statistic	R ²	Function 1/	Multiple regression 2/
1a. United States	2.46	0.90	1	$\text{Log } Q_K^d = 1.92026 - \frac{0.18477}{(0.03554)} \text{Log } P_K - \frac{0.30904}{(0.13365)} \text{Log } P_T - \frac{0.02836}{(0.01478)} \text{Log } P_C + \text{Log } T_m$
1b. United States	2.01	0.86	1	$\text{Log } Q_K^d = 2.55133 - \frac{0.17486}{(0.03922)} \text{Log } P_K - \frac{0.51163}{(0.09140)} \text{Log } P_T + \text{Log } P_C$
1c. United States	2.90	0.93	1	$\text{Log } Q_K^d = 2.63549 - \frac{0.13578}{(0.03392)} \text{Log } P_K - \frac{0.00994}{(0.01474)} \text{Log } P_T - \frac{0.16256}{(0.06007)} \text{Log } P_C - \frac{0.52709}{(0.07703)} \text{Log } T_m + \text{Log } P_C$
1d. United States	1.10	0.79	1	$\text{Log } Q_{LK}^d = 0.15397 - \frac{0.10304}{(0.07152)} \text{Log } P_K + \frac{0.24430}{(0.17508)} \text{Log } P_T + \text{Log } P_C$
1e. United States	1.95	0.87	1	$\text{Log } Q_{LK}^d = 0.47911 - \frac{0.09920}{(0.06313)} \text{Log } P_K + \frac{0.06996}{(0.02960)} \text{Log } P_T + \frac{0.12781}{(0.15512)} \text{Log } P_C + \text{Log } T_m$
2a. United Kingdom	1.67	0.96	1	$\text{Log } Q_K^d = -2.10161 - \frac{1.51479}{(0.66313)} \text{Log } P_K + \frac{2.22534}{(0.42165)} \text{Log } P_T + \text{Log } P_C$
2b. United Kingdom	2.03	0.96	1	$\text{Log } Q_K^d = -4.27283 - \frac{2.14865}{(0.74362)} \text{Log } P_K + \frac{2.82620}{(1.80733)} \text{Log } P_T + \frac{2.40025}{(0.41186)} \text{Log } P_C + \text{Log } T_m$
2c. United Kingdom	1.78	0.96	1	$\text{Log } Q_K^d = -7.78674 + \frac{1.38307}{(2.36286)} \text{Log } P_K - \frac{1.55580}{(1.34542)} \text{Log } P_T + \frac{0.44816}{(0.73435)} \text{Log } P_C + \frac{3.25431}{(0.98528)} \text{Log } T_m + \text{Log } P_C$
3a. Canada	1.94	0.90	1	$\text{Log } Q_K^d = -1.46959 - \frac{0.23187}{(0.11491)} \text{Log } P_K + \frac{0.79169}{(0.31084)} \text{Log } P_T + \text{Log } P_C$
3b. Canada	1.51	0.94	1	$\text{Log } Q_K^d = -4.25499 - \frac{0.28811}{(0.09465)} \text{Log } P_K + \frac{1.75803}{(0.44094)} \text{Log } P_T - \frac{0.13050}{(0.04909)} \text{Log } P_C + \text{Log } T_m$
3c. Canada	1.97	0.73	2	$\text{Log } Q_K^d = -0.01182 - \frac{0.39566}{(0.14042)} \text{Log } P_K + \frac{1.76707}{(0.78705)} \text{Log } P_T + \text{Log } P_C$
3d. Canada	1.57	0.93	1	$\text{Log } Q_K^d = -0.59651 - \frac{0.15256}{(0.14569)} \text{Log } P_K + \frac{0.44985}{(0.26675)} \text{Log } P_T - \frac{0.06927}{(0.37932)} \text{Log } P_C + \frac{0.82004}{(0.39385)} \text{Log } T_m + \text{Log } P_C$
4a. Australia	2.29	0.92	1	$\text{Log } Q_K^d = 0.70107 - \frac{2.10218}{(0.59353)} \text{Log } P_K + \frac{1.63809}{(0.99091)} \text{Log } P_T + \text{Log } P_C$
4b. Australia	2.38	0.92	1	$\text{Log } Q_K^d = 2.01808 - \frac{2.49827}{(0.75594)} \text{Log } P_K + \frac{0.33058}{(0.38317)} \text{Log } P_T + \frac{1.22610}{(1.11054)} \text{Log } P_C + \text{Log } T_m$
4c. Australia	2.56	0.94	1	$\text{Log } Q_K^d = 4.84338 - \frac{2.10508}{(0.76717)} \text{Log } P_K + \frac{0.60402}{(0.40977)} \text{Log } P_T - \frac{0.91836}{(0.63394)} \text{Log } P_C - \frac{0.37438}{(1.52702)} \text{Log } T_m + \text{Log } P_C$
5a. Sweden	2.49	0.99	1	$\text{Log } Q_K^d = -2.61130 - \frac{0.25248}{(0.05743)} \text{Log } P_K - \frac{0.06348}{(0.04217)} \text{Log } P_T + \frac{1.04984}{(0.12704)} \text{Log } P_C + \text{Log } T_m + \text{Log } P_C$

Footnotes at end of table.

Continued

Table A-8 --Summary of multiple linear regression analyses on per capita coffee consumption, selected countries, 1952-65 -- Continued

Country	Durbin Watson statistic	R ²	Function 1/	Multiple regression 2/
5b. Sweden	2.49	0.99	1	Log Q _K ^d = -3.03551 - $\frac{0.28176}{(0.05706)}$ Log P _K + $\frac{1.16409}{(0.10758)}$ Log C _E
5c. Sweden	2.67	0.99	1	Log Q _K ^d = 2.48175 - $\frac{0.28419}{(0.05521)}$ Log P _K + $\frac{1.00869}{(0.15663)}$ Log C _E + $\frac{0.02821}{(0.02126)}$ Log T _m
6a. Denmark	3.00	0.92	1	Log Q _K ^d = -4.50901 - $\frac{0.62638}{(0.36628)}$ Log P + $\frac{0.17559}{(0.20480)}$ Log P _C + 1.59939 Log C _E
6b. Denmark	0.80	0.92	1	Log Q _K ^d = -3.53922 - $\frac{0.51433}{(0.38802)}$ Log P _K + $\frac{1.35971}{(0.31498)}$ Log C _E
7a. Norway	2.20	0.97	1	Log Q _K ^d = -1.79307 - $\frac{0.33323}{(0.12028)}$ Log P _K + $\frac{0.38322}{(0.18237)}$ Log P _M + $\frac{0.84283}{(0.27160)}$ Log C _E
7b. Norway	1.46	0.95	1	Log Q _K ^d = -1.68724 - $\frac{0.41937}{(0.12945)}$ Log P _K + $\frac{0.81799}{(0.31063)}$ Log C _E
7c. Norway	1.63	0.96	1	Log Q _K ^d = -2.35073 - $\frac{0.57207}{(0.16822)}$ Log P _K + $\frac{0.21173}{(0.15638)}$ Log P _C + $\frac{0.98501}{(0.32391)}$ Log C _E
7d. Norway	2.20	0.97	1	Log Q _K ^d = -2.13810 - $\frac{0.42889}{(0.17938)}$ Log P _K + $\frac{0.11507}{(0.15689)}$ Log P _C + $\frac{0.32684}{(0.20193)}$ Log P _M + $\frac{0.92995}{(0.30240)}$ Log C _E
8a. West Germany	1.54	0.96	1	Log Q _K ^d = 0.33662 - $\frac{2.32512}{(0.29043)}$ Log P _K + $\frac{0.81827}{(0.24597)}$ Log P _T + $\frac{1.12781}{(0.96682)}$ Log P _C + $\frac{0.23303}{(0.14213)}$ Log C _E
9a. France	1.66	0.95	1	Log Q _K ^d = -0.72514 - $\frac{0.32571}{(0.17036)}$ Log P _K + $\frac{0.39055}{(0.16954)}$ Log P _T + $\frac{0.31501}{(0.09623)}$ Log C _E
9b. France	1.66	0.96	1	Log Q _K ^d = 0.22565 - $\frac{0.28192}{(0.11941)}$ Log P _K + $\frac{0.23928}{(0.07304)}$ Log P _C + $\frac{0.13454}{(0.10481)}$ Log C _E
9c. France	1.69	0.96	1	Log Q _K ^d = 0.29856 - $\frac{0.26832}{(0.15740)}$ Log P _K - $\frac{0.04099}{(0.28529)}$ Log P _T + $\frac{0.25661}{(0.14304)}$ Log C _E + $\frac{0.12260}{(0.13814)}$ Log C _E
10a. Netherlands	3.03	0.99	1	Log Q _K ^d = -2.74486 - $\frac{0.77063}{(0.13321)}$ Log P _K + $\frac{1.31622}{(0.19765)}$ Log C _E
10b. Netherlands	3.07	0.99	1	Log Q _K ^d = -2.95867 - $\frac{0.80504}{(0.15648)}$ Log P _K + $\frac{0.13159}{(0.28070)}$ Log P _C + $\frac{1.38801}{(0.25593)}$ Log C _E
11a. Italy	2.35	0.98	1	Log Q _K ^d = -0.82012 - $\frac{0.26280}{(0.23610)}$ Log P _K - $\frac{0.00289}{(0.12530)}$ Log P _C + $\frac{0.81802}{(0.20557)}$ Log C _E
11b. Italy	2.35	0.98	1	Log Q _K ^d = -0.84218 - $\frac{0.26166}{(0.22013)}$ Log P _K + $\frac{0.82180}{(0.11803)}$ Log C _E

Footnotes at end of table.

Continued

Table A-8 --Summary of multiple linear regression analyses on per capita coffee consumption, selected countries, 1952-65 -- Continued

Country	Durbin Watson statistic	R ²	Function 1/	Multiple regression 2/
11c. Italy	2.12	0.98	1	$\text{Log } Q_K^d = +0.37504 - \frac{0.18288}{(0.28103)} \text{Log } P_K - \frac{0.3144}{(0.54578)} \text{Log } P_T - \frac{0.01755}{(0.13218)} \text{Log } P_C + \frac{0.69798}{(0.29782)} \text{Log } CE$
12a. Switzerland	2.71	0.97	1	$\text{Log } Q_K^d = -.48306 - \frac{1.05429}{(0.42287)} \text{Log } P_K + \frac{0.58336}{(0.22516)} \text{Log } P_C + \frac{0.46250}{(0.30325)} \text{Log } CE$
12b. Switzerland	1.71	0.95	2	$\text{Log } Q_K^d = -1.55855 - \frac{0.40376}{(0.41960)} \text{Log } P_K + \frac{0.72569}{(0.35219)} \text{Log } CE$
13a. Austria	1.70	0.99	1	$\text{Log } Q_K^d = -6.96787 - \frac{0.41198}{(0.20798)} \text{Log } P_K + \frac{1.93069}{(0.18005)} \text{Log } CE$
13b. Austria	1.72	0.99	1	$\text{Log } Q_K^d = -6.92956 - \frac{0.44028}{(0.29208)} \text{Log } P_K + \frac{0.02198}{(0.15104)} \text{Log } C + \frac{1.92603}{(0.19133)} \text{Log } CE$
13c. Austria	2.13	0.77	2	$\text{Log } Q_K^d = 0.01631 - \frac{0.23270}{(0.34276)} \text{Log } P_K + \frac{1.37574}{(0.88671)} \text{Log } CE - \frac{0.03649}{(0.01919)} \text{Log } T_m$
13d. Austria	1.72	0.99	1	$\text{Log } Q_K^d = -6.92956 - \frac{0.44028}{(0.29208)} \text{Log } P_K + \frac{0.02198}{(0.15104)} \text{Log } P_C + \frac{1.92603}{(0.19133)} \text{Log } CE$

1/ "1" indicates a double log function. "2" indicates a first difference -- double log function.

2/ Numbers in parentheses are standard errors.

Q_K^d = per capita consumption in green bean equivalent (kilograms); Q_{LK}^d = per capita liquid consumption (cups); P_K = real price of coffee per kilogram; P_T = real price of tea per kilogram; P_C = real price of cocoa per kilogram; P_M = real price of milk per kilogram; CE = real per capita consumer expenditures; T_m = time (trend).

Table A-9 --Value and volume of coffee exports by producing countries under projection sets I and II compared with the base period, 1964-66

Region and country	Coffee exports in base period		Projection set I				Projection set II			
	1964-66		1980		Change from 1964-66		1980		Change from 1964-66	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
	<u>Thousands</u>									
Central America:										
Costa Rica	50,617	48,339	69,820	66,678	19,203	18,339	77,953	52,151	27,336	3,812
Dominican Rep.	27,776	23,748	38,314	32,758	10,538	9,010	42,777	25,623	15,001	1,875
El Salvador	100,168	90,752	138,170	125,182	38,002	34,430	154,265	97,804	54,097	7,052
Guatemala	95,438	89,521	131,645	123,483	36,207	33,962	146,950	96,566	51,542	7,045
Mexico	89,852	71,702	123,940	98,904	34,088	27,202	138,377	77,353	48,525	5,651
Other	79,536	71,574	109,710	98,728	30,174	27,154	122,491	77,167	42,955	5,593
Total	443,387	395,636	611,599	545,733	168,212	150,097	682,843	426,664	239,456	31,028
South America:										
Brazil	909,188	746,443	1,254,116	1,029,629	344,928	283,186	1,400,204	805,117	491,016	58,674
Colombia	352,262	355,432	485,903	490,276	133,641	134,844	542,505	383,009	190,243	27,577
Ecuador	38,322	30,428	52,861	41,972	14,539	11,544	59,018	32,814	20,696	2,386
Peru	36,595	30,813	50,478	42,502	13,883	11,689	56,358	33,195	19,763	2,382
Other	25,325	20,278	34,933	27,971	9,608	7,693	39,002	21,850	13,677	1,572
	1,361,692	1,183,394	1,878,291	1,632,350	516,599	448,956	2,097,087	1,275,985	735,395	92,591
Latin America	1,805,079	1,579,030	2,489,890	2,178,083	684,811	599,053	2,779,930	1,702,649	974,851	123,619

Continued

Table A-9 --Value and volume of coffee exports by producing countries under projection
set I and II compared with the base period, 1964-66 -- Continued

Region and country	Coffee exports in base period		Projection set I				Projection set II			
	1964-66		1980		Change from 1964-66		1980		Change from 1964-66	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
	<u>Thousands</u>									
Africa:										
Cameroon	55,706	38,326	76,840	52,866	21,134	14,540	85,791	41,351	30,085	3,025
Zaire	37,370	23,468	51,547	32,372	14,177	8,904	57,552	25,323	20,182	1,855
Ethiopia	74,742	66,595	103,098	91,860	28,356	25,265	115,107	71,827	40,365	5,232
Ivory Coast	187,741	116,963	258,966	161,336	71,225	44,373	289,132	126,062	101,391	9,099
Kenya	44,750	44,750	61,727	61,727	16,977	16,977	68,918	48,242	24,168	3,492
Malagasy Rep.	44,552	28,068	61,454	38,716	16,902	10,648	68,613	30,258	24,061	2,190
Angola	151,381	99,760	208,812	137,607	57,431	37,847	233,136	107,475	81,755	7,715
Tanzania	37,604	32,415	51,870	44,712	14,266	12,297	57,912	34,921	20,308	2,506
Uganda	156,476	94,824	215,840	130,799	59,364	35,975	240,982	102,176	84,506	7,352
Other	89,655	58,922	123,668	81,276	34,013	22,354	138,073	63,526	48,418	4,604
Total	879,977	604,091	1,213,822	833,271	333,845	229,180	1,355,216	651,161	475,239	47,070
Asia and Oceania:										
India	26,819	24,942	36,994	34,404	10,175	9,462	41,303	26,888	14,484	1,946
Indonesia	89,788	31,246	123,852	43,100	34,064	11,854	138,279	33,740	48,491	2,494
Papau and New Guinea	10,042	9,028	13,852	12,453	3,810	3,425	15,465	9,727	5,423	699
Other	10,236	7,663	14,120	10,571	3,884	2,908	15,764	8,263	5,528	600
Total	136,885	72,879	188,818	100,528	51,933	27,649	210,811	78,618	73,926	5,739
Other countries n.e.s.:	14,601	12,907	20,140	17,804	5,539	4,897	22,486	13,919	7,885	1,012
World total	2,836,542	2,268,097	3,912,670	3,129,686	1,076,128	860,779	4,368,443	2,446,347	1,531,901	177,440

n.e.s. = not elsewhere specified.

Table A-10 --Value and volume of 1980 coffee exports by producing countries under projection sets I and II

Region and country	Projection set I		Projection set II		Change from set I	
	Tons	Dollars	Tons	Dollars	Tons	Dollars
	<u>Thousands</u>					
Central America:						
Costa Rica	69.8	66,678	78.0	52,151	8.1	-14,527
Dominican Republic	38.3	32,758	42.8	25,623	4.5	-7,135
El Salvador	138.2	125,182	154.3	97,804	16.1	-27,378
Guatemala	131.6	123,483	147.0	96,566	15.3	-26,917
Mexico	123.9	98,904	138.4	77,353	14.4	-21,551
Other	109.7	98,728	122.5	77,167	12.8	-21,561
Total	611.6	545,733	682.8	426,664	71.2	-119,069
South America:						
Brazil	1,254.1	1,029,629	1,400.2	805,117	146.1	-224,512
Colombia	485.9	490,276	542.5	383,009	56.6	-107,257
Ecuador	52.9	41,972	59.0	32,814	6.2	-9,158
Peru	50.5	42,502	56.4	33,195	5.9	-9,307
Other	43.9	27,971	39.0	21,850	4.1	-6,121
Total	1,878.3	1,632,350	2,097.1	1,275,985	218.8	-356,365
Latin America total	2,489.9	2,178,083	2,780.0	1,702,649	290.0	-475,434

Continued

Table A-10 --Value and volume of 1980 coffee exports by producing countries under projection sets I and II -- Continued

Region and country	Projection set I		Projection set II		Change from set I	
	Tons	Dollars	Tons	Dollars	Tons	Dollars
	<u>Thousands</u>					
Africa:						
Cameroon	76.8	52,866	85.8	41,351	9.0	-11,515
Zaire	51.5	32,372	57.6	25,323	6.0	-7,049
Ethiopia	103.1	91,860	115.2	71,827	12.0	-20,033
Ivory Coast	259.0	161,336	289.1	126,062	30.2	-35,274
Kenya	61.7	61,727	68.9	48,242	7.2	-13,485
Malagasy Rep.	61.5	38,716	68.6	30,258	7.2	-8,458
Angola	208.8	137,607	233.1	107,475	24.3	-10,132
Tanzania	51.9	44,712	57.9	34,921	6.0	-9,791
Uganda	215.8	130,799	241.0	102,176	25.1	-28,623
Other	123.7	81,276	138.1	63,526	14.4	-17,750
Total	1,213.8	833,271	1,355.2	651,161	141.4	-182,110
Asia and Oceania:						
India	37.0	34,404	41.3	26,888	4.3	-7,516
Indonesia	123.9	43,100	138.3	33,740	14.4	-9,360
Papua and New Guinea	13.9	12,453	15.5	9,727	1.6	-2,726
Other	14.1	10,571	15.8	8,263	1.6	-2,308
Total	188.8	100,528	210.8	78,618	22.0	-21,910
Other	20.1	17,804	22.5	13,919	2.3	-3,885
World total	3,912.7	3,129,686	4,368.4	2,446,347	455.8	-683,339

APPENDIX B

MAJOR OPERATIONAL AND ADMINISTRATIVE ASPECTS OF THE INTERNATIONAL COFFEE ORGANIZATION

Historical Background of the International Coffee Agreements

From the middle 1950's through the late 1960's, the world coffee industry was plagued by overproduction; from 1955 through 1961, the industry's problems were intensified by a sharp decline in world coffee prices (fig. 2). In an effort to halt the economic decline of the coffee producing industry, a sequence of multinational producer organizations was formed. By the early 1960's, this sequence had effectively laid the groundwork for the first International Coffee Agreement (1962), which included all major coffee importing countries as well as the major producer-exporters.

The highlights of the sequence of organizations which culminated in the 1962 International Coffee Agreement are as follows: 30/

- | | |
|----------------|--|
| May 1955 | The International Coffee Bureau was formed by 15 Western Hemisphere nations and the Belgian Congo. The main purpose was to study possible stabilization methods. |
| October 1957 | The Mexico City Agreement was signed by seven major Latin American producers -- an unsuccessful effort to support the market through informal export limitations. |
| June 1958 | The Coffee Study Group was established by 30 producing and consuming nations to seek a solution to the worsening surplus problem. |
| October 1958 | A 1-year Latin American Coffee Agreement came into being, incorporating provisions for export retention; however, this agreement did not have enforcement clauses. |
| October 1959 | The Latin Pact acquired world scope by recruiting French-associated countries and Portuguese Angola. |
| September 1962 | A new 5-year International Coffee Agreement was approved at the United Nations by 58 coffee exporting and importing countries. An international coffee organization was formed to carry out the mandates of the agreement. |

30/ Taken largely from (18, p. 38).

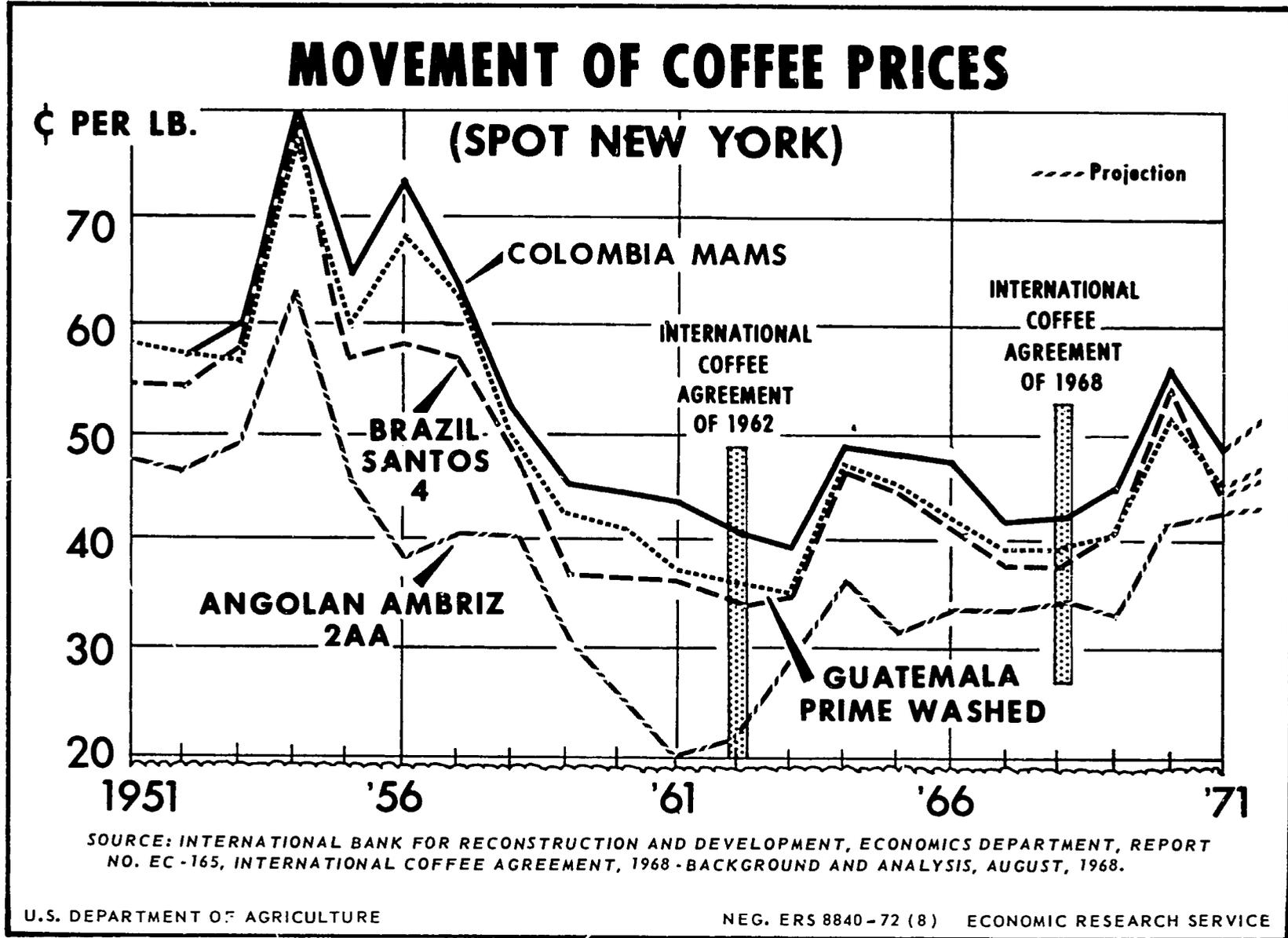


Figure 2

February 1968 A successor to the 1962 agreement was approved by the International Coffee Council. By March 31, 1968, 53 member governments had signed the agreement.

Organizational Aspects of the International Coffee Organization

The principal governing body of the International Coffee Organization (ICO) is the International Coffee Council (ICC), which is composed of the representatives of all the member governments. The exporting members on the ICC together hold 1,000 votes and the importing members, 1,000 votes. The exporting members are assigned votes in proportion to their individual basic export quotas and the importing members are assigned votes in proportion to their coffee imports. No member may hold more than 400 votes. All major ICC decisions are debated and voted upon.

Objectives of the 1962 and 1968 International Coffee Agreements

The objectives of the International Coffee Agreements are as follows:

1. To achieve a reasonable balance between supply and demand on a basis which will assure adequate supplies of coffee to consumers and markets for coffee to producers at equitable prices, and which will bring about long-term equilibrium between production and consumption;
2. To alleviate the serious hardship caused by burdensome surpluses and excessive fluctuations in the prices of coffee to the detriment of the interests of both producers and consumers;
3. To contribute to the development of productive resources and to the promotion and maintenance of employment and income in the member countries, thereby helping to bring about fair wages, higher living standards, and better working conditions;
4. To assist in increasing the purchasing power of coffee exporting countries by keeping prices at equitable levels and by increasing consumption;
5. To encourage the consumption of coffee by every possible means; and

6. In general, in recognition of the relationship of the trade in coffee to the economic stability of markets for industrial products, to further international cooperation in connection with world coffee problems.

Another objective of the coffee agreements -- the stabilization of world coffee prices -- was enumerated within the text of the agreements. It was stipulated that prices should be "equitable" and if there were "marked price rises or falls occurring within brief periods," the export quotas might be adjusted by the ICC so as to stabilize the market. Although not specified, it was envisioned that "the general level of coffee prices would not be allowed to decline below the 1962 average."

Management of the World's Imported Coffee Supply

The main mechanism for controlling world prices is the restriction of export volumes from producing countries. Each year, the ICC makes a determination of global export requirements (the annual quota) which would support the agreement's export price objectives. Thus, the annual quota is the total amount which may be shipped by all member countries. Each country's basic quota represents its percentage share of the total annual quota. Although basic quotas are expressed in terms of numbers of bags, they represent in fact the country's percentage of the total. For example, Colombia's 1965 basic quota was 6,011,280 bags and all basic quotas totaled 46,504,363 bags. Therefore, Colombia's percentage share is 12.93 percent. This percentage is considered when future quotas are established.

Export quotas can be adjusted during the "quota" year if the price goals of the ICA are not being realized. Thus, the quota aspects of the ICO can be likened to a faucet which increases or decreases the flow of coffee to the world's coffee import markets.

Maintenance of World Coffee Export Prices

The general price objective of the 1968 agreement was carried forward from the 1962 agreement. However, the 1968 agreement does make an important policy departure from the 1962 agreement by incorporating an article relating to the selective system of adjusting exports on the basis of price changes in the various groups of coffee. This provision specifies that, for the duration of the new agreement, separate price ranges will be maintained for robustas, unwashed arabicas, and the two groups of mild arabica coffees. These ranges are subject to modification from year to year, as was done in the last 2 years of the 1962 agreement, to reflect changes in market conditions. This system of selective price quota adjustments is designed to ensure that shifts in consumer demand for the various types of coffee will be satisfied through corresponding adjustments in the export quotas for the various types of coffee (27, p. 24).

Price zones for each of the four groups are to be set by the ICC at the beginning of each coffee marketing year at the time when the market requirements and the effective quotas are determined for the following year. The ICC may set different ranges each year, altering them upward or downward (as has been done in the past) depending on market conditions. If, for any group, the price stays above the ceiling or below the floor for 15 consecutive market days, the quotas for that group would be adjusted upward or downward to stabilize prices within the range (27, p. 24).

Other Functions of the International Coffee Organization

Establishment of Production Goals

As mentioned, a major objective of the agreement is to bring coffee production and consumption into balance. A significant step in that direction was taken by incorporating a provision requiring the establishment and application of specific production goals for each exporting member. By 1973 -- when the 1968 agreement expires -- production in each country should approximate its internal consumption, permitted exports, and appropriate stocks. As a means of enforcement, violators will forfeit quota increases and may eventually be expelled from the agreement. Coffee importing countries are also required to refrain from offering assistance to coffee producing countries which continue production policies that conflict with the objectives.

Diversification Fund

As a complement to production goals, a Coffee Diversification Fund was established to assist members in the necessary adjustment of production that will be required of some of them. The fund is financed primarily by producing countries which are required to contribute a minimum of 60 cents for each bag of coffee exported above a basic exemption of 100,000 bags. These contributions are expected to amount to at least \$30 million per year. Thus, during the lifespan of the 1968 agreement, a minimum of \$150 million will be contributed by producing countries. Consuming countries may also make voluntary contributions to the fund.

Coffee Promotion

To expand coffee consumption, the exporting countries agreed to finance promotional activities, and to this end, the ICO established a world coffee promotional committee (WPC). WPC activities include advertising, public relations, consumer education, and research. The committee operates a promotion fund financed by a compulsory levy on exports to quota markets.